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### FAQ: Renewable Energy FAQ

- [Batteries -- Can I use car batteries in my solar/wind RE system?](#)
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Batteries -- Can I use car batteries in my solar/wind RE system?  
car batteries are not a good choice for this type of an application.

[DETAILS >>](#) (0 Comments) [\[Top\]](#)

Batteries -- What voltage should my SLA battery read when fully charged?  
This question gets asked allot along with a few other SLA (Sealed Lead Acid) related questions.

[DETAILS >>](#) (0 Comments) [\[Top\]](#)

everything you wanted to know about magnetism but were to repulsed to ask  
for all those magnetics questions look here

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Systems -- Fuses and Circuit Breakers -- where do I put them in a system?  
For safety's sake, there are different places to put them, with different types of fuses and breakers required.

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Wind -- Can I use a car alternator to build a wind generator?  
You could...but they are poorly-suited for the task,

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requiring high rpms to make power, and have other problems.

[DETAILS >>](#) (0 Comments)

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Wind -- Can I use a car voltage regulator to regulate my wind generator?

No, vehicle voltage regulators are built to perform a completely different function.

[DETAILS >>](#) (0 Comments)

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Wind -- How do I regulate voltage from my windmill to my battery bank?

The batteries actually regulate themselves, UNTIL they get full. At that point you must start diverting power to a Dump Load.

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Wind -- How do you get the windmill power down the tower, since the mill yaws into the wind?

Commercial slip rings are expensive...you can build your own, or go with a simple "pendant cable." Read on....

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# OTHERPOWER.COM

The **CUTTING EDGE** of Low Technology



### **The first of the Triplets is set free and flies!**

Over the last few weeks, Otherpower.com has been building a set of Wind Triplets -- 3 axial-flux brake disc wind turbines named Curly, Moe and Larry. The 3 brake disc alternators are identical, but Curly and Moe sport 10-foot props and Larry an 8-footer. This one is Moe, and it's up and flying at TomH's cabin. So far so good -- Moe starts spinning in 5 mph winds and has been producing good power at under 15 mph windspeeds. **We completed a detailed series of web pages about the construction of the triplets--[you can check it out HERE.](#)**

## Thank you for dropping by!

We are a group of alternative energy enthusiasts who want to spread the message that *It's EASY to make your own power FROM SCRATCH!* Otherpower.com's headquarters is located in a remote part of the Northern Colorado mountains, 15 miles past the nearest power pole or phone line. All of our houses and shops run on only solar, wind, water and generator power...not because we are trying to make some sort of political or environmental statement, but because *these are the only options available.* And we refuse to move to town.

We could never have made it to our current level of electrification up here without the help of friends, neighbors--and folks we've never met, thanks to the internet. Our goal is to share our information about experimental successes and failures alike, free of charge, with anyone who is interested. We also offer a wide selection of books and hard-to-find alternative energy parts and components on our [web Shopping Cart](#). We hope you find our pages informative, useful and enjoyable!

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## OUR NEWEST PAGE

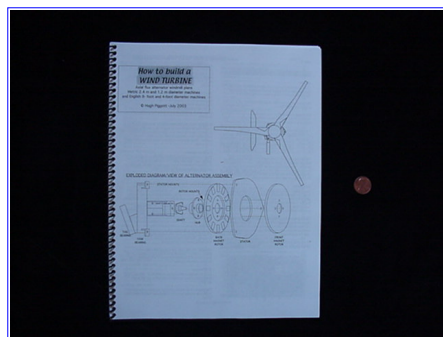
### [Hamster-Powered Alternator](#)



Skippy the Hamster is Forcefield's newest employee! We custom-built a low-rpm permanent magnet alternator onto his exercise wheel, and he lights a night light at DanF's house. We installed a data acquisition computer on his wheel too! And of course this simple alternator, buildable by kids, would work for wind or hydro power experiments and science fair projects too.

## OUR NEWEST PRODUCT

### [Axial Flux Alternator](#) [Windmill Plans by Hugh Piggott](#)



The latest of Hugh Piggott's axial-flux wind turbine plans.

Detailed CAD drawings, dimensions, photos, instructions, and theory. Build for 12, 24 or 48 vdc, both an 8-foot and a 4-foot diameter version. All the information you need to build a wind turbine from scratch!

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**SAFETY NOTE:** Some of the experiments described on our pages may present various hazards. Please be cautious. We are not responsible for injury resulting from neglecting safety precautions when performing experiments.



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This page last updated 12/01/2003

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# Construction of a 10' diameter Wind Turbine

## With Furling Tail

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[Para Español, traducción de Julio Andrade.](#)

**These pages are HUGE with lots of photos to download, so please be patient...it may take some time. All of the diagrams drawn with DanCAD are scanned larger than they appear on these pages. Sometimes they don't show very clearly, depending on your screen size. If you have trouble reading a diagram -- first try Right Click --> View Image to enlarge it. You can also do Right Click --> Save Image or Right Click --> Print Image to get the hi-res version.**



This is a sort of diary about how we built the last 5 windturbines, all of which are pretty much identical. The windmills use axial field, dual rotor alternators, with a furling tail system and a 10 foot diameter 3 blade prop. It's very much inspired and along the lines of Hugh Piggott's latest design. [Click Here](#) to visit his site for lots of useful information.

The windturbine I'm describing here turns very freely and should start generating power at, or below 7mph. [Click here](#) to see a less detailed page about a nearly identical machine I helped a neighbor build earlier in the summer. They spin easily, they start charging in low winds, and seem to work pretty well. They are quiet, slow.. and seem safe and strong. Time will tell, this is an experiment!

Here is a fairly complete list of the materials we used, not including the tower.

80" of 1/2 - 13 allthread

10" of 1/4 - 20 allthread

44 1/2 - 13 nuts

2 1/4 - 20 nuts

1 washer 2" outer dia and 1/2" inner dia

6' of 3/4" steel pipe

6.5" of 1" steel pipe

2' of 2" X 3/16" steel bar stock

3 or 4' of 1" X 1/8" steel bar stock

A half of 1/2" plywood

about 6 square feet of 3/8" plywood

18" square piece of 3/4" plywood

A little bit of 1/4" masonite and misc lumber scraps for the coil winder

A quart of polyester resin and some fiberglass fabric

A bottle of baby (talcum) powder

thin viscosity superglue and accellerator for hardening coils

5 pounds of AWG 14 magnet wire

24 NdFeB magnets 2" diameter X 1/2" thick

strut tube/wheel spindle assembly from a volvo 240

2 11" diameter brake rotors from a volvo 740 or 850

3 boards, 5' long and at least 1.5" thick and 7.5" wide

lots of 1.5" long wood screws, at least 60

And for tools, I used common hand tools and power tools. A metal lathe is nice for this - there are a couple quick simple things that can't be done easily without it. The lathe work is easy and any machine shop could do it quickly

and cheaply for you. A bit of redesigning and one could live without it. I had a welder, a drill press, belt sander, power planer.. the usual! A draw knife is a **MUST HAVE** for carving the prop. I'd not try this project without a reasonable workspace and plenty of tools. For me, it takes about 30 hours to build one - I don't fret too much about little details or getting things just perfect.

The most expensive part of the project is the magnets, they cost around \$250. The rest of the cost depends on what gets purchased new, what gets salvaged, and resources on hand. I like to use salvaged, or recycled materials whenever possible. I'd figure the cost of the whole system not including batteries or a tower to be around \$300-\$400. In the end we get a machine which performs quite well, especially in low windspeeds. I think one would be lucky to get similar performance from a commercial machine costing less than \$1500. I think it's a great way to go so long as the resources are on hand and so long as it's fun! In the end there is a wind turbine which the builder understands, and feels comfortable maintaining, modifying, and repairing.

This page will often have pictures of different machines in progress. When we built these, I had 2 neighbors come by and we worked together on 3 machines at one time to make things a bit more efficient and fun!



Pictured above are the Volvo 240 strut assemblies we start with. Volvo made the 240 for almost 20 years! They should be easy to find. We have to remove any extra parts that come with the strut assembly.

We'll need to remove the strut inside (shock absorber), any brake parts, and the spring. One should probably either pay a shop to remove the spring, or get a spring compressor. These springs are under quite a bit of tension in this assembly. Simply loosening the large nut which holds all this together will result in the spring popping off with quite a lot of force! I've seen them fly over 20', if you are not very careful this could be quite dangerous. We'll take the wheel hub off, remove the bearings - clean and re-grease them. The Volvos are nice, they have very nice large wheel bearings which may never wear out in this application. Compared to banging your Volvo up and down the road, these bearings don't see much stress in a wind turbine application.

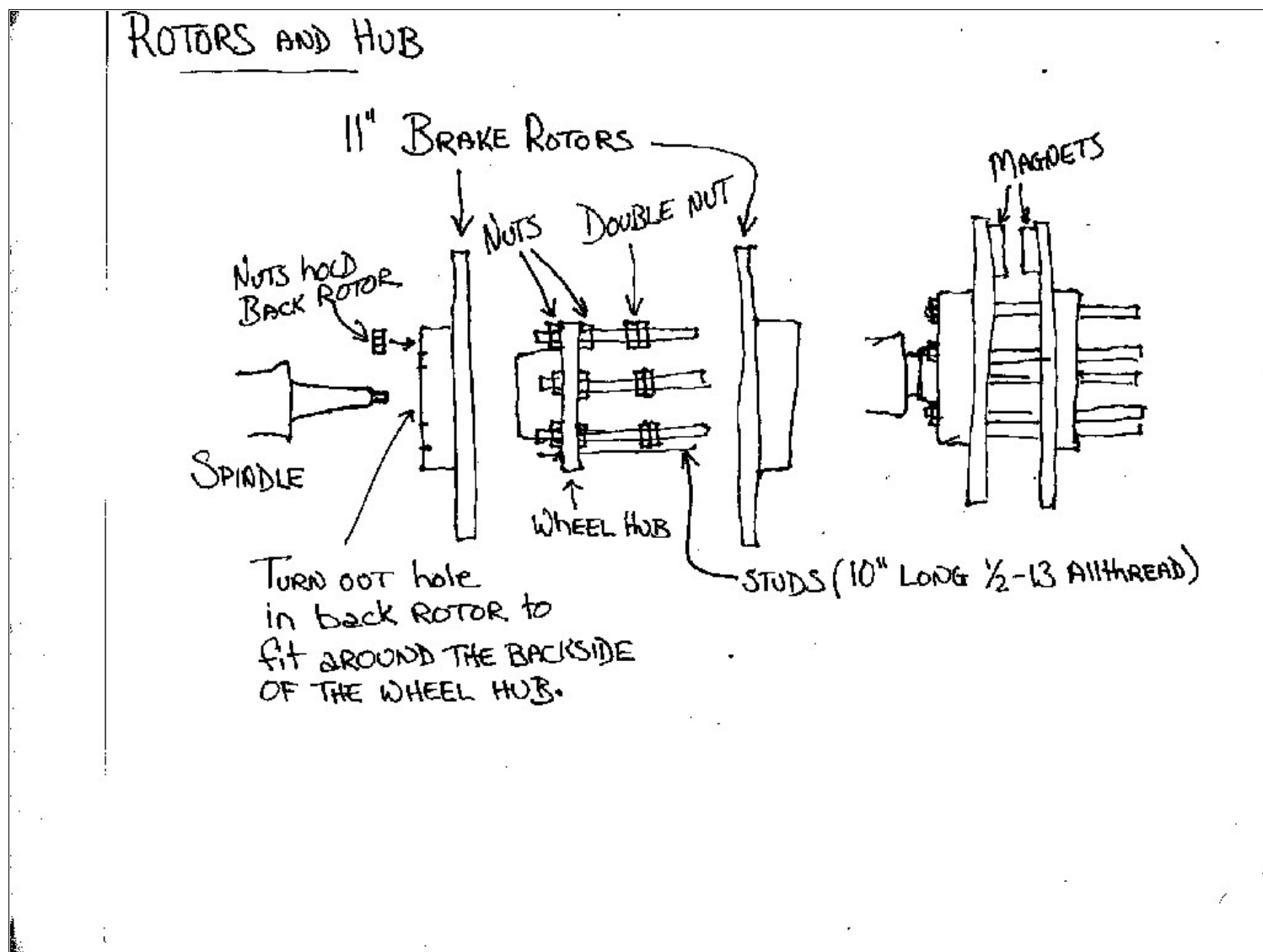


The Volvo 240 comes with 10" diameter brake rotors. I prefer a bit more diameter for a machine this large, so I found larger rotors on some of the newer Volvos - and they fit the same bolt pattern. Brake rotors on modern cars get thrown away frequently. Our local Volvo shop always has a dumpster full of them! Each machine requires 2 11" diameter brake rotors, these will be the "armature" for the alternator. Each rotor will have 12 magnets fixed to it.



I like to turn down the inside of the brake rotors just a bit. This leaves a rougher, yet flat surface for gluing the magnets down. We also leave a very thin lip on the very outer edge of the rotor to help with placing the magnets in a concentric circle - and to help hold the magnets in against the centrifugal force they'll see when the alternator is turning quickly. This is an easy operation- if I didn't have a lathe I think any automotive machine shop could do it quickly.

The other important operation with the lathe, is to bore the hole in the middle of 1 brake rotor a bit larger so that it can fit over the back side of the wheel hub. The picture below will hopefully show that.



The picture above shows how 5 long studs, made from the 1/2" - 13 allthread will hold all this together. The coils will exist between the two brake rotors, in between the magnets. These brake rotors were designed to fit over the front of the wheel hub, and the hole in the middle is not quite large enough to fit over the backside of it, so this is why we need to turn it out just a bit with the lathe. I suppose this could be done with a grinder or something...



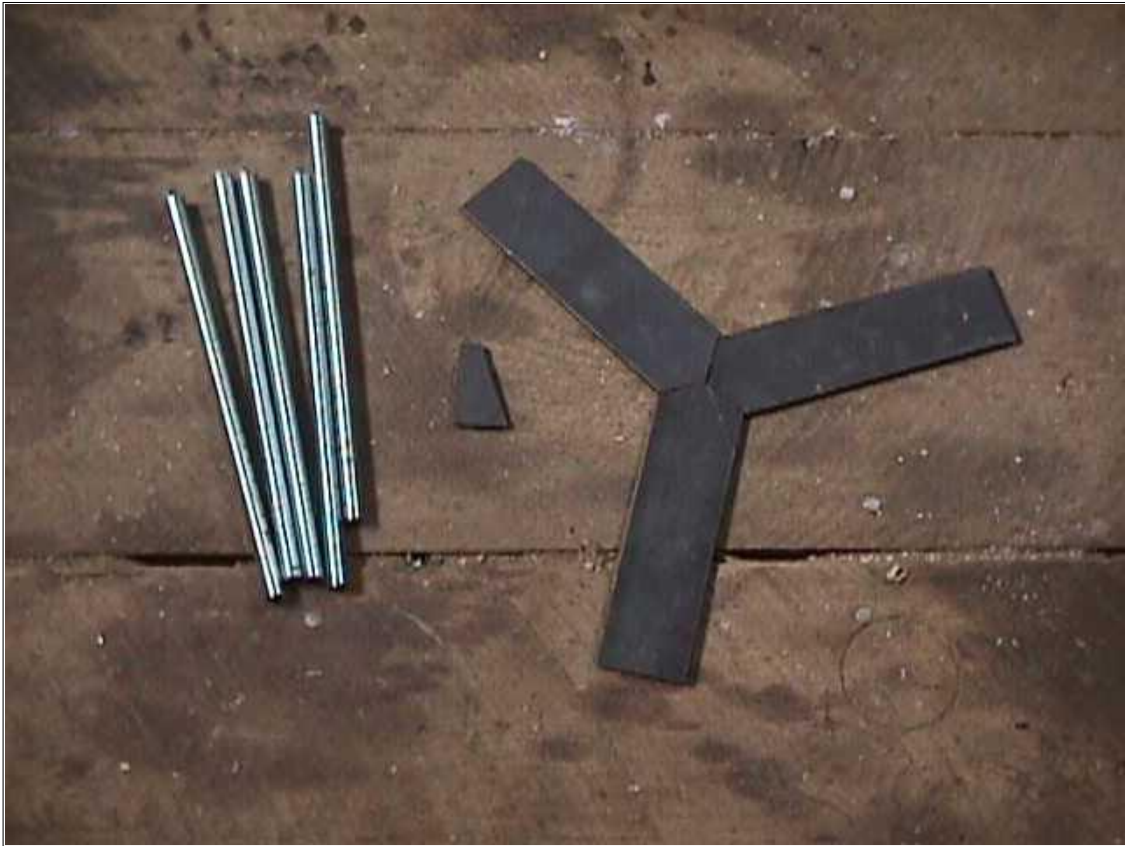


Above is shown the brake rotors after being turned. You can see that the hole in the ones on the left is slightly larger than those on the right. After machining them, we clean them carefully with paint thinner or gasoline so that we can glue the magnets on later.



Tom is cutting pieces on the saw. It's nice to get a list of all the parts you need to cut and get it over with in one shot. Here Tom is cutting a 5' piece of 3/4" pipe, 5 pieces of 1/2"-13 allthread 10" long, 3 pieces of

1/2"-13allthread 6" long, 1 piece of 3/4" pipe about 6" long, and 1 piece of 1" pipe about 6.5" long. We also need 3 pieces of 2" barstock cut at 7" long, with a 120 deg angle on one end. These are for the bracket which will hold the stator in place. A picture of that is below. It's important to be careful and try to leave nice edges when cutting allthread, either with a bandsaw or a hacksaw! It saves time... cleaning all these ends up with a grinder so the nuts will thread on is tedious and completely unnecessary if you make careful and clean cuts.

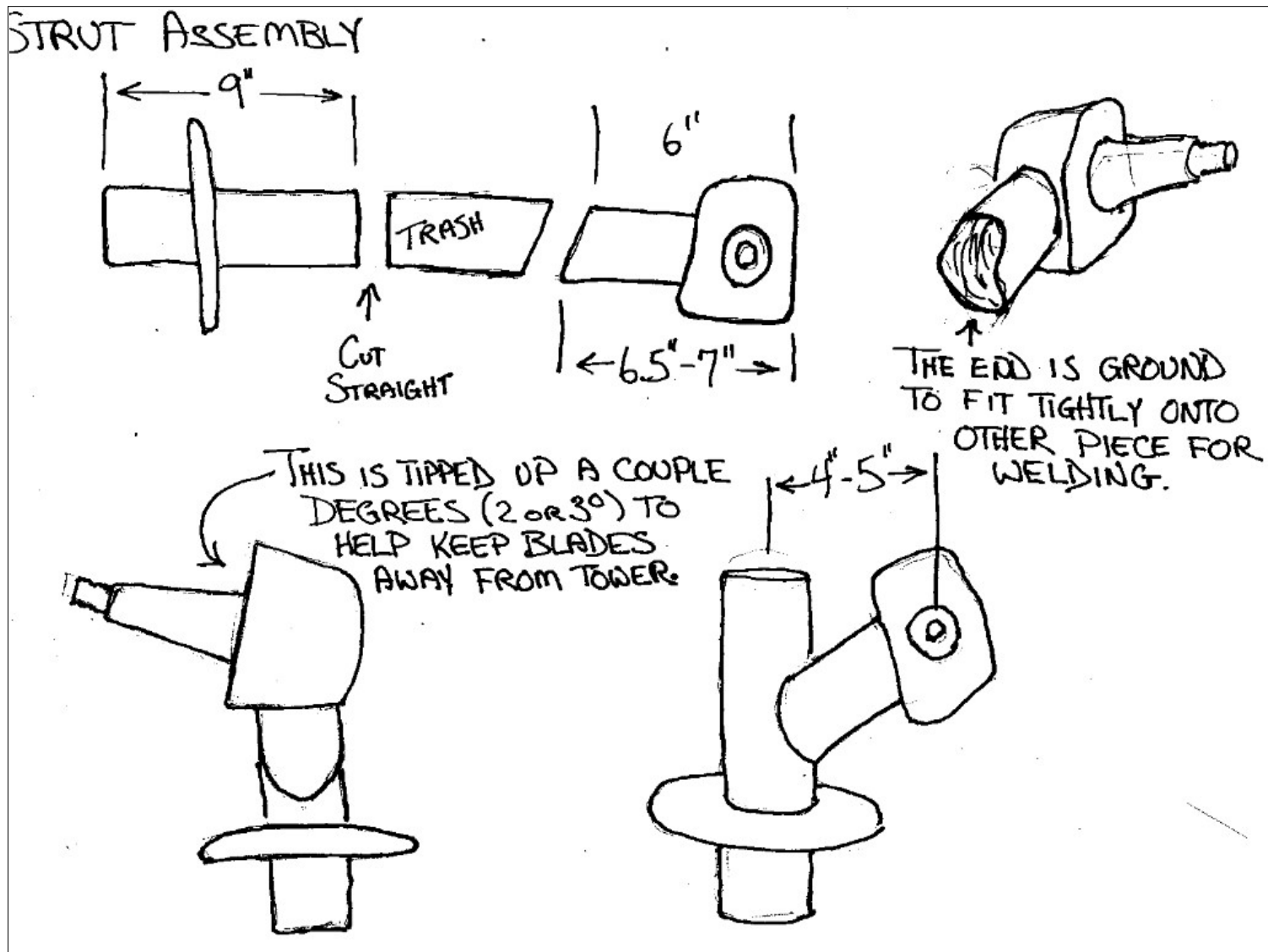


Pictured above are some of those pieces I described above.

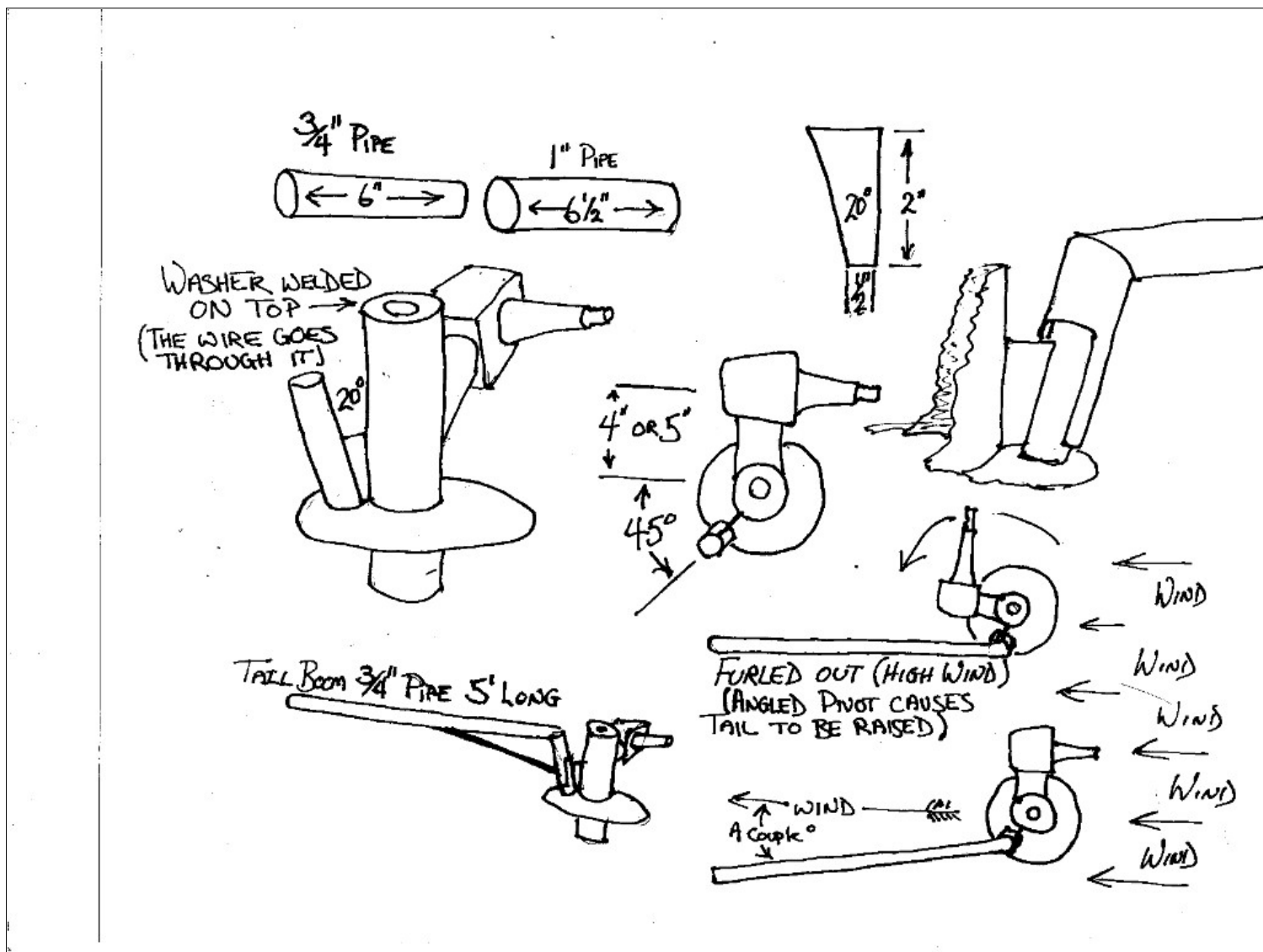




Above we can see the strut assembly mostly stripped of it's extra parts. The picture below will show how we need to cut this up and weld it back together to make the furling system work.



In the older and simpler wind turbines I made there was no system by which the machine could turn away from high winds. In this one there is, and part of that simple system requires that the alternator be offset to the side of the tower a bit. So we need to cut up the strut tube! I used a bandsaw, it could be done with a torch, grinder, or hacksaw. The picture above describes (hopefully) how we cut it and weld it together. The angle is not critical, and things should work fine so long as the center of the wheel spindle is about 4"-5" to the side of the main tube which fits over the tower (yaw bearing).



The picture above shows how we weld the tail pivot to the strut assembly. The 2" tall 20 degree wedge is important for this. Looking at the picture, you can see also how the tail fits over the 3/4" pipe we welded on and pivots. The tail is welded to the 1" pipe, which should allow it to pivot over the 3/4" pipe. I've noticed that some 1" pipe fits nicely over 3/4" pipe, and some does not. It's probably wise to check when buying the pipe! I wound up having to grind ours down a bit to make things fit.

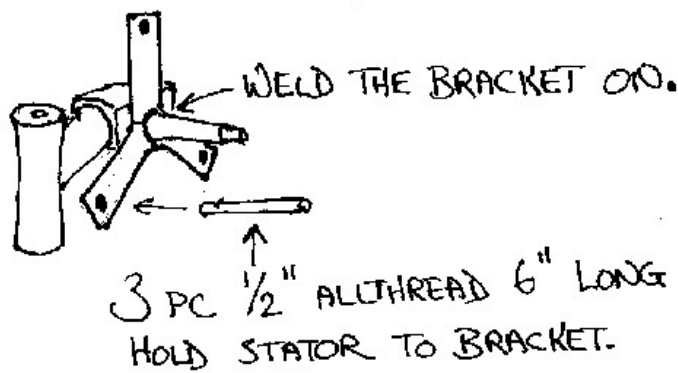
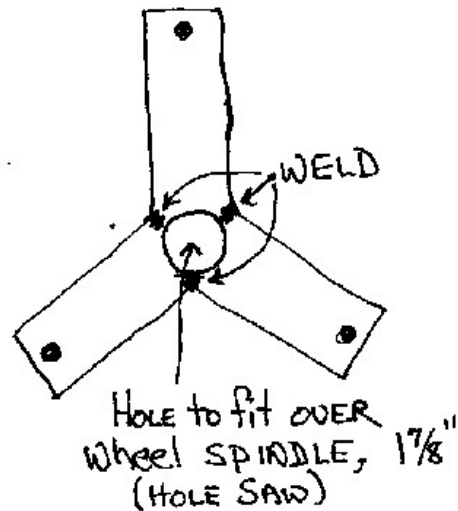
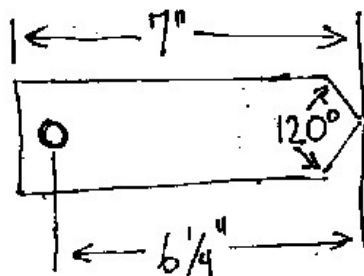
At some point we'll grind (or cut) a notch in the 1" pipe to which the tail is welded. This notch will serve as the stop to determine where the tail rests in normal operation and where it stops in high winds when it's completely furled away from the wind.



Above you can see the assembly described in the last picture. Again, there are 3 because we were building 3 machines at one time.

# STATOR BRACKET

$\frac{3}{16}$ " x 2" BAR STOCK

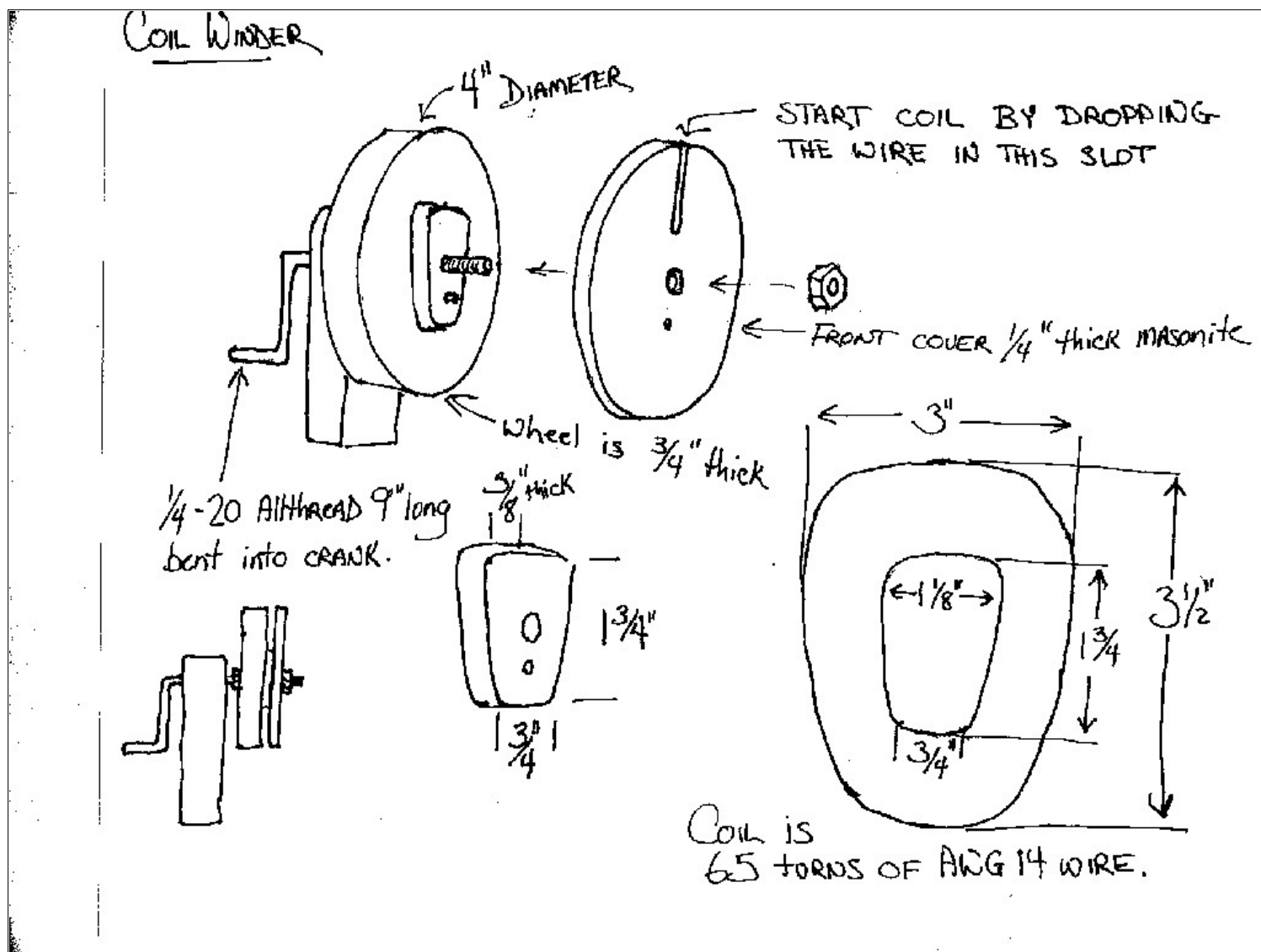


The drawing above shows the stator bracket I mentioned earlier, and how it will be welded to the assembly we've been making.



Here we see the basic frame for the windturbine with the stator brackets welded on. Now we can start really building the alternator!

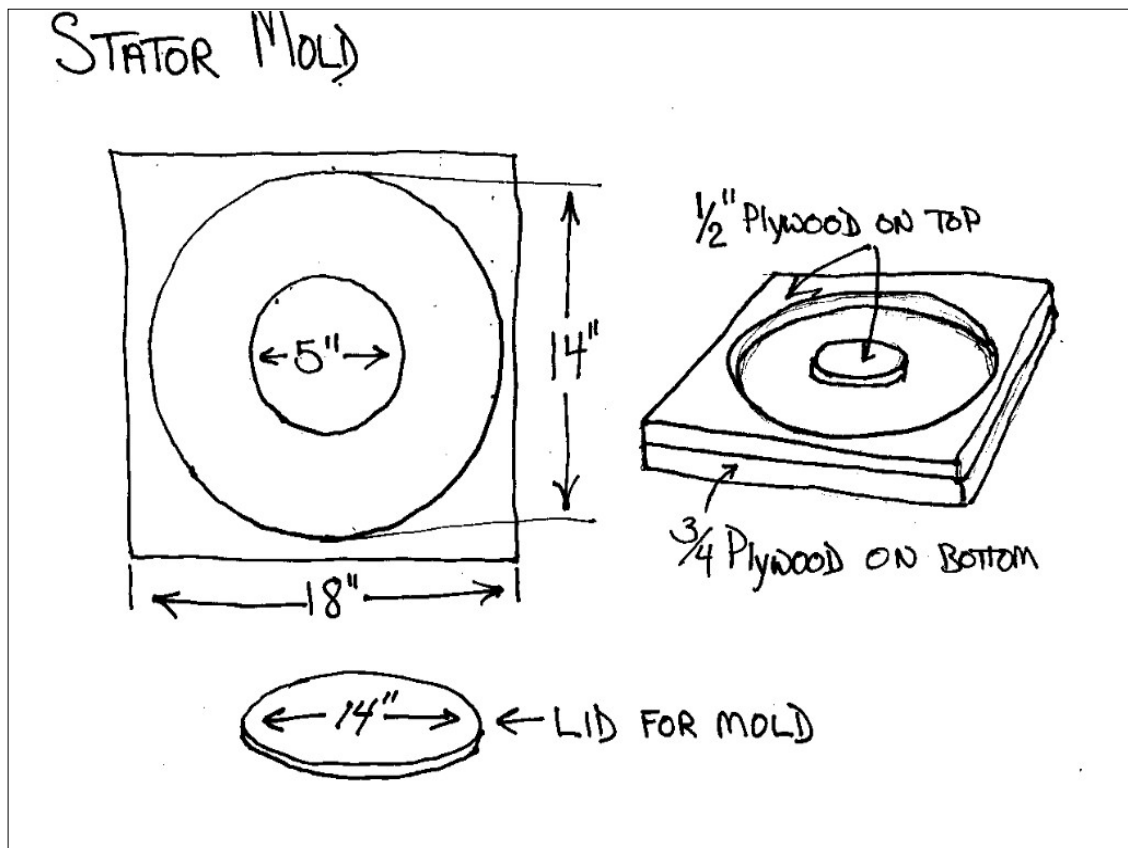




Above I've drawn some details about the coil winder I used. We need to make this because we need 9 nice tight identical coils. Each coil will be 65 windings of AWG 14 enameled magnet wire. Basically the coil winder is made up of two disks 4" diameter. I drill them 1/4" in the middle so they fit over 1/4" allthread tightly. The shaft and crank are of one piece of 1/4 - 20 allthread with a crank bent on the end. The back disk in the winder is thick wood (1/4") and it fits tightly over the allthread and it glued on there. The center part of the spool is of 3/8" material - this is the part we'll wind the wire over. I like to sand it very smooth, and give it a slight taper (so the front is slightly narrower and shorter than the back) so that the finished coils slide off easily. The front of the coil winder has a slot so we can drop the wire in there and tie it off to the shaft when we start winding a new coil. Before using it, I wax it carefully. (well be putting glue on the coils and this keeps the coil from getting glued down!) We bolt the front on it, drop the end of the wire in the slot (leaving about 10" sticking out) - and wrap the end around the shaft to secure it. I hold the wire with tension in one hand while winding with the other, taking care to keep the wire reasonably tight, and the windings pretty neat. It goes very quickly. The drawing shows about the size the coils should come out. Once the coil is done, before removing it I put a bit of thin viscosity super glue on it. It soaks into the coil tightly gluing all the windings together and making the coil quite hard and tough. I then spritz the coil with accelerator and the glue dries instantly. It's a neat sort of glue, very handy! [Click here](#) to find that on our shopping cart. Once the glue is hard the coil should be easy to remove. Sometimes they are a bit tight and gentle prying with a butter knife or something helps.



Pictured above is the glue, the coil winder with the lid off showing a coil... and a few coils I wound. Once all 9 coils are wound we're almost ready to build the stator! First we have to make a mold.



The mold we made is very simple, the picture above leaves little to be explained. It's all screwed together. It's important to sand it well, and leave the insides slightly tapered so that the casting will slip out easily. In the bottom of the mold I take a heavy black marker and draw lines at 40 deg to each other so that we have exact spaces to put



our 9 coils. The lines should be heavy so we can see them through 1 layer of fiberglass material and some resin.



Pictured above is the finished mold. The dark purple spots are caulk we used to fill gaps and cracks between wood... this just helps the casting come out more easily. Before using the mold, we need to put some kind of release agent in there. Auto polish wax works great... we didn't have any so we used axle grease! Lard, butter... I'm sure lots of things would work fine!



We need some fiberglass in the stator for strength. Pictured above DanF is cutting out 2 rings of fiberglass fabric exactly the size of the stator, 14" diameter with a 5" hole in the middle. We'll have one of these on each side of the coils for reinforcement.



Pictured above we are wiping axle grease all over the mold to assure things will come out easily in the end.





We mix up a little polyester resin and put it in the bottom of the mold. Then we lay the fiberglass fabric over that, and pour a little more resin over the top. We work it in with gloves so the fiberglass is completely soaked in resin. At that point it becomes somewhat transparent so we can see the lines we drew in the bottom of the mold and we can tell exactly where the coils should be placed. Something to note about polyester resin: It smells bad! Some folks will get headaches... it's the sort of horrible smell that can stick with you for hours! A respirator is probably wise. You don't want it in your eyes, so safety goggles would be appropriate. It's sticky - messy, so wear latex gloves or something to keep it off your skin and hands.

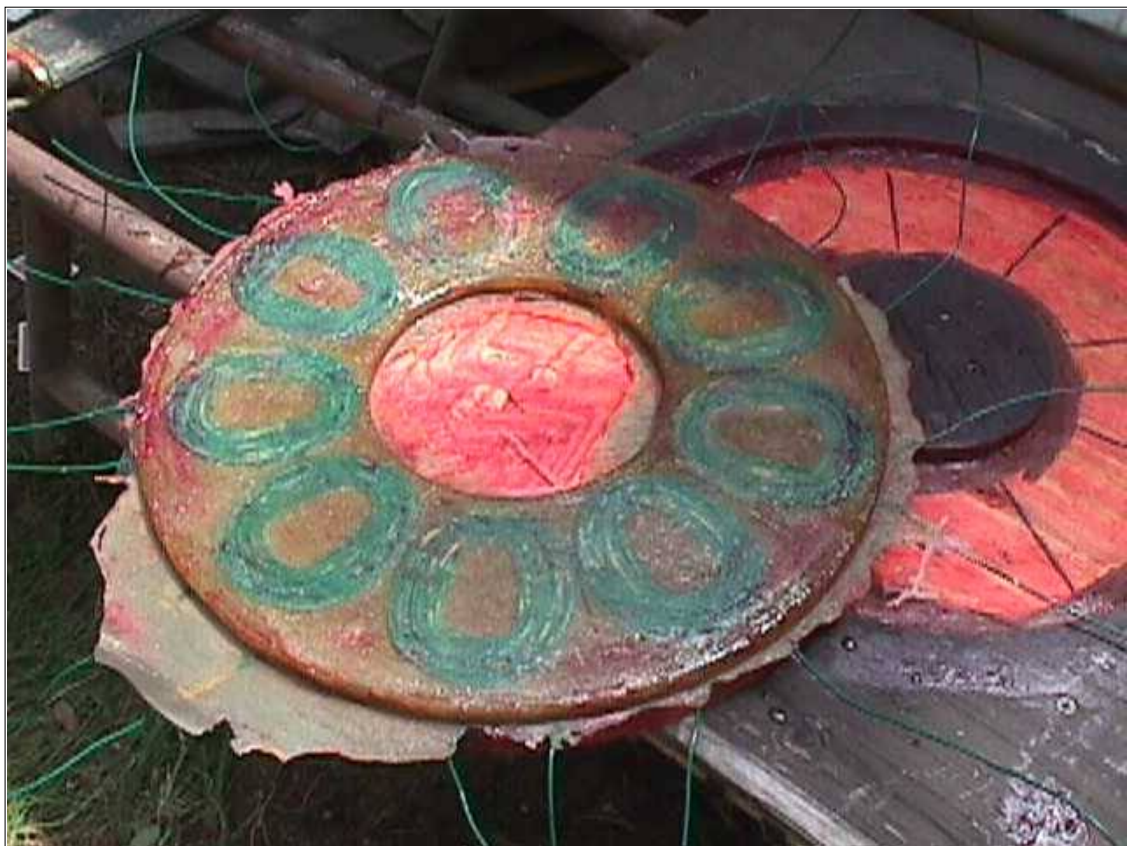


Pictured above we've layed the coils in the mold, as you can see they fit pretty tightly! This picture is actually from an earlier machine so it's not quite right. Since then I've shortened the coils a bit and made the hole in the center of the mold a bit smaller so that the coils have less wire in them, lower resistance - and don't come quite so close to the outer edge of the mold. It's important to push the coils in towards the center of the mold as much as possible so they are existing directly beneath the magnet rotors. The leads from the coils should stick out the sides in an organized fashion. Each coil has a "start" - the inside lead, and an "end"- the outside lead - I like to keep them organized so that wiring them up is easy later on. At this point we mix up more resin and add some talcum powder - mix it up real well. By volume, a half and half mix is reasonable though it could be thinner. The talcum powder adds some strength and lets the resin go a bit further. We pour that into the mold till the coils are covered, and then lay on top the other fiberglass fabric ring. We can then mix up a little more resin (without talc) and pour it over the top making sure the fabric is completely soaked and transparent.





Once the resin is poured we put the lid on the mold and put lots of weight on it to keep things clamped down and flat. Best is to leave it like this overnight.... I get impatient and usually wait about 2 hours!



And here we have an almost finished stator! All we have now to make a functional alternator is to bolt it on, wire it up, and add a couple of magnet rotors. Lots of pictures in this page and LOTS more to go!

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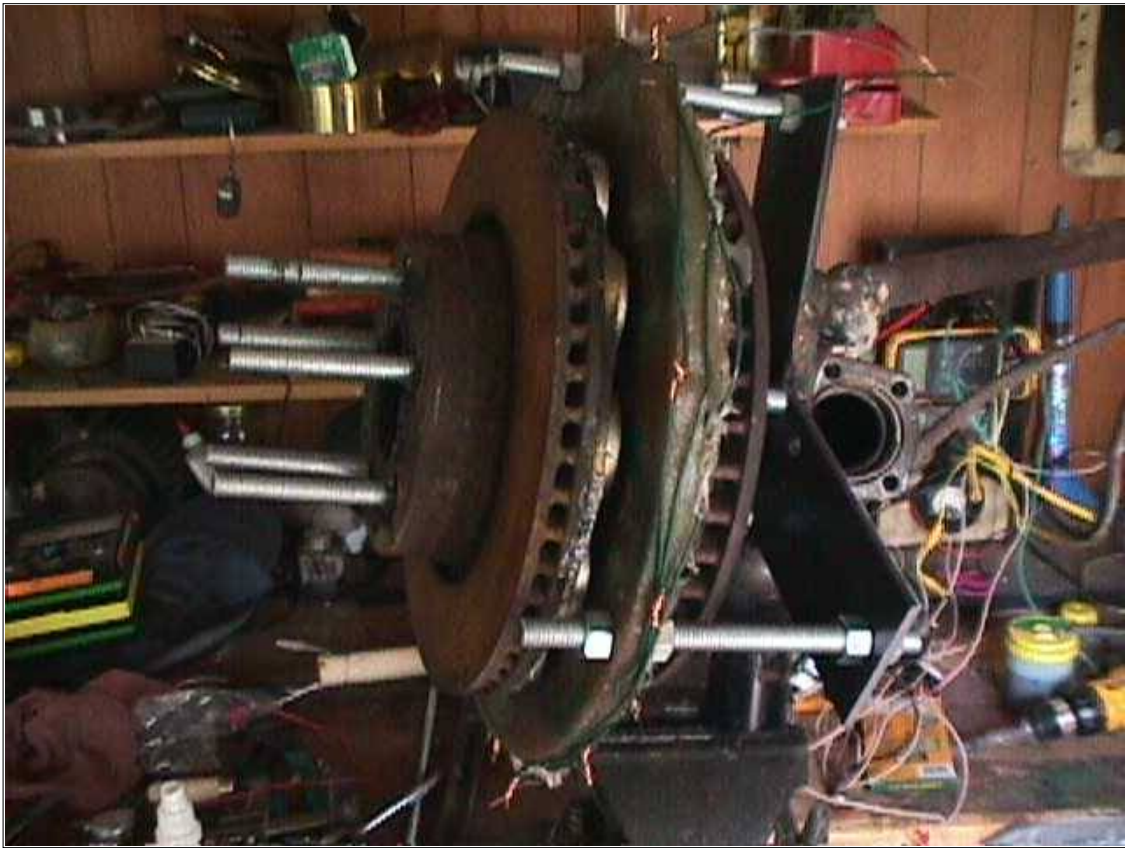
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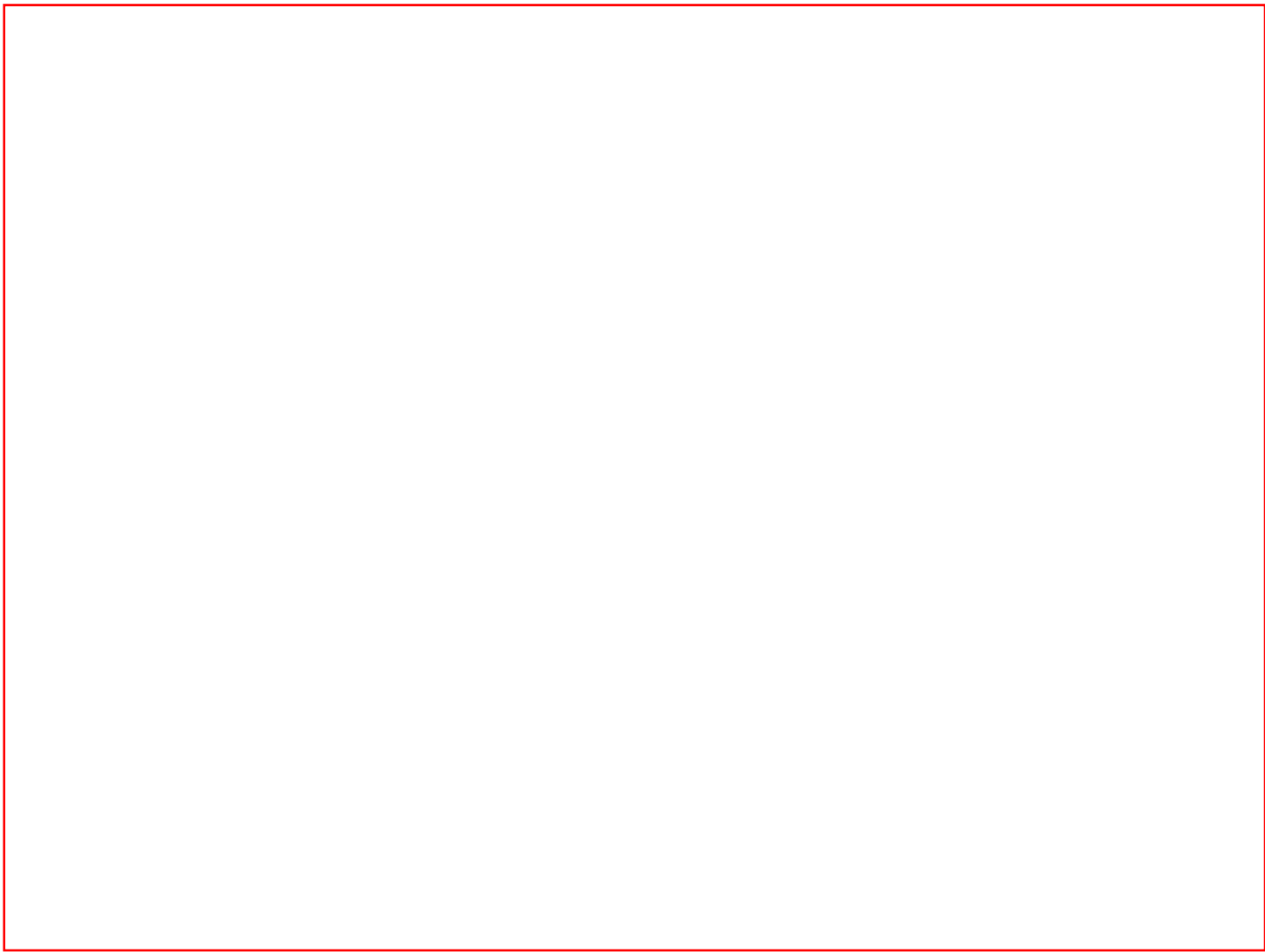




In the picture above we've put the front rotor on, and basically the alternator is done. Putting the front rotor on is not necessarily easy or safe the way I do it! Perhaps better would be to weld a bracket and a nut onto the inside of the front rotor so we could safely lower it down. The force between these two magnet rotors is fantastic! What I do, is carefully hold the front rotor up, and line up the marked hole with the marked stud so I know its close to the right position. Then, quickly, I place the rotor on there so that it's resting on top of the studs! This is a bit tricky, because the magnets are attracted to the studs and unless things are fairly well centered the rotor will be pulled into the studs and I have to pull it off and try again. This could be resolved if we used stainless steel allthread studs, but I'm not sure the extra cost and difficulty cutting stainless warrants it.

Once the rotor is sitting on top of the studs slightly skewed, I can then rotate it a bit so that it lines up with the studs. **It's very important to hold the rotor in such a way that there is NO POSSIBILITY that fingers could get caught between the rotor and the stator!** I then start lowering the rotor down over the studs, and very quickly the magnetic force will yank it from my hands and it will be sucked down onto the nuts which hold it into place! Again - a jacking screw in the center of the rotor would improve this operation a good bit, I think it's well worth the time to do so and will next time! As it is, this bangs on with gobs of force and sounds a bit like a gun going off when it comes into place. Without a jacking screw or a wheel puller, it will be impossible to remove! At this point, we can rotate the alternator. The gap between the front rotor should remain the same as it rotates (none of that sort of wobble is tolerable). Again, a bit of up and down/side to side wobble could be balanced out... it means we didn't get the studs quite straight probably. But wobble that changes the distance between the stator and rotor must be fixed with the adjusting nuts.

I've really not had much problem with either though, the worst being less than 1/16". If all looks good, then we know it's well adjusted and don't have to make any changes. We'll take it apart 1 more time for painting. If all doesn't look good, we keep disassembling it/putting it back together until it does! In either case, at this point we can turn the alternator and check output. At 60 rpm (1 revolution per second) we should see about 6 volts AC between any of the two terminals on the stator.



Above is a drawing of the wheel puller as we made it. This doesn't do much to help peaceful lowering of the magnet rotor I don't think, it's not stable enough, but it does pull the rotor back nicely so that we can get it back far enough from the back rotor to safely remove it by hand. It might be better to weld the 3.5" steel part of the puller to the inside of the front rotor, this way it might be easier to use and it might serve well to lower the rotor back on easily. If I were going to do that, I think I would upgrade to thicker steel and larger allthread just to be sure nothing could bend.



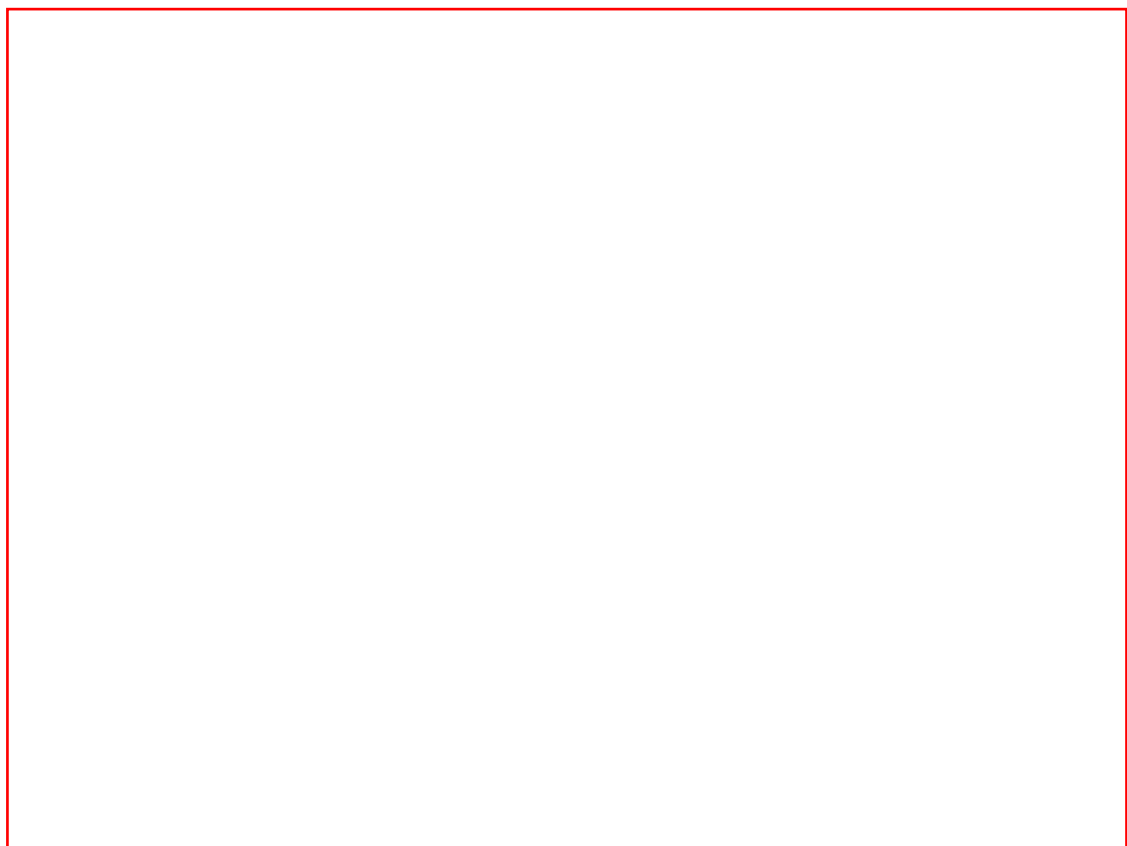
In the picture above we are hand turning the alternator and testing for output.



I didn't get many good pictures of this, but above is shown the notch in the tail pivot which sets the stops for the furling system. We like to weld a bead around it to strengthen it here and hopefully prevent cracking. The drawing on page one shows this to some degree. The notch must allow the tail to pivot around so that it's almost perpendicular to the wheel spindle on which the alternator rotates during furling (in high winds) and it must stop it



As per the drawing above, the tips of the blades are only 3/8" thick, and the root is full thickness. So quite a bit of material needs to be removed. Pictured above we are cutting off this extra wood on the bandsaw. We leave a bit of extra, just in case we make a mistake with the saw, it gets tricky ripping through the thickest part of a board this way, it's best to leave some room for error.



I used to think the saw, hammer, chisel and power planer was the way to make a blade! After spending a bit of



To rough out the airfoil, First we plane (I use a power planer) the back side of the prop down so it's to the right thickness. ( $3/8$ " at the tips tapered to full board thickness at the root) Then I draw a line,  $1/3$  of the way back from the front (leading edge) of the prop, and use the draw knife (and power planer) to basically carve it into a triangle. From here it's quick to use the drawknife and the power planer to make a nice looking airfoil.



The picture above shows the airfoil almost finished up.



We pulled the tower up with a truck and a chain. It went smoothly! At the time of writing this page, the machine has been up for about a month. It turns in the lightest of winds and seems to make 10 amps in practically the lightest breeze. In higher winds it speeds up some and makes reasonable power, although again, I think the blade could be a bit larger if we wanted more power from the machine, especially in higher winds. As it is, you can never hear any noise from the blades and it's making good power when we need it most! (7-15mph winds) It seems we're getting a good 100 watts around 10mph, which is quite reasonable for a 10' prop. We probably see about 500 watts or so at 25 mph and maybe 700 at 30 when it starts furling out of the wind. 500 watts in 25 mph is a bit less than we'd hope for from the 10' prop, and I believe it's because the alternator is a bit too powerful for it.

A larger prop could still cut in nicely at 7mph and have the power to bring the alternator up to speed in higher winds. As it is, our alternator produces 12 volts DC at 110 rpm. If our 10' prop runs at a tip speed ratio of 7, we could actually be hitting that speed in about a 5.5mph wind! So it seems reasonable, that if we wanted more power from the machine, an 11 foot prop would be appropriate... although it would work the machine harder and heat up the alternator more.

So, we could run a bigger prop I think, but for safety, quiet, and peace of mind I'm quite pleased the way it is. Tom used to conserve power, he only had 200 watts worth of solar. I believe he's got well over twice the power he had, especially in winter. Since we installed this he's usually turning the machine off early in the day as he cannot seem to use enough electricity! It's been lots of fun.

I've tried to cover most of the details about building this. I'd strongly suggest that anybody considering such a project first do a bit of homework!

Check out these pages....

[Hugh Piggott's website!](#) This machine is very much along the lines of his design and his plans are the main inspiration.

[Windstuffnow](#) for lots of useful formulas, 3 phase alternator education, ideas projects and plans.

[Our Discussion board](#), because this sort of thing is mostly what we talk about!

[Windpower Workshop](#), you'd be silly to set out on such a project without reading this first!

[Hugh Piggott's Axial Field Wind turbine plans](#) are excellent! Similar to the machine described in these pages, yet lots more detail and well proven!

[The Caboose Windmill page](#) is an almost identical machine we built earlier in the year. There's less detail, but it might be useful!

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This page last updated 9/29/2003

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[WWW.WONDERMAGNET.COM](http://www.wondermagnet.com)

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# CONSTRUCCION DE UNA TURBINA DE 10 PIES DE DIÁMETRO - Con Veleta Oscilante

## Página 3

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Al final de la [página 2](#) dejamos nuestra máquina casi terminada excepto por ajustes finales, pintarla y fabricar las aspas.

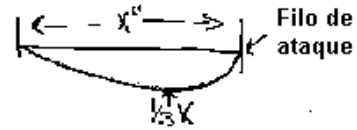
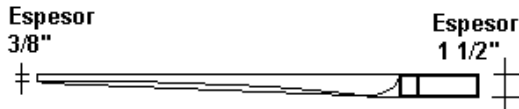




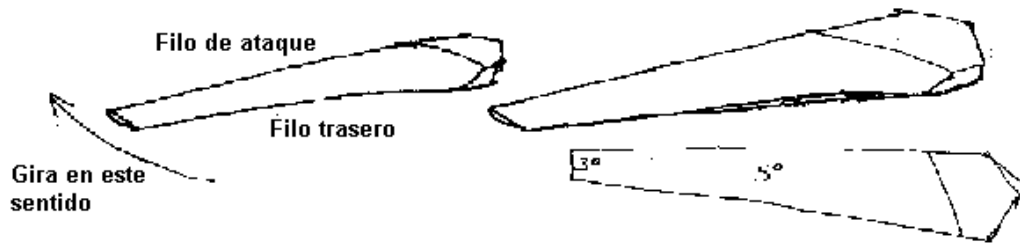
Esta es la última oportunidad que tenemos de pulir nuestro trabajo eliminando esquirlas y restos de metal. Luego desarmaremos toda la máquina, la limpiaremos con gasolina y le daremos sus manos de pintura. Si quiere no pinte el estator. Las bobinas le dan un toque interesante al conjunto.



Aquí tenemos el resultado después de pintar la máquina.



**Ala sencilla.** Su grosor máximo esta a 1/3 de su anchura desde el filo de ataque  
 (Si el aspa tiene 3" de ancho, su grosor máximo está a 1" de su filo de ataque)



El dibujo anterior muestra cómo trabajamos las aspas. No hay nada de científico en ello. Es posible que con un ángulo de ataque de 5° en toda su longitud trabaje igual. El bisel puede ser recto y no curvado. La razón por la que las hicimos así fue por pura distracción. En el [sitio de Hugh Piggott](#) o en la página [Ed's page on blade design](#) seguramente habrán ideas que usted puede estudiar. La naturaleza de este alternador es tal que un aspa de 10' podría resultar pequeña en presencia de ráfagas violentas (Más de 30 KPH). Esto nos proporciona menor producción a alta velocidad pero en compensación obtenemos seguridad y silencio. Todo es cuestión del viento que se tenga.



Empezamos con tablas de 5 pies de largo, 7 ½" de ancho y 2" de espesor. Luego dibujamos el contorno de un aspa y lo cortamos. Eso nos da una plantilla del contorno de las tres aspas.



La foto de arriba muestra las tablas cortadas.





Como se ve en el dibujo anterior, la punta del aspa es de 3/8" de espesor y en el eje es de espesor completo. Hay que quitar bastante material. Una sierra es útil en el primer paso. Debemos dejar algo de espesor extra para prevenir errores.





Ni una sierra, martillo, formón ni una lijadora eléctrica sirven para fabricar un aspa. Un cepillo y en último caso una escofina es lo mejor. Hemos trazado líneas en el canto de la madera para guiarnos en la profundidad del corte. Con un buen cepillo este trabajo inicial se hace en 15 minutos. El remate se puede hacer con una lijadora eléctrica de disco o de correa.



En la foto anterior se puede ver cómo limpiamos la superficie de la madera para llegar al corte que deseamos.



Para dar forma de ala a la madera usamos una lijadora. Observe la curva que queremos en la punta.



La fotografía anterior nos muestra el aspa y su curva casi terminada.



No es bueno dejarse llevar por la perfección. Fabricar tres aspas toma un día. Pero si tratamos de hacer un trabajo perfecto podemos pasar varios días en una sola aspa. Lo importante es que parezcan lo más posible entre sí dentro de las medidas dadas.

Una vez fabricadas las unimos. Nuestra tapa consiste de dos discos de madera de  $\frac{1}{2}$ ". El disco trasero tiene 10" de diámetro. El frontal sólo 8". Las aspas deben ser colocadas equidistantes entre sí. Hecho eso, atornillamos el aspa a su sitio con bastantes tornillos. Colocadas las aspas sólo queda pintarlas con alguna pintura resistente al agua. Finalmente deben pintarse con varias manos de pintura a base de linaza.





Y aquí está todo listo. Ahora lo que tenemos que hacer es balancear las aspas, hacer el circuito eléctrico y poner funcionar la turbina. Para balancear las aspas la impulsamos a mano y determinamos qué lado pesa más al lado opuesto colocamos pequeños trozos de plomo con unos tornillos. A veces basta con arandelas.





Este alternador será instalado en la casa de un vecino (Que ayudó en su construcción. Vamos a construir una torre izable de 30' (Unos 9 metros). No es gran cosa, pero estamos trabajando con lo que encontramos por aquí. En todo caso, hay espacio libre para que el viento se desplace. En la fotografía se puede ver dónde decidimos colocar la base de la torre. Es un pedazo de granito que aflora de una roca en el suelo. Le hemos perforado varios agujeros de  $\frac{1}{2}$ " a la roca con un taladro de percusión. El trozo metálico es parte de una viga en H que servirá de base al pivote que fabricaremos de tubos. Este método de fijación es el que nos gusta por acá ya que hay bastante grandes rocas de granito aflorando no sólo para la base sino para los vientos de la torre. Al rellenar los agujeros con cabillas que pegamos con resina epóxica logramos bases muy resistentes.



El trozo de viga ha sido soldado a las cabillas. Lo normal es fabricar una base plana y nivelada. En la montaña esto no es posible. Para subir la torre no dispondremos sino de un solo cable para subir y bajar la torre. Esa base debe ser muy resistente. En un sitio plano las cosas cambiarían.



Para fabricar la torre estamos usando los restos de una escalera. Uno de sus tubos es de 2" soldado a otro tubo de 1 ½". Una de las secciones nos servirá de base de la torre y la otra nos servirá de brazo de izamiento. En la fotografía estamos cortando lo que necesitamos para soldarlo posteriormente a su forma final.





Aquí podemos ver la torre en la medida en que la armamos sobre la base.

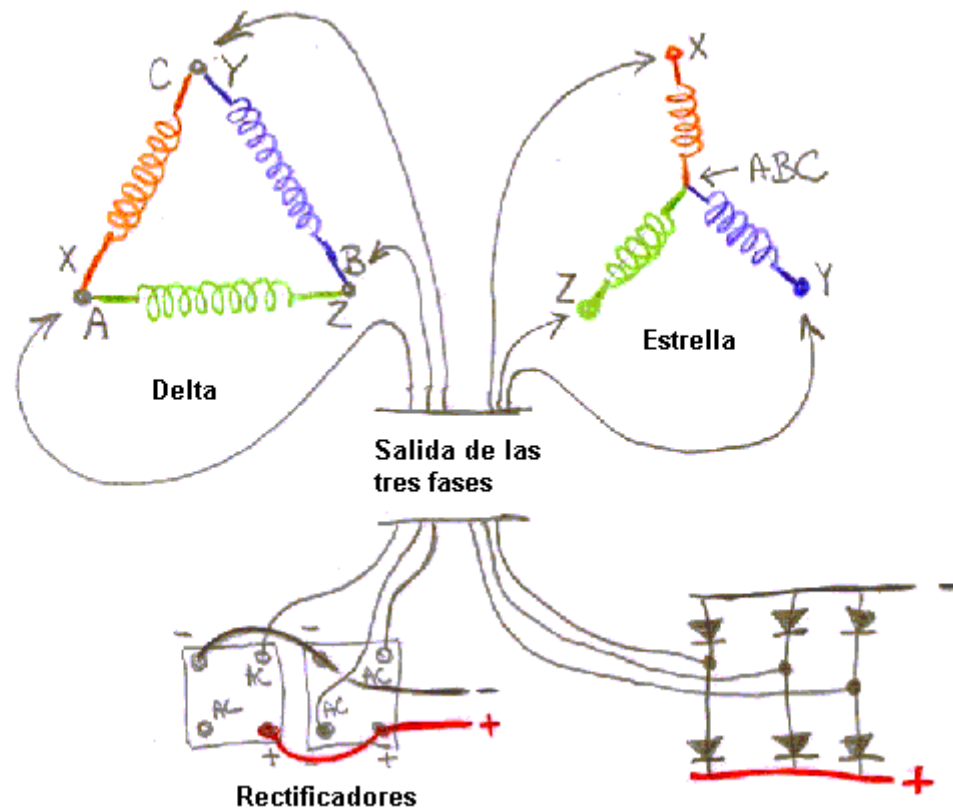


Hemos soldado más tubo a la punta de la torre para obtener el alto de 30'. En esta foto se aprecia cómo quedará todo.



Esta es otra fotografía de cómo quedará la torre una vez izada. Ahora podemos colocar la turbina en su sitio. Para bajar la electricidad usamos cable calibre 10 conectado a los tres terminales del alternador y que baja por el centro del tubo. En la parte baja de la torre hemos colocado un tomacorriente de tres patas. Así podemos despegar el cable y desenredarlo si es que por dar vueltas el alternador eso llegara a suceder. Desde el tomacorriente nos vamos a las baterías. Esta instalación resultó muy conveniente ya que el banco de baterías de nuestro vecino está muy cerca de la torre y casi ni tenemos pérdidas de electricidad.





Tenemos tres cables con las tres fases de corriente AC que llegan a la caseta de baterías. El dibujo anterior nos muestra cómo usar diodos individuales o rectificadores para transformar esta corriente AC en DC. Ahora podemos ir a las baterías o colocar un regulador antes.



La torre la subimos usando una cadena fijada a un camión. Este generador tiene un mes funcionando. Gira a la menor brisa generando 10 amperios. En ráfagas de mayor velocidad genera mayor potencia. Pensamos que si las aspas fueran más largas tendríamos mucha más potencia, especialmente con vientos fuertes. Pero tal como está genera 100 vatios a 15 KPH. Probablemente llega a 500 vatios a 37 KPH y 700 vatios a 45 KPH. A mayor velocidad oscila fuera del viento. Nosotros diríamos que 500 vatios 37 KPH es ligeramente por debajo de lo que esperábamos, pero es que nos parece que la máquina es demasiado potente para sus aspas. Un aspa más larga seguramente haría que la generación comenzara a 10 KPH. Tal como está el generador nos produce 12 voltios DC a 110 RPM. Con un aspa de una proporción de giro de 7 esas RPM se lograrían a menos de 10 KPH. Es posible que un aspa de 11 pies sea la mejor solución a este problema. Pero esa solución traerá cola: la máquina trabajará más y recalentará el alternador.

Un aspa más larga trabajará mejor pero en obsequio a la seguridad, silencio y tranquilidad de espíritu preferimos dejar las cosas como están. Nuestro vecino apaga la máquina ahora más temprano pues parece no poder gastar la corriente de que dispone.

Le recomendamos a quienes traten de embarcarse en un proyecto parecido al nuestro que hagan su tarea. Visiten los siguientes sitios:

[Sitio de Hugh Piggott](#) Nuestra máquina se ha inspirado en los planos que él ofrece..  
[Windstuffnow](#) cantidades de fórmulas, explicaciones sobre corriente en tres fases, planos, y otros datos..  
[Nuestro foro](#), en él es casi lo único que tratamos. Si tiene una o varias preguntas alguien le contestará.  
[Windpower Workshop](#), sin leer este libro es riesgoso iniciar este proyecto. Hugh Pigott es su autor..  
[Hugh Piggott's Axial Field Wind turbine plans](#) Los planos que se ofrecen son muy parecidos a nuestro proyecto.  
[The Caboose Windmill page](#) es un proyecto que construimos a principios de año. Sin mucho detalle pero muy recomendable.

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*[Correos a: info@otherpower.com](mailto:info@otherpower.com)*

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**Esta página fue actualizada el 29/9/2003**

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MAGNETS



Hugh Piggott's Homepage  
updated 29th November 2003  
[hugh@scoraigwind.co.uk](mailto:hugh@scoraigwind.co.uk)

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[Windmill building workshop courses](#)

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I am now selling the ['Axial flux alternator windmill plans'](#) (workshop notes from my courses)

[Here are my other books.](#)

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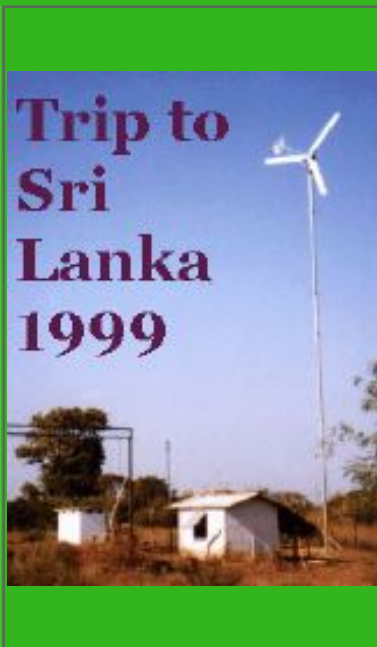
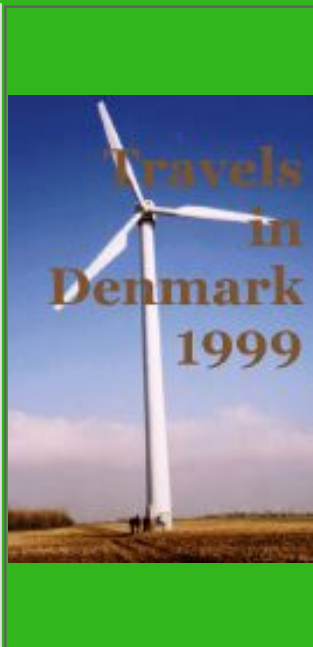
new [blade design spreadsheet](#)

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<b>Quick links to stuff on this site</b>	<a href="#">Homebuilt windpower - general information</a>	<a href="#">Blade theory</a>	<a href="#">Blade carving - diagrams</a>	<a href="#">Blade carving - colour pics</a>	<a href="#">Power performance testing of small wind turbines</a>
<a href="#">Free downloadable pdf files</a> for blade manufacture and other aspects of small wind/battery systems	<a href="#">Permanent magnet alternator construction manual - free download in acrobat pdf</a>	<a href="#">Using a servomotor as a pm generator</a>	<a href="#">Notes for brakedrum builders - extra information to supplement my plans</a>	<a href="#">Differences between the 'European' and the 'North American' versions of the brakedrum design</a>	<a href="#">Magnet suppliers</a>

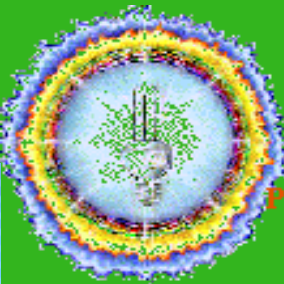
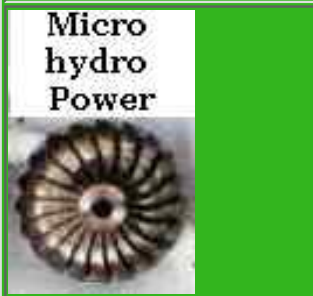


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<p><a href="#">Windmill building workshop courses</a></p>	<p><a href="#">Pictures of the most recent course in April USA</a></p>	<p><a href="#">Pictures of the most recent course at CAT in Wales</a></p>	<p><a href="#">Scoraig 2003 course</a></p>	
<p><a href="#">My books</a></p>	<p><a href="#">New '<b>Axial flux alternator windmill plans</b>' for sale</a></p>	<p><a href="#">Scoraig where I live : Our house</a></p>	<p><a href="#">Tour of the Scoraig wind turbines in year 2000</a></p>	<p><a href="#">More information about Hugh</a></p>
<p><a href="#">Scoraig Wind Electric <b>renewable energy installation service</b> - new grants available in the UK</a></p>	<p><a href="#">Renewable energy options for electricity supply on the Isle of Eigg</a></p> <p>A report on the potential for small hydro, wind and photovoltaic systems on the island</p>			



**pmg construction manual is now available for free download IN DANISH (på Dansk)**

Free downloadable pdf files for blade manufacture and other aspects of small wind/battery systems.



**PROMOTIONAL MAGAZINE SITE.....**

Email me at: [hugh@scoraigwind.co.uk](mailto:hugh@scoraigwind.co.uk)

Or (if you must) send snail mail to:  
Scoraig Wind Electric, Dundonnell, Ross shire, IV23 2RE, Scotland, UK,  
UK phone 01854 633 286, fax 01854 633 233.  
international phone +44 1854 633 286, fax +44 1854 633 233.  
Mobile 077 1315 7600

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I do reply to all reasonable e-mail questions.  
Letters often get no reply.



[Abundant RE sell the AWP36 turbine in the USA](#)

# African Windpower

[crow electric make brakedrum windmills for tipi dwellers in Wales](#)



[Claus Nybroe at windmission, the small-wind guru of Denmark, with exciting alternators for self-build](#)





[Ampair wind and water turbines are about as near to 'fit and forget' as you can get!](#)



[Proven make really substantial wind](#)

[machines, for rough weather and the long haul.](#)

As seen on Castaway 2000.

A site with both windmills and woolly bits!

[Clive \(DCW\) Wilkinson](#)

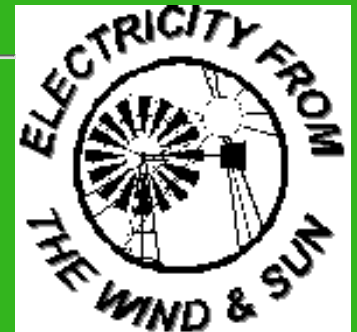
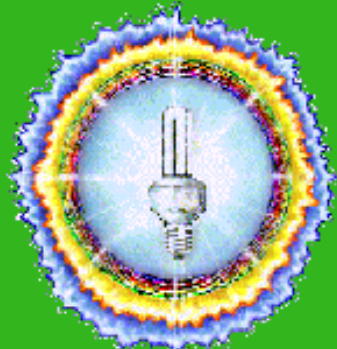
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[Wind and sun are a UK company who specialise in grid connected solar, and other applications which use inverters.](#)



[Home Power magazine is the Hands-on Journal of Home-Made Power.](#)

A shop window of small scale renewable energy in the USA, with some 'homebrew' stuff too.

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[An e-mail chat list](#) on small wind systems.

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[Picoturbine](#) are marketing my books in the USA with great efficiency. You can use a credit card on this site.

"We provide plans, books, videos, and kits for renewable energy education and homebrew projects. Projects are available for fifth grade through adult at this time."

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[www.electrichorse.co.uk](http://www.electrichorse.co.uk)

is George Glaister's site for **electric-powered mopeds**.

---



E-mail me at: [hugh@scoraigwind.co.uk](mailto:hugh@scoraigwind.co.uk)

# Axial flux windmill plans

or "How to build a wind turbine"

[hugh@scoraigwind.co.uk](mailto:hugh@scoraigwind.co.uk)

## Introduction

The term 'axial flux' refers to a type of alternator where the magnets are mounted on **disks** and the flux between them is parallel to the axis of the shaft. This is unlike conventional alternators whose flux is radial across the air gap. The brakedrum alternator is a radial flux type.

Lately I have been developing construction techniques for axial flux alternators. In 2001, I made a construction manual available for free down load from [this site](#). Since then I have taught a lot of [courses](#) and my ideas have moved forward. I have made the process simpler and I have made the alternator much more powerful by using [neodymium magnets](#).

You can see pictures of the construction process in action during my my latest workshop course in the USA by going to the [picture pages](#) for the course. There are two slightly different versions of the design - one using inches and one using metric measurements. Both are described in full. There are also plans at the end of the document for a smaller alternator using a 4 foot diameter rotor (blades).

There is a lot of exciting new stuff going on at the [Otherpower discussion board](#) where Dan is extending the design and using old Volvo parts to do it based on what we did on the course in April. Dan has made a [page](#) about his latest machine.

[Other books](#)

---

The November edition of the plans is just freshly printed!  
(with black and white photos)



---

How to buy these 'axial flux windmill plans'

Prices including shipping:

UK £10.60

Europe € 17

World US\$ 21

Please send cash and not checks or money orders from overseas. UK cheques in pounds are OK  
If you send foreign currency money orders the bank will steal half of it. If you send cash it will get here safely.

Here is my address for the coming winter months (until April).

**Hugh Piggott**  
**40 Logie Green Road**  
**Edinburgh**  
**EH7 4HD**  
**Scotland, UK**

or you can pay by credit card at paypal with the button below

click [here](#) for a series of snapshots of the document, or read on for full details....

---

Dear Hugh,

I just finished your latest book. Damn, it's good. Great information and written very clearly. If you are ever near Denver Colorado and want to get a beer let me know.

Sincerely,

John Steele

---

also now available from



This is a pre-publication edition, produced in small batches. A final version will be available in a few months.  
This document will probably supercede the brakedrum plans although they will still be of interest to some readers. It's easier to build and involves less hunting around for parts. The brakedrum idea has a lot going for it, but it's not the way I would do it now (ten years on).

---

The plans describe how to build **two machines**. Both have axial flux alternators and 3-bladed wind rotors.





The large one has an eight foot diameter rotor and 500 watt output.  
The smaller one (below) is half the diameter and one quarter of the output.  
We only use a single magnet disk on the smaller machine.



**"I like the plans and the info, I really feel like I understand everything in it....**

**What I really liked was the way the "Little Pancake" machine was thrown in at the end. With just a couple of pages we have a complete construction plan, once we know the principals. Reminds me of house plans, all you need is some drawings, notes, a good material list and someone to ask questions when you get stuck. "**

**Ron Dinishak**

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Alternator 2

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# PMG booklet page

PMG stands for permanent magnet generator. This booklet describes how to build one. It was prepared in year 2000 by [Hugh Piggott](#), for Intermediate Technology Development Group ([ITDG](#)), as part of an [overseas aid project](#) for DfID. It is not confidential; in fact the object is to disseminate it widely.

---

The latest version of the booklet can be downloaded [in pdf format here](#)

---

Feedback is more than welcome. Please let me know what you think.

---

**Steel disks** for the pmg can be obtained in the UK from [Andy Taylor](#) phone 01305 861001 for £6 each.

--

From: taywind@supanet.com  
To: hugh.piggott@enterprise.net  
Subject: windmills  
Date: Thu, 29 Aug 2002

Dear Hugh

I have built a number of axial field pmg's (down loaded from your excellent website) and I am very pleased with them. I have recently had a batch of mild steel discs 305 dia. x 6mm with a 65mm hole at the centre as per plans lazer cut (very nice finish).

and I thought that some pmg constructors or would be constructors may have difficulty in cutting out or obtaining such discs. I would therefore be happy to supply discs at a very good price of six pounds each plus postage. I hope this could help others to enjoy constructing there own pmg/windmill as I have. I can be contacted by e-mail or phone 01305 861001 or snail mail at 18 Tillycombe Road, Portland, Dorset, Dt51lg, England. Yours sincerely Andy Taylor

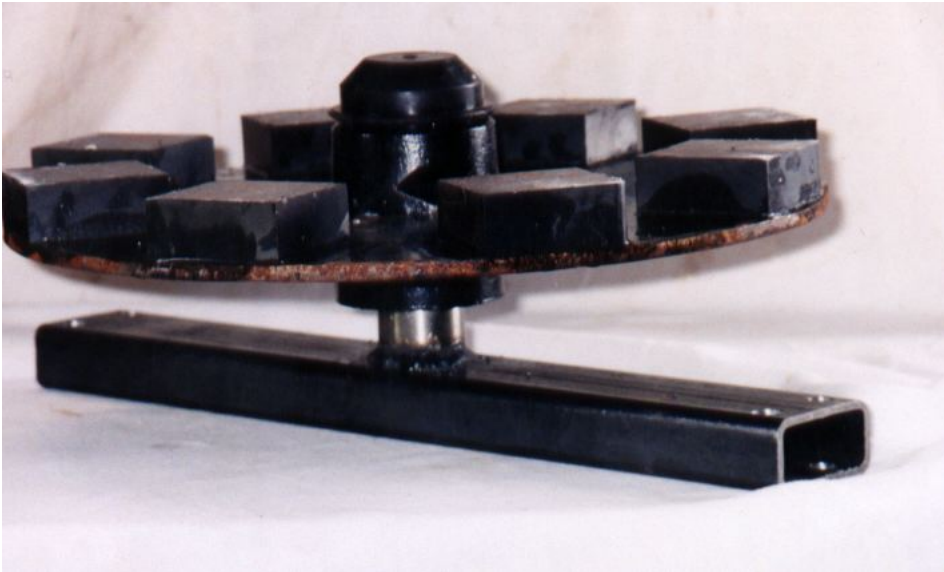
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The pmg is intended for small wind turbines (although it can also be used for battery charging hydro turbines). It is of the 'axial flux' type. Magnets are fitted to steel disks and spun



past coils. Here is a picture of magnets on a wheel bearing. Later I learned to embed the magnets in resin so as to prevent them from flying off at high speed. All this is covered in the booklet.



Here's a picture of the stator which is the stationary bit which holds the coils. The coils are set in resin. Here below the resin is clear so you can see the coils embedded within. A magnet rotor passes on each side of this disk and produces AC voltage in the coils.



Another magnet rotor fits on top of the stator. Next, in this early picture, I am spinning the alternator with a power drill to collect data about the output at various speeds.





Here is a set of pictures detailing the way the stator is cast in a mould



And here is the rotor casting process:-



Assembly...



and flight :-)





I am also teaching [courses](#) where you can learn how to do this.

[Hugh Piggott](#)

# PMG construction manual

Hugh Piggott - Scoraig Wind Electric - February 2001

comments welcome at [hugh.piggott@enterprise.net](mailto:hugh.piggott@enterprise.net)

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Dr Smail Khennas  
Senior Energy Specialist  
Intermediate Technology  
The Schumacher Centre  
for Technology and Development  
Bourton Hall  
Bourton on Dunsmore  
Warwickshire  
Tel +44-1788-661 100  
Fax: +44 -1788 44-(0)1788-661 101  
Email: [smailk@itdg.org.uk](mailto:smailk@itdg.org.uk)  
Url: <http://www.oneworld.org/itdg>  
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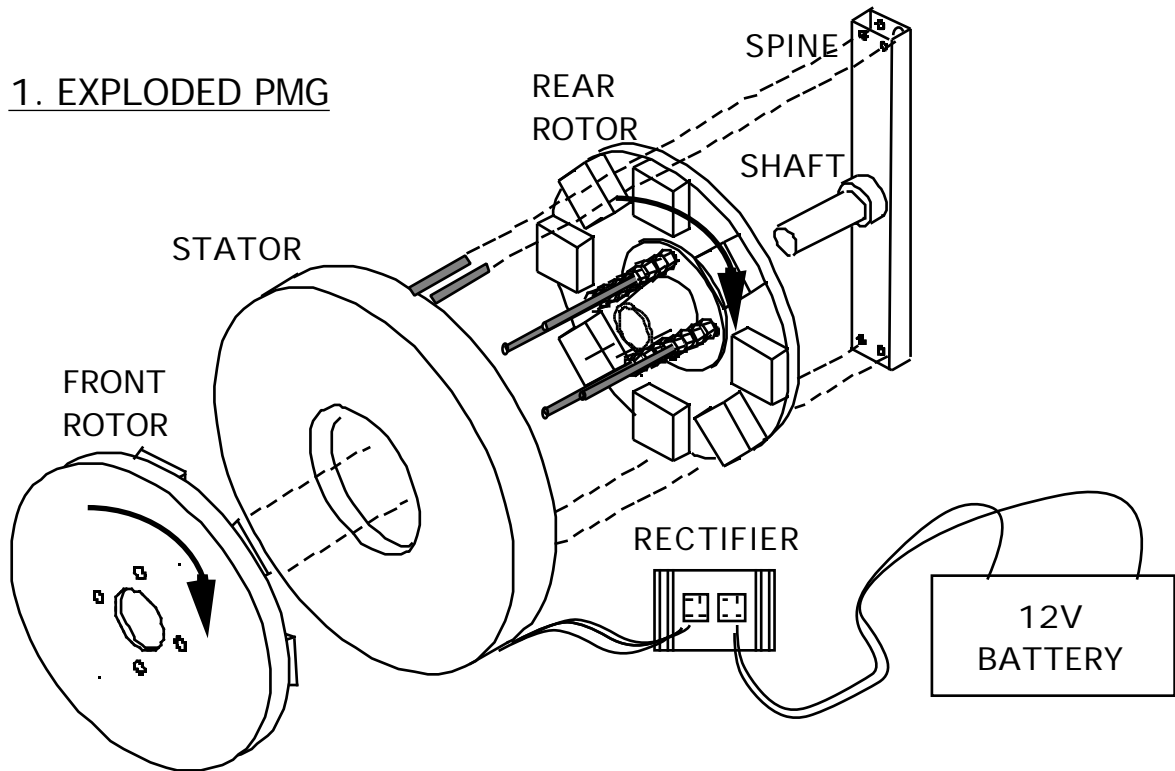
On site assembly in Peru



# 1. Introduction

This manual describes how to build a 'permanent magnet generator' (PMG). We can also call it an 'alternator', because it generates alternating current (AC). It will not generate 'mains voltage' or 'utility power' AC. It generates low voltage, 'three phase' AC, and then changes it into 'direct current' (DC) for charging a 12 volt battery.

What this PMG is made of



The PMG (see diagram 1) consists of:-

- A steel spine and shaft.
- A stator containing coils of wire
- Two magnet rotors
- A rectifier

The stator contains six coils of copper wire, cast in fibreglass resin. This stator casting is mounted onto the spine; it does not move. Wires from the coils take electricity to the rectifier, which changes the AC to DC for charging the battery. The rectifier is mounted on an aluminium 'heatsink' to keep it cool.

The magnet rotors are mounted on bearings, which turn on the shaft. The rear rotor is behind the stator, and enclosed within it. The front one is on the outside, fixed to the rear one by long studs which pass through a hole in the stator. The wind turbine rotor blades will be mounted on the same studs. They will turn the magnet rotors, and move the magnets past the coils. Magnetic flux passes from one rotor to the other through the stator. This moving magnetic flux is what produces the electric power.

## Building the PMG

This manual describes how to build the PMG. Read right through it before starting.

Section 2. is a list of materials and tools for the job.

Section 3 explains how to build the special tools (called jigs) and the moulds which are needed. You can build more than one PMG with them. There are many possible ways to make these jigs and moulds, but there is only room in this manual to describe one way to do it.

Section 4 is about the stator. It describes how to wind the coils of enamelled copper wire, and cast them in resin, using the jigs and moulds.

Section 5 shows how to build the magnet rotors, using magnet blocks and steel disks, set in another resin casting.

Section 6 shows how to assemble the parts into a whole PMG. It explains how to build the mechanical parts, how to balance the rotors, and what is required to connect the wiring from the stator.

Section 7 is about testing the PMG. It contains procedures for checking that it is correctly balanced and ready to use. It describes the options for connecting up the electrical output. It also explains how to connect the PMG to the battery.

Section 8 contains additional information about the use of polyester resins, and about using the PMG for hydro power.

## What this PMG can do

This PMG is made for small wind generators (see diagram 2). To build a complete wind generator, you also need

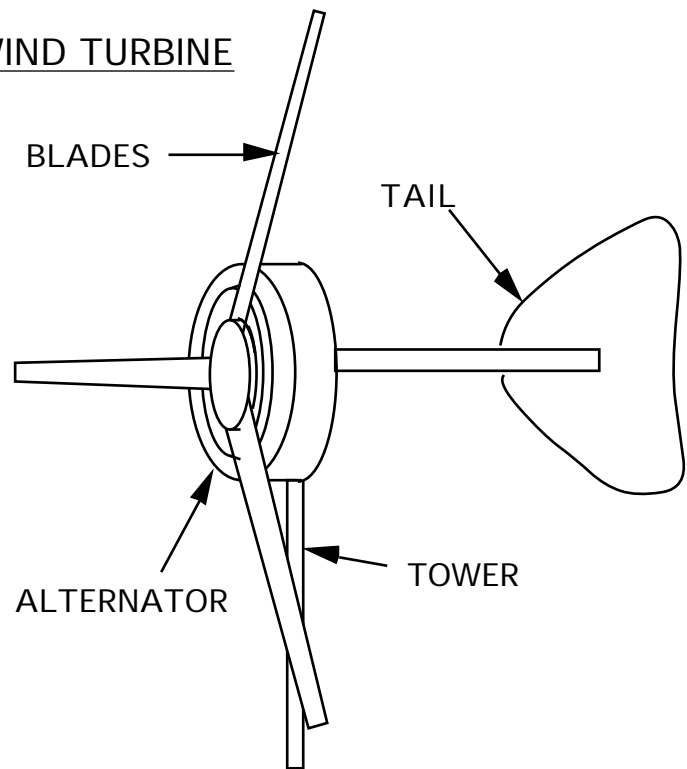
- a tower : perhaps a steel pipe, supported with guy ropes,
- a 'yaw head' swivelling on the tower top,
- a tail, to keep it facing towards the wind,
- a set of blades, to turn it.

The spine of the PMG bolts on to the yaw head. The blade assembly fits on to the front of the PMG. The yaw head and tail need to be so constructed that the wind generator will turn from strong winds, to protect itself. (This manual does not describe the blades, tower, or yaw head.)



On test at Scoraig

## 2. WIND TURBINE



The PMG works at low rotational speed. The chart shows the power output of the PMG, charging a 12 volt battery. At 420 rpm it generates 180 watts, which is 15 amps at 12 volts ( $15A \times 12V = 180W$ ).

At higher speed, the PMG can generate more power. But high currents cause the coils to heat up, and so the efficiency gets worse as the output current gets higher. For higher speed it is better to change the stator coils, either by using different size wire, or by changing the way they are connected.

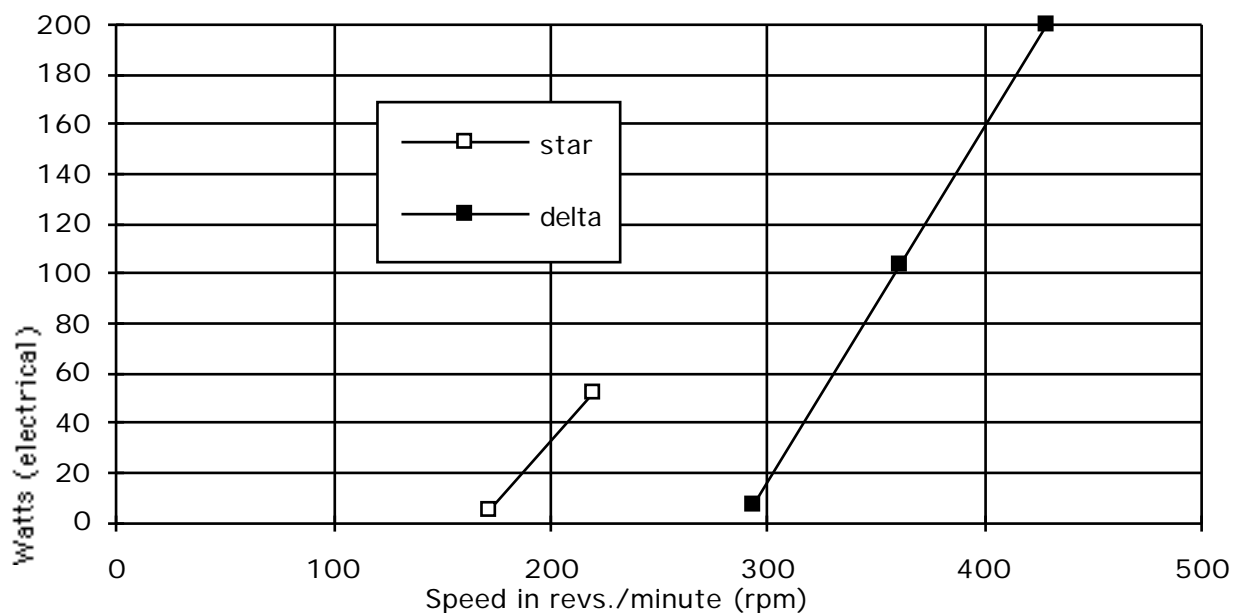
If the PMG is always used at higher speeds, it is better to use thicker wire, which can carry more current without getting so hot. Using thicker wire means there are fewer turns on the coils, which means that the PMG would not work at low speed.

To use the same PMG for both low and high speeds, it is possible to change the connections. There are two ways to connect the stator wires to the rectifier. They can be connected 'star' or 'delta'. See Section 7 for a detailed description of the star and delta connections.

See diagram 3 for the graph of power vs. speed. Star begins to work at low speed (170 rpm). Delta gives more power, but only at higher speed. Star is good in very low windspeeds, and delta is better in higher winds.

A bigger version of this PMG would be able to give higher power at lower speed.

### 3. GRAPH OF POWER VS. SPEED



#### Caution

Take care when building and assembling the PMG so that the magnets cannot come loose. This can happen under extreme circumstances. Loose magnets rubbing on the stator can then destroy the PMG.

- Follow all the instructions for casting the magnet rotors - do not simply glue the magnets to the steel disks.
- Do not hit the magnet rotors with hammers during assembly.
- Take care that there is at least 1mm gap clearance between the magnets and the stator, on both sides. (For heavy duty, or high speed, use a larger gap.)
- Do not run the PMG at speeds faster than 800 rpm on a wind turbine. (When the wind turbine yaws, large gyroscopic forces will flex the shaft, and the magnets may touch.)
- Do not mount the rotor blade assembly directly onto the front magnet rotor disk, at any point away from the studs. Mount it only onto the studs and nuts themselves, which come through the disk.
- When mounting the PMG on the wind turbine yaw mount, keep the box section 'spine' of the PMG vertically upright, and not horizontally cross-wise.



## 2. List of Materials and tools

Materials for PMGs	No. per PMG	size	Total wt. grams
<b>FIBREGLASS SUPPLIES</b>			
Polyester resin (premixed with accelerator)			2700
Catalyst (peroxide)			50
Talcum filler powder			1200
Fibreglass mat (1oz/sqfoot)		1 sq metre	300
Colouring pigment resin (if required)			50
plasticene or putty			
<b>STAINLESS STEEL</b>			
stainless steel wire		2mm x10metres	200
<b>MAGNETS</b>			
Grade 3 ferrite magnet blocks (premagnetised)	16	20 x 50 x 50mm	4000
<b>ELECTRICAL</b>			
Enamelled winding wire		14AWG or 1.7mm (or 17AWG - see p.44)	3000
flexible wire (about 14AWG size)		same size x 6 metres	
solder and sleeving for connections			
1/2 inch masking tape			
Bridge rectifiers	2	25A 200V single phase	
Heatsink for rectifiers			250
<b>STEEL</b>			
Box section tube ('RHS') for spine	1	380 x 50 x25 x 4mm	1100
Magnet disk (or octagonal) plates	2	6mm x 305mm Outer Diameter	6000
10mm threaded rod ('studding')		1000mm	500
10mm nuts	32		300
10mm washers	16		
8mm threaded rod		400mm	125
8mm nuts	8		50
5mm nuts and bolts for rectifiers	2	5mm x 20mm	
Shaft		25mm x 150mm	500
<b>MECHANICAL</b>			
Bearing hub to fit shaft, as described in Section 6	1		1250



Spine, shaft, hub and magnet rotor

### Materials for moulds and jigs

Composite floorboards (other ideas are possible) and wood glue

Sand paper, wax polish

(Polyurethane varnish, and PVA release agent, if available.)

Paint brushes, and thinners to clean them

13mm Plywood for jigs and formers and stator mould centre

Steel rod, or pipe, for coil winding machine

Small pieces of steel plate or thick sheet metal

<u>Bolts (with nuts and washers)</u>	<u>diameter</u>	<u>length</u>	<u>For</u>
2 with butterfly nuts	6mm	60mm	coil winder
4	10mm	25mm	balancing with jig
1	12mm	150mm	stator mould

### Tools

Safety goggles, face mask, gloves, etc. as required

Workbench with vice

Welder

Angle grinder

Hacksaw, hammer, punch, chisel

Compasses, tape measure, angle gauge.

Spanners: 8, 10, 13, 17, 19mm : two of each.

Tap wrench and M10 taps for outer holes in magnet rotors.

Brass wire to gauge the heights of magnets

Pillar Drill Press

Drill bits 6,8,10,12mm

Holesaws 25mm, 65mm

Wood lathe, or a substitute as in Section 3

Chisel for wood lathe

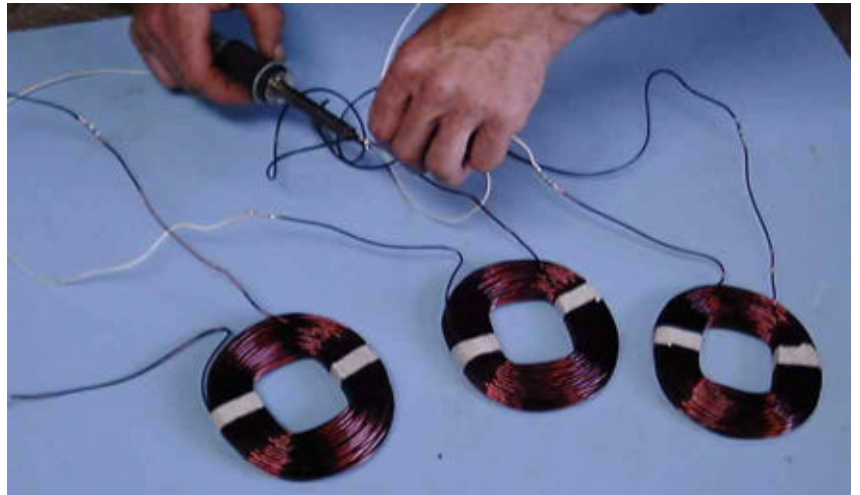
Jigsaw to cut wood

Scales to weigh resin. Dispenser for catalyst, plastic buckets, scissors.

Soldering iron, resin-cored solder, wire cutters, sharp knife.

### 3. Jigs and Moulds

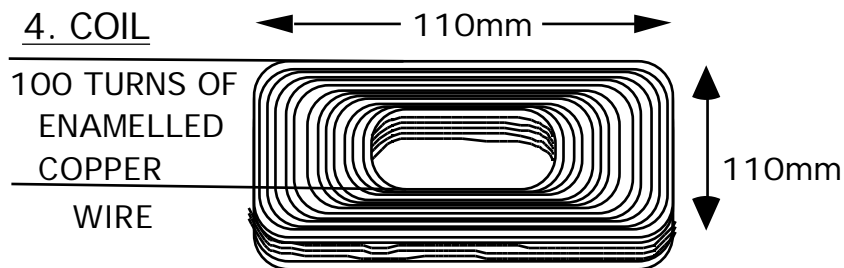
This section describes how to make the jigs and moulds for building a PMG. Once you have made them, they can be used again, to build more PMGs.



Coil winding machine

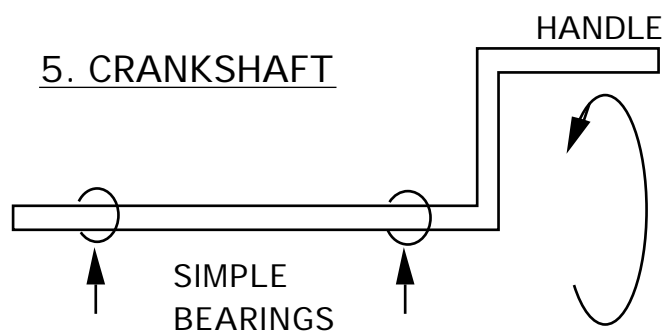
Some coils for the stator

The PMG stator contains six coils of copper wire (see diagram 4).

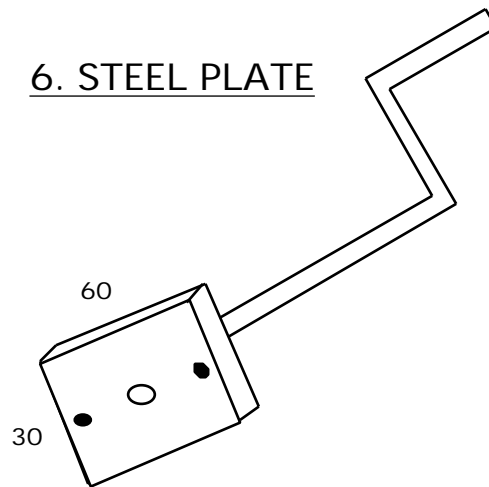


The coils will be wound on a plywood coil-former. The former is mounted on the end of a crankshaft, between cheek pieces.

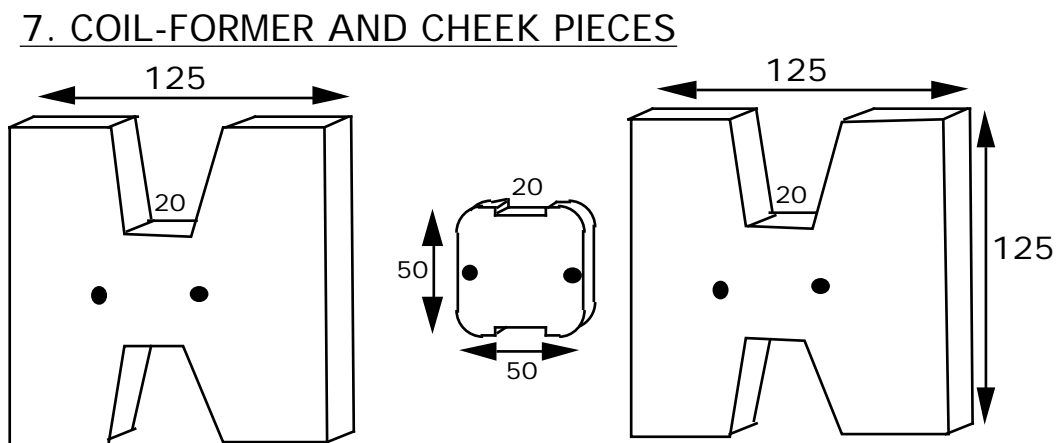
- Make a crankshaft, turned by a handle (see diagram 5).



- Cut a small flat steel plate 60 x 30 x 6 mm (suggested sizes) and fix it securely or weld it to the end of the crankshaft as shown in diagram 6.
- Drill 2 holes, 6mm diameter and 40mm apart, centred on the shaft.



- Cut out 3 pieces of 13mm plywood as in diagram 7.



The coil former is 50mm by 50mm by 13 thick. It has rounded corners. The two 'cheek pieces' are 125mm by 125mm. There are 20mm wide notches top and bottom in each. The notches are for putting masking tape under the coil, so that it can be taped up before removing it from the former.

- Stack the pieces with the notches in line (diagram 8), and drill holes for the mounting bolts.

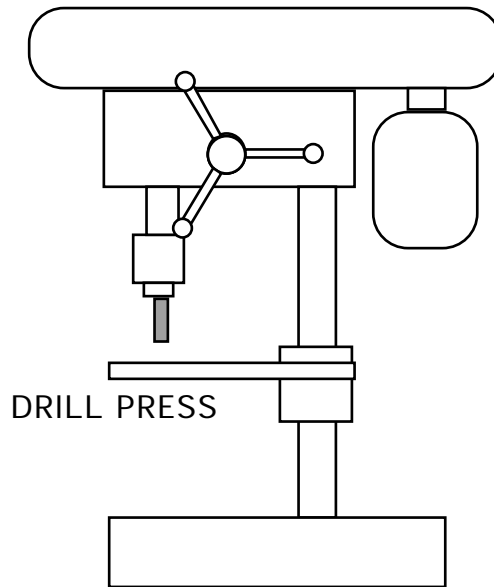
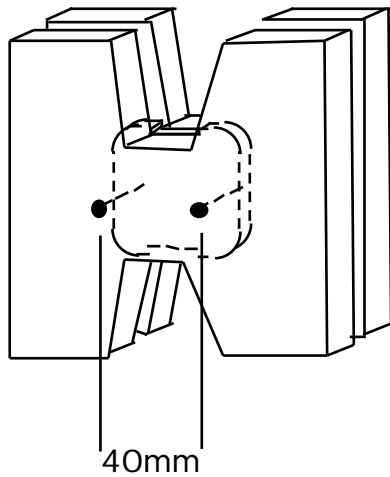
The holes are 6mm diameter and 40mm apart.

Use a drill press to drill the holes exactly square to the plywood.



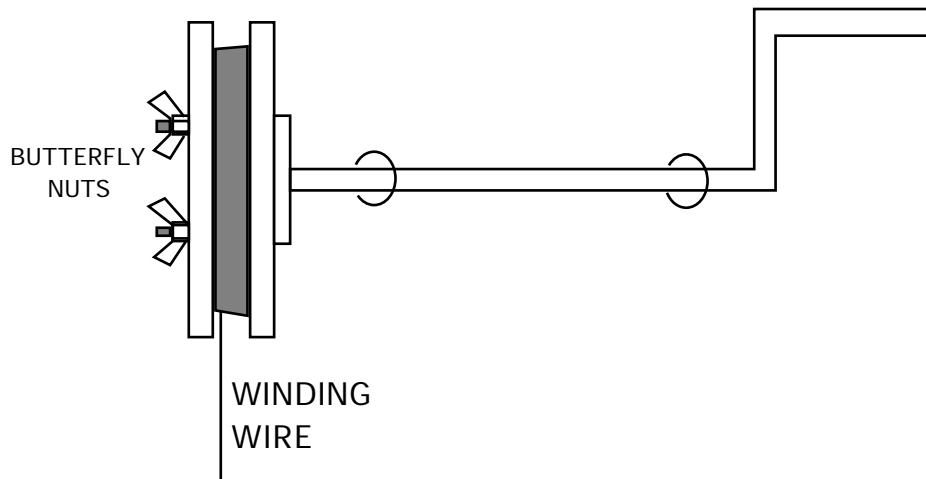
## 8. DRILLING THE 2 HOLES

STACK THE THREE PIECES  
LIKE THIS:-



- Pass two bolts through the holes in the flat plate, and bolt on the cheekpieces, with the coil-former between them. Use butterfly nuts if possible. (diagram 9.)

## 9. FITTING THE COIL FORMER AND CHEEK PIECES

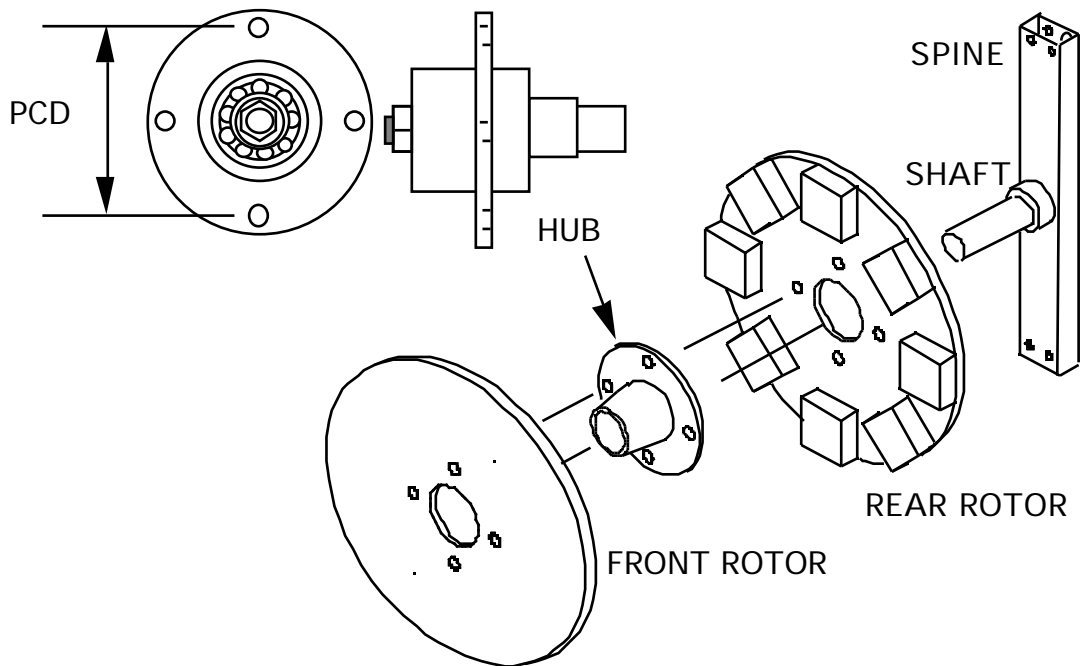


## Jigs for the rotors

### PCD jig for drilling holes

The magnet rotors are mounted on a bearing hub (see diagram 10). The hub has a flange with holes in it. For example there may be four holes on a 102mm (4 inch) 'pitch circle diameter' (PCD). Or you may have some other arrangement. This will depend on what kind of hub it is. Here we shall say 102mm PCD.

### 10. THE BEARING HUB PCD



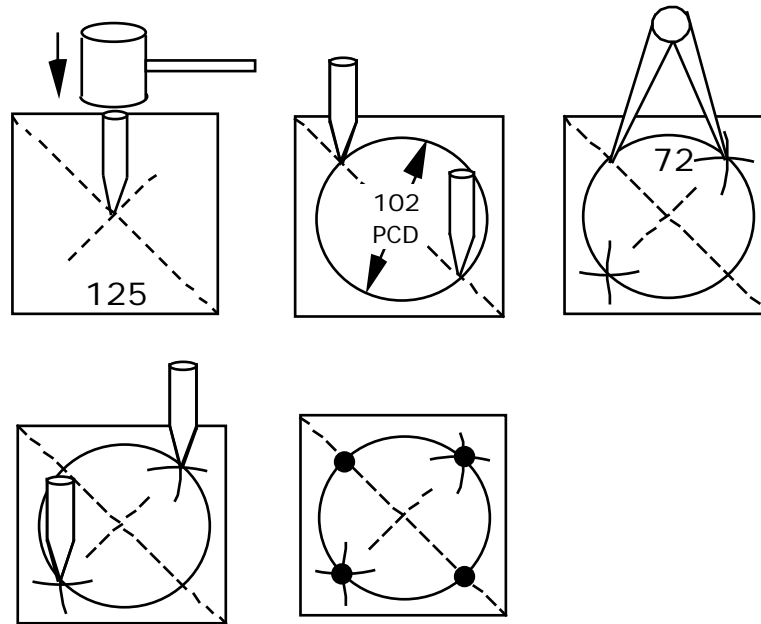
The PCD jig will be used to drill holes in the rotors etc.

It will also be used to balance the rotors.

The holes must be marked and drilled very precisely. (See diagram 11.)

- Cut a square piece of steel plate 125mm by 125mm.
- Draw diagonal lines between the corners and mark the exact centre with a punch.
- Set your compasses at 51mm radius (or to suit whatever PCD). Draw a circle.
- The diameter of the circle is the PCD of the holes in the hub.
- Punch both places where one line meets the circle.
- Set your compasses at 72mm. Mark two points exactly this distance from the first two, on the circle. (If you have a different PCD, this size would not be 72mm. Find the size by trial and error.)
- Drill four holes exactly 72 mm apart on the circle. Use a small drill first and then a larger one.

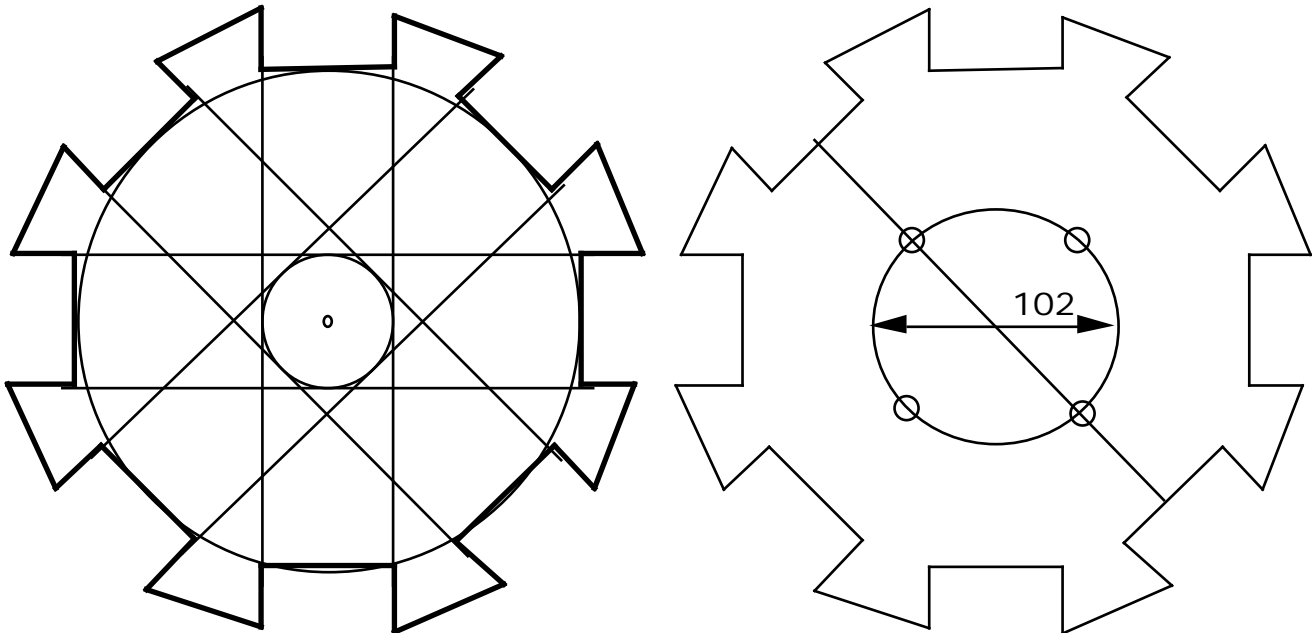
## 11. MARKING AND DRILLING THE PCD JIG



Magnet positioning jig (See diagram 12)

This jig is for putting the magnet blocks into the correct places on the steel disks. Only one jig is needed. Make the jig from 250x250 mm plywood or aluminium sheet (not steel).

## 12. THE MAGNET POSITIONING JIG



- Mark the centre of the workpiece.
- Draw three circles, with diameters 50mm, 102mm and 200mm, on this centre.
- Draw a pair of parallel straight lines, as tangents to the 50mm circle as shown.

- Draw 3 more pairs of straight lines at 45 and 90 degree angles to the first pair.
- Using these lines, mark the magnet positions, and cut out the jig along the bold lines as shown in the diagram.
- Draw a line connecting two opposite magnet centres.
- Place the PCD jig on top of the 102mm circle, aligned with the magnet centres, and drill four holes to match the four holes in the steel disks.

### Making the moulds

Make moulds for the stator and rotor castings. They can be turned from wood or aluminium. Another method is to make plaster or clay plugs on a wheel, like a pot. The shape of the plug would be the shape of the outside of the stator. Then make a fibreglass mould on the plug. The surface of each mould must be perfectly flat.

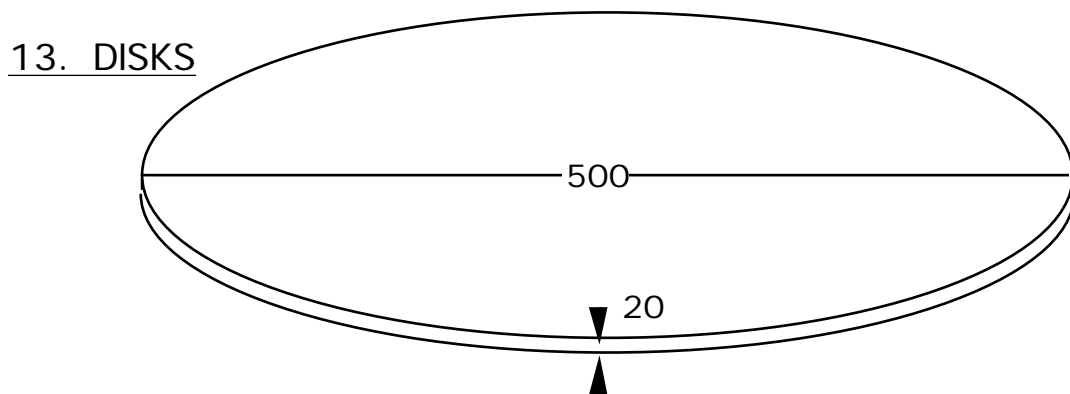
The moulds need to be strong and smooth. It is not easy to separate the stator casting from the moulds. Hammer blows are usually needed.

It is a good idea to wind one coil (see section 4) before making the stator mould. This coil should fit neatly in the mould.

Here is one way to make the moulds, from composite wooden floorboard sheets, using wood-turning.

### Stator Outer mould

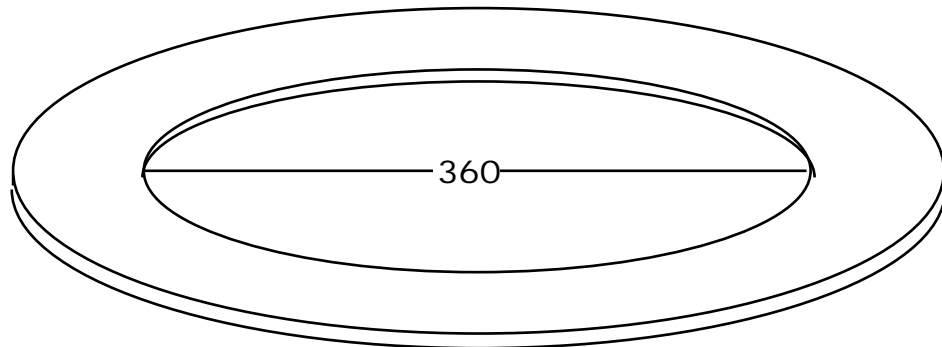
- Cut out several disks of flooring sheet (see diagram 13), approximately 500mm diameter.





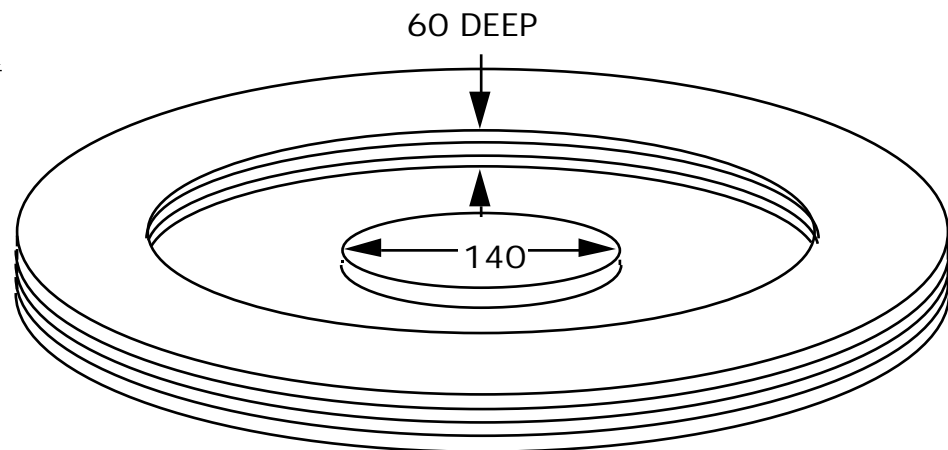
- Take all but one of the disks, and cut circular hole in each, 360mm diameter to form rings (see diagram 14).

#### 14. RINGS



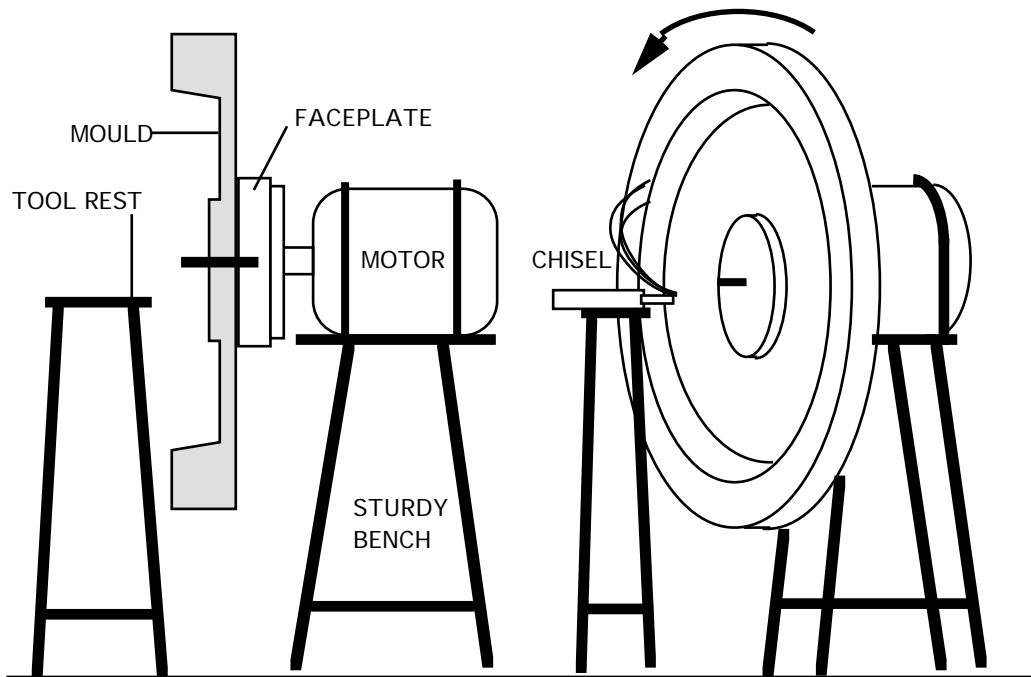
- Draw a circle 360 mm diameter on the remaining disk
- Drill a 12 mm hole at the centre of this disk, to help with centring.
- Glue the rings on top of the remaining disk, to form a stack, with a hole 60mm deep (diagram 15). Use plenty of glue at the insides of the rings.
- Cut out a small disk of 15 mm plywood, 140 mm in diameter, and drill a 12 mm hole at its centre.
- Placing a 12 mm bolt through both holes, glue the small disk into the exact centre of the hollow. Use plenty of glue at the edge of the disk.

#### 15. STACK



- Mount another piece of wood or board onto a lathe, a motor or the wheel hub of a small vehicle (for example a 3-wheel taxi). This is a the faceplate (see diagram 16).
- Spin the faceplate and use a pencil to make a very small circle at the centre.
- Drill a 12mm hole precisely at this centre. Hold the drill parallel to the shaft.
- Screw the glued stack onto the faceplate, using a 12mm bolt to centre it. Use four woodscrews through the disk and into the faceplate.
- Check that the face of the mould runs true. You can do this by holding a pencil close to it while it spins. Where the pencil makes marks, the face is 'high'. Loosen the screws and insert pieces of paper between the faceplate and the stack, on the opposite side from the pencil marks. Tighten the screws and check again.

## 16. TURNING A MOULD



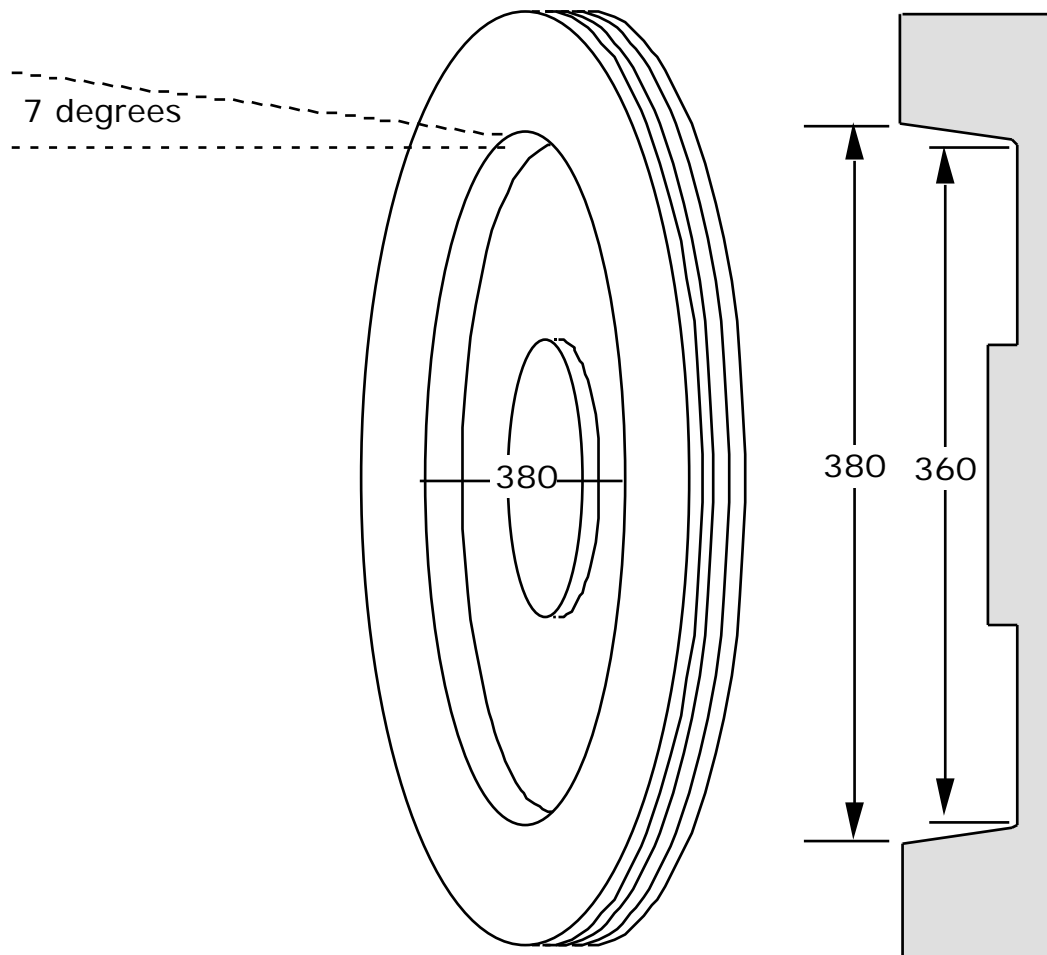
Now it is possible to shape the mould with a chisel. Wear a mask over your mouth to avoid inhaling the dust. Beware of loose clothing, which may become caught in the rotating mould.



Turning a stator mould on an electric motor

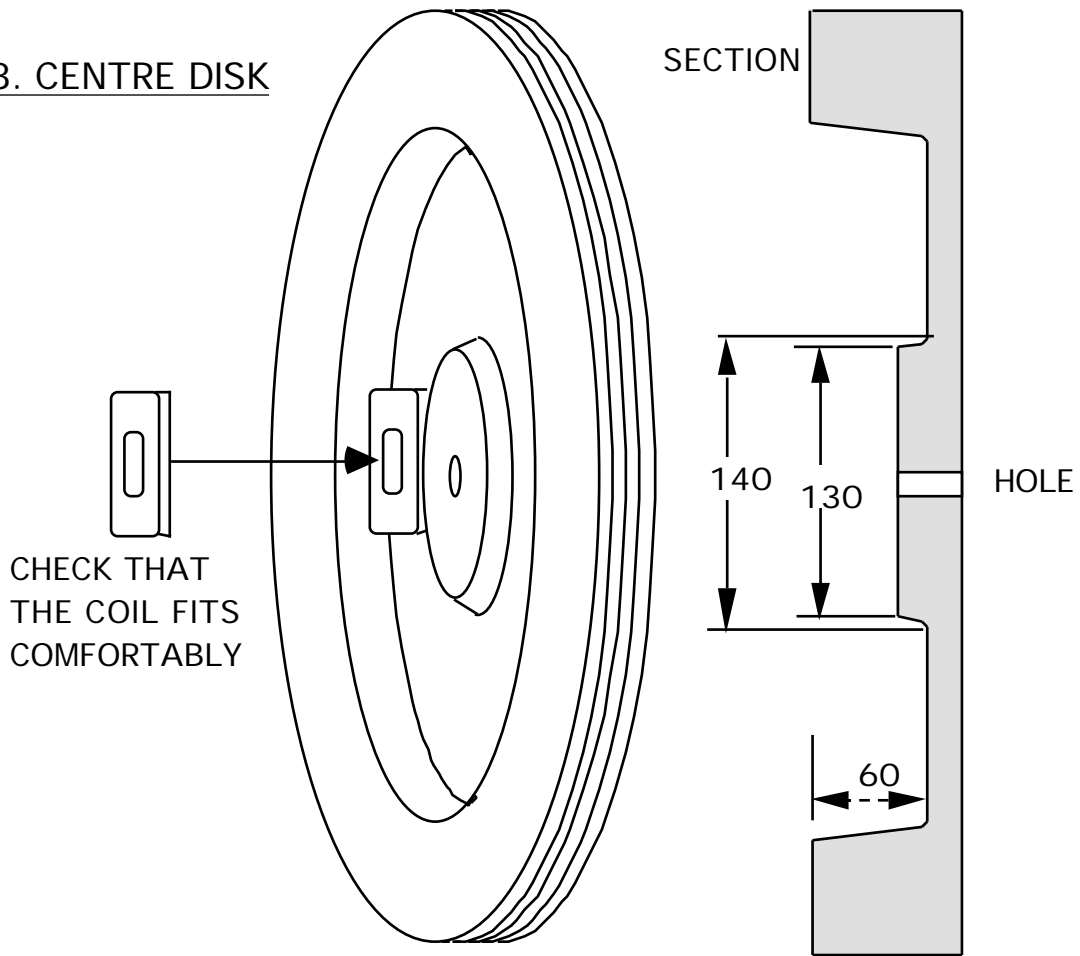
- Cut a smooth surface on the inner edges of the stack (diagram 17).
- The surface tapers at about seven degrees.
- The overall diameter at the outer edge is 380mm
- The diameter of the flat face is 360 mm.
- The corner inside is smooth (slight radius) not sharp.

### 17. THE SHAPE OF THE STATOR MOULD

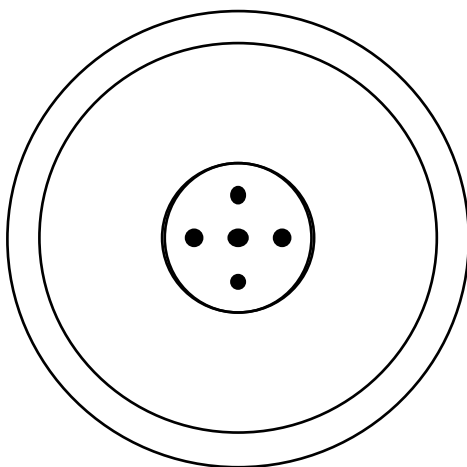


- Turn the inner disk down to 130 mm diameter on the face (see diagram 18), with a taper. The corners are rounded as before.

## 18. CENTRE DISK



- Place a coil against the face of the mould and check that it fits comfortably - if not, then the hollow must be made a little larger, or the centre disk a little smaller. In the end, the coil's centre must be at 250 mm from the mould centre.
- Remove the mould from the lathe or motor.



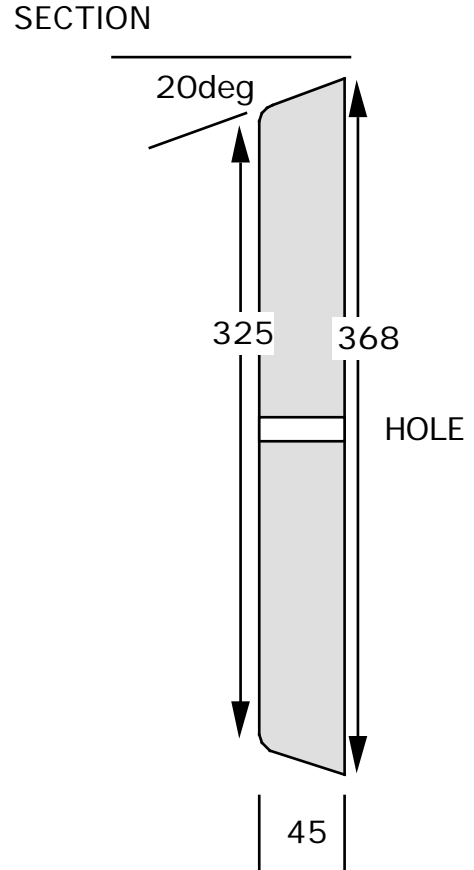
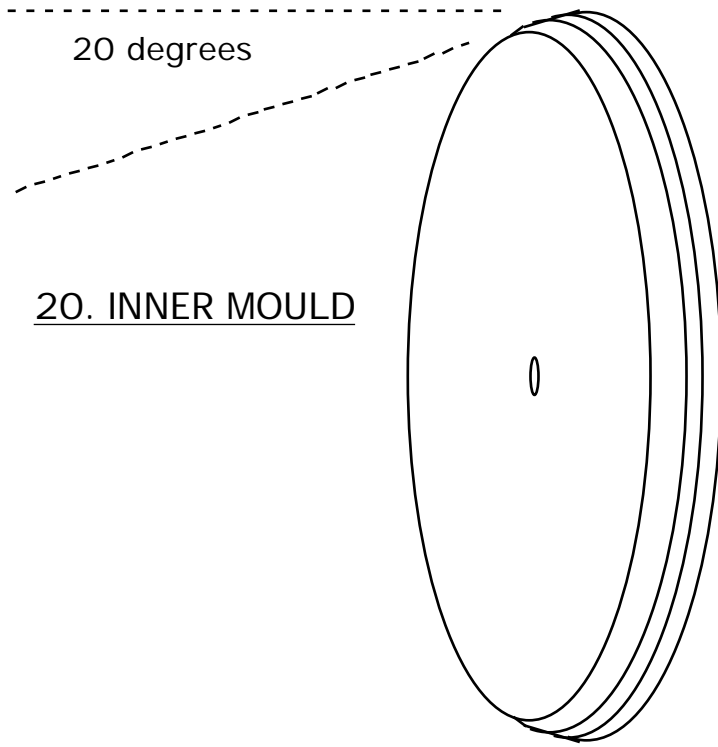
## 19. HOLES IN THE MOULD

Drill four holes in the central part which are used to separate the two moulds (diagram 19). Screw some small pieces of plywood onto the underside of the mould to make 'feet'.



Stator Inner mould

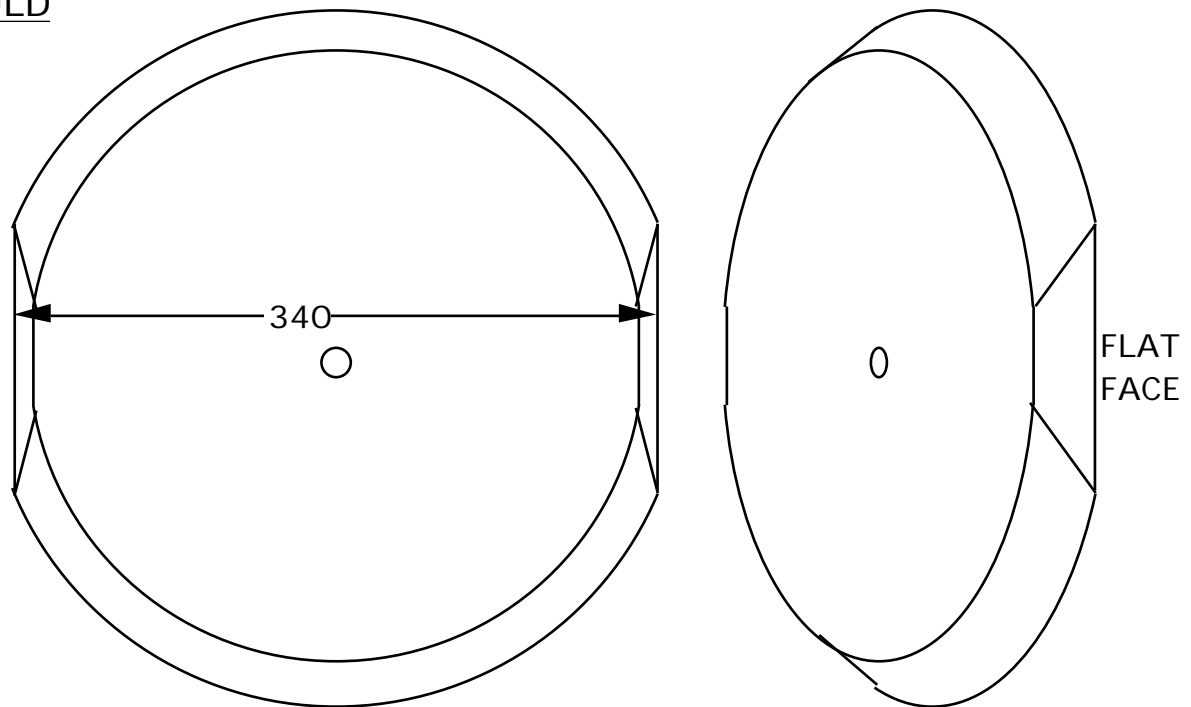
- Cut disks with diameter 370mm



Sawing flat faces on the inner mould

- Drill a 12mm hole at the centre of each
- Glue them into a stack (diagram 20), using a 12mm bolt to centre them.
- The stack is at least 45 mm thick, better 50 mm.
- Turn a 20 degree taper on the rim, and round off the corner, so that the diameter reduces from 368mm to 325mm.
- Check that the outer mod fits over the inner mould, with a 6mm gap all around the edge. Then remove the inner mould from the faceplate.
- Draw 2 lines on the larger face of the mould, 340mm apart (diagram 21)
- Cut two flat faces, as shown in diagram 21

## 21. CUTTING FACES ON THE INNER MOULD



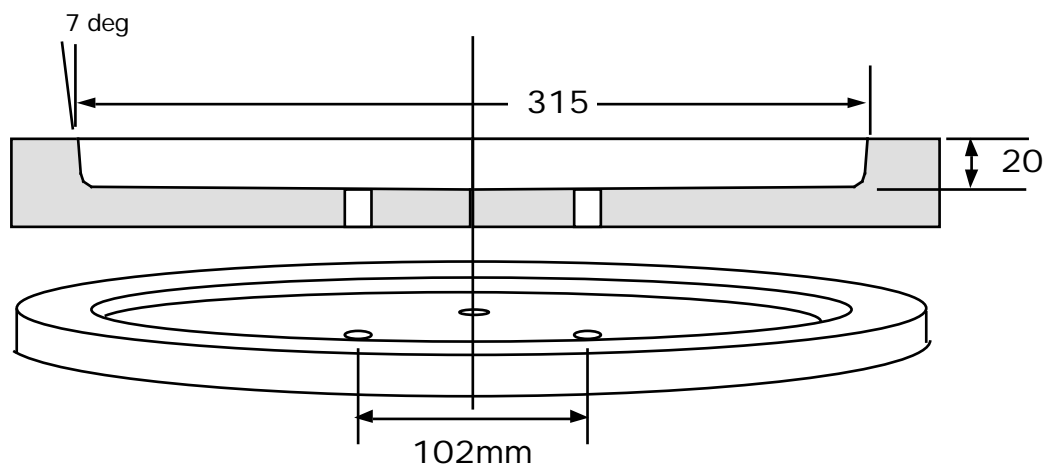
These two faces will create a thicker casting around the mounting studs.

### Magnet rotor moulds

The PMG needs two magnet rotors. Only one mould is needed, but production is easier if there are two moulds, so that two rotors can be produced at one time.

The outer mould (diagram 22) is similar to the stator outer mould, but simpler

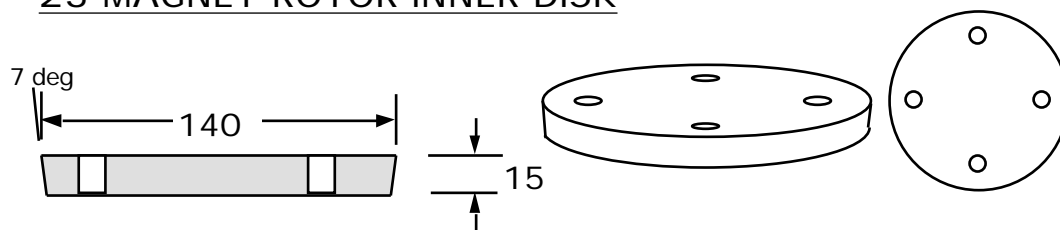
## 22. ROTOR MOULD



Use the PCD jig to drill four holes to match the holes in the magnet disks.

Each magnet rotor also needs an inner disk mould (diagram 23), with the same pattern of four holes.

### 23 MAGNET ROTOR INNER DISK



All moulds are sanded down to a very smooth surface, and finished with polyurethane varnish and wax polish. Do not use ordinary paint on the moulds. The heat of the resin process will cause the paint to wrinkle and spoil the appearance of the casting.



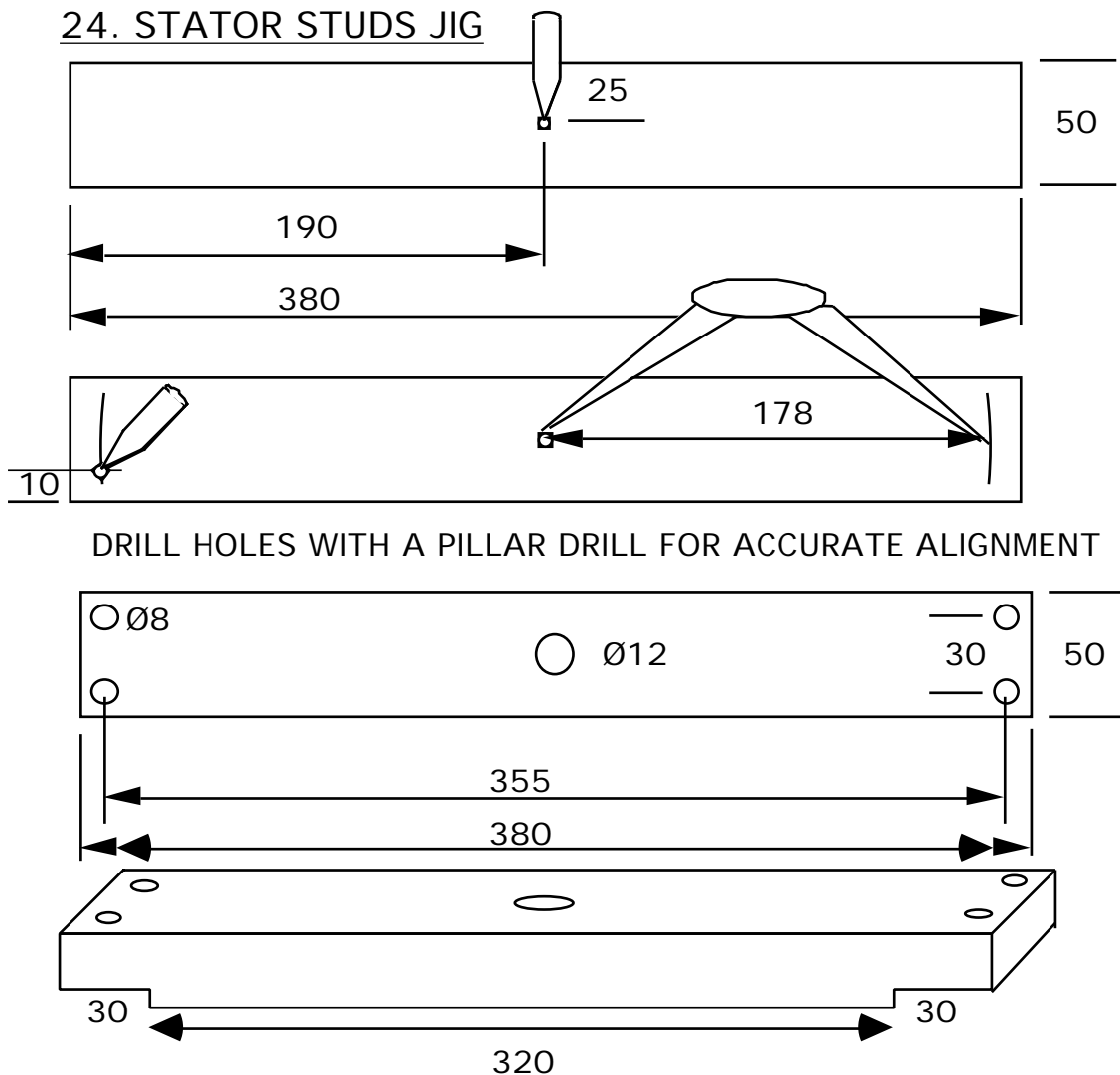
Rotor mould being made and used

## Jigs for the stator

### Stator studs jig (see diagram 24)

The stator needs four 8 mm supporting studs cast into it. These studs need a jig to hold them in place, until the resin is set. This jig is made from wood 380 x 50 x 25mm. It must be made precisely, or the studs will not fit the spine later.

- Make a punch mark at the exact centre of the largest face (see diagram 24).
- Use dividers or compasses to mark arcs at a radius of 178 mm from this mark.
- Punch four marks on these arcs, 30 mm apart and 10mm from the edge.
- Drill through with an 8mm drill (using a smaller size first to be accurate). Use a drill press, to drill the holes truly square.
- Remove some of the underside of the ends of the piece of wood, so as to prevent contact with the fibreglass resin.

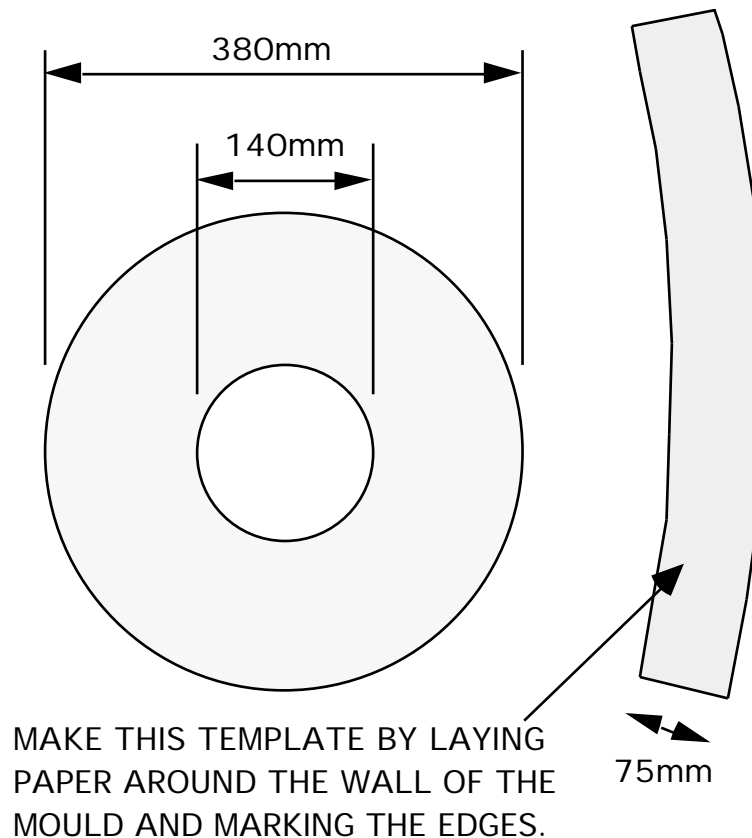




Paper templates (see diagram 25)

Fibreglass 'chopped strand mat' (CSM) is to be used in the stator. Make some paper templates for cutting out the pieces of CSM. Later you can lay the templates on the sheet of CSM, draw around them with a felt pen and then cut the pieces out.

## 25. PAPER TEMPLATES FOR GLASSFIBRE CSM

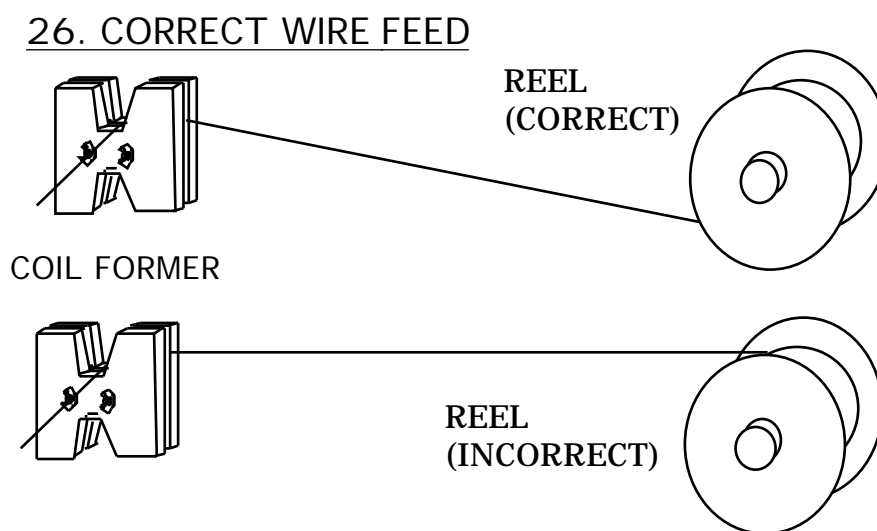


## 4. Stator construction

This section tells how to make a stator, using the jigs and moulds from section 3. It is a good idea to wind a coil before making the stator moulds, so that the mould can be checked for correct fit.

### Winding the coils

- Mount the reel of winding wire on an axle behind you, in line with the coil former. The wire should form an 'S' bend as it winds onto the coil (diagram 26).

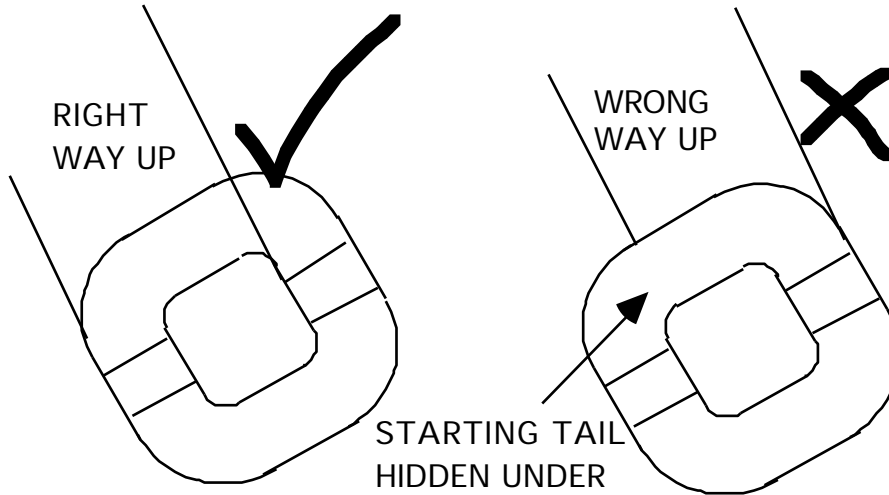


- Bend the tail of the wire 90 degrees, at a point 100mm from the end. Do not handle the bend any other part of the wire; leave it straight. Bent wire does not make a compact coil.
- Place this bend in the notch, so that the tail hangs out.
- Twist the tail loosely around one of the butterfly bolts.
- Grip the wire between the reel and the winder in a piece of rag to keep it tight.
- Wind the handle of the crankshaft.

The first turn lies against the cheek piece on the side where the tail comes out. The other turns lie against each other neatly, without crossing over. Build the coil up in even layers. Count the number of turns carefully. Normally there will be 100 turns.

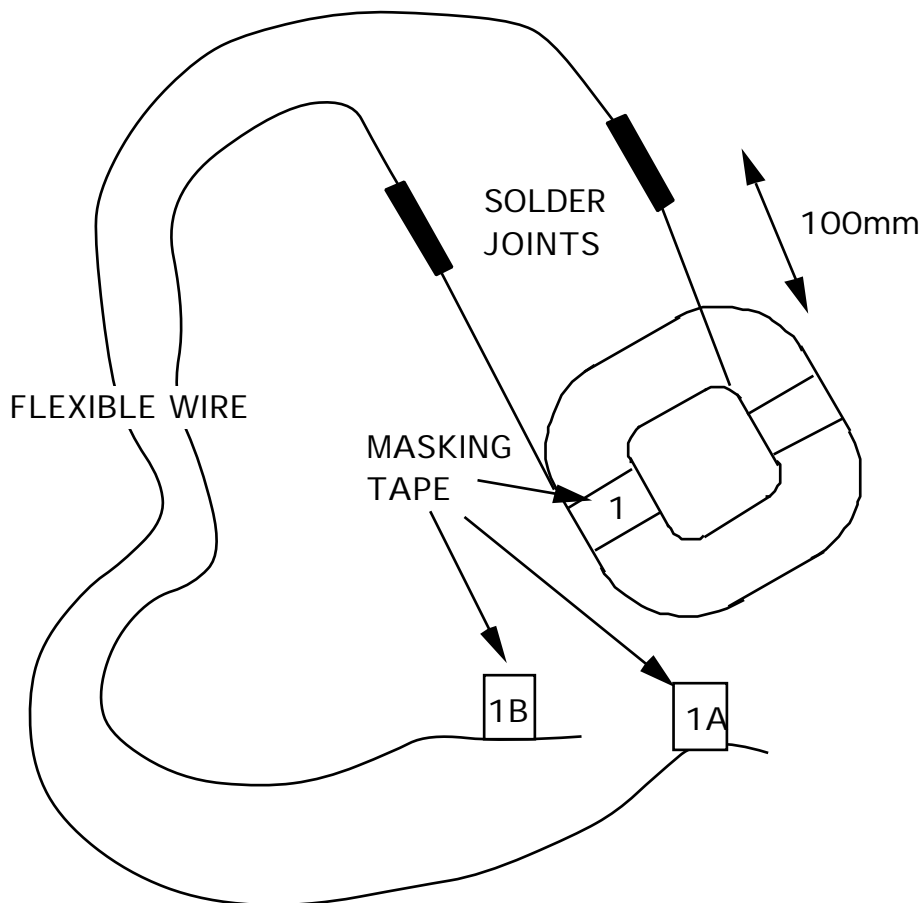
- When the coil is complete, pass a piece of sticky tape under the coil on both sides and bind it tightly. Do not cut off the winding wire until this is done, or the coil will spring out, and loosen. Cut the tail of wire 100mm away from the coil.
- Remove the coil from the former, and wind five more coils in exactly the same way.
- Place the coils on a table (so that they are all exactly the same way up (diagram 27) Check that the starting tail is on the upper surface, and not hidden under the coil.
- Number the coils 1-6, writing on the masking tape.

## 27. THE COILS MUST ALL BE THE SAME WAY UP



- Scrape the enamel off the last 20mm of each tail of enamelled wire, until it is all bright copper. (A hacksaw blade makes a very good scraper, when the edge has been sharpened with a grinder.)
- Solder on tails of flexible wire (diagram 28).

## 28. SOLDERING ON TAILS OF FLEX

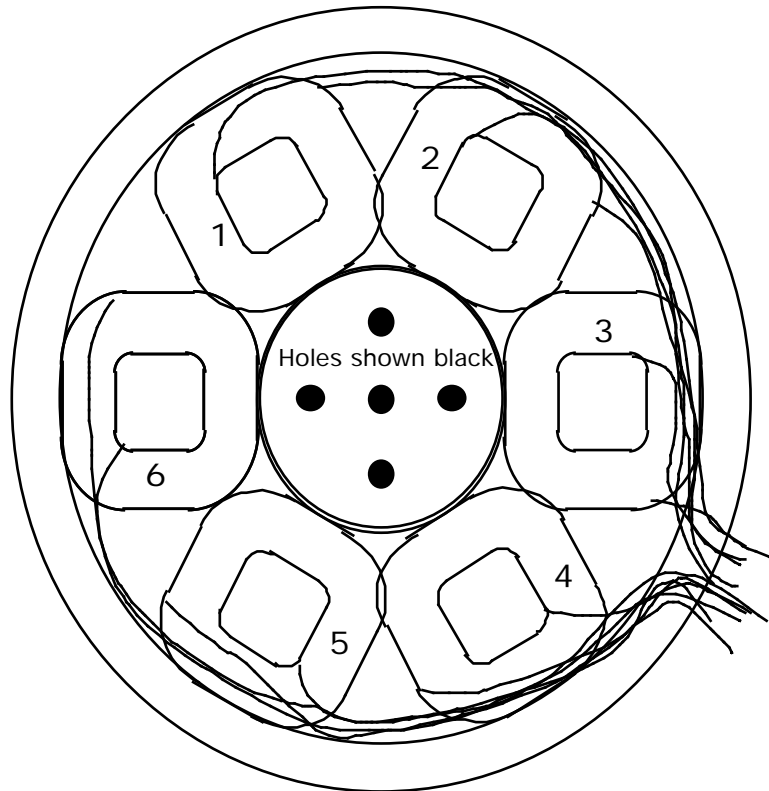


Suggested lengths of flexible tails:

- coils 1 and 6 - 800 mm flex
- coils 2 and 5 - 600 mm flex
- coils 3 and 4 - 400 mm flex

- Cover the soldered joints with sleeving. Leave no bare copper showing.
- Label the tails with the coil number and the letter A or B. A is for the start of the coil, B is for the finish. Do not mix them up. Or use two colours: black flex for the starts and white for the finishes.
- Lay the coils out in the outer mould.
- Check that they will fit comfortably, and that the tails are long enough to remain within the mould until the exit point between coils 3 and 4. It is important to lay all the coils the same way up.

## 29. THE COILS IN THE MOULD



### Preparations for stator casting

The stator casting will contain:-

- six coils
- polyester resin and talcum powder (and perhaps pigment)
- fibreglass mat (CSM)
- four studs of 8mm x 100mm threaded rod

Also, be sure to have the moulds prepared properly. Sand them, seal them, polish them. If PVA release agent can be got, then use it.



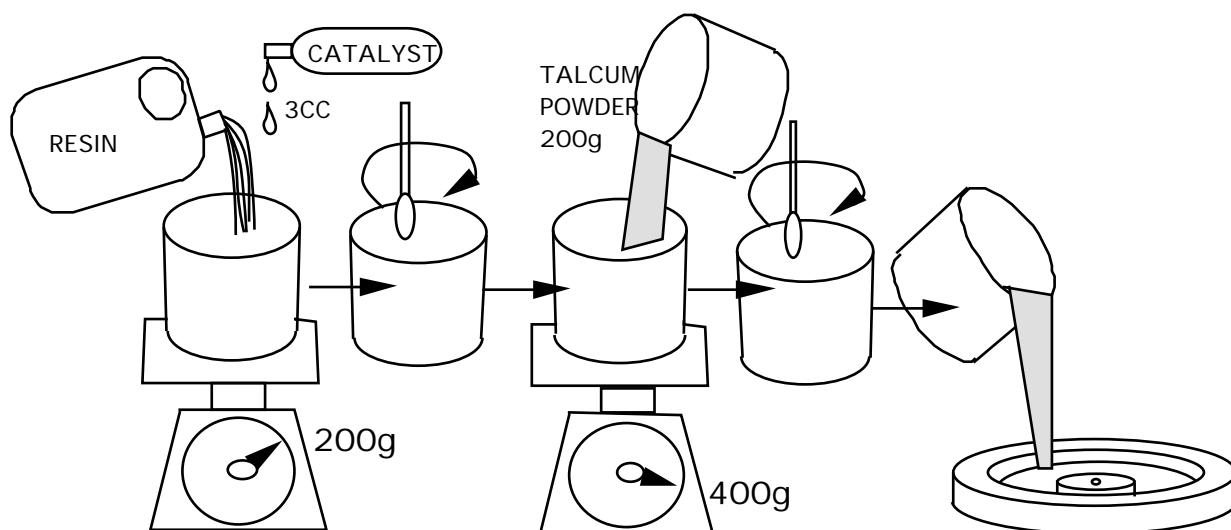
Cut out pieces of fibreglass CSM, using the templates. There will be 2 circular disks for laying flat in the outer mould. You also need enough curved strip pieces to cover the inside wall of the outer mould in a double thickness of CSM. Overlap 25mm between pieces.

When you are sure that you have everything to hand, start the resin casting process. It is a good idea to read through the procedure first, and check that you understand it all before you start. There are notes on polyester resins in section 8.

### The stator casting procedure

Diagram 30 shows the procedure for weighing out the resin and the talcum powder. The talcum powder is only used for bulk mixes (not thin layers with CSM), to prevent overheating, and to thicken the mix. Different mixes use different weights - follow the step by step instructions below. Diagram 31 shows all the parts coming together.

### 30. MIXING POLYESTER RESIN



Mix resin with catalyst thoroughly but slowly to avoid churning in air bubbles. Add any talcum powder only after the catalyst is mixed. When the resin is mixed, use it at once. After a few minutes in the mixing bucket, it will heat up, and begin to set.

Use exactly the right amount of catalyst. Resin casting needs less catalyst than normal fibreglass work (about half the time). When the workshop is hot, put in less catalyst. Casting thick layers of resin, put in less catalyst. If in doubt, make some trial mixes of resin, to find out the correct amount of catalyst.

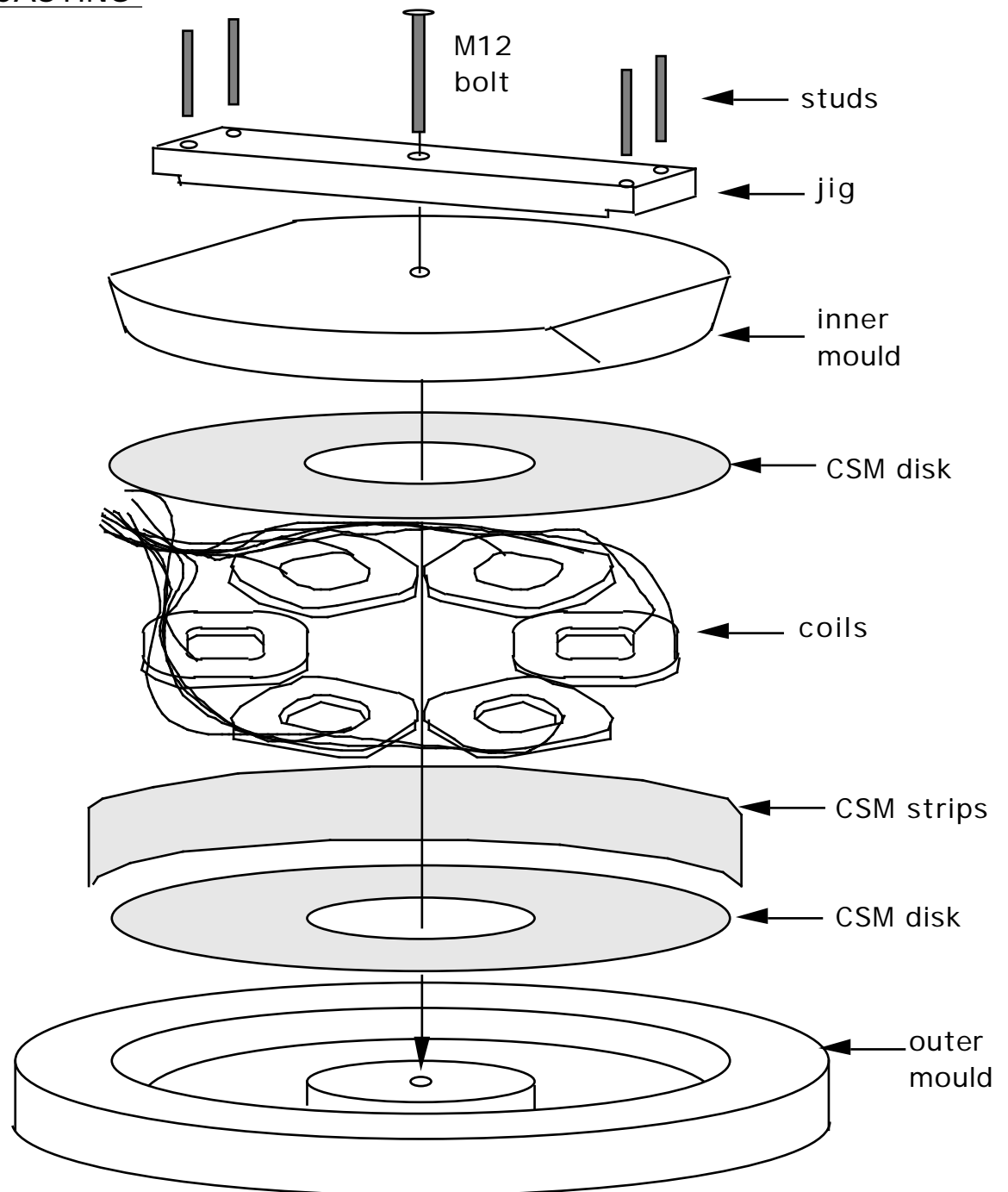
If there is no PVA 'release agent', then take care not to wipe the polish off the mould with brush strokes. Apply the resin with a 'prodding' action.

- Place the outer mould on some newspaper on a workbench.
- Mix 200g of resin, with 3cc of catalyst (and 15-30cc of pigment for colour, if required). Use no talcum powder in the first two mixes.
- Paint this resin all over the inside of the outer mould. Do not paint it on top of the island in the centre.
- Apply one layer of fibreglass mat (CSM), and paint more resin over it again, with a poking motion to remove bubbles. Work the resin into the CSM.
- Apply a second layer of CSM to the wall, but keep one disk for later.
- Put the coils into the mould. The wire tails all come out in one place, between coils 3 and 4.
- Mix another 100 g of resin with 2cc catalyst. Pour this over the wires of the coils so that it soaks in. Avoid making 'pools' of resin.
- Mix another 600g of resin with 9cc catalyst and 600g of talcum powder. Pour this mix into the spaces between the coils. The resin should fill the outer mould until it is level with the island at the centre.
- Shake the mould vigorously, to remove air bubbles. Rotary motion and vibration will help the resin to settle, and help any air bubbles to rise .
- Mix another 200g resin with 3cc catalyst and only 100g of talc. Put the second CSM disk over the coils and paint it with this mix. Thoroughly wash out the paint brush with thinners.
- Put the inner mould down inside the outer mould, and fit the 12 mm bolt through the centre of both. Tuck the wiring neatly into the space between the moulds. One flat spot on the inner mould sits over the part where the wires come out of the stator. The resin will rise up the sides. Some resin may spill out.
- If necessary, pour resin gently into the gap between the moulds until it rises to near the top of the female mould. You may need to mix another 100g of resin with 1.5cc of catalyst to do this. Keep notes of the amounts of resin used, for next time.
- Place the jig (for the studs - diagram 24) over the inner mould, with one end over the wire tails. Tighten the 12mm bolt with a nut. Insert the four 8mm studs into the holes, with nuts on top. The studs should be immersed in resin for about half of their length.



Six stages of the rotor casting procedure

## 31. STATOR CASTING ELEMENTS



The casting is now complete. It should become slightly warm, and harden within hours. If it does not begin to set within a few hours, then put it in a warm place to speed up the process.

When the resin is fully hard, remove the casting from the mould. Be patient and gentle if possible. Remove the jig from the studs. Tap the two moulds apart, using a bolt in each of the holes around the central hole. Knock the casting out of the outer mould by turning it over and knocking the edge of the mould gently against the floor.

## 5. Rotor construction

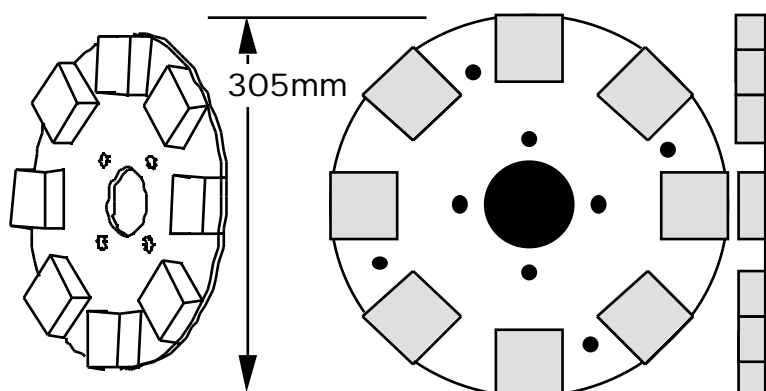
The magnet rotor is also a casting. There is also a procedure later for assembling the parts. First collect together the magnet plates, magnet blocks, stainless wire rope, etc. as described next.

### Magnet plates

Each magnet rotor is built on a steel disk, 6mm thick. See diagram 32. Do not use aluminium or stainless steel for this disk! The disks have to be made of magnetic material. The disk has holes to mount it to the hub - in this manual the hub has four holes, each 10mm diameter, on a circle at 4 inches (102mm) PCD. If a different hub is chosen, then all the jigs and moulds must match this hub.

At the centre of the disk is a 65mm diameter hole. There should also be four holes drilled and tapped (threaded) for M10 rod between the magnet positions, at 220mm PCD. Screw four pieces of M10 rod, 20mm long, into these holes. These will bond to the resin and help to secure the casting onto the disk.

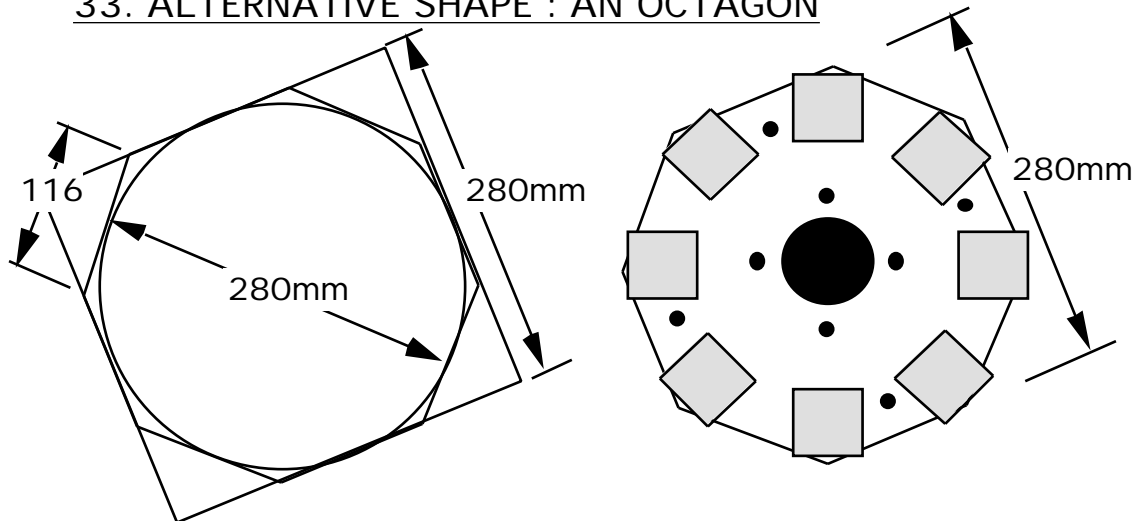
### 32. MAGNET ROTOR DISK



The magnet plates must be flat, not warped. It is not easy to cut the outer circle without warping the plate. A guillotine can cut steel plate into an octagon (see diagram 33), without warping the plate. This is an alternative way to make the rotor disk. First cut a square, draw a circle on it, and then cut off the corners at 45 degrees. The length of each edge is 116 mm.

The magnets will be placed on the corners of the octagon.

### 33. ALTERNATIVE SHAPE : AN OCTAGON



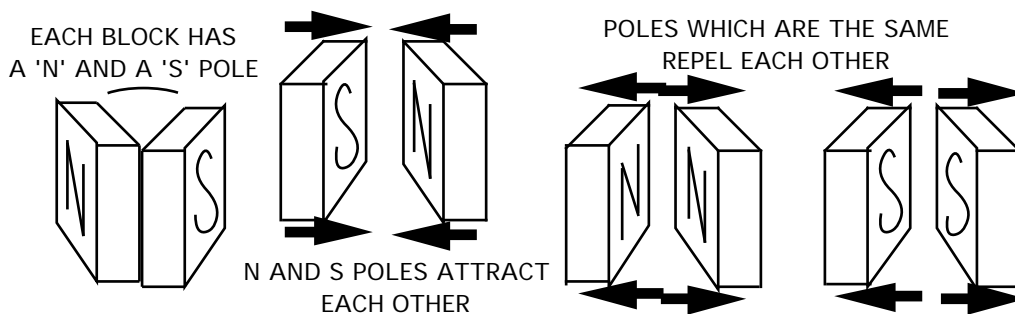
The central hole is made with a hole-saw or it can be cut out on a lathe.

Grind the steel disks until they are bright and clean, just before putting them in the mould for resin casting. Remove any grease with spirits.

#### Magnet blocks

There are 8 magnet blocks on each rotor. Each block has a north pole and a south pole (see diagram 34).

### 34. POLES ON THE MAGNET BLOCKS

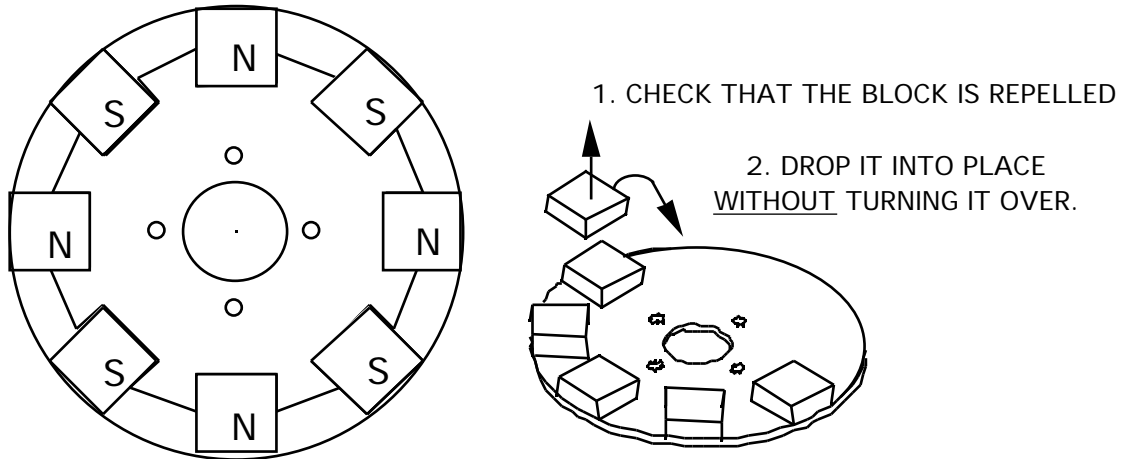


Take care when handling the magnets. Magnets can damage floppy discs, music tapes, credit cards and other magnetic media. Separate them from each other by sliding them sideways. They attract each other with strong forces. Take care not to let them fly together - they may break. Never use a hammer to assemble the PMG. You may break a magnet or break the resin holding it.

The top faces of the magnet blocks on the disk must alternate N-S-N-S-... There is a method to check that you are doing this correctly, as follows. Each time a magnet block is placed, hold it so that it repels the one before (see diagram 35). Then place it without turning it over. When they are all in, check with another magnet: it will be attracted, repelled, attracted, repelled, by each magnet in the circle.

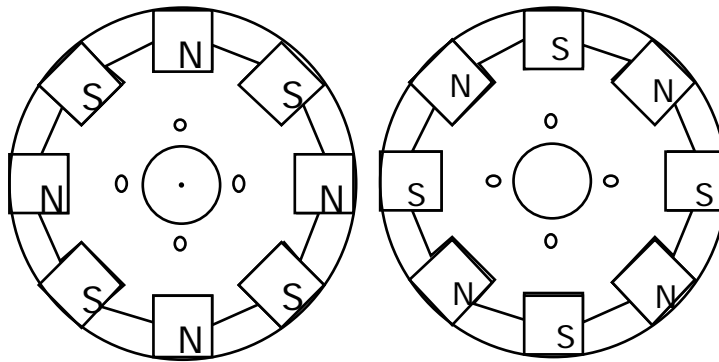


### 35. PLACING THE MAGNET BLOCKS



The two magnet rotors must attract each other when the mounting holes are aligned. Check that the magnets next to the holes on one rotor are different from the ones next to the holes on the other rotor (see diagram 36).

### 36. THE TWO ROTORS ARE NOT THE SAME



#### Stainless Steel wire

When the PMG is turning, the magnets will try to fly off the rotors. There is a large centrifugal force pulling the magnet blocks to fly away. When we started building these PMGs, the magnet blocks were simply glued to the steel disks. When the PMGs turned fast, the magnets flew off, and the wind generators were destroyed.

Now we embed the magnets in a resin casting. Resin alone is not strong enough to hold the magnets. It should be reinforced. Wrap wire around the outside of the magnet rotors to hold the magnets in. Steel wire is strong enough, but steel would take the magnetism from the magnet blocks. We use stainless steel because it is not magnetic and it does not spoil the effect of the magnets. Stainless steel wire cable is used on fishing boats.

Before using any resin assemble the parts dry. Put the stainless steel rope around outside the magnets five times, and cut it off with a grinder or chisel. Tape it in several places so that it is in a coil, ready to drop into place later.

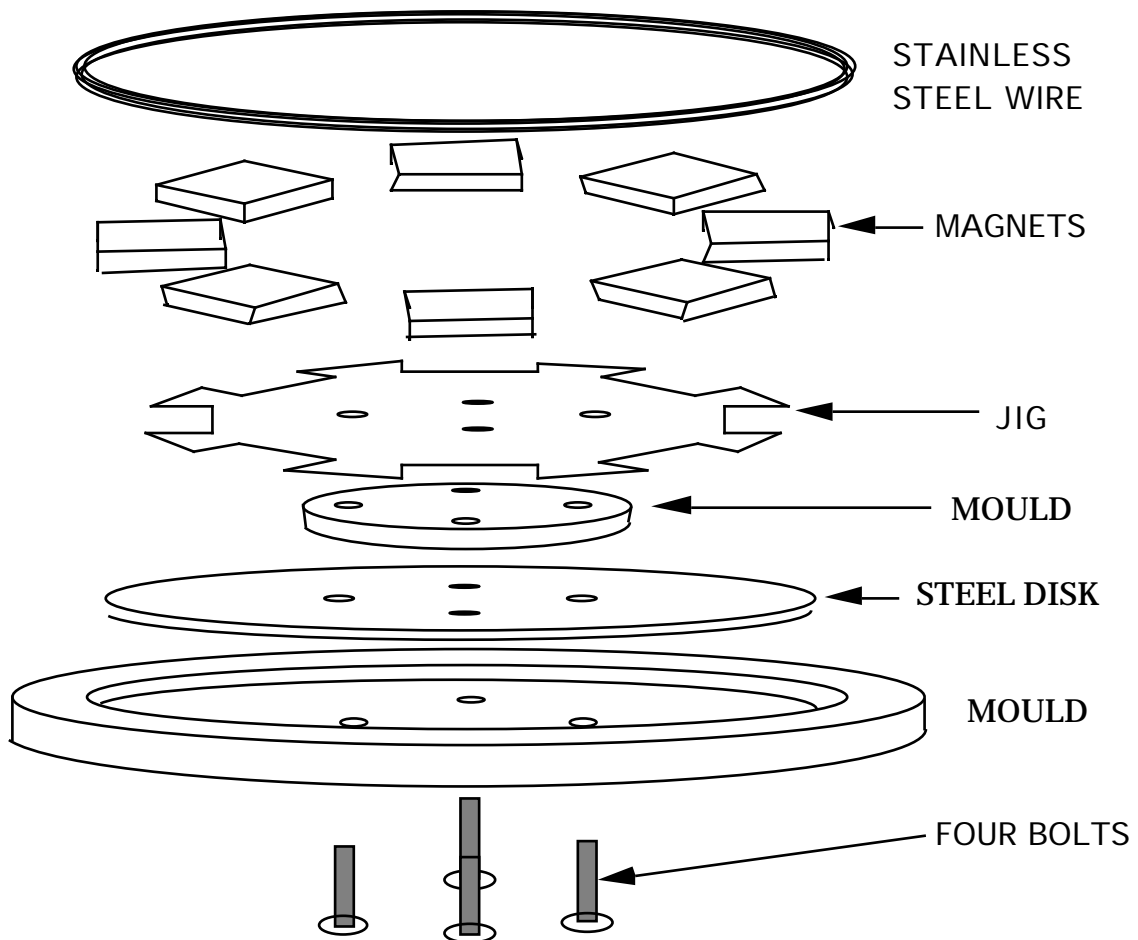
### Rotor casting procedure

Before starting, check that everything is ready:

- the moulds are prepared with polish or release agent,
- the magnets and the magnet disks are clean and bright (no grease),
- 16 strips of CSM are ready to fit between the magnets
- the stainless steel wire is cut to length and taped
- the magnet positioning jig is ready

The amounts of resin mentioned in this procedure are enough for two magnet rotors.

### 37. MAGNET ROTOR MOULD ASSEMBLY



- Place four bolts through the holes in the outer mould, from below (see diagram 37). Lay a steel disk in the outer mould. Place the inner mould on top. Check the taper, and place the smaller face down, so that it can be easily removed after casting.
- Mix 200g of resin with 3cc catalyst. Paint it all over the steel disk. Add 20g of pigment for colour if required. Mix 100g talcum powder with the remains of the

resin. Pour this mix around the edge of the disk until it fills the gap, level with the top of the steel disk.

- Place the magnet positioning jig onto the bolts. Place the magnet blocks on the steel disk, within the positioning jig. Take care that the poles of the magnets alternate - north, south, north, south.. Before you place a magnet on the disk, check that the underside of the magnet is repelled by the one next to it (diagram 35). When all the magnets are in, remove the positioning jig, and use it for the next magnet rotor. Remember : position the magnet blocks differently, so that the two rotors attract each other. Take care not to knock the magnets out of place, or they will slide together under the magnetic attraction.
- Fit nuts to the four bolts and tighten the central disk down onto the steel disk.
- Mix 500g of resin with 7cc of catalyst. Add 300g talcum powder. Lay small strips of CSM between the magnets and into the gap at the edge. Add resin until the CSM is soaked. Poke it, or vibrate it, to remove bubbles.
- Lay the coil of stainless steel wire loosely around the outside of the magnets, below the top of the mould. Do not let the wire fall below the magnets. Let it sit on the CSM. Take care not to move the magnets around.
- Mix 500g of resin with 7cc of catalyst. Add 300g talcum powder. Fill the spaces between the magnets until the resin mix reaches the top of the mould.

Leave the rotor castings to set hard (several hours) before you remove them from the moulds. Be patient when removing the rotors from the moulds. Do not use violent hammer blows which may damage them. Hit the mould, and not the rotor.



Four stages of the rotor casting procedure

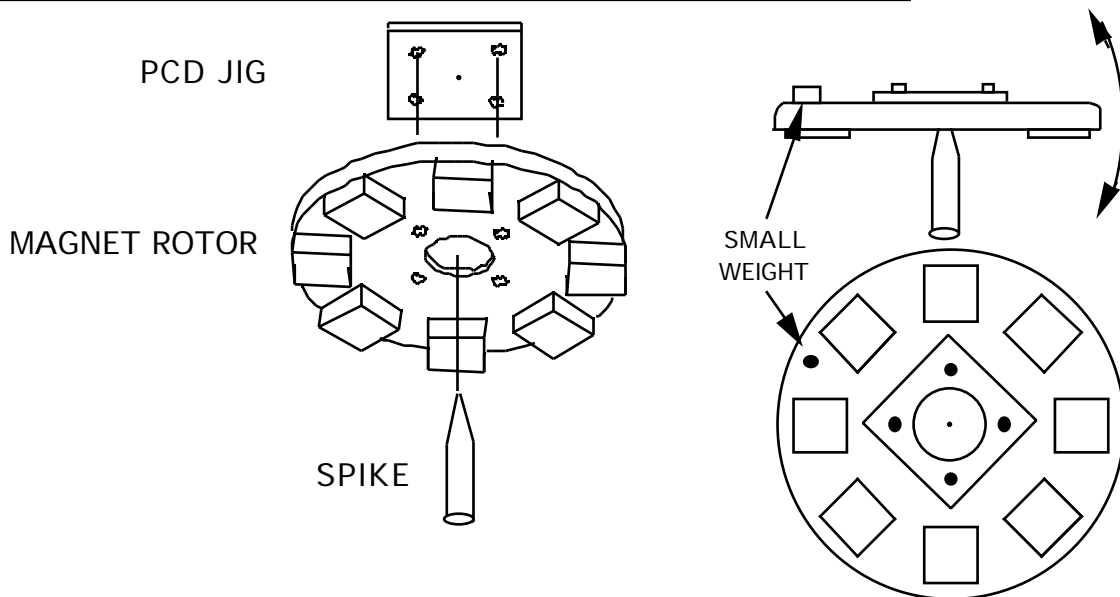
## 6. Assembly

### Rotor balancing

Each rotor should be balanced, or the PMG will shake when it is turning. The whole PMG needs to be balanced again at the end, because the rotors may not be mounted exactly centrally. A different procedure is used for the final balancing in Section 6.

To balance a magnet rotor (see diagram 38), first attach the PCD jig (from diagram 11), using four bolts. Then balance the rotor on a spike as shown:

### 38. ASSEMBLY OF THE BALANCING JIG AND SPIKE



If the rotor will sit level, then it is balanced. If it will not sit level, then add small weights to it, or drill out some of the resin between magnets, until it will sit level. Turn the PCD jig around on the rotor, and check it again. Replace any weights with pieces of M10 threaded rod, screwed into holes in the resin between the magnets.

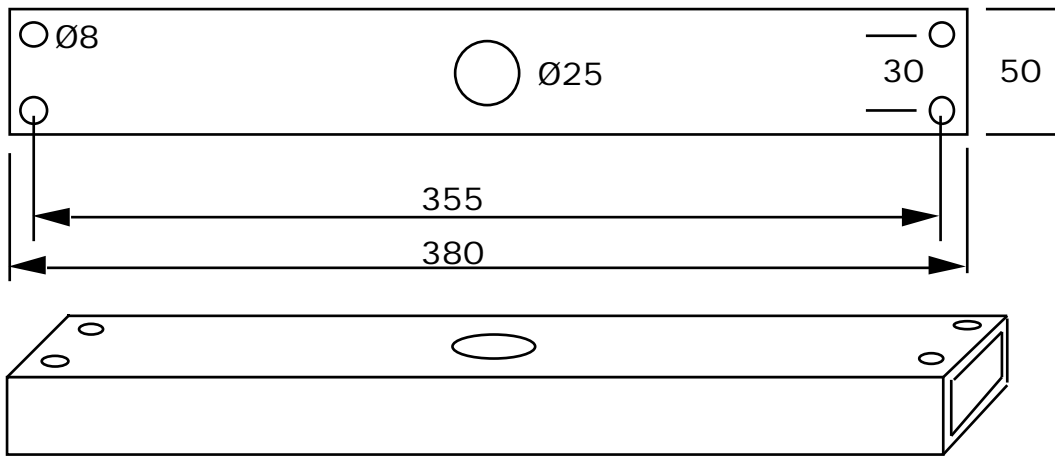
### PMG spine and bearing hub (see diagram 39)

Make the spine of the PMG from a 380mm length of 'box section' steel tube 50x25x4mm (sometimes called RHS). Mark the exact centre of one large face, and then mark four 8mm holes, in the same way as for the 'stator studs jig'. It could also be possible to use the stator studs jig to help drill the holes.

The hole at the centre is 25mm (or to suit the shaft used). Drill this with a hole-saw, or bore it on a lathe.

### 39. THE BOX SECTION SPINE

DRILL HOLES WITH A PILLAR DRILL FOR ACCURATE ALIGNMENT

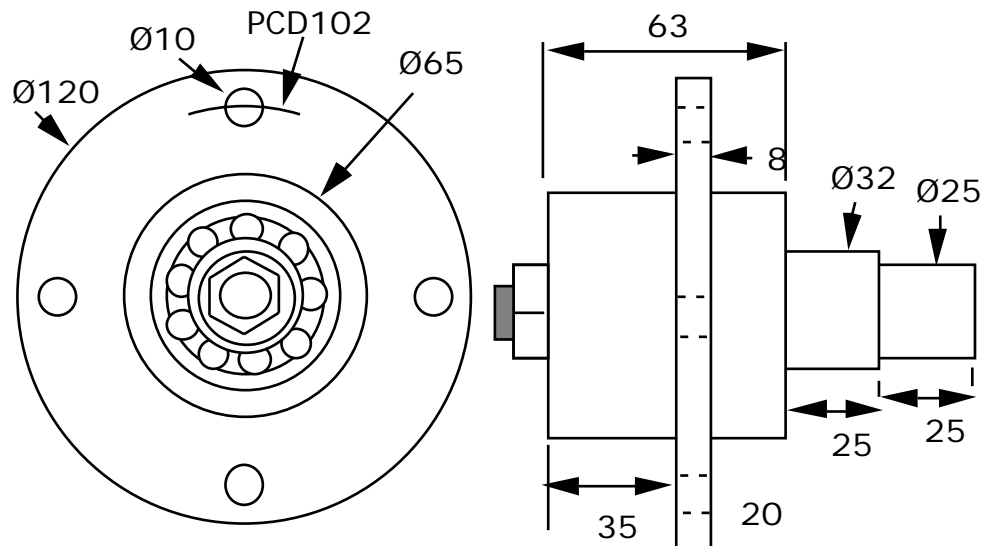


Weld the shaft in the 25mm hole. Take care to hold the shaft as square as possible (90 degrees) to the spine, when welding it.

The bearing hub (diagram 40) fits on the shaft. It has two 50x25 mm deep-groove ballraces in it, with a spacer between them. It needs a plastic cap over the end to keep dirt out of the bearings.

Do not forget to grease the bearings. Pack them with grease around half of their circumference only. Do not fill them entirely or they will become stiff to turn.

### 40. THE BEARING HUB





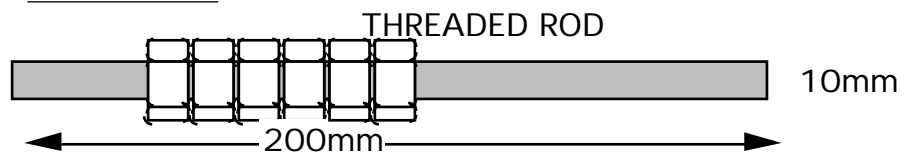
Photos show the rear magnet rotor being fitted



### PMG assembly

- Cut 4 pieces of M10 threaded rod, each 200 long. They are used as studs to hold the magnet rotors to the hub. The wind turbine blades will also mount onto these studs.
- Put 6 nuts onto each stud) see diagram 41).
- Fit the studs through the holes in the bearing hub, from the front
- Put the rear magnet rotor onto the ends of the studs.
- Put a nut on the end of each stud, and tighten the other nuts down, so that the rear magnet rotor is attached to the back of the hub flange. The outer end nut should be sealed with paint or thread-sealant.
- Place the spine in a vice with the shaft upward. Place the hub onto the shaft. Do not hammer the magnet rotor while fitting. Fasten the hub to the shaft with a nut and split pin. Do not over tighten the nut. Fit a dust cover over the end of the bearing hub.

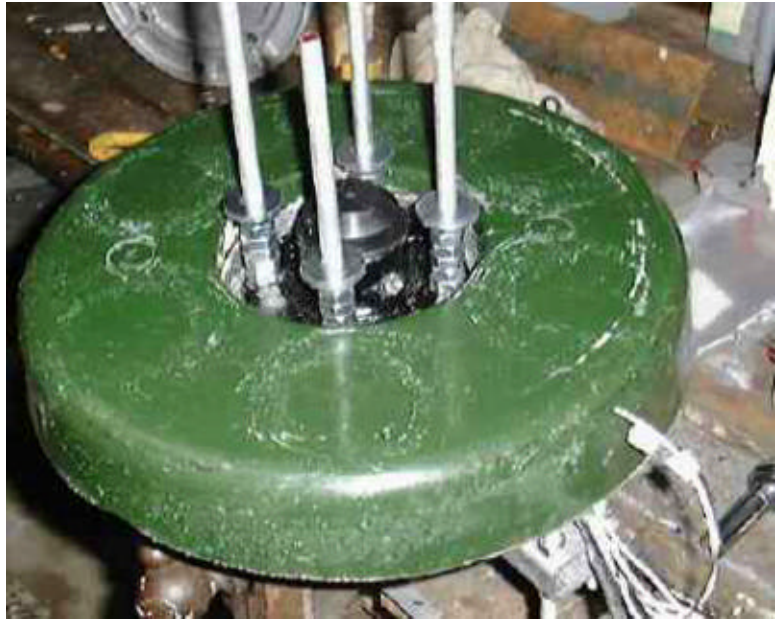
#### 41. STUDS



- Rotate the magnet rotor past a piece of brass wire. Do not use steel wire, because it is attracted to the magnets. The magnet faces should all be at the same height +/- 0.5mm. If not, use very thin shims between hub-flange and rotor-disk, to adjust the rotor.
- Using a spirit level, adjust the spine in the vice until the magnet rotor is level. Check both ways: north-south and east-west.
- Take the stator. Fit one 8 mm nut onto each support stud. Screw them right down.
- Place the stator over the rear magnet rotor

and fit its support studs into the holes in the spine. Fit more 8 mm nuts to the ends of the studs.

- Slowly lower the stator, and rotate the rear magnet rotor. Keep the stator level in both directions. You will hear a sound when the highest magnet touches the stator.
- Use the nuts to raise the stator equally 1mm on all four studs.
- Fit some washers to the 10 mm studs which hold the rotors. Always the same number of nuts and washers on each stud. A total of six nuts and two washers may be



Fitting the stator

enough. Then fit the front magnet rotor.

- If the front magnet rotor is less than 1mm from the stator at any point, then add more washers under it. If it is much more than 1mm from the stator then remove washers. To find the correct number it is necessary to remove washers until it begins to rub the stator. Then add 1mm.
- When the front rotor is 1mm from the stator, then fit more nuts on top, and tighten them securely.

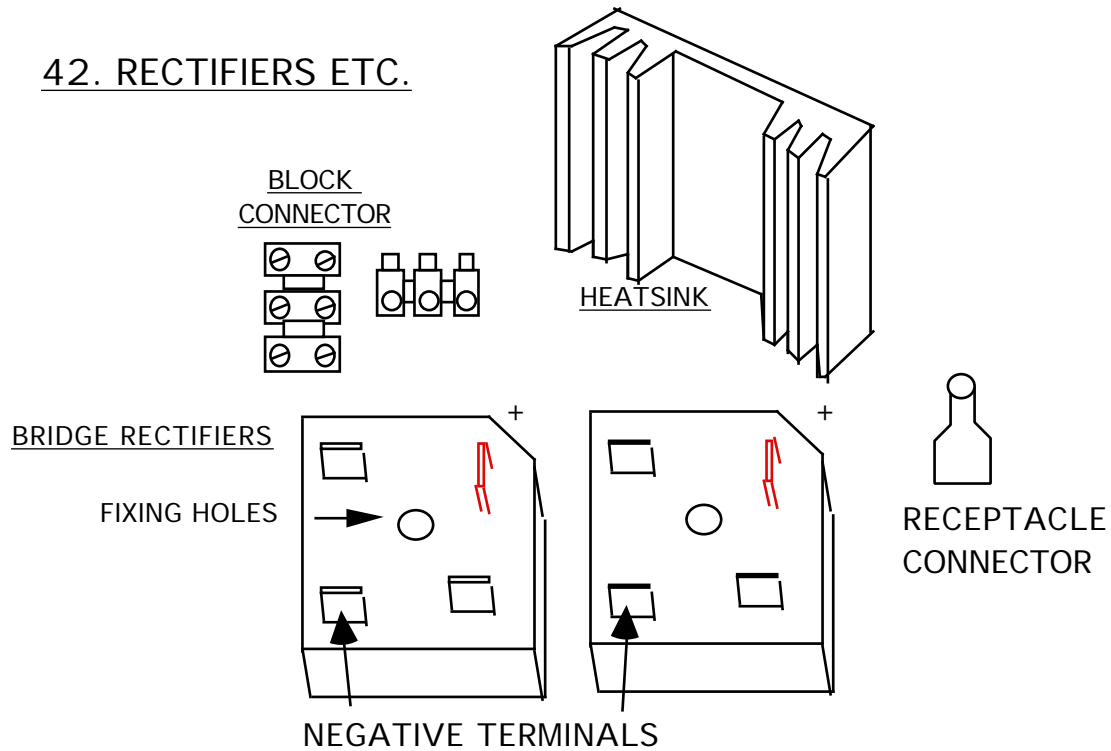


Fitting the front magnet rotor

### Electrical Parts

The next section (Section 7) will describe how to connect the rectifier to the stator. I recommend using two 'single phase bridge rectifiers' (see diagram 42). They come in blocks 30 x 30 mm. The positive terminals are both connected to the battery positive terminal. (They are often at right angles to the other three. ) Both negative terminals are connect to the battery negative. The remaining four terminals are for AC connection to the stator. You will probably only need to use three of these, connected as desired to suit the speed (see Section 7).

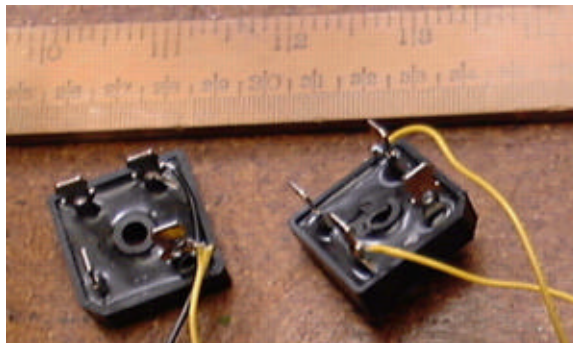
## 42. RECTIFIERS ETC.



'Block connectors' are useful for connecting the wires from the stator. Alternatively soldering or crimping would be fine.

Use solder, or crimped 'receptacle' connectors, to connect wires to the rectifiers. Take care not to overheat the rectifiers while soldering. Bolt the rectifiers onto the heatsink, which will probably look like the one in the diagram, but can be any piece of aluminium approximately 250 grams or more in weight.

Keep all the connections under a weatherproof cover.



Two bridge rectifiers

## 7. Testing and connecting

Check that the PMG has no faults before it is put into use. It will be much easier to correct the faults now, than to return the unit to the workshop later.

### Mechanical testing

Mount the spine vertically in a vice. The magnet rotors are free to move. The shaft is horizontal, as it will be in a wind generator. Check that the wires are not touching each other, creating a short circuit which makes the PMG harder to turn.

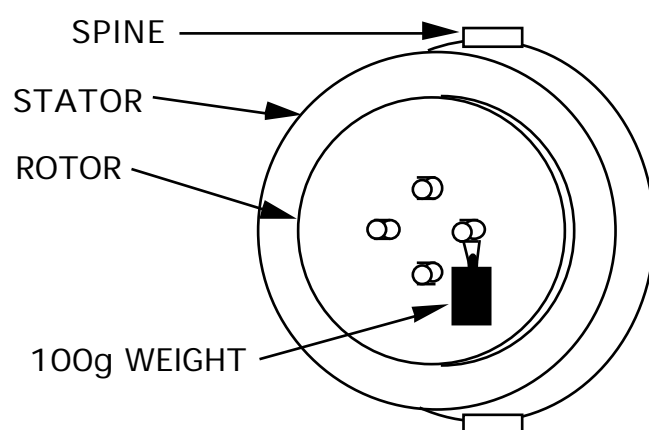
Check that the rotor will spin freely.

Spin the rotor and listen for sounds. There should not be any scuffing or brushing of the rotor, as it turns. It should spin freely for several seconds and gradually come to a halt. If it slows down rapidly then there may be an electrical fault, or the bearings may be over-tightened.

Grasp the stator with both hands. Push one side backward while pulling the other side forward, while the rotor is spinning. It must not touch the rotor. If there is a rubbing sound, then it may be necessary to disassemble the PMG and assemble it more carefully, with more space between the rotor and the stator. Or it may be possible to correct the problem by making minor adjustments to the stator mounting studs.

Stop the rotor with one of the studs in the 3 o'clock position (diagram 43). Hang an object weighing 100 grams on this stud. The rotor should begin to turn clockwise. If it will not turn, then the bearings may be over-greased or too tight.

### 43. HANG A WEIGHT ON ONE OF THE STUDS



### Checking the balance

The rotors have already been balanced in section 6. The wind turbine blades must also be balanced in the same way. When the unit is assembled, you should check the balance again using the new procedure below. This is necessary because the rotor disk may not be perfectly central on the PMG shaft.



Repeat the starting test (diagram 43) with each of the four rotor studs in the 3 o'clock position. Try different weights, and find the lightest weight which will start the rotor turning. If one stud needs much more weight than another, then the rotor is not balanced. Fix small weights to the rotor until the balance is correct.

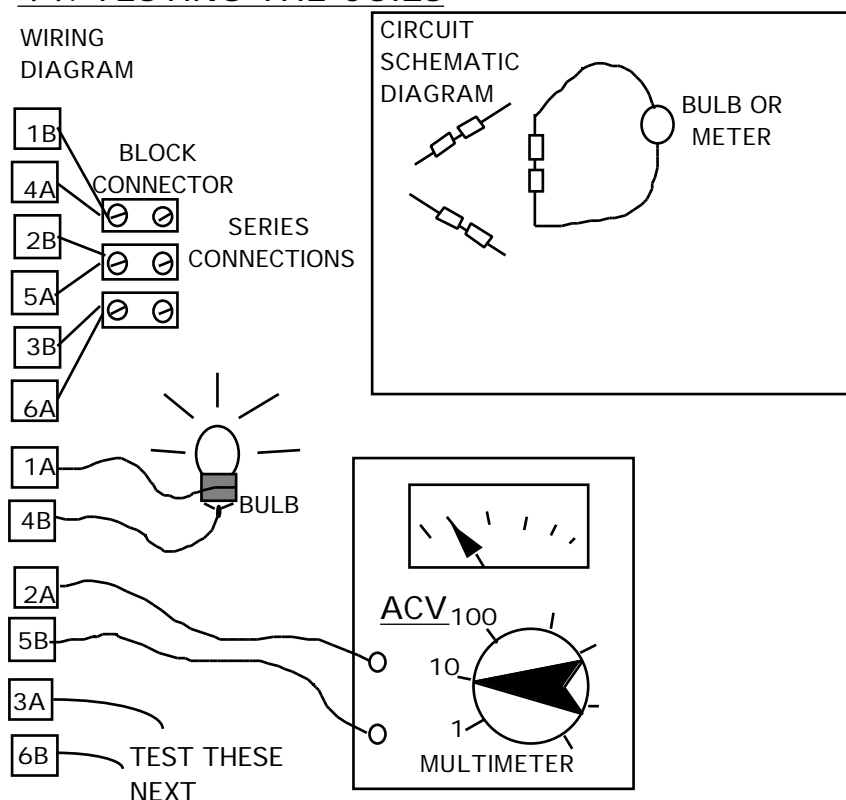
## Electrical testing

### Coil connection test

It would be helpful to have a multimeter when testing the PMG, but it is possible to do some basic tests with a 3 volt torch bulb. See diagram 44.

- Connect the wires 1B to 4A, 2B to 5A, and 3B to 6A. (Series connections of pairs of coils which are in the same phase.)
- Set the multimeter to '10VAC' or similar (if you have one).
- Connect the meter, or a bulb, between the wires marked 1A and 4B.

### 44. TESTING THE COILS



- Rotate the PMG slowly by hand, about one revolution per second.
- The meter should give a reading of about two volts, or the bulb should flicker.
- Repeat the test with two more pairs of wires: 2A and 5B, 3A and 6B.  
In each case the result should be the same.

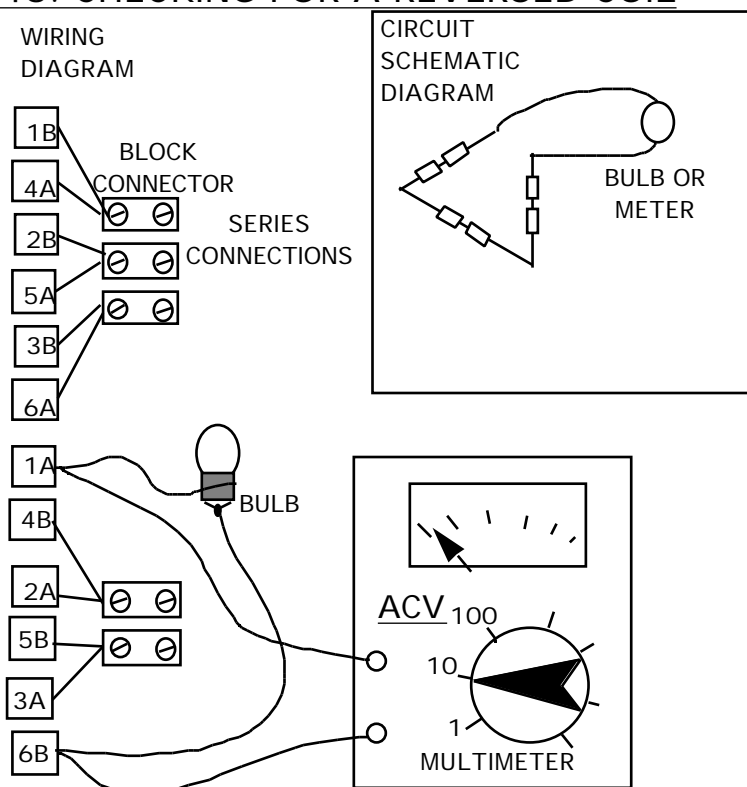


If there is no reading, or a very low reading, then check that the series connections (1B-4A, 2B-5A, 3B-6A) are correct. If all these connections are good, then it is possible that one coil has been reversed (placed upside-down).

If any coils have been reversed, then it is necessary to do another test (see diagram 45), to find out which one is at fault. Connect 4B-2A and 5B-3A as shown in the diagram. Now test between 1A and 6B. There should NOT be more than a very small voltage. If there is a voltage, or the bulb lights up, then reverse the connections (swap A for B) on the coils until the voltage drops to a very low level.

When the faulty coil has been found, label the tails again, with A and B at the correct ends.

#### 45. CHECKING FOR A REVERSED COIL



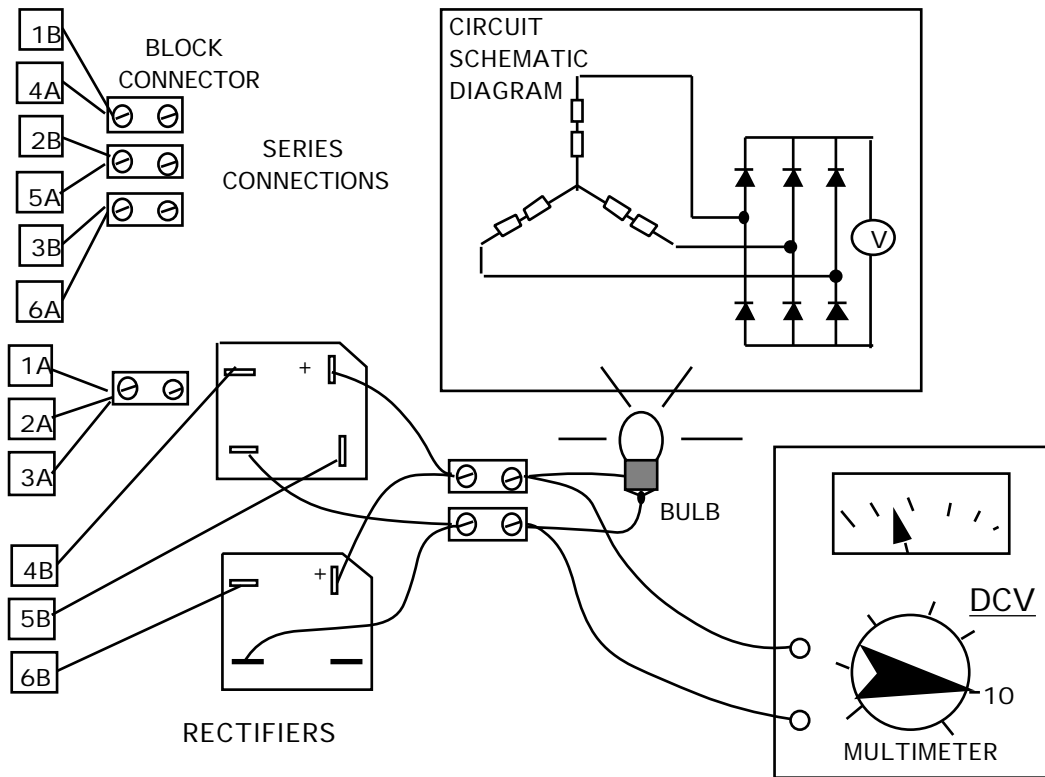
There will always be a small voltage in this test, because the coils are not perfectly positioned in the mould. If the test gives more than one volt, then it should be possible in future to make a better stator by placing the coils at exactly equal distances apart in the mould.

#### DC output test

When these tests have been completed and the results are correct, then connect the rectifier, as shown in diagram 46. Connect the tails 1A, 2A and 3A together. Connect each of 4B, 5B and 6B to any three of the rectifier AC terminals (marked with 'S' symbol). This is the 'star' connection. Connect a bulb to the output. If possible, also a multimeter on 10 VDC (or similar).

## 46. DC TEST

### COILS CONNECTED STAR



Rotate the rotor by hand as before, approximately one revolution per second (60 rpm). The meter should show a steady reading around 4 volts DC (or 3 volts with the bulb present). The bulb should glow with a steady light, not flickering as before.

If there is no reading, or the bulb flickers, then there is a faulty connection or a faulty rectifier. Check the connections carefully. Try another rectifier.

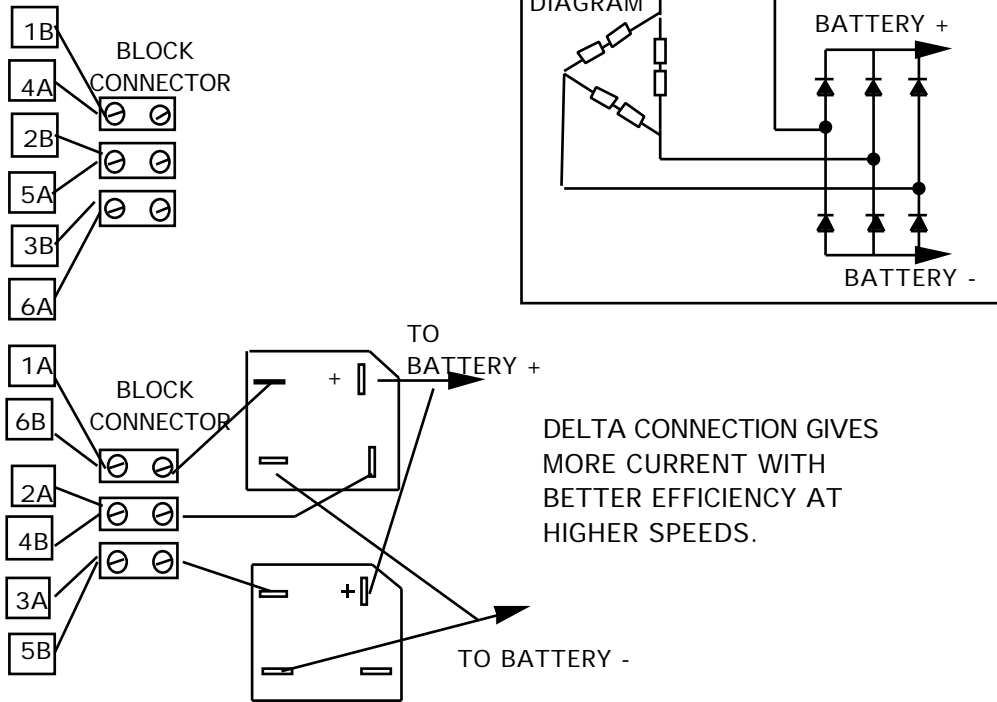
You can also test the PMG without a bulb or a meter. Simply connect the positive and negative wires from the rectifiers together (all four) in a 'short circuit'. Now try to turn the PMG. It should be stiff but smooth to turn. If it trembles as you turn it then there is a fault.

### Connecting the PMG to the 12 volt battery

#### Star and Delta connections

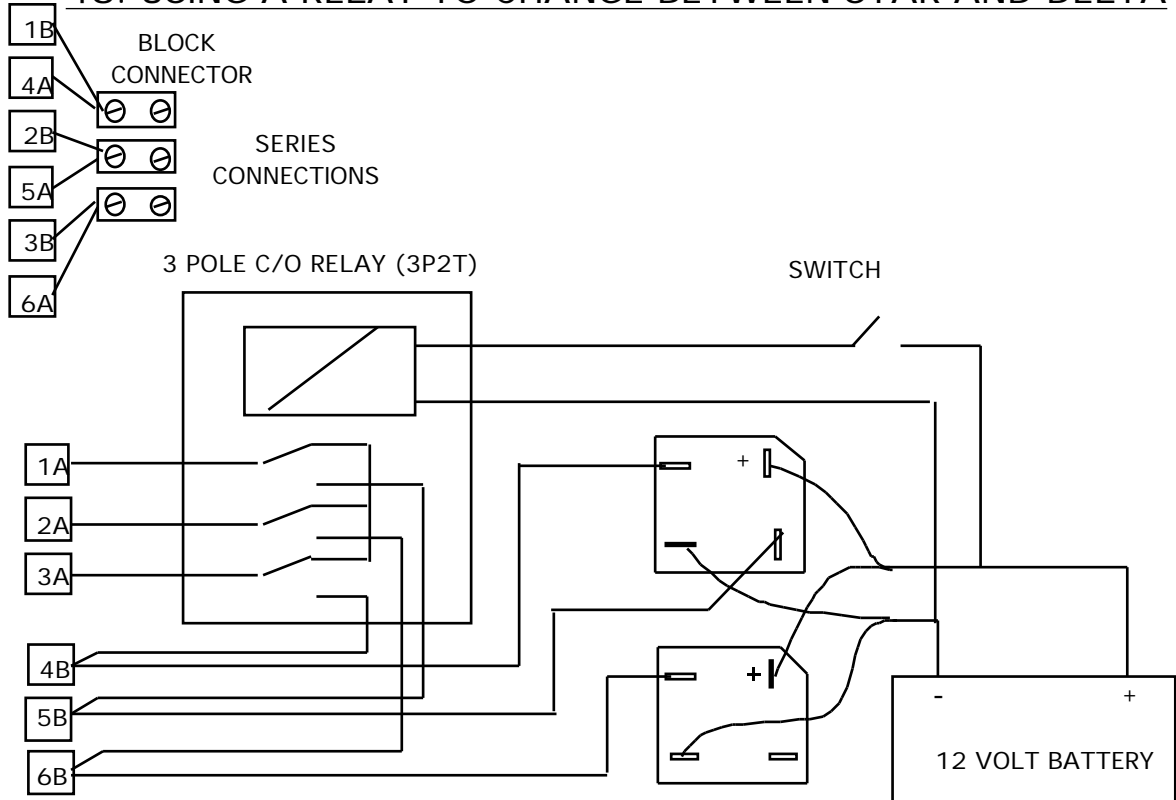
For low windspeeds, connect the coils 'star' as above. For high winds, and higher current output, connect the coils 'delta', as in diagram 47.

## 47. DELTA CONNECTION



It is also possible to wire a relay (see diagram 48) which will switch the connections from star to delta and back as desired.

## 48. USING A RELAY TO CHANGE BETWEEN STAR AND DELTA



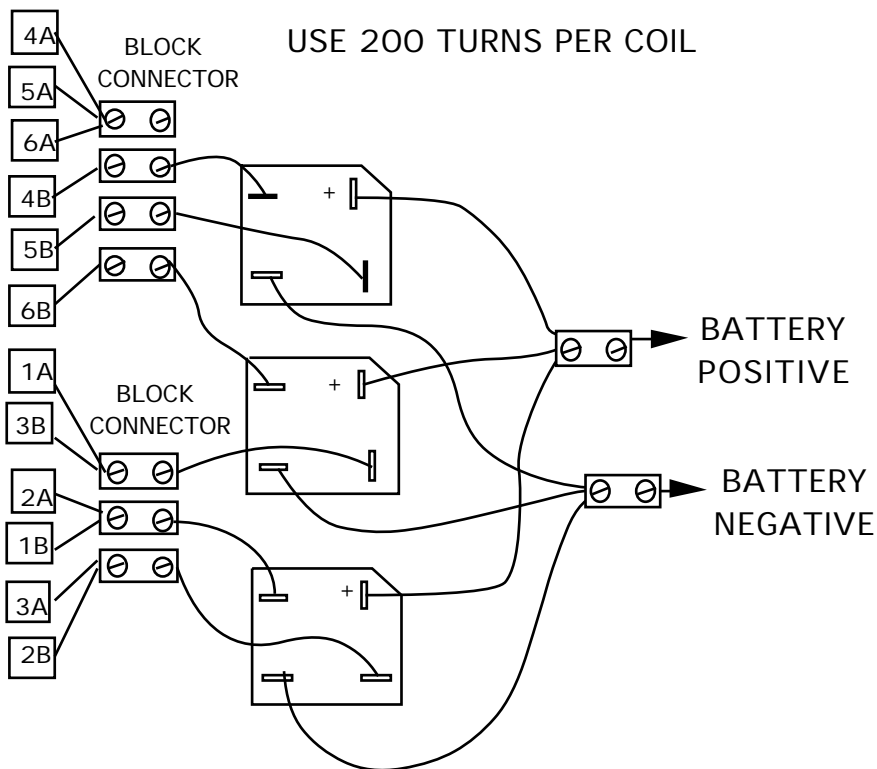
Yet another option for connecting the stator

At the time of writing this document, the above arrangement (using a relay to change the connections) is still under development. Later, an electronic control circuit will be available to automate the changeover. This is all very complex, and it so it can go wrong.

If you do not wish to have to change the connections between low and high windspeeds, then the PMG will still work. However, the efficiency will be slightly less. Three are two options:-

- If you expect mainly low windspeeds, then you can simply use the star connection shown in diagram 46.
- If you also need higher power in higher winds, you can use a 17AWG wire (1.2 mm diameter) to wind coils with 200 turns each. Then you can connect one group in delta and one group in star as shown in diagram 49. Note that you need six AC terminals on the rectifiers so you will need three rectifier blocks.

#### 49. STAR/DELTA CONNECTION



#### PMG-to-Battery Cable size

The cable from the PMG to the battery can be either three-phase-AC or DC. If the rectifier is mounted at the wind generator, then it will be DC. This is only slightly more efficient than three phase AC.

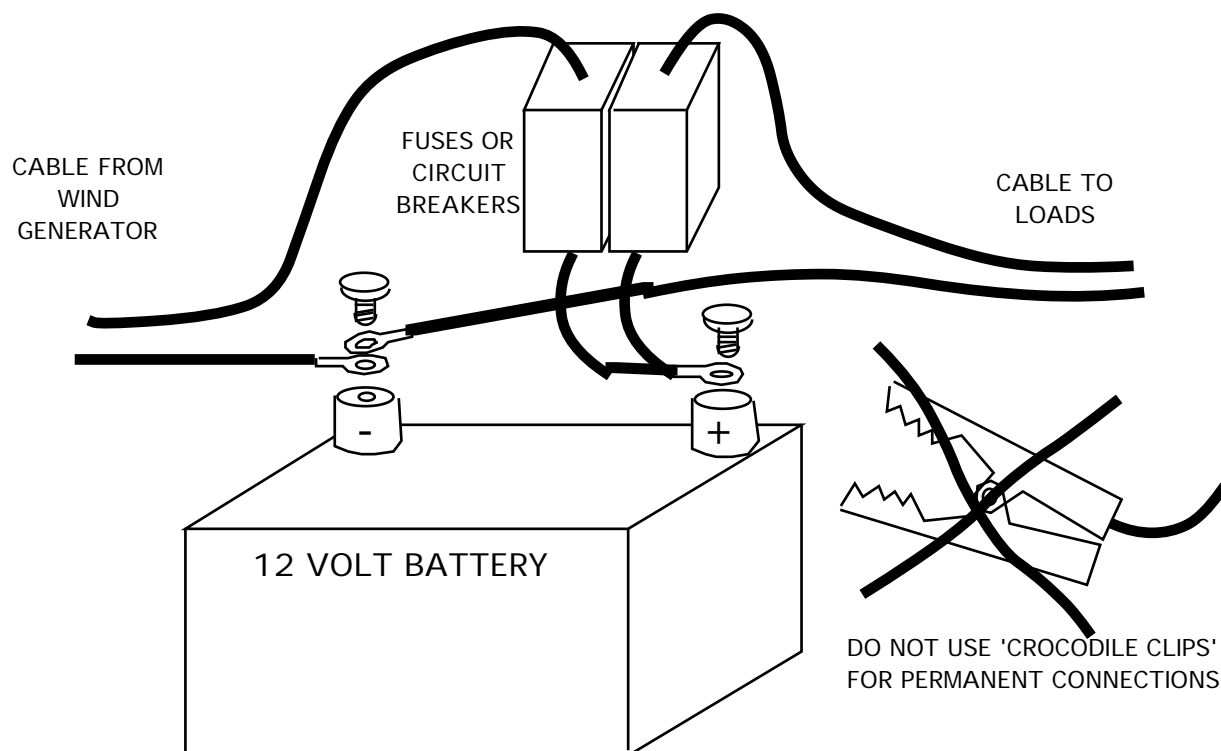
At 12 volts, the size of the cable must be large. Even if the current is only 15 amps, it is advisable to use a heavy cable. For a distance of 20 metres, the recommended size is 6 mm<sup>2</sup> (10AWG). The diameter (thickness) of each copper wire is about 3mm. A 15 amps current flowing in this cable will lose 15% of the power from the wind generator as heat in the cable. If the cable is longer, it should be heavier, in direct proportion.

## Electrical Safety

There is no danger of electric shock from a 12 volt battery. But if the wind generator is disconnected from the battery, and running fast, then the voltage will be higher than 12 volts, maybe as high as 50 volts. Do not run the PMG at high speed without a battery connected.

The battery contains stored electrical energy. When there is a short-circuit fault in the wiring from the battery, for example the positive and negative wires touching each other, this energy is released in a very high current. The cable will heat up and burn. Therefore it is necessary to use a fuse or a circuit breaker on every wire which attaches to the battery positive terminal. Use one fuse for the wind generator and a separate one for the cable to the load (the lights, or whatever uses the power). See diagram 50.

### 50. CONNECTING THE BATTERY





Battery acid is bad for the clothes and the skin. Do not splash it. Be especially careful of the eyes. If there is an accident, the best cure is to flush with plenty of water.

Batteries produce hydrogen gas, which is very explosive. Do not make sparks near a battery or it may explode, and throw acid in the eyes!

### Battery Charging

Lead acid batteries should be kept in a charged condition. In the case of a wind powered system, you may have to wait for a wind to charge the battery. But be careful not to discharge the battery too deeply, or to keep it too long in a discharged state, or it will be damaged (sulphated) and become useless. Stop using a battery before it is fully discharged. If there is a problem with the wind generator, then charge the battery from another source within two weeks.

Charging the battery too hard will also damage it. At first, when the battery is discharged, it is safe to use a high current, but later the current must be reduced or the battery will overheat and the plates will be damaged. The best way to fully charge a battery is to use a small current for a long time.

Watch the battery voltage. If the battery voltage is below 11.5 volts, then it is being discharged too much. If the voltage is high (over 14 volts) then the battery charging current is too high. Use less current or more current in the loads to correct these problems. If there is no voltmeter available, then the user should watch the brightness of the lights and follow these rules:-

- Dim lights, mean low battery. Use less electricity!
- Very bright lights mean too much windpower. Use more electricity!

A good way to use more electricity is to charge more batteries in windy weather, perhaps charging batteries from neighbours' houses.

There are simple electronic circuits which can regulate the battery voltage automatically. They are called 'low voltage disconnects' and 'shunt regulators'. If the user is not willing to watch the battery voltage, then it is necessary to fit a disconnect and a regulator.

## 8. Additional information

### Using polyester resin

Polyester is the plastic substance used in fibreglass work for building boats, car body parts, etc. Various things are added to it to make it work better for various jobs. Talk to your supplier and explain what the resin is to be used for. Your supplier should be able to help you.

### Hardeners

There are two systems used to harden polyester resin, and each system uses two chemicals. For resin casting and most fibreglass work we use peroxide and cobalt. ('Body filler pastes' use the other system.)

Cobalt is a purple fluid. Ask the supplier to mix the right amount of cobalt into the resin. After it is mixed, the resin must be stored in the dark, or it will harden.

Peroxide is a hazardous chemical. Avoid contact with skin. Store in a PVC container, in the dark, below 25 degrees C. Never mix it with cobalt (except for the cobalt already in the resin), or it will explode. Mix very small quantities (about 1-2%) of peroxide with resin or it will overheat.

### Wax-free 'Air inhibited' resin 'B'

This type of resin is used for 'gel-coats' on boat moulds, where the resin is going to be built up in stages. We do not recommend using this resin for the PMG. Any exposed surface will remain tacky indefinitely. Ask for resin 'A', or better still 'casting resin'.

### Thixotropic additive

A special powder of very light silica is often added to resin to make it thicker, so that it is easier to spread it with a paint brush. This powder is not needed for casting resin. If it is already added, it does no harm.

### Styrene monomer

Approximately 35% of the resin as supplied is styrene monomer. This is used for thinning the resin. It causes the smell. It is possible to add a little more styrene monomer (10%) to make it more liquid.

### Pigment

Pigment is used to colour the casting, if a coloured finish is desired. Add pigment to the first mix, which will be on the outside of the casting. Add no more than 10% pigment to the mix. It is not necessary to add pigment to the resin. Without pigment, the casting is transparent and the coils are visible.

## Fibreglass

The resin has almost no strength without fibreglass. It is available in sheets of 'chopped strand mat' (CSM). It is also possible to buy just chopped strands, and to mix them with the resin. This is useful for the magnet rotor castings. Add a little resin to the fibreglass, and press out all the air bubbles, before adding more resin.

## Talcum powder

Talcum powder is a cheap filler which can be mixed with the resin after the peroxide has been added. It makes the resin mixture much cheaper, and a little thicker. Resin can be mixed with up to twice its own weight of talcum powder. The powder also helps to reduce the heat build-up in large resin castings.



Using painted moulds in Peru

## Mould preparation

### Polyurethane varnish

Ordinary paint should not be used on moulds. Better to use nothing. If possible, use polyurethane varnish. This will prevent moisture coming out of a mould made from wood, plaster or clay. Smooth the varnish off with sandpaper before polishing it.

### Polish

Polish the mould several times before using it first time. Rub all the polish off with a rag and then leave it some hours and do it again. Silicone polish is not compatible with PVA release agent. Use wax polish.

### PVA Release agent

Paint this over the mould and let it dry. It forms a sheet of PVA, which greatly helps to separate the casting from the mould.

## Using the PMG for hydro power

The PMG can also be used for charging batteries from small hydro turbines. It will be ideal for low head, low power sites, because it is efficient even when producing only a few watts. It can also be used for higher head higher power sites, because it is capable of high power outputs at high rpm.

There is a danger of rust damage to the magnet rotors in a very humid or wet environment such as in a hydro application. It is advisable to galvanise or plate the steel components with zinc.

### Low head sites

Here are some examples of conditions where the PMG could work without modification (connected delta). It would need a simple 'impulse' runner mounted on the front magnet rotor.

Head (metres)	10	10	5
Flow (litres/second)	1	5	5
Net Power(watts)	40	200	100
pcd runner (cm)	37	27	23
speed (rpm)	325	440	360

### High head, high power

At higher rpm, higher power is available from the PMG. Doubling the speed can also double the output voltage and the current, offering four times as much power with the same efficiency as before. The PMG may overheat under these conditions, so it may be better to keep the current the same, and have better efficiency. Much will depend on whether the water is used for cooling.

In any case, increasing the speed improves the PMG's power handling abilities considerably. It would be risky to run a wind turbine at high speeds, because of the problem of gyroscopic forces on the rotors, but this problem does not arise with hydro power, because the shaft axis is fixed.

If higher voltage is not required, then the stator winding can be changed to give 12 volts (as before) at the higher speed, but deliver higher current without overheating. This is done by connecting the coils of each phase in parallel instead of in series. Or the coils can be wound with fewer turns of thicker wire. This is better still, because parallel and delta connections can suffer from parasitic internal currents.

Do not use the star/delta connection (diagram 49) for hydro power where the speed is constant. There is no advantage.

# Homemade Easter Egg Anemometer

**UPDATE 12/05/2003 -- We've been building and flying [Bicycle Speedometer Anemometers](#) recently. The project is more expensive than this one, but it's simpler and easier to build. We used our [Anemometer Cup and Hub Assembly](#) to save time, and an inexpensive digital bicycle speedometer to calculate speed and acquire data. Another cool project, check it out! And you can use the pre-built cup assembly on this Easter egg anemometer project, too, to save time.**

In any wind generator installation, it's critical to be able to measure wind speed. That gives you a baseline against which to measure your machine's performance, and anemometers respond much more quickly to changes in windspeed than do wind generators. Commercial anemometers are very expensive and the operational concept is pretty simple, so we decided it would be cheaper (and MUCH more fun) to build our own! Plastic Easter Egg halves made ideal (and very colorful) cups.



**Our homemade anemometer...a fun project!**

We chose a really neat little brushless DC permanent magnet motor as the basis for our DIY anemometer. The reason for this choice was simple...these motors contain a superb little ball bearing that would cost far more new than the entire motor cost surplus! In addition, the internal windings of the motor provide enough circuitry to calibrate the anemometer by both frequency and voltage output.





**Brushless DC motor--note the really nice ball bearing!**

In the past, we've built anemometers based on small DC hobby motors. While these units did work, there were problems to overcome. Most hobby motors use cheap bushings instead of bearings. The bushings tend to fail rather quickly, since they are not designed to withstand the forces put on them in an anemometer. Their voltage output is not linear with the windspeed, but instead tapers off as speeds get higher. And there is quite a bit of physical resistance in the motors, resulting in high startup speeds.

The internal circuitry of our brushless DC motor consists of 12 coils, and a permanent magnet ring that spins around them. These motors are NOT like a normal DC motor...they require a special driver circuit to make them spin. If you apply plain DC current to the motor, it will simply seek a point aligned with the coils, stop, and burn out. The motors have 3 leads...a common in the center and 2 outputs (well, actually inputs!). For connection to measuring equipment, you need only connect to the center common lead and one of the side ones. The output of the motor when spun as an anemometer can be measured with a multimeter set for AC volts, or by counting pulses with a frequency meter or BASIC stamp. We had the best results using a Fluke 87 multimeter set for measuring Hz (cycles per second). There are 12 internal coils in the motor, but we only measured the output of half the coils (since we connected to only one power lead). Therefore, a meter reading of 6 Hz equals one revolution per second (60 rpm). Both frequency and voltage readings from the motor are quite linear, making for easy calibration. The other advantage of counting frequency over measuring voltage is that the length of the data cable would affect voltage readings; when counting frequency it can be any length and the calibration will stay the same.



**Internal coil layout of the brushless DC PM motor**

### **Materials and Tools Needed:**

- brushless DC PM Motor (check our products page, we do have these available surplus from time to time)
  - 4 plastic Easter eggs, 2.2" dia. (use the hemispherical half)
  - 3 short pieces of steel rod (we cut them from an old oven rack)
    - 3 nuts to fit the steel rod
    - 3 small self-tapping screws to mount the motor
  - 1 piece of solid plastic for the hub, 1/4" thick, about 3" dia. (ours was Lexan®)
    - 1 PVC 1 1/2" to 2" reducer
    - 1 length of 1 1/2" PVC for the mast (2 ft or longer)
  - 2-conductor wire for the data cable...telephone wire works great
    - epoxy

### **Construction**

To build the mount, first solder and insulate the data cable wires to the center and one of the outside terminals of the motor. Using a hacksaw, cut the wide 2" end of the PVC reducer off to leave a flat plate (about 0.4" wider than the 1 1/2" side of the reducer). Thread the wires through the reducer, and screw the DC motor mounting lugs onto this flat plate, pressing the motor into the 1 1/2" hole. It's a tight fit...we also used epoxy in addition to screws in mounting the motor, and had to bend the leads out straight to fit them in.

To construct the hub, first cut the 1/4" plastic sheet into a 3" dia. circle. We used a lathe. A hole saw would be the next best choice. If you don't have a lathe or hole saw available, remember that plastic is pretty easy to cut! You can cut it out roughly with a hand saw, chuck it to a mandrel, and spin it with a hand drill against a piece of sandpaper to make it circular. This piece does need to be perfectly circular so the anemometer will be balanced, but the exact diameter is not critical. The center hole in the hub should press fit tightly on the motor--the diameter needed is about 0.83". Since we didn't have a hole saw or bit in this size, we again used the lathe. With no lathe, it would be easiest to drill a centered hole slightly under this diameter and ream it out to a tight fit using a

file or a small sanding drum on an electric hand drill. Again, the hole must be perfectly centered so the machine will be balanced. Lastly, lay out the 3 holes for the cup spokes at exactly 120 degree angles. Drill into the outside diameter of the hub with a bit sized for the steel rod you have chosen--it should again be a very tight fit. Be sure to drill all 3 holes to the same depth so hub balance is maintained.



To build the cups and spider, first carefully drill 2 holes into the rim of each Easter egg half, about 1/4" to 3/8" in from the edge. Be sure the holes are aligned so the egg will hang straight on the rod. Cut the 3 rods to exactly the same length, so the weight will be equal. Weld or solder a nut to the end of each rod. Slide an egg half onto each rod, align them to vertical carefully, and glue them down with epoxy on both sides. After the epoxy cures, weigh the rods on a sensitive scales and file off the solder or weld material until the weights match exactly. Rough up rod ends with sandpaper, cover with epoxy, and insert the rod/cup assemblies into the hub. Be sure they are all inserted to the same depth to maintain hub balance. I also glued the edges of the cups to the hub directly with epoxy for added strength; with longer spider arms this would not be possible.

Cover the inside hole of the hub with epoxy, and press fit it tightly onto the motor. Epoxy the 4th egg half onto the top of the hub to cover the bearing as a weather shield. We turned a groove into the hub top to accept the egg, but it should hold with just epoxy. Thread the data cable down through the piece of pipe you've cut for the mounting mast. That's it for construction! There are many variations to this design that could work equally well, if not better...in particular, the hub could be designed in many different ways depending on the materials and machine tools you have available.

I chose the anemometer diameter of 7.4" completely arbitrarily. As is, it starts spinning at about 8 mph, which is slightly below where our wind generators start spinning. It would be nice to have it respond in lower wind speeds; for the next one I'll probably extend the spider arms an inch or so to solve this. Lighter cups and hub would also help, but I wanted this unit to be very sturdy...we get winds in excess of 100 mph up here!

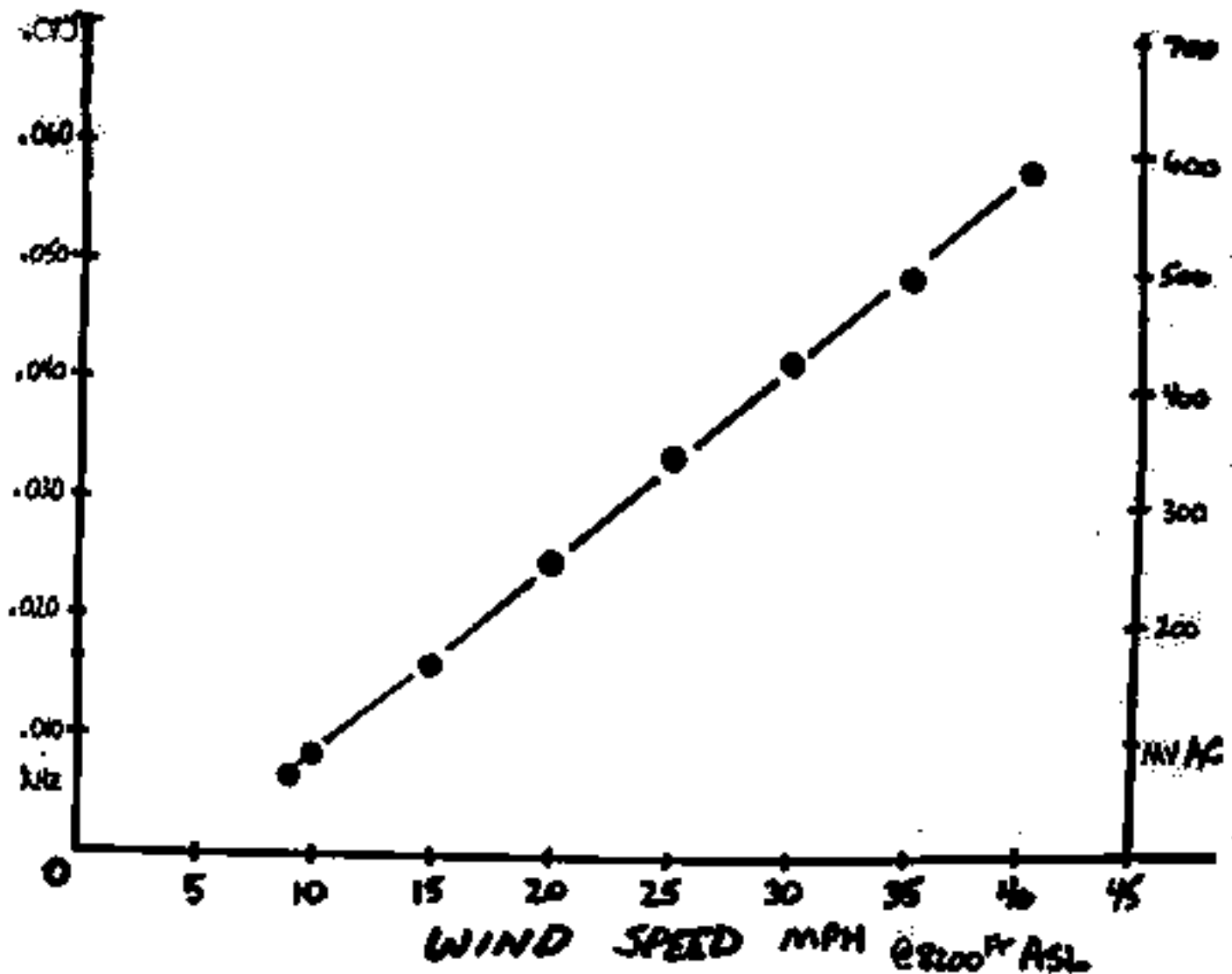
### **Calibration**

This is the fun part! You may wish to build a vehicle mount for the anemometer, though it can be

calibrated just fine by someone other than the driver holding it out the car window, away from the car's slipstream. If you choose to calibrate it without a mount, the holder should wear thick welding gloves and eye protection in case it comes apart. DanF's anemometer calibration rig is shown below...the unit rides a good 6 ft above the truck cab, out of the truck's slipstream and turbulence. **SAFETY NOTE: THERE ARE NO POWER LINES UP HERE WHERE THE CALIBRATION WAS DONE!!!! IF THERE ARE POWER LINES IN YOUR AREA, DO YOUR CALIBRATION SOMEWHERE ELSE, or use a lower mast!!!**



It's essential to pick an absolutely calm day for calibrating the anemometer. Any wind will throw off your readings significantly. First, we checked my truck speedometer using a GPS receiver. It turned out to be right on, so it wasn't necessary to use the GPS any further. We connected the data cable leads to a Fluke 87 multimeter set to measure Hertz. Radio Shack and Harbor Freight also sell some inexpensive multimeters that count frequency, you shouldn't need to spend too much money on one. Then it's simply a matter of the driver trying to maintain constant speeds and calling out the vehicle speed to the passenger, who writes down the speed and frequency readings. We later repeated the procedure while measuring AC volts and made a chart for them too. Since there was the occasional breeze during our calibration, we took readings travelling both up and down the road, and averaged them.



### Reading Wind Speed Directly

The simple solution for reading wind speed directly as mph was a quick paper template overlaid on the meter's "bar graph" display. While the numerals on the meter must be translated to get actual windspeed, the bar graph can be read directly against the calibrated paper template.

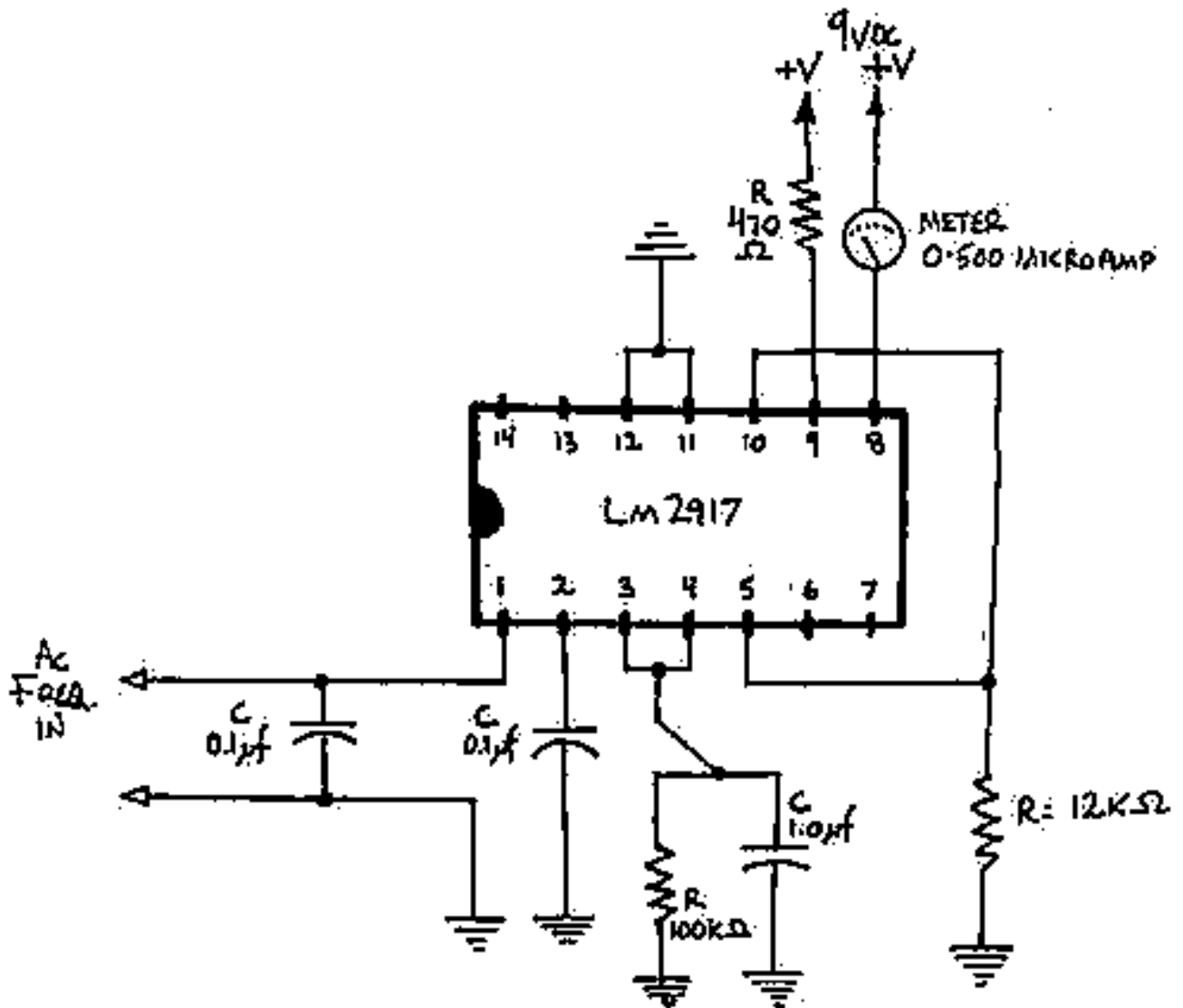
However, DanF has quite a silly fondness for large old analog meters--he wanted to watch windspeed on an excellent old 8"x10" analog microammeter (salvaged from a pH meter). The meter reads 0-500 microamps on a scale of 0-14 pH. The LM2917 frequency to voltage converter chip proved to be a perfect choice for this application...it can even drive much more powerful analog meters with no problems and minimal external circuitry. The chip costs under \$3 at most electronics stores, and only 3 capacitors and 3 resistors are needed to get it working.

The LM2917 provides an output voltage proportional to the input frequency. It differs from the LM2907 in that it has an internal Zener diode voltage reference--the supply voltage can change without affecting the output. It can be used in many applications and configurations...in this case, it provides a 0-500 microamp current proportional to a frequency of about 0-90 Hz. With the anemometer design above, that means full scale (500 microamps) equals about 60 mph.

**DISCLAIMER:** DanF is NOT an electronics expert. He still believes in 'magic smoke' inside electronics components...if you mess up and let the smoke out, it's very hard to put it back in the

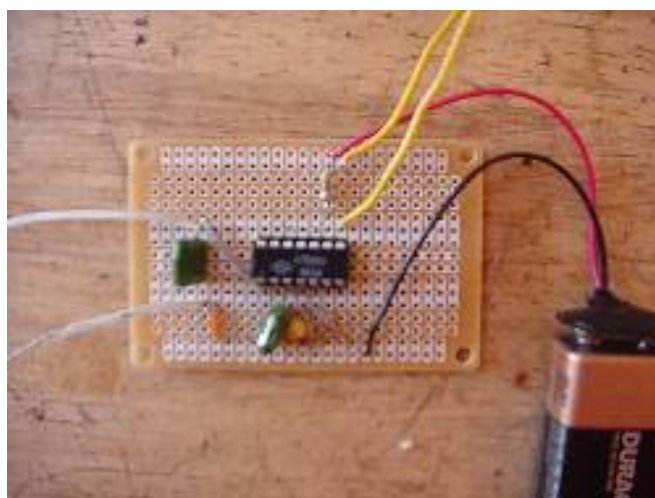
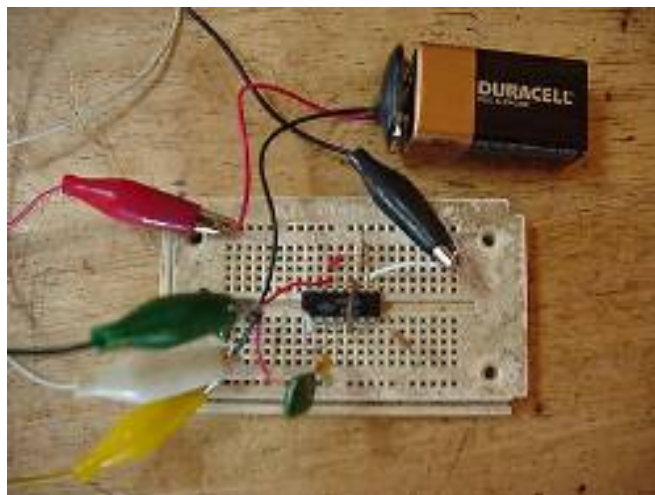


right places. He used extensive trial and error (plus some help from a member of the Otherpower.com message board) to get the resistor and capacitor values right...so there's no guarantee we will be able to help you if you want to use this circuit in a different configuration! END DISCLAIMER. The manufacturer's data sheets for building circuits with this chip are located [HERE](#), and have many useful charts, calculations, and schematics for possible circuits. The circuit was taken right from the 'application notes' pages. There is also an 8-pin version of the LM2917 available; the two are very similar, and the datasheet will tell you how to connect between them. All parts were purchased at Radio Shack, with the exception of the LM2917 chip--I had to go to an electronics store for it.



The 470 ohm resistor from pin 9 simply drops the supply voltage a bit. The circuit will work as-is from a 12-14v supply also. The meter can be any 0-500 microamp meter. The resistor from pins 10 and 5 sets the full-scale amperage for the meter...12K ohm gives you approximately full scale at 500 microamps; a trimmer pot could be added here if you want high precision. The 0.1 microfarad capacitor across the frequency input terminals is simply to filter out spurious signals...the chip is very sensitive, and will read frequencies seemly from nothing if not filtered. The other 2 capacitors and 100K ohm resistor were calculated right from the chip's datasheet....there's a chart and a formula for selecting them. All resistors are 1/4 watt.

I first built the circuit on a solderless breadboard. I highly recommend this...unless you build the exact same circuit shown here and use the exact same motor for the anemometer, you'll need to adjust some or all of the component values. The breadboard makes this easy to do. Once everything is calibrated and working properly, switch the circuit over to a soldered version; PC boards are available at Radio Shack that match the connections inside the solderless breadboard. Buy a 50 cent IC socket for the chip, and solder that into the board instead of the chip itself! It could save you much grief...



From your calibration procedure with the anemometer, you should have a listing of what frequency equals how many miles per hour. If your calibration was done on a windless day, it will be easy to figure out how many Hz equals how many miles per hour. In my case, it ended up that a 6 Hz frequency increase equalled a 4 mph windspeed increase. I did a final calibration check by spinning the anemometer at a constant speed, noting how many Hz were produced, and marking where on the meter this speed fell. In my case, 34 Hz = 25 mph = 4.6 pH (this WAS a pH meter to start with!). I drew a new scale on white paper, matching the meter's, but with new tick marks for every 5 mph. I carefully glued this new scale on the meter face (being careful not to damage the needle), with the 34 Hz/25 mph/4.6 pH mark lined up as a calibration reference.



Since I wanted the unit to be portable, it is designed to run from a 9V battery. It's been running for over a week now (in fairly windy conditions) on this battery--power use is very low! Thanks to the chip's internal voltage reference, accuracy will not degrade as the battery is discharged...it will run until power is too low, and then stop completely. Meter deflection is very crisp and defined...when a gust hits the unit, the needle jumps up quickly. The scale is completely linear, unlike DC hobby motor anemometers in which the upper part of the scale is compressed. I am VERY pleased with how this project turned out! And so far, I have not let any of the magic smoke out of any components. ;~)



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# An Easier Homemade Anemometer

## Built using a digital bicycle speedometer



**The completed anemometer cup and sensor assembly.**





Sigma Sport Targa digital bicycle speedometer -- about US\$25 at any bike shop.

DanF's [Easter Egg Anemometer](#) has been up and flying beautifully for 2 years now. This new design is much easier and quicker to build, but costs a little bit more initially. We learned how to build it during our trip to Guemes Island, WA for [Hugh Piggott's](#) homebuilt wind power seminar for [SEI](#). It uses a digital bicycle speedometer to count pulses from a magnet and reed switch on the anemometer cup assembly, and the speedometer translates this automatically to mph or kph. It also keeps track of your maximum gust, average windspeed, and total wind miles -- so it works as a wind odometer too! Very useful for doing wind power site evaluations.

## Parts List

- **Digital Bicycle Speedometer** -- We used a Sigma Sport Targa because of the peak speed, average, and odometer features. It's available at almost any bicycle shop for about US\$25.
- **Anemometer Cup and Hub Assembly** -- We used a pre-built Polycarbonate (Lexan®) cup and hub assembly. It's available on our web [Shopping Cart](#). You could use any commercial or homebuilt cup assembly for this. Check out our [Easter Egg Anemometer](#) page for details on how to build your own.
- **NdFeB Magnet** -- The magnet that comes with the speedometer is a rod shape, and we found it easier to fit a 3/8 inch diameter by 1/16 inch thick disc magnet to the cup assembly rather than the rod. It's Item #75 on our Shopping Cart, and costs only US\$0.20.
- **Bearing Assembly** -- Many different designs of bearing assembly will work. You want it to spin as freely as possible, so you can get better response and also measure very low wind speeds. For this project, we used the same ball bearing DC brushless PM motor as in our [Easter Egg Anemometer](#), and we removed the coils to make it spin more freely....we just need

the bearing for this project. The motor costs only US\$2.50. It's Item#2105 on our shopping cart. You could use any sort of bearing assembly you can devise from scratch, just make sure it spins VERY freely.

- **PVC reducer fitting** -- 2 inch to 1.5 inch white PVC reducer coupling.
  - **3 Machine screws** -- #4-40 , 1/4 inch long.
  - **Glue** -- epoxy, PVC cement, and thread lock compound are needed.
  - **Tap** -- a #4-40 tap, available at hardware stores.
- **Mounting supplies** -- 1.5 inch diameter PVC pipe for mast; telephone or other thin wire to extend sensor wire.

## Assembly

Cut the PVC pipe reducer off with a hacksaw right at the flange, on the big 2 inch side. This gives a wide, tapered rim surface to mount the bearing assembly to. See photos below. Using a file, cut a notch in the flange just big enough to fit the sensor from your bike speedometer. Cut it deep enough so that the sensor can ride flush with the pipe.



Place the bearing assembly upside down in a vise so it's suspended by the flange. DON'T tighten the vise. Gently tap the center bearing loose from the back using a Phillips screwdriver and small hammer. Or press it out on your drill press. Gently pry the coils out using a flathead screwdriver. Gently press the motor back together -- if you go all the way back in now, the motor will bind and not spin freely!

*Optionally, you can skip that entire step. However, there will be a bit more resistance in the bearings from cogging, and it will take a couple more mph of wind to set your anemometer spinning. By prying the motor open, you also risk bending and ruining it. So you might want to have an extra*

*available if you try this. The performance difference is very small with the coils left in. Our success has been mixed with removing the coils from these motors -- it's hard to get them back together so they are tight but still spin freely.*



**Disassembled Motor**



**Coils removed from Motor**

Drill out the center of the hub with a 1/4 inch hole. The exact center is already drilled with a tiny hole, so it's easy to get it perfect.

To mark the anemometer hub for drilling the mounting holes, we cut off 3 small nails with wirecutters, and dropped them point-up into 3 of the small holes in the motor. We then centered the hub around the motor shaft (si it does not touch the shaft) and pressed down to mark the holes. See photo below. Then drill your 3 holes.



**Nails in motor for marking hub holes.**





**Completed anemometer hub assembly**

Now, tap your 3 mounting holes in the motor. Don't push any deeper than the holes already are, or you will distort the metal and sieze up the bearing -- it'll be ruined. Assemble the anemometer cups onto the hub -- they press in, but you have to press hard! Put thread lock compound on the #4-40 machine screws, and attach the cup and hub assembly to the motor. Try it, and it should spin freely by just blowing on the cups. This is essential -- it should spin in the slightest breeze. And it should be nearly perfectly centered on the bearing. To seal the top (acutally the bottom, after mounting the thing upside down) we just epoxied a poker chip on there to cover it -- perfect size!





**Completed anemometer hub assembly, mounted in PVC reducer, with sensor attached.**

Next you'll need to install the trigger magnet and rpm sensor switch, then mount the cup, hub, and bearing assembly into the sawed-off reducer. Mount a small NdFeB magnet to the inner shoulder of the cup assembly with epoxy. Use a file to notch the PVC reducer mount to accept the sensor that came with the bike speedometer. We simply used epoxy to glue the sensor tightly in the notch. Be sure to test the sensor before glueing it into place! The range at which it will trigger depends on the location and strength of the magnet. Ours triggered best at about 1/8" clearance between the magnet and sensor. We found the sensor triggered best by pointing the small end of it right at the magnet (see picture above). The sensor wire with the speedometer is only a couple feet long, so we snipped it and used telephone wire to extend it to 20 feet long, so it could run right into the house for mounting the speedometer display inside. We used small machine screws and epoxy for mounting the bearing assembly.



**Finished unit, ready for pole mounting.**

Because of how our bearing assembly is built, there's a big chance that water could get down inside the bearing assembly and ruin it. So we opted for mounting these anemometers upside down, with the mounting pipe pointed down. The mount can be any design you come up with with 1.5 inch PVC pipe, using Tees, 90 deg bends, anything that fits your mounting area.

## **Testing and Calibration**

For testing the new anemometer, I once again used my truck testing rig. It's simply a pipe mounted in the bed of my pickup that sticks up 6 feet over the top of the cab. Just be careful about overhead power lines and branches while you are testing! The only problem with truck testing anemometers -- is that even the slightest breeze will completely destroy your test results. You'll need to find an absolutely breezeless day for calibration. If you already have another anemometer that's calibrated (or rent one from the local renewable energy store for a day), you can just mount your new one near the old one and compare the readings.

The bike speedometer uses the measured circumference of a bicycle tire to calculate the bike's speed, using the number of tire revolutions per minute as tallied by the sensor mounted at the bike and the magnet mounted to the wheel. But with anemometer cups, there's a bunch of 'slip' involved -- the cups to not catch all the wind that goes by. So you can't just enter the anemometer's circumference into the speedometer. That's why calibration by some method is required. With our 2

anemometers, the offset number entered into the speedometer was 1320 (mm). If your unit is showing a higher speed than the truck or test anemometer, you increase the diameter that you enter into the computer. If your anemometer reads low, you decrease the diameter. A change of 5-10 mm makes a big difference! But after fiddling with it for a while, you should be able to get very close. If you get widely varying readings -- there is probably too much breeze for testing.

## Fun Features of the Bike Speedometer

The speedometer computer has some fairly sophisticated data acquisition features, available by pushing buttons. You can have it track the maximum speed recorded, at reset it at your leisure. Using the odometer on the Targa unit, you can also track total wind miles -- a feature found only on expensive commercial scientific anemometers! It will also track your average windspeed -- but keep in mind this is a different figure than 'average windspeed' as rated for a potential wind power site. The bike speedometer **ONLY** averages the wind *when the wind is blowing*. True 'average site wind speed' readings take into account all the hours that the wind is not blowing at all. But the information can still be useful when designing or selecting a wind turbine.

**We hope you enjoy building this project as much as we did. It's a very quick and simple way to build a very accurate anemometer. Thanks to Ed Kennel of the University of Washington for showing us this system out on Guemes Island!**

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# SEI Homebuilt wind generators workshop

Guemes Island April 2003

Main picture page

[hugh@scoraigwind.co.uk](mailto:hugh@scoraigwind.co.uk)

"The most fun you can have with your pants on!"

(Dan Bartmann of [wondermagnet.com](http://wondermagnet.com))

Thanks to **Ian Woofenden** for providing many of the pictures on these pages.  
These pages may be **slow** to load because I have gone for high resolution images in this case.  
If you have a slow connection, why not go off and get a breath of air  
or make a cup of coffee and come back soon.

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sorry about the smell, Rani :-)

Miscellaneous pictures.....



Why does the sun never come out for the group photo?



This is the bigger of the two machines we finished during the course. Rotor diameter is 8 feet (2.4 metres).



Guemes Island Resort, where we stayed. Chris Freitas of Ouback stops by with his wireless winch.





Robert Preus came to talk to us. [Robert](#) is the distributor for [African Windpower](#) in the USA. There was one AWP machine in the classroom, and another on a 150 foot tall tower across the road. The one on the tower looks pretty small.

Later, Robert gave us a talk about how wind turbines fail. In the picture below he has a hub from a Jacobs machine.





Andy Gladish was in charge of metalworking but he can also do **stick** welding.







Here are Dan Fink and Dan Bartmann. They supplied the [magnets](#), the wire and some music.



They also worked hard on the smaller of the two machines. Here Dan Bartmann applies some subtle persuasion.



An evening session on 'magnets at work and play'





Course staff from top left : Ian Woofenden (SEI and Home Power), Brain Faley (Shoreline Power), Andy Gladish and BJ Daniels of Guemes

Hugh Piggott, and Win Anderson and Michael McGuinnes of Guemes

We were using Win's shop for the week. BJ and Win helped with the [woodworking](#).

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Dan Whitney came back and brought the machine he built [last time](#) using a Ford truck brakedrum.

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Putting the larger machine onto the tower for erection. The tail is a map of the island.





The big machine is on the tall tower (twenty feet up but still not nearly tall enough) and the little 4' diameter machine is on a short stand in the foreground.



Of course we had no wind to speak of and the best I saw was a 7 watt output.



Later we did truck testing of the small machine. I recorded 30 amps output at 16 volts. But to get that output I had to hold down the furling tail and we had to hit about 45 mph. Not very scientific, but lots of fun!



At 30 mph we got about 10 amps at 15 volts and the tail was starting to furl.

---

**In October 2003, the SEI workshop lead by Mick Sagrillo erected Win's machine at the Guemes Island store for grid intertie with some pv.**







Here is the power room with the SW inverter that manages the inertia.





**"What a warm, sweet feeling on a dark, ugly day to look  
up and see that mill makin' watts!"**

**Win**

---

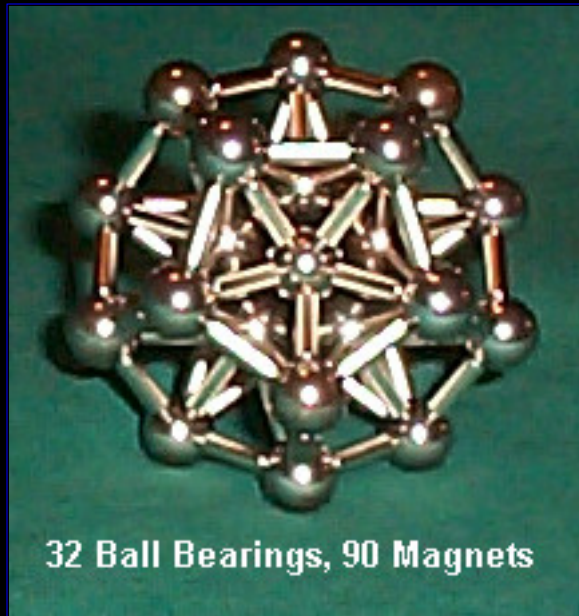
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sorry about the smell, Rani :-)



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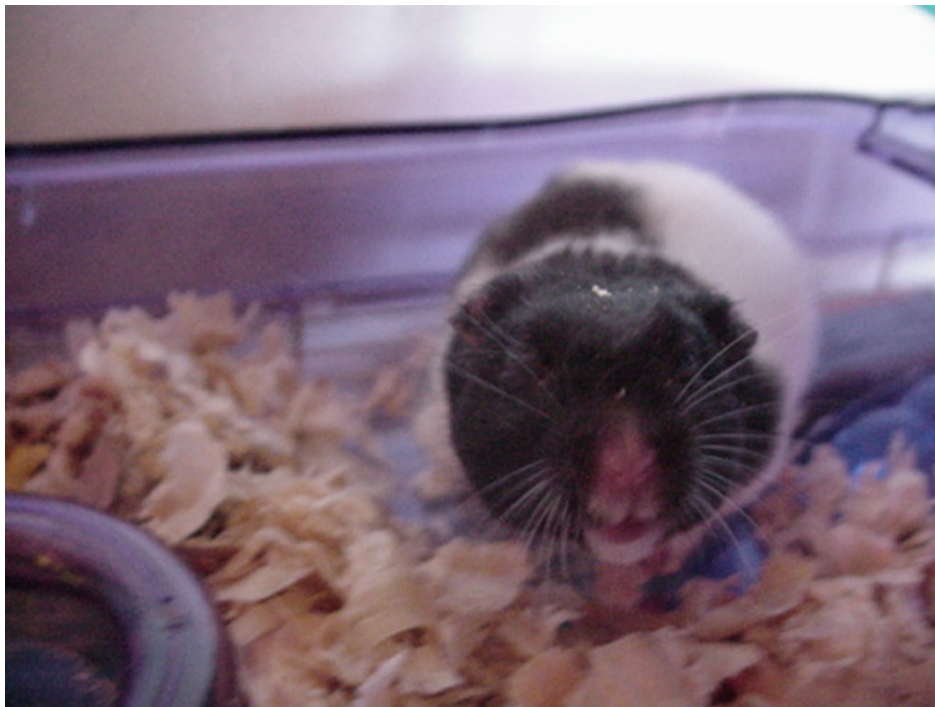
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# Hamster-Powered Night Light With Custom Low-RPM Alternator

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**Though Skippy the Hamster powers this night light by running on his exercise wheel, the same concepts and low-rpm alternator design could be applied to a school science project using different energy sources! A small wind or hydro turbine could easily power this alternator.**

The Otherpower.com staff thought of building a hamster-powered nightlight a couple years ago at a rather, uh, soused company Christmas party. Then recently Analise, an 8th grader from Albuquerque, NM, contacted DanF through the [AllExperts.com](http://AllExperts.com) Science For Kids forum, asking 'Can a rodent generate enough electricity to power a light by running on it's wheel?' That was enough inspiration for us to start the project, and we soon added Skippy the Hamster to the Otherpower.com payroll. He's a Syrian Hamster, and we chose that breed since they are nocturnal and like to run on the exercise wheel. Analise will be using a mouse named Ghost for her science fair project.



**Skippy the Hamster**

The first criteria we needed to design the alternator was an estimate of the Revolutions Per Minute (RPM) a rodent can generate on the wheel. The lower the RPMs, the more difficult it is to design a good alternator for it. Analise took a stopwatch to the local pet store and recorded how many times the wheel went around in 10-second intervals, then multiplied these figures by 6 to get RPMs. She found that most rodents can make between 40 and 60 rpm on the exercise wheel. That gave us a starting point for the alternator design.

Our first thought was to use a DC hobby motor to generate the electricity, so we could charge up some NiCad batteries to run a light. However, we immediately ran into the same problems as when we built toy wind turbines using hobby motors -- at the required low RPMs, most hobby motors cannot get the voltage high enough to start

charging batteries. And you often can't tell what a hobby motor is rated at, there is not usually a specs plate on it. So you might have a 500 RPM motor, or a 10,000 RPM motor! The rated RPMs of the motor determine at what RPM it can make a certain voltage. None of the DC hobby motors we had available could make even 1.2 volts (the voltage of a single AA NiCad) at 40-60 rpm. So we scrapped the idea of using a DC motor as a generator. Plus, the required diode (to keep the battery from just spinning the motor) would drop the voltage by at least another 0.7 volts. It would be possible, but complicated (and bad practice) to use gearing or a belt and pulley system to raise the RPMs -- the friction losses in the gearing system would be major, and design would be complicated. Rodents like to chew, and a rubber belt would be fair game. Plus it's much more fun to build your own alternator than to use a pre-made hobby motor!

### Frame and Bearing Construction

So, we chose to scratch-build a tiny low-RPM alternator for the hamster wheel. The first issue we noticed is that the wheel that came with the cage was noisy when Skippy ran on it. VERY noisy! That meant that some of Skippy's energy was being converted to sound by mechanical vibration--and we want all of his energy to go into power production! So the first thing we did was modify the wheel with a new ball bearing. We simply used one of our inexpensive, [surplus DC brushless motors](#). Although the design of the motor itself is exactly like a permanent magnet (PM) alternator, these motors can't produce enough power to even light an LED at low RPMs. We used it simply because it was a cheap source for a really nice little ball bearing, and was easy to mount the wheel to. You could use any free-spinning bearing that's available--off an old skateboard, rollerskate, anything that spins freely and you can mount the wheel to.



### Surplus brushless DC motor used for the ball bearing inside and easy mounting

To mount the wheel to the motor, we simply centered it on the wheel and marked 3 holes from the top of the hub for drilling. The motor hub has 6 holes--3 are tapped to a weird little SAE 2/56 thread, the other 3 are blank. We used a simple 4/40 tap to thread these smooth holes to fit 4/40 machine screws, and mounted the wheel to the motor hub with these. The motor was then mounted to a thin piece of wood. The entire wheel is free-standing on this wooden bracket -- it does not have to mount to the side of the rodent cage.



**Wooden frame showing motor mounting, from back side**

### **Permanent Magnet Alternator Construction**

The next step was building an alternator onto the wheel. A big advantage of using a Permanent Magnet (PM) alternator for any kind of power generation is that no brushes are required for electrical contact to the spinning part (the armature, also called a rotor)--the magnets spin, and are not connected to the coils in any way. So we simply fitted a steel ring with magnets evenly spaced on it to the flat side (the axis) of the wheel. This makes it an 'axial-flux' alternator....if you fitted the magnets to the curved surface of the wheel around the circumference it would be called a radial-flux alternator.





**alternator mounted to back side of wheel**

We cut out a ring of approx. 16 gauge steel to fit the wheel. You could easily use 2 coffee can lids stacked and cut out for this-- you could use a drill and tin snips for this. We used a hole saw for the inner circle and a bandsaw for the outer. Be careful, when the steel is first cut the edges will be very sharp! Grind them down with a wheel or file so they are safe for both you and your rodent. This steel ring behind the magnets forms a more complete magnetic circuit so there's more flux passing through the stator coils. It also makes it much easier to mount and evenly space the magnets, since they stick to it.



**Magnets mounted on steel ring**

We chose the magnet size with the limited amount of power a hamster can produce in mind. They are our [Item #30](#), 3/4 inch diameter by 1/8 inch thick Grade N-35 Neodymium-Iron-Boron magnets. Very powerful, but not



too heavy. You can make up for lots of design and mechanical tolerance problems by using very strong magnets in a homemade alternator! If you use weaker magnets, your power output will be significantly reduced. We used 14 magnets because it was the largest EVEN number of magnets we could space around the ring, so this may vary depending on the size of your rodent's wheel. You must use an even number of magnets. We spaced them evenly using playing cards...by trial and error we found the right number of cards to use as a shim between each magnet.

It's important to get them spaced evenly. *The magnets also must be placed with the North and South poles alternating on each magnet.* And the edges of the magnets should be aligned in a perfect circle, too. Read on for magnet mounting details.

Compared to the giant, finger-breaking magnets we used in our [10 foot wind turbines](#), these little magnets are pretty safe and easy to work with. They are, however, powerful enough to pinch skin and give you a blood blister, so handle them carefully and keep out of reach of young children. Parental guidance is needed for older kids too.

**Please read our [Magnet Safety Warnings](#) before starting the project!**

First, place one magnet on the steel ring and center it between the inner and outer edges of the ring. Tack it down with a drop of cyanoacrylate glue (Superglue®) applied around the edges--be sure to use [thin viscosity glue](#), so it will wick underneath the magnets and set up. It also helps to have [glue accelerator](#) around--one spritz of this and the glue sets up instantly (keep your fingers out of the way!). Now each magnet must be placed with the opposite polarity of it's neighbors facing out. To get this right, carefully take each new magnet off of the stack, and carefully hold it up to the next magnet mounted on the ring. If it repels, hold the magnet exactly as it is oriented and gently snap it to the ring. Use this test for placing each magnet, and check it when you are done...the magnets should alternately repel and attract the magnet in your hand as you go around the ring testing. Remember, you must always use an even number of magnets. After they are all placed, use playing cards to space them so they are aligned evenly around the circle. And make sure they are aligned in a perfect circle radially too -- check the inner and outer diameters of the circle of magnets and slide them around to get perfect alignment both ways. When everything is good and you've checked to be sure the magnets alternate in polarity, tack all of them down with drops of thin superglue applied around the edges of the magnets.

To make things simple, we simply centered the magnet disc on the back of the plastic hamster wheel, and held it in place with 4 more strong magnets stuck to the inside of the wheel! This makes it easy to remove, but still holds it tightly on there. You could also use glue if needed. Remember also in designing your mount -- the magnetic field from the magnet disc should be away from metal cage bars or other metal parts.....it will be attracted to these metal parts and will be slowed down significantly.....you'll be wasting lots of hamster power. And use caution handling the disc -- it will be powerfully attracted to ferrous metal or other magnets.

The next step is winding the coils. We wound one, tested it, and found we needed more voltage, so we ended up using 2 coils. Each coil is 400 turns of [#30AWG enameled magnet wire](#). We used a simple hand-held coil winder, and made up a new center insert to get the coils the right size. The inner hole of the coil should be about the same size as each magnet you are using. You could also wind the coils around a tube that's the right size, but the elliptical coil shape we got by using a winder performs a little better, and the tapered form in the middle makes it easier to get the finished coil off of the winder. The important thing is to pack the wire in there as evenly and tightly as possible.....the finished coils should be about 1/4 inch thick, with each leg of the coil about 1/4 inch wide and the center hole matching the magnet size. Here's a detail of how we built the winder:



Here's DanB winding a coil. Notice how the spool of magnet wire is on a pin in the vise to permit easy feeding. We also wax the winder form with crayons so superglue won't stick to it...makes it easier to remove the finished coil. Leave a big tail on both ends of the magnet wire.



Once you get 400 turns on the coil, twist the leads together so the coil won't unwind, and drip superglue into the coils. We then hit it with accelerator to speed the drying time. Then disassemble the winder and carefully remove the coil. Hit it with more superglue if it wants to come apart on you. At this point you can even spin the wheel and hold the coil up near it by hand. In our first test we showed about 1.2 volts AC when doing this. That told us we needed another coil, which will double the voltage when hooked in series and in phase with the first coil. You'll need to strip the wire ends with sandpaper, razor blade, or knife before connecting.

At this point you can mount the first coil. We simple glued it to a small block of wood and glued this to the frame. Get the coil as close to the rotating magnet ring as possible without it touching. We ended up with a big airgap here due to the wobbly motion of the wheel....about 1/8 inch. But the big magnets make up for this tolerance flaw. You should get an AC voltage reading now from the mounted coil when you spin the wheel. We could get more power out of the coil by mounting laminates or another magnet rotor behind them, like we do when building [wind turbine alternators](#). But we decided that Skippy probably wouldn't care either way, and one side of the magnetic circuit open made for much easier construction.



**Closeup of mounted coil.**

Next we wound the second coil, identical to the first one. Here, however, it's very important to orient and mount the second coil correctly! It should be placed exactly the same way as the first. The easiest way to figure this is to use a voltmeter. Connect one lead of the first coil to one lead of the second coil and set your meter for AC volts (remember to strip the insulation off first). Hold the second coil away from the alternator and spin the wheel.

You'll see the voltage from the first coil. Hold the second coil up to the alternator and spin it again. If you see approximately double the voltage, it is placed right. If you see no voltage, it's backwards. Flip it 180 degrees, so the other face points towards the magnets. When you know you have the coil oriented right, glue it to your mount (like with the first coil, we used a small block of wood that can then be glued right to the wooden alternator frame).

You also must place the second coil in phase with the first. The easiest way to do this: Have a helper hold the wheel so that the coil is exactly centered on one magnet. While your helper keeps the wheel from moving, place the second coil so that it is also exactly centered on a magnet and glue in place. We placed ours opposite each other, but you could place the second coil anywhere -- right next to the first, or whatever you want, as long both coils are centered on a magnet when you place them.

Now you can test the alternator. You should again see about twice the voltage you saw with one coil. If not -- first make sure all the wires are thoroughly stripped! It's trickier than you'd think. It's also possible you got a coil reversed. Try flipping one coil over and see if that works. And also check to see that a magnet is aligned exactly over both coils at once, so it's in phase.

### **Data Acquisition**

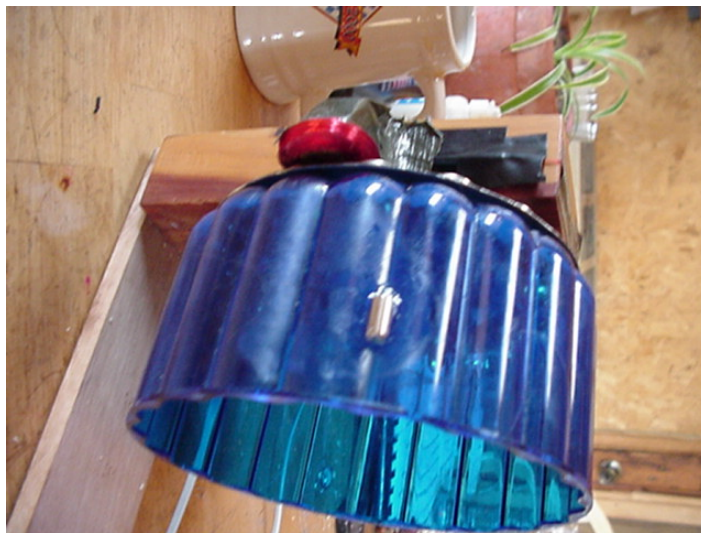




**Bicycle computer for data acquisition.**

Next, we want to install the data acquisition computer for the system. We used an inexpensive bicycle computer, available at any bike store. The trigger is simply a cylindrical NdFeB magnet, and comes included with the bike computer. We disassembled the sensor and trigger to show how they are constructed. You don't have to do this unless you want to. The sensor is simply a reed switch connected to the computer -- I had already used the sensor from this computer for another project, so I just got another reed switch and made a new sensor, shown below.

Again, you don't need to do this unless you want to.



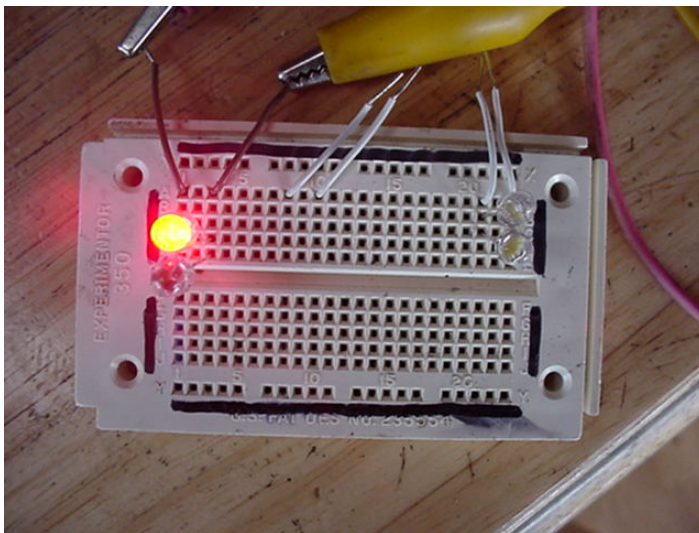
**magnet trigger glued to outside radius of wheel**



### Reed switch trigger

We simply taped the reed switch sensor to a small piece of wood and glued it to the frame. The magnet must pass within 1/8 to 1/4 inch of the sensor to trigger it. Now you need to tell the computer the circumference of your rodent's wheel, in millimeters. There will be a special button for setting the wheel size, consult the owner's manual of the bike computer. Skippy's wheel turned out to be 540 millimeters in circumference. After the computer is set, spinning the wheel should show you a miles per hour reading! Skippy does from 2-3 mph at normal speed, and slightly faster when DanF's cats are leering at him through the cage walls. The computer will also keep track of maximum speed, average speed, time spent on the wheel, and total miles run for you. We just got Skippy's system up and running, so we don't have any data yet for average hamster-miles per night yet.

### Lights



As we mentioned before, we were not able to get enough voltage with this simple 2-coil design and low rpms to charge a battery. The losses from rectifying the AC output of this alternator into DC would be very large...over half the voltage made. We could double the number of coils or number of turns of wire -- but then the resistance in the coils is getting very high, and the machine runs inefficiently with more than half it's output going to make heat instead of light. These are the exact same sort of trade-offs we must make when designing alternators for home wind turbines too! However, the opportunity for experimentation is excellent. Adding more coils would be one way to do this. With enough voltage to overcome the drop from rectifiers, a self-contained system could be built. An LED nightlight that turns on automatically when it gets dark, run off a rechargeable battery, charged by



the hamster alternator. Please drop us an email if you experiment more with this project!

So, we decided to run 2 super-bright red LEDs off the alternator directly. We chose red because they need the least voltage of any color to light up.....about 2 volts to get real bright. Other colors will work too, but they need higher voltage and therefore won't be as bright at any given speed. LEDs only pass current in one direction, so we connected the 2 backwards from each other....when one is lit, the other is off. The frequency of the flicker changes as the hamster changes speed. The light is bright enough in DanF's living room to find the bathroom at night when Skippy is running. Run Skippy, run!

### **Experimentation and Rodent Psychology**

Another interesting fact -- though it's hard for the hamster to make higher voltages with his low-rpm wheel, he has torque to spare. 2 LEDs are barely taxing him.....we are drawing only about 30 milliamps into the LEDs at Skippy's top speed. If we add more electrical load to the circuit, he could make more power, with a resulting increase in physical resistance on the wheel---like running uphill. We have yet to try small incandescent flashlight bulbs in the circuit--something that draws more power and makes more physical resistance against the wheel spinning. We did try more LEDs -- he had no trouble lighting up 6 of them. Next we plan to try an array of low-voltage incandescent flashlight bulbs to get optimum power output without tiring Skippy out too much. DanF is guessing that Skippy is good for 200 milliamps without tiring, and we'll post our data as it comes in.

You can observe this alternator loading effect by disconnecting the alternator's leads from the LEDs. Spin it by hand -- it should spin freely for quite a long time before stopping. Now spin it, and short the alternator leads together -- it stops very quickly. Now try it with the LEDs hooked in -- it stops more quickly than having nothing at all connected, but spins longer than when shorted out. Skippy can run against the shorted wheel fairly well, but gets tired and doesn't run as many hours per night. So the goal is to find out, by experimental data, just how many lights (how much current) Skippy can push.

This illustrates another principle of designing alternators for wind turbines -- the relationship between the power available from the source (the wind or the hamster), the RPMs possible, the electrical load that's connected, and how much energy the alternator can take out of the system and turn to electricity. All of these factors involve design trade-offs. Again, the opportunities for experimentation here are endless! How much power can the rodent make without getting irritated with how much load is on the wheel and refusing to run? Does using high-performance food for working hamsters help? How about weighing the hamster's food and figuring how efficient he is at converting kibbles to electricity? Tracking watt-hours per hamster-mile (wH / hM)?

The bicycle computer gives you an incredible amount of data for your project! It always shows you the speed of the hamster in miles or kilometers per hour. It remembers maximum speed, and keeps track of the total miles run by your rodent, with a resettable trip odometer too. The resettable timer shows you how many Hamster-Miles (hM) were run each night, and it will also compute the average speed maintained when the wheel is turning.

We bet that Analise will be working on some of these challenges for her project, and keeping careful records. We just helped her with the alternator design -- I don't think they teach it in school these days. And we hope others will try this experiment, and refine it for their own needs too! As for us -- the silliness level here at work has reached an all time high--even more so by finding out that the project actually works! Skippy is happily employed by Forcefield and keeps DanF from stumbling during those late-night trips to the bathroom. We'll keep feeding him hamster chow (Skippy, that is) and see how many watt hours he makes yearly!



**A WORKIN' Hamster!**

Rodent exercise wheels vary in size, and there are many ways to make mounts and bearings. So we are not including a complete parts list --hopefully your experiment will vary! If it does, please send us a photo of it. You may not have some of the tools we used available. Hopefully we've provided enough information so you can design a custom alternator for your own Chinchilla Challenge, Rat Race, or Hamster Hill Climb. One absolutely essential tool for this project is a multimeter--mandatory for any kind of electricity experiment. You can get one at Radioshack or Home Depot for only \$10-15, and a student will have uses for it until graduation and beyond.

And while we probably could have built this project without Superglue, it sure made it go together fast.

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# Wind Power

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Wind power can be an excellent complement to a solar power system. Here in Colorado, when the sun isn't shining, the wind is usually blowing. Wind power is especially helpful here in the winter to capture both the ferocious and gentle mountain winds during the times of least sunlight and highest power use. In most locations (including here) wind is not suitable as the **ONLY** source of power--it simply fills in the gaps left by solar power quite nicely.



## OPTIONS FOR GETTING STARTED IN WIND POWER

### Build your own!

Building a wind generator from scratch is not THAT difficult of a project. You will need a shop with basic power and hand tools, and some degree of dedication. Large wind generators of 800 watts and up are a major project needing very strong construction, but small ones can be built mostly of wood, and be up and flying in a weekend! In fact, we highly recommend that you tackle a small wind turbine before even thinking about building a large one. A machine shop in which you can turn metal parts on a lathe is very helpful, but any automotive shop that is equipped to turn brake rotors could make these parts for you at low cost.

*In most locations, GENTLE winds (5-15 mph) are the most common, and strong winds are much more rare. As you'll see by examining our latest machines, our philosophy about designing wind turbines is to make large, sturdy machines that produce good power in low wind speeds, and are able to survive high wind events while still producing maximum power.*

**Here's a roundup of all of Otherpower.com's homebrew wind turbines. The individual web pages give construction and performance details. We've changed many things in our designs**

**over the past few years, so if you are reading an older page, be sure to check out what we've been doing recently before you start the project. Enjoy!**



**10/10/2003 -- The Triplets -- 3 new 10-foot diameter dual-rotor brake disc wind turbines!**

These 3 nearly identical machines are built with the same design as the mill at the Caboose (5/20/03, below) but we streamlined the construction process significantly and built 3 machines at the same time -- Curly, Moe and Larry. These are the latest of our designs, and they perform great in low winds. Detailed DanCAD drawings and dimensions on this page.



**5/10/2003 -- New Brake Disc Mill**

9-foot dia prop, furling tail, 3-phase, separate laminate assembly with excellent specs. Many improvements over our previous designs! Spins up and makes power freely in low winds, and governs itself in high winds.



**5/20/2003 -- Dual Rotor Brake Disc Mill**

Up and flying at the Caboose. Excellent low wind performance with 10 foot prop, great furling system.



**The Wood 103**

A 100-watt windmill built entirely from wood! More of a demonstration than anything, but a quick weekend project that will teach you about windmill construction.



**The Wood A-X**

A quick-and-easy 200 watt windmill, built mostly from wood! Perfect for a remote cabin or RV, this one is quick and easy, and we are working on an updated version too.



### DanF's Wood A-X

DanF's version of the Wood A-X is very similar to the original, but with slightly sturdier construction. The props are interchangeable between the two. Some problems to be fixed here, but in progress. .



### Ward's Prop Gallery

Ward and his collection of broken props, tails and stators. This is what happens when you let DanB and DanF use you for a wind guinea pig! But Ward's tower has the best height and wind exposure in the area, so it's where we try and make windmills blow up to further our research. And he's a good sport!



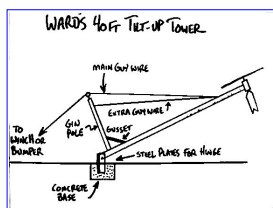
### 400-watt Volvo Windmill

One of our older designs with no furling system. But it has been up and flying for a year and half now.....with no furling system.



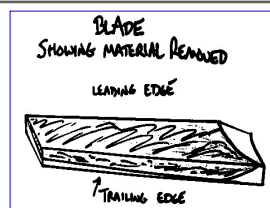
### 400-watt Volvo Windmill

Again based on a Volvo brake disc, this one has a 3-bladed prop that is slightly smaller than Ward's mill. It's an ongoing experiment too...a new stator is in the works. One of our older designs with no furling system.



### Building Towers for Wind Turbines

Details, diagrams and photos of many different ways to construct tilt-up towers -- ranging from the extremely solid and sturdy to the quick and dirty, field-expedient versions!



### Designing, Building and Flying a Wind Turbine

Just our collection of information on all phases of the process! If you are new at wind power, it might help explain some confusing aspects of this 'black art.'





### [Induction Motor Conversion Mill](#)

Built using an AC induction motor converted to a permanent-magnet alternator. We've since found that from-scratch PMAs are more efficient than conversions.



### [Small Science Fair Windmill](#)

With a small computer fan blade as a rotor, this little mill makes a great science fair project. The frame is made of PVC pipe, and nothing is too big or fast to be very dangerous. It will light a small bulb using a box fan for power.

## [Glossary of Wind Power Terms](#)

**A high-tech test rig for our high-tech wind generators! Otherpower.com's trusty Model A Ford windmill tester.**



*Click on the image to see a 15-second MPEG video of the Model A wind test experiment*

### **Find an antique**

If you find an old windmill for sale, first make sure it's intended for generating electricity instead of just pumping water. One common old windmill that's often found for sale used is the **Wincharger**.

The other popular wind generator of the era was the **Jacobs**. These were of higher quality than Winchargers--but many of both are still flying today. Several people around the U.S. restore, service and stock parts for old windmills. And the Jacobs is still being made today! The current production models are very large and expensive, with over 10 kW output--they are magnificently designed and built. Check out the [Manufacturer's Website](#) for more information and cool pictures.

Electricity producing wind generators were very popular in the 1920s and 1930s all over rural America. They were available in many different sizes and voltages, and can often be found for sale in rural farm communities. Most models are quite suitable for a modern remote power system no matter what voltage they are. If you are able to locate an old wind generator, some basic maintenance (rust removal, lubrication, and testing) could put it back in working order quickly. They were built to last--before Rural Electricifation, they were the ONLY source of power for many rural farms and ranches. [Backwoods Home Magazine](#) published an excellent article in 2001 about finding and restoring old wind generators.

[Otherpower.com](#) is always interested in purchasing used wind generators, including these!

### Buy a commercial wind generator

Suitable only if you have more money available than time. Prices range from \$500 to \$5000 for small-scale wind turbines up to 5 Kw. Your wind generator retailer should provide you with LOTS of information regarding many issues if you choose to purchase a wind generator! Since you will be spending lots of money, it might be wise to survey your site with a logging anemometer before making a commitment. The [AWEA Discussion board](#) is a good place to ask questions about commercial wind generators, and [Mike Klemen's Wind Generator Page](#) has lots of performance data on a variety of commercial wind turbines that he has flying. Check out our [LINKS](#) page for retail suppliers. Or contact the wind turbine manufacturer directly and have them point you toward a retailer nearby.

### Wind Generator Manufacturers

[| Bergey Windpower Company \(USA\) |](#) [| Southwest Wind Power \(USA\) |](#) [| Jacobs \(WTIC\) \(USA\) |](#)  
[| WindMission of Denmark \(DK\) |](#) [| Marlec \(UK\) |](#) [| Proven \(UK\) |](#) [| Flowtrack \(AUS\) |](#) [| African Wind Power |](#)

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This page last updated 10/10/2003

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# 9' Diameter Brake Disk Windmill

With Furling Tail



This page is a diary about my latest wind turbine experiment from May of 2003. Although a bit more complex, it features some significant improvements over the brake disk turbines I've made in the past.

[Para Español, traducción de Julio Andrade.](#)





This is what I started with. It's the front strut, brake and wheel assembly from a Volvo 240. The Volvo parts are good, and since they are rear wheel drive this front assembly is simple and inexpensive from junk yards. They also built these cars for about 20 years, so the parts are easy to come by. Volvos are somewhat heavy cars, so the bearings are large and the brake disks are larger in diameter than most.





Above are pictured the important parts. The spindle and strut tube will make up the main frame of the wind turbine. The blade will bolt down to the front of the brake disk, where the rim used to fit on the car. That stator shown below will replace the backing plate that used to cover the back of the brake rotor. Of course the machine will use the wheel hub, and the strong wheel bearings from the car. I take some care to inspect the used bearing, clean it and grease it again. Normally in the past I've used the same brake disk that came with the assembly. In this case, I noticed that the front brake rotors from the Volvo 740 (a heavier car) were a whole inch larger in diameter (11 inches), and they fit over the same wheel hub, so I aquired the larger brake disk off the 740 for this project. It's important to consider when disassembling these struts that the spring is under some tension! One should compress and clamp the spring.



This wind turbine has a furling system so that in high winds the alternator and blades will turn sideways out of the wind and protect itself from overspeeding. To do so, the tail must raise. The weight of the tail ultimately determines when the machine can furl. This seems to be the most popular furling system on small home brew machines, and the idea has been perfected by Hugh Piggott from [Scoraig Wind Electric](http://www.windstuffnow.com). Go to his site, or [www.windstuffnow.com](http://www.windstuffnow.com) for details about how this system works. In this case, the center of the alternator sits about 4 inches off to the side from the center of the mast. I did this by cutting the strut tube off at about 4 inches from the wheel spindle and welding it onto the side of the remaining tube at somewhat of an angle. The tail will pivot over a 1 inch diameter pipe which is welded to the assembly at an angle of about 20 deg from the mast.





Above is another picture of the same assembly.



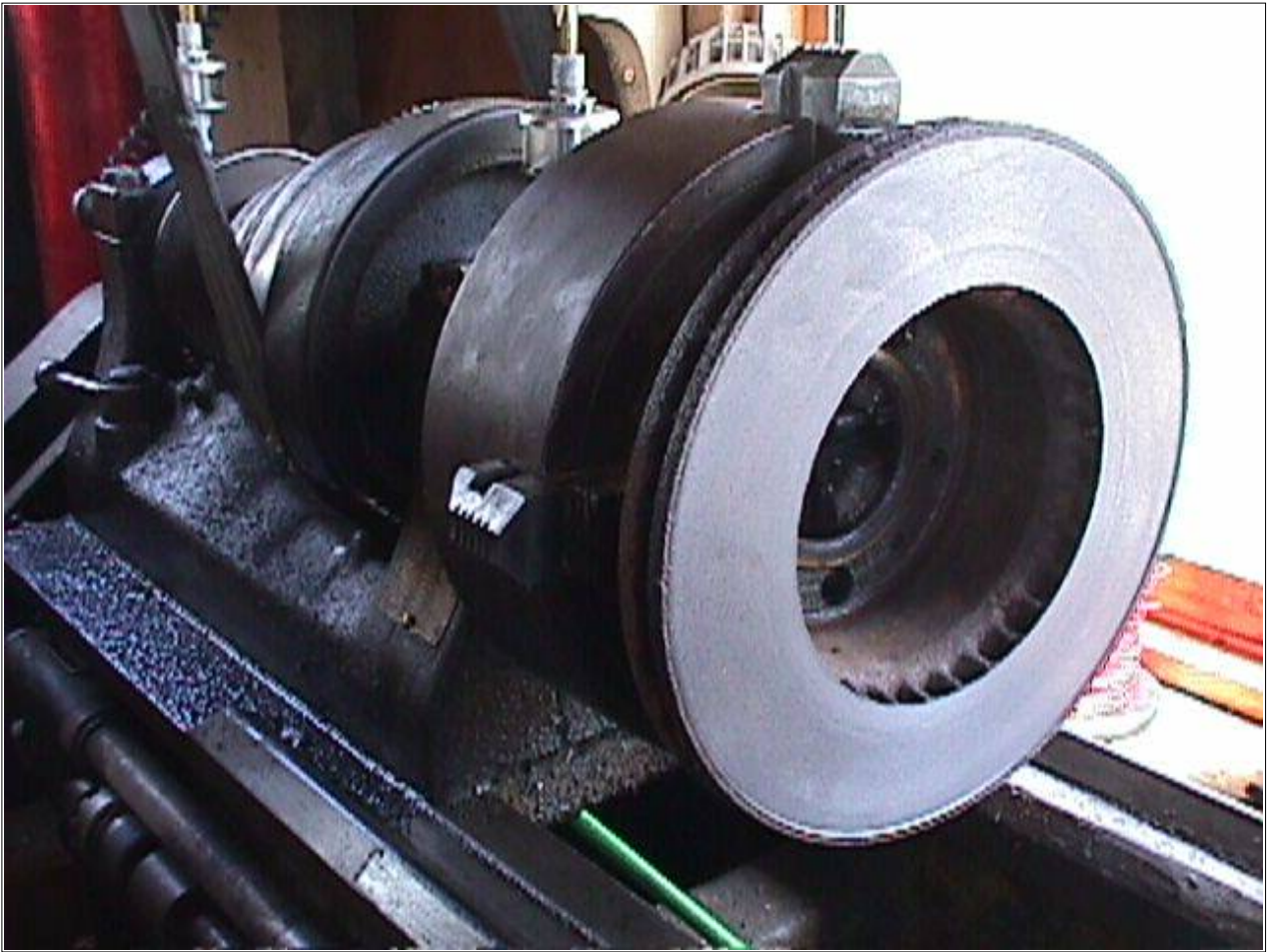
The tail is shown above. Actually - when I got 'round to testing this the tail came up too small and too light weight. I wound up making it slightly larger in the end. The end which attaches to the wind turbine is a short segment of pipe slightly larger than the 1 inch diameter pivot, which is welded to the main frame of the windmill.





Above is pictured the main frame, with the tail mounted. I painted the metal frame with green epoxy enamel to prevent rust and keep things looking as nice as possible.





Although probably not necessary, I like to cut a bit off the back of the brake disk from the inner diameter, almost all the way out to the outer edge, but not quite. This leaves an edge, about 1/16 inch high, which catches the magnets to help hold them in. It also leaves a nice clean flat surface. Since the magnets will also be glued and held in with some polyester resin, it's important after cutting this to clean it and make sure it's oil and iron filing free so the resin sticks well.



Pictured above are the magnets I used. This machine has 12 magnets, each one is 1.8 inch diameter and 1 inch thick. They are available on our web [Shopping Cart](#).





The magnets lay down on the brake disk such that each one has the opposite pole facing up as the one next to it. Alternating North and South poles all around the disk. I push the magnets all the way out to the lip I cut and space them approximately by eye. Then I use shims (playing cards) and go 'round the circle so they are perfectly spaced. The space between the magnets here is about 1/2 inch (or exactly the thickness of 49 playing cards).

I think the leakage (magnetic field which is going from magnet to magnet before it has a chance to go through the coils) between these 1 inch thick magnets is significant. More space between them would reduce that, it is also possible that thinner magnets (like 1/2 inch) might even work as well, or better. Once the magnets are spaced evenly, I wrapped some tape (duct tape) around both the inside and outside of the brake rotor so the edge stuck up about half an inch, creating a dam, or cavity in which I could pour polyester resin to glue the magnets down and keep the space between them. I wish I'd caught a picture of that.



I made a simple hand cranked coil winder.





I tested lots of coil shapes and sizes. Lots of things worked, but through lots of testing and some good advice I wound up deciding on this wedge shaped coil. The coils are wound from AWG 14 wire, and each coil has 60 turns. They are 3/8 inch thick, and the width (I never measured it) is such that exactly 3 coils fit over 4 magnets. Unlike the past machines I made which were single phase, this one is 3 phase. This setup seems to squeeze a bit more power from the same magnet rotor and also offers some benefits in reducing line loss. The alternator will also run more smoothly as 3 phase, meaning basically less vibration. Since there are 12 magnets, I need 9 of these coils and 3 coils will be wired in series to make up each phase.

The inside of the coil winder is waxed (I used crayons) so that glue wont stick to it. After the coil is wound, and the top removed from the coil winder, I put thin viscosity cyanoacrylate 'super glue' in the coil and spritz it with accelerator which hardens the glue instantly. This makes for very hard, strong coils that don't come apart easily.



Pictured above are the coils, and the magnet rotor (the magnets are not glued down yet, actually I never did that till the very end and never got a picture of it finished).





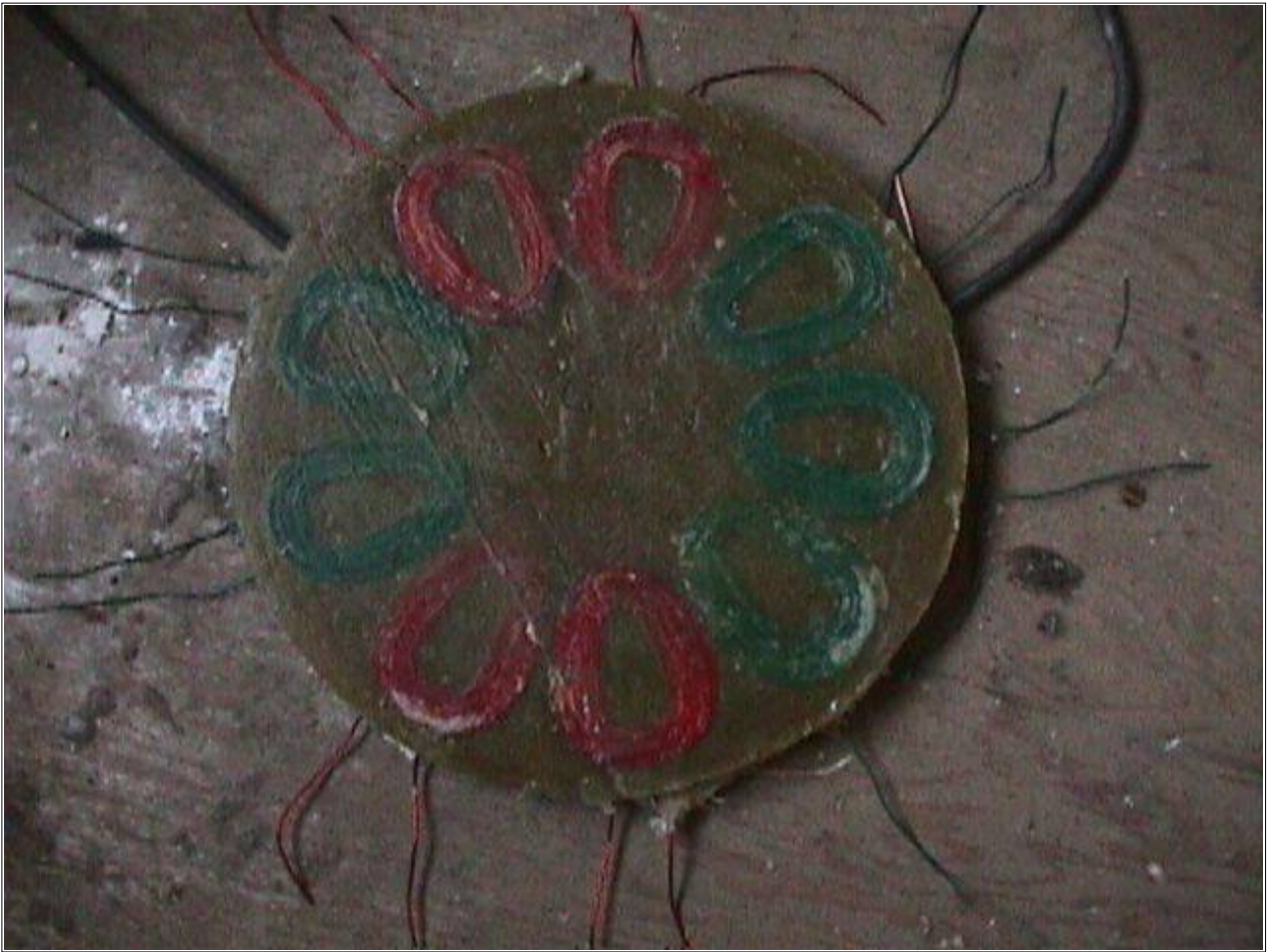
I made a mold out of partical board. The circle is 14 inches in diameter and I divided it into nine parts and drew lines so that I know where to place the coils. The top of the mold is the cutout from the bottom. The mold is 1/2 inch thick. I waxed the mold so that the resin would not stick to it. Once I place the coils and pour the resin, the top will get clamped in, and the wires from each coil will poke out the edge so all the wiring will be done later.



I cut two disks of fiberglass fabric about 14 inches in diameter. I put one down in the bottom of the mold before placing the coils. Then I put down a thin layer of polyester resin. I then put each coil in its place. I took care to make sure each coil is placed the same way. In other words... when the coil comes out of the winder, it has a top, and bottom side. I made sure they are all the same way so that the inside wire of the coil (the start) and the outside wire (the end) come out the same for each coil. Although not absolutely necessary it makes for much easier wiring later on. Once all the coils were placed, I filled up the mold with polyester resin mixed with talcum (baby) powder. The powder makes the resin go further and makes things a bit stronger. Once the mold was filled I put another fiberglass fabric disk over the top, and poured over some straight (no talcom powder) resin. I thin clamped the top on the mold with the wires poking out.

The reason for the red, and green coils is simply that I ran out of magnet wire! The green stuff is extra high temperature wire rated for about 400 deg F, and the red is less - but it will work fine.





After a couple hours I opened the mold and the stator is pictured above.

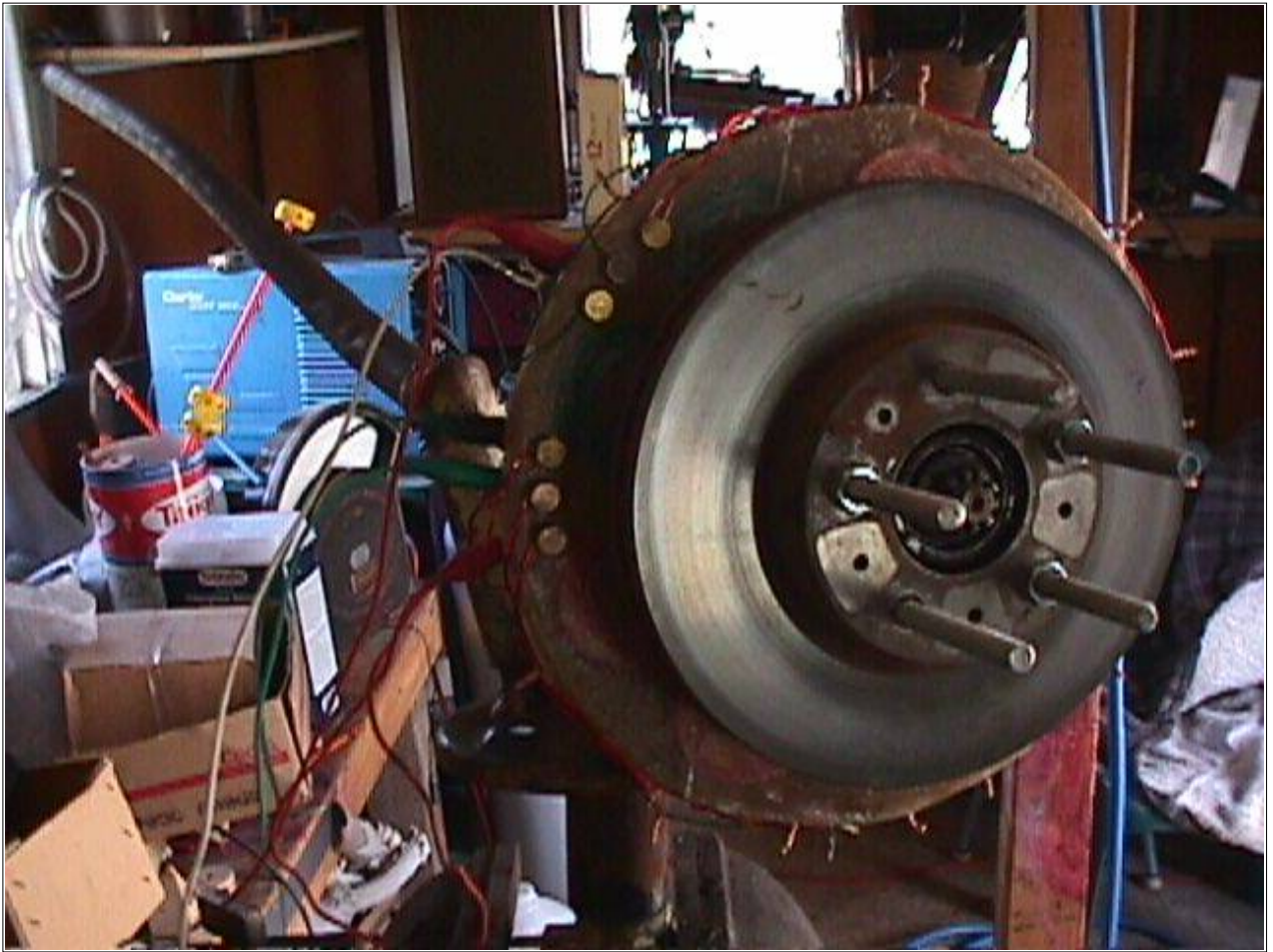


You can see in the picture above how the center of the stator is drilled out the same as the backing plate. The center hole has to be a bit larger (2.5 inches) so that the bottom of the wheel hub will fit inside it. The mold could have been modified to leave this hole in the stator and it would've saved some resin, but it was easy to use a hole saw and resin is cheap. On past machines I've made, the back of the stator was plywood, and steel laminates (which help to conduct the magnetic field through the coils) were glued into the plywood. The coils were glued over the top of the laminates, and the plywood bolted to the windturbine frame. A problem I had was that the laminates were getting yanked out of the plywood by the very strong magnets. In this machine, the laminates will be a separate part which simply lay (stuck there by the force of magnets alone) behind the stator. Or, with a smaller and faster prop it would probably run just fine without laminates at all.



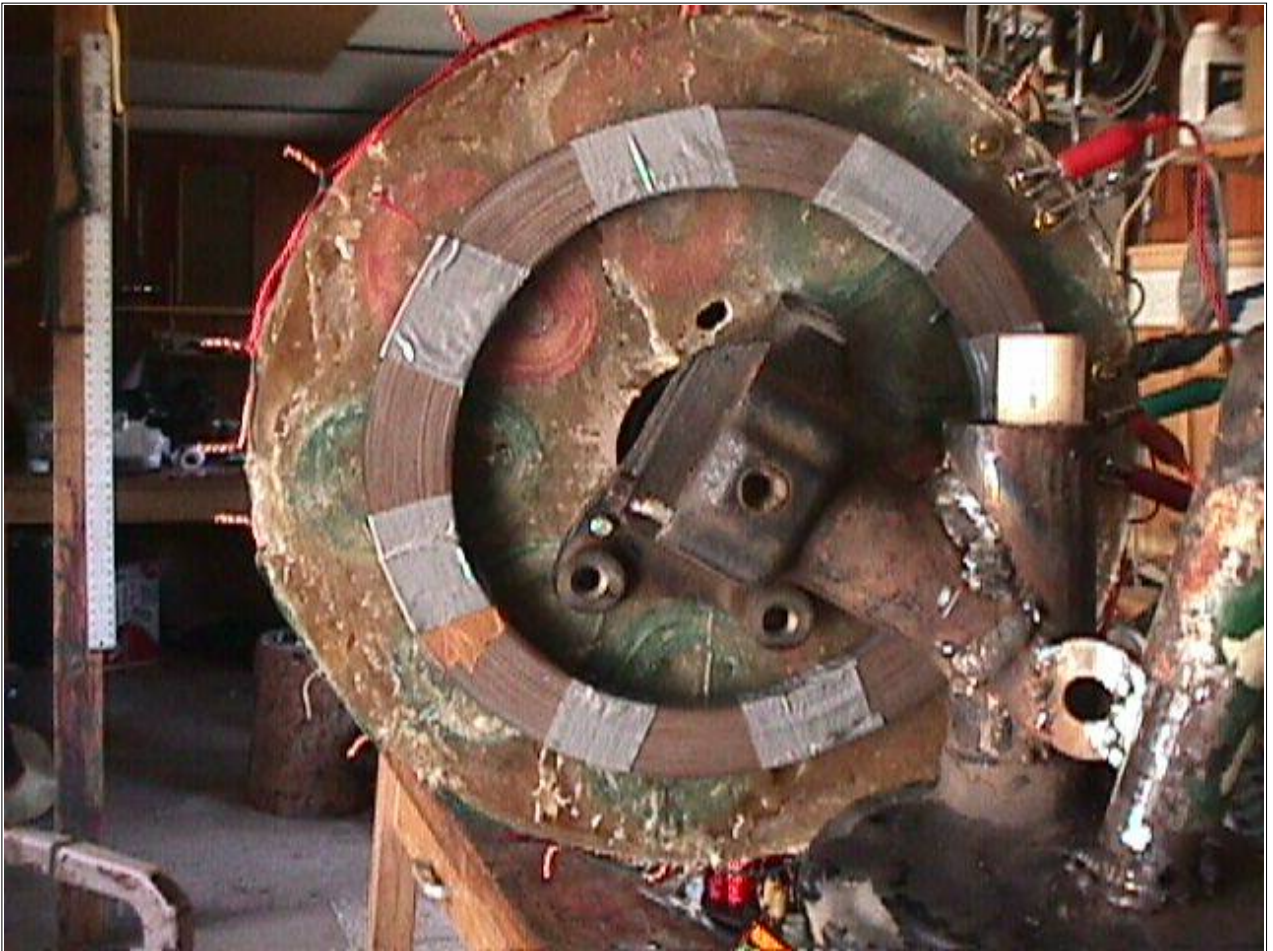


Pictured above is the stator bolted onto the machine. I've also got the wheel hub on here. You can see how the studs (where the lugnuts used to go) have been replaced by longer (7 inch long) pieces of 1/2 inch allthread. The studs were pressed in, and are easily knocked out with a hammer. The allthread is held on with nuts on each side, and then another nut is used on each one to hold the magnet rotor out the proper distance so that the magnets run very near (about 1/8 inch) the stator.



Above the whole machine starts coming together so that I can wire, and test the alternator. I used 6 brass bolts for binding posts to hook up the 3 phases. My intention with this alternator was to wire it in Delta.





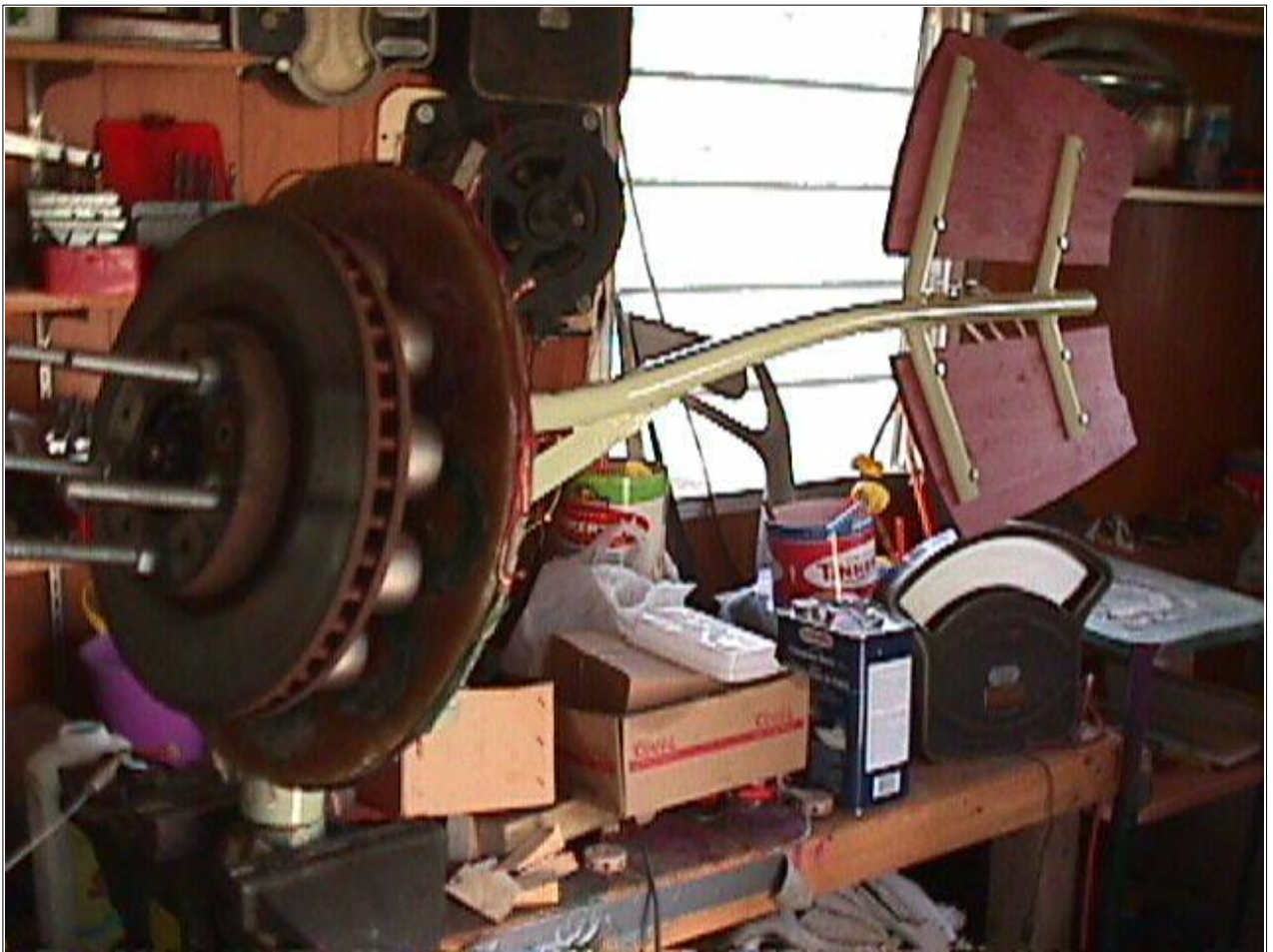
Here you can see how the laminates simply "stick" to the stator when the magnetic rotor is on. This is convenient, because it is easy to remove the laminates before removing the magnet rotor! It can otherwise be difficult to pull the magnet rotor loose when the laminates are built into the stator. Of course, this design with the fairly thick coils and removable laminates means I have a pretty thick airgap (distance from magnets to laminates). Past machines I've made could have much thinner coils and probably make slightly better use of the magnets.

The laminates I used here are actually a coil of very nice Silicon steel which I got from Ed at [Windstuffnow.com](http://Windstuffnow.com). Also go there for lots of good information on all aspects of building and designing small wind turbines.



Probably not necessary, but I glued the steel laminates into a plywood ring to make them easier to handle and prevent corrosion.





Here the machine is pretty finished up except for the prop. At this point I've got about 20 hours into the project if I don't count the mess I have to clean up later.



I made the blades from wood about 8 inches wide and 1.5 inches thick. Each blade started out 5 feet long, for a 10 foot prop. Here you can see I cut out the shape for one prop. Then I used it as a template and cut the others to match.





These are simple blades (as usual with me...). The tips are pitched about 4 deg, and the middle of the blade about 6 deg. From there it pitches steeper and steeper until the angle takes up the board thickness near the root of the prop. The airfoil is designed to do little more than 'look like an airfoil' and the thickest part of the airfoil is about 1/3 of the way back from the leading edge towards the trailing edge.

It'd probably work better if I designed it 'properly'. Hugh Piggot has some good information on this on his website [here](#) and Ed from [windstuffnow.com](http://windstuffnow.com) offers some nifty software which figures it all out for you!

I've seen several commercial machines which have very simple non-tapered, non twisted (straight pitch) blades which work fine, so it inspires to me to keep things simple.



Before doing any carving, I cut one slot with a cross cut saw at the point where the angle of the blade is steepest. This is insurance that I won't ruin the hub area of the blade with the drawknife should I make a mistake or have the wood split.





After attending Hugh's seminar this spring... the drawknife has moved to the top of my list as the favorite tool to use. Very fast, and very accurate. No need for a chisel and the only power tools were used for finishing. I roughed out the whole prop with this quickly and then finished it up with a power planer and a belt sander.



Pictured above the top of one blade is finished.





Here you can see the airfoil, and the back of the prop.



I rounded the tips to look nice, although later in testing I wound up cutting them off as the prop was too large and a bit slow.





The blades are sandwiched between two plywood disks and held together with a ton of screws. In the past I've used glue here, but I opted not to this time thinking that the screws, along with the tight squeezing that happens when the prop is bolted on would be good enough. This way if I ever need to replace one blade it will be easy.



Pictured above she's pretty much finished up on the nose of my truck for testing. When I do this I have a battery in the truck on the floor, some rectifiers, and meters so I can get a rough idea of how much it charges at certain speeds. This also allowed me to test the furling setup. In the first test it was clear the tail wasn't quite big enough or heavy, as it wouldn't run square with the wind and started furling at about 15 mph. The next morning I increased the tail size some and made it from thicker wood. As it is now - the tail is back about 36 inches from the machine, and it's about 4 square feet in area. It works reasonably well, although a bit larger might be better. I'm keeping it as it is because my tower is not so strong and I want it to furl early.

This is a big improvement from past machines, mainly in that it turns in practically no wind at all and the slightest breeze spins it up to charging speed quickly and quietly. Past machines I've made wouldn't start till they saw a 10mph wind, and then it took them some time to spin up--so they were not nearly as responsive. The reasons for this improvement: the good laminate material I got from Ed, the 3 bladed prop, and the poor (wide) airgap (these laminates are not seeing near the magnetic field intensity as others I've made). It's always spinning even on a still day - and it seems to be making an amp or two at 7mph. At 10 mph it charges 12 volts at 8-10 amps. 15 mph I see about 15, and at 20 mph it's doing 30 amps and just starting to furl. At 25 mph it's furling out of the wind almost half way and doing about 35 amps and at 30 mph it's more than half way turned out of the wind and charging about 45 amps. I believe the power I'll get from this in very light winds will add up significantly and prove it to be a much better producer than others I've made, some of which actually had more powerful alternators.



In one test I added some weight to the tail. Although it was still somewhat turned out of the wind, it was producing about 60 amps at 30mph. So, if I add weight to the tail it will produce much more, but as it is it's less stress on my tower. I also think that the majority of the power I see from it will be in winds below 20mph so this is the area I'm concerned about.



Above is a good picture of how we test them on the truck. [Click Here](#) to see a brief movie of the truck test!



In this picture I'm tying it up so we can more easily navigate the trees on our driveway for the ride home. This picture does give a good idea of how the furling system works, as the wind puts force back on the blades it makes the machine want to fold up like this - but in order to do so the tail must be raised! So the furling system is a balancing act between the force back on the blades, and the weight of the tail.



This is how it looks now up on my tower with the blades cut down to 9 foot diameter and the larger tail. It's been doing well now for a few days, starting to turn below 5mph and definitely making power. It's definitely an improvement over past machines. I notice significantly less line loss due to the 3 phase power, and it generates in much lower windspeed because it turns much easier. To do it over again, changes I'd make would be a still larger tail, and/or... cut down the prop size maybe a bit more. I'm pleased with it though and will probably leave it as is. Can't wait to make the next one!

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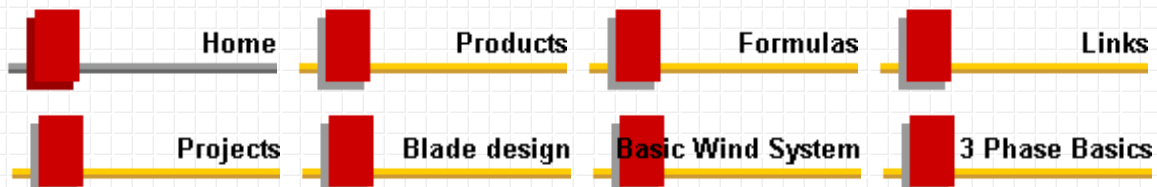
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**Thanks for dropping by and Welcome!!!**

As a dedicated "do it yourselfer" I put this site up for all those who share similar DIYS skills and convictions.

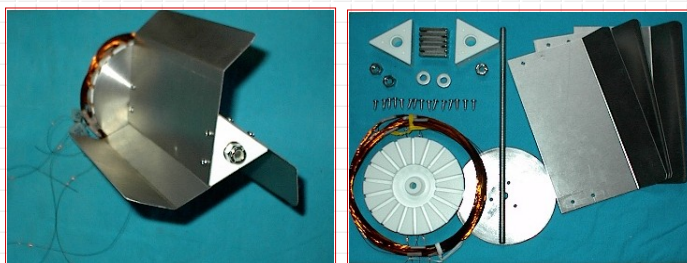
I hope what I have here helps you in your endeavors in some way, big or small.

This site is maintained using windpower only. My entire office is powered by the wind.

[Email me](#) Please send me feed back about this site or any questions you may have.

***[A semi-new Vawt... the "Lenz turbine"](#)***

**[New addition ...](#)**



An educational 3 phase turbine kit. Comes with everything you need to create a 3phase wind turbine. Great for science projects, learning about 3phase PMG alternators, and alternative energy. The kit includes 6 very powerful neodymium magnets. Check it out!

**Budget builders....**



More Neodymium magnets for those on a budget. They make nice alternators as shown in the section "[Alt from scratch](#)"



These are the new magnets I've been working with. They have proved to be quite impressive for building the axial flux type alternators and for building motors for electric vehicles. I have a few extras for those interested in them. Click on the picture to go to the builders corner page.



The

original 6 ft turbine with a car alternator and chain drive. It was changed to the axial Flux type alternator and ended up being much more efficient and powerful. The chain drive was quite noisy because of the cogging in the modified alternator. It was in service for about 2 years and is now down for maintenance. Actually it will be refitted with a new alternator using the new magnets and the blades refurbished.

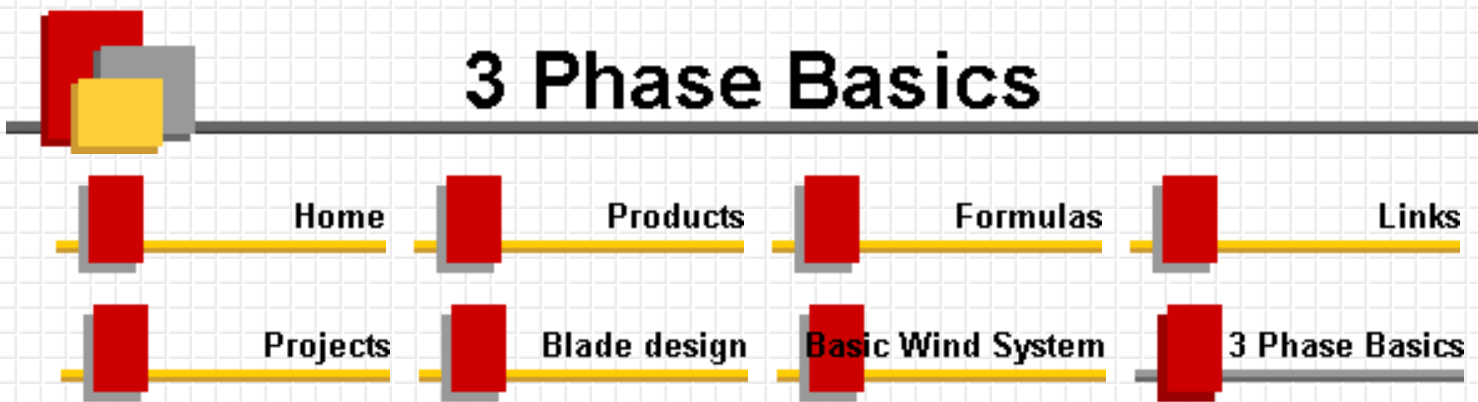


The downwind turbine, a very small but quite efficient little unit. This one was a bit more complicated to build but it features the star/delta controller ( check the link on downwind turbine for more detail)



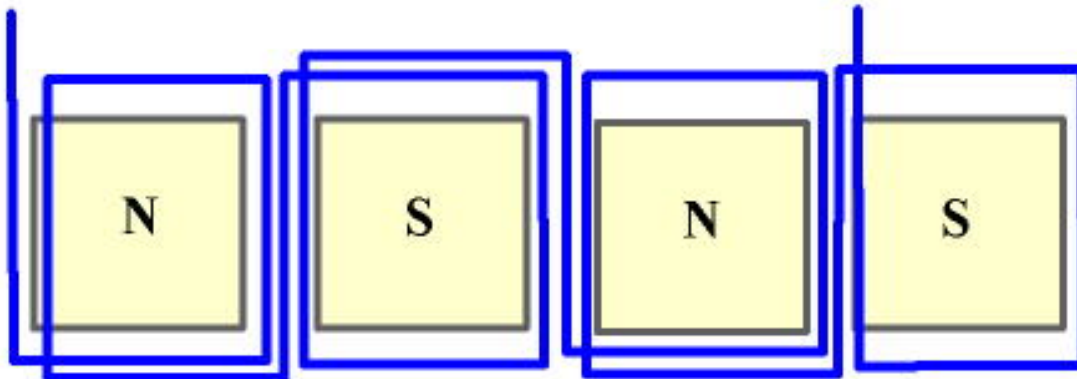
One of the original alternator modifications. This one had a rewind stator and the modified rotor using Neo' magnets.

# 3 Phase Basics



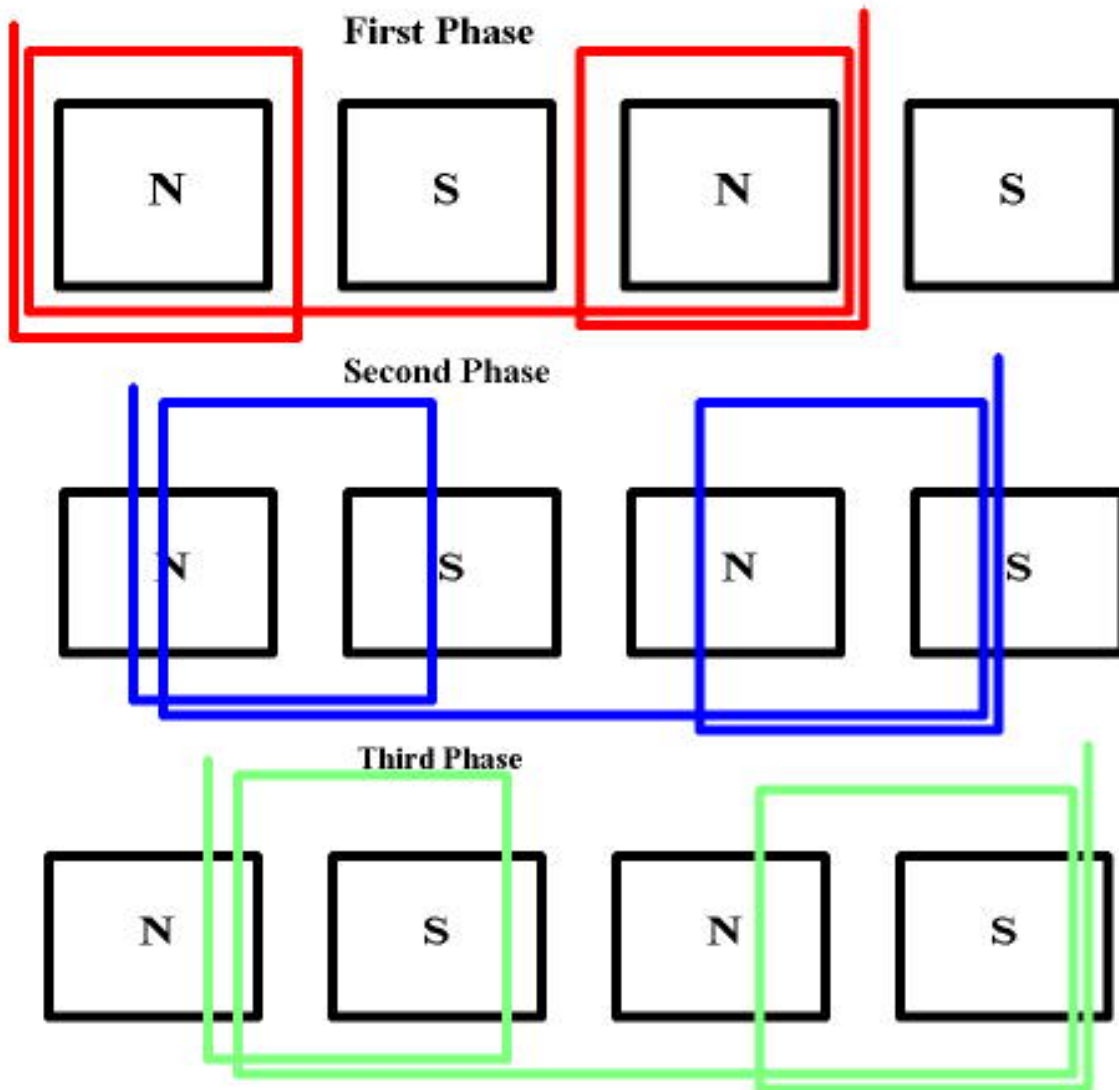
## Understanding 3 phase alternators....

Three phase is nothing more than single phase with 2 extra coils slightly out of phase with first. Basically "Phase" relates to the timing of the magnets passing over the coils at different times. With single phase the magnets and coils all line up with each other and are said to be in "phase". The diagram below shows single phase wiring....

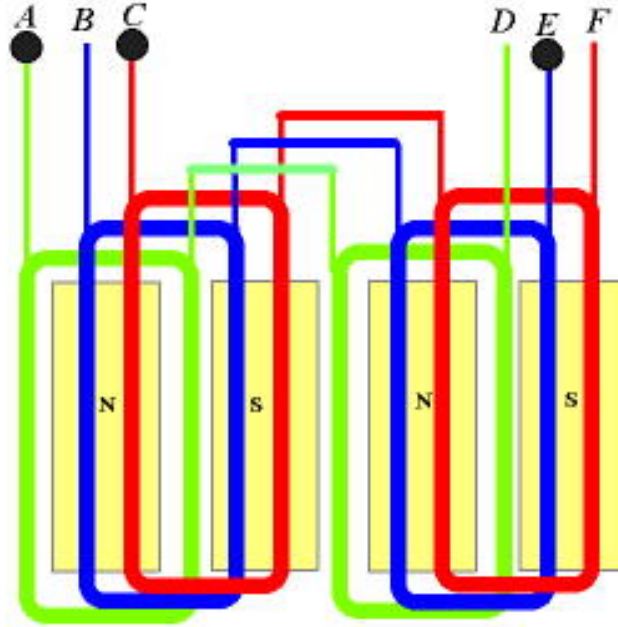


In a single phase unit the coils are wound opposite of the first. That is to say one is wound clockwise and the next is counter clockwise. If your unit has 8 magnets then it would also have 8 coils. With 3 phase you would have 3 coils for each pair of magnets. A pair meaning one north and one south magnet. There are many combinations for any one set up. For instance you could use 8 magnets and only have 6 coils without overlapping them... or 3 set of 4 coils in series. For now we won't worry about the combinations and stick with the basics. Below shows a diagram of 4 magnets with the placement of each of the coil sets...





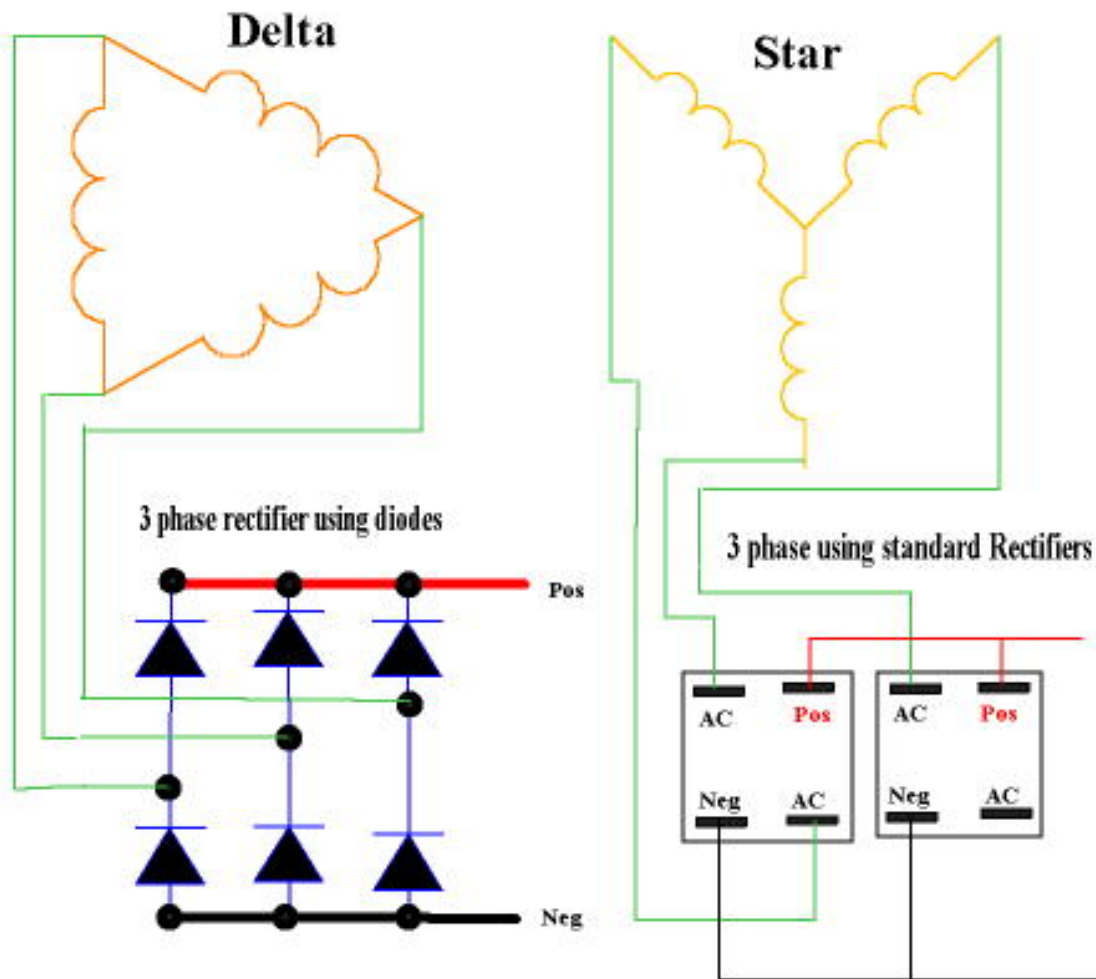
As you can see the first phase covers only the north pole magnets and are wound all in the same direction. The other of the two are identical to the first with the exception they are offset equally. The next diagram shows all the sets in place for a 4 pole alternator. You end up with 3 start wires labeled A,B,C and 3 end wires labeled D,E,F. The output wires to this arrangement would be A, C and E. The reason E is an output or ends up being a "start" wire is because when the magnet passes over the 2nd phase its out of phase between the 1 and 3 so the ends are reversed instead of winding them in the opposite order.



Now to connect the ends and change the AC to DC for battery charging... Below shows the star and delta symbols and 2 different types of rectifiers. Either rectifier can be used for star or delta. You can use diodes and make your own rectifier set up or you can purchase the standard rectifiers. Notice on the standard rectifiers one AC lead isn't used. Similar to the diodes, a rectifier that is already made up for such use and my personal preference is a unit from a GM alternator. They seem to give the best rectified output out of all of them. I'm not sure why but they do. They are expensive to buy new but usually you can get them from the junk yard fairly cheap. Sometimes get the whole alternator for around 15 bucks. They also make a nice clean set-up.

There are basically two ways to wire a 3 phase alternator, star ( or Wye) and Delta. With Delta you get lower voltage but more amps. In star you get higher voltage but less amps. You can calculate these by using the square root of 3 ( or 1.732 ). Each coil set is a "phase" of the alternator so when you measure voltage, ohms or current to test one phase of the alternator you would measure the "phase". Once you know what the output will be from one phase you can calculate the "line" output of either delta or star. The line voltage would be measured from any 2 of the 3 outputs. If one phase measured 22 volts in your test and 10 amps then the star configuration would produce 38 volts and 10 amps (  $22 \times 1.732$  ). The amps remain the same as the phase measurement because the star is basically series'd to another phase. In Delta you would get 22 volts at 17.32 amps (  $10 \text{ amps} \times 1.73$  ). If you calculate this out  $22 \text{ volts} \times 17.32 = 381 \text{ watts}$  and  $38 \times 10 = 380 \text{ watts}$ ... so what is the advantage? Typically the resistance in Delta is 1/3 the resistance of star. If the resistance of star was 1.5 ohms we could calculate the output ( see formula section ). Lets assume the

test was at 600 rpm, we achieved 38 volts in star ( about 16 rpm per volt ) so at 1000 rpm we would get 62.5 volts less battery voltage of 12.6 = 49.9 volts / 1.5 ohms = 33.26 amps \* 12.6 = 419 watts... not to bad. Now in delta we had 22 volts at the same rpm ( about 27 rpm per volt ). So at the same 1000 rpm we get 37 volts - 12.6 battery = 24.4 volts / .5 ohms = 48.8 amps \* 12.6 = 614 watts. Almost a 200 watt gain !!! The advantage of star is the higher voltage at lower rpm which means our unit would have to make 201 rpm to start charging at 12.6V where the Delta would require 340 rpm to start charging.



Some Basic factoids about 3 phase.... Most of the electric power in the world is 3 phase. The concept was originally conceived by Nikola Tesla and was proven that 3 phase was far superior to single phase power. 3 phase power is typically 150% more efficient than single phase in the same power range. In a single phase unit the power falls to zero three times during each cycle, in 3 phase it never drops to zero. The power delivered to the load is the same at any instant. Also, in 3 phase the conductors need only be 75% the size of conductors for single phase for the same power output.

And there you have it ! Not really much more difficult than single phase but much

more efficient !!!

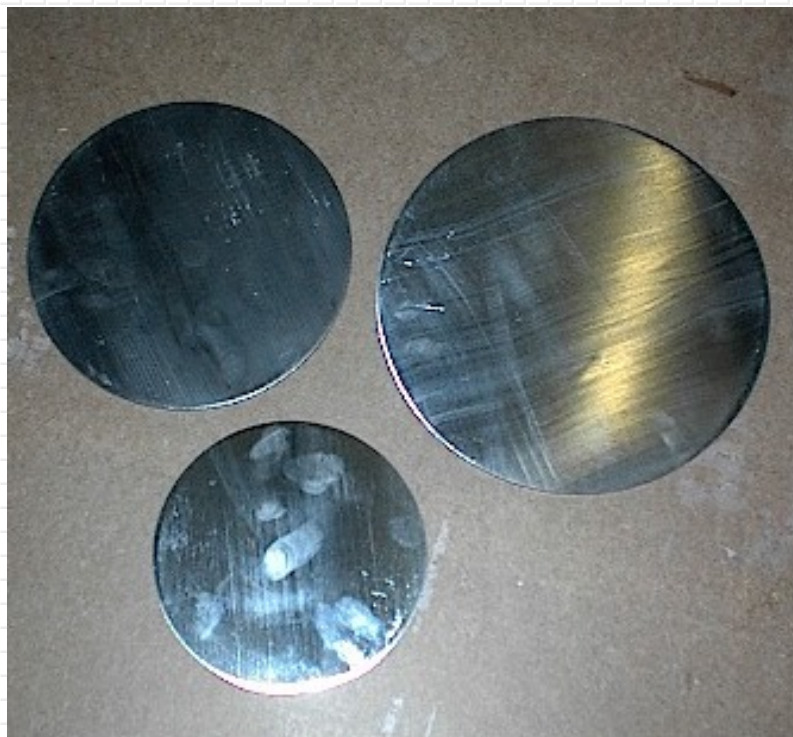


# Builders Corner

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I will be adding things as time goes on so keep checking back from time to time. If you would like to see other items that are not listed send me an email and let me know what your looking for...

## Large Steel Discs



### Steel Discs

I have 3 sizes available right now, 8 inch, 10 inch and 12 inch. All made from 1/4" steel plate. Great for prop mounting hubs, magnetic discs for use with an axial flux machine or a combination of both.

**8 inch disc \$11.95**

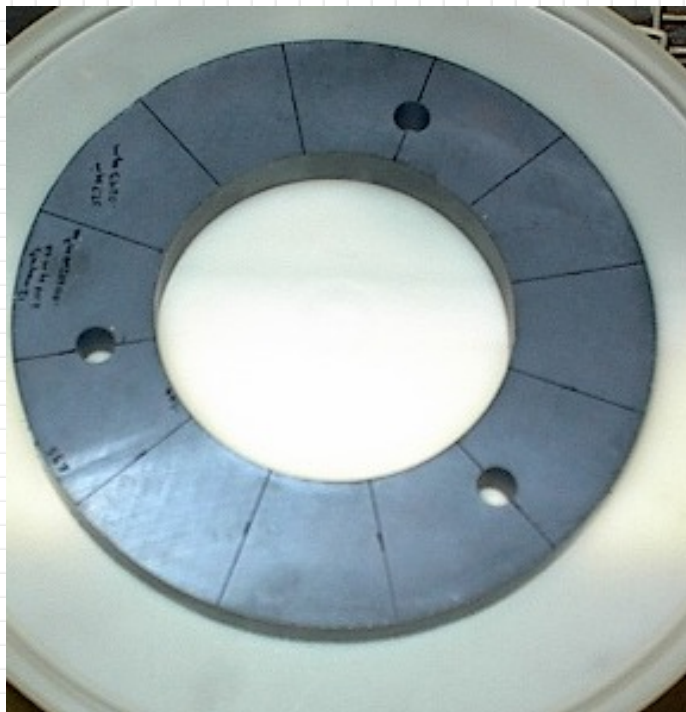
**10 inch disc \$14.95**

**12 inch disc \$19.95 Out of stock... sorry,check back**

There is no center hole in these but I will mark and center punch them so it will be easy to find and drill the center to any size you desire. If you know what size hole you need I can drill them for you but there will be a \$5.00 set up fee.

### Very Large Ceramic magnets

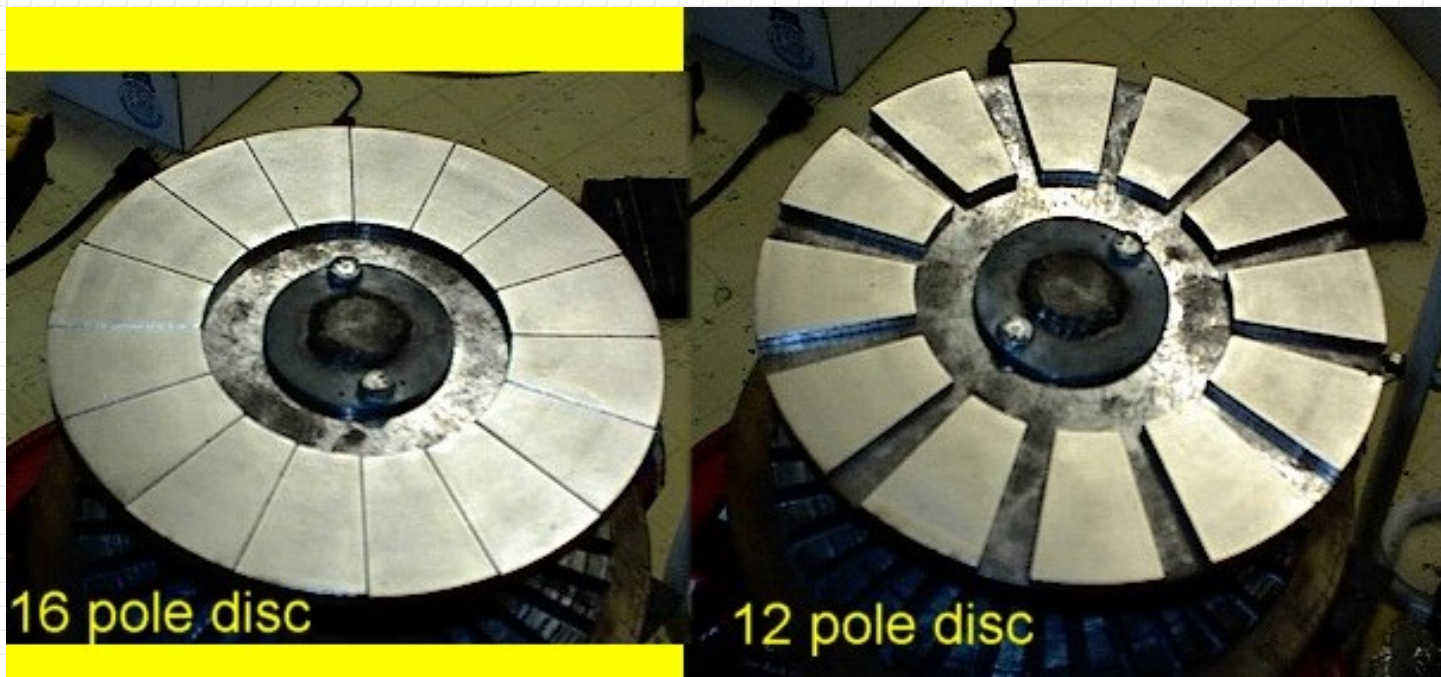
These are the magnets I've been using for the downwind turbines. They are very large Ceramic 5 type magnets. They are easily cut with a tile saw. The dimensions are 8.35" diameter with a 4.66" hole in the center by .75" Thick. There are 3 mounting holes in the magnets. If cut into 12 sections will cut through the holes. This doesn't cause any problems with the alternators. Shown here marked off for 12 equal sections. It could be cut in any other configuration also.



The magnet uncut is only **14.95** plus shipping. The magnet weighs 5 lbs. Depending on how its cut this comes out to about 1.25 per magnet cut in 12 sections. 1.50 ea cut in 10 sections or 1.86 cut in 8 sections. One tested with 12 sections on an 8" disc with 36 slots for a 3 phase unit made over 700 watts. They make very nice units.

### Very Large Neodymium Ring magnet sections

If your looking at making lots of power... and I do mean LOTS you may want to investigate the neodymium magnets I've been using for testing. One unit has achieved over 3500 watts using an 8 inch disc with 16 magnets. These are custom made and 16 magnets make an 8 inch OD ring with a 4 inch ID.



The above shows the magnets mounted on an 8 inch disc using 12 or 16 poles. They also fit nice on a 10 inch or the 12 inch discs I sell above.

**NOTE: Under no circumstances should you attempt to assemble the rings without a steel backing. They are near impossible to get apart without destroying the magnets or your body!!!!**

I have a limited supply of these so you may want to get them as long as their available.

These are rather expensive and are priced as follows...

**\$6.50 each (normally 8.00 each)**

or

**\$96.00** set of 16 (normally 120.00)

**( while they last !!!)**

If your interested in any of these send send an email to [elenz@windstuffnow.com](mailto:elenz@windstuffnow.com) .

**Smaller Magnets for the budget builders**



These are the ones I used in my smaller alternators. Also, built a 400 watt unit for the 6ft prop with these shown in the Alt from Scratch section. They make nice inexpensive alternators for wind power.

They measure 1 inch x 1/2 inch x 1/8 inch thick

These are being sold for only **.99 cents each** so a batch of them won't break you. Buy them by the 100's

**Ask about discounts for quantities over 100**

If your interested [email me!](#)



# 3Phase turbine kit

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## Educational Three phase turbine Kit



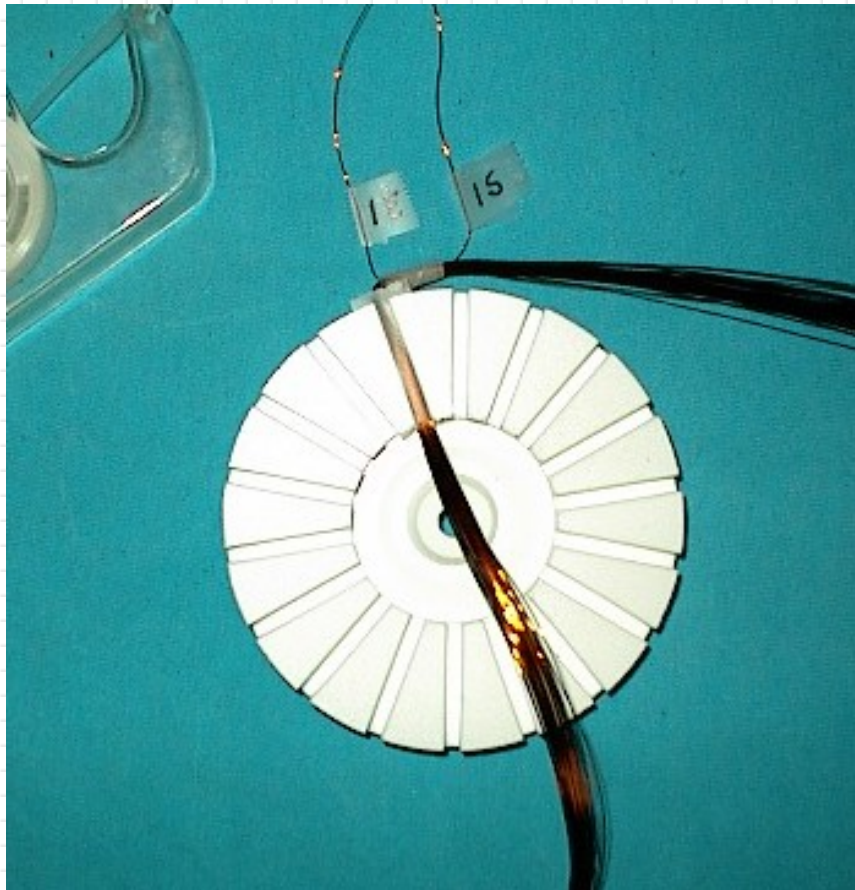
This kit comes with everything you need to assemble a 3 phase wind turbine. Including easy step by step instructions to build and wire it. The kit also includes 6 powerful neodymium magnets.

**All for only \$29.50 plus 4.95 shipping**

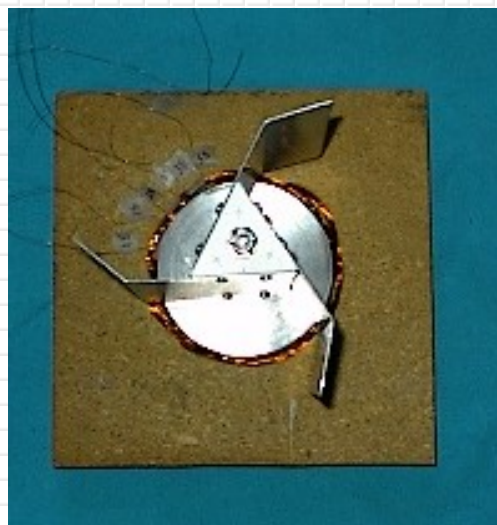
The turbine stands approximately 8 inches tall and is 6 inches in diameter. Although not a real powerhouse, it will charge ni-cad batteries and run LED's without a problem. Only basic tools are needed for assembling the kit such as a drill, various

drill bits, 7/16" wrenches, #1 phillips screwdriver. You will also need some tape and super glue.

Winding the coils has been made easy, using a slightly different approach that anyone can do. The slotted stator makes it very easy to hold the wires in place



The base is up to you and can be a simple board with feet or a PVC plug to mount it on a pole.



Very simple and fun to build!!! Order one today. If your an educator ask about quantity discounts so all your students can learn.

You can download the instructions to see if its something you would like to build. The instructions are now in PDF format which makes it simple to print and use

[Click here for the download \(50k\)](#)

## *Assembling your 3phase turbine Kit*

### Turbine Kit Parts List

- |    |                                      |
|----|--------------------------------------|
| 1  | 1 Stator ( slotted thingy)           |
| 2  | 2 Blade mounts ( triangular plastic) |
| 3  | 1 8 inch x ¼ inch threaded rod       |
| 4  | 2 ¼ inch standard nuts               |
| 5  | 1 ¼ inch nyloc nut                   |
| 6  | 2 ¼ inch washers                     |
| 7  | 3 Aluminum Blades                    |
| 8  | 6 Neodymium magnets 1" x .5" x 1/8"  |
| 9  | 3 50 turn coils of magnet wire       |
| 10 | 15 #4 x ¼ phillips head screws       |
| 11 | 6 N4001 diodes                       |
| 12 | 1 3 ½ " steel disc                   |

### Tools you will need to assemble this kit

#### **Drill**

**5/32 drill bit**

**1/8 drill bit**

**¼ drill bit**

**#1 Phillips screwdriver**

#### **Pliers**

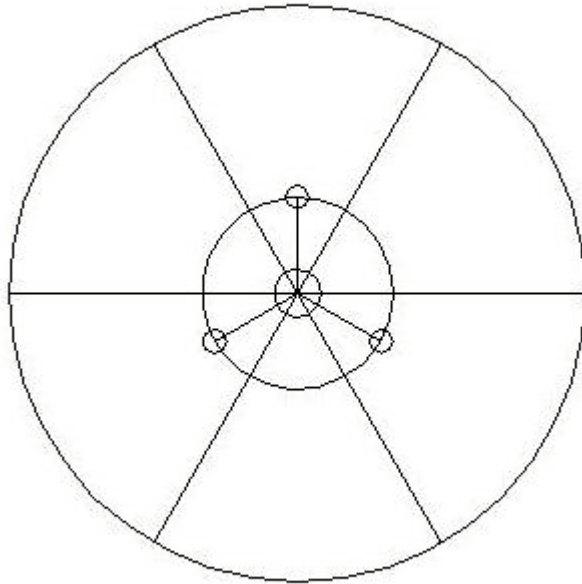
**7/16" wrench**

**Tape**

**Super glue**

**Mild grease or oil**



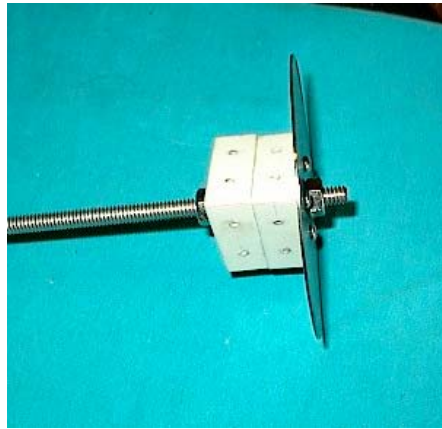


Start by finding the steel disc and cut out the template above. A flashlight is handy to line up the center hole. Lay the steel disc on the flashlight and lay the template over the disc. Line up the center hole with the light shining through the hole. This will center the template. Tape the template in place and use a center punch to mark the 3 holes. Use a marker to mark the lines on the disc where the magnets will be placed. Remove the template and drill the marked 3 hole locations using a 1/8 inch drill bit. When this is done take a ruler and connect all the lines on the disc. This will be the placement of the magnets. The two triangles have small divits in the sides and top. Use a 5/32" drill bit to drill into these divits.

Continue by locating the steel disc, triangles, 2 washers and threaded rod as well as the 2 standard nuts as shown below.



Take one of the nuts and screw it on the threaded rod about 2 inches down. Place one of the washers on the rod and one of the triangles with the washer groove toward the washer. Place the second triangle on the other one with the washer groove up as well as another washer. Install the steel disc with the lines showing and install a nut. Line up the 3 holes in the steel disc with the 3 holes in the triangle. Install the 3 screws to hold the disc in place. This assembly is to assure the disc is centered on the triangle. Below shows the assembly jig assembled.



Remove the disc and triangles from the rod and find the 3 turbine blades. Install one turbine blade on the triangle attached to the disc. Attach the other triangle to the top of the blade. Make sure you have the washer groove upward and the triangle lines up with the blade. Below shows the first blade assembled and the turbine assembled.



Flip the unit over showing the steel disc and find the magnets. The magnets have to be placed on the disc with alternating poles. Such as North, South, North, South etc. It really doesn't matter which is north or south as long as they alternate. The simplest way

to do this is to place the first magnet down on the disc centering in on one of the lines. These can be superglued in place if necessary.



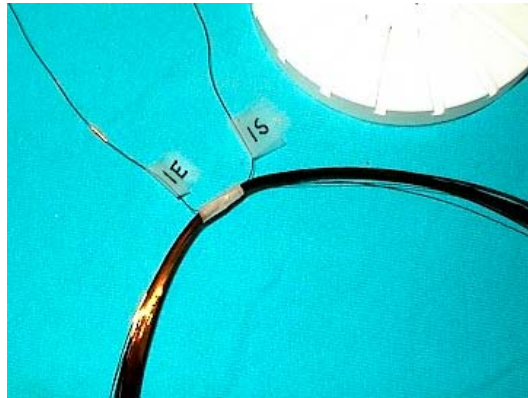
Take the next magnet and hold it a distance away from the magnet already on the disc, If it attracts then flip it over... it should repel. This is the way it should go down on the next line same as the first. Remember the magnet should repel the one before it. The rest of the magnets can be installed at this point. When you get to the fifth one it's a good idea to double check your work using the last one to test the poles. Circling the poles one should attract the next repel and so on. The last magnet will repel both the ones beside it.



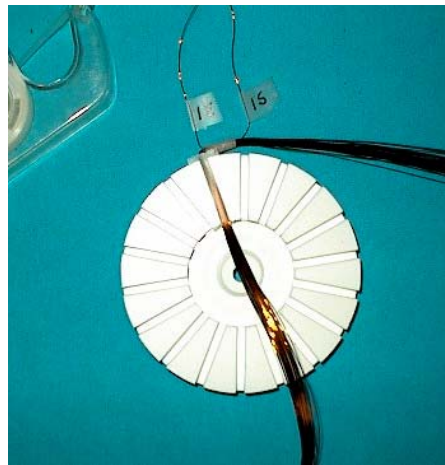
This portion of the turbine is completed for now. Set this aside and find the 3 coils of wire and the stator ( slotted plastic thingy). As shown below...



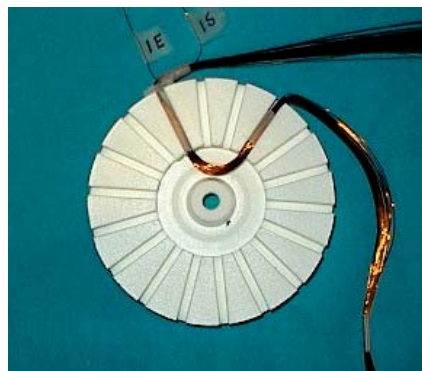
Untwist the coils and take one from the three. Notice there are two wires coming out from the coil. One wire is short and one is longer. When installing the coils the short wire should be on the right hand side. The short wire represents the “Start” of the coil and the long one is the “End” of the coil. Using some tape and a marker label the ends of the coil 1S and 1E. A fine point sharpie works nice for this. Below shows the coil with the ends labeled...



At this point you should get some tape ready to help hold the wires in the slots as we go along. Cut 6 pieces about 1 inch long and stick them to the table edge or somewhere easily accessible. Bend the wire to a 90 degree angle just left of the edge of where the two wires come out of the taped connection. You can place this in any slot to start with and place a piece of tape over the slot to hold the wire in place as shown below...

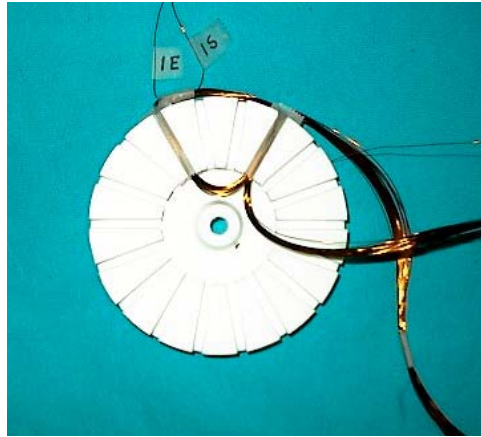


Bring the bottom of the wire, leaving a small loop while skipping two slots back up through the slot as shown below....

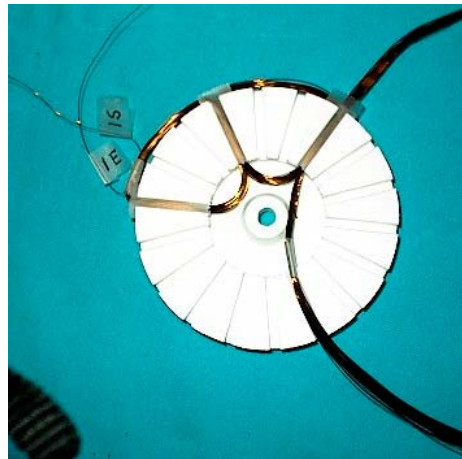




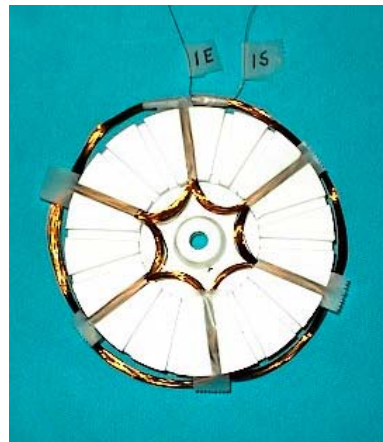
The top wire will come down through the same slot forming one of the six coils to be completed. A piece of tape covering the slot will hold the wires in place once again. The picture below shows the completed first coil...



The next coil will be similar to the first, skipping 2 slots, the bottom wire goes up through the slot and the top coming down through the same slot. A piece of tape to hold the wires in the slot. Below shows the next coil in place...



Continue on until all the coils are in place. The last coil will share the same slot as the starting coil. You'll have to pull the tape up, install the wire and replace the tape. When completed should look like the one below...



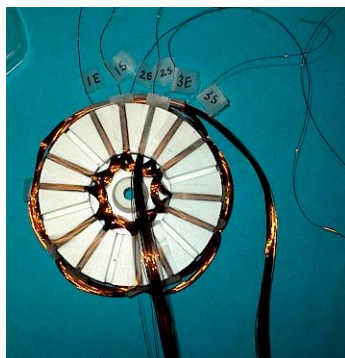
Now you have completed all the coils of one phase. You've just created a single phase alternator. The next two phases will go in the same as the first. The next phase will start in the slot directly to the right of the start of the first phase. Start by finding the long and short wire as with the first coil and label the start and end as you did with the first only this one will be labeled 2S and 2E for the second phase. Shown below is the beginning of the second phase...



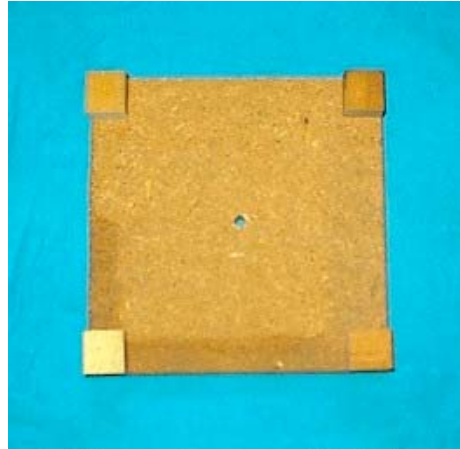
Follow the same pattern as you did with the first phase and using tape to hold the wires in place. Below shows the second phase in place...



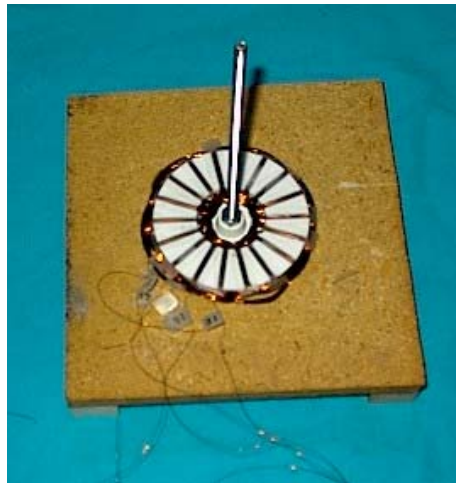
Proceed with the third phase the same as the first two filling the remaining slots. Shown below is the first coil start and the completed stator...



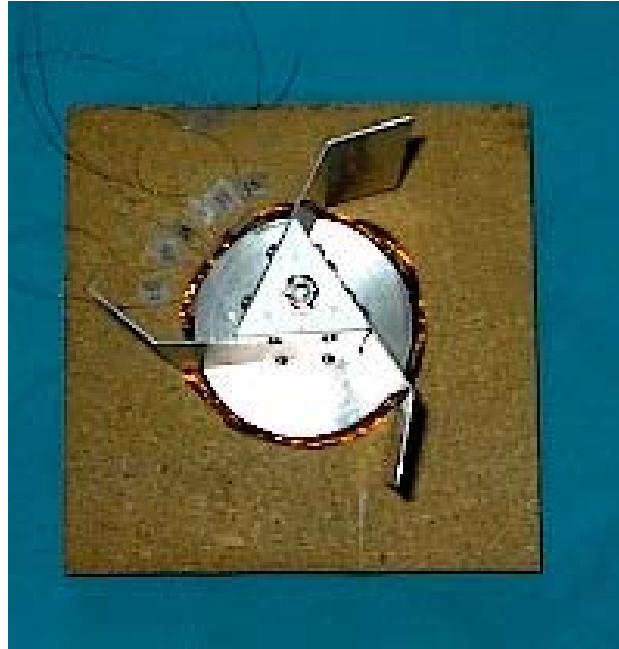
That completes the stator at this point. Assembling the stator to the turbine is a simple step. But, before we continue you should decide on the base. The base can be a board with feet which I will show in the following assembly or you can use a PVC pipe plug that will fit a pole to mount it on. Simply drill a hole in the plug and bolt the stator to the plug. Makes a nice pole mounted unit for experimenting. For simplicity I've chosen to make this one on a wooden base. A simple square of wood and 4 feet has been made for the instructional version. Below shows the base ...



A  $\frac{1}{4}$  inch hole has been drilled through the center for mounting the stator and 4 wood feet glued to the base. Mount the stator using the threaded rod and two nuts provided in the kit. Below shows the stator mounted to the base...



Slide the magnet end of the turbine unit over the rod, install a washer on top making sure it drops into the washer groove of the triangle and install the nyloc nut provided in the kit. When tightening this nut make sure its not tight against the washer but not loose enough to allow the washer to jump out of the slot. The turbine should rotate freely. Make sure the magnets are not hitting the stator or wires and rotates without much friction. If the lower hole is difficult to install on the rod you can run a ¼ inch drill through the hole to make sure its free of burrs. Also a little grease or oil can be applied at the top and bottom pivot points to further reduce any friction created at these points. Below shows the completed turbine on base...



To make the stator a bit more permanent you can coat the wires with a clear enamel. This will help stiffen the looseness of the wires and hold them in place much better. Polyester resin works well also if you have some on hand .

From here we need to wire it up so it can actually do some useful work. There are basically two ways to wire a 3 phase alternator, star and delta. The “star” configuration gives you more volts but less amps and the “delta” gives you less volts but higher amps. I will show you how to wire it both ways but for the instructional model I will wire it in star.

The connections of the wires for star configuration are:

1S – 2E – 3S are output wires  
1E – 2S – 3E are all connected together

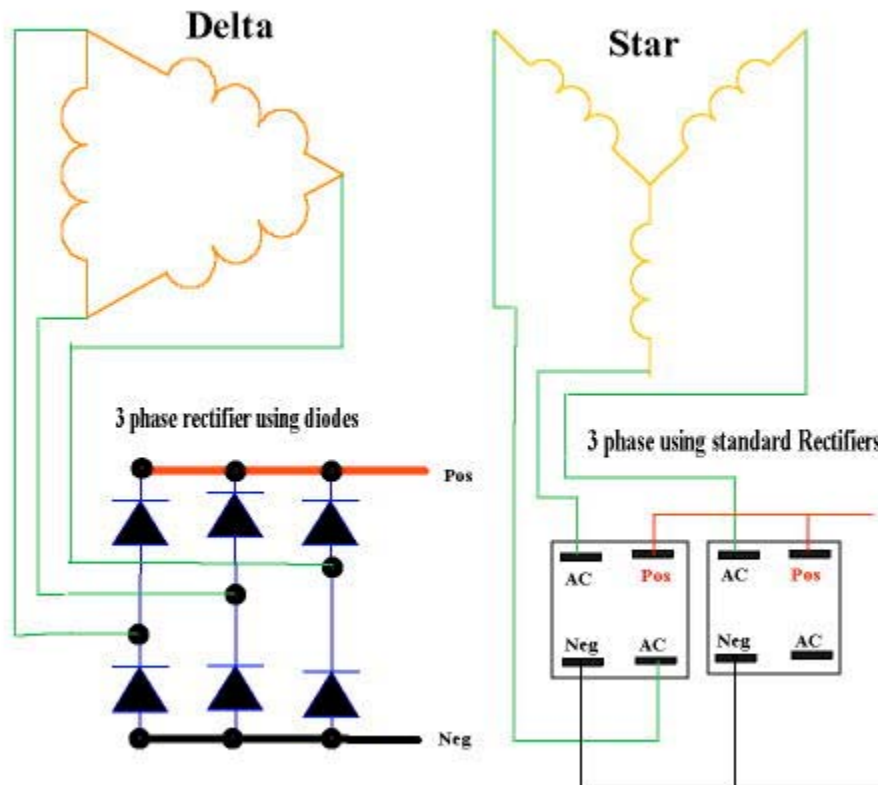
The connections of the wires for delta configuration are:

1S to 3E



2E to 1E  
3S to 2S  
each of the three pairs are output leads.

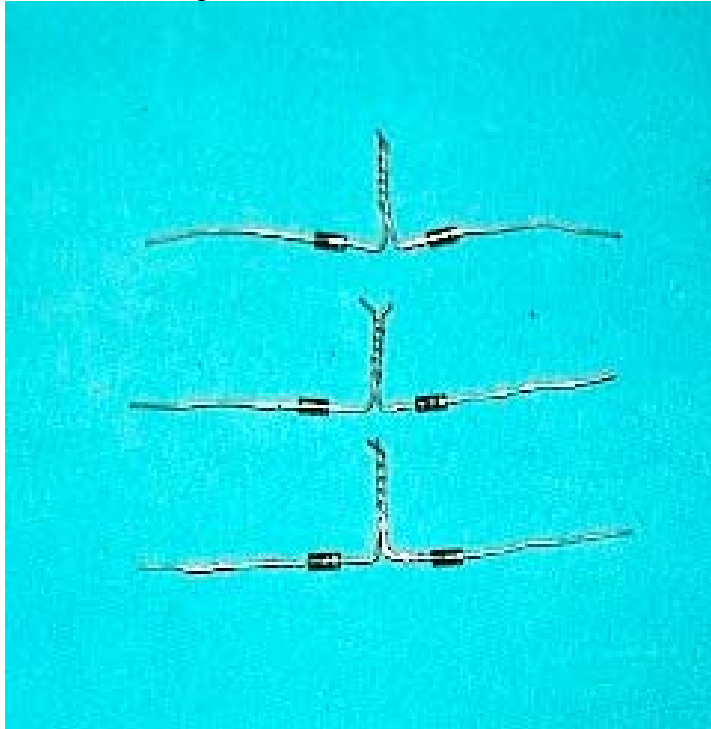
Below is a diagram of star and delta configurations...



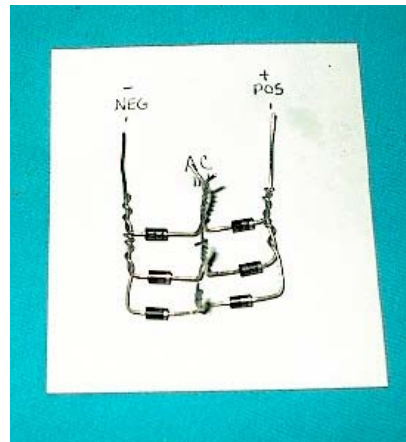
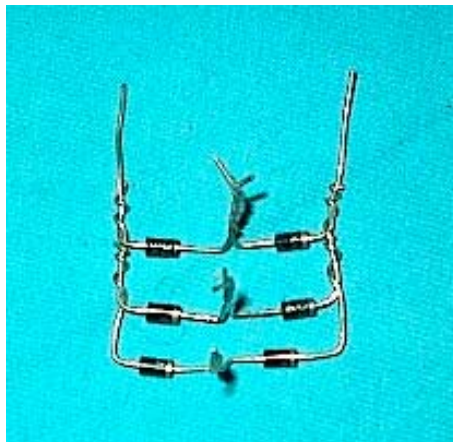
We will be using diodes to rectify the AC voltage coming from the alternator to DC voltage. Shown above in the delta configuration. You can use standard rectifiers shown above in the star configuration but with the power this unit makes the diodes are sufficient.

Since the output of the alternator is in the form of AC (alternating current) its not storable. To make it storable we convert it to DC (direct current). In order to do this we will use standard diodes to make a rectifier. Notice the band around the diode, it is on the end in which the direction the voltage/current will flow. You can connect the diodes together by soldering the ends or simply twisting them together. I have twisted the sets together for simplicity but soldering them makes a nicer looking end product. Below shows the pairs of diodes twisted together...

The picture isn't very clear but if you look closely each of the pairs are going in the same direction. That is to say the band shows the flow from left to right. The twisted portions shown here will be the AC inputs.

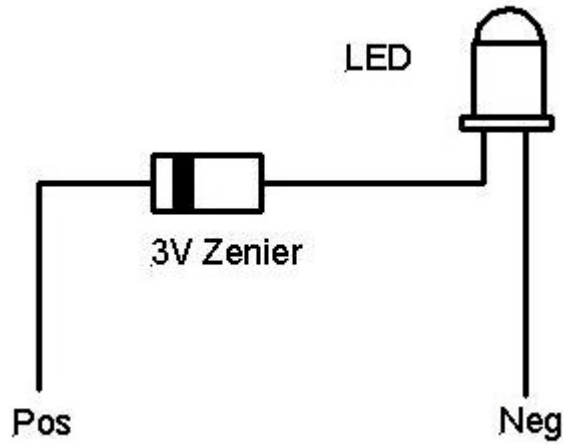


The next picture shows the ends of the 3 pairs twisted together forming the pos (+) and the neg (-) sides of the diodes. These are the ends that will connect to a battery for charging or become the outputs for powering an LED light or other. You can purchase a battery holder and NiCad batteries from Radio shack and wire it to the rectifier. Below shows the diode rectifier twisted together to form the rectifier (left) and input and output of the assembly ( right)...

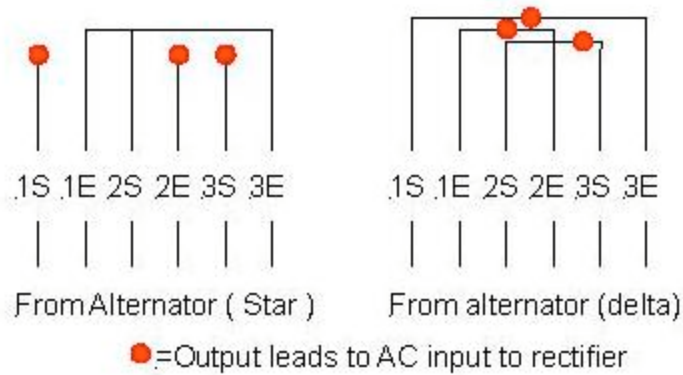


To complete your system you can install a Zenier diode of 3 volts and an led to make a simple shunt regulator. When the batteries reach 3 volts the light comes on telling you the batteries are charged and burns off the extra voltage. If the wind stops and the

batteries are not being charged anymore the light will burn off any excess in the batteries. When the voltage drops to just below 3 volts the light will go out leaving the batteries at a full charge. The simple shunt diagram is shown below...

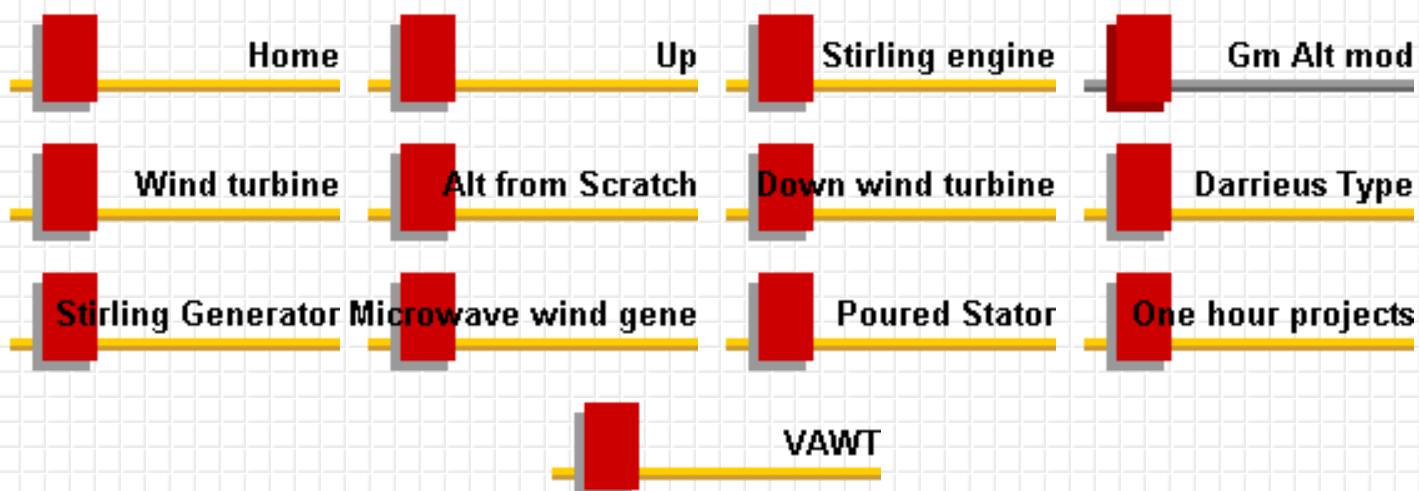


Below is the alternator wiring diagrams for both “star” and “delta” configurations ...



Now you have a completed RE (Renewable energy) system. Experiment and have some fun !!!

# Gm Alt mod



This originally started out as a 37amp alternator from the late 60's to early 70's. I machined the rotor to accept the magnets, then glued them in place one on each "finger" of the old rotor. 14 of them total. Below is a picture of the first rotor. The epoxy I used didn't hold when I spun it up to around 2500rpm. I changed to the Aircraft structural epoxy ( the kind used to hold wing ribs in place ) and this worked very well. In the case you can see the brush assembly was completely removed. There was no need to power the field coil any longer. This unit will now produce 750 watts of power at just under 2000rpm







I had some problems cutting the rotor because of the hardness of the material used for the rotor. I went through 3 cutting bits during the process. I decided to try a different approach on the next one. I pressed the shaft off the old rotor unit completely and made another rotor out of a piece of 6061-T6 aircraft aluminum I had laying around. Although it seems like a bit more work ( starting from scratch ) it actually didn't take as long and I can use the same cutter on other projects also. Below is a picture of the shaft removed from the rotor and the aluminum rotor pressed on the shaft...



Most of the machining was done after the shaft was pressed into the new rotor. The next one shows the soft iron strip cut to fit the slot. The slot was cut deep enough to recess the magnets and the metal strip. The next picture shows the metal strip with a magnet laying in the groove



I roughed up the metal strip with a 20grit sanding disc ( paper with a rock glued to it - its pretty rough ). Then proceeded to glue the strip into place. I used a hose clamp to pull it in place and hold it until the epoxy set up. Actually put it in the oven at 150 degrees for an hour to help cure it a bit quicker.... worked well. The picture on the right shows the magnets in place and the spacing....

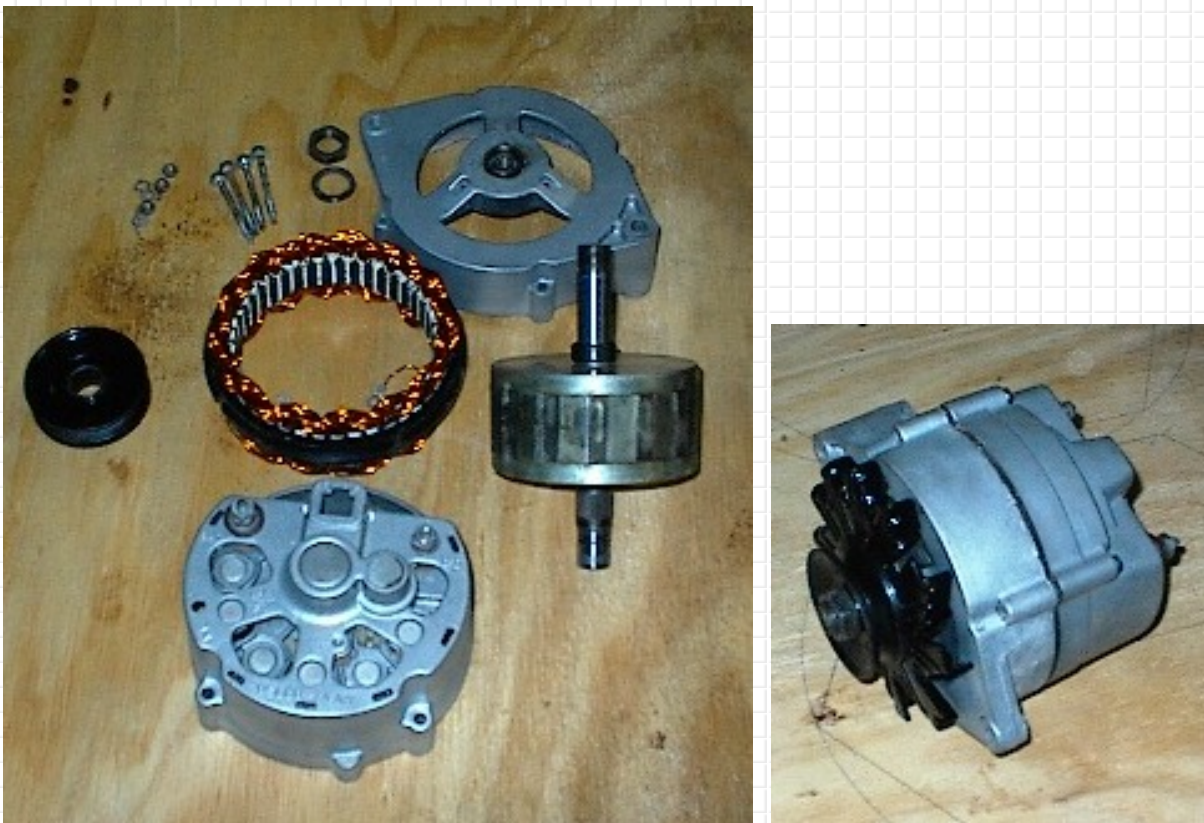


Below shows the magnets all glued in place and the rotor is ready to go back into the case....





After the new rotor was installed, the first tests came out quite good. Initially turning the rotor I noticed less cogging with the larger magnets. On the machine it showed 36.1 volts at 1500 rpm. It came up almost another volt from the first one. Amps were similar to the first. This one produced 50 amps at 1850 rpm. I rewound a stator with one size wire smaller and installed it in a case using this rotor and it now produces 50 volts at 1500 rpm but the output amps dropped ( give and take unfortunately ).



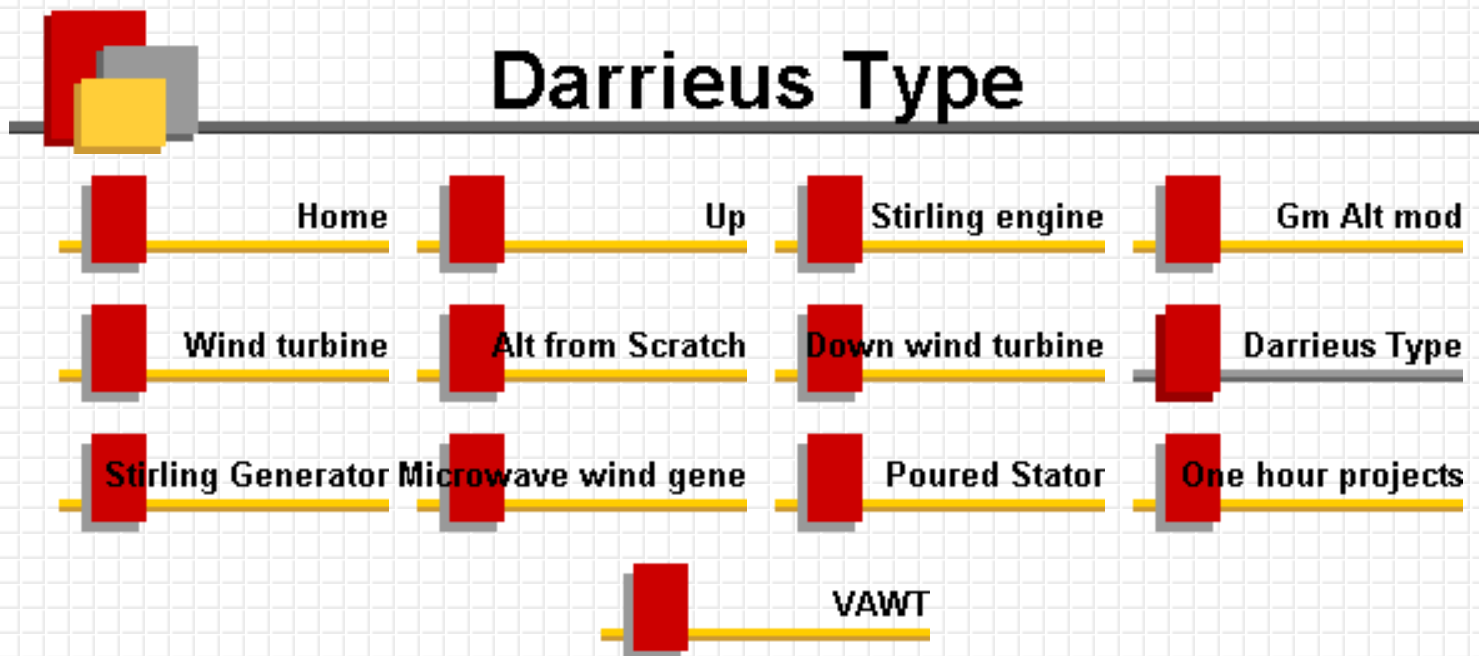
Above... all the parts to the completed unit and the unit completed

Below is a comparison chart of the three units I've tested....

	<u>Original modification</u>	<u>New Rotor</u>	<u>New windings</u>			
<u>RPM</u>	<u>Open Volts</u>	<u>Amps</u>	<u>Open Volts</u>	<u>Amps</u>	<u>Open Volts</u>	<u>Amps</u>
300					9.9	
400					13.2	
500			12		16.6	1.7
600	13.9	1.4	14.5		20	4.5
700	16.2	2.8	16.8	3.7	23	7
800	18.6	6.6	19.2	7.7	26	9.5
900	20.9	10.5	21.6	11.8	30	12.8
1000	23.2	14.4	24	15.8	33	15.3
1500	34.8	33.8	36	35	50	29.5



# Darrieus Type



This was a fun wind project and I learned a lot about these from researching and building this. This is a Darrieus type wind turbine. Probably more in the cycloturbine class. Most of the Darrieus type turbines don't start themselves and need an external source to start the spin. Actually it should be stated that they don't start themselves reliably because in certain circumstances they will start and run by themselves. This project incorporates a tail driven cam that angles the blades in and out of the wind and probably more of a drag type than lift type and **will** start by itself - reliably. As soon as the tail is pointed to the wind... its running! The pictures below show the small unit I built as an experiment into the wonders of these fascinating machines...





This unit was approximately 2 ft tall ( blades ) and 2 ft in diameter and would spin around 450 rpm's in a 20 mph wind. I've had several different small pm motors attached to it for testing and the best one was an electric "weed eater" motor which would produce about 50 watts in a 25mph wind. I was quite impressed for its size and materials it was made from. It was up for about a year and had survived a 70 mph storm. I really wish I had a tach on it that day, the only visual on it was the tail and center. It did however suffer a main bushing seizure the very next day.... A little grease and it was back up and running.

The next one soon to come is a 3 ft by 3ft unit with the same tail driven cam design but incorporates lift on the upwind blade.....

Below are some pictures of the new unit.... First two show the mounting and hinges as well as the push/pull rod for the tail driven cam... I made provisions for 2 setting for the wing control rods. The farther out the less movement and the closer in the more movement. Close in there is alot of torque but less rpm and farther out the rpm goes up and the torque goes down.... interesting although I believe the power output is about the same. It runs just a bit faster than the wind and calculated a TSR of about 1.5 to around 3 with the movement lessened.



The next one shows the completed unit on a 6 ft ladder.... and it had a 6 mph breeze at the time so it was difficult timing the shot....



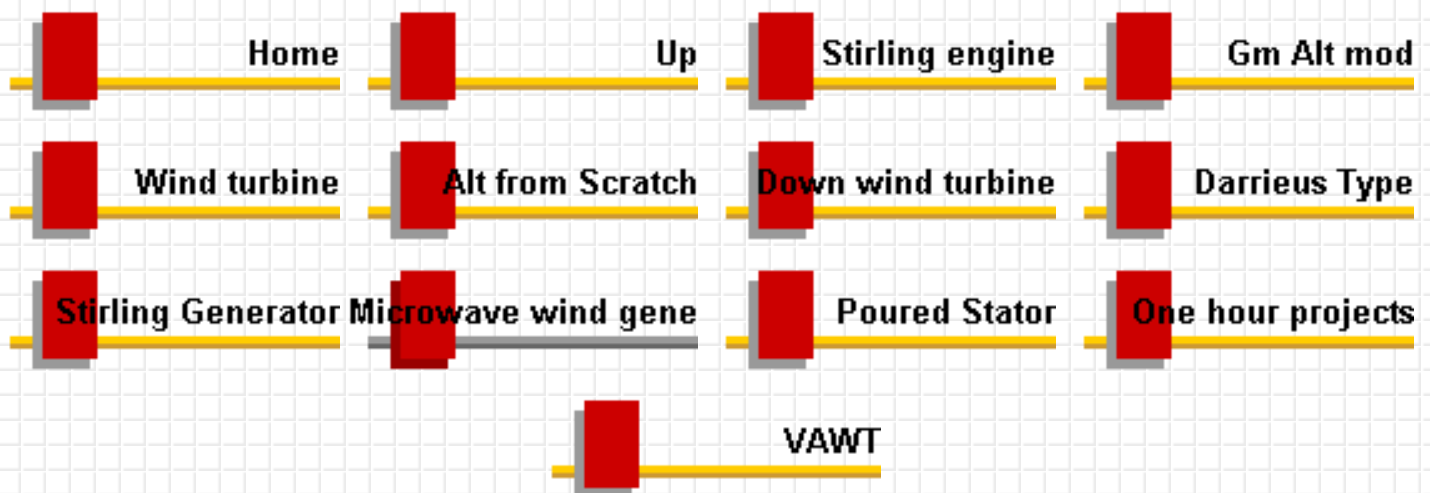


I've taken this unit out in a 12mph wind and as soon as the tail points into the wind its off and running. Doing a performance test using the old "finger dyno" on the shaft I could not stop it from turning... as hard as I was squeezing it simply would not stop... I was impressed... and the dyno was measuring some extreme heat!! I decided not to go any further with this one and a new project springs to life.... A 4 ft dia x 6 ft tall blades... possibly a 3 bladed unit with the cam design...

We'll see.....



# Microwave wind generator



This is a lesson on recycling. Everything here was built from scrap microwave ovens with the exception of the bearings and pivot mount also the plywood. Microwave ovens have an abundant source for the materials used in making an alternator and the rest of the components of an actual working wind generator. They contain large 2 1/4" round magnets ( 2 in each unit - in the magnetron ) plenty of sheet metal ( cases ) and even useful wire in the transformer. You could actually use the transformer metal as the stator laminates.

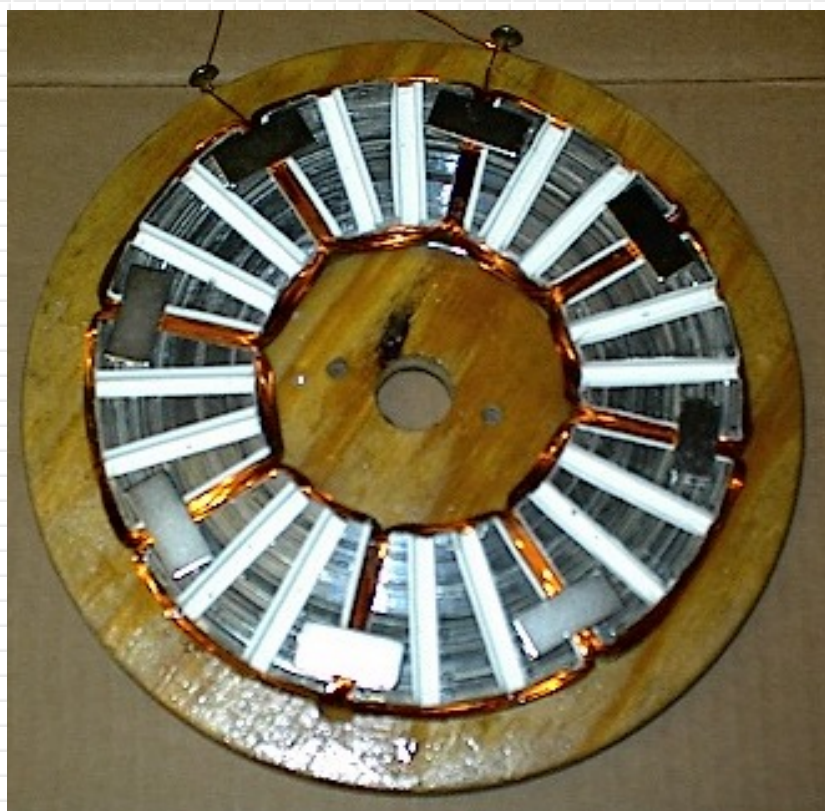
This will probably dry up my source for microwaves but you can call any appliance repair and find many microwaves free for the asking. I called one shop just to inquire about the possibility of getting a couple, they told me they had a few. I went over there and he directed me to the warehouse where there was about 40 of them. He looked at me, smiled and said if you take one you have to take them all.... I really think he was kidding but 3 trips later they were all in my shop. I tore them down and started saving all the little parts that could prove to be useful for other projects... screws, rubber feet, micro switches, fans, transformers, etc... ( I don't throw nothing away ) and about 80 magnets.

I started out by cutting an 10" disc out of plywood, cut strips of steel out of the case to make the laminates. Coiled the strips to form the stator and epoxied them to the board. I used strapping tape on all the metal strips which served two purposes, One to help hold the whole thing together and Two to isolate them from each other thus reducing eddy currents. I machined 24 slots to hold the wire and started the winding process.

Below are the beginning shots of the process...



There is 60 feet of 3/4" steel in this stator. The stator is 8" in diameter and 2" wide. Below show the winding in process...







The white inserts are made out of old milk cartons to isolate the wires from the steel. Each picture shows each of the 3 phases being placed into the slots. This was wound on the stator itself and each phase is wound as if it were a single phase unit. There are 36 wires in each slot making up 18 turns per coil. And yes I know I blew my rule number one... Keep it simple. The slots really are unnecessary but do help to bring the power and efficiency up and since this is a small turbine ( 28" diameter) I needed all the efficiency I could get.

Initial testing of the alternator came out quite promising. At 600 rpm the open voltage was 29.6 volts. My goal here is to make a very small turbine that will produce 150 watts in a 30

mph wind. After many doodles and calculations, 3 or 4 pads of paper later this is what I've come up with. I'm not going to show the turbine in great detail and all the alternator functions will be left out as there is a patent pending on this unit, although won't be manufactured out of microwave ovens in the end.

Below is the preliminary installation of the stator on the pivot head of the turbine. You can see the coils are shrouded and sealed...



This next picture shows the microwave magnets taken from the "magnetron" and setting on an 8" steel disc. Also shows the octagon plywood rotor ( 14" ) and the blades mounted on the rotor assembly. Using steel blades makes the rotor quite heavy and would be extremely susceptible to high winds and over speeding. This is simply a test unit and will not be installed permanently...





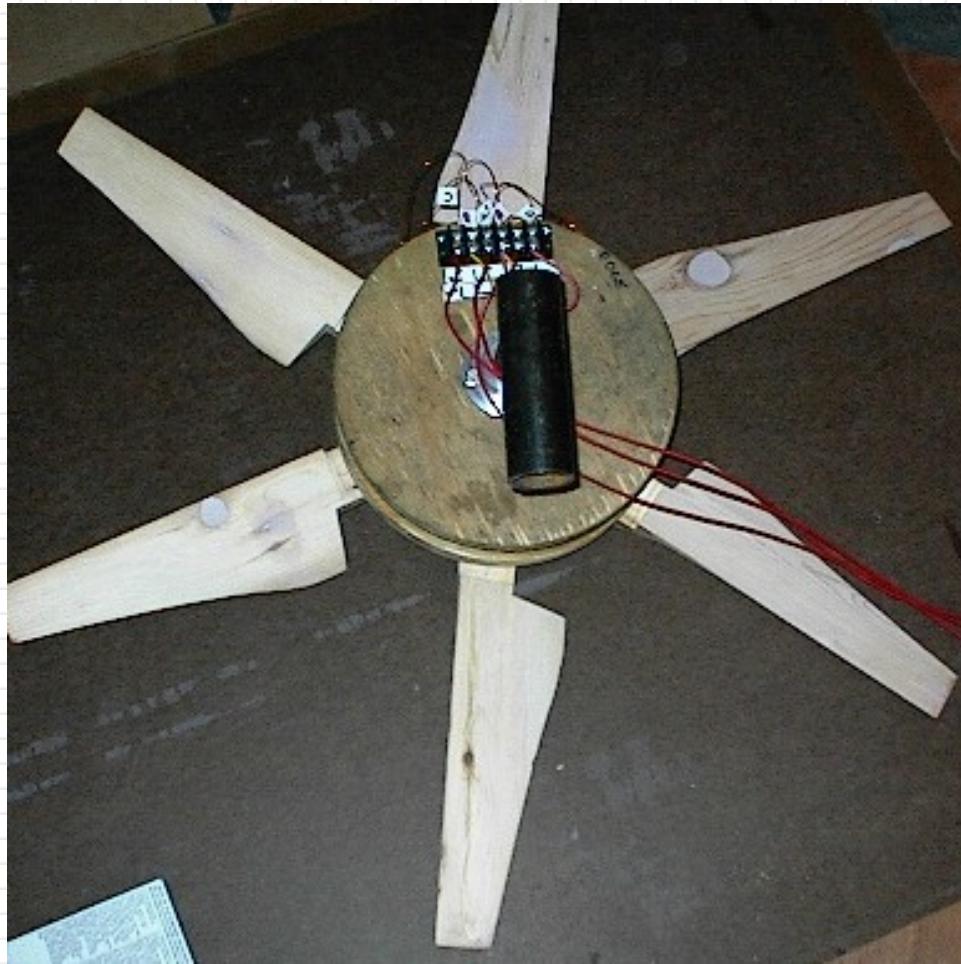
I've calculated the stress point to be somewhere around 1100 to 1200 rpm before the wood structure would come apart, this being winds at around 50mph. This could be changed by adding longer mounting tabs on the blades and installing 3/16" bolts instead of the sheet screws. The blades are 7" tall and 8 of them are installed on the plywood. Each blade is set at an angle of 10 degrees. The metal came from a large microwave case and was bead blasted and is now ready for paint. The plywood will be coated in poly resin ( fiberglass resin ) to seal and waterproof the assembly, the magnets will be resin'd in also.

After all was assembled, unfinished and semi balanced, testing went fairly well. The performance of the "microwave" turbine was below my projected output but not bad for its size. The maximum output achieved was 90 watts in a 30mph wind. It performed well in lower winds giving 22 watts in a 14mph wind. No powerhouse by any means but for its size ( 28" - not much bigger than a basic box fan) it did quite well.

All in all a good lesson in scavenging and making due with what is available. The entire project cost about 8 bucks not including any labor. Comes out to about 8 cents a watt....

I've dismantled this unit since and have added a different rotor with 6 blades. Initial tests on the new one are providing much better results but still about 20watts under my goal here. Initial testing showed an overall efficiency of 23%. The eight bladed ( steel blade) was giving me about 11% ( not impressive by any means). I'll post some images of the new rotor shortly.....

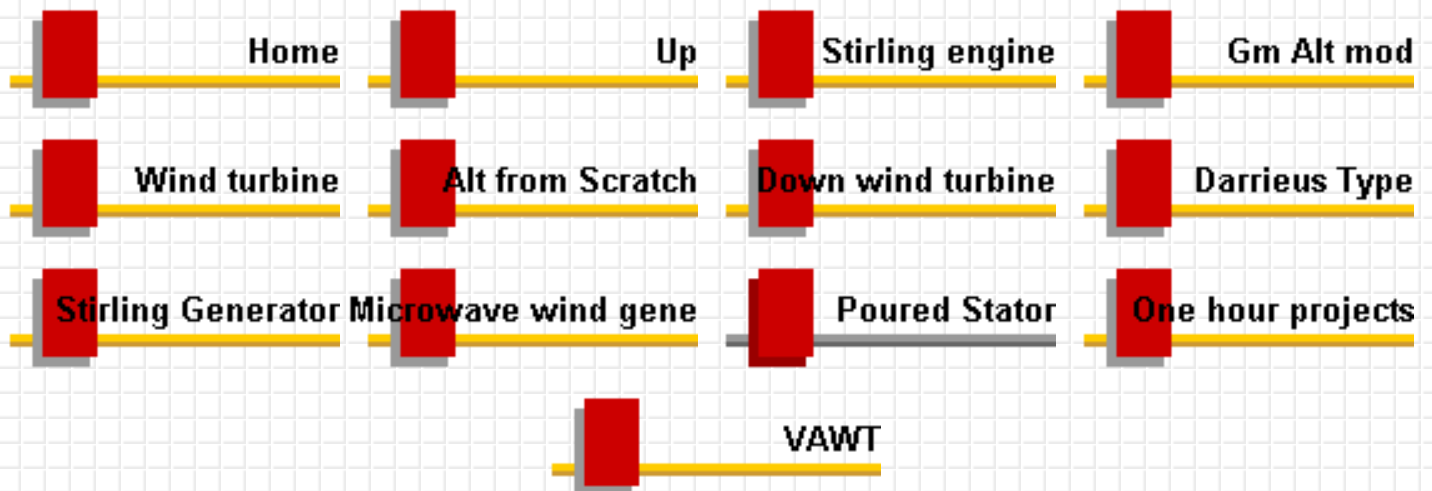
The blades are carved from standard 2x4 board scraps and the center was brought down from the 14" octagon to a 10" circle allowing for more blade area....



Still only 30" in diameter, testing was done in a 14 mph wind and the results are coming out good. Unloaded the blades run around 720 rpm and with a load 570 rpm. Using a slightly dead battery with a 50 watt load its making 11.75 volts at 1.7 amps ( total of 19.9 watts ). The total available watts for that area of blade is 77.78 so that makes the overall efficiency of around 25%. It will make about 170 watts in a 30mph wind and the efficiency drops to around 22%. Still just over 13 amps at 12.7 volts... not bad for a tiny turbine...

Still testing various configurations and shields.....

# Poured Stator



This is the beginning test of a full size poured stator. I've done some small ones in the past for stirling engine projects but never really followed up on them. Bob Gayle inspired me to follow up on it to see if would really perform equally as well as a steel slotted stator. Initial tests are showing some losses over the steel core but with the ease of fabricating it may well be worth the efficiency loss over labor involved with the steel slotted cores. Here is a picture of the poured core stator ....



To keep it simple I used fiberglass resin as the binder and mixed in the iron powder.



It was basically a paste when mixed. There is about 5 pounds of iron powder in this stator. Actually, very little resin was needed to saturate all the particles, guessing at around 6 oz. The slots are .46 deep and .3 wide for 14 turns of #15 wire through 36 slots. There will be 12 magnets used on this one. I plan to test the unit with both ceramic 5 magnets and neodymium type. Ceramics are nice in the sense there is little to no cogging effect but I don't expect the cogging of the neo's will be bad enough to hurt performance much.

Below is a picture of the stator completed with all its windings...



The next one shows the stator just as it was being finished with the 3rd phase. Notice the special clamp for getting the last phase in place. Typically the last phase goes in sort of free hand, but, because of the wire size used in this one this is near impossible. The clamp holds snug to the stator core and allows you to wind the wire without having to use all 12 fingers on each hand





The initial tests proved that this unit would work but at less efficiency than the steel strips. I suppose the efficiency loss is a fair trade off for labor. The unit has 12 poles using the 1.5" round neo's. 12 turns per coil and 12 coils per phase ( 36 coils total ), Each phase came in at .3 ohms. #15 wire was used for some fair power. Because of the low turns of wire the rpm per volt came in fairly high which would require a fairly good size prop to drive it. An 8 ft prop designed to run at around a TSR of 8 would work quite nicely making around 650 watts of power in a 28mph wind. Not to bad for a small 8 inch unit.

I plan to do some brief testing with some ceramic magnets cut from the large rings I sell in the "builders corner" of this site under products. I'm sure it won't be a potent as the neo's but something I have to give a shot. This will increase the magnet area considerably so the loss shouldn't be drastic.....

Stay tuned

***WindStuffNow.com***

[Click here to enter](#)

# OTHERPOWER.COM

The **CUTTING EDGE** of Low Technology



### **The first of the Triplets is set free and flies!**

Over the last few weeks, Otherpower.com has been building a set of Wind Triplets -- 3 axial-flux brake disc wind turbines named Curly, Moe and Larry. The 3 brake disc alternators are identical, but Curly and Moe sport 10-foot props and Larry an 8-footer. This one is Moe, and it's up and flying at TomH's cabin. So far so good -- Moe starts spinning in 5 mph winds and has been producing good power at under 15 mph windspeeds. **We completed a detailed series of web pages about the construction of the triplets--[you can check it out HERE.](#)**

## Thank you for dropping by!

We are a group of alternative energy enthusiasts who want to spread the message that *It's EASY to make your own power FROM SCRATCH!* Otherpower.com's headquarters is located in a remote part of the Northern Colorado mountains, 15 miles past the nearest power pole or phone line. All of our houses and shops run on only solar, wind, water and generator power...not because we are trying to make some sort of political or environmental statement, but because *these are the only options available.* And we refuse to move to town.

We could never have made it to our current level of electrification up here without the help of friends, neighbors--and folks we've never met, thanks to the internet. Our goal is to share our information about experimental successes and failures alike, free of charge, with anyone who is interested. We also offer a wide selection of books and hard-to-find alternative energy parts and components on our [web Shopping Cart](#). We hope you find our pages informative, useful and enjoyable!

### The Blunt Edge of High Technology

For all questions about orders, inventory, tracking, shipping, etc. please [E-Mail our Shipping Office](#)

or call us at: 877-944-6247 (toll-free in USA) or (970) 484-7257. Our mailing address is: Forcefield  
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Fort Collins, CO 80521

Also, you can visit our Retail Store at 614 South Mason St., Fort Collins, CO

You can [send DanB and DanF an E-mail HERE](#). However, PLEASE be aware that we receive many more Email requests for free information and advice than we can possibly respond to and still run our business...they come in twice as fast as we can reply. For quicker advice and opinions alternative energy questions from experimenters worldwide, try posting your question to the [Otherpower Discussion Board](#). Please research your question by searching our discussion board and Google before posting or emailing us. If you do Email us, make sure your email has a good subject line -- if the subject is 'blank', says 'hello' or 'how are you' it will never be read - many viruses and spam contain these headers. Please keep your questions *specific* regarding topics we've written about. If you ask 'how do I build a windmill?' or 'how big a system do I need to run my house?' you probably won't get a reply...please do your homework first. If you ask us 'on your Gerbil-powered generator page, how many turns are in each coil and what direction are they wound' we will almost certainly reply promptly. If we dont, please email again and remind us. THANKS for being considerate!

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## OUR NEWEST PAGE

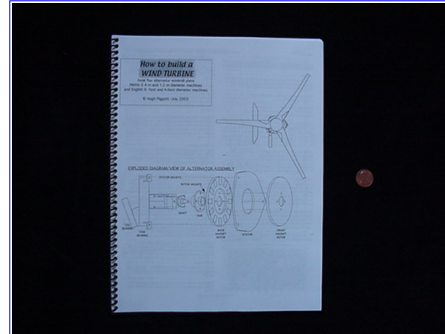
### [Hamster-Powered Alternator](#)



Skippy the Hamster is Forcefield's newest employee! We custom-built a low-rpm permanent magnet alternator onto his exercise wheel, and he lights a night light at DanF's house. We installed a data acquisition computer on his wheel too! And of course this simple alternator, buildable by kids, would work for wind or hydro power experiments and science fair projects too.

## OUR NEWEST PRODUCT

### [Axial Flux Alternator](#) [Windmill Plans by Hugh Piggott](#)



The latest of Hugh Piggott's axial-flux wind turbine plans.

Detailed CAD drawings, dimensions, photos, instructions, and theory. Build for 12, 24 or 48 vdc, both an 8-foot and a 4-foot diameter version. All the information you need to build a wind turbine from scratch!

**[Make Your Power From Scratch!](#)**

**SAFETY NOTE:** Some of the experiments described on our pages may present various hazards. Please be cautious. We are not responsible for injury resulting from neglecting safety precautions when performing experiments.



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This page last updated 12/01/2003

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# About Us

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Otherpower.com is owned by ForceField--a small business, run completely out of our homes. Our inventory and shipping office is in Fort Collins, Colorado, USA. It is usually staffed Monday thru Friday, 9-4 Mountain Time, and is a very busy place! Some of our staff live and work in a very remote area west of town, high up in the mountains. They are connected to the office thru the miracle of [Starband](#) 2-way satellite internet service. Since there are no telephone or power lines up there, please be aware that when you call our toll-free number, the person you wish to talk to may not be in the office--though we can certainly relay a message! However, everyone in our company is available via [Email](#).

## Forcefield's Websites:

### [Otherpower.com](#)

A huge FREE resource for alternative energy enthusiasts and experimentors. Build your own low-rpm permanent-magnet alternators, battery chargers, anemometers, windmills, hydro turbines and more. Free information on building remote power systems for cheap. Very active discussion board...get your solar/wind/hydro power questions answered fast! Many DIY projects and experiments. Unusual and hard-to-find components and books!

### [Wondermagnet.com](#)

The world's most powerful magnets in dozens of shapes and sizes. Magnet and magnetism FAQs, safety information, science experiments with magnets, amazing demonstration images, very active magnet science discussion board! Diamagnetic levitation, superconductors, magnetic water treatment, unusual uses for strong magnets. Links to other magnet science resources. Great selection of unusual experimental science and magnet books!

### [Matchrockets.com](#)

Experimental Science for Everyone! This site is still under construction, but there's lots of neat stuff there already. You'll find all of our science experiments from Otherpower and Wondermagnet collected here in one place, and lots of other new experiments too!

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We sell our products exclusively on the Internet. We do have a mail-order catalog available. If you would like a copy, please call, write or email us! Customers may place orders on the order form and pay via check, money order, paypal, or through our secure credit card processing form. After

payment is received, we ship products on the same or next business day via UPS or Priority Mail.

We also sell certain products on Ebay, including magnets and one-of-a-kind experimental science and alternative energy components. Our Ebay user ID is [pie](#), and we have many thousands of positive feedbacks.

FORCEFIELD was created in 1998. One day DanB purchased a computer and browsed the web for the first time. Mark suggested that Dan give eBay a try. Dan immediately became hooked as he experimented selling a variety of odd products, and quickly discovered that surplus magnets had tremendous appeal.

The next step was the creation of the web site. Initially it was a scanned image of a hand-written sign, declaring "FORCE-FIELD" with a phone number.

Since then, we have been gradually growing, selling larger numbers of a greater variety of products. Otherpower.com was our next big project, a natural thanks to the remote rural environment where much of our staff lives. Our web sites are continually growing as new products, experiments, information, and functionality are integrated into the pages. The project has grown considerably and has developed into full-time work for many of us. We're not on the NASDAQ yet, but we plan to be, someday.

Our goal is to share our information free of charge with anyone who is interested. Information is a very powerful tool, and we hope our experiments with magnets, alternative energy and experimental science are helpful to you. However, if you need magnets, books or science supplies please consider ordering them from us! We hope you find our pages informative, useful and enjoyable.

## THE PEOPLE

**We all take up slack when it's necessary. We try our hardest to be friendly, honest, and *FAST!* It is our goal to provide complete satisfaction for each and every one of our customers--please let us know if you are having a problem, and we'll try our best to help. We currently have 5 full-time and 2 part-time employees, some of whom work at the office, some at home.**

---

**DanB** is the founder and CEO of ForceField. He is President of Mad Scientist Activities and Vintage Electrical Equipment, which means he is involved in every aspect of the company! He lives high up in the mountains west of town with wife Michelle and daughter Maya. Like his brother Matt, he has unusual tastes in [cars](#). DanB plays nearly every stringed musical instrument ever made (guitar, mandolin, fiddle, banjo, and (his favorite) washtub bass) and builds his own instruments too.

---

**Maya** is our President of Research, Development and Theoretical Physics. She facilitates progress in



our cutting-edge quantum electromagnetism, wind power design, and perpetual motion research laboratory. (Maya, at age 4, has a PhD in Theoretical Physics from Cambridge University.)

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**Michelle** is our President of Support Services. She helps all Forcefield employees in keeping their sanity, and she also provides technical and maternal assistance to Dr. Maya.

---

**Mark** is our President of IT Services, Linux Operations, and Computer Wizardry. He keeps our in-house servers running, repels evil Crackers and ScriptKiddies, writes the CGI scripts that let you order our products, and generally waves his magic wand to make everyone's computers perform as they were instructed. If things start to go wrong, he waves his magic axe at the computers and they start to behave. He is what is known as a "Linux God." Mark has a post-graduate degree in physics and is thus responsible for pseudo-scientific issues. He firmly believes that perpetual motion and faster-than-light travel are impossibilities. If you want to know why you should NEVER trust your website, business, and customers to Micro\$oft products, he can tell you. Our company computers are CERTIFIED Micro\$oft-Free, except for the United Parcel Service system. He is an accomplished jazz, classical and bluegrass guitar player.

---

**Matt** is our President of Business Operations, Extreme Golf and Old Dodge Powerwagons. He is often found at our shipping office in town answering the phone, taking orders, solving shipping and inventory problems, and answering Email until the wee hours of the morning. He also has a cabin way up on the mountain, and spends the rest of his time up there playing Extreme Golf, working on his vintage 1948 Jaguar, and [pulling his 1951 Dodge Powerwagon out of the crick.](#)

---

**Kristy** is our President of Shipping and Customer Relations, and Supreme Ruler of the Office. She keeps everything running smoothly, makes our customers happy, and generally makes order out of chaos at our office. Everyone down there does exactly what Kristy tells them to do! She plays a mean fiddle and will someday surpass [Alison Krauss](#) in legend.

---

**Paul** is our President of Packing and Magnetic Flux Analysis. He is an expert in cancelling magnetic fields so we can safely ship your magnet orders, and tests each package before it goes out using a scientifically-designed electron-beam-deflection system. He plays a mean banjo when we get together and jam up on the mountain.

---

**Hank** is our President of Morale, Cuteness, Sweetness and Light. He spends all day at the office with Mommy Kristy and Daddy Paul, and is an expert at being good while entertaining the Forcefield staff. He loves bluegrass music (he's listened to it since before he was born!), and will probably surpass both Brad (below) and Hank Williams in musical prowess by the time he turns 12....that's only 11 years away!

---

**DanF** is our President of Vices, Web Pages and Firefighting. He produces most of our magnet, experimental science and alternative power web pages, administers the message boards, and writes

articles and copy for us. He also lives way up on the mountain, and is on call 24/7 to respond next door to DanB's house when giant balls of flame, huge sparks, and loud noises emit from the Wondermagnet/Otherpower Research Laboratory Facilities Trailer. He is a State-Certified firefighter for the local Volunteer Fire Dept., and has decided that the only safe way to live next door to DanB is to have a Fire Truck parked in your yard. So he does -- it's a 1967 Jeep 5/4, type 6x wildland engine. DanF plays the banjo and trumpet (not at the same time), and built his own banjo.

---

**Brad** is our President of Custodial Engineering, Disassembly Services and Organizational Services. He is our newest employee, takes apart magnet assemblies so we can ship you your surplus magnets, and keeps the office clean and organized so Kristy doesn't quit. This is his secret life...in his *real* life, he's the lead singer, guitarist and songwriter for the [Open Road Bluegrass Band](#). They just recorded their second album, and are an absolutely *top-notch* traditional bluegrass band! Their live shows are incredible, try to catch them if you visit Northern Colorado. Just don't tell Brad's fans that he walks around the Forcefield office with a pink feather duster in his back pocket!

Thank you for visiting! Please [Email](#) us if you have any questions or comments.

Sincerely,

***FORCEFIELD***

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This page last updated 5/22/2003

[WWW.WONDERMAGNET.COM](http://WWW.WONDERMAGNET.COM)

# Otherpower.com Live IRC Chat

**Chat live with alternative energy enthusiasts worldwide, using IRC! No matter what time of day or what day of the week it is, you are virtually guaranteed to find someone else online that shares your interests.**

If you are unfamiliar with IRC and how to get it working on your machine, please check out our [IRC Help](#) area.

## #otherpower Live Alternative Energy IRC Chat

**Server:** otherpower.serveirc.com

**Channel:** #otherpower

**Port:** 6667

**OR use the [Web Browser IRC Client](#).**

The #otherpower IRC channel was formed by wind power enthusiasts who frequent the [Otherpower.com Discussion Board](#). There is almost always somebody here, 24/7 on any day of the week, willing to talk about alternative energy, homemade wind generators, low-rpm alternators, remote homesteading, good beer and more.

Since quittin' time in one world time zone is breakfast time in another, this channel is always active. *JimU is running this IRC server on a Laptop running Linux, powered by it's own renewable energy system (solar and wind). We believe this is the only RE-powered IRC server on the internet!*

**If you do not have IRC running on your computer, you can still connect without installing any software by using a [Web Browser IRC Client](#). The client used is CGIIRC. It works great, and is a simple way to connect.**



When you log into IRC, this is the server that's running it! It's completely RE powered, and runs Linux.

While you're at it, you can also check out the [IRC users Photo Gallery](#) -- cool pics from IRC users!

## IRC (Internet Relay Chat) Help

If your IRC software has a command line interface, you would type:

`/attach otherpower.serveirc.com`

`/join #otherpower`

to connect.

A great resource for information about IRC: [IRChelp.org](http://IRChelp.org)

- **Windows**--If you do not have IRC software running on your Windows machine, your best bet is to find a shareware IRC client program and install it. Some common IRC programs for Windows are [mIRC](#), [PIRCH](#), and [ViRC](#). Or, even better, switch to [Mozilla](#) for all your web browsing and email in place of Microsoft Internet Explorer and Outlook Express. Mozilla has an easy-to-use IRC client (Chatzilla) built in--and as an added bonus your computer will be nearly immune to all the common web and email viruses. If you don't want to deal with installing software, you can still use the [Web Browser Java IRC Client](#) if your web browser



is Java-enabled. If you see a blank box when you open the page, either you don't have Java installed for your browser, or your version of Java is old. You can download the latest version of Java [here](#).

- **Linux**--If you are running Linux, you almost certainly already know how to use IRC! Your install of Linux came with a built-in IRC client. X-Chat is popular one, but there are many choices.
- **MacIntosh**--Since we use Linux instead of Macs up here, we can't provide much help here. But check out [IRChelp.org's Mac IRC page](#) for advice and Mac IRC shareware.

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This page last updated 12/18/2003

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[WWW.WONDERMAGNET.COM](http://WWW.WONDERMAGNET.COM)

# Welcome to the IRC webclient login Page

This webclient only takes you to [otherpower.serveirc.com](http://otherpower.serveirc.com) port 6667  
and channel #otherpower

## Otherpower IRC Login

Nickname

Channel

[Advanced..](#)

[CGI:IRC](#) 0.5.2

# OTHERPOWER IRC GALLERY

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Search:

19 albums, 599 photos

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## [Woofer's place](#)

Breeze created from My Genny running from the battery

Last changed on Nov 29, 2003. This album contains 2 items.

This album has been viewed 50 times since Nov 29, 2003.



## [Wolvenars Stuff](#)

No description

Last changed on Jan 01, 2004. This album contains 3 items.

This album has been viewed 37 times since Nov 20, 2003.

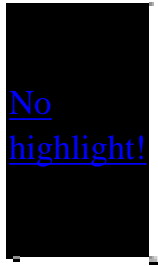


## [thefoots place](#)

No description

Last changed on Nov 28, 2003. This album contains 2 items.

This album has been viewed 42 times since Nov 20, 2003.



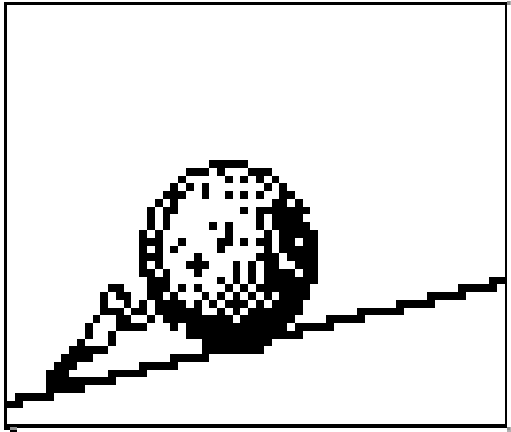
### [Zubbly's Album](#)

Make a description here!

Last changed on Nov 29, 2003. This album contains no items.

This album has been viewed 47 times since Nov 09, 2003.

---



### [Kurt's Place](#)

just a collection of junk.....

Last changed on Dec 20, 2003. This album contains 11 items.

This album has been viewed 191 times since Sep 21, 2003.

---

### **Sub-albums:**

[otherpower irc user maps \(80 hits\)](#)

[animations \(21 hits\)](#)

---



### [Ifred](#)

How to build a dual rotor PMG!

Last changed on Sep 08, 2003. This album contains 24 items.

This album has been viewed 136 times since Sep 07, 2003.

---

### [Jerrys Stuff](#)

Jerry has a LOT of windmills in use at his Audio Store.

Last changed on Sep 07, 2003. This album contains 87 items.

This album has been viewed 107 times since Sep 05, 2003.

---







[Bruce from Sydney](#)

Bruce the bushman --fair dinkum Aussie

Last changed on Dec 01, 2003. This album contains 32 items.

This album has been viewed 298 times since Aug 13, 2003.

---



[Bob's show](#)

charts and graphs concerning RE

Last changed on Jan 02, 2004. This album contains 51 items.

This album has been viewed 218 times since Aug 13, 2003.

---

**Sub-albums:**

[the evolution of props \(19 hits\)](#)

[Wings and Things \(25 hits\)](#)

[Untitled \(5 hits\)](#)

---



[Allan's Album](#)

No description

Last changed on Jan 04, 2004. This album contains 18 items.

This album has been viewed 244 times since Aug 14, 2003.

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[MickS album](#)

No description

Last changed on Sep 01, 2003. This album contains 4 items.

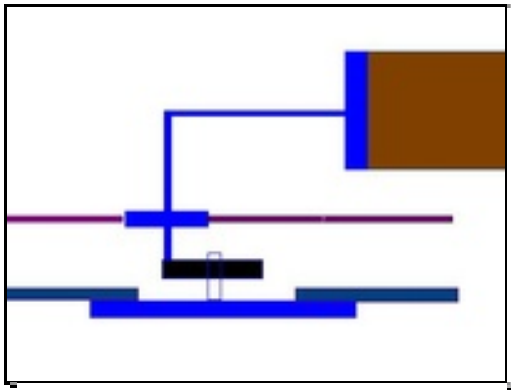
This album has been viewed 131 times since Aug 14, 2003.

---

**Sub-albums:**

[My first real attempt \(91 hits\)](#)

---



[Seth](#)

Track the wind my freind!!!!

Last changed on Sep 22, 2003. This album contains 9 items.

This album has been viewed 102 times since Aug 14, 2003.



[Mary's Album](#)

No description

Last changed on Dec 30, 2003. This album contains 17 items.

This album has been viewed 93 times since Aug 13, 2003.



[JimU](#)

No description

Last changed on Jan 04, 2004. This album contains 32 items.

This album has been viewed 28 times since Dec 05, 2003.

**Sub-albums:**

[My PV system \(28 hits\)](#)

[SLA Batteries \(18 hits\)](#)

[Harley trip 2001 \(31 hits\)](#)

[Work pics \(15 hits\)](#)

[Neat pics from Deutsch days \(30 hits\)](#)

[DC Servo Motor \(14 hits\)](#)

[Schematics and PCB layouts \(14 hits\)](#)



[Marty's Place](#)

No description

Last changed on Aug 13, 2003. This album contains 24 items.

This album has been viewed 168 times since Aug 13, 2003.



---

[Mech](#)

No description

Last changed on Aug 13, 2003. This album contains 1 item.

This album has been viewed 52 times since Aug 13, 2003.

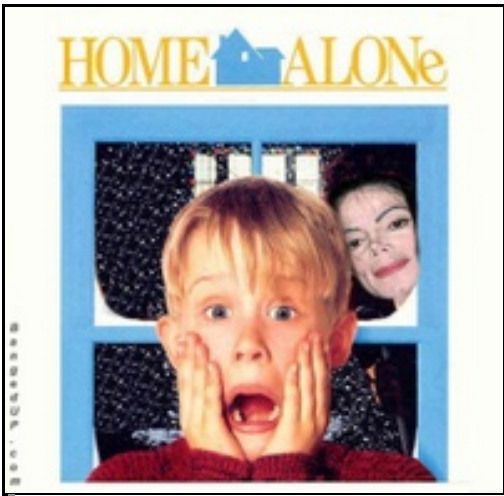
---

[Toms Place](#)

Some of my experiments in windpower

Last changed on Dec 06, 2003. This album contains 16 items.

This album has been viewed 159 times since Aug 17, 2003.



---

**Sub-albums:**

[ATV Stuff \(62 hits\)](#)

[3 boards blade set \(37 hits\)](#)

[Blade Carving \(45 hits\)](#)

[Pinwheels \(29 hits\)](#)

[Crossflow VAWT \(86 hits\)](#)

[Nylon Blades \(59 hits\)](#)

[Diagrams \(87 hits\)](#)

[JerryBlades & Tape Drive Motors \(86 hits\)](#)

[Miscellaneous Stuff \(51 hits\)](#)

[Wood Gasifier Diagrams \(93 hits\)](#)

[F&P Parts \(61 hits\)](#)

[Blade Mounting Failure or ?? \(58 hits\)](#)

[Maps. As I find the ones we can use \(18 hits\)](#)

---

[Public Area](#)

Upload area for anyone. Use public public as user / password. Enjoy

Last changed on Nov 21, 2003. This album contains 6 items.

This album has been viewed 150 times since Aug 13, 2003.

---





[Doug's Place](#)

No description

Last changed on Dec 01, 2003. This album contains 9 items.

This album has been viewed 83 times since Sep 26, 2003.

▶ 1 ◀

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**Dont forget to visit us on IRC at :  
otherpower.serveirc.com port 6667 channel #otherpower**



# OTHERPOWER IRC GALLERY

JerryBlades & Tape Drive Motors

9 items in this album

[\[slideshow\]](#) [\[login\]](#)

Gallery: [Welcome to the Otherpower IRC Photo Gallery](#) ↗ Album: [Toms Place](#) ↗

▶ 1 ◀



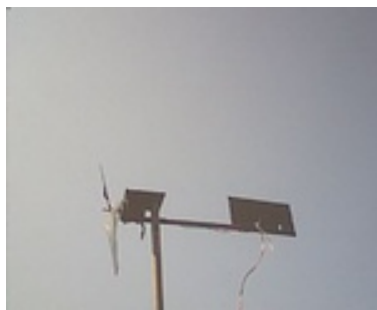
jb\_tdm\_spar5  
Viewed: 12 times.



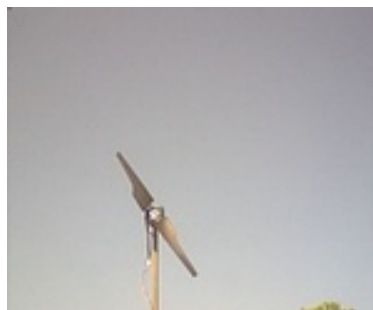
jbmclose  
Viewed: 26 times.



jbmod1  
Viewed: 19 times.



jbmod2  
Viewed: 10 times.



jbmod3  
Viewed: 11 times.



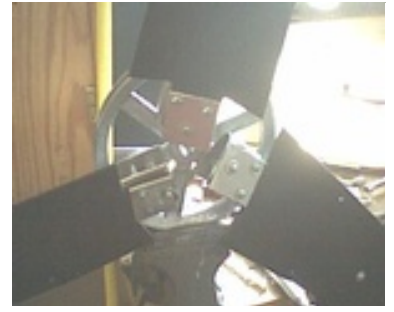
jb\_tdm\_spar1  
Viewed: 20 times.



jb\_tdm\_spar3  
Viewed: 20 times.



jb\_tdm\_spar4  
Viewed: 12 times.



jb\_tdm\_spar2  
Viewed: 23 times.

▶ 1 ◀

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otherpower.serveirc.com port 6667 channel #otherpower**



[Argentina](#), [Australia](#), [Italy](#), [Kuwait](#), [South Africa](#), [United Kingdom](#), [USA](#).

## Welcome to the mIRC Homepage!

Search Website:

The mIRC homepage provides the latest news on mIRC, general IRC information, and links to many other [IRC-related websites and resources](#). Please click on one of the links to the left to find out more. We hope that you find this website useful, and your experience on IRC enjoyable! Have fun :-)

[Latest News](#)  
[Download mIRC](#)  
[How to Install](#)  
[Translations](#)  
[Message Board](#)

[Intro to IRC](#)  
[IRC FAQ](#)

[Intro to mIRC](#)  
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[How to Register](#)

[Mailing Lists](#)  
[IRC Networks](#)  
[Chat Links](#)  
[More Info \(Links\)](#)

### **New collection of IRC servers.** (December 13<sup>th</sup> 2003)

A list with a fresh collection of IRC servers for mIRC is available in the [servers.ini](#) file on our website. Save the file to the mIRC directory on your harddisk (c:\mirc\ or similar), replacing the old file, and enjoy this refresh! The server list will immediately be available to you from within mIRC. Have fun exploring some new IRC networks!

### **Charity appeal: child vaccinations across Africa**

(November 20<sup>th</sup> 2003 - updated December 20<sup>th</sup> 2003)

Thanks to all of the mIRC users who registered their copies of mIRC between November 20th and December 20th to support our appeal, 100% of your registration has been donated to the [International Federation of Red Cross and Red Crescent Societies](#) for use in their [measles campaign](#) in Africa. **2826** mIRC

users registered, raising a total of **\$55,230.00**. Many thanks to everyone who helped out! **The appeal is over, however if you still have any questions about it please email [Khaled](#) or the [Red Cross](#).**



### **mIRC 6.12 has been released!** (October 13<sup>th</sup> 2003)

mIRC v6.12 has been released to address a remote vulnerability found yesterday, capable of crashing your mIRC. The vulnerability affects versions of mIRC from v6.0 onwards, so it is highly recommended that you upgrade to mIRC v6.12. You can do so by downloading the new mIRC from the [download page](#)!

### **mIRC 6.11 has been released!** (October 10<sup>th</sup> 2003)

A fresh new version of mIRC! With this new release we hope to address most the comments, requests and remarks we received after the release of version 6.1. Of course this new version fixes lots of

the small but nevertheless annoying buggies found in the previous version. Details of all changes are available on the [news page](#). Discussions about the changes and features in this new version are very welcome on the [message board](#). Have fun and [download and try mIRC 6.11!](#)

### **mIRC 6.1 has been released!** (August 29<sup>th</sup> 2003)

With this release we hope to address most of the comments, requests and remarks we received after the release of version 6.03. Several new features and functions have been implemented. Details of all changes are available on the [news page](#).

#### **What is IRC?**

IRC (**I**nternet **R**elay **C**hat) is a virtual meeting place where people from all over the world can meet and talk; you'll find the whole diversity of human interests, ideas, and issues here, and you'll be able to participate in group discussions on one of the many thousands of IRC channels, on hundreds of IRC networks, or just talk in private to family or friends, wherever they are in the world.

#### **What is mIRC?**

To use IRC you need a small program like mIRC, an IRC client for Windows, written by [Khaled Mardam-Bey](#). mIRC is a friendly IRC client that is well equipped with options and tools. mIRC is shareware, which means that you can [download mIRC](#) and try it out freely for 30 days to evaluate it. If during, or at the end of, the evaluation period you decide that you would like to continue using mIRC, you must [register your copy](#).

#### **Message board**

The mIRC website has a useful and friendly [message board](#) where you can post questions if you need help, or just discuss mIRC and IRC-related issues. The message board can be used by anyone, so feel free to dive right in. If you're new to the message board and wish to post questions, make sure that you log in as a New User first.

#### **mIRC Release announcement list.**

We can send you an announcement by E-mail as soon as a new mIRC version has released! Subscribing to this list is very easy; just fill in your E-mail address below and we will make sure you will be among the first to know about every new mIRC version. We will update you on the new functions and features in mIRC and you will get a list of fast download addresses. We guarantee your E-mail address will only be used for release announcements. Read more on the [mailing lists](#) page.



Fill in your E-mail Address:

and push the button:

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Feel free to [link](#) to this official mIRC website. You can send requests for help in English to [help@mirc.com](mailto:help@mirc.com). Please e-mail comments on this website to [Tjerk Vonck](#). These web-pages are Copyright © 1995-2003 Tjerk Vonck & mIRC Co. Ltd. mIRC® is a registered trademark of mIRC Co. Ltd.

# OTHERPOWER.COM SITE NEWS

Please stand by....

*Redirecting you to the Site News section of our message board.*

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# Energy Conservation

## Electricity Wasters

**Remote Controlled appliances**--TVs, VCRs, stereos and such that turn on when you push a button on the remote. We've measured some TVs that use 6 watts (half an amp out of a 12-volt battery) just sitting there waiting for you to push "ON" on the remote!

**Refrigerators**--normal, mass-market refrigerators waste huge amounts of power with both inefficient compressor motors and lack of insulation. A frost-free cycle adds a huge electric heating element every couple days to waste even more power.

**Wall Warts**--Those ubiquitous black cubes that plug into your sockets. These force you to make 12 volt DC power to charge your batteries, convert it to 110 volt AC with an inverter (and with

## Conservation Solutions

Plug these appliances into **switched power strips** and turn them on only when needed. Yes, this means you must get off your butt to turn the TV on and off, and your VCR will never show the correct time. But you'll save lots of power.

Use either a **propane refrigerator** or a special **energy-efficient refrigerator** designed for remote power systems, such as the SunFrost or VestFrost. Chest freezers are also available in both propane and efficient electric. The initial cost increase will pay for itself quickly if you use batteries for energy storage.

If possible, **buy or make 12 volt DC converters** for these items (try Radio Shack's multi-voltage universal cigarette lighter adaptor)--then you'll be converting 12 volt DC directly into whatever DC voltage you need with very little loss. Also, you can at least **plug all these warts into a power strip** so you don't use power when your item is turned off.

**Example of the perfect energy-efficient, multi-use appliance--Kodiak the Dog**



**Kodiak is a truly multipurpose appliance--she saves hot water by prewashing dishes, firewood by helping warm the bed, and electricity by vacuuming food scraps off the floor.**

power loss), then they convert it back down to around 12 volts DC (again at a loss). Plus they use power when your printer, charger, laptop computer, etc. is not even on!

### **Incandescent Light**

**Bulbs**--These dinosaurs produce 90% heat and only 10% light. Halogen lights are only slightly better, but last much longer.

### **Electric heat in**

**general**--Despite what the power company says in their advertisements, electricity is a very poor, inefficient way to make heat if your home is not on the grid. This goes for electric stoves, heaters, coffee makers, air conditioners, water heaters, crock pots, deep fryers, etc. None of these should be included in an alternatively-powered home. It does -not- apply to microwave ovens, since they only operate for a few minutes per day, though at high power draw.

Use **LED, fluorescent and compact fluorescent bulbs** in most of your lights, AC and DC. 120 volt AC versions are available at any hardware store. Use 12 volt DC halogen bulbs instead of 12 VDC

incandescents. Fluorescent and compact fluorescent bulbs are available in 12 volt DC versions for a higher cost, since they are not common items at the local hardware store. **Try the new LED bulbs.** [Click here to check out our efficient lighting page.](#) See our [products page to order do it yourself kits for LED lights](#)--they use far less power and last 10 times as long as even compact fluorescents!

[\(click here for home built LED lamp information\)](#)



[Click here to see a solar-powered outhouse way up in the mountains!](#)



Wall Wart

## **Early to Bed, Early to Rise**

**makes a man healthy, wealthy and wise**

**(and saves lots of power in the winter)**

We're not kidding! Around 40 degrees latitude where we are, you can expect only half as many full-sun hours in December as in June. Add to this increased use of lights during long winter nights, and you'll find that Ben Franklin's adage will also save lots of electricity.



**Phantom Loads--**Any appliance that draws power even when turned off. Includes the TVs and VCRs with remotes mentioned above, anything that has a clock (microwave, clock radio), and anything where you touch a button to turn on the power instead of just flipping an old-fashioned switch, even such innocuous items as washing machines.

**City Slicker Habits--** We're not joking here either. People who move to a remote area and expect to run their solar-powered house the same way they did in town are in for a rude surprise (ruined batteries). Those of you who have spent a year or more reading by kerosene lamp or candle, hauling water in 5-gallon buckets, and using a stereo powered by AA batteries will marvel at how wonderful even a single solar panel and battery are--and will conserve power to keep the system working for as long as possible!

Again, **use a power strip or wire a switch to the outlet** where such things are plugged in. Phantom loads also wreak havoc on inverters. If the inverter is designed to shut down at night to save power, they will keep it on. Buy a clock that runs on AA batteries instead of AC power.

**Be aware of your power use** at all times. **Turn off the light** every time you leave the room. **Early to bed, early to rise** for the whole family, at least in winter. In the bathroom, **if it's yellow, let it mellow; if it's brown flush it down.** Do all your power-intensive chores (vacuuming, washing machine, power tools, water pumping) when the generator is running. Make your spouse and kids pay attention too, even to the point that they call you "**the Power Ogre.**" Make your family generate their own power on a treadmill or bicycle generator to watch TV or movies...at least until divorce is threatened!

**The Lawrence Berkeley National Laboratory calculated that phantom loads waste the equivalent of the output of 5 power plants each year!**



Liz generating electricity to power the TV and VCR. The kids complain and call me the Power Ogre; we compromised and made their mother exempt from this requirement for watching movies. [Click here for plans on making this bicycle.](#)

Regular electric grid customers in our area can voluntarily pay more for their electricity in order to subsidize wind power plants in Northern Colorado. The concept has caught on quickly.

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# Efficient Lighting

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**Incandescent lights are basically electric space heaters that give off light as a byproduct. They are VERY inefficient, wasting most of the power they consume as heat.**

**Since lights are one of the biggest power uses in a remote home, pay close attention to what kind you use. If you replace all of your lights with efficient versions, you may be able to get by with fewer expensive batteries and solar panels!**

You may have noticed that we've made major changes to this page. This is because of new information given to us by some lighting experts regarding lighting efficiency. Our thanks to Don Klipstein and Victor Roberts for the engineering lessons...

**Otherpower.com's lighting recommendations in a nutshell:** For best efficiency, use fluorescents of any type. Install standard fluorescents in workspaces where you can stand the blue-tinged light, hum and flicker. Use compact fluorescents in living spaces for a more 'friendly' ambiance. Use halogen lighting for outdoor applications where temperature causes problems with fluorescents. Use white LED lighting for applications that normally use dismally-efficient small incandescents...task lights, nightlights, pathway lighting, exit signs, and flashlights. Don't use incandescent lighting at all if you can afford to avoid it.

## Lighting Efficiency Ratings

A standard way of rating lighting efficiency is in lumens per watt--this figure accounts for all of the light produced by a bulb. This rating does not necessarily reflect how much usable light is thrown on your work area. The reflector and fixture will have a large effect on this. So be sure to read our guidelines for each type of lighting discussed below--lights that show a lower efficiency may still save you energy depending on the application.

- **32 watt T8 fluorescent**--85 to 95 lumens/watt
- **standard F40T12 cool white fluorescent**--60-65 lumens/watt
- **compact fluorescents**--low 30's to low 60's lumens per watt, usually 48-60
- **T3 tubular halogen**--20 lumens/watt
- **white LED**--15-19 lumens/watt
- **standard 100 watt incandescent**--17 lumens/watt
- **incandescent night light bulb (7w)**--6 lumens/watt
- **incandescent flashlight bulbs**--dismal, less than 6 lumens/watt

**But wait! What about all the white LED high-efficiency claims that are all over...including the claims that used to be on this site?** Unfortunately, much of this information is incorrect.

Comparing the efficiency of a white LED light with a compact fluorescent by measuring the intensity of a tiny spot within the beam does NOT give proper efficiency results. We got much of our data for efficiency claims from an article in Home Power Magazine ([click here to see this testing article](#)) and in literature from LED distributors. The problem? All of the light from our LEDs is concentrated in a 20 degree beam, while the incandescent and compact fluorescent lights were tested without fixtures...and most of the light they produced was never measured in the test, since it sensed only light falling on the sensor. It's OK to compare different lights by how brightly they illuminate a certain size area...but put a reflector behind the compact fluorescent and incandescent bulbs in the test rig and the data would change significantly. Therefore, while the LED lights in this test may illuminate a small area as brightly as other lights, they are NOT significantly more efficient. **LEDs can still be a good choice for illuminating your workbench, for example, as long as the light cast onto your small work area is as bright as you need--in this case your LED light could be a good investment for saving power, especially if your old incandescent fixture is also lighting the rest of the room where you don't need the light (like in the Home Power experiment link above).** If you try and light an entire living room with an LED fixture, though, you are not saving much--in that case you want a wide dispersal of light, and a fluorescent fixture would be the hands-down winner for efficiency, cost and practicality.

**Another thing to keep in mind--notice that with current commercial lighting products, the smaller the incandescent bulb, the less efficient it is. For small-sized and lower-light-intensity applications such as task and reading lights, pathway lighting, exit signs, and flashlights, LED lights will be much more efficient than the equivalent small incandescent.** This is because fluorescent light products in these small sizes are not available commercially. We are currently researching remote power applications for small cold-cathode fluorescents, which are commonly used to backlight LCD screens. We hope to have more information about these lights soon, though they are still significantly larger than LED products...too big to use in anything smaller than a very large flashlight.

## LED lighting

Despite our new information regarding white LED efficiency claims, they are still VERY useful in certain applications. They are an excellent, efficient replacement for the terribly inefficient SMALL incandescent bulbs found in task lights, nightlights, pathway lighting, exit signs, and ESPECIALLY flashlights. As the amount of light needed gets larger (lighting an entire room, for instance) LEDs are only marginally more efficient than a 100 watt incandescent--but a nightlight made with white LEDs is almost three times as efficient as the incandescent it replaces. Also, if run at recommended current levels, LED lights should last tens of thousands of hours, a huge improvement over other lighting technologies. They are also very shock and cold resistant, perfect for portable and outdoor applications.

Groups of 3-9 white LEDs are effective as reading lamps. 3 of our white LEDs running together use only 0.22 watts! Single white





LEDs make great pathway lights, and can be left on all the time. Flashlights can be easily converted to use LED bulbs...this is probably the best application for them. Converted LED flashlights have become my favorite lights for fire/rescue and wildland firefighting, since the batteries last 6 times longer, I've never replaced an LED bulb, and light output is more even, though slightly dimmer than the original.



[Click Here for information about home built LED room lighting](#)

[Click here for information on converting flashlights to LED bulbs](#)

**otherpower.com offers state of the art white LEDs in bulk for experimentors to make their own LED reading and path lights, and flashlight conversions.** Visit our [products](#) page for ordering information.

## Compact Fluorescent

These lights were a huge advance in energy efficient lighting--very efficient, with 10 times longer life than an incandescent bulb. Plus, the light quality (color temperature) is much warmer than normal fluorescents, they fit in most normal light fixtures, and flicker is hardly noticeable. Models are available for any application, including spotlights with reflectors.



We highly recommend these lights in both 120 volts AC and 12 volts DC models. The AC versions are available at any hardware store and are very inexpensive for efficient lights (\$8 to \$15 each). DC compact fluorescents are more expensive because of limited demand for 12 volt ballasts, but only the ballast is different for AC and DC compact fluorescents--the bulbs are the same! We may soon offer interchangeable compact fluorescent bulbs and ballasts for both 12 volt DC and 120 volt AC systems. Currently, interchangeable parts are available from Jade Mountain.

The only drawbacks to keep in mind for compact fluorescents are 1) they are not very bright at cold temperatures, and 2) the quality of light is still not as good as halogen or incandescent bulbs. I personally use 12 volt DC halogen bulbs for reading lights, while lighting whole rooms with compact fluorescents.

# Standard AC Fluorescent Lights

These really are a very good, energy efficient method of area lighting, and are widely available. They are the most efficient room light available. Problem is, the quality of light is very irritating to some people. It's too blue, and the flicker is extremely annoying to me. Perhaps this is a reaction to my lifelong aversion to large office buildings with windows that don't open! But fluorescents make great energy efficient lights for shops, garages, etc. where you don't have to spend too much time in the winter. I also use them for under-cabinet countertop lights in the kitchen.

## Quartz-Halogen Lights

These bulbs are only about 15% more efficient than standard incandescents, but are available in 12 volt DC versions. They were a lifesaver for our house--the inverter doesn't have to run to use them, they are more efficient, and the quality of light is excellent for reading or any other use. They fit in ALL standard light sockets, so the monetary investment is low. AC versions are available anywhere, and are still more efficient than standard bulbs. They give out lots of light even in an outdoor situation where its 25 degrees below zero, and last almost 3 times longer than incandescents. We hope to offer 12 volt DC Halogen bulbs for sale on our products page soon, as they are difficult to find--even most RV shops don't carry them, only the innefficient 12 volt incandescents.



# Standard Incandescent Bulbs

They give out more heat than light. Only 40 cents each, or lots more in 12 volt versions. Popular electricity wasters, seen in almost every grid-connected house. Edison's invention changed the world, but much more efficient lights are available now. Besides, **EDISON HAD GRID POWER!**

## Gas Lights

A real technological innovation a hundred years ago, these lights are still effective today if you have no electricity and some propane or gasline to burn. Humphrey has been making these lamps for 92 years, they are available from Jade Mountain, Lehmans, and certain Amish catalogs. They make some noise, but not too much.

Coleman lanterns are another familiar gas light--they use white gas that is vaporized in a heated generator tube. These are VERY noisy! Also, the mantles in these lights (and in kerosene mantle lamps) are treated with radioactive thorium--it doesn't pose much of a hazard, but don't carry mantles in your pocket! The thorium from lantern mantles can be used to construct a home built lightning detector for fun or experiments--see our plans on this website.

[Click here to read about making a home built lightning detector!](#)

## Kerosene Lamps

The Aladdin mantle version of these (with the tall glass chimney) produces lots of light and heat, more than enough to read by. Regular kerosene lamps produce enough to read by, barely, but are much brighter than a candle. But most of us up here spent at least a year with ONLY kerosene for lighting, and it sure beats a candle or nothing! Be careful of the fire hazard--don't burn these lights unattended.



Amory Lovins of the Rocky Mountain Institute calculated that replacing a 75 watt incandescent lightbulb with an 18 watt compact flourescent (that gives the same amount of light) would, over the lifespan of the new bulb, prevent the emission of about 1 ton of carbon dioxide and 8 kilograms of sulphur dioxide into the atmosphere, plus a huge savings on electricity cost. And, the compact flourescent will last over 10 times as long.

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# Home Built LED Lighting

Light Emitting Diodes (LEDs) have been around for years in red, yellow and green. New technological advances have given us incredibly bright blue and white versions--the white LEDs on our products page are state-of-the-art in brightness. The rated brightness varies by how wide the beam angle is. LEDs with a super-high brightness rating also have a very narrow beam angle. Wider-angle LEDs have a lower brightness rating, but may put out just as much light. It's important to choose the beam angle to suit your needs.

- **LEDs can last tens of thousands of hours if used at rated current**
  - **No annoying flicker like from fluorescents**
  - **LEDs are impervious to heat, cold, shock and vibration**
- **No breakable glass is used, and LED lights can be waterproofed for marine use**

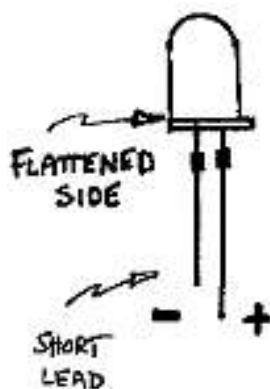
White LEDs are perfect for replacing small, inefficient incandescent bulbs in night lights, flashlights, path lights, task lights and exit signs. Try 6-9 white LEDs for reading and task lights, and 1-3 LEDs for flashlights and path lights.



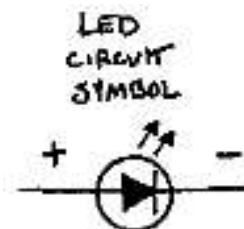
# Designing LED lighting

LED ratings are specified by current, not voltage. For longest life, we recommend you run them at 20-25 milliamps (ma). HOWEVER, in our LED flashlight conversions (and many commercial LED flashlights), the LEDs are run at 50-60ma, twice the rated current. One of our test LEDs ran at 98ma for over 200 hours without damage or appreciable light loss. So go ahead and experiment with running them at over rated current if you are willing to take the risk of a shorter life. In my opinion, a flashlight bulb that lasts 100 hours is a huge improvement and cost saver over the incandescent alternative which gives only 15-20 hours before it dies.

You must use some method of limiting current to your strings of LEDs. The easiest is simply using the right number of LEDs for your supply voltage. Each white LED gives a voltage drop of 3.6 volts. So, for a 115 volt DC light, you could use 32 white LEDs in series ( $115 / 3.6 = 32 \pm$ ) with NO current limiting (they will limit themselves by their inherent voltage drop). Reverse polarity will not damage an LED unless the voltage is very high--it simply will not work, and will not pass current through. The diagram below shows how the LED package is marked for polarity.

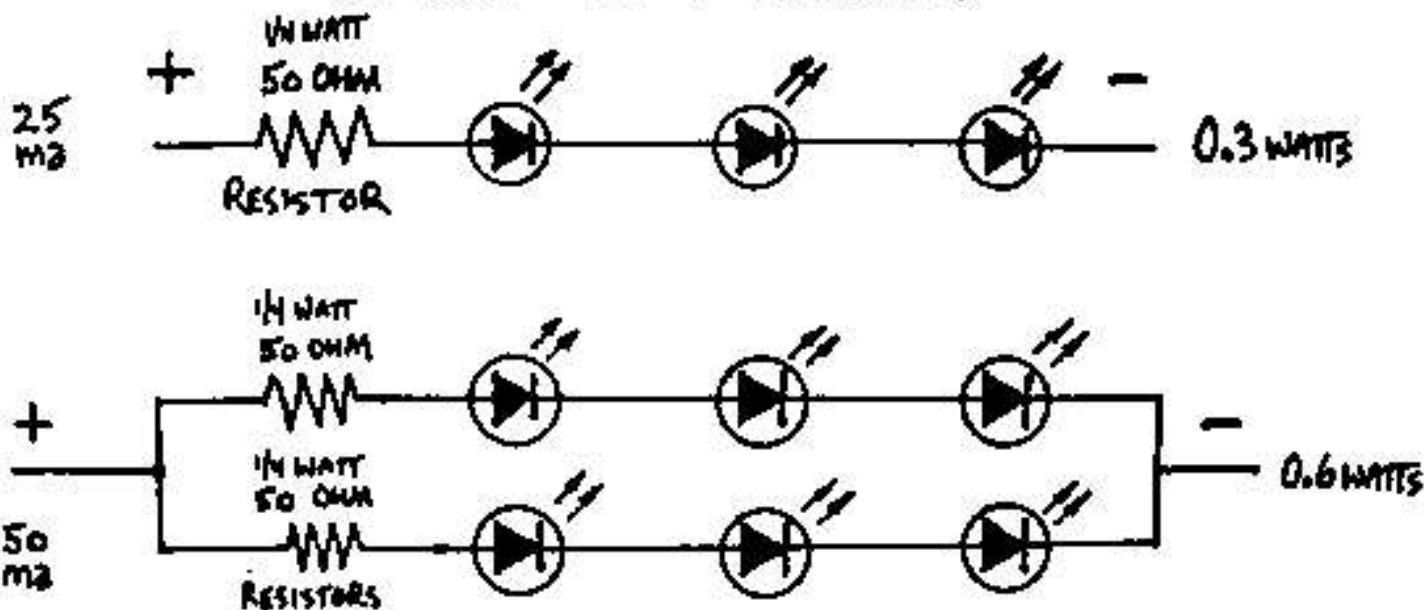


The next easiest is a simple resistor. The resistor does consume power, though, but is usually needed since an 'ideal' 3.6 volt source is rarely available. Use Ohms law (Resistance(R)=Voltage(E)/Current(I)) to calculate the value and wattage needed:  $(R=E/I)$



Each white LED gives a voltage drop of 3.6 volts. As an example, for a 12 volt light, you can run a maximum of 3 white LEDs in series at full power ( $3.6 \times 3 = 10.8$  volts drop). Subtract this from your supply voltage of 12 volts to get the additional voltage that must be dropped (in this case,  $12 - 10.8 = 1.2$  volts of additional drop needed). In this case,  $1.2 \text{ volts of additional drop} / .025 \text{ amps (25 ma)} = 48 \text{ ohms}$ . Use the next highest value of resistor available, 50 ohms. You must also be sure the resistor can handle enough current. Volts x Amps = Watts; resistors are rated in watts. So in this case,  $12 \text{ volts} \times .025 \text{ amps} = 0.3 \text{ watts}$ . A 1/4 watt resistor would work fine, but if you run a second string of 3 LEDs in parallel, each string would need its own 50 ohm, 1/4 watt resistor. It's important that each string has its own resistor....putting them in parallel with a single resistor is bad practice. We didn't know this when this article was first written....thanks to all the folks that pointed this out!

## 12 VOLT LIGHT DIAGRAMMS

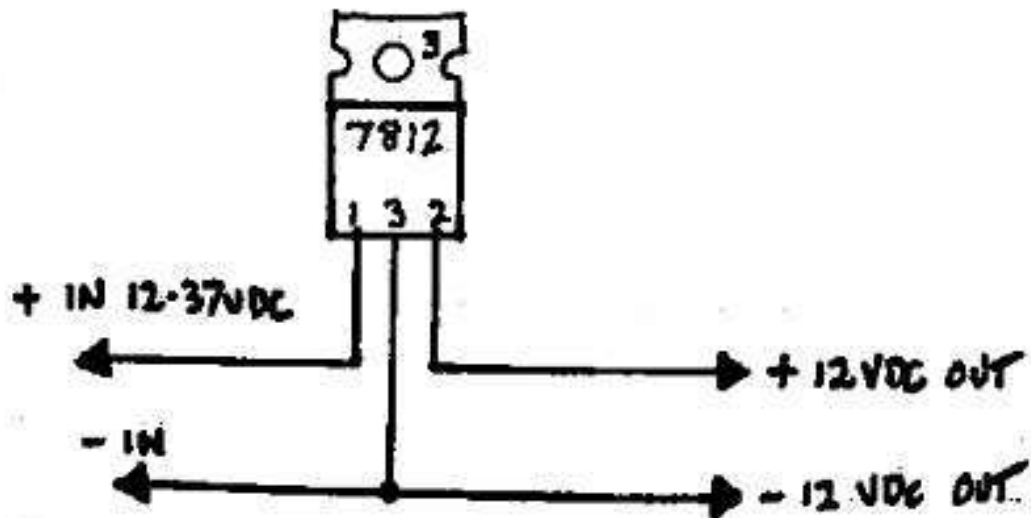


This method is cheap and works great, but there's one problem--voltages in a remote power system (or car, for that matter) tend to vary. In our home system, voltages range from about 12 volts when the batteries are low up to 14 volts when equalizing the battery bank. An LED lamp string designed to run at 25 milliamps at 12 volts would be pushing 64 ma at 14 volts, which would be very bright and PROBABLY last at least a few hundred hours...but then then when your batteries are low, the LEDs will pull only 10ma or so, making them very dim. If you are looking for maximum lifespan (which could be over 10 years of run time) and brightness that doesn't vary with your battery condition, try a voltage regulator circuit (below).

Therefore, we highly recommend a simple voltage regulator chip for the safety of your LEDs. White LEDs are expensive, and it would be a shame to blow them out. Parts for a current-limiting circuit are very cheap--less than \$2. Regulator chips are available for various voltages. Use the Ohm's law calculations above to select the resistor for the voltage you choose. Or, use the regulator in a current-limiting configuration to run the LEDs. You can also use an LM317 adjustable voltage regulator set to the exact voltage needed by your strings of LEDs. See the circuit diagrams below.

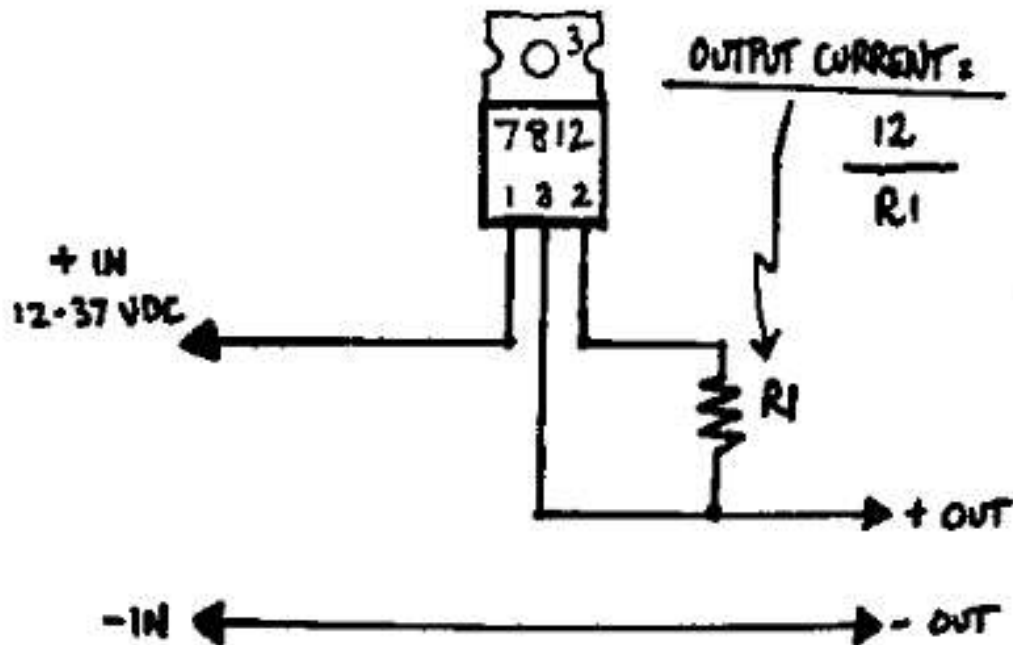
## 2 possible regulator circuits using the 7812 regulator chip

## 12 VOLT VOLTAGE REGULATOR



With this voltage regulator circuit, choose your current-limiting resistors as described above. Output will be 12 volts DC no matter how high your input voltage goes...up to 37 VDC. This protects your LEDs from fluctuating system voltages.

## CURRENT REGULATOR



If you use the 7812 in this current-limiting configuration, make sure resistor R1 has a big enough wattage rating to handle ALL the current. Just choose R1 for 25 ma if you are running one string of LEDs, 50 ma for 2 parallel strings, etc.



# Large AC LED lights

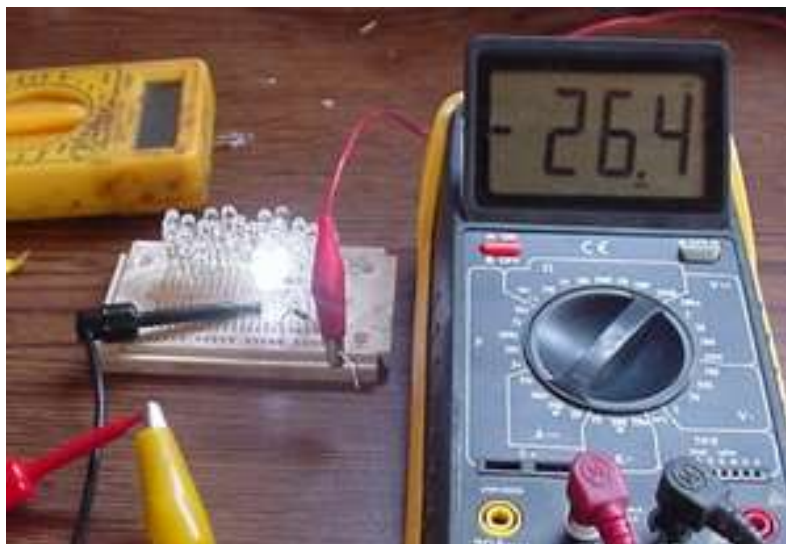
**You may have noticed that we deleted the circuit diagram for a 'monster' 32 LED room light. The simple circuit presented here earlier had some serious design problems in terms of peak voltage and efficiency. Thanks to the many people who pointed out the problems to us! We were also concerned about safety considerations; 120 VAC current is not to be trifled with by people not experienced with it. If you have little or no electrical knowledge and want to try a 120 VAC LED room light, purchase a commercial version. If you DO have 120 VAC electrical experience, keep reading...**

First, note that 120 VAC house current varies in different parts of the country. You will probably have to adjust the component values in your circuit to match the exact voltage at your location. The most efficient way to run LEDs from 120 VAC is to use no series resistor at all, but instead a non-polarized series capacitor before the rectifier. We also highly recommend a fuse in the circuit before the capacitor and rectifier. The capacitor must be rated at least 200 volts. A good foil capacitor is expensive (\$5 or so) but also gives very low losses and will not get warm. Such capacitors may be found in certain older fluorescent lamp ballasts. The true beauty of the capacitor-rectifier-LED light is the flexibility in the number of LEDs. If you use fewer LEDs, your series capacitor for 25 mA would get smaller and cheaper, while a series resistor would waste more power and would have to get bigger and more expensive.

Here's some examples of 120vac LED circuits -- from someone who knows more about electronics than we do.

[http://ourworld.compuserve.com/homepages/Bill\\_Bowden/page10.htm#lineled.gif](http://ourworld.compuserve.com/homepages/Bill_Bowden/page10.htm#lineled.gif)

We also highly recommend using a multimeter (\$10) and solderless breadboard (\$5) for designing your home built LED fixtures. Both are available at Radio Shack. With the multimeter, you can check your polarity, voltages, resistors, and current draw before assembling the final version of your light by soldering. The breadboard allows you to make changes to the circuit without soldering, and makes it easy to transfer the working circuit to a soldered version--solder-in PC boards are available that exactly match the connections of your solderless breadboard. (see photo below).



## Other LED design and handling concerns

- If your LED mounting does not allow any air circulation, we recommend running them at 18-20ma instead of 25ma to avoid any heat buildup, which will shorten their life.
- LED lights generally do not need reflectors, as the angles at which they emit light are set internally. Our white LEDs emit in a 20 degree arc. Very little light is wasted from shining in the wrong direction.
- Although our LEDs are not powerful enough to require eye protection labelling, DO NOT look directly into the beam from a close distance, just like with a halogen lamp.
- Solder your connections quickly and efficiently, using a small (less than 30 watt) soldering iron. LEDs can be ruined if the internal temperature gets too high from soldering.
- Do not place too much strain on the LED leads when bending them. Bend the leads ONLY below the square tab on each lead.
- LEDs are sensitive to static. The manufacturer recommends a grounding wrist strap, but we have had no problems without one during our research. Just be careful not to drag your feet across the carpet and grab a handful of LEDs...or simply touch a grounded metal chassis before handling LEDs.

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# STORAGE BATTERIES

**"FEW  
BATTERIES DIE  
A NATURAL  
DEATH...MOST  
ARE  
MURDERED"**

---Unknown Industry  
Representative (please  
take credit for this quote if  
you originated it!) Source:  
Sunelco Planning Guide

**BATTERIES ARE  
YOUR MOST  
IMPORTANT COMPONENT**



Your battery bank is *THE MOST* important part of your remote power system. If you have to cut corners to afford the system you need, skimp somewhere else. The rest of your system is only as good as the battery bank!

**BATTERIES ARE ANTIQUE TECHNOLOGY**

Well, OK, not quite! But the most common and cost-effective banks of large batteries for remote power storage are the flooded lead-acid type, and a battery reference book from 1910 will give you all the information you need about charging and maintenance. And like the antiques, modern batteries for remote power use are still heavy and cumbersome to move.

**"DEEP-CYCLE" BATTERIES ARE NOT**

Unfortunately, there's not a battery out there that thrives on abuse. "Deep-cycle" batteries are designed to resist damage from repeated deep discharges (50% to 80% of capacity used up)...but will still last significantly longer if discharged by only 20%.

## CHECK OUT THIS CHEAP AND INFORMATIVE BATTERY BOOK!

*Secrets of Lead-Acid Batteries* by Thomas Lindsay is one of the best reference books on the subject that we've ever seen. Plus, it's cheap, since he doesn't waste any paper talking about irrelevancies. Available on our [Products Page](#) for only \$4.95!

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[Deep Cycle Battery FAQs](#)

[Battery References and Links](#)

## BATTERY MYTH:

**"Never leave batteries on the ground or a concrete floor...all the power will leak out."**

This one is a "rural legend"--batteries don't care what they sit on. It probably originated from when batteries came in porous wooden cases. There are some truths behind this myth, though! All batteries do self-discharge over time when they are not being charged. If dust and dirt build up on the battery tops, sulfuric acid will carbonize the grime into an electrical conductor, acting like a short circuit across the terminals and quickly draining the power. Cold temperatures also reduce available power from a battery. And thermal gradients can reduce the life of large battery...this can occur when the air temperature around a battery is much warmer than the surface it is sitting on.

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# BATTERY COMPARISONS

## for

# Remote Power Systems

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**CHECK OUT THIS GREAT, INEXPENSIVE BATTERY REFERENCE BOOK!**

*Secrets of Lead-Acid Batteries* by Thomas Lindsay is one of the best reference books on the subject that we've ever seen. Plus, it's cheap, since he doesn't waste any paper talking about irrelevancies. Available on our products page for only \$4.95!

## Lead-Acid Batteries

listed in order of suitability to remote power use, in our humble opinion

- **Industrial forklift batteries.** These are truly top-of-the-line for a remote home, if you can afford them. Highly recommended for their longevity and resistance to abuse. Available in single 2-volt cells or trays of 3 cells (6 volts). 15-25+ year life expectancy. **Advantages:** longest life, most resistant to deep-discharge abuse, durable metal case, interconnect wires built-in, available in many capacities. Best value for the dollar when factored over service life. **Disadvantages:** Very high initial cost, extremely heavy.
- **Deep-cycle solar batteries (L-16s).** The most common choice for remote power systems. Originally designed for industrial floor sweepers, but very well-suited to remote power use. 6-volt batteries. 5-6 year life expectancy. **Advantages:** good service life, fairly resistant to occasional abuse, reasonable cost. **Disadvantages:** not as resistant to abuse as industrial cells.
- **Golf cart batteries.** Often used in small systems or as "training batteries" for flatlanders who move to the mountains. But don't expect more than 2 or 3 years from them if your system gets frequent or heavy use. 6-volt batteries. 2-3 year life expectancy. **Advantages:** very low cost, available at many discount stores, lightweight. **Disadvantages:** short service life, vulnerable to deep-discharge abuse.
- **Solar gel cells.** Expensive, but good for certain specialized applications such as on boats, RVs, and computer backup power supplies. 6-volt batteries. 2-3 year life expectancy. **Advantages:** maintenance-free, no hydrogen emissions, low self-discharge rate, shock-resistant, spill-proof, cold and heat resistant. **Disadvantages:** expensive, requires special charger and regulator, vulnerable to abuse, life expectancy very short for the price.

- **Telephone cells.** Manufactured with lead-calcium instead of the lead-antimony compound of normal batteries. Not really designed for remote power use, but often available at surplus/salvage for very low cost. Can give extremely long service if pampered and not abused. Keep careful track of your battery bank's state of charge with an amp-hour meter and only shallow-cycle the batteries or they will expire quickly. 2-volt cells. **Advantages:** extremely low cost (sometimes even free), very low maintenance, can take very heavy use if not deep cycled. **Disadvantages:** cannot be deep-cycled without damage, very heavy, usually only available used, so condition is unknown, lower voltage than lead-antimony cells for charging, equalization, and metering, battery bank must have more capacity to avoid deep-cycling.
- **RV/marine batteries.** Very low cost with a very short life, but better than a car battery. 12-volt battery. 6 month to 1 year life expectancy. **Advantages:** very low cost, lightweight, available at any hardware store. **Disadvantages:** short life, will not tolerate abuse.
- **Car batteries.** Better than reading by kerosene or candle light, but will last a few months at best.

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## Nickel-Cadmium Batteries

[\(if you are looking for information about small NiCad batteries \(AA, C, D, etc.\) click HERE\)](#)

These batteries are super-expensive and hard to find unless you come across a surplus deal. They are very sensitive to damage from deep discharging, though a myth has circulated for years that NiCads should be deep-cycled. It's not true, even for AA-size batteries! They do, however, have some unique properties that are worth mentioning, since surplus NiCads do become available on occasion.

Industrial NiCad cells do not exhibit a "memory effect" like their smaller AA, C and D brethren. Both appear to "die quickly," but this is really just a function of their power curve--NiCads release power at a constant voltage until they are almost empty, then quickly taper off into nothing. Therefore, voltage readings are useless in determining state of charge. They can freeze without damage, and require different regulator and charger settings than lead-acid batteries. NiCad batteries of different ages and capacities can be mixed, which does not work with lead-acid cells. **Advantages:** very long life if not deep-cycled, can freeze without damage, different sizes and ages of battery can be mixed.

**Disadvantages:** Expensive, voltmeter cannot be used for measuring state of charge, cannot mix with lead-acid batteries, special charger and regulator required.

## Surplus Submarine Batteries

If anyone has used these puppies or knows where to get them, please let us know!

# Surplus Klingon D7 Heavy Cruiser Starship Batteries

Thanks to a warp in the space-time continuum and improved Klingon-Federation of Planets relations, these batteries may soon be available. Dilithium-Deuterium construction. Each cell is approximately the size of a Volkswagon beetle and weighs 12,000 kilograms (convert this unit to normal peoples units at [metricsucks.com](http://metricsucks.com)). 872,000 Amp/Hour capacity, 2 volt cells. Check our products page for availability.

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# Small Rechargeable Batteries

## (AA, C, D, etc.)

Buying rechargeable AA, C and D cells for your Walkman (TM), flashlight, GPS, toys, etc. can be a very good investment. If you factor the cost of disposable alkaline batteries over the service life of rechargeables, the cost for disposables is almost 1000 times higher! Add to this the factor of pollution in landfills from disposables, and the choice of using rechargeables is a very good one. However, rechargeable NiCad and NiMH cells are not suited for every application. Hopefully, our advice will be helpful for your choices.

- **Disposable Alkaline Cells**--These are very powerful batteries and will work for all applications. However, they are incredibly expensive to just use and throw away. Don't even bother with chargers that say they will recharge disposable cells...the batteries are not designed for this, and you will be wasting your money if you have to **depend** on the batteries like we do up in the mountains. **Advantages**--long storage life without use, very powerful, available everywhere, just use and throw away. **Disadvantages**--Very expensive since they can only be used once, heavy, pollution concerns in landfills, poor power output in cold temperatures.
  - Use disposable alkalines when your electronic equipment must sit for months without use. An example would be the flashlight in your drawer or truck that hardly ever gets used. Our radios in the local volunteer fire department have all been converted over to use disposable alkaline cells for this reason (at a cost of \$50 per radio--they were designed for NiCads). Rechargeables self discharge very fast compared to disposables, and our radios must be ultra-reliable, since hazards to life and limb are involved. A few incidents where NiCad powered radios were dead after sitting for 3 months in the fire truck was all that it took to convince us. The alkaline cells perform admirably in these conditions, and we haven't had a problem since the conversion. Of course, the cost of these disposable cells comes out of the fire department budget and not our pockets.
- **NiCad (Nickel Cadmium) Rechargeable Cells**--These can be found almost everywhere, from laptop computers to cordless phones to electric shavers. However, they are being quickly phased out in favor of NiMH (Nickel Metal Hydride) cells because Cadmium is a **VERY** toxic metal that lasts forever in landfills and pollutes groundwater...even rechargeables eventually end up in landfills. Don't be guilty of this! Most battery dealers will accept dead NiCad cells for recycling! Though the initial cost is high for the batteries and charger, they save a substantial amount of money in the long run. These cells self-discharge quickly, and should not be used in applications where the device they power has to sit unused for months at a time. **Advantages**--can be recharged many times, good power compared to weight, constant voltage output until cell is discharged (flashlights don't gradually get dimmer and dimmer...they stay at the same brightness until they suddenly go out). **Disadvantages**--Toxic waste in landfills, fast self-discharge when sitting unused, regular chargers may actually damage batteries and reduce life, lower voltage (1.2 volts instead of 1.5 with disposables)



means special adaptors are required in some equipment (though equipment designed for rechargeables may need an adaptor to use disposable batteries), very sensitive to overcharging or deep discharging.

- The so-called "memory effect" in NiCads gets lots of press, and lots of special chargers designed to "fix" it. This is mostly a myth! NiCad cells **can** exhibit this effect in appliances like a "dustbuster" vacuum cleaner, where the appliance is used for only a couple minutes at a time and then put back on the charger. After a few months of this, the batteries will only charge up to the level they were discharged to over and over. In most applications, the memory effect is not even an issue, though special equipment is available that fully discharges ("conditions") the batteries before recharging. This is another myth! These batteries are ruined by being run down until they are empty, too, just like expensive remote power batteries. To avoid the dreaded "memory effect," every couple of months simply run your dustbuster or cordless drill longer than you need, until the motor -just- starts to slow down. Recharge it. Problem solved.
  - For best NiCad life, use your video camera or laptop until the batteries are ALMOST dead, but not completely. Avoid any product that claims to "condition" your batteries.
  - Recharge the batteries until they are full (use the time estimate that came with the equipment manual), then immediately remove them from the charger. NiCads are VERY sensitive to overcharging, and will be ruined in a few months if you let them sit in the charger.
  - If you are really anal-retentive about your batteries (a good thing--you'll save lots of money in replacements!), find a charger that charges first at a high rate (1 amp or so) with PWM (pulse-width modulation), then switches to a trickle charge to finish, then completely shuts off. We don't know of one that does this so far, please let us know if you have one. Plans are available in a back issue of Home Power magazine--we are currently experimenting with them.
- **NiMH (Nickel Metal Hydride) cells**--These are the new high-tech replacement for NiCads. Most new laptop computers and cordless phones come equipped with these cells now. The biggest advantage is that dead batteries don't contain nearly as much toxic waste as NiCads, a good reason for switching in itself. Otherwise, their performance is similar to NiCads with a few real advantages besides. **Advantages**--Higher power density than NiCads (more power by size and weight), no toxic waste in the landfill, can be recharged many more times than NiCads, no "memory effect" (see above). **Disadvantages**--Even more sensitive to overcharging and complete discharging than NiCads, self discharge rate very high, so don't leave them sitting for even a couple weeks.
  - Within a few years, these cells will completely replace NiCads just by virtue of the toxic waste issue. Just keep in mind that if you leave NiMH cells sitting in the charger cradle for too long, you WILL ruin them.
- **Lithium Ion Cells**--While not rechargeable, these batteries have some special properties that make them very useful in certain applications. They have an incredible storage life--years and years without self-discharging. They pack more power than a standard alkaline cell, but weigh very little, and function perfectly in cold weather where alkalines would give up quickly. Use these very expensive, non-rechargeable for special applications. I use them for my firefighting equipment--flashlights, GPS, emergency strobes--where the equipment may

sit for 2-3 months between uses.

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# Battery Bank Wiring

## 12 volts versus 24 volts

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Most remote power systems are wired for 12 volts. Some larger systems are wired for 24 volts. It's a delicate call to make this decision in most cases. Even larger voltages are used in some huge systems. The main advantage of 24 volt systems over 12 volts is that wire size is cut in half throughout the system. Besides affecting battery bank wires, this includes solar panel, wind generator and hydro plant wiring, too--if you have hundreds of feet of wire, this cost can add up quickly. The disadvantages of using 24 volts are that 1) you'll need an expensive, power-wasting transformer to run 12 volt lights and appliances, and 2) if you want to buy a cheap, Chinese inverter, they are only available in 12 volt versions. More expensive inverters are available in different voltages.

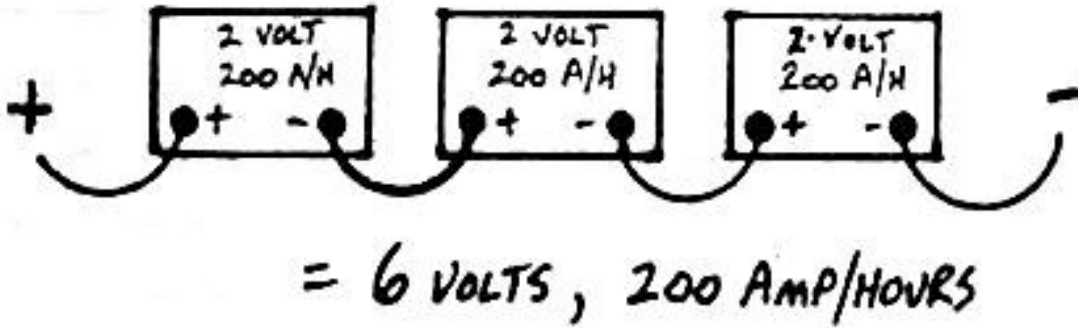
### Series and Parallel Battery Wiring

Lead-acid batteries always have 2 volt cells wired in series to give the desired voltage. Some batteries have 3 2 volt cells in the case, already wired together for 6 volts. Most battery banks use a combination of series and parallel wiring.

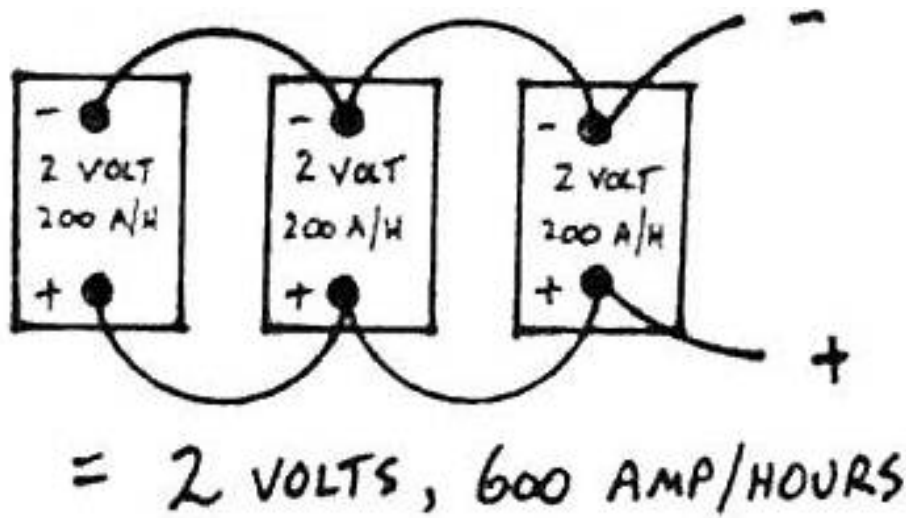
Series wiring increases voltage but **NOT** amp/hour capacity.

Parallel wiring increases capacity but **NOT** voltage.

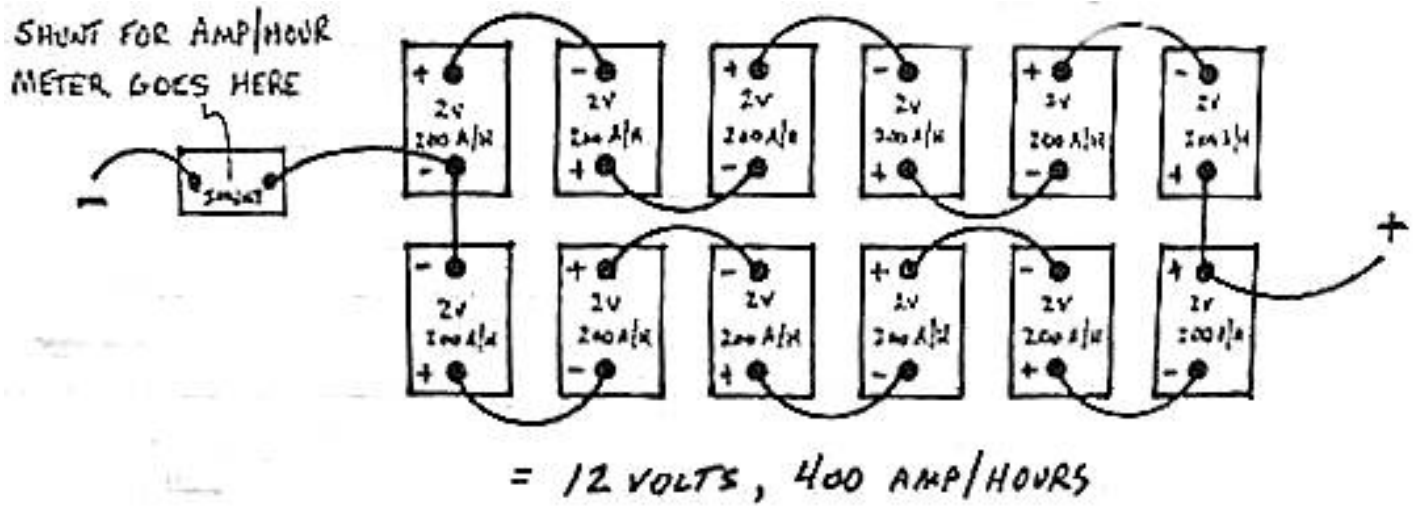
### Series Wiring Example



Parallel Wiring Example



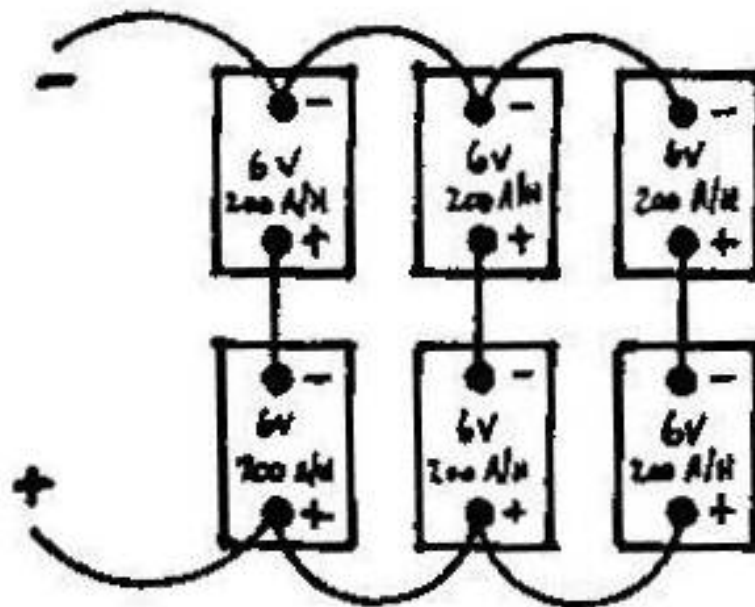
Typical remote power battery bank using 2 volt batteries  
(series + parallel)





## Typical remote power battery bank using 6 volt batteries

(series+parallel)



= 12 VOLTS, 600 AMP/HOURS

### Battery Bank Wire Sizing

Batteries can put out a huge amount of power in a short time. It is important to use big enough wire for your series and parallel connections between the battery terminals (the interconnect wires) and to the inverter.

**Note: We do not guarantee the accuracy of any of our information regarding whether it meets NEC code or not!**

**For BATTERY INTERCONNECT wires, use #4 gauge if you have a 500 watt or smaller inverter. Use #2 gauge for an 800 watt inverter, and go with #2/0 for larger inverters. If you can afford using #2/0 welding cable or can find a surplus deal on it (we did), we highly recommend it for battery interconnects no matter what size inverter you have since it is so flexible. Keep in mind that welding cable may not meet NEC code, even though it is clearly the best and safest choice (because of welding cables' flexibility, it puts little strain on the connection points) for battery and inverter wiring. Go figure!**

### Buss Bars

It often saves a lot of trouble later to install + and - buss bars directly off of your battery bank, connected with wire thicker than what you need for your inverter ([click here to jump to the inverters page for the inverter wire sizing chart](#)). These buss bars give you extra room to hook up new windmills, solar panels, meters, loads, etc. Use rectangles of at least 1/4" thick copper, drilled with extra holes. It's easy to tap threads into copper, too--this will speed your hookup time (no nuts

necessary on the back side of the buss bar). If you have an amp/hour meter, it's shunt should go between the - (negative) buss bar and the battery bank so that all power collected and used is measured.



My buss bars and main power switch

[Battery Type Comparison](#)

[Battery Bank Wiring](#)

[Battery Bank Care](#)

[Battery Safety](#)

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[Small Rechargeable Batteries](#)

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# Inverters

## Inverter Cable Sizing Chart

Inverter Continuous Watts	Voltage	Fuse Size in Amps	Minimum Wire Size
150	12	20	#4
250	12	40	#2
250	24	20	#4
500	12	100	#2
500	24	40	#2
800	12	110	#2
800	24	60	#2
1000	12	150	#2/0
1000	24	100	#2
1500	12	200	#2/0
1500	24	100	#2/0
2500	12	400	#4/0
2500	24	200	#2/0

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# Solar Power

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Solar power is the basis for all life on earth! Solar heating has been used for thousands of years to warm dwellings. But solar electricity (photovoltaics) is a very new industry. We will be expanding this website to cover solar space and water heating soon--please email us with suggestions and your own experiences. For now, we are concentrating on solar electricity.



## A ZERO-MAINTENANCE GENERATOR

Solar panels have **no moving parts**. You just sit them out in the sun, hook up the wires, and collect power, without adding fuel or replacing worn-out parts. It's amazing that nobody knows for sure how long a solar panel will last. That's because many of the very first photovoltaic panels are still producing power today.

## USED SOLAR PANELS

**If you are going to buy solar panels, compare them by Dollars per Watt. Used solar panels are a bargain in every way. The old ARCO panel shown here has been in the sun for around 20 years, and produces only 10% less power than when it was new!**

[otherpower.com buys and sells used solar panels in any quantity! Click here for more information.](#)

Northern Colorado, where we are located, has LOTS of people living in remote mountainous areas with no grid power. Over the last 2 years, we have tried to obtain used solar panels from various sources, and have had NO LUCK at all. In many cases, used panels are selling here for the same price as brand new ones. We'll keep trying, but we most likely will not be able to sell used solar panels.

## DOLLARS PER WATT versus SPACE

Used solar panels produce less power per square foot (or square meter...convert these units at [metricsucks.com](#)) than do new panels. A modern solar panel might produce twice as much power as an old one of the same size--but will cost **more** than twice as much. That's why you should compare dollars per watt! The best current deal on new 50 watt solar panels is about \$4.25 a watt--\$212 for a 50 watt panel, in quantity. Other new panels of about the same size can produce 120 watts, but cost \$700--\$5.83 per watt. The only difference is size--unless you have limited mounting space (rarely a problem), panels that cost the least dollars per watt are the best deal. **You just put up more of them!**

[Used Solar Panels](#)

[See a Solar-Powered  
Outhouse](#)

[Repairing Dead  
Solar Panels](#)

[Solar Power  
Systems](#)

[New Solar Panels](#)

[Solar Water  
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# SELL YOUR STUFF!

We are interested in buying most anything related to alternative energy, including solar panels, wind generators, antique light plants, meters etc. We are also interested in re-selling certain books or plans. **Please simply send us an email if you have something!**

We also encourage folks to offer goods for sale on our discussion board (individuals, not businesses!). If your business in selling remote power goods/information, let us know via email and we'd consider trading links or advertising.

**[Contact us via email!](#)**

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# Water Power

Large scale hydroelectric power has been used worldwide for a long time to generate huge amounts of power from water stored behind massive dams. Small scale hydropower has been used for hundreds of years for manufacturing, including milling grain, sawing logs and manufacturing cloth. However, it can also be used **without a dam** to generate electricity for home scale remote power systems. These so-called micro-hydro installations can be a very good complement to a solar power system, as they produce electricity 24 hours a day.

**Waterwheels**--It's important to differentiate between water wheels and water turbines. A water wheel is the antique version we are all familiar with--a massive wooden wheel that slowly turns as the creek pours down over it. Water wheels spin slowly, but with lots of torque. This presents problems for generating electricity, as complex gearing is required to reach a rotation



speed high enough to produce power with an alternator or generator. By the time this torque is sent through the gears, a huge amount of power has been lost to friction. However, one of our neighbors did construct a water wheel generator that produces a steady 2 amps of power, 24 hours a day. He used a natural dam (a log that fell across the creek years ago) to get the fall and to mount the generator on. Some of the locals were positive it wouldn't work, but that was 6 years ago, and the device is still producing power now! [Click here for more information on this clever water wheel.](#)

**Turbines**--All of the commercial micro hydro generators available today use a small turbine connected to an electrical generator or alternator. Water is collected in an intake pipe upstream, travels down to the turbine in plastic pipe, and is forced through one or more nozzles by its own gravity pressure. No dam is needed; systems without a dam are called "run of river" systems. By this time, the water is moving VERY fast, and it spins the turbine wheel very fast. Power is generated by a generator or alternator directly connected to the turbine wheel (no gears or pulleys

needed). All of the factors below must be calculated correctly for your micro-hydro equipment to make power most efficiently. All commercial micro-hydro setups are custom-made by the manufacturer for your specific application. For proper operation, you must supply the manufacturer with specific data about your site, most importantly the vertical drop in feet (called "head"), the amount of water flow available during different seasons in gallons per minute, and the length of pipeline required to get a sufficient head.

Look for more information on home built water turbines here soon!

- In general, for a water turbine you need at least 3 feet of fall and at least 20 gallons per minute of flow. If you have more fall (head), less water is required. You can calculate potential head with a water level, a contractor's level and stadia rod, or with just a string level attached to a measuring stick. The more fall and flow that you have, the more potential power you can generate. You can measure flow by building a weir in the creek and measuring how fast it will fill up a 5 gallon bucket.
- Your pipeline must be of a big enough diameter to minimize friction loss in the pipe. Your micro-hydro supplier can give you specific information regarding this.
- Nozzle size and turbine wheel type are all interrelated to your total head and flow. Again, your hydro supplier will customize these for your specific application. Often, different size nozzles are designed to be switched in and out as stream conditions change throughout the year.
- There are two main types of turbines, impulse and reaction. With impulse turbines, a jet of water is created by the nozzle and squirted onto the wheel. Reaction turbines are more akin to propellor that spins **INSIDE** the pipe, generating power.
- The 3 primary impulse turbine wheel types are Pelton, Turgo, and Cross-flow. Pelton wheels are used in low flow, high head conditions, and Cross-flow wheels are for high flow, low head installations. Turgo wheels are somewhere in the middle. Francis and propellor turbines are the most common reaction type; the Francis design is very similar to the innards of a centrifugal pump.
- Home built reaction turbines have been built using centrifugal pumps running in reverse (generating power with moving water instead of using power to move the water). We hope to have more information about experimenting with this soon.

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# Simple Home Built Waterwheel

This machine was built by a neighbor of ours in about 2 hours, 6 years ago. It's been in constant operation since, except when the creek is frozen. He chose a natural dam, which was created when a tree blew across the creek. The tree is approx. 20" diameter. A slot was cut in the tree to channel the water into the turbine. The turbine was made from a junk squirrel cage fan. The fan housing was bolted to the tree, so that the water poured into the "output" of the fan, and came out a hole which was cut in the bottom of the fan housing, making for an "undershot" waterwheel. He used the pulley which was already on the fan, and belted it to a surplus computer tape drive motor (the kind they used to use in large computer tape drives, check our Products page for availability). The gear ratio is 1:3-- the generator turning 3 times faster than the water wheel. They make excellent low rpm generators. This system charges 2 amps into a 12 volt battery, 24 hours per day! His only power needs were 2 lights, and a small car stereo, the water wheel provided more than enough. It doesn't work after the creek freezes(4-5 months of the year), and he simply lets it freeze over each year, without any apparent damage.



It's easy power, cost next to nothing to build, and is low maintenance. The front bearing has failed twice (once every 3 years), but no effort was made to keep water out of the bearing--doing so might fix this problem. 2 amps may not seem like much, but consider the cost of solar panels required to produce 576 watt hours per day! Simple improvements could certainly be made to make a machine like this much more efficient. It uses a normal V belt, which introduces a lot of friction and loss. I don't know for sure, by my guess is the V belt may suck more than half the available power here. Gears, or a smaller belt would be interesting. I don't believe he ever took the time to try different pulley combinations either, it's possible there is room for improvement. Since we have been experimenting with them, it seems like a homebuilt wooden alternator or induction motor converted to an alternator (see our experiments page for more information) would work more efficiently by charging at lower rpm. Considering all the room for improvements, it's reasonable to think a unit like this could provide twice or three times the power. 50 watts, 24 hours per day would be an incredible amount of power considering the cost, low maintenance, and only about 20" of head on a small creek.

Other simple undershot waterwheels have been made using 55 gallon metal or plastic drums with attached vanes, suspended above a river. Please let us know about **your** experiences with home built hydro power!

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# INTERNAL COMBUSTION

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Alternative energy can be expensive. The system that meets your needs 90% of the year could cost a fraction as much as the system that will always provide more energy than you need. Even with an excellent solar array and wind power supplement, there will be times when the sun doesn't shine for weeks, and the wind won't blow. In order to keep your batteries from cycling too much, a gasoline backup is usually wise. On this page we'll show some systems at work.

A good gas backup should be quiet, reliable, and efficient. Unfortunately...this sort of machine is very difficult to find these days. Only in the last couple of years has anyone put effort into building a commercial generator designed specifically for charging batteries. This is surprising considering how much research and development has gone into solar panels, windmills, etc. Most generators today are designed to run 120VAC appliances; most of them are loud, and all the affordable ones are lightweight, cheap, and not designed for the long haul. Using a normal 120VAC generator to charge batteries is terribly expensive, requires frequent maintenance, is generally loud, and not very efficient.

There are a couple of alternatives....

## Find an antique!

[Click here to check out our antique Maytag battery charger!](#)

My favorite option, and it should not be difficult for most folks with some mechanical inclination to find an old lightplant, restore it to usable condition, and make good use of it for many years. Keep in mind, most of these antique lightplants were built for daily use. Properly maintained, they could run a lifetime with very little trouble. Check out my 1930's Delco below...

[<Save this link for an MPEG movie of this charger running>](#)

Delco made lots of these in the 20's and 30's. When I got mine, it was seized. The cylinder and valves looked like they came from the bottom of a lake! I spent one afternoon beating the piston loose, lapping the valves, and making other small modifications. It runs well now - although it could certainly use a good valve job. Although this machine was designed for 32 volts, it starts and runs well on 12 or 24



volts. Mine runs well on gasoline, but seems to prefer kerosene, or diesel. Its good for about 25 amps at 12 volts, and consumes a little over 1 pint of fuel per hour( a little less with kerosene, a little more with gasoline). Surprisingly, it seems to run best of all on citronella tiki lamp oil, which is probably mostly kerosene. And we've had



no mosquitos around for months now! Electric start makes it convenient. It runs slow, under 1000 rpm, so with a good tailpipe and muffler, it's very peaceful to have running. It weighs in somewhere around 300-400 pounds, and the size of the castings/bearings/brushes etc. almost guarantee that it should run, and stay put, forever.

## Build your own!

Something as simple as a small lawnmower engine belted to a car alternator can do a wonderful job of charging batteries very efficiently. Most lawnmower engines have crummy mufflers...this is real important, noise pollution is intolerable. It is best to use an oversized engine...run it slow and gear up the alternator. It will run quieter, and last longer. 5-10 horsepower is a good match for a 30-50 amp alternator. Watch for more information about this here soon. Home Power Magazine has had some excellent articles about building one of these.

## Buy a New Dedicated Gas Battery Charger

These chargers are a commercial version of the home built model we discussed above. We have not tested any of these chargers, but are VERY relieved that other people are as frustrated as us with the maintenance, noise and inefficiency of charging 12 volt DC battery banks with a 120 VAC generator.

We know of 3 companies that manufacture dedicated gas battery chargers. Check out [wildernessenergy.com](http://wildernessenergy.com), and [epowerchargerboosters.com](http://epowerchargerboosters.com). We congratulate these companies for their foresight, and urge you to check out their products! We will be testing them out soon.

## Buy a normal generator

The least desirable option in our opinion, but may be your only choice if you have a 220 volt AC well pump or do not have time to work on an antique or build your own. Click below for more information about regular 120/220 volt AC generators.

[Click here to read about regular gas generators \(AC\)](#)

[Click here to read about AC battery chargers](#)



[Click to read about our homebuilt AC battery charger](#)

[Click to read about electric alternators and generators](#)

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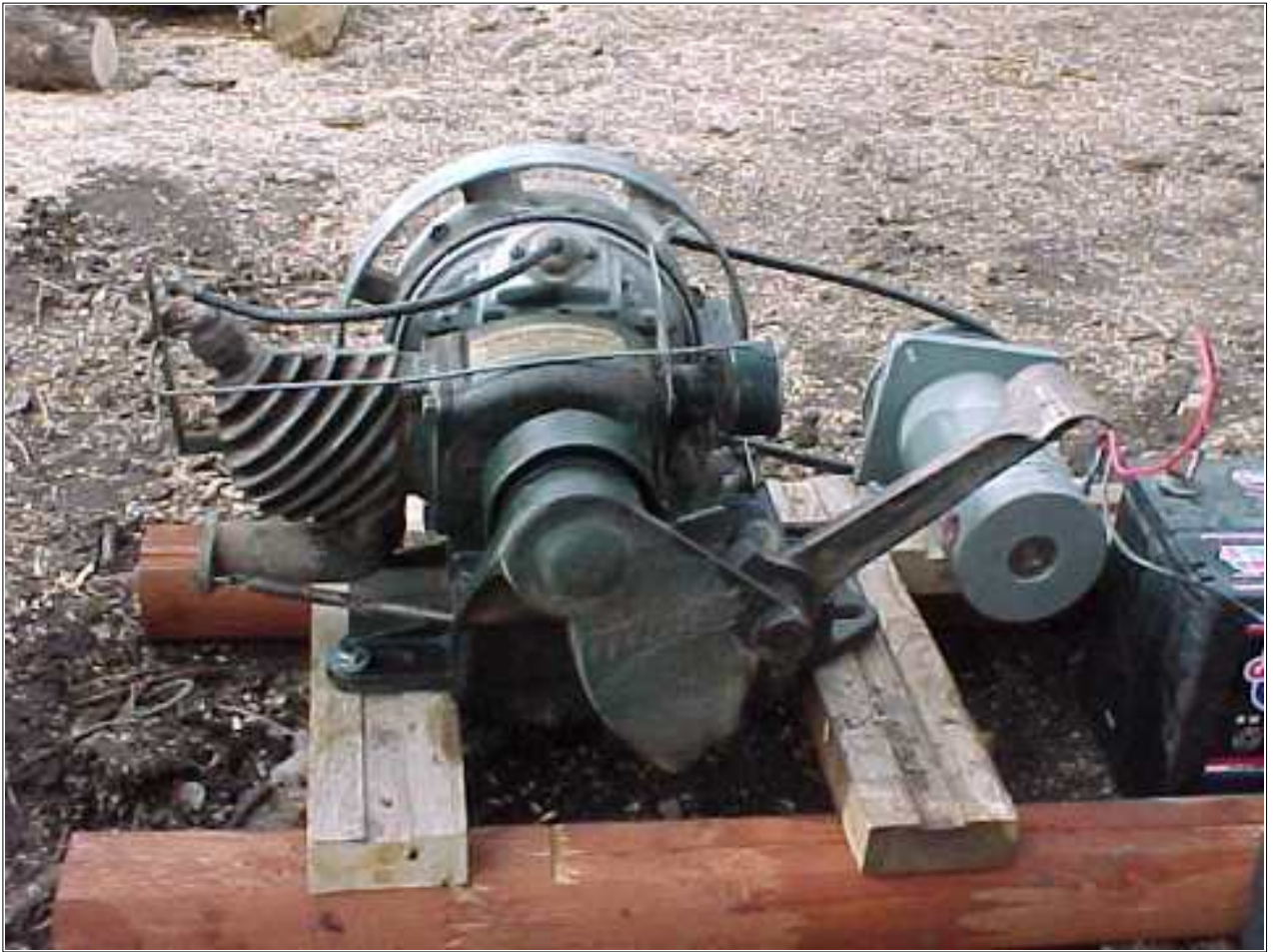
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# Maytag battery charger

This page features a small battery charger we built from an old "antique" Maytag gas engine, and a computer tape drive motor. We only spent about an afternoon on this one, so lots of room for improvement probably exists.



These motors were popular back in the 1930's, and were built by Maytag, mostly for use in washing machines, although other accessories were available to be used with them, including a small battery charger, similar to this. I found this motor at a local "flea market", and they can be easily found. If interested, a good one can usually be had from Ebay for less than \$200! These are 2 stroke motors, with an interesting governor. When the engine comes up to speed, a centrifugal governor breaks a contact in the ignition, preventing the engine from firing. When idling, the engine will hit about once per second, about once per every 6-8 strokes. When under load, the engine will fire however often is required to maintain speed. Neat looking, and sounding engines, they are also very reliable and easy to start. All these Maytag engines have kick starters.



The base is made from treated posts and 2X4's held together with lag bolts. The generator is one of those old computer tape drive motors which make excellent low rpm generators. We try to always offer these on our products page, but if none are available, they can usually be found on Ebay. Although not yet tried, good chance this whole charger would work better with an alternator or an old car generator for reasons which I will explain later. The generator has a 5" pulley on it, the gas engine has a 4" pulley, stock for the Maytag engine. This setup works reasonably well for charging 24 volts, but when hooked to 12 it bogs down the engine too much and it dies. To fix this, a higher rpm generator could be used, or a larger pulley would do, probably 6-8" diameter on the generator.





In conclusion, with a well tuned engine and the right pulley combination this unit should do a fine job of charging at about 150 watts. There are certain drawbacks to both this type of engine, and the generator we are using. The engine is a two stroke, they tend to be noisy and inefficient, but..they sure are cute, and fun to watch. Maytag engines are an excellent value where antique engines are concerned. They are still easy to get parts and support for. The tape drive motor we are using makes a fairly good generator, with the right sized pulley. The drawback, they don't cool very well, and if run for extended periods at full output (about 15 amps) they will get hot! An improvement might be to use an old car generator or an unregulated alternator and use an appropriate field resistor to properly match the load to the engine. Although not "ideal" a charger like this could easily be used to recharge small systems or car batteries. A more efficient design would probably be a modern 4 stroke engine (like a briggs from a lawnmower) and an alternator. That sort of setup could easily provide 500 watts or more, and might even use less fuel! Let us know if you have any comments or questions about this project! We are always experimenting with odd ways of making electricity and love to hear input on that matter!





What in the world could all those magnets be doing stuck to that big flywheel? This could be our next inefficient gas charger!

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# EXPERIMENTS

We at Otherpower.com have always been in a quandary...we have more time on our hands than money, and remote power equipment is *expensive!* That's why we started making our power from scratch! The experiments presented here are not to be interpreted as "plans" or "kits"--they simply show what we did, and how it worked. Some of these experiments worked well, some were partially successful, and others were complete failures! But we hope that our experiences will provide a good starting point for your own experimentation. **If you have any experiments that you would like to share, please contact us by [Email](#) or post on our [Discussion Board](#).**

**WARNING!! These experiments are things we and other people have done. We are serving only to share free information and take no liability for the dangers imposed should somebody attempt these experiments at home. Most of these could be dangerous! If you are unsure of the dangers involved, DO NOT try any of these experiments! Always wear eye protection and gloves. FAILURE TO INITIATE AND FOLLOW YOUR OWN SAFETY PROCEDURES MAY RESULT IN BODILY INJURY OR DEATH! Possible hazards include high and low voltage electrocution, large items spinning very fast that could remove your head, high towers, power lines, battery acid, explosion danger from hydrogen or propane gas, and faulty wiring causing fires. IF YOU ARE NOT SURE, DON'T EVEN START!!!!!!**



## [10/10/2003 -- The Triplets -- 3 new 10-foot diameter dual-rotor brake disc wind turbines!](#)

These 3 nearly identical machines are built with the same design as the mill at the Caboose (5/20/03, below) but we streamlined the construction process significantly and built 3 machines at the same time -- Curly, Moe and Larry. These are the latest of our designs, and they perform great in low winds. Detailed DanCAD drawings and dimensions on this page.



## [Hamster-Powered Alternator](#)

Skippy the Hamster is Forcefield's newest employee! We custom-built a low-rpm permanent magnet alternator onto his exercise wheel, and he lights a night light at DanF's house. We installed a data acquisition computer on his wheel too! And of course this simple alternator, buildable by kids, would work for wind or hydro power experiments and science fair projects too.



### [5/10/2003 -- New Brake Disc Mill](#)

9-foot dia prop, furling tail, 3-phase, separate laminate assembly with excellent specs. Many improvements over our previous designs! Spins up and makes power freely in low winds, and governs itself in high winds.



### [5/20/2003 -- Dual Rotor Brake Disc Mill](#)

Up and flying at the Caboose. Excellent low wind performance with 10 foot prop, great furling system.



### [DanB's Homebrew Volvo 240 400-watt Windmill](#)

One of our older designs, but still functional. No furling system.

### [Choosing Alternators and Generators for Wind Power](#)

A guide to help you figure out where to start for your application...



### [Ward's Homebrew Volvo 400-watt Windmill](#)

One of our older designs. 7-foot prop, no furling system.



### [Volvo 140 Disc Brake Alternator](#)

One of our earlier designs.



### [The Wood 103](#)

The infamous "Wood 103," a 100-watt windmill made entirely from wood--and from scratch! You can also download our entire Home Power Magazine article [here](#).

### [Regulator for PM Alternators](#)

Uses the Lenz effect to change alternator wiring from series to parallel and back. Not a very practical design, but a great demonstration.

[Windmill Testing with Model A](#) Our windmill testing rig--a 1930 Model A Ford! Cool video.

[Converting Motors Into Alternators](#) How we have converted AC induction motors into permanent-magnet alternators



### [The Wood A-X](#)

Sequel to our infamous Wood 103, this all-wooden 200-watt wind genny uses sturdy ball bearings. One of our older designs, but we are working on a new version.

### [Surplus Tape Drive Motors](#)

How to use surplus tape drive motors for wind and hydro power

### [Homebrew Easter Egg Anemometer](#)

A very quick and easy project for accurately measuring wind speed. Good science project for kids, too!

### [OOPS! Always Tighten Your Cable Clamps](#)

How a very small oversight caused a major disaster while raising a windmill on a 40 foot mast! No humans, dogs or pickup trucks were hurt.



### [Homebrew Wind Generator](#)

Uses an AC induction motor converted to a permanent magnet alternator



### [Homebrew Wooden Alternator](#)

A very powerful permanent magnet alternator built from wood, and from scratch! We use it as a demonstration unit at our retail magnet store!



### [Science Fair Wind Generator](#)

A bunch of ideas for building tiny wind generators for science projects.



### [Anemometer made from Bicycle Speedometer](#)

Very simple and easy to build! Uses a standard, inexpensive bike computer to calculate wind speed and acquire data, including maximum gust, wind miles, average speed, and hours of wind. Built using our pre-made anemometer cup assemblies so it goes together fast.





### [Homemade Waterwheel](#)

Built from a surplus squirrel-cage blower and a surplus tape drive motor



### [Maytag Engine Battery Charger](#)

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# 10' Diameter Brake Disk Windmill

With Furling Tail



This page is a diary about my latest wind turbine experiment from June of 2003. Although a bit more complex, it features some significant improvements over the brake disk turbines I've made in the past. All the machines I've made in the last two years featured a single magnet rotor with steel laminates, and coils in between. This one is using two magnet rotors turning together with the coils in between. It has some advantages in that there is no loading on the bearings, and no losses in the laminates so it turns very freely. Be patient, there are a LOT of pictures detailing the construction [here](#).



Yesterday my freind and neighbor Dave came up to start building a wind turbine for his small power system. Currently he's got 2 105 watt solar panels setup which do OK, but his site is not excellent for sun. He does have a pretty good wind site up the hill from his caboose. His system is 12 volts, so were building the machine for that.





As usual, we started with some Volvo parts (just have too many around....). We're using the front strut assembly off a Volvo 240, and two 11" diameter brake disks which fit the wheel hub. This machine will be very much like the last one I made. [Click here](#) for more details about that. The main change we're making here, is that this will be a dual rotor machine. The tail will also be slightly larger and longer. It should be slightly more powerful at lower rpm than mine was, we're using slightly more magnet and exactly the same 3 phase stator design as I did last time.



To make the furling tail assembly, I cut the strut about 6" from the wheel spindle. We want the spindle (and therefor the alternator and the prop) to be offset from the tower about 5" to the side.



I ground it out so its a good fit for welding. It will be welded on at an angle to provide more contact between the two pieces making the joint stronger. I also like to weld it on so that the spindle (and therefor the alternator and the prop) is pointed up about 2 deg to help keep the tips of the blade away from the tower.





Pictured above you can see what I described a bit better. You can also see the wedge I was setting up on the back side to hold the tail pivot out at about 20 deg.





I like to cut the brake rotors down so that there is a slight lip (about 1/16 inch) to hold the magnets in. This helps a bunch too in spacing the magnets out evenly later. Pictured above Dave is doing this on the lathe.



Here Dave is learning to run the lathe and his friend Fred is cutting up various metal pieces which we'll need.



This is how the brake rotors look after cutting them down to make a lip on the outside which holds things together. I don't think this step is necessary - but it's easy and provides some insurance against magnets flying loose. It also makes a nice clean flat surface to put the magnets down onto.

You'll notice that the rotor on the right side has a larger hole in the middle than the one on the left. We turned it out a bit so that this rotor could actually fit on the back side of the wheel hub! (where I put the stator on past machines...). This way the back rotor sits behind the wheel hub with its magnets pointing forward towards the stator.





Here Dave is struggling with strong magnets trying to lay them down with about a quarter inch between each one. They kept sliding together - he was getting a bit frustrated! These magnets are 2" diameter X 1/2" thick. They go down with alternating poles up. Were using 12 of these on each rotor. Once they get placed down and approximately evenly spaced, we used playing cards as shims to make sure the space between each magnet was exactly the same. Its kind of trial and error, but it goes very quickly. Once they are right - a few spots of super glue on each magnet holds them in place untill we pour polyester resin around them.





Since this is a dual rotor machine, the stator will not be able to bolt on in place of the backing plate like I've done in the past. The stator will have to be in between two rotors, and held on by a bracket which ties into the outside of the stator. These are the pieces I made up for this bracket. The bracket will actually bolt on in place of the backing plate (to the strut assy behind the wheel spindle). These 3 pieces are cut from 3/16" thick X 3" wide steel, and they are 7" long.



Above you can see how those go together. After this we drilled holes in the center to bolt it down, and a large 1.75" dia hole in the center for the wheel spindle to pass through. We also need to drill holes out at the ends to accept allthread so we can mount the stator to it.



Pictured above Dave is winding up some coils. Just like my last one, each coil occupies the space of about 1 and 1/3 magnets (so 3 coils take up space occupied by 4 magnets, so there are 9 coils in the stator). Its 3 phase, so each phase consists of 3 coils in series.

The coils are made up of 65 windings of AWG 14 wire.



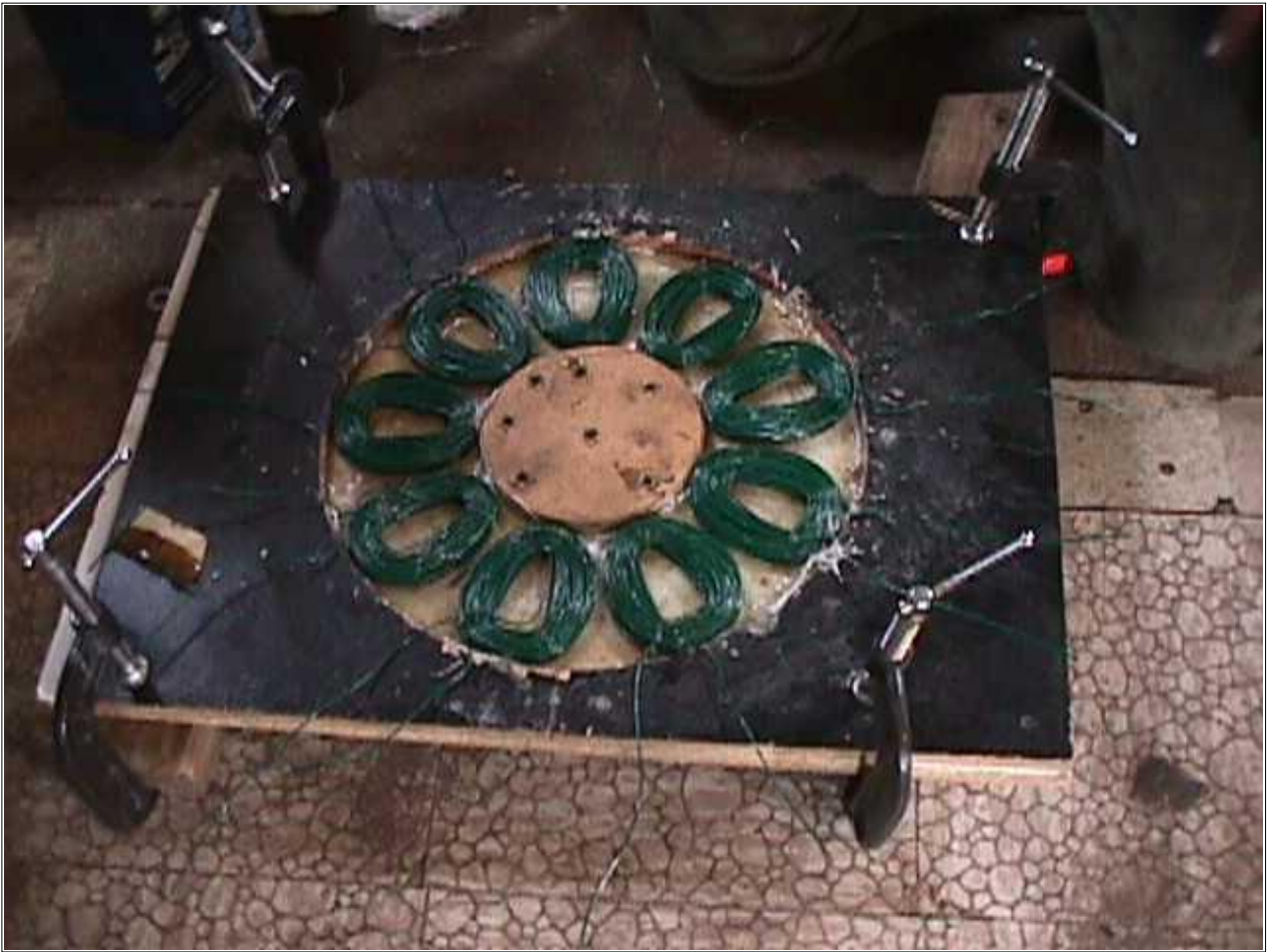


Here Dave is putting duct tape around the inner and outer diameters of the magnet rotor. This simply serves as a "quck and dirty" sort of mold, so that we can pour the resin around the magnets and it hopefully wont run out the sides!





Pictured above is the mold we made for the stator, and we're putting some fiberglass fabric in the bottom to strengthen it.



We first poured a bit of resin in the bottom of the mold (got the fabric saturated) and then placed the 9 coils in. Then we cover the coils with more fabric, and pour resin over those and put the lid on the mold.



Here we are pouring resin (mixed with talcom powder) into the magnet rotor. Well have to make 2 magnet rotors, but for now we're just doing one. It is possible the alternator will work OK with only one magnet rotor and the other rotor simply serving to conduct the field of these magnets (like laminates except itll be rotating) - so were not doing the 2nd rotor untill we test the alternator. We may even decide to use different magnets on the 2nd one.



Pictured above the main chassis of the wind turbine is pretty much together. You can see now how the stator bracket bolts on. The tail boom is 5' long.





Here you can see the magnet rotor, and the stator mold while the resin sets up. The battery serves as a weight to hold the top of the mold down tightly.



After about 2 hours we opened the mold and took the stator out.



Above you can see how we replaced the studs in the wheel hub with long (10 inches) pieces of allthread. The allthread will serve to hold the magnet rotors, and the prop securely to the wheel hub.





That's where we were at after 1 day (About 8 hours of work). You can see things starting to come together! It should be said, this machine is very similar to the one we built at the [SEI Wind turbine workshop on Guemes Island](#) in April. It's very much along the lines of Hugh's [Axial Flux Windmill Plans](#). If I really wanted a guaranteed good machine, I'd probably follow them to the letter, but I like to play with junk I have on hand and experiment a bit. I should also say - again, we have about 8 hours into this so far, and I believe we'll have it completely finished in about 20 hours. But it might come out a bit cleaner, prettier - and possibly a lot better if we took a little more time on certain steps. Time will tell! It's fun though, and since I have limited time to put towards this sort of thing, and Dave only has a few free days available, we're trying to move things along quickly.





Here we were putting allthread and nuts into the stator bracket to hold the stator on. The allthread is 1/2" diameter with 13 threads per inch.



Pictured above you can see the notch in the tail hinge which determines the angle of the blade during normal operation and when it's furling in higher winds. We reinforced the pipe around the notch to make things stronger, my guess is it might crack eventually if we didn't.



Here Dave is putting the stator on over the first magnet rotor. It's interesting to note here... with one magnet rotor on the machine, and the 3 long pieces of steel allthread which hold the stator on, that the magnets are somewhat attracted to the allthread and at this point the machine cogs a bit. When we attended [Hugh Piggot's seminar in Guemes Island](#) in April, we used stainless bolts for this, so the magnets would not be attracted to it. I kind of wondered if this cogging would get worse with the 2nd magnet rotor on (since there'd be twice the magnets and the top rotor might be getting attracted to the nuts on the front of the stator)... or better, since the magnetic circuit would be completed and the lines of flux would be concentrated between the magnets. As it turned out, when we did put the 2nd magnet rotor on the front of the stator this cogging disappeared completely. I was planning to replace this steel allthread with stainless, but as it turns out I think it is not necessary.





Here we're gluing magnets on the 2nd rotor. It is very important that the 2nd rotor line up perfectly with the 1st one. In other words, wherever we have a North pole facing out on the 1st rotor, we must have a South pole facing it on the 2nd rotor. Keeping in mind that there are 5 studs which hold the 2nd rotor on, we have to take care to position the magnets exactly. What we did, is put the 2nd rotor on without any magnets, and made some marks around it noting the position and polarity of the magnets on the 1st rotor. We then positioned the magnets on the 2nd rotor accordingly. This worked out well.





Here we basically have the whole alternator together. At this point we could spin the alternator by hand. We're getting about twice the voltage at any given rpm now with two rotors than we were with only one before. We didn't have a tach, or even a clock with a second hand.... so no real numbers yet. But it seems to be hitting cut in voltage (12 Volts) perhaps a bit below 100 rpm.



We soldered all the connections on the stator and made 6 lugs (2 for each phase) from brass screws and brass nuts. It can get tedious stripping all the ends of the magnet wire, a good way is to burn the insulation off with a propane torch, and then sand it lightly.



Here the alternator is pretty much done, and the tail is finished! The tail occupies between 5 and 6 feet of area. (If you look real close at the ammeter on the wall, you can see that my [last wind turbine](#) is putting out about 40 amps. It was a breezy day!)





I drew up and cut out the profile for one blade, and Dave is tracing it onto blank boards in preparation for making the other two. The wood here is 6/4 (an inch and a half thick) Eastern White pine, and it's 7.5 inches wide. It's pretty lightweight, but fairly dense and strong. We have a couple knots to work around here, but not too bad.





Here Dave is cutting out the blades on the bandsaw.



Since the blades get very thin (in this case about 3/8") at the tips, it saves time to remove some of the thickness of the board with the bandsaw.



Pictured above we are roughing out the front of the blades with the draw knife.





At the end of the 2nd day we had the front side of the blades roughed out. Each blade is 5 feet long, for a total diameter of 10'. The pitch at the tips is 5 deg, and it gets steeper to about 6 deg in the middle of the blade, at which point it gets steeper quickly towards the root (near the hub) until we pretty much take up the whole thickness of the board. No real scientific blade design here, just going with what feels good and what's worked fairly well in the past! I've since been advised, and will do this next time - to reduce the pitch at the tips of the blades to something like 2 deg. This would make it a bit faster and a bit quieter.





Here we are finishing up the front of the blades with a power planer. We did most of the work with the draw knife, but the power planer does nicely to finish things up quickly.



While Dave was planing on the blades I made up a cable with lugs on it and wired the alternator in Delta. For more details on Star, or Delta wiring and 3 phase alternators, checkout Ed's 3 phase basics [here](#).



Here we are roughing out the back side of the blade (making an airfoil) with the draw knife.



Same as above, working over the back side of the blades with a draw knife, but here you can really see things coming together! This blade is nearly done.





Once the blades were carved and sanded fairly smooth, we put them together - measuring from tip to tip to make sure the distance between tips is equal. Then we used 10 inch diameter plywood disks, one half inch thick, and screwed one on each side of the blades with a ton of wood screws to hold them together.



This is a simple tool I made to go with the machine. Notice my beautiful welds... (I have one of those cheap 120 AC mig welders which barely work on good power. Up here I have to run it off my generator which stalls quickly when I start welding. Welding here is very frustrating...)

Once you get two magnet rotors like these made up, and close to each other, it become impossible to pull one off without a tool. This makes the job easy. It should also be said... one of these rotors is a very powerful and dangerous thing! Two is twice as bad... anything that gets between them gets smashed. This tool does a nice job of removing the front rotor, but it's not so useful for putting it on gracefully! On this machine we've simply been lining it up and letting it snap into place which works fine as long as you keep your fingers clear! (I did get my thumb in there and my thumbnail was the only casualty. I think I got lucky...) Better would be for me to weld a nut right in the center of the front rotor and then we could use this same setup for smoothly lowering the front magnet rotor onto the alternator.



Here is a picture of the wheel puller in action. It doesn't pull it quite straight, but it does a good enough job to make it very easy to pull the rotor off by hand once it's a few inches back.





We pulled the whole thing apart in preparation for painting. Here you can see all the alternator parts on my workbench.





Here Dave is putting primer on the machine. First we ground off some of the uglier welds and then cleaned it carefully with gasoline to remove any oil.



That's pretty much where we wound up at the end of day 3! We used wood stain on the hub and tips of the prop, and on the tail. The rest is good old Avacado green epoxy appliance enamel just like on my last machine. At this point we need to make adjustments in the airgap, get some wobble out of the magnet rotor on the front, balance the blades and test it!





Here Dave is soldering up 6 bridge rectifiers we'll need in order to convert the 3 phase AC current into DC current useful for charging batteries.



We made a short tower that fits the front of my truck. In the end, this short tower will go on top of Daves (probably wooden) tower down at the caboose. The machine weighs too much to lift it up this high, so we had to disassemble it, and reassemble it on the truck for testing.





It was a pretty good calm day for this sort of testing today, although the more I do it the more I'm starting to take this sort of data with a "grain of salt". We get pretty consistent readings at higher speeds, but lower speeds (like 10mph) come in all over the place. When testing like this, I have a 12 volt battery on the floor of the truck, a volt meter, a frequency meter, and a DC ammeter. The frequency meter always gives numbers that bounce around and I don't trust it fully, but the numbers did seem to make some sense this time, so I'll write down the rpm as we got it and it may.... or may not be right! This battery was about half charged - and we ran the power to it with about 20' of AWG 14 extension cord (I figured this kind of simulates a longer line from the windmill to the battery made of better wire, plus... it was handy). When we do this, we always run one way down the road at a certain speed, turn around and go the other way at the same speed - so that we can kind of average the numbers out. Even the lightest breeze will cause it to do much better one way than the other.

So here's what we come up with roughly in the truck test...

Our neighbor Tom is in the Volvo pacing us (his speedometer works... mine doesn't) with his flashers on to warn oncoming traffic.

It starts charging at around 110-120 rpm and the frequency meter in the truck was in agreement with the tachometer I used on my workbench.

At 10mph we were getting readings ranging between 5 - 20 amps, 10 amps seemed a pretty good average, so a little over 100 watts. At 10 mph the frequency meter didn't

seem to be working so we got no rpm readings. (we later found it a wire had come loose)

At 15 mph it was producing about 15 - 20 amps consistantly both directions. At 20 mph 25-30 amps, and it was just starting to furl. At 20 amps output it seems to be running right around 400 rpm. At 30 amps output it's running right at 500 rpm.

At 25 mph we seemed to be getting around 30 - 35 amps and it was furled out some all the time.

At 30 mph we got consistant readings of 37-40 amps and it was quite furled out by this time (I'd say it was at about 45 deg to the wind). At 37 amps output we recorded around 550 rpm.

I've certainly seen higher numbers from past machines which did not furl before - but I don't think I've ever done so well at very low windspeeds, which is what's important. Output could be increased I think by adding weight to the tail (so it furls a bit later) and making a better stator. I think it's fine as is though. It runs square with the wind - the tail seems of fairly reasonable size and overall it runs pretty well. I like the double rotor design, it's a bit more work than others I've made, but it has 0 load on the bearings, and 0 losses in the laminates. I can give this alternator a good spin by hand, and then walk across my shop and give one of my old laminate alternators a good spin. The old ones will rotate once or twice and then stop... this one will keep turning for 10 or 20 seconds. Time will tell how it holds up! Sure was fun though. We've got 4 days into it now since we started with the front strut assembly off a Volvo and all that's left to do is get it into the air down at the caboose.

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# 9' Diameter Brake Disk Windmill

With Furling Tail



This page is a diary about my latest wind turbine experiment from May of 2003. Although a bit more complex, it features some significant improvements over the brake disk turbines I've made in the past.

[Para Español, traducción de Julio Andrade.](#)





This is what I started with. It's the front strut, brake and wheel assembly from a Volvo 240. The Volvo parts are good, and since they are rear wheel drive this front assembly is simple and inexpensive from junk yards. They also built these cars for about 20 years, so the parts are easy to come by. Volvos are somewhat heavy cars, so the bearings are large and the brake disks are larger in diameter than most.





Above are pictured the important parts. The spindle and strut tube will make up the main frame of the wind turbine. The blade will bolt down to the front of the brake disk, where the rim used to fit on the car. That stator shown below will replace the backing plate that used to cover the back of the brake rotor. Of course the machine will use the wheel hub, and the strong wheel bearings from the car. I take some care to inspect the used bearing, clean it and grease it again. Normally in the past I've used the same brake disk that came with the assembly. In this case, I noticed that the front brake rotors from the Volvo 740 (a heavier car) were a whole inch larger in diameter (11 inches), and they fit over the same wheel hub, so I aquired the larger brake disk off the 740 for this project. It's important to consider when disassembling these struts that the spring is under some tension! One should compress and clamp the spring.



This wind turbine has a furling system so that in high winds the alternator and blades will turn sideways out of the wind and protect itself from overspeeding. To do so, the tail must raise. The weight of the tail ultimately determines when the machine can furl. This seems to be the most popular furling system on small home brew machines, and the idea has been perfected by Hugh Piggott from [Scoraig Wind Electric](http://www.windstuffnow.com). Go to his site, or [www.windstuffnow.com](http://www.windstuffnow.com) for details about how this system works. In this case, the center of the alternator sits about 4 inches off to the side from the center of the mast. I did this by cutting the strut tube off at about 4 inches from the wheel spindle and welding it onto the side of the remaining tube at somewhat of an angle. The tail will pivot over a 1 inch diameter pipe which is welded to the assembly at an angle of about 20 deg from the mast.





Above is another picture of the same assembly.

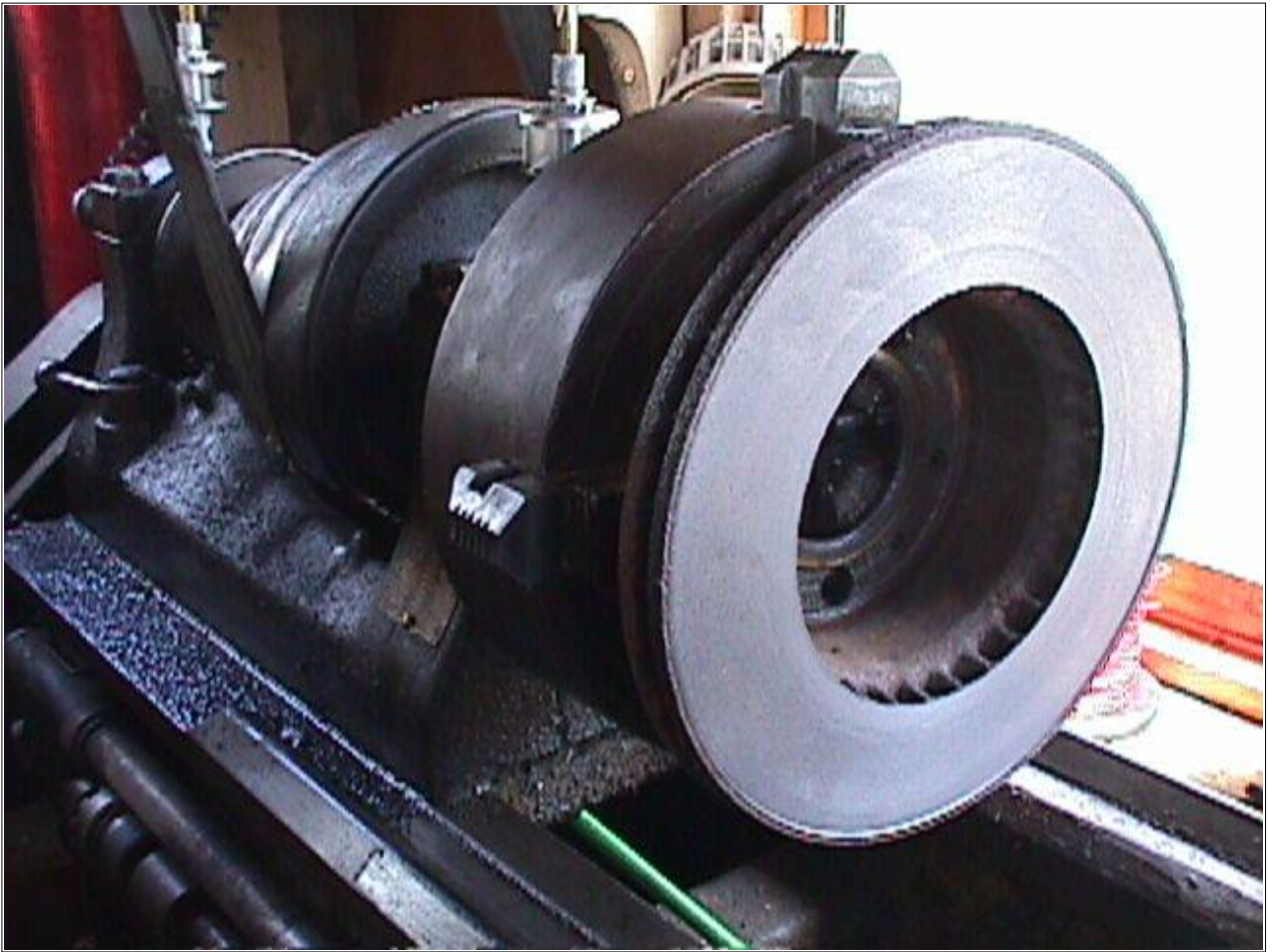


The tail is shown above. Actually - when I got 'round to testing this the tail came up too small and too light weight. I wound up making it slightly larger in the end. The end which attaches to the wind turbine is a short segment of pipe slightly larger than the 1 inch diameter pivot, which is welded to the main frame of the windmill.





Above is pictured the main frame, with the tail mounted. I painted the metal frame with green epoxy enamel to prevent rust and keep things looking as nice as possible.



Although probably not necessary, I like to cut a bit off the back of the brake disk from the inner diameter, almost all the way out to the outer edge, but not quite. This leaves an edge, about 1/16 inch high, which catches the magnets to help hold them in. It also leaves a nice clean flat surface. Since the magnets will also be glued and held in with some polyester resin, it's important after cutting this to clean it and make sure it's oil and iron filing free so the resin sticks well.



Pictured above are the magnets I used. This machine has 12 magnets, each one is 1.8 inch diameter and 1 inch thick. They are available on our web [Shopping Cart](#).





The magnets lay down on the brake disk such that each one has the opposite pole facing up as the one next to it. Alternating North and South poles all around the disk. I push the magnets all the way out to the lip I cut and space them approximately by eye. Then I use shims (playing cards) and go 'round the circle so they are perfectly spaced. The space between the magnets here is about 1/2 inch (or exactly the thickness of 49 playing cards).

I think the leakage (magnetic field which is going from magnet to magnet before it has a chance to go through the coils) between these 1 inch thick magnets is significant. More space between them would reduce that, it is also possible that thinner magnets (like 1/2 inch) might even work as well, or better. Once the magnets are spaced evenly, I wrapped some tape (duct tape) around both the inside and outside of the brake rotor so the edge stuck up about half an inch, creating a dam, or cavity in which I could pour polyester resin to glue the magnets down and keep the space between them. I wish I'd caught a picture of that.





I made a simple hand cranked coil winder.



I tested lots of coil shapes and sizes. Lots of things worked, but through lots of testing and some good advice I wound up deciding on this wedge shaped coil. The coils are wound from AWG 14 wire, and each coil has 60 turns. They are 3/8 inch thick, and the width (I never measured it) is such that exactly 3 coils fit over 4 magnets. Unlike the past machines I made which were single phase, this one is 3 phase. This setup seems to squeeze a bit more power from the same magnet rotor and also offers some benefits in reducing line loss. The alternator will also run more smoothly as 3 phase, meaning basically less vibration. Since there are 12 magnets, I need 9 of these coils and 3 coils will be wired in series to make up each phase.

The inside of the coil winder is waxed (I used crayons) so that glue wont stick to it. After the coil is wound, and the top removed from the coil winder, I put thin viscosity cyanoacrylate 'super glue' in the coil and spritz it with accelerator which hardens the glue instantly. This makes for very hard, strong coils that don't come apart easily.





Pictured above are the coils, and the magnet rotor (the magnets are not glued down yet, actually I never did that till the very end and never got a picture of it finished).



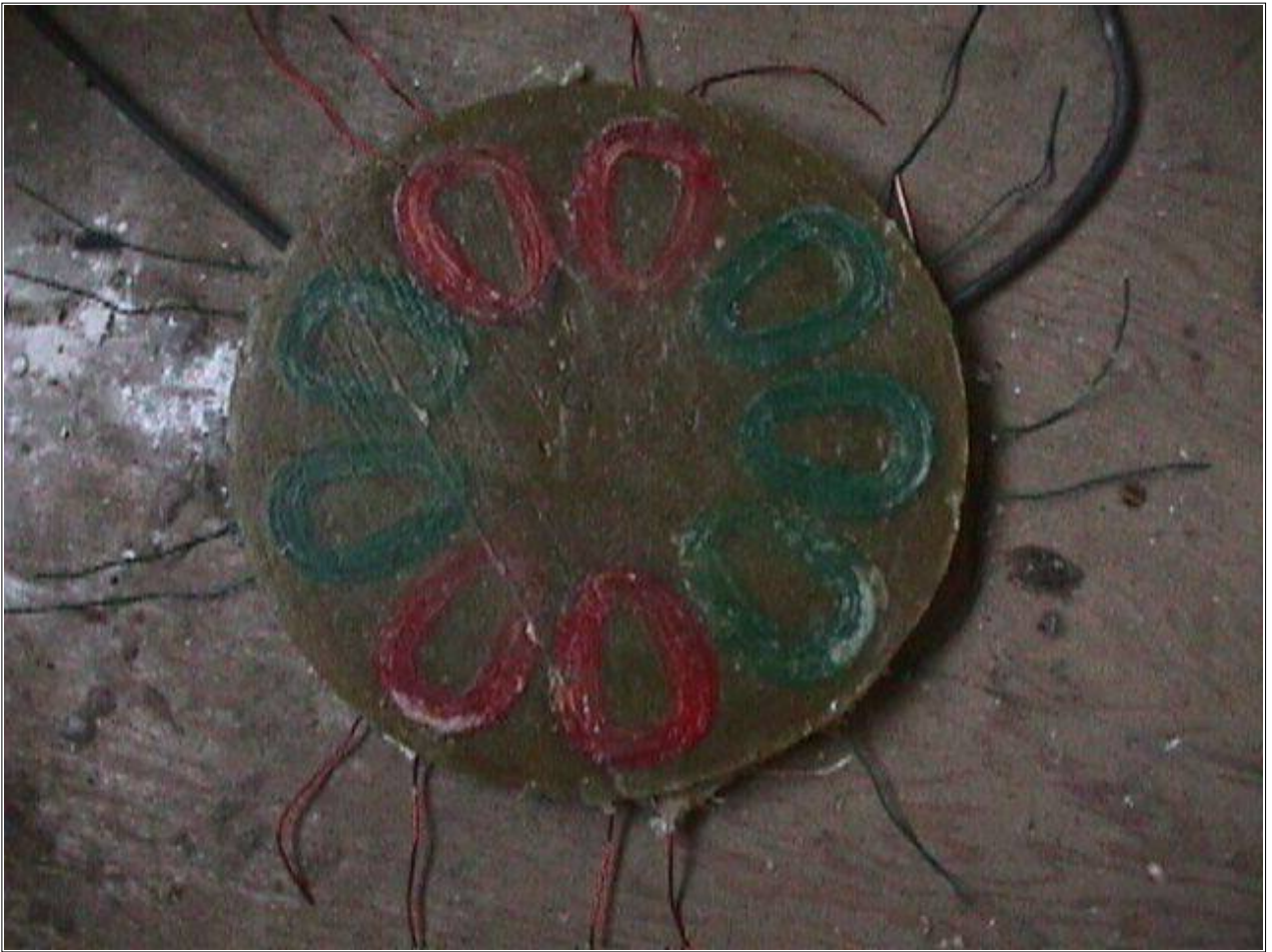
I made a mold out of partical board. The circle is 14 inches in diameter and I divided it into nine parts and drew lines so that I know where to place the coils. The top of the mold is the cutout from the bottom. The mold is 1/2 inch thick. I waxed the mold so that the resin would not stick to it. Once I place the coils and pour the resin, the top will get clamped in, and the wires from each coil will poke out the edge so all the wiring will be done later.





I cut two disks of fiberglass fabric about 14 inches in diameter. I put one down in the bottom of the mold before placing the coils. Then I put down a thin layer of polyester resin. I then put each coil in its place. I took care to make sure each coil is placed the same way. In other words... when the coil comes out of the winder, it has a top, and bottom side. I made sure they are all the same way so that the inside wire of the coil (the start) and the outside wire (the end) come out the same for each coil. Although not absolutely necessary it makes for much easier wiring later on. Once all the coils were placed, I filled up the mold with polyester resin mixed with talcum (baby) powder. The powder makes the resin go further and makes things a bit stronger. Once the mold was filled I put another fiberglass fabric disk over the top, and poured over some straight (no talcom powder) resin. I thin clamped the top on the mold with the wires poking out.

The reason for the red, and green coils is simply that I ran out of magnet wire! The green stuff is extra high temperature wire rated for about 400 deg F, and the red is less - but it will work fine.



After a couple hours I opened the mold and the stator is pictured above.



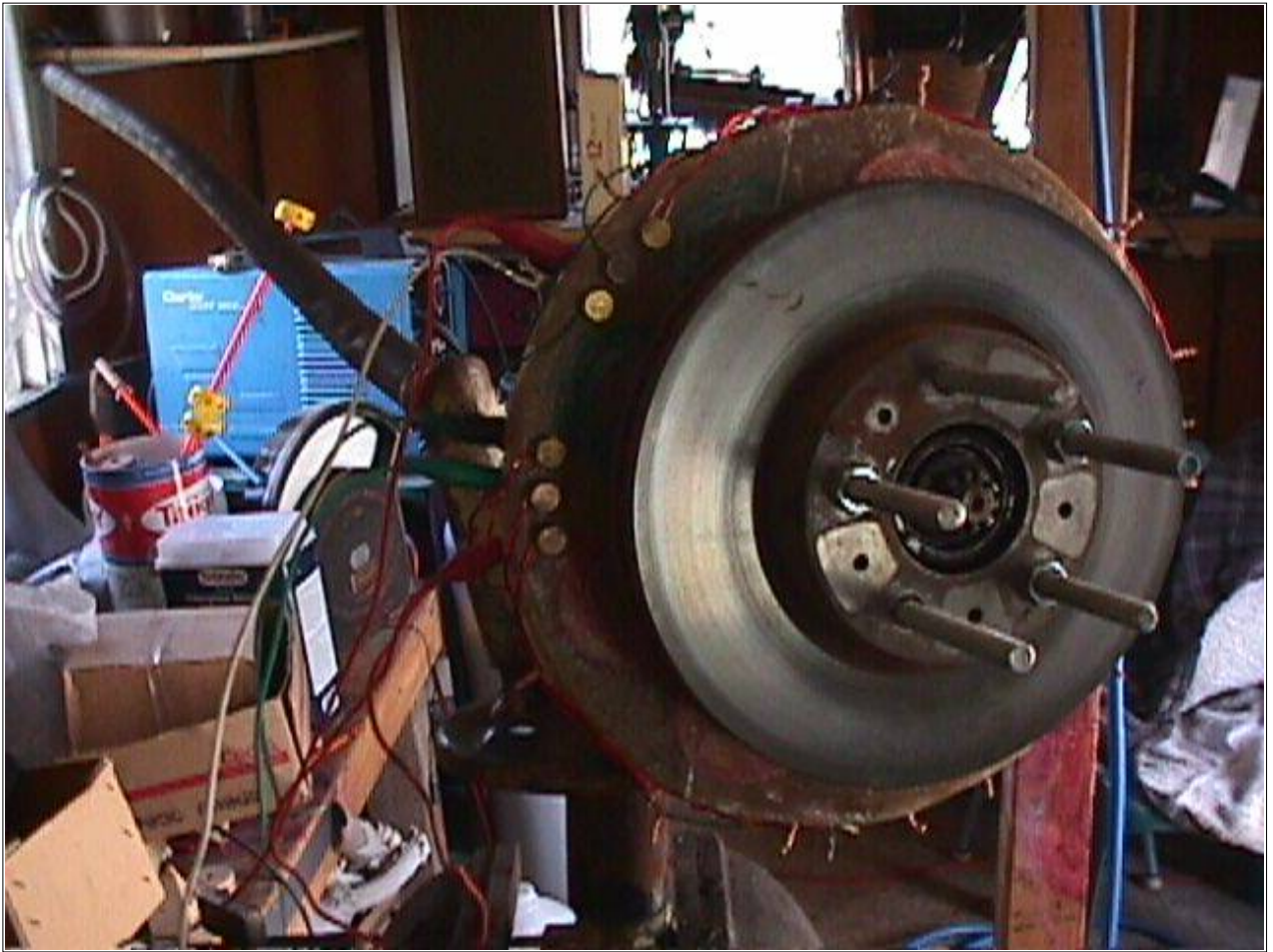


You can see in the picture above how the center of the stator is drilled out the same as the backing plate. The center hole has to be a bit larger (2.5 inches) so that the bottom of the wheel hub will fit inside it. The mold could have been modified to leave this hole in the stator and it would've saved some resin, but it was easy to use a hole saw and resin is cheap. On past machines I've made, the back of the stator was plywood, and steel laminates (which help to conduct the magnetic field through the coils) were glued into the plywood. The coils were glued over the top of the laminates, and the plywood bolted to the windturbine frame. A problem I had was that the laminates were getting yanked out of the plywood by the very strong magnets. In this machine, the laminates will be a separate part which simply lay (stuck there by the force of magnets alone) behind the stator. Or, with a smaller and faster prop it would probably run just fine without laminates at all.

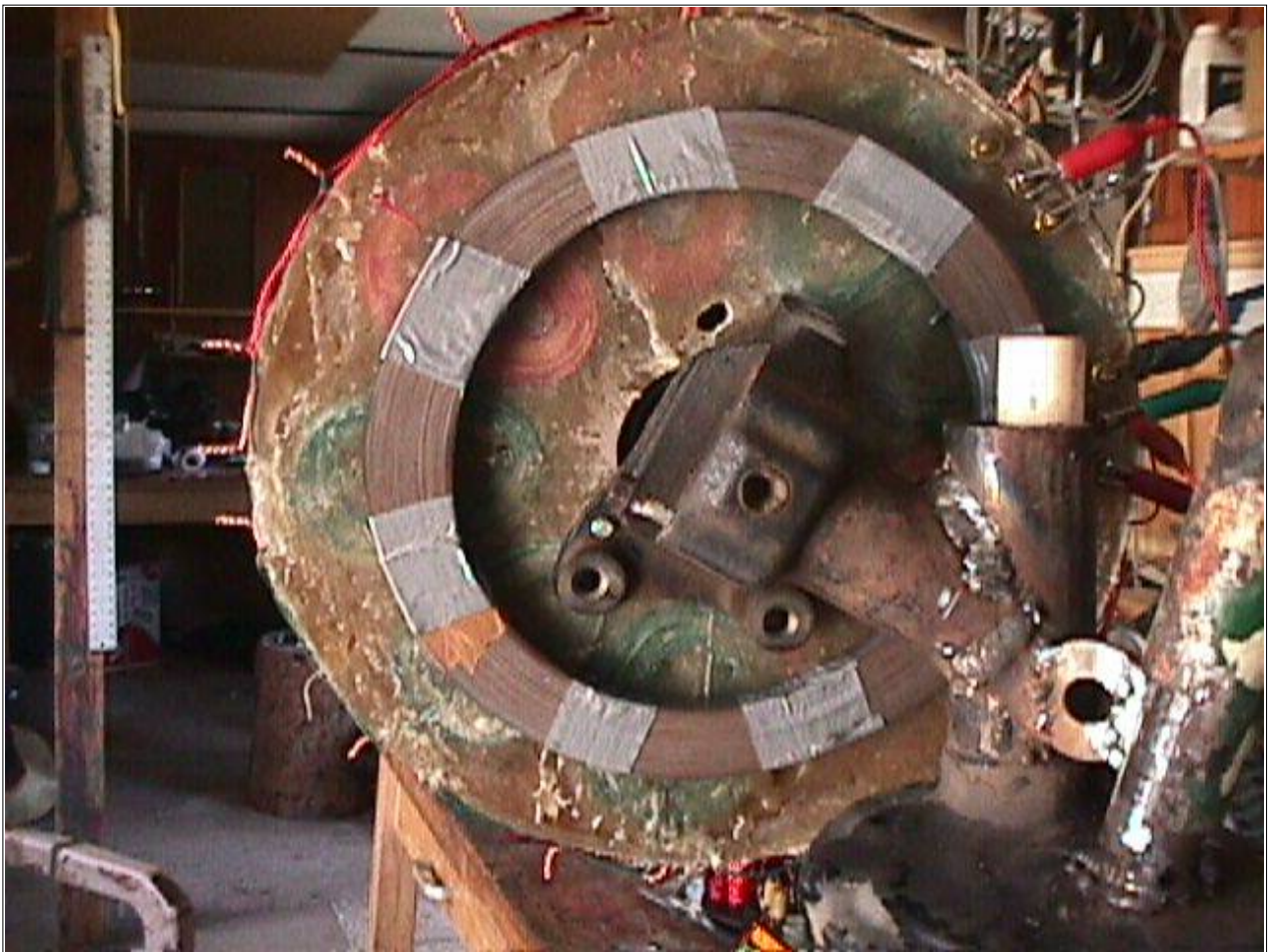


Pictured above is the stator bolted onto the machine. I've also got the wheel hub on here. You can see how the studs (where the lugnuts used to go) have been replaced by longer (7 inch long) pieces of 1/2 inch allthread. The studs were pressed in, and are easily knocked out with a hammer. The allthread is held on with nuts on each side, and then another nut is used on each one to hold the magnet rotor out the proper distance so that the magnets run very near (about 1/8 inch) the stator.





Above the whole machine starts coming together so that I can wire, and test the alternator. I used 6 brass bolts for binding posts to hook up the 3 phases. My intention with this alternator was to wire it in Delta.



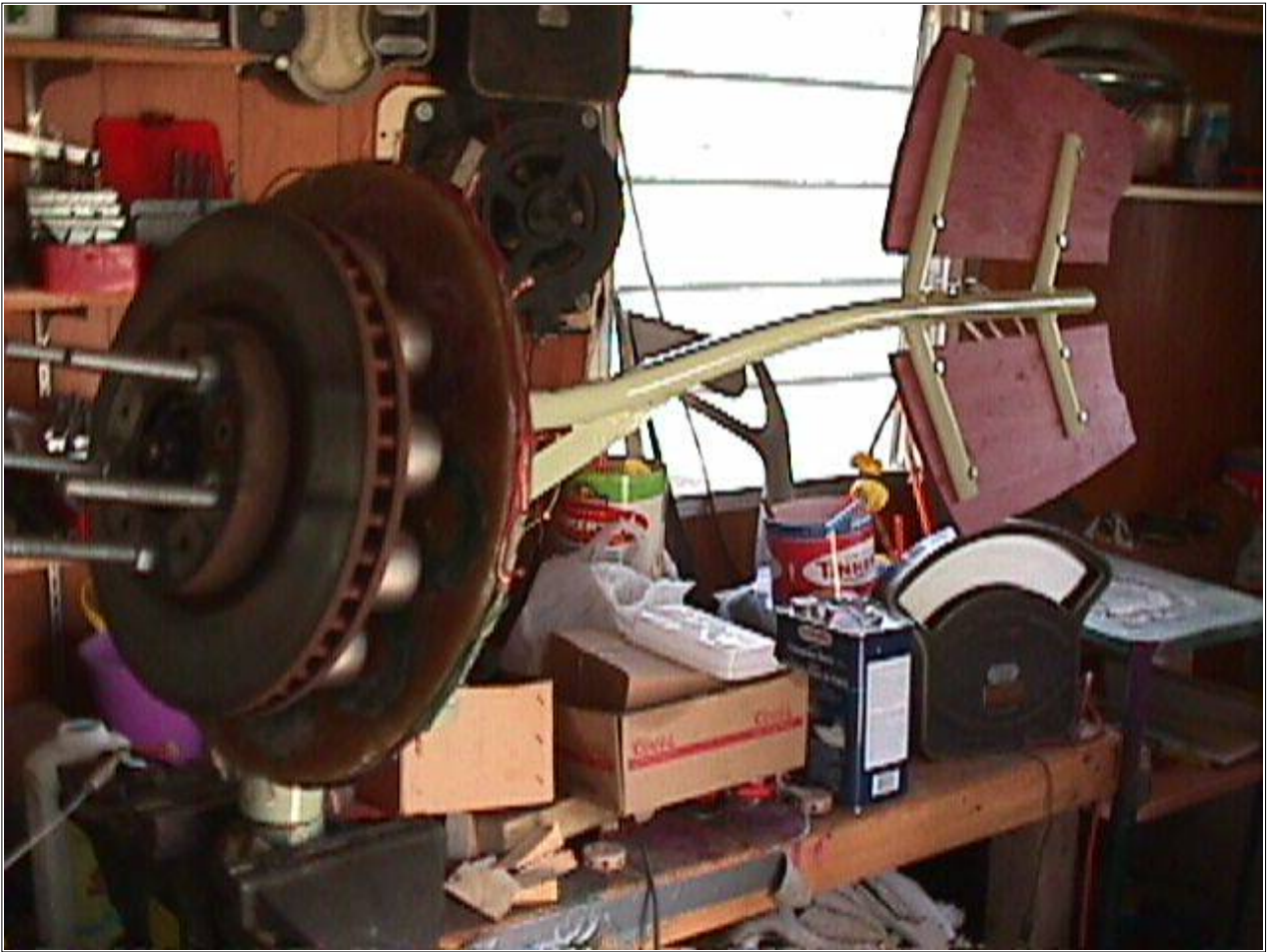
Here you can see how the laminates simply "stick" to the stator when the magnetic rotor is on. This is convenient, because it is easy to remove the laminates before removing the magnet rotor! It can otherwise be difficult to pull the magnet rotor loose when the laminates are built into the stator. Of course, this design with the fairly thick coils and removable laminates means I have a pretty thick airgap (distance from magnets to laminates). Past machines I've made could have much thinner coils and probably make slightly better use of the magnets.

The laminates I used here are actually a coil of very nice Silicon steel which I got from Ed at [Windstuffnow.com](http://Windstuffnow.com). Also go there for lots of good information on all aspects of building and designing small wind turbines.





Probably not necessary, but I glued the steel laminates into a plywood ring to make them easier to handle and prevent corrosion.



Here the machine is pretty finished up except for the prop. At this point I've got about 20 hours into the project if I don't count the mess I have to clean up later.





I made the blades from wood about 8 inches wide and 1.5 inches thick. Each blade started out 5 feet long, for a 10 foot prop. Here you can see I cut out the shape for one prop. Then I used it as a template and cut the others to match.



These are simple blades (as usual with me...). The tips are pitched about 4 deg, and the middle of the blade about 6 deg. From there it pitches steeper and steeper until the angle takes up the board thickness near the root of the prop. The airfoil is designed to do little more than 'look like an airfoil' and the thickest part of the airfoil is about 1/3 of the way back from the leading edge towards the trailing edge.

It'd probably work better if I designed it 'properly'. Hugh Piggot has some good information on this on his website [here](#) and Ed from [windstuffnow.com](http://windstuffnow.com) offers some nifty software which figures it all out for you!

I've seen several commercial machines which have very simple non-tapered, non twisted (straight pitch) blades which work fine, so it inspires to me to keep things simple.



Before doing any carving, I cut one slot with a cross cut saw at the point where the angle of the blade is steepest. This is insurance that I won't ruin the hub area of the blade with the drawknife should I make a mistake or have the wood split.





After attending Hugh's seminar this spring... the drawknife has moved to the top of my list as the favorite tool to use. Very fast, and very accurate. No need for a chisel and the only power tools were used for finishing. I roughed out the whole prop with this quickly and then finished it up with a power planer and a belt sander.





Pictured above the top of one blade is finished.



Here you can see the airfoil, and the back of the prop.



I rounded the tips to look nice, although later in testing I wound up cutting them off as the prop was too large and a bit slow.





The blades are sandwiched between two plywood disks and held together with a ton of screws. In the past I've used glue here, but I opted not to this time thinking that the screws, along with the tight squeezing that happens when the prop is bolted on would be good enough. This way if I ever need to replace one blade it will be easy.





Pictured above she's pretty much finished up on the nose of my truck for testing. When I do this I have a battery in the truck on the floor, some rectifiers, and meters so I can get a rough idea of how much it charges at certain speeds. This also allowed me to test the furling setup. In the first test it was clear the tail wasn't quite big enough or heavy, as it wouldn't run square with the wind and started furling at about 15 mph. The next morning I increased the tail size some and made it from thicker wood. As it is now - the tail is back about 36 inches from the machine, and it's about 4 square feet in area. It works reasonably well, although a bit larger might be better. I'm keeping it as it is because my tower is not so strong and I want it to furl early.

This is a big improvement from past machines, mainly in that it turns in practically no wind at all and the slightest breeze spins it up to charging speed quickly and quietly.

Past machines I've made wouldn't start till they saw a 10mph wind, and then it took them some time to spin up--so they were not nearly as responsive. The reasons for this improvement: the good laminate material I got from Ed, the 3 bladed prop, and the poor (wide) airgap (these laminates are not seeing near the magnetic field intensity as others I've made). It's always spinning even on a still day - and it seems to be making an amp or two at 7mph. At 10 mph it charges 12 volts at 8-10 amps. 15 mph I see about 15, and at 20 mph it's doing 30 amps and just starting to furl. At 25 mph it's furling out of the wind almost half way and doing about 35 amps and at 30 mph it's more than half way turned out of the wind and charging about 45 amps. I believe the power I'll get from this in very light winds will add up significantly and prove it to be a much better producer than others I've made, some of which actually had more powerful alternators.

In one test I added some weight to the tail. Although it was still somewhat turned out of the wind, it was producing about 60 amps at 30mph. So, if I add weight to the tail it will produce much more, but as it is it's less stress on my tower. I also think that the majority of the power I see from it will be in winds below 20mph so this is the area I'm concerned about.



Above is a good picture of how we test them on the truck. [Click Here](#) to see a brief movie of the truck test!





In this picture I'm tying it up so we can more easily navigate the trees on our driveway for the ride home. This picture does give a good idea of how the furling system works, as the wind puts force back on the blades it makes the machine want to fold up like this - but in order to do so the tail must be raised! So the furling system is a balancing act between the force back on the blades, and the weight of the tail.



This is how it looks now up on my tower with the blades cut down to 9 foot diameter and the larger tail. It's been doing well now for a few days, starting to turn below 5mph and definitely making power. It's definitely an improvement over past machines. I notice significantly less line loss due to the 3 phase power, and it generates in much lower windspeed because it turns much easier. To do it over again, changes I'd make would be a still larger tail, and/or... cut down the prop size maybe a bit more. I'm pleased with it though and will probably leave it as is. Can't wait to make the next one!

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# Water Pumping

Water pumping is a wonderful use for alternative power technology. Even if your ranch house is powered by conventional power from the grid, what about getting water to your cattle on the back 40? Windmills have been used for over 100 years for this purpose, but other alternative power methods are effective too. Really, ANYTHING is better than pumping water by hand, but gas powered generators are the worst of the bunch.

First, a word about **your well pump**. The standard well pump your well drilling company will install is usually a 220 volt AC model. If they tell you, "don't worry, your solar system will run this just fine if you add a 220 volt transformer," DON'T believe them! This has been a big problem with a certain well pump company in our area. Standard 220 well pumps are very inefficient, and the required 220 transformer wastes lots of power. A huge Trace 2500 watt inverter can only sometimes power one of these behemoths--even if the pump IS able to start, all your lights may dim every time the well pump kicks on, resulting in premature inverter failure. We recommend you avoid this sort of system if at all possible. The only solution if you have this sort of well pump is to run a generator to fill your cistern, or replace the pump with a variety suited to remote power. And if you have a remote power system, why be dependent on a gas powered generator for all your water? It will eventually leave you stranded without water, and usually at midnight when its 20 below zero outside. **Spend an extra 1000 bucks on a 12 volt deep well pump or a super efficient 120 volt AC model.** You can pump with your regular remote power system, your generator will last longer, and if it won't start when its 20 below zero, you still have water.

**The single 75 watt solar panel shown here pumps water to my house from a shallow spring.** It moves the water at 75 gallons per hour in full sun. The total lift to the house from the spring is 35 feet, the total horizontal distance is 480 feet. The pump is an inexpensive Shurflo pressure pump, controlled by a Photocomm controller and Linear Current Booster (LCB). There are float switches at the spring and at the cistern underneath the house. **No batteries are used**, but I installed jumper cable lugs at the pump so that I can hook up my truck battery to the pump for times of no sun (our cistern is only 150 gallons). This system has run for over a year now without any maintenance.

**In any remote water pumping situation, avoid using batteries if AT ALL possible!** Your water storage tank should be your battery--that is, your



system should pump water fast enough and your cistern should be big enough that you can last through as many days of no sun or wind as necessary. Batteries are a waste of money and resources in a remote water pumping system, unless you are planning some sort of specialized application.

**Home water pressure pumps**--For pressurizing your tap water, the best choice is a 12 volt DC pressure pump. These are inexpensive, efficient and reliable, and the pressure settings for turning on and off are built-in. They cost from \$40 to \$200. 120 volt AC versions are very inefficient, using far more power than necessary.

[Click here for information on our solar water system.](#) It uses one solar panel to pump spring water 480 feet horizontally and 45 feet vertically to our cistern under the house.

### Power for Water Pumping

- **Solar**--Solar technology is very well suited to pumping water, even more so than the traditional windmill. A typical system includes one or more solar panels, an efficient 12 volt DC pump, a controller (with float switches), and a "linear current booster" (more about this later). As long as it's daytime and the float switches show that the water source is not empty and the cistern in the house is not overflowing, the pump will run. The linear current booster allows the pump to run even if it's cloudy out.
- **Wind**--The traditional windmill is still useful technology. The pump is directly coupled to the wind generator. The only problem comes if there is no wind for a few days at a time, and with maintenance. The leather seals on this sort of pump wear out and require replacement. The Bowjon windmill system uses pressurized air to pump water, and requires very little maintenance. It can also be used to generate power. Other systems have been built using an electric wind generator, linear current booster, and pump, as described in the Solar section above.
- **Water**--Yes, water can be used to pump water. The device involved is called a "water ram." It uses your local stream's water pressure to move a fraction of the total stream flow uphill--as much as 30 times the total fall. Water rams can be purchased, or built at home with PVC pipe and valves. Look for more information on this here in the future.
- **Gasoline**-- A waste of resources. Avoid it if possible.
- **Hand Pumps**--Better than not having water, if you have no resources available. Or if you can get your kids to do it. Different hand pumps are available commercially (my grandma had one), or pumps can be constructed than run on foot power instead of hand.

**Linear Current Booster (LCB)**--This device trades voltage for extra current to start a pump. Electric pumps take more power to start up than they take to run, and the LCB takes care of this problem. It will allow your pump to start and run even on cloudy days.

[Click here for more information on Dan F's waterpump system](#)

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# Dan F's Solar Water Pumping System



[Para Español, traducción de Julio Andrade.](#)

**This solar water pumping system has been in service for over a year with zero maintenance. It supplies water from a shallow spring to our house, and is sufficient for a family of 4, plus dogs, cats and plants. Many principles of good system design were incorporated--the system has been a real time saver for our family. Previously, we filled our cistern with garden hose and a gasoline-powered pump!**

## **System Specifications:**

- Total Vertical Lift: 45 feet
- Total Horizontal Distance: 480 feet
  - **No batteries used!**
- Power Source: one 75 watt solar panel
- Pump: 12 volt DC Shurflo pressure pump
- Controller: Photowatt with limit switches and LCB

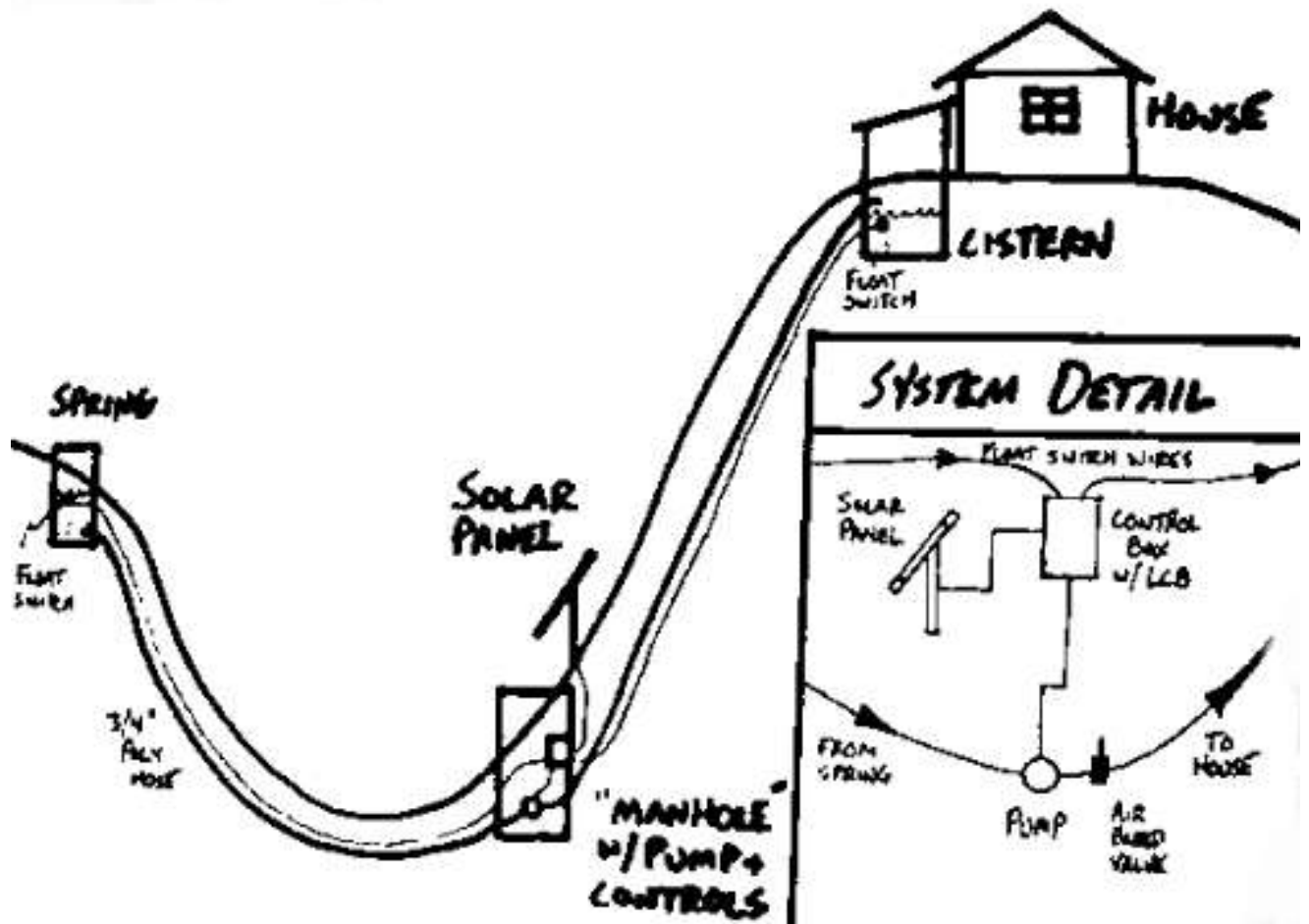
- Float switches were installed at both the spring and the house cistern. This way, if the spring runs dry or the cistern is full, the controller will shut off the pump.
- The controller's built-in Linear Current Booster (LCB) allows the pump to start up even on cloudy days. Without an LCB (solar panel hooked directly to pump) it would take full sun to start.
- All pipe is buried 4 feet deep. We added 2 extra runs of pipe so we can switch over if one run freezes.
- The pump is always under forward pressure, since it is in a valley below the spring. If the pump ever runs dry (due to feed pipe rupture or float switch failure at the spring), an air bleed valve was installed at the output side of the pump. Otherwise, air bubbles will make the pump cavitate and not work. This process was required upon initial pump installation, too.
- We added + and - lugs at the top of the "manhole" where the pump and controller are located. This way, if we are without sun for a few days, I can drive my truck down there and hook up jumper cables from the truck battery to fill the cistern.

**UPDATE! Both float switches failed during February 2001. That's only 1 1/2 years of life, and the switches cost \$40 each! This caused me considerable consternation--the root cellar was flooded when the cistern switch failed. The other switch up at the spring works only part of the time.**

**NEW UPDATE 12/03/2003 -- The manufacturer of the float switches, SJE Rhombus, found these pages on the internet, and contacted us out of the blue recently. They informed us that we are using the wrong model of float switch--the controller only switches a tiny amount of current in the float switches, but the model we got is made only for high-power loads that arc across the contacts. The retailer who recommended this model to us and who we purchased them from has been bought out by another company. *SJE Rhombus is sending us 2 new float switches of the proper kind, free of charge. We thank them for GREAT customer service!***

**[CLICK HERE](#) to see the details of why they failed, the reason the manufacturer does not recommend this model for this application, our cheap, home-built replacements, why THEY failed, and information and specs on the new switches that SJE Rhombus sent us that ARE made for this application!**

## System Diagram



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This page last updated 12/03/2003

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# Sistema Solar de Bombeo de Agua de Dan F

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Este sistema ha estado en uso por más de un año sin requerir mantenimiento alguno. Lleva el agua desde un manantial de poca profundidad a nuestra casa y atiende una familia de 4 personas además de algunos perros, gatos y jardín. Se han respetado buenos principios de diseño que le ahorran mucho tiempo a la familia. En el pasado nuestra cisterna era llenada via una manguera con una con una bomba de gasolina.

## **Especificaciones del Sistema:**

- Elevación a la vertical: 15 metros
- Distancia horizontal: 150 metros
- **No se emplean baterías**
- Fuente de poder: Un panel solar de 75 vatios
- Bomba Shurflo de presión de 12 VDC

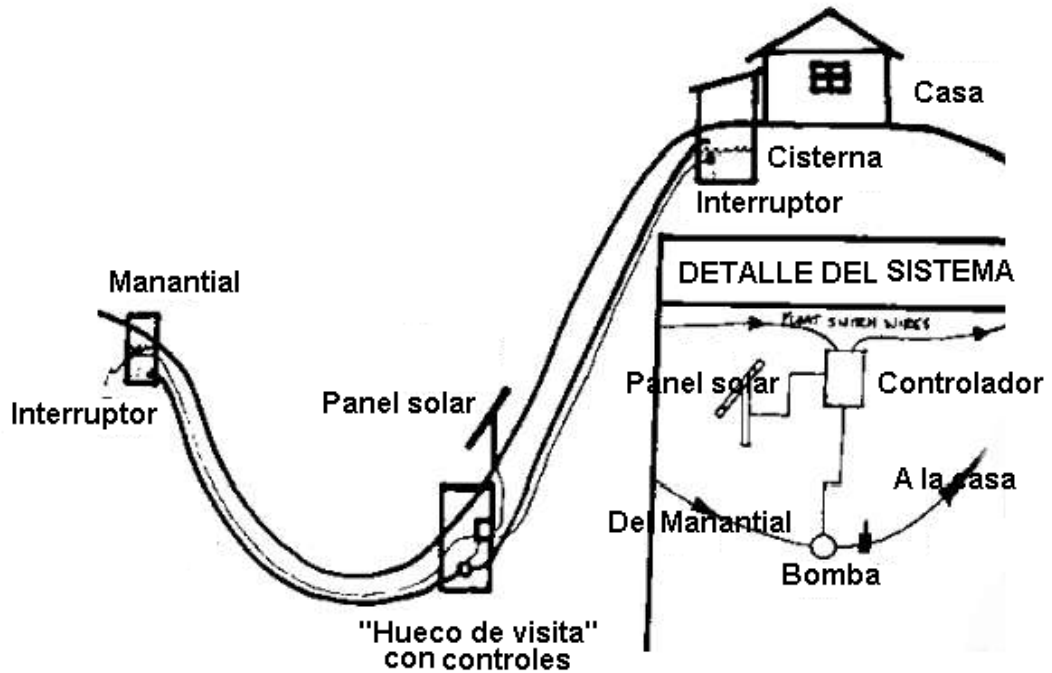


- Controlador Photowatt con interruptores de límite y LCB (Amplificador Lineal de Corriente)
- Interruptores flotantes fueron instalados en el manantial y en la cisterna. Si el manantial se seca o la cisterna se llena el sistema se apagará.
- El LCB hace que la bomba arranque aún en día nublados. Sin él el arranque sólo sería posible en día soleado.
- Toda la tubería está enterrada a 1 metro de profundidad. Se han tendido dos circuitos de tubos para el caso de que una se congele.
- La presión sobre la bomba es positiva, ya que está en un valle debajo del nivel del manantial. Si la bomba se secase (Por rotura de la tubería o fallas de los interruptores flotantes) se instaló una válvula de purga de aire a un costado de la salida de la bomba. Así evitamos cavitación de la bomba.
- Añadimos terminales + y – en el sitio de ubicación de la bomba y el controlador. Si no llegara a haber sol por varios días podemos alimentar el circuito de la bomba con la batería de mi camioneta.

**¡ACTUALIZACION!. Ambos interruptores fallaron en Febrero de 2001. Han transcurrido sólo 1 ½ años y los interruptores cuestan \$40 cada uno. Esto nos causa mucha consternación. El piso del sótano está inundado. El interruptor del manantial sólo trabaja de vez en cuando.**

**NUEVA ACTUALIZACION 3-12-2003. El fabricante de los interruptores, SJE Rhombus encontró estas páginas en Internet y se puso en contacto con nosotros. No informaron que estamos empleando el interruptor inadecuado – el que usamos sólo está manejando cantidades mínimas de corriente y el nuestro está diseñado para cargas completas. Nuestro distribuidor fue adquirido por otra empresa. *SJE Rhombus nos enviará dos interruptores nuevos gratis. Les agradecemos su excelente servicio post venta***

## Diagrama del Sistema



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MAGNETS

# Failed Float Switches and Home-Built Replacements

[Para Español, traducción de Julio Andrade.](#)

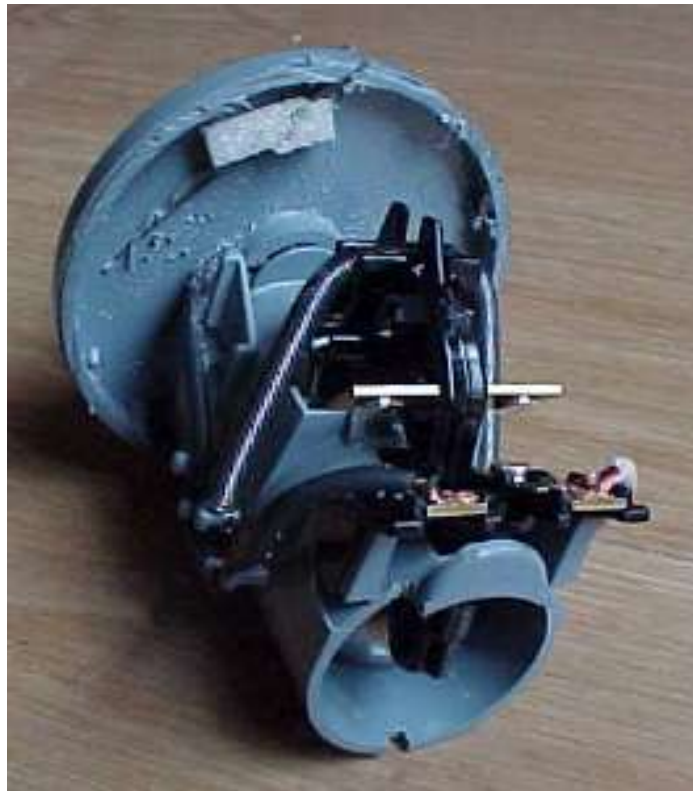


**These things cost \$40 each and failed after only 1 1/2 years! The reason why? The retailer sold us the wrong switch for our application....read on! The manufacturer, SJE Rhombus, has sent us 2 replacement float switches of the right kind, free of charge. Thanks for the great customer service, SJE Rhombus!**

I was quite distressed in February 2001 when these expensive commercial float switches failed. They are the standard variety found at farm supply stores; They were recommended and sold to us by a retailer who obviously did not know what they were talking about, and have now been bought out by another company.

The one on my cistern failed completely, letting the solar pump overflow the tank and flood my root cellar. The one at the spring continued to correctly and turn off the pump when the water level got low (whew...otherwise, if the pump sucked air from the spring instead of water, I'd have to remove all the fiberglass insulation layers, climb down in, and bleed the air from the line). But the switch also started failing to reset itself...so I'd have to hike up the hill to the spring through 3 feet of snow, open the spring house and manually shake the switch to make it reset. What a drag.





We cut open a switch to see why it failed

### **Why they failed (we think)**

Everything appears fine with the inner mechanism of the switch. No corrosion was noticed on the contacts. These switches were originally designed to be used for the direct switching of 120 volt AC pump loads. In my application, they are only switching a miniscule amount of power from the pump controller box instead of the whole load. We are guessing that the switch design depends on a tiny 120VAC arc to jump between the contacts every time the switch triggers.

**UPDATE 12/03/2003 --why they failed, from the manufacturer--**  
the float switch manufacturer, SJE Rhombus, has sent us 2 new replacement float switches, free of charge. They found this page on the internet and contacted us out of the blue. Our guess was correct -- the model of float switch we used (the PumpMaster) **REQUIRES** a 120vac load to arc across the contacts -- that's what keeps the contacts clean.

With the controller system I am using, only a tiny amount of DC current is used for the float switches to control the controller/LCB box. This tiny amount of current does not arc, and that caused the switches to malfunction. The replacement switches they are sending us free of charge are called the MicroMaster, and are rated for this application.

Thanks again to SJE Rhombus for great customer service.

### **Our Do-It-Yourself Float Switch**

We decided to try a simple, homebrew version. My home-built version uses a well made of 1 1/2 inch PVC pipe with a cap on one end. Holes

are drilled in the end to allow water in, but not let the float drop. The float is just a pill bottle super glued shut with a strong magnet glued to the top. The switch is a glass-encased magnetic reed switch that triggers when it is about 1 inch from the magnet. It is sealed inside a plastic soda straw and inserted through holes drilled in the PVC above the top of the tank (so the switch never touches water). I drilled a series of holes to allow easy calibration of where the switch turns on and back off by moving the reed switch up and down.



The finished float switch



## Magnetic reed switch



Float with magnet glued on top

So far the new switch has been very reliable. It took a bit of adjustment to get the magnet to trigger the reed switch without sticking to it and holding the float up when the water level dropped. All in all this was about a 2 hour project, including epoxy drying time. Total cost was ZERO for me, since all the parts were from my junk bin. New, the reed switch would cost less than a dollar, same for the magnet.

**Update 12/03/2003 --- well, after 2.5 years of service the home-built float switch finally failed. We actually received a couple emails from experts predicting that they would fail, and why. They were right! The reason -- after all those cycles, the big neo magnet in the float magnetized the tines of the reed switch. Eventually, after many cycles, the magnet now has to be much closer to the switch to make it trigger at all and shut off the pump. *The fix was easy -- I just replaced the reed switch at a cost of about 30 cents!* These homemade switches are still a good, cheap way to go -- just be sure to monitor your system and make sure everything is working right so you don't flood your water cistern room!**

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# Power Systems

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## How Cheaply Can You Get Started in Alternative Power?

We get asked that question a bunch. The cheapest, most basic system possible consists of simply an old solar panel and a truck battery, plus some Romex! That's how everyone up here at Otherpower got started in solar power, too. But for a higher comfort and convenience level, check out [Ward's Cheap Solar Page](#)-- We wanted to see how cheaply it could be done, and his *really nice* little AC/DC system came in at under \$800.

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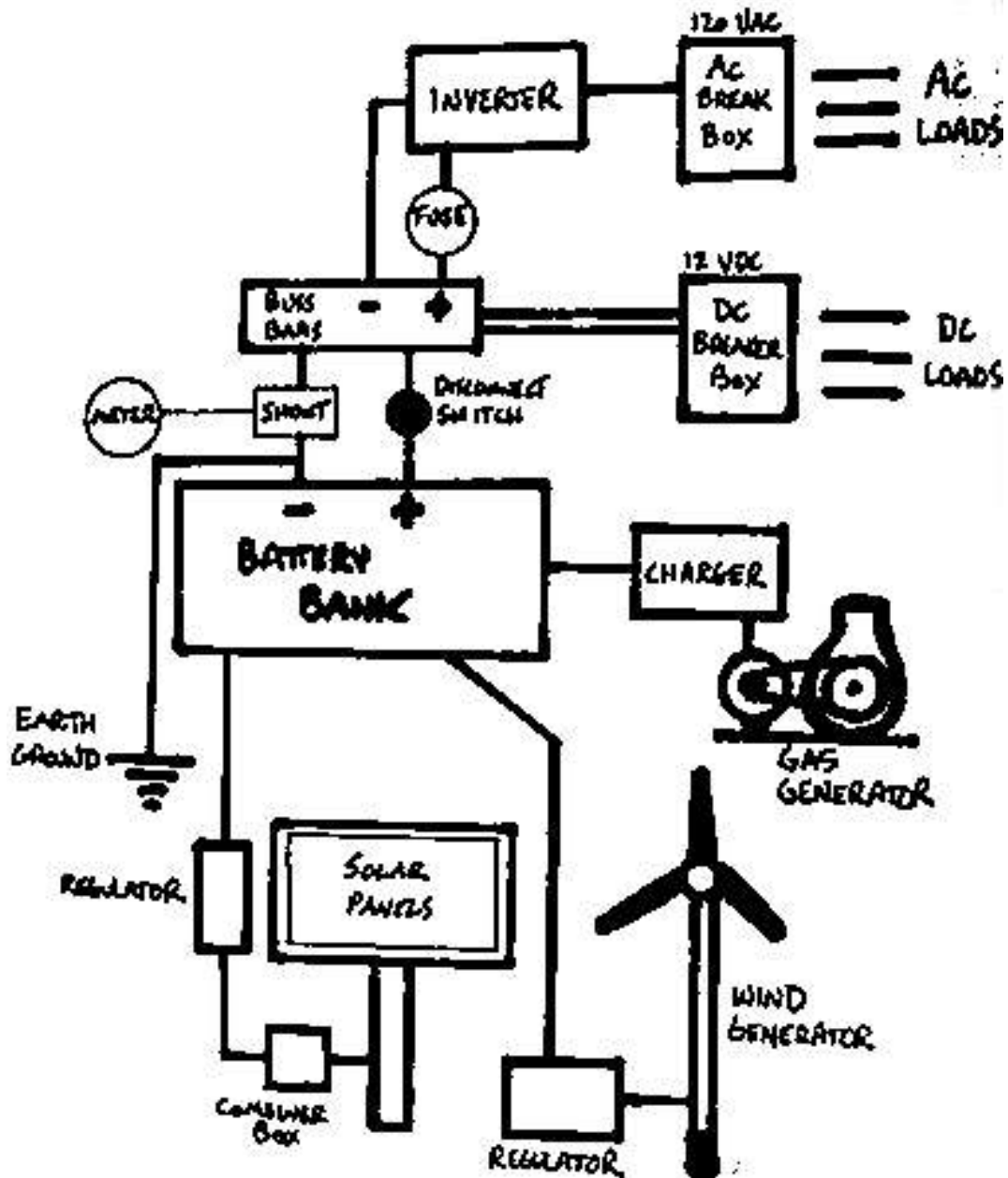
Here's a basic rundown on how a remote power system functions, and a diagram of a typical system. Click on any highlighted keyword to jump to a page about that subject.

First, your electricity is produced by [solar panels](#), [wind generators](#), [hydro generators](#), and/or a [gasoline generator](#). This electricity is usually in the form of 12 volt direct current (12 VDC). Some gasoline generators produce 120 volt alternating current (120 VAC), and require a [battery charger](#) to convert this to 12 VDC.

Your electricity then flows to your [batteries](#) through a charge controller, with a [meter](#) in the line to tell you what's happening with the system. The charge controller shuts off the charging current when your batteries are full.

When you run 12 VDC lights or appliances, the current flows from your batteries, through a meter and fuse box to your appliance. Devices that run off of 120 VAC take their power from an inverter, which converts the 12 VDC to 120 VAC. Inverters are available that can power your whole house through regular AC wall outlets, or in small versions that can run only one device at time.

Below is a diagram of a sample power system:



*This page is still in progress...we have LOTS of information to add!*

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# Ward's Cheap Solar Power System

We've been asked the same question over and over, ever since Otherpower.com was created: 'How cheaply can I build a solar power system?' The answer, of course, is 'it depends on what you want to run!' If you want to run a normal house in town off of solar, you're in for a investment of tens of thousands of dollars, thanks to a house that's almost certainly full of power-wasting, inefficient lights and appliances. But if you can start from scratch...that's a different story! The awesome little 7-sided log cabin Ward bought has *never* had an electrical system...in fact it was built back the 1960s using NO POWER TOOLS of any kind. The builder didn't believe in power tools...It's located only a mile from Otherpower.com headquarters.

**Total cost of Ward's cabin solar power system :  
Less than 700 Bucks!**



Ward thought carefully about what electrical appliances he needs to run at his new home. It's important to do this before planning and purchasing your power system! He's a bachelor, but still



wanted enough 'stuff' for a comfortable lifestyle. Here's what he came up with for essential items:

- **Lighting**--all lights to be high-efficiency. 120 VAC compact fluorescent (CF) lighting was chosen because bulb cost is so cheap compared to 12VDC CFs (\$50/ea for 12VDC, \$9/ea for 120VAC)
  - 120 VAC CF room light, 9 watt
  - 120 VAC CF light over kitchen counter area, 6 watt
  - 12 VDC halogen light in bedroom, 20 watt (this way he can turn off the inverter before bed to save power, and still have light to get back to the bedroom). Plus, halogen lights are better for reading
  - 120 VAC Halogen outdoor spotlight, 50 watt....there's bears, cougars, and rogue moose up here all the time. Better to see them first when you have to visit the outhouse at 3 AM!
- **TV/VCR**--We have about zero TV reception up here...so it's hard to waste much power on television. So Ward bought a little 13 inch color TV, rated 54 watts (though in normal use it draws only about 25 watts), and brought up his VCR from town. Winter nights up here are long and dark, and movies can save you from serious depression!
- **Boom Box**--Get the CHEAPEST one available. Why? Because *Fancy stereo/TV equipment that lets you turn it on and off with the remote will draw power even when it's turned off!!!* The inexpensive model he bought has a hard-wired on/off switch, and wastes no power (called a 'phantom load') when off.
- **Future Needs**--always remember to factor these in when designing a system! Eventually he might put in pressurized water (with a 12VDC pressure pump), more lights, etc.
- **Non-Electric Appliances**--these can save you lots of money on solar panels and batteries. The 'downtown' versions suck up electricity fast, but these simple alternatives are far more efficient.
  - **Refrigerator**--Propane, RV size. Less than \$200 used from an RV dealer, uses very little propane so it can be run off of 40 lb. portable tanks. Ward's road is too rough for propane trucks.
  - **Heating**--Woodstove, from Harbor Freight.
  - **Cooking**--Propane cooktop, used from an RV dealer.
  - **Water Heating**--A big pot of water on the woodstove!
  - **Plumbing**--Maybe a pressurized water system in the future, but just a sink with an outside drain and 5-gallon buckets for now.
  - **Outhouse**--The outhouse works just fine, is not subject to mechanical breakdown, and uses no electricity. TIP: During winter when it's 20 below zero outside, keep the toilet seat in your house near the stove, and bring it with you when you have to visit the outhouse!



**South Side of Cabin Showing Solar Panel.** Shading is from trees...Ward's planning on some chainsaw work, both for solar exposure and wildfire protection! That's DanF's dogs, Kodiak and Tarmac, in the picture.

## System Components

- **Battery Bank**--4 golf cart batteries. 6 VDC, 220 amp/hours, only \$45.99 each from Sam's Club. Wired in series and parallel, these give 440 amp/hours of storage. That's more than enough for the minimal loads in the cabin, especially when you consider that the owner is away from home at work during the day, giving the system time to charge back up.
- **Solar Panel**--BP 75 watt, from an internet distributor. \$310 new, plus \$20 for shipping. Wired to controller and battery bank with #10 Romex.
- **Solar Panel Mount**--Home built from 1 inch aluminum angle, adjustable for summer and winter positions. About \$20 total for aluminum stock, nuts, and bolts.
- **Charge Controller**--An industrial model from Jade Mountain, rated for 16 amps (to provide room for adding more solar panels later), and cost only \$62. Ward had to buy 2 fuse holders and 20 amp fuses, mount this controller on a home-made aluminum heat sink and build a cover himself....but for the price he'll be able to add 2 or 3 more solar panels without a new controller.
- **Inverter**--A 350-watt Wagan from Harbor Freight, only \$40. Includes fuse on main power

cable and overload shutdown. DanB has used one of these for a year, heaping abuse and neglect on it, and it's performed like a champ. The only drawback of this model is that the fan is on all the time, and produces a little noise. Ward plans to turn the inverter off at night, and during the day while he's at work.

- **Metering**--Cheap digital multimeter, only \$10. Not real accurate, but enough to determine general battery state of charge. Plus, the controller has an LED to indicate full charged condition.

## TOTAL SYSTEM COST: Less than 700 bucks!

Battery Bank -- 4 Golf Cart Batteries



Power Panel with Inverter and Charge Controller



BP 75 Watt Panel



---

**It would be impossible to power a home down in town with a system of this size...but this design goes to show that if you are conservative with your power use, realistic with your expectations, and thrifty with your equipment purchases, you can power up a home for under a grand. Just don't try to plug in that damn air conditioner!**



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**Folks who make electricity from scratch are on the cutting edge of low technology. Most of our ideas at Otherpower.com hatch from the previous experiments of many neighbors, friends and others who we have never met. The free exchange of information has made this possible--and it's truly amazing that this exchange is now worldwide.**

If you have a website that relates to alternative energy, remote power, experimental science, remote living or anything in between, please submit your URL using the form below. We'll review it and possibly include your link on our site. Personal websites are fine--you don't have to be a business! *All we ask is that you link back to us.* Any link that frequently malfunctions may be removed at our discretion. If you think your link is relevant and not covered by one of our categories, we are always open to adding more categories! And feel free to send in link ideas for sites that are *not* yours, also--we'll contact them for a link exchange.

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# Building a wind generator from scratch

Mostly...

Chuck Morrison ©2001,2002,2003

## Disclaimer

This publication is **not** a manual for constructing your own wind turbine. If you do so, you are on your own and incur all the risks yourself. Information included here is incomplete and may be misleading. You owe it to yourself to do your own research and understand these subjects thoroughly before undertaking such a project. I would suggest that you look into purchasing a prebuilt wind generator and save yourself a lot of time and money. It will still be a great adventure and our wind enthusiasts and entrepreneurs need your support. Please note that these documents are being created as I go along. Thus there will be information that is based on conjecture and inexperience. This means that some of it will be pigheadedly wrong, just plain not true or only partially true.

## Web Sites of the pros

For great information and a look at the old country see [Hugh Piggott's web site](#). My ancestors came from very near where Hugh lives now (is the wind the real reason the Morrisons left Scotland ?) .

[Bergey Wind Electric](#)

[African WindPower](#)

[Windmission workshop](#)

[Proven wind machines](#)

## Why do this crazy thing ?

I undertook building a wind generator simply because I wanted to. I'd been fascinated by them since the mid 1970s when I became aware of them through my reading about alternative energy sources. The romance of it struck a chord that has never stopped ringing. It was because of the challenge of learning new things and it seemed like fun, so I started. It has turned out to be very educational and very time consuming. It is an ongoing project that has yet to be completed. I include this narrative and photos because I didn't find much like it on the web and thought others might like to share the experience vicariously.



## **Contents:**

[How much energy can you get from small wind turbines ?](#)

[Building a set of blades](#)

[Acquiring a generator](#)

[Replacing Magnets](#)

[Rewinding the generator](#)

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# AIRHEADS

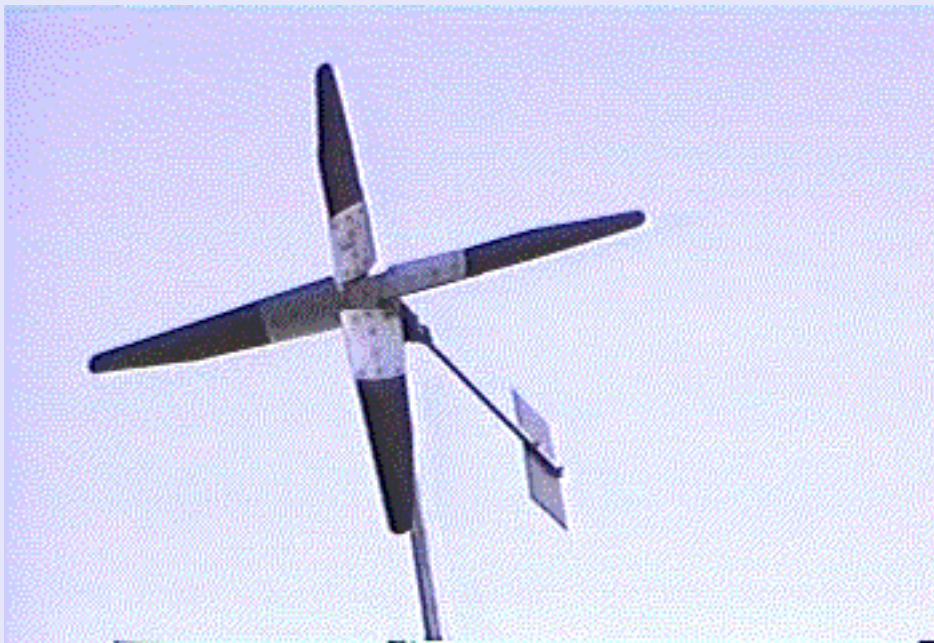
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comments by dave

I feel that the pictures and info on this page are mostly due to a dedicated commitment by Jerry, to find the best solutions possible for alternative power, using as many easily found and affordable parts as possible.



new gen-reinforced Jerry blades-Mike mods-tape drive motor-(have high hopes)



newest gen-reinforced Jerry blades-Mike mods-tape drive motor-my extended reinforcements(5ft diameter)

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To read some comments & info left by Jerry Click this



[Click on this to E-MAIL JERRY](#)

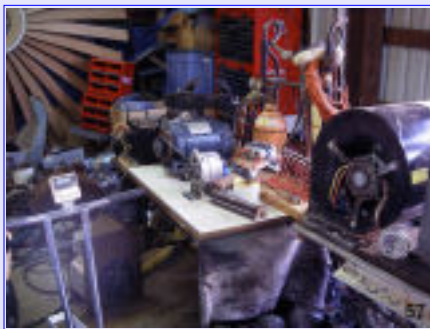
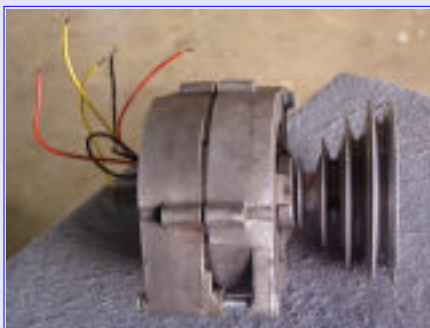
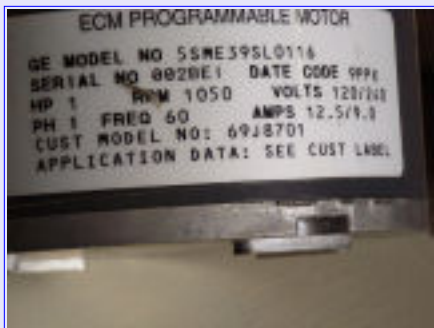


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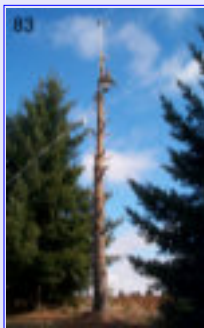
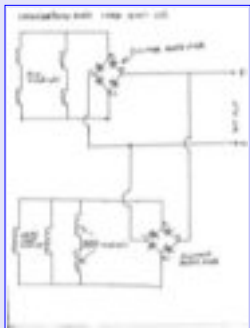
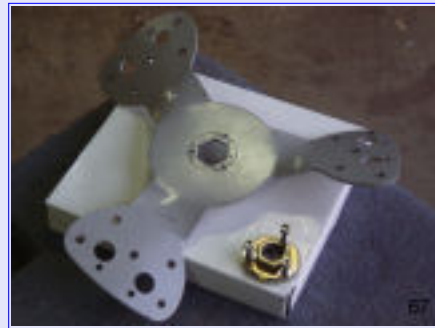
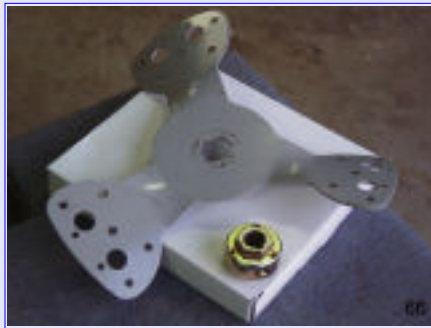
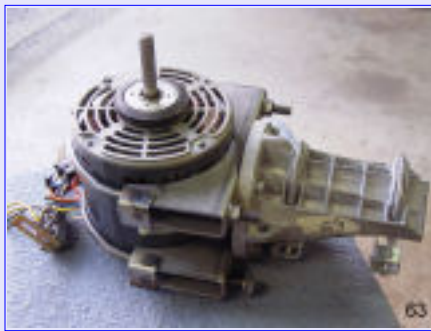
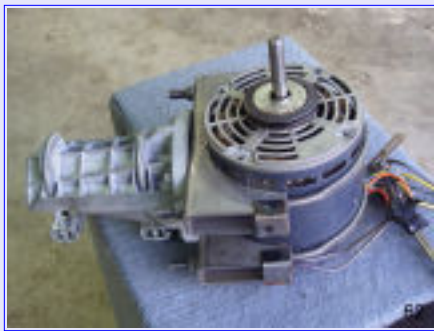
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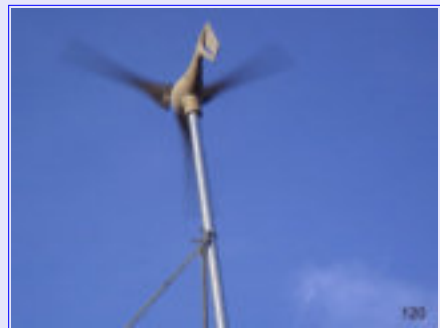
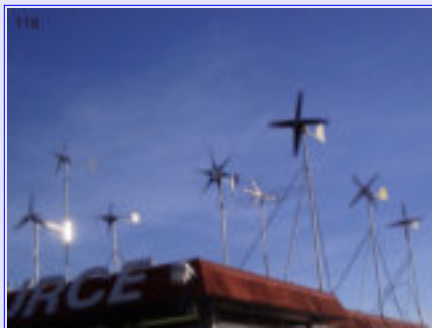
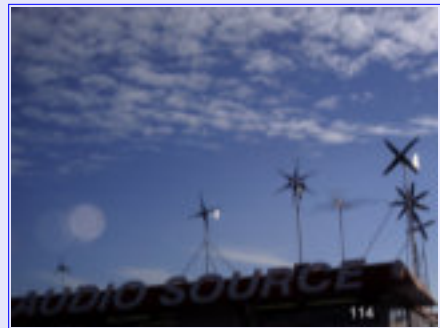
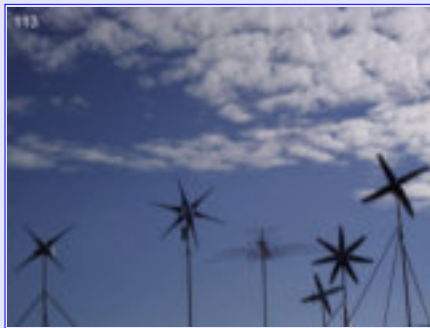
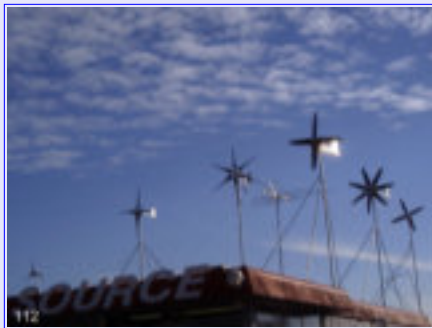
















These are mine









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## WELCOME

Windmission is a small Danish family owned company. Over the years specialized in turbines equipped with Windflower rotors, quiet multi bladed super wind roses with a high efficiency.

A fire in 2000 stopped selling. Now focus is on developing new Windflowers, general consulting and PMG distribution. A new [1.5 kW Windflower](#) goes up for testing in Autumn 2003. Also, a new Micro turbine design is underway.

# Welcome to Jemmett Engineering's energybook site

[greenfreedom.com](http://greenfreedom.com) is your guide to voluntary simplicity, green living, healthy vegetarian recipes and information, environmental ideas, free stuff, a cheap but fun lifestyle, and finding the freedom to enjoy it all. It's a challenge to balance saving the planet with saving money and enjoying life, but you've come to the right place to find answers to your questions.



The energybook site provides free information, books and other products associated with energy, DIY, outdoor living and homebuilt products. Browse the site and click on the links to find out more.

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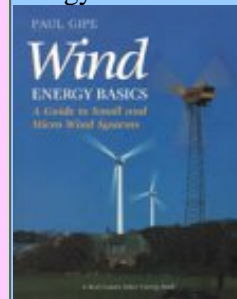
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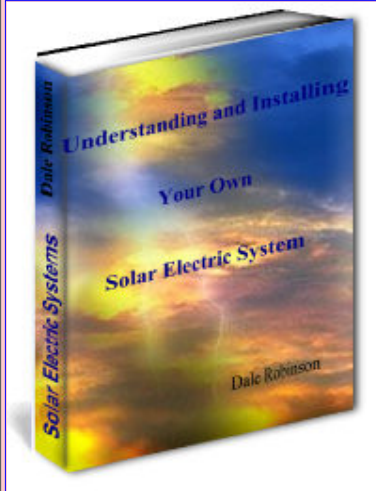
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- [WINDPOWER Workshop](#)
- [Dream Building](#) is a story of how a family built one of their life's dreams. A dream that would impact them for years to come. It is a book packed with information and humour about how they built and cruised their own boat affectionately named the Fair Havens. It is loaded with photographs and answers to questions that arise with such a project.



[Understanding and Installing Your Own Solar Electric System](#) is an electronic book that provides the average home owner with the basic knowledge of how solar powered electric systems work and the relationship the various components have to each other.



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**Motors as generators for Micro-Hydro power** - Nigel Smith  
This is a guide to the use of induction motors for electricity generation in remote locations. It is written as a practical handbook for engineers and technicians involved in designing and installing small water power schemes for isolated houses and communities. The manual arose out of the practical experience of manufactures and installers of induction generator units working in village locations in a number of countries.

[BUY MOTORS AS GENERATORS FOR MICRO-HYDRO POWER](#)



# PicoTurbine

## Welcome!



Pico (pee'ko) *very small*  
Turbine (ter'bine) *a motor driven by curved vanes*

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We provide [plans](#), [books](#), [videos](#), and [kits](#) for renewable energy education and homebrew projects. Projects are available for fifth grade through adult at this time.

We offer our projects as free, downloadable do-it-yourself plans, as well as kits that include all the materials for a modest charge. We also sell plans and kits from other vendors.

We offer hard-to-find [books](#) on homebuilt renewable energy and classic renewable energy titles.

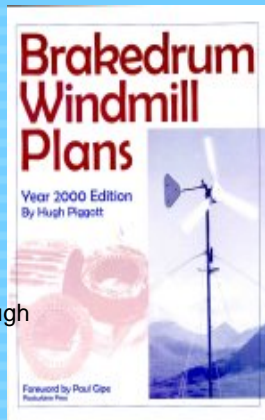


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**ORDER IT!**

## Homemade Wind Turbine

**New! Year 2000 Edition.** Hugh Piggott's **Brakedrum Windmill Plans** have been built all over the world. This is a proven design that can output 300 to 500 watts of power. These plans are available in the USA only from PicoTurbine.com! (30 page booklet).



Hugh

Piggott's book **Windpower Workshop** is a best seller! It gives general design principles and discusses alternator mods, choosing a surplus DC generator, wiring, towers, loads, and even design of a purpose-built alternator. A must-have reference for the DIY wind power enthusiast. (166 pages soft cover book).

book).

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**ORDER IT!**

## DIY Solar Stovetop

Build a solar stove top capable of reaching 600 degrees F [300 C] in a matter of minutes! Not an oven, but rather a cook top suitable for frying. This set



Solar StoveTop Cooker

of plans includes a life sized pattern for the parabolic shaped parts required to reach maximum heat, no calculating to do! Serve solar burgers at your next bar-b-q and demonstrate a very practical use of solar energy.

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**2600 Porter Avenue, Unit B**  
**Fullerton, CA 92833**  
**714-992-5594**  
**Doug@Selsam.com**

## Latest Selsam Wind Turbine Flies in Tehachapi!

More Rotors = More Power.

Currently funded by The California Energy Commission

[http://www.energy.ca.gov/contracts/smallgrant/2003-02-21\\_awards\\_02-02.html](http://www.energy.ca.gov/contracts/smallgrant/2003-02-21_awards_02-02.html)

U.S. Patent Number 6,616,402 and other patents pending including international (PCT) <http://www.uspto.gov>







Six rotors give many times the power of a single rotor turbine of the same diameter...

We are currently funded by The California Energy Commission:

[http://www.energy.ca.gov/contracts/smallgrant/2003-02-21\\_awards\\_02-02.html](http://www.energy.ca.gov/contracts/smallgrant/2003-02-21_awards_02-02.html)



Doug Selsam with 3 kW prototype, utilizing seven 7-foot diameter rotors, nearing completion at ground level.



View from region of generator - 3 kW prototype Selsam Multi-rotor wind turbine partially assembled on stand at ground level





Parts is parts...hub, diodes, disk brake assembly, monoshock, alternators, and associated components

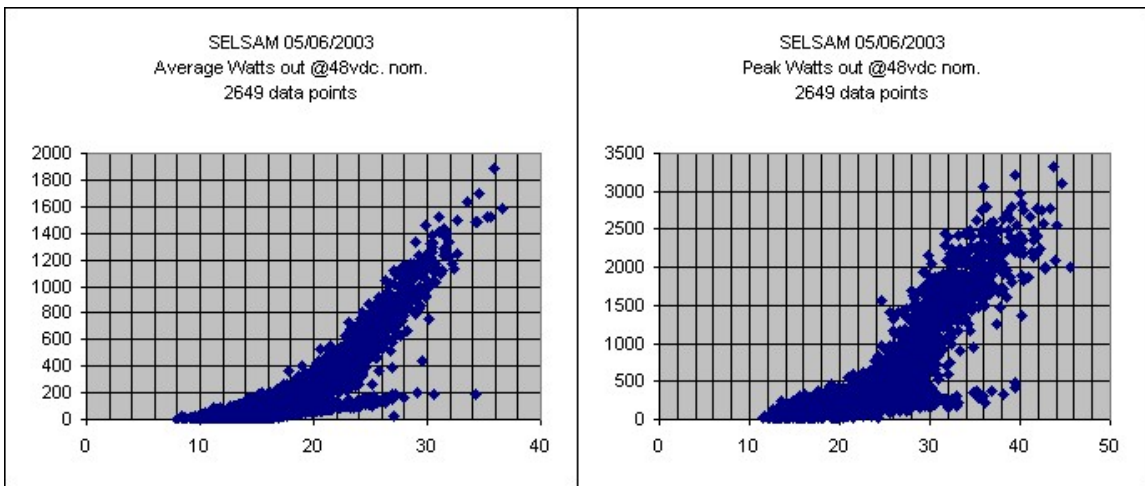


Experimental Prototype Selsam Wind Turbine with four 4-foot diameter rotors (left).

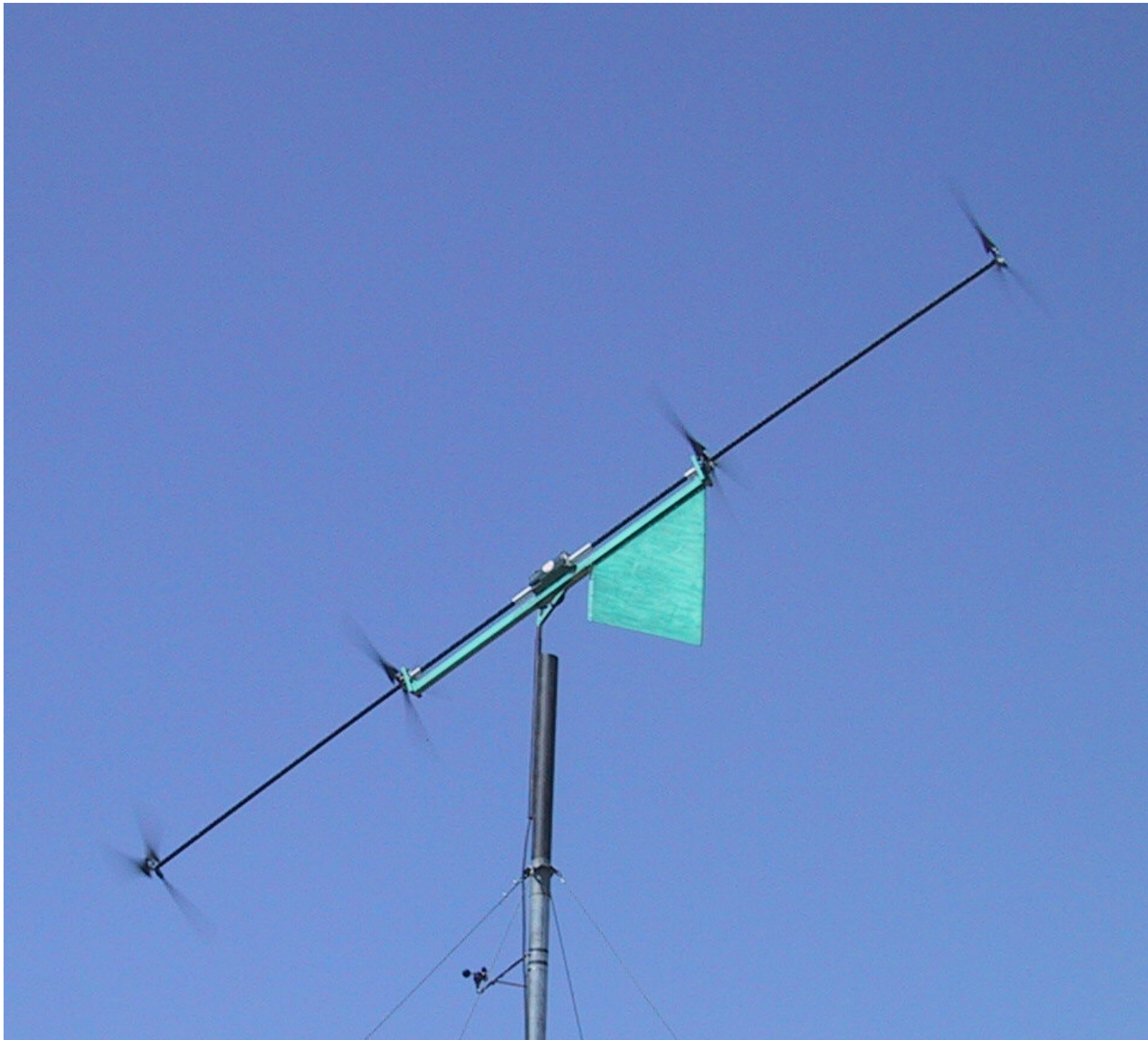




Selsam Turbine with four 4 foot diameter rotors furling to a horizontal configuration at about 30 mph, still producing full power. Downwind rotors are protected by the slipstream of the upwind rotor, limiting power production and thereby protecting from a runaway situation which would burn out the generator. This stops what would otherwise be a geometrically climbing power curve and begins to level it out above the rated wind speed. Conventional "1000 watt" turbine can be seen furling sideways in background, "cringing" at the force of this strong wind, and consequently producing very little electrical power when the wind speed is above the rated speed, where the best opportunity for producing power actually exists.



Power curves for a Selsam Multi-Rotor Wind Turbine with four 5 foot diameter rotors show a solid 1000 watts average power output at 28 - 29 mph. This is at 5000 feet elevation in Tehachapi, CA, where the air is about 14% thinner than at sea level. Most "1000 watt" turbines will actually average only about 600 watts at this windspeed, even if the data is corrected for altitude. Notice that at 35 mph, where most small wind turbines are producing very little power due to sideways furling, we are producing 1600 average watts - 2000 average peak watts.





This "1 kilowatt" model produces 1200 watts at 33 mph  
We see peaks of up to 1400 watts at 33 - 34 mph  
New highest peak 1686 watts at ~34 - 35 mph!

We're calling this one the "**Quadrunner**" - We're pleased to see this prototype running very smoothly during the first few months of preliminary testing. Utilizing four 45" diameter sets of *Air-X* blades from *Southwest Wind Power*, placed approximately 7 feet apart, it's up and producing power during the first few weeks of operation. Preliminary readings show 800 watts at 27 mph, 1000 watts at 30 mph, and 1200 watts at 33 mph. We've seen **peak** output of **1400 watts** at ~34 mph, and **1686 watts** at wind speeds of ~35 mph. The generator is a dual-shaft 1 hp PM DC motor specially fabricated for us by *Leeson Electric*. In high winds, we are pushing this motor/generator over its designed power rating, as we had hoped we would, but it is well-cooled by the flow of wind, so it can handle the extra amps. The filament-wound carbon fiber driveshaft for the compound rotor is from *Advanced Composites Products and Technology* in Huntington Beach, CA. The frame is welded steel, as per the "heavy metal" design philosophy. Note that we are now utilizing a tail for quicker response to changes in wind direction. It is tracking perfectly. (Note: U.S. and International Patents issued and pending)





Here's the "Quadranner" beside a Whisper H-40 from SWWP, which is a bit further from the camera, at the testing facilities of Windtesting.com. According to Brent Scheibel, founder and Chief of Operations at



Windtesting.com, the two turbines are generating comparable amounts of power. The new "Quadrunner" has a much faster rotational speed (RPM), and so far makes a pleasant sound - not too loud either.



Above is a rendering of an 8-rotor model having an offset angle in the horizontal plane, Rendering by Michael Sanchez of Dreamworks, the movie animation company.

To The left, a 3-rotor experimental Selsam Multi-Rotor Turbine unit is seen being tested at the facilities of Windtesting.com in Tehachapi, CA. It produces an average of 1200 watts at 30 mph at 5000 feet elevation.

Below is an early prototype that was able to produce 400 watts using modified 18" diameter wooden model airplane propellers as rotors.



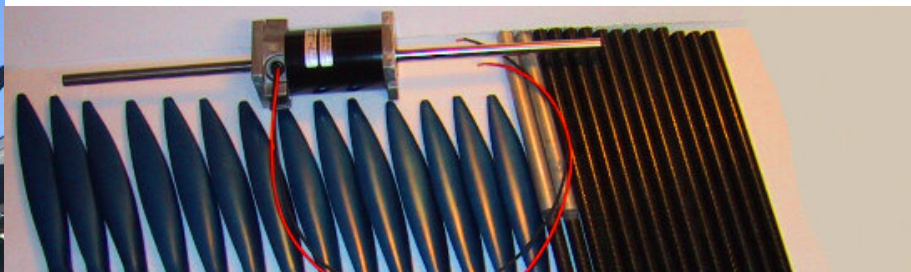
U.S. Patent Number 6,616,402 and other patents pending including international (PCT) <http://www.uspto.gov>





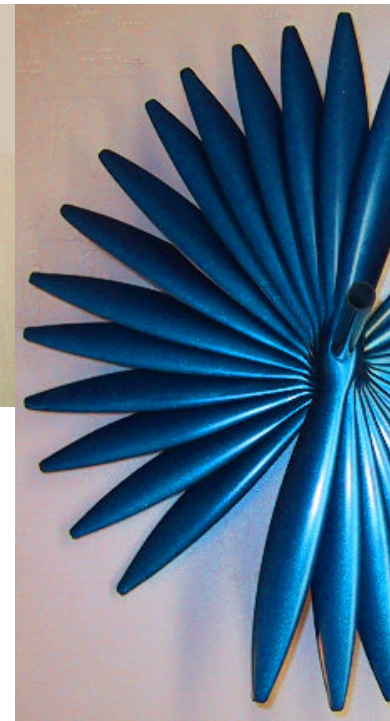
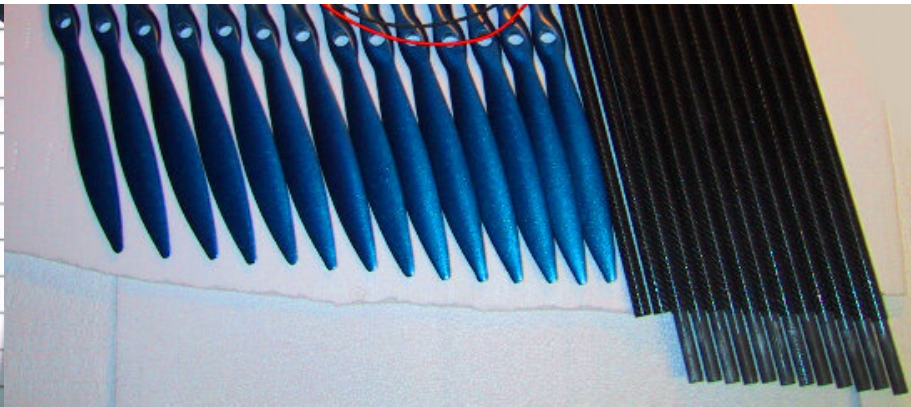
Rendering of a Selsam Multi-Rotor Wind Turbine by Michael Sanchez of Dreamworks Animation (above).

**Ready to Rock** - a "condensed" version shown for the photo, with a 3/4 hp generator, held by the inventor, Doug Selsam.



**Parts that will were used to assemble an early version of an offset axial flow multi-rotor semi-horizontal**

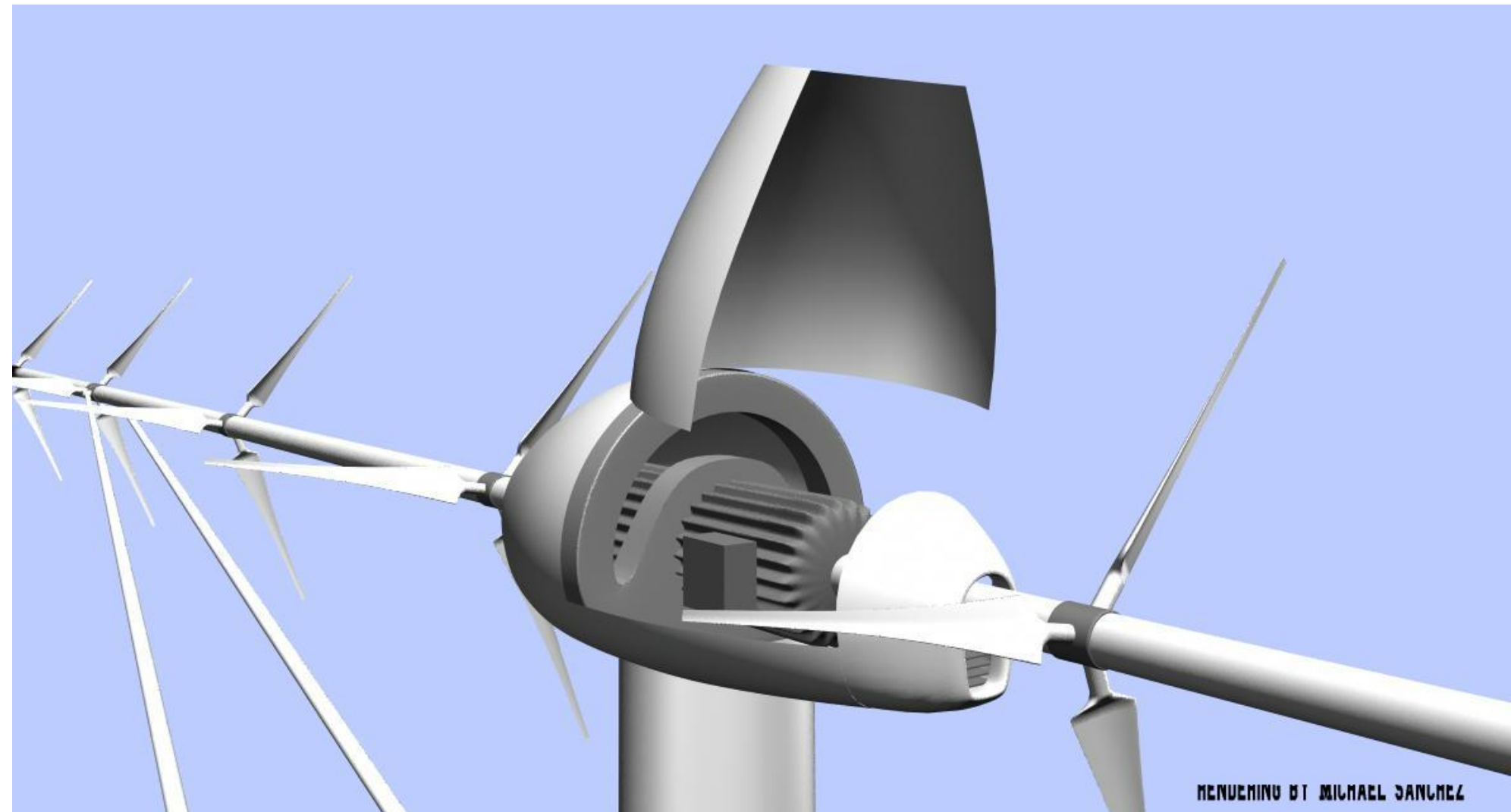




Here are the blades of a 20 inch diameter turbine, that produces about half a kilowatt. They will be mounted on a shaft that projects for a long distance forward, and backward, at an angle from horizontal, so that the wind encounters the rotors like a stairway. Each additional rotor brings more power. The combined output from all these small rotors really adds up.

This Turbine Utilizes Massive Parallel Wind Processing (MPWP) to maximize the wattage generated for a turbine of a given diameter.





## **April 2002 Pictures of the Selsam Wind Turbine... The Sky Serpent Flies in Tehachapi, Calif.**

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The New Turbine is flown in Tehachapi, mounted to a Tower by Brent Scheibel, of General Electric Wind and owner of WindTesting.com

Well, it's up and running, with data being logged. Not doing too badly on the first day. The winds are averaging in the teens, sometimes high teens, gusts in the low 20's. The faster it turns, the smoother it runs. With 18" diameter rotors, we're putting out a varying current running between 100 and 200 watts. At 30 mph we get about 400 watts.







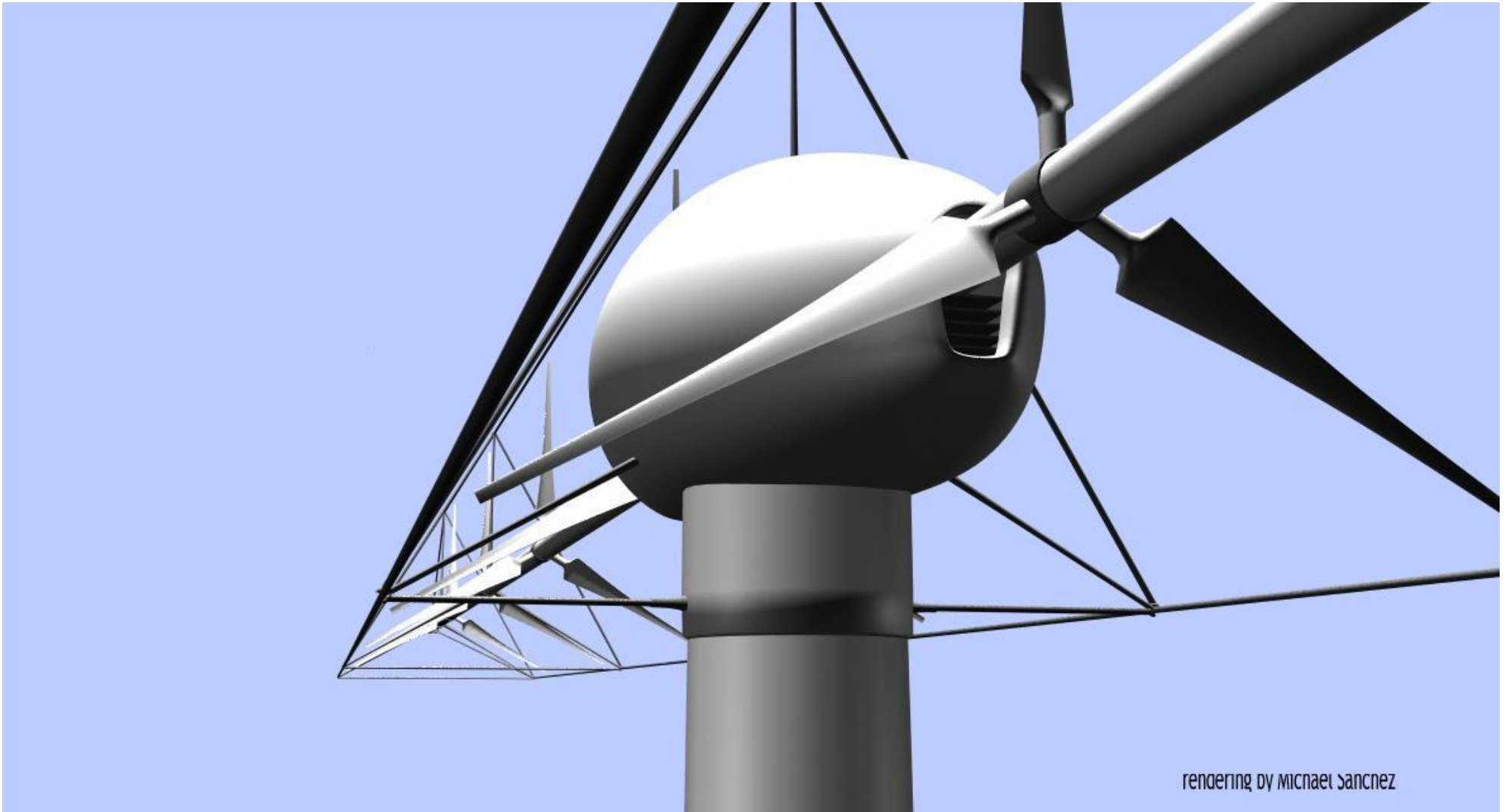
Brent Scheibel, WindTesting.com, His wife, Teri, with their dog Ezra, and Doug Selsam, windmill is seen in background

This is the test team, Brent Scheibel, who handles Anemometry over at Zond / Enron Wind - now General Electric Wind Energy, and runs Windtesting.com, His wife Teri, their dog Ezra, who barks at windmills, and Doug Selsam, the inventor. Brent really knows his windmills, from the biggest to the smallest, and handles large towers with ease.



rendering by Michael Sanchez





rendering by micnael sanchez





The Sky Serpent, flying alongside Brent Scheibel of Windtesting.com's SWWP 900 watt turbine. Enron (now G.E.) Wind Farm barely visible in background



Row after row of clean-turning turbine blades adorn the landscape... pretty cool.  
U.S. Patent Number 6,616,402 and other patents pending including international (PCT) <http://www.uspto.gov>



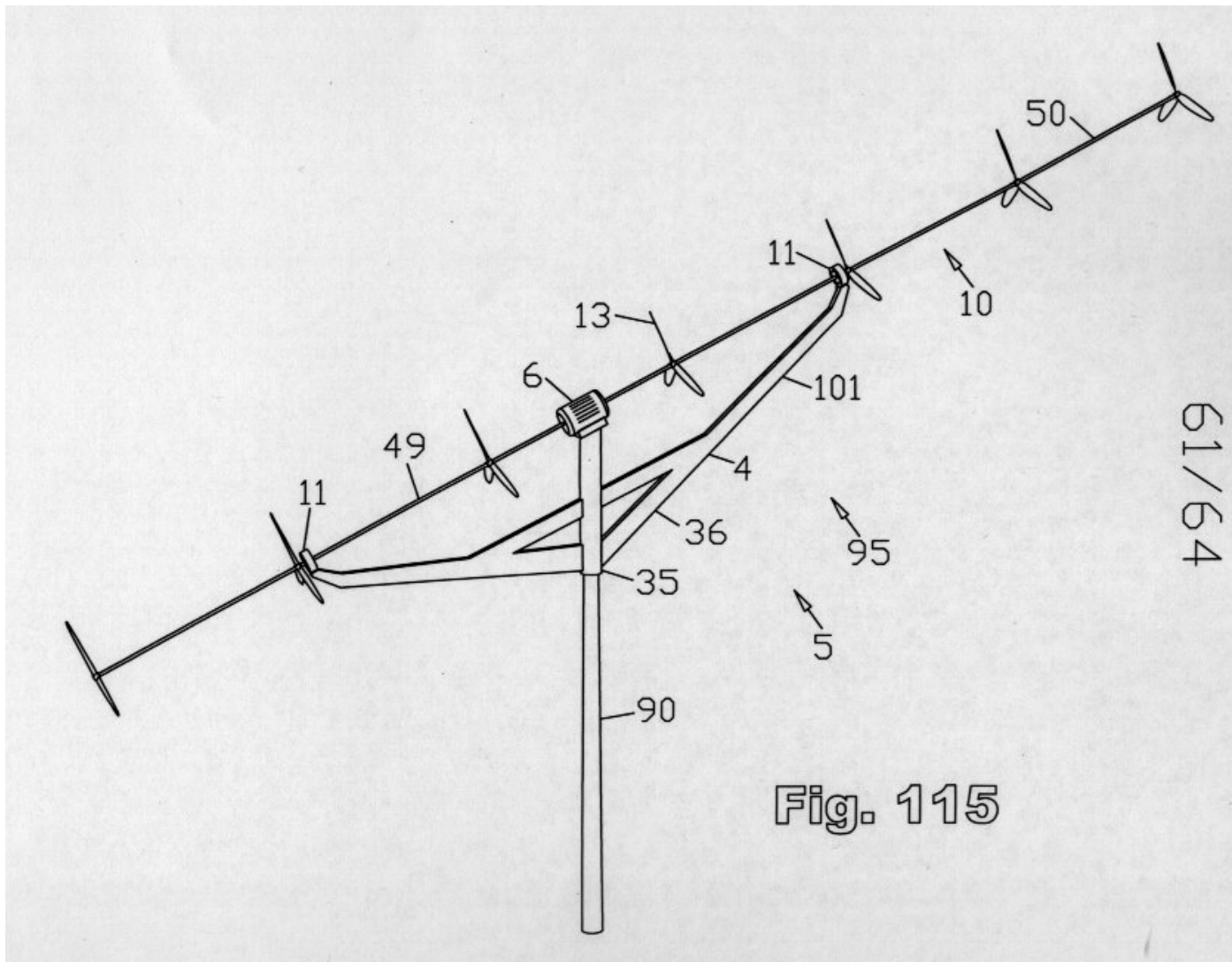


Fig. 115

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The Mitsubishi Heavy Industries Wind Farm, down the road. Row upon row of rotors, each with its own separate tower and generator.



As evening falls, the sky serpent flies on...



and on into the night, what adventures await...

U.S. Patent Number 6,616,402 and other patents pending including international (PCT) <http://www.uspto.gov>

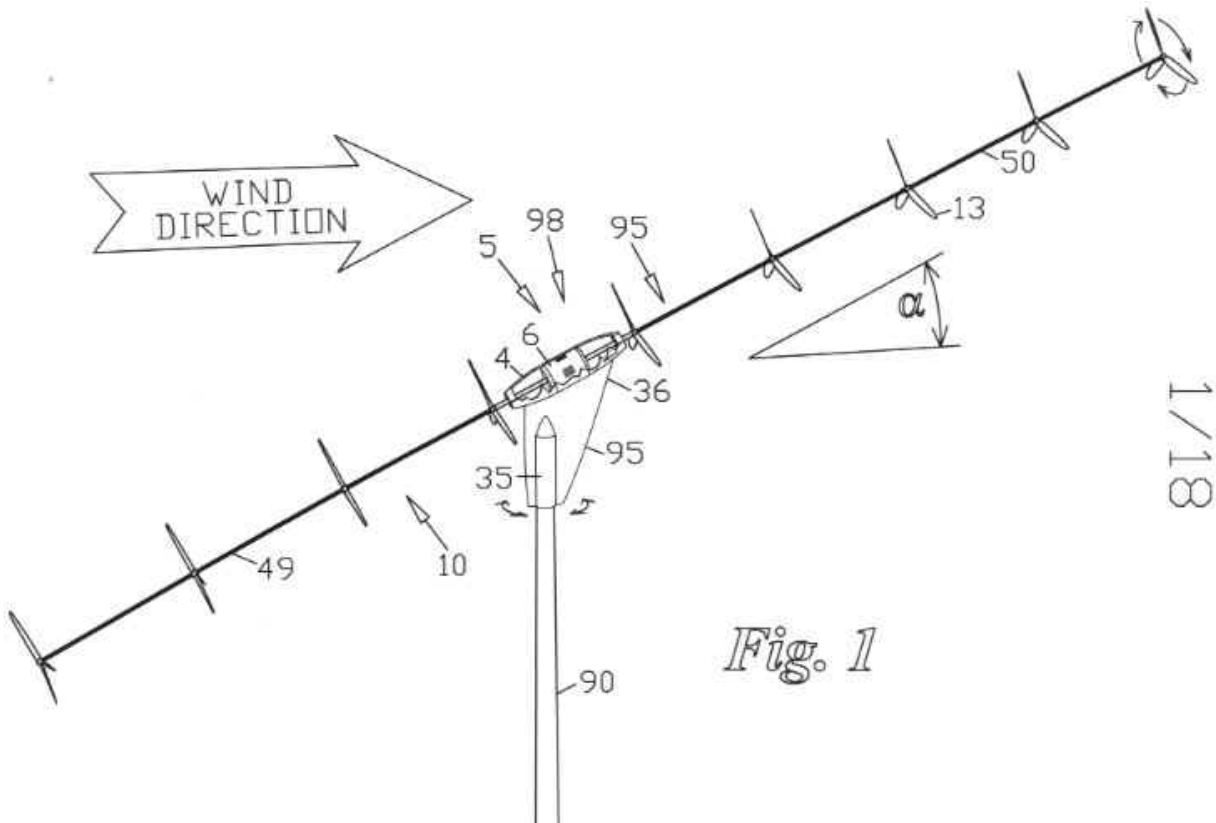
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## **Balanced, High-Output, Rapid-Rotation Wind Turbine**

U.S. and International Patents Pending  
Douglas Spriggs Selsam





*Fig. 1*

An illustration from pending U.S. Patent application 09/9\*\*\*\*\*:  
"Balanced, High Output, Rapid Rotation Wind Turbine"



Doug Selsam

**Currently Used Technology:**

Current wind turbines are a refined version of a 1000 year old design, originated when cast iron was a high tech material. These wind turbines suffer from the following problems, challenges, and drawbacks:

1. **Inordinately heavy rotor weight** since larger rotors become disproportionately heavy.
2. **Inordinately slow blade rotation** since larger rotors turn more slowly.
3. **Inordinately robust drivetrain** required due to high rotor mass & high torque of slow rotation
4. **Gearbox required** due to slow rotor rotation, since a generator needs to turn faster.
5. **Not self-aiming** – special apparatus required to maintain a heading into the wind.

6. **Inordinately complex mechanisms** required to **prevent damage** in gale force winds.
7. **Excessively robust support structure** required to hold up all that excessive weight.
8. **Excessive maintenance costs** are required to service this inordinately complex machinery.

**NEW** Our Multi-Rotor technology neatly solves **all** of these classic problems in wind turbine design. Our new design, now proven in small models, combines the power of **multiple smaller rotors** mounted to a **single elongate driveshaft**, to give the **same power** as a single larger rotor, with **less cost, weight, and complexity**. Smaller rotors **weigh less** for the swept area, and **turn faster**, thereby **dispensing of the need for a gearbox**. Our new design is naturally **self-aiming**, requiring no dedicated apparatus to achieve this, and is **generally simpler**, having **fewer moving parts**, requiring less maintenance. We expect to validate this revolutionary **California design, using multiple rotors coupled to a single elongate shaft** as being able to harvest **more wind energy at less cost** than current models which use only a single rotor.



**The car headlight at Doug's feet is 50 watts** The rotor size is only **fourteen inches!** Wind speed in the 20's mph (more rotors produce more power)

**Proprietary position - Our Unique Design:**

**This entirely new class of wind turbines was developed in California.**

Currently funded by The California Energy Commission

[http://www.energy.ca.gov/contracts/smallgrant/2003-02-21\\_awards\\_02-02.html](http://www.energy.ca.gov/contracts/smallgrant/2003-02-21_awards_02-02.html)

U.S. Patent Number 6,616,402 and other patents pending including international (PCT) <http://www.uspto.gov>


**NEW**

Our new proprietary **California** design utilizes a **multiplicity of rotors** mounted at spaced intervals along a single elongate driveshaft. This **lightweight yet strong carbon fiber shaft** is aimed into the wind, with the **nose pointing slightly downward, so that each rotor encounters fresh, undisturbed wind**. The shaft is **balanced** fore and aft about a centrally located generator, which it **directly drives**. This assembly is mounted so that the center of aerodynamic drag is slightly downwind of an azimuthal pivot point, making it **conveniently self-aiming** while using no extraneous device to achieve this self-aiming behavior.

The result is a **lighter, faster-turning, self-aiming, simpler, more reliable wind turbine**, having **fewer moving parts**, using **substantially off the shelf components**.







The inventor, Doug Selsam, testing a small prototype of an entirely new class of wind turbines

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## What Makes Our New California Class of Wind Turbine Better? A Detailed Explanation of the Advantages:

First, let's look at some of the problems with wind turbines today – then see how our design solves these problems.

Existing Wind Turbines, using the modern "Danish Design", based on the "Old Dutch" design, have made great advances, and are indeed awesome machines, yet suffer from certain classical challenges. We will address our solutions to these problems one at a time:

### 1. Problem # 1 – Inordinately Heavy Rotor Weight - Larger Rotors (propellers) are heavier for the amount of wind captured:

The volume, and hence the **mass**, of a rotor is proportional to the diameter **cubed**, while the swept **area** is only proportional to the diameter **squared**. (typical volume/area relationship for any solid, 3-D object) This means that the amount of wind a rotor can capture, in relation to its mass, is **inversely** proportional to rotor diameter. In other words, if a rotor's **diameter is increased by 10 times**, the **area** (and hence the amount of wind captured) is **increased by 100 times** (good), however, the **mass has increased by 1000 times!** (bad) The **larger** turbine can only capture **a tenth** as much energy compared to its mass! This simple mathematical fact tends to limit the size of current single-rotor wind turbines. (Note that this same effect of scale is the reason why **an ostrich can't fly**, while a small **flock of geese**, weighing the same amount in total, can easily undergo **transcontinental migrations**, and a **hummingbird**, whose name we borrow for our smallest model, **can easily hover**.) The largest turbines have rotor diameters of well over 100 feet. These monstrous structures must be made to perform for many years, and have many problems with stress and fatigue. The giant blades are notoriously difficult to manufacture **and ship**.

**Currently used Solution: Keep making larger** and larger single-rotor turbines anyway, regardless of the inherent problems of scale, because nobody has thought of a better solution.



**OUR SOLUTION: Smaller Rotors weigh less per unit of swept area.**

We mount **multiple, smaller rotors**, at spaced intervals along a **very elongate, carbon fiber composite driveshaft**. (The shaft is at a slight angle from the wind direction so each rotor gets its own fresh wind.) Multiple small rotors **weigh much less** than a single larger rotor sweeping an equivalent total area, can be much **lighter in construction**, and are far **easier to produce**. They **consume less material, cost less**, and are **much less subject to material fatigue**.

### 2. Problem # 2 - Slow Rotation – Larger rotors turn too slowly:

For a given wind speed, the rate of rotation (RPM) of a rotor is inversely proportional to rotor diameter, meaning that larger rotors turn more slowly. The largest turbines rotate at less than one revolution per second. Generators, on the other hand, require a faster rate of rotation (typically 1800 - 3600 rpm). There are two classic solutions to this problem, both of which add cost, weight, and complexity to a wind turbine:

**Currently used Solution #1 to remedy slow rotation – Add a gearbox:** A gearbox can be used to convert the slow rotation provided by a large rotor to the faster rotation required by a generator. This solution is **heavy, expensive, noisy** and introduces a source of **friction, wear, and unreliability** to a wind turbine. Reliability is of paramount importance in a wind energy installation. Gearboxes consume **about 20% of the cost** of current wind turbines.

**Currently used Solution #2 to remedy slow rotation – Use a specially-built, low speed generator or alternator, having many more poles than usual:** Small to medium-sized wind turbines often feature specially-built alternators having many extra poles, to generate useful power at a slower rate of rotation. This strategy allows the alternator to be directly driven by the rotor, saving the wear, expense, and power loss introduced by a gearbox. Unfortunately, this strategy has its own drawbacks, being:

- only useful up to a certain size;



- heavy, adding weight to the installation and therefore requiring a more robust support structure;
- wasteful of materials, since the alternator must be much larger;
- expensive, since the specially made, slow speed alternators are not only larger and heavier than they would otherwise need to be, but must be specially fabricated, rather than taking advantage of existing, standard, off-the-shelf types of generators and alternators. Such special generators are considered as more expensive initially than using a gearbox, but with less maintenance costs in the long term.

**OUR SOLUTION: Small rotors rotate faster than larger ones**, so for small to midsize turbines of our new design, a **conventional generator or alternator** can be **directly driven** within a proper rpm range. Multiple rotors give more power for the same diameter than a single rotor. Our design needs no gearbox. (Very large turbines of our new design may utilize some gearing, but, due to faster rotation, it need be **much** less robust for the power generated than current models require.)

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**More Rotors = More Power: Multiple Rotors deliver more power, at a faster speed, for less weight**

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### **3. Problem # 3 - Drivetrain must be inordinately robust - The aforementioned high rotor mass and slow rotation require the supporting drivetrain to be much stronger than the generator's actual driveshaft:**

The **robustness** required of a driveshaft transmitting a given amount of power is **inversely proportional to rpm**. A typical wind turbine drivetrain has a very heavy shaft to support the single, ponderous, slowly-turning rotor, and to transmit its power to the gearbox. The slowly turning portion of the gearbox must be similarly robust. Not only is it transmitting a large amount of power at an excruciatingly slow rate of rotation, but this low speed driveshaft and its bearings are supporting the huge rotor in a non-balanced, projecting, cantilevered manner.

As the rotational speed increases within the gearbox of a conventional wind turbine, the gears and driveshafts become less robust. The output shaft of the gearbox - the quicker-turning shaft that **actually drives the generator** - is **much thinner** and less massive than the input shaft driven by the single giant rotor.

**Currently used solution: Designers have no choice** but to make the rotor end of the drivetrain much more robust than the generating end.

**OUR SOLUTION: A Faster-Turning Driveshaft can be less robust for the same power:** Our higher speed drivetrain need not be more robust than what is required to drive the generator, and to support the multiple, lightweight rotors.

**Also, Our New Design is Better Balanced: Our Generator is located approximately at the center of our driveshaft.** Our elongate carbon fiber composite driveshaft with its multiple small rotors, weighing much less than a single large rotor sweeping an equivalent area, is supported near its midpoint **by the bearings of the generator**, and so is also approximately **balanced about these bearings**, fore and aft, rather than being cantilevered in one direction, and needs no other bearings.

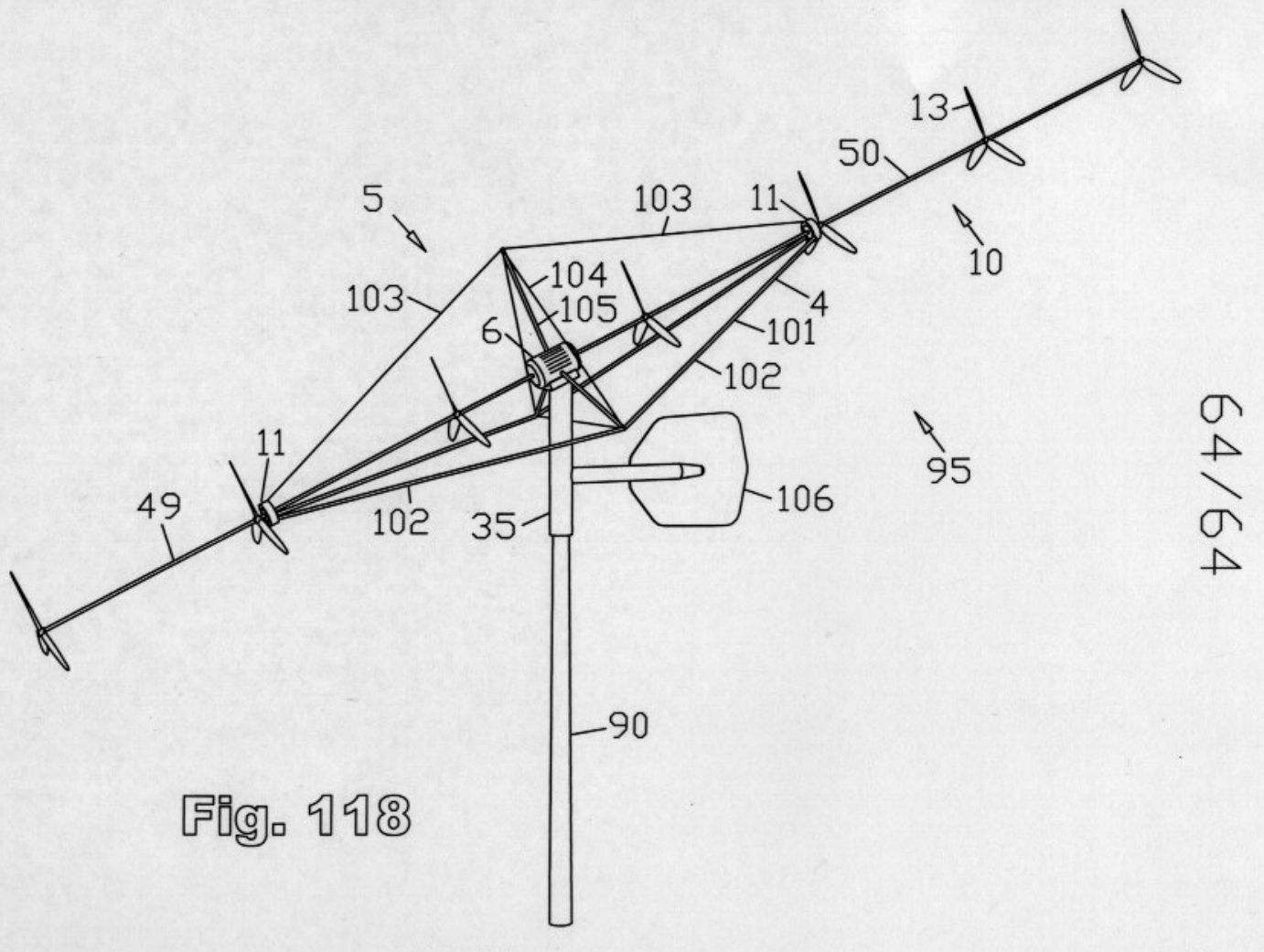


Fig. 118



An easy 200 watts in about a 20 mph wind or so, lighting the four 50 watt car headlight bulbs you see at Doug's feet. We get much more power than this in higher winds. This kind of power output is unheard of for an 18" diameter horizontal axis windmill! – the secret? Multi-Rotor technology, made possible by the strength of modern carbon fiber materials.

This rotor is really thirteen rotors harnessed as one, giving an order of magnitude (~10 times) more power than a single rotor design of the same diameter.

In stronger winds this prototype blows out these lights like flashbulbs - poof!

---

4. **Problem #4 - Special, dedicated apparatus required for directional aim, adding mass and complexity:** Current wind turbines are **not self-aiming**.

**Currently used Solutions:**

1. A **tail** consisting of a vertical fin projects downwind from a central pivot point, forcing the single rotor to aim into the wind. Used for smaller to midsize turbines.
2. An **active mechanism**, comprising a wind direction sensor, a microprocessor, and powered, heavy-duty, gear-driven aiming machinery constantly adjusts the aim of the huge rotor to keep it pointed into the wind.

Either of these **currently used solutions** to the aiming problem adds **mass, complexity, and cost** to the installation.

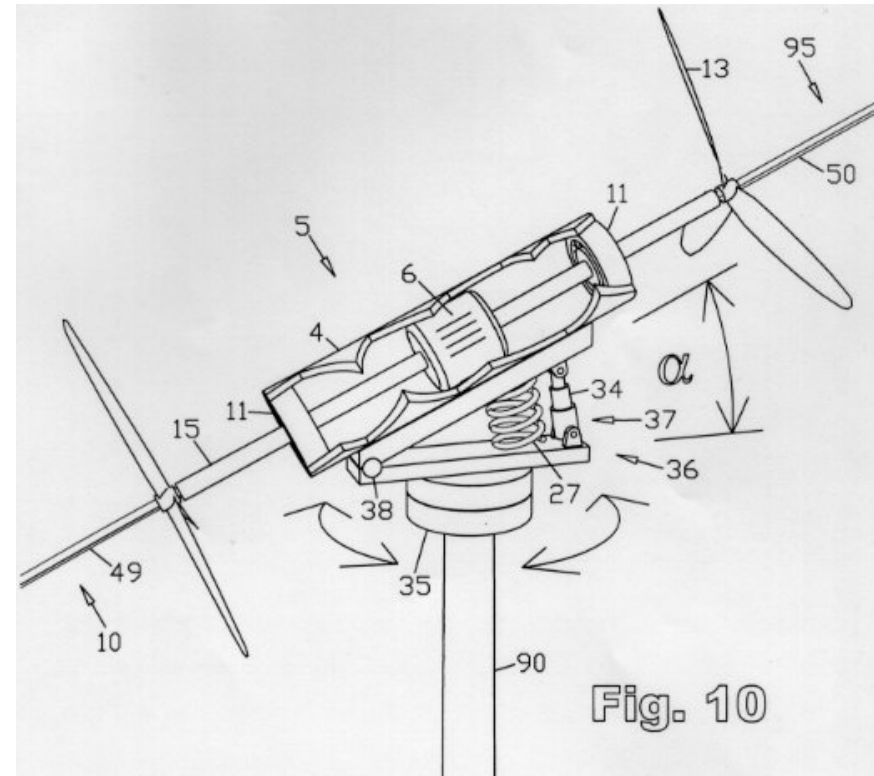
**OUR SOLUTION: Self-Aiming Behavior: Our machine simply locates the center of aerodynamic drag downwind of an azimuthal pivot point.** This may be accomplished by either having the driveshaft slightly offset to the aft direction, or by having the entire assembly offset slightly downwind from a master pivot point. 6 rotors upwind and 7 rotors downwind has been working well so far. **The machine eagerly seeks the wind, and stays headed windward.**

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5. **Problem #5 – Inordinately complex mechanisms required to prevent damage in gale force winds – any wind turbine that is efficient at gathering wind will be in danger of damage should that wind reach excessive velocities. Some means must be provided to prevent such damage.**

**Currently used Solution:** Current wind turbines require either a special mechanism to "furl" the single rotor (turn its aim sideways to the wind) or a means to adjust the pitch of the blades, to prevent damage

in storms. This adds further to the cost and complexity of the installation.



**OUR SOLUTION: Simple protection from damage in excessively high winds -**

Our new design is **resiliently mounted** at a slight angle from horizontal. In high winds, the resilient carbon fiber composite driveshaft is pushed to a more horizontal position, placing the rotors directly in line with the wind and with each other, so that upwind rotors act to shield downwind rotors (wind shadow effect). This protects from overspeed conditions.

**6. Problem # 6 Excessively Robust Support Structure Required:** All of this inordinately heavy equipment, including the disproportionately massive blades, must be installed and supported at a sufficient height to encounter strong winds. The **heavier** this equipment is, the **more robust** must be the support structure. The single super-massive rotor carries a huge amount of angular momentum, and so is not very tolerant of flexibility in the tower, instead requiring a "hard mount".

**Currently used Solution:** use more steel in the tower to make it stronger. Today's towers account for about 20% of the cost of a turbine installation.

**OUR SOLUTION: Less robust supporting structure required: - Lighter weight and less angular momentum,** as well as the



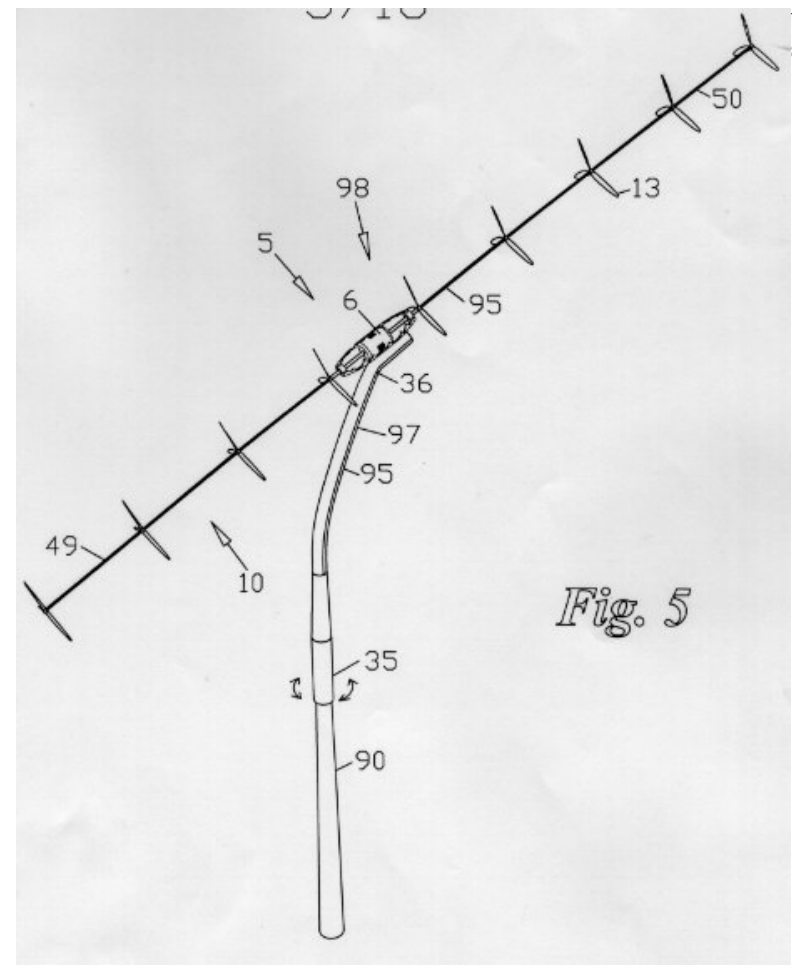


Fig. 5

**balanced mounting**, and the **resilience** of the **elongate driveshaft** of our new design, allow a **lighter tower** to be used, even one that has some "give".

**7. Problem #7 - Maintenance: Complex machinery** requires **more attention** and **maintenance** for continuous operation. Such maintenance is made more complicated by the fact that the equipment is at a **dangerous height** above the ground, and often, by its very nature, in a **remote location**.

**Currently used Solution: Hire more personnel**, and buy more equipment, vehicles, tools, lubricants and replacement parts, to constantly attend to the complex mechanisms.

**OUR SOLUTION: Less Maintenance required - Fewer moving parts** and a simpler method of operation translate to less labor, equipment, vehicles, tools, and spare parts required to keep it all running smoothly.

**NEW!**

This **vast improvement** over the state of the art utilizes the lightweight strength offered by **recent advances in composite materials** to place multiple rotors along a single shaft. Multiple small rotors are **lighter**, and rotate **more rapidly** compared to a single rotor of equivalent area. More rapid rotation **reduces or eliminates the need for a gearbox**. Extreme reliability demands such simplicity. This entirely new class of wind turbines is balanced, and self-aiming, with an offset from horizontal to allow each rotor to encounter fresh wind.

Because our **rotors cost less**, having far **less total mass**, and our **generator costs less**, and the **gearbox is eliminated**, and our drivetrain, **rotating at a faster rate**, can be less substantial and still deliver the **same power**, and because it is **self-aiming**, requiring no azimuthal guidance system, our new windmill can be made for less than **half the price** of the competition. Because it is **lighter** and **better balanced**, with **less angular momentum**, and a **resilient driveshaft**, a **lighter gauge tower** can be used. For these same reasons it's **safer**. And because it's **simpler**, it requires **less maintenance**, and has **less downtime** than current designs.



14 inch rotors lighting a 50 watt car headlight. More rotors = more power! So balanced it's comfortable to hold right in your hand - and very easy on the bearings!

#### Products and Projects Planned:

We plan to **continue building larger and larger prototypes** of our **California** design, developing at **least one for commercial production**. We will also continue to develop related designs, and continue to secure intellectual property protection for the entire family of designs.

#### Unique Capabilities:

Our **patent pending California design** is **lighter, faster, simpler, quieter, and self-aiming, more reliable**, with **fewer moving parts**, delivering **more energy for the money**.

#### Competition:

Virtually all other companies in the wind energy business are now using the "Danish Design" based on the ancient "Standard Dutch" single rotor design at this time. We predict that, rather than being competition, other wind energy companies will become partners and/or licensees utilizing our superior technology.

#### Market Penetration Strategy:

We plan to continue development of our new class of wind turbines, to prove that the technology will work in a small to medium sized installation, and to produce at least one production model for commercial sale. We project that the resulting test data, as well as the attention garnered from the superior performance of our production models, based on cost per kilowatt hour, will create a demand for licensing by others. We will also continue to develop some of the **more advanced** versions of the **California** design, incorporating a **rotating tower/driveshaft** and/or **atmospherically buoyant versions**. These even more advanced technologies may become production models or licensed to others.

#### Strategy and Objectives:

The immediate **objective** is to prove the technology for a new and improved class of wind turbines, by building and testing a reliable prototype of a size suitable for household use. This entirely new class of wind turbine is expected to further reduce the cost of wind power. We expect to eventually to derive a revenue stream from our overall, long term effort. The more far-reaching **objective** is to reduce dependence on oil and other fossil fuels, from whatever source, making the world a cleaner and safer place.

#### The overall strategy is:

1. To secure **international patent coverage** for the **Revolutionary New wind turbine designs, conceived in California, and** revealed in U.S. Patent Application Numbers 09/8\*\*\*\*\*, and 09/9\*\*\*\*\*, by Douglas Spriggs Selsam.
2. To continue to **build larger and improved prototypes** of wind turbines based on these **California** designs, and to further refine the designs. Each prototype is tested and studied, defects corrected, and a larger

prototype built.

3. To secure further intellectual property protection on any improvements made.
4. To arrange for **production of at least one commercial model**, using the **California** design called "Balanced, High Output, Rapid Rotation Wind Turbine" from U.S. patent application number 09/9\*\*\*\*\*.
5. To further develop more **advanced California designs**.
6. To **further benefit humankind** and to **profit** from the intellectual property generated by **licensing the technology** to others.

#### Accomplishments:

Currently funded by The California Energy Commission

[http://www.energy.ca.gov/contracts/smallgrant/2003-02-21\\_awards\\_02-02.html](http://www.energy.ca.gov/contracts/smallgrant/2003-02-21_awards_02-02.html)

U.S. Patent Number 6,616,402 and other patents pending including international (PCT) <http://www.uspto.gov>

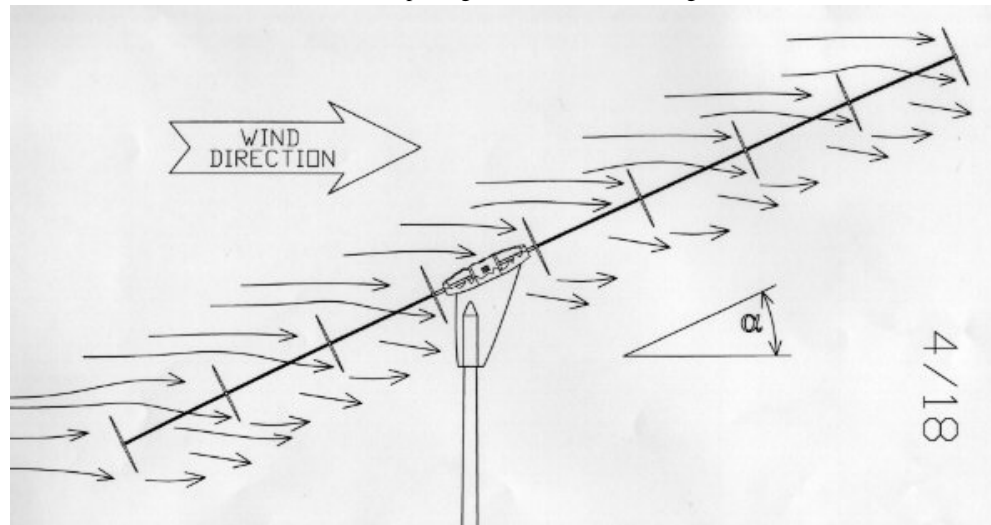
- An **entirely new class of wind turbines** has been invented (which doesn't happen every day), which is **lighter, faster, simpler, quieter, and less expensive**.
- Several small **working prototypes** have been constructed by the inventor, **proving that the concept is viable on a very small scale**.
- **Two U.S. Patents** as well as an **International (PCT) Patent** have been filed for this new class of wind turbine.
- **One U.S. Patent has issued**, the other **has been allowed and will issue soon**.
- **Government assistance and grants**, as well as **funding from private sources**, are now being sought to assist in further development of this new class of wind turbines.
- We have filed for **PCT (Patent Cooperation Treaty)** coverage based on priority established from these U.S. Patents. For a certain period of time we will then have the option of obtaining international patent protection in whatever specific countries we deem advantageous. This means that we could enjoy a **positive revenue stream into the U.S. and to California** from around the world from this revolutionary new type of wind turbine technology **for the next 20 years**.

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#### F.A.Q. - Frequently Asked Questions:

Q1. Doesn't the wind shadow from one rotor inhibit the next rotor from getting wind?

A: That's definitely a factor to consider. Our driveshaft is at an angle from horizontal, with the nose pointing slightly downward so that, with proper spacing, each rotor gets its own wind. In addition, the forward tilt of the rotors tends to direct the wind downward, pulling more fresh wind through the machine from above...



Any slight losses of power from wind shadow effects are more than made up for by the overwhelming combined power of a multiplicity of rotors.

15/18

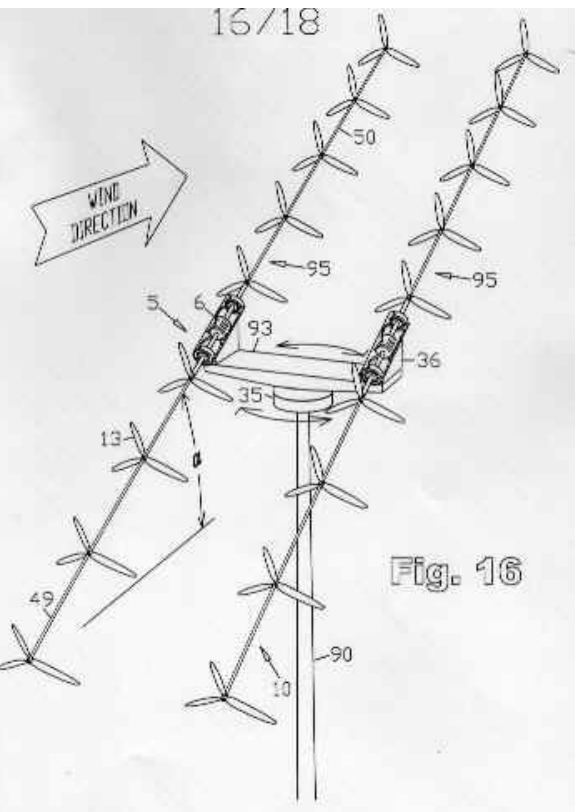


Fig. 16

Q2. Can two or more of the Selsam Multi-Rotor Wind Turbines be combined on a rotating frame to form a single self-aiming wind-power-production structure?

A: Yes. Multiple turbines mounted to a single rotating armature are self-aiming as a combined unit. Multiple levels are also possible.

Q3. Is the Selsam Multi-rotor wind turbine well suited for rooftop mounting?

A: Yes! The low profile design makes good use of the flow of air over a roof. The multiple rotors combine for smooth, quiet, relatively vibration-free operation.

Q4. What about the fact that the horizontal axis rotors aren't aimed exactly into the wind, but instead are aimed slightly downward from horizontal? Don't they lose a lot of power?

A: Another good point. Luckily, a slight deviation from the wind direction has almost no effect on a rotor's performance. The offset angle can also be in another plane, such as horizontal, useful in larger installations where rotor size is a significant fraction of tower height.

Q5. What about the bearings? Isn't there a lot of radial loading from the weight and wind loading amplified by the leverage of the length of the shaft?

A: The upwind section of the shaft approximately balances the downwind section. This minimizes radial loading on the bearings. That allows long bearing life.

Q6. Why doesn't it need a tail, or a dedicated azimuthal orientation means of any kind?

A: We feel that since a tail doesn't contribute any power, get rid of it and put on something that does produce power, like more rotors. A conventional tail is like a partner on a tandem bike who refuses to pedal! We simply place the center of aerodynamic drag of the entire driveshaft with its attached rotors slightly downwind of an azimuthal pivot point, and the machine will faithfully stay headed windward.

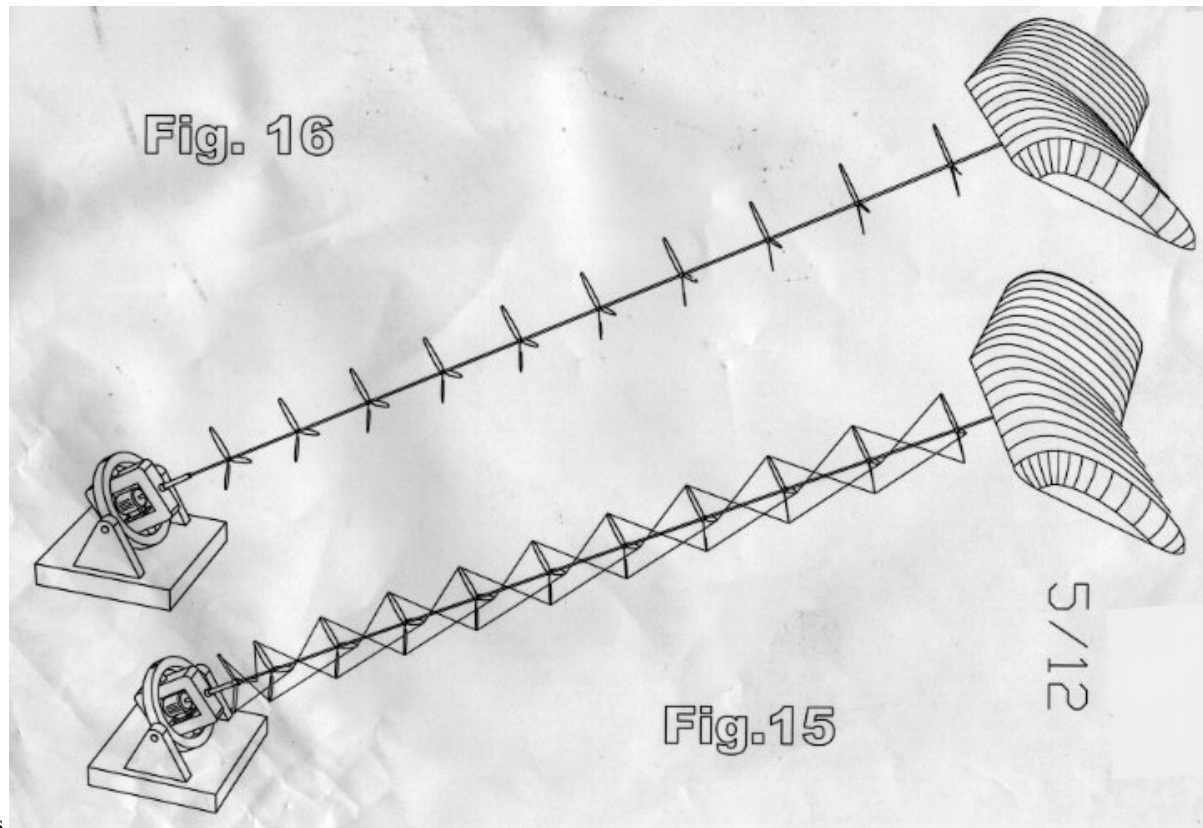
Q7. What about protection in high winds?

A: Several factors act to protect the machine in high winds: First, at the higher Reynolds numbers that come with increasing wind speeds, the length of wind shadows effectively increases, so that upwind rotors will begin to protect downwind rotors. More importantly, the downwind section of the shaft will tend to bend to a more horizontal direction, placing downwind rotors more into the wind shadows of the upwind ones. Finally, the generator and shaft can be resiliently mounted, so that they are blown into a more horizontal orientation by very strong winds, so that overall rotor exposure is reduced, while power output and rpm are maintained. The key to proper behavior at all wind speeds is that progressively more rotor surface is exposed in low winds, and less in high winds. No furling cycle is involved, so there is never a time when no power is generated because of excessively strong winds. The action is also not as radical as furling, and is less prone to "finicky" behavior.

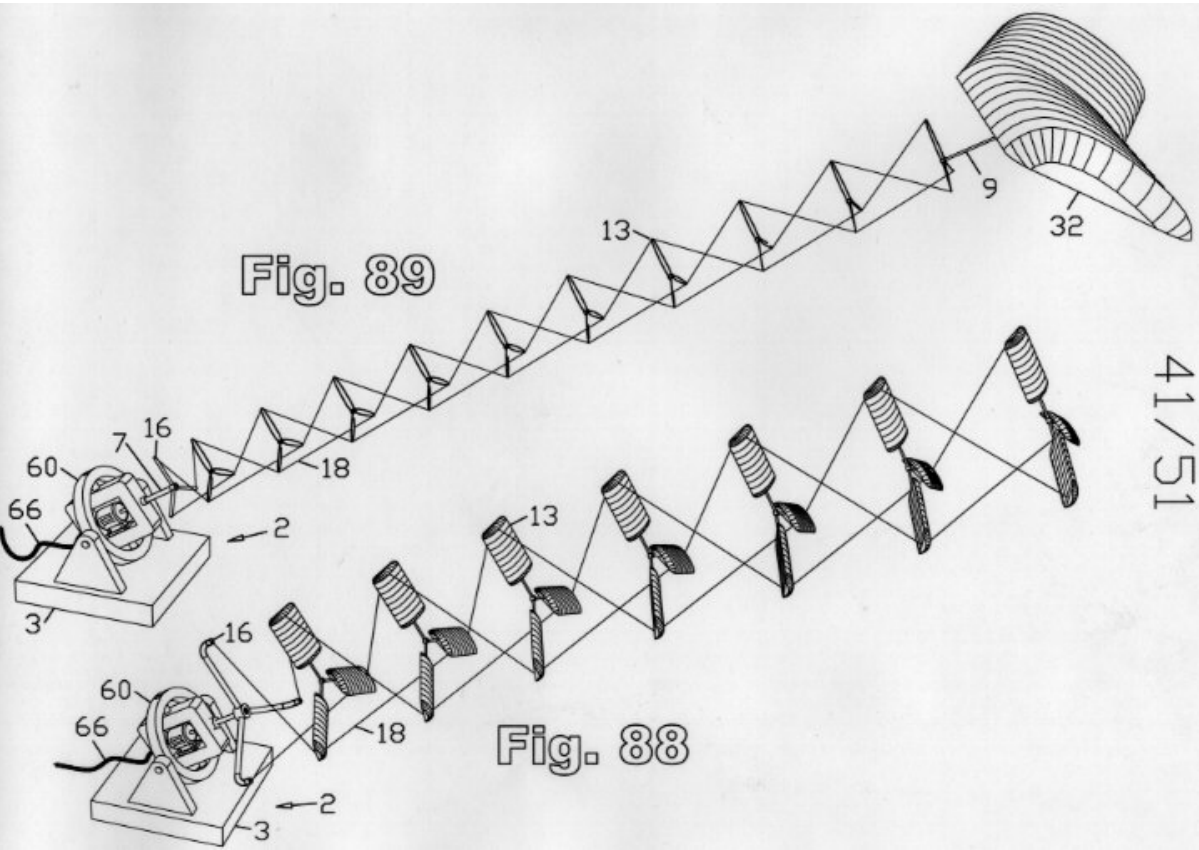
Q8. What designs do you have in mind for the future? Are they also covered by your patents pending?

A: Yes, and the future is wide open. This design is an important advance, yet is still just the tip of the iceberg. Future patent pending designs include atmospherically buoyant versions that incorporate helium-filled or hydrogen-filled kite-like aerodynamic lifting bodies instead of a tower. Others utilize buoyant, inflated rotors. We have much more advanced designs still. We have had preliminary discussions with some NASA personnel





indicating that such turbines might find use as easily deployable power sources on Mars.



Q9: Despite all the logical reasons why this new design seems to be a step forward, I'm having trouble accepting it. It seems too simple or something - I can't quite put my finger on it, but it bothers me. Is there any help for someone like me?

A: Innovative designs are often surprisingly simple. Advances in materials science make such progressive designs more practical. Progress inevitably involves change. Just close your eyes and relax, and keep repeating this mantra: "More rotors mean more power".

Q10: Utility-sized Turbines are being made larger all the time. Will yours scale up to Megawatt sizes?

A: So far they are scaling up beautifully. They are surprisingly stable even in very strong winds. We don't see any upper limit yet - further experiments will tell us how big they can get. For a given power rating, say 1 megawatt, our rotors are much smaller, about 1/3 of the diameter or less, and weighing a total of only about a third as much, collectively, with 2/3 less angular momentum. Blade stress considerations would thus be reduced, for a given power rating, using our design. This would suggest that the upper size limit for this design could also be in the megawatt range, and for atmospherically buoyant versions, possibly higher.

Q11: The trend has been going toward low speed, high torque alternators and generators.

A: Only because there hasn't been any other choice, except using a power-robbing, maintenance and wear-prone, heavy, expensive gearbox. By comparison a specially-built, multipole generator designed for low speed, high-torque generator has indeed been an attractive, albeit initially expensive alternative, but a generator made for normal speeds is still preferable, if there is a choice. There's a reason generators have traditionally been made for a faster RPM, given a choice. They can be smaller, and lighter, and simpler, by just turning faster. Also, at a faster RPM, the same power is transmitted at less torque, so the drivetrain can be less robust. The result is a lighter, simpler, more economical installation. When this new design is scaled up, we, too will preferentially take advantage of specially built, multipole generators with many poles for slow, high-torque operation. Our design, however, can be more powerful before it reaches a size where such a specially-built low speed generator is needed.

Questions to ask yourself:  
 How many wheels does your car have?  
 Not just one? What about trucks?  
 How many cylinders in your engine?  
 More cylinders run smoother - and have more surface area per unit mass.  
 How many cars in a train? Not just one? Why?

It's much easier on the track. Economy of scale - repeating units...

How many sails on a clipper ship? Not just one? Why not?

How many tiles around your bathtub? Not just one huge thick tile? Better surface to volume ratio with multiple small tiles? Just checking...

How many tiles on your roof? Not just one big, thick tile? Better surface area to mass ratio with multiple smaller, thinner tiles? I see.

Why do we look up and see a flock of geese, rather than just one giant goose? (run!) Why do ostriches and all other birds over a certain size have to walk everywhere?

How many engines on a large airplane? How many props? Why not just one big prop?

How many loops of wire in a generator? Not just one? Why not? More power?

How many fingers do you have? How many Toes? How many teeth?

How many leaves on a plant?

Now how many rotors should a wind turbine have?

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**2600 Porter Avenue, Unit B**  
**Fullerton, CA 92833**  
**714-992-5594**  
**Doug@selsam.com**

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We are currently funded by The California Energy Commission:

[http://www.energy.ca.gov/contracts/smallgrant/2003-02-21\\_awards\\_02-02.html](http://www.energy.ca.gov/contracts/smallgrant/2003-02-21_awards_02-02.html)

**U.S. Patent Number 6,616,402** and other patents pending including international (PCT) <http://www.uspto.gov>

Thanks for taking your time to explore this new idea.

Sincerely,

A handwritten signature in black ink, appearing to read "D. Selsam".

Douglas S. Selsam



[Doug@selsam.com](mailto:Doug@selsam.com)

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Links:

Yahoo Wind Energy <http://groups.yahoo.com/group/awea-wind-home/>

Cool Alternative Energy Website <http://www.otherpower.com>

Thanks to:

Joe Zingali - Owner - J & Z Products / Zinger Propeller - <http://www.zingerpropeller.com>

Brent Scheibel - Professional Anemometry - <http://www.windtesting.com>

Jeff Jean, Jim Leslie, Lee, Juan Mendoza, Alex Ruiz - Advanced Composite Products and Technology - <http://www.acpt.com>

John Supp - Southwest Windpower - Well-Designed and World-Renowned Wind Turbines - <http://www.WindEnergy.com>

Kyle Wetzel - Aerodynamicist - <http://www.kwetzel.com>

Paul Gipe - Author and Tester - <http://www.chelseagreen.com/Wind/PaulGipe.htm>

Hugh Piggott - Author, Wind Turbine Designer, Builder, and Advocate - <http://www.scoraigwind.co.uk/>

Ron Green - Thermodyne Systems - Affordable Wind Turbines - <http://www.HydrogenAppliances.com>

Kurt and Ingrid Degener - Carbon Tube Fabricators - <http://www.AviaSport.net>

Michael Sanchez - Photorealistic Renderings - Michael is an Engineer and an Animator at *Dreamworks*... he can be reached by e-mail at [mikesa71@hotmail.com](mailto:mikesa71@hotmail.com)

Randy Philpot, Dan Buckmiller, Jerry, Dennis at [Advanced Composites of Salt Lake City, Utah](#)

Raphael Aguirre of Aguirre Machine in Fullerton, CA

and thanks to the many others who have helped as well.



RENDERING BY MICHAEL SANCHEZ



# Dragonfly Wind Generator

Wind Generator plans and kits by

[Bill Cornelius](#)

[Theory](#)

[Specifications](#)

[Using your own Alternator or Generator \(Power Chart\)](#)

[Field Switch](#)

[Maintenance](#)

[Parts list](#)

[Troubleshooting Guide](#) [Testimonials](#)

[Prices & shipping](#)



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**Note:** This design is developed from plans published by the USDA in 1939. Typical use supplies 12 v. fluorescent light, radio, and laptop for a cabin. Please let me know what you think!

## Dragonfly Theory

Designed for people who operate and maintain their own system. Dragonfly philosophy recognizes that nothing manmade lasts forever, but planned obsolescence is like being patronized by vampires. To avoid this, the Dragonfly is designed to last as long as the user has interest, with locally available spare parts, few critical tolerances, and the maintenance technology somewhere between a paper airplane and a bicycle. Components are adaptable to the supply: off the shelf hardware, lumber, and any variety of alternators or generators.

Included with plans are directions for construction, wiring, trouble-shooting, towers, battery maintenance, site selection (wind appraisal without an anemometer), some sources of inexpensive materials, and instructions for blade making and balancing (though I also sell blades and kit blades). Blades are twist taper cut from 2x4 lumber.

Watts per dollar, Dragonflies are one of the most "efficient" wind generators on the market, though one could expect that initial low cost might be offset by higher maintenance, this is not necessarily true, and depends on the local environment. I personally know of one that was 4+ years old, near the coast, and still working fine after 2 years without an inspection.

## Self-Feathering

The feathering mechanism consists of a horizontal hinge which allows the blade, axle, and alternator to tip back as a unit to spill high winds over the top. It is held in operating position by its own weight and a coil pull-spring. Units that I sometimes make are guaranteed to survive winds to 80 mph, when the blade is properly balanced, and the field is loaded. Manual shutdown for stronger wind can be accomplished from the ground.



The blade, bearings and drive pulley rotate as one unit about a fixed axle. The v-belt drive pulley is available in several sizes from heating and air-conditioning stores, and may be easily interchanged to obtain the best power ratio.

## Specifications

Frame Material: wood, metal brackets.

Net Weight: 50 lbs.

Blade Diameter: 9 feet.

Blade Material: wood, stainless steel.

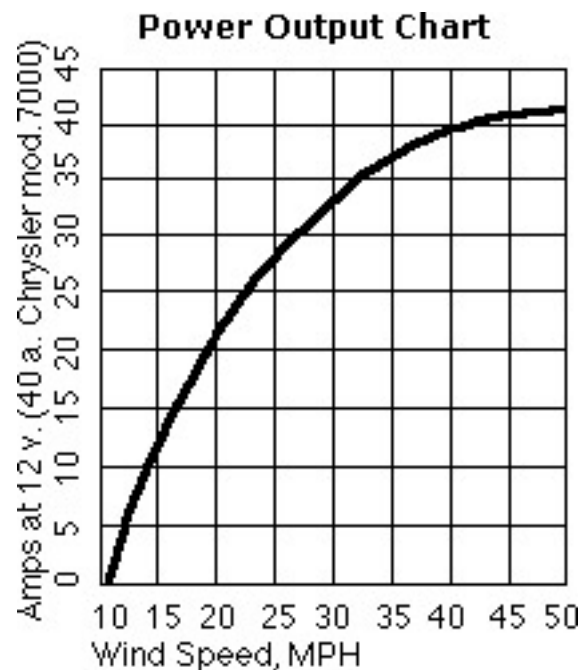
Blade Weight: 10 lbs.

Minimum windspeed: 10 mph.

Maximum output: 700 watts at 45 mph with Chrysler alternator and a 10 inch drive pulley.

# Using your own Alternator or Generator

Any alternator will work, but those with higher rated output means more wind is necessary to overcome the draw of it's large field, so big alternators won't produce in milder winds. Generators and lower rated alternators loose the power advantage of storms, (which occur to a greater or lesser extent about every 2 weeks worldwide), but take better advantage of wind below 10 MPH. Some desirable characteristics are:  
 Rated Power Output: 400 to 800 watts.  
 RPM Output Range: between 200 and 1,000.  
 Alternators starting around 450 rpm.



The alternators exposure to the elements is not a problem unless the unit is used in a marine environment. Otherwise there is nothing at the top of the tower that won't be found under the hood of a car, except sunlight which may affect the wiring insulation.

If the unit IS in a marine or other harsh environment, marine alternators are available with enclosed brushes, bearings and a corrosion resistant finish. Electrical terminals can be coated with protective caulking or shellac.

## Field Switch

There are two kinds of automatic field switches shown in the Dragonfly plans, either will do: one is a momentary switch that requires occasional cleaning, this switch is normally on and is turned off by the weight of the feathering mechanism at rest in still air. The other is an enclosed mercury switch (good to 32 degrees below zero) which is clamped to the side of the feathering mechanism. The blade is designed to have a high RPM which will create a vacuum behind it to instigate feathering. When the RPMs are sufficient to produce electricity, the blade has already begun to feather slightly. As it tips back, the mercury switch tilts, or the momentary switch closes, to turn the field on.

## Maintenance plan A:

Check list in order of probability, depending on climate, 2 to 4 times a year:  
 1): loose nuts, or fatigue at wire terminals. Too much loose stuff means the blade's out of balance. See manual for balancing.

- 2): belt tension.
- 3): check for wear or dirty turntable brushes.
- 4): loose or dry blade bearings (grit in bearings or unbalanced blade). Zerks require grease gun, should be greased regularly.
- 5): tight feathering hinge (need oil?)
- 6): check wood parts for rot, warp, or splitting.

Maintenance plan B: Wait till it stops working, then fix it. This actually is practical, but risks complications like: parts falling off, drained battery, or working in the rain.

---

## Testimonials

The following customer responses testify to the simplicity of design and construction of the Dragonfly wind generator as well as its durability and the ease with which it can be modified to local materials and conditions.

... I really like your design and feathering mechanism. Around Thanksgiving the mill went through an 8 hour storm with winds 50 to 60 mph with one recorded gust of 78 mph and held together.

N.S., Ferndale, WA

...also the other (Dragonfly) worked very well with a permanent magnet generator which I borrowed from a friend...

P.A.W., Kingman, AZ

..We would like to try another machine at a second location...

B.B., Glendora, N.J.

...instead of the mercury switch, I have a centrifugal switch from a Coleman furnace that turns it (a Chrysler alternator) on at about the time it is going fast enough to charge...

J.C., Kingman AZ

We presently (1982) have 20 wind students on-site on our Energy Education Center working with a Dragonfly wind generator that is on campus...

P.E., Red Wing, MN

... the prop blades were very nice and the plans were good... the Dragonfly has proven to be very practical and has been through the worst weather here in more than 100 years. I just had to write you to tell you I am very satisfied with the whole project. Thru rain snow, sleet, hail, sub-zero and winds to 60 MPH plus. It turned 2 days and nights thru a snowstorm and in the morning



the prop hub looked like a giant sunflower made of ice and snow...

R. H., Hampton Bays, NY

## Prices

Plans: \$15.00

Available by download only, approximately 27 pages (depending on the printers resolution). Please provide current email address.

Blade Balance Kit: 1lb \$15.00

A piece of copper pipe, 2 washers, and string. weights not included. Works only for Dragonfly design, easy to make, get plans & make your own.

Kit blade set: 14 lbs. \$100.00

pitch and foil are rough cut, centers not located. holes not drilled. Needs sanding, painting, and sometimes light planeing. Does not include bearings, pulley, or hub.

Finished Blade Set: 14 lbs \$200.00

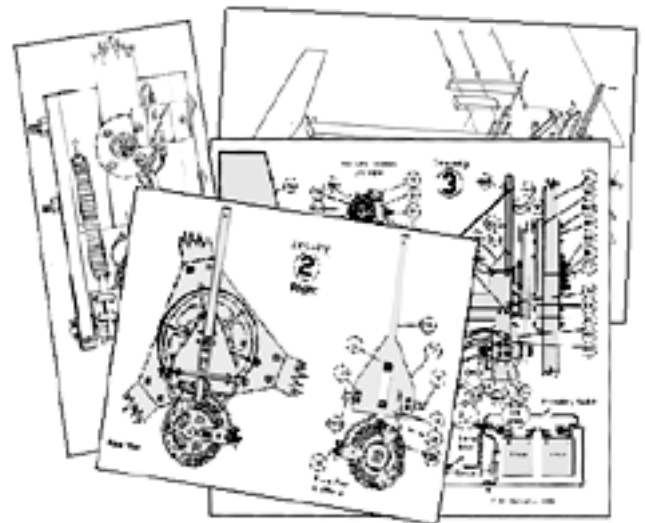
centers not located. holes not drilled. Does not include paint, bearings, pulley, or hub.

Individual blades: 5 lbs cost = 1/3 set, kit or finished

All blades sold unbalanced and unpainted. A stainless foil strip comes attached to the leading edge in finished blades, and included unattached with kits. Does not include bearings, pulley, or hub.

Shipping: Blades delivered within 3 weeks. Inside US & Canada: by United Parcel Service. COD accepted for postage. Outside US & Canada: please specify carrier and include correct postage. Sorry, no foreign COD.

Payment: in advance by PayPal, Credit Card, Check or Money Order. I'm sometimes away from my site for a week at a time, so please be patient Send Check, Money Order or by [Western Union](#) to: WS Cornelius Enterprises, POB 57, Albion CA 95410-0057



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# REALTIME CONTROL

## DIY Rotorvane Anemometer

- \* LED dials display wind speed, wind direction and maximum gust
- \* Serial port allows direct connection to a computer or modem
- \* Integrated data logger stores wind speed and direction distributions
- \* Windows™ software supports realtime display and logged data retrieval
- \* [Rotorvane™](#) sensor provides accurate data from simple, reliable hardware
- \* [Low cost Kit](#) contains the critical electronic and mechanical parts

These pages describe how to build an elegantly simple vector anemometer. It is an accurate and reliable standalone instrument for general use and has features which simplify its use in more complex applications.

The LED dials display wind speed to within a knot or so and wind direction within a few degrees. Pressing the pushbutton displays maximum gust speed and direction. Holding the pushbutton down resets these.



Web-based weather servers and other computers can read the wind data directly from its serial port. Its serial port can be connected to a modem, allowing remote wind monitoring via a dialup line.

The built-in data logger records speed and direction distributions and so stand alone it collects and stores the data for wind power site assessment.

One sensor measures both speed and direction and the download is general purpose twinlead. This reduces cost and improves reliability.



We supply a Kit containing two bare printed circuit boards, the less common electronic parts and the specialised mechanical parts. You provide the other items required, and build and calibrate the instrument. Total cost is typically around US\$95.

Electronic construction is fairly straightforward, and likely to be uneventful for those who have previously successfully built electronic kits. Mechanical construction requires only a drill and a few other hand tools.

Our Rotorvane for Windows package allows you to read and save current and logged data from a DIY Rotorvane Anemometer, and to plot wind speed and direction in real time. The anemometer can be either directly connected to the computer serial port or connected via modem. This package (and the VB source code) can be downloaded free of charge from our site.

Rotorvane™ technology is the intellectual property of Realtime Control. The design is copyright. Permission is granted to copy the hardware design provided it is used with a microcontroller supplied by REALTIME CONTROL.

- [Specifications](#)
- [Parts list](#)
- [Sensor](#)
  - [Housing](#)
  - [Shaft and bearings](#)
  - [Cups and spider](#)
  - [Sensor board](#)
  - [Bearing shield](#)
  - [Assembly](#)
- Display
  - [Speed units and scale](#)
  - [Front panel](#)
  - [Printed circuit board](#)
- [Calibration](#)



- [Operation](#)
  - [Wind power site assessment](#)
- [Serial port](#)
- [Windows software](#)
- [Kits and Prices](#)
- [FAQ](#)
- [Fault finding](#)
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Pole Mount

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**INTERNATIONAL:** Australia, British Columbia, Belgium, Brazil, Canada, the Channel Islands in the UK, Cyprus, England, Latvia, Ontario Canada, Sicily, Scotland, and Switzerland.

**bold** = recent additions & orders  
Check out customer feedback on [ebay](#)



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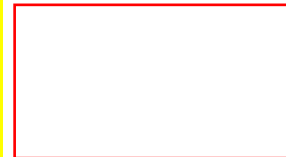
- kite flying
- windsurfing
- storm chasing
- weather monitoring
- wind power
- target shooting
- kiteboarding
- sailing

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**Hurricane Isabel**  
[Testimonial:](#)

"Just wanted to tell you the Vortex pole mount worked great last Thursday during the hurricane. We registered gusts up to 48.6 mph in Waynesboro (just north of the Mason/Dixon line)."  
William M.






[Proud to supply the David Tonnesen Legal's Sculpture](#)









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Website designed by [Webvine Designs](#)

# Micro Hydro Power Plants

	<p><b>Micro Hydro Power Plant Overview &amp; Power Calculations.</b> Knowing how to calculate the generating capacity of a Micro-Hydroelectric Power Plant is of prime concern. The following pages are a compilation of data I've collected over the past 20 years or so on power production &amp; control as related to Micro-hydroelectric power plants.</p>
	<p>Induction motors have been used as generators for decades. This is called Induction Generation. Induction Generating is the simplest method of generating electricity. Your local power company furnishes most of the things you'll need in except for hardware. The Power Company furnishes the Voltage Control, Frequency Control and excitation you'll need to run your induction motor as an Induction Generator.</p>
	<p>Anyone contemplating building a Micro Hydro Power Plant must know how much water is available. Weirs and several other methods for measuring water flow from small streams to rivers have been around for centuries. The pages following include basic weir construction as well as Weir Charts.</p>
	<p>Several Tables detailing various mechanical properties of various pipe types (PVC, Steel &amp; Others)</p>
	<p>A basic outline of why a Governor / Load Control is needed for Synchronous (Real) Generators, as well as some AC theory within the context of line frequency &amp; high &amp; low voltage conditions.</p>

	<p>Most of the basic Turbine types are on this page with photos and their theory of operation. Several "Older" turbine types will also be found here</p>
	<p>"The Banki Water Turbine", Oregon State University, Civil Engineering ,Department Engineering Bulletin Number 25 By C. A. Mockmore and Fred Merryfield. Originally published in 1949. Details the theory of operation of the crossflow turbine. Very math intensive. Original document scanned in PDF format. You will need Adobe Acrobat (available on my Links &amp; Sources page) to read this.</p>
	<p>Various "home-brew" method for machine work need for the Banki Crossflow Turbine. It's not really as easy as you've been lead to believe! You still need a small machine shop in your backyard.</p>
	<p>Waterhammer basics. What it is, how to control / prevent it as well the math to find peak excess pressure.</p>
	<p>A look into the past. A variety of waterwheel types with photos. Nothing technical here, I just like old Waterwheels.</p>
	<p>Various "Hardcopy" publications I used as research for this web sits as well as internet links relative to hydro power.</p>

# Uncle Joe's Funny Stuff About Electricity

## The Layman's Guide to Electricity

## The History of the Water Transformer

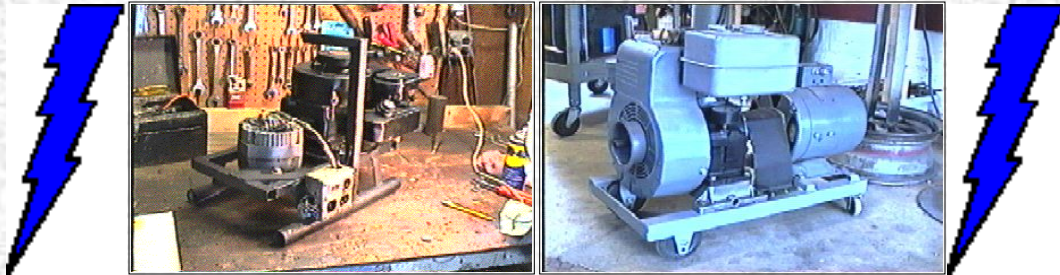


# Unusual Electrical Terms

## How Vacuum Tubes Work



# Portable Lightplants and Generators



**W**elcome! For some ethereal reason, I have a genuine interest and fascination with generators and electricity. I'm sure it all started 39 years ago when I was 4 years old and was playing in the basement of our house. Little did I know, I was about to get my first electric shock. I reached over to move a large electric fan, that had a short in it and was hot with 120 volts of good 'ol Alternating Current. Well, it took me quite a while to let go of that fan and after I did I went screaming to Mom. I had to be thinking, "What in the world happened and why did that hurt? What mysterious force did that?" After that experience, I was hooked on electricity.

My Uncle Norm (Mom's brother) did nothing to dispel that fascination! He would bring me boxes of electronic/electrical/mechanical "treasures", books and other things that furthered my interest. A lot of fascinating stuff for a curious kid like me. Geesh, I learned a lot of things from him! He is a superb machinist and craftsman of the first order.

Because of all the above reasons, I've built, designed and played with various forms of "Rotating Electrical Machinery" throughout my lifetime.

I'm not sure if it has reached the obsession level yet... I still have a job so maybe I'm OK...?

(In building the more critical components of these generators, I have to give credit to Dewey King, NJ8V, a master machinist. He helped me with the machining and design of many of the parts, adaptors, couplings and other things too numerous to mention. If he ever decides to call in my debts to him, I'll be out at least an arm, a leg and my firstborn...)

---

One of the neatest ones that I built was this Delco Automobile Alternator (3 phase) that I converted to a single phase alternator. Voltage is regulated by a [homebrewed regulator](#). The generator/engine combination is mounted on a small welded steel frame and powered by a typical lawnmower-type Briggs and Stratton Classic 3.5 hp engine.





It is capable of 700 watts at 120 Volts AC or DC output. The AC frequency is about 250 to 400 hz, depending of engine speed. You may ask, "What can you power at that frequency?" Plenty! Lightbulbs don't care what frequency they operate at. Devices that are power-transformer operated, such as a radio, TV, VCR, etc. work very well on this frequency.

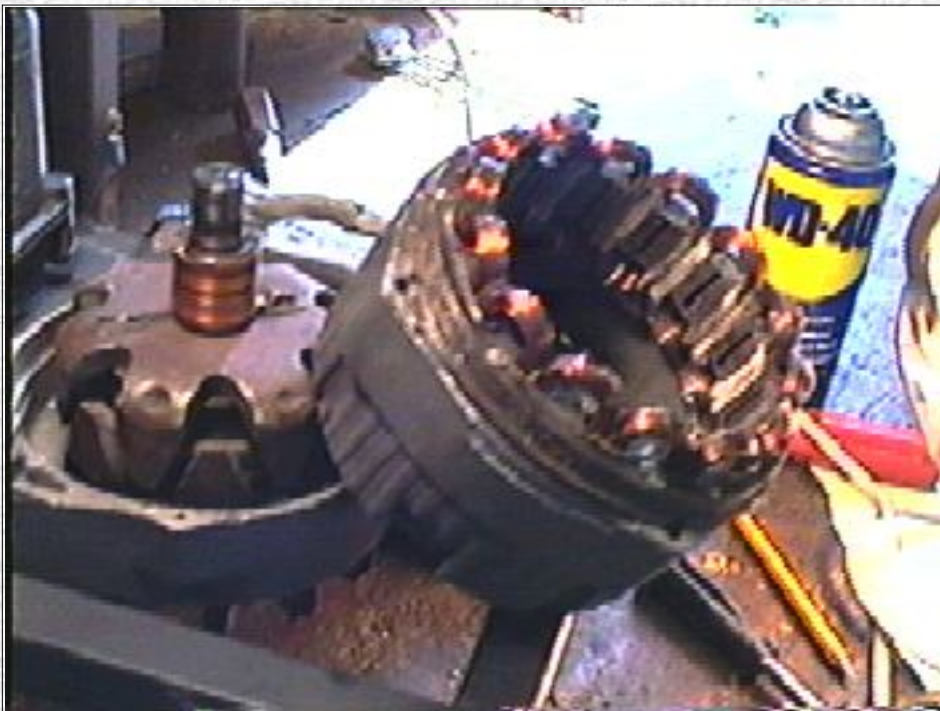
I included a full wave diode bridge to also provide 120 Volts DC. This makes it possible to operate any universal-motor operated device. Power saws, drills, angle grinders, etc.

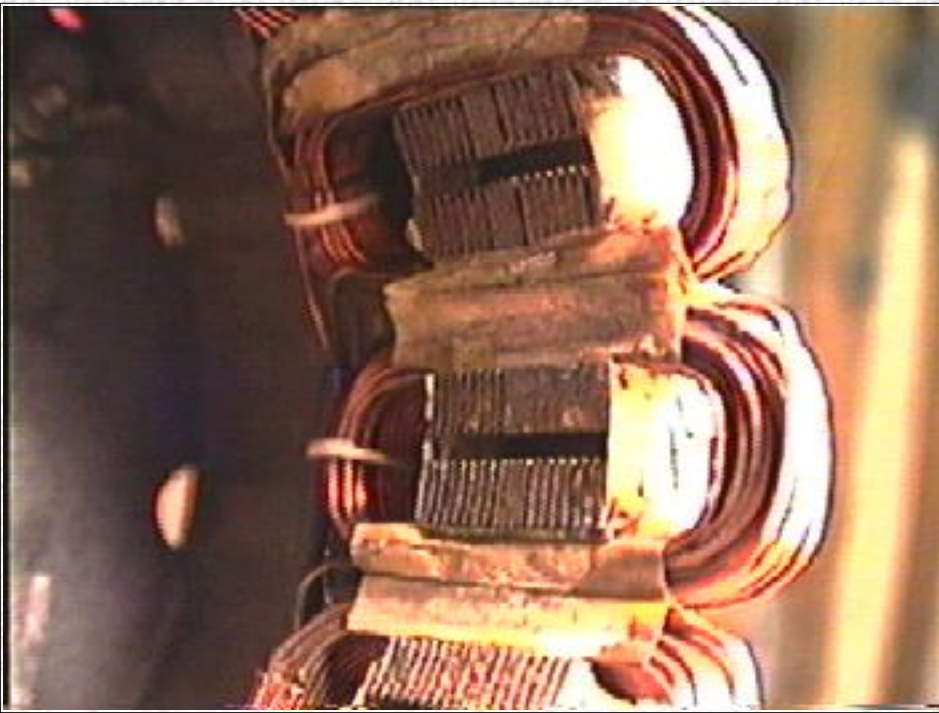
This generator is a veteran of a ham radio expedition to Manchester islands on the Ohio River. There it powered a TS-520 ham transceiver at about 350 watts maximum for the day. I'd refuel it about every hour or so. This power source has seen a lot of use and is very reliable.



---

You ask, "How in the world did you convert a 3 phase alternator to a single phase system?" In its original condition, it had 42 poles on the stator. The rotating field has 14 poles. (42 stator poles divided by 14 rotor field poles equals 3 phases, ... Hey! How 'bout that? ) Well, NJ8V helped me cut out every third pole on the stator of the alternator. This left 2 poles with a large space between them and the next 2 poles. I wound each of the 2 pole pieces as a single pole, for a total of 14 poles.





In this close-up shot, notice the two pole faces wound as one and where each third pole has been cut out. A small coil form was made out of plexiglass to wind the coils. I used epoxy glue to hold the coils in place, with fiber tape as an insulator. The coils are about 36 turns of #18 wire, all connected in series.

The only advantage of converting the alternator to single phase was that I could get the full 120 vac out of the windings. That was better than having to use a transformer or other method of getting 120 volts out of it. Besides, it was a good education!

---





**Here is a new welder/generator that I've just finished in February, 2000.  
It is a 100 ampere DC welder, powered by a B&S 8 hp gasoline engine.  
Click on it to go directly to this welder page.**

---

[Click here to see some of my other generators](#)

Chrysler, Navy Surplus, Dayton, Kohler, Induction Generator, Renewable Energy Experiments,  
Dayton '99.

---

## Other cool lightplant/generator links:

[Antique Lightplants](#) by Frank DeWitt Very good site!

[Dan's Handmade Electricity page](#)

Dan has some great ideas on making low rpm generators using [Neodymium magnets](#). Included is experiments and results with pictures!

Greg's Lightplants page last changed Feb. 9, 2000

Email me at: [NS80@qsl.net](mailto:NS80@qsl.net)





## Animated Engines

I have loved mechanical things since I was a kid. Engines in particular have always intrigued me. All my life I've pored over books, studying cutaway diagrams, hungry to understand how things worked. These pages are an attempt to share that magic.

Some of the animations are rather large, so you may need to **allow a few extra seconds** while each page loads. These pages use animated GIF files, so they require a fairly recent browser -- any but the oldest browsers will do. If the main illustration at the top of each page isn't moving, you'll need to update your browser for the full effect.

I hope you enjoy visiting my engine pages as much as I have enjoyed creating them.

Internal combustion		
<a href="#">Four Stroke (Otto)</a>	<a href="#">Two Stroke</a>	<a href="#">Wankel</a>
<a href="#">Atkinson</a>	<a href="#">Gnome Rotary</a>	<a href="#">Jet Propulsion</a>
Steam		
<a href="#">Locomotive</a>	<a href="#">Oscillating</a>	<a href="#">CO2</a>
<a href="#">Coomber</a>	<a href="#">Crank Substitute</a>	<a href="#">Revolving Cylinder</a>
<a href="#">Watt Beam</a>	<a href="#">Grasshopper Beam</a>	<a href="#">Unknown Beam</a>
<a href="#">Newcomen</a>		
Stirling		
<a href="#">Two Cylinder</a>	<a href="#">Single Cylinder</a>	<a href="#">Ross Yoke</a>

I would love to hear your comments about these pages. Are there any other engines you think I ought to make illustrations of? (I already have to-do list...) Also, please contact me if you feel I have made any errors or omissions.

Click here if you want to know [how the illustrations were made](#).

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Last update: 5/23/2001

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Solar Electric-Solar Thermal-Radiant Floor-Pool Heating



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Home Power magazine, the hands-on journal of home-made power, grew out of our passion for renewable energy (RE). We're concerned about a world that is increasingly polluted. We're concerned about the high energy use and waste of "developed" cultures. And we're concerned that people are dependent and unable to care for themselves when it comes to energy. Renewable energy gives people control over their energy future by using energy that is provided daily by nature. New to Home Power... [click here](#) to learn about us!



**Books**

Feature Articles

Off-Grid Luxury

"Leap then look" has always been my subconscious motto. Sometimes this method has had definite pitfalls, but with my wife and my renewable energy system—so far so good. When I received the PG&E estimate for line extension, renewable energy became the obvious choice. The thought of paying US\$80,000 to the utility was a bit hard to swallow. With a distant background of having worked for the IBEW on two of the first solar-electric facilities in the U.S. in the early 1980s, I figured... [more](#)

**RE Tips**

We have the technology. Don't wait -- start using renewable energy today!

**Poll**

My goal is to utilize renewable energy in a \_\_\_\_\_ home.

- Remote
- Rural
- Suburban
- Urban
- Mobile

[View Results](#): 2009 votes

PV Training

On a clear, sunny day in March 2003, a group of women were outside a California environmental science school talking shop—and that isn't short for shopping. Discussing everything from conduit bending to system voltage, these 25 women were at Walden West Center in Saratoga, California, installing a 1.5 KW solar-electric system. Walden West is an outdoor environmental science school in the Saratoga hills that hosts week-long science programs for 5,000 to 7,000 students each year. The women, who came from all across.... [more](#)

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Purely from a financial standpoint, people on the grid without solar hot water are way behind the times, and people with solar electricity are just a little ahead of their time.

Andy Kerr, Solar Tour host

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**▶ Applying Technologies**

We partner with international, environmental, and government agencies to apply renewable energy and energy efficiency solutions. We help license and transfer technologies into the marketplace, and help clean energy entrepreneurs succeed.

**▶ Learning About Renewables & Energy Efficiency**

All about renewable energy and energy efficiency, plus information for homeowners, businesses, students & teachers, inventors, electricity providers, and farmers.

As I buckle my baby daughter into our car, I marvel at the possibility that her first car could be powered by hydrogen—the third most abundant element on the Earth's surface. That is, if researchers—including those at NREL—can find a safe, economical, practical way of storing hydrogen fuel on board a vehicle. [Full Story](#)

**Major R&D Areas**

Solar



Wind



Biomass



Geothermal



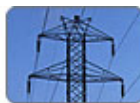
Hydrogen &amp; Fuel Cells



Buildings



Advanced Vehicles &amp; Fuels



Electric Infrastructure Systems



Energy Analysis



Basic Sciences

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# AC Battery Chargers

This discussion centers on battery chargers that convert 120 volt AC power to 12 or 24 volt DC. There are a few different varieties available. In our opinion this is the **least** desirable option for charging batteries in a remote power application, but is often the **only** option if you are not willing to tinker with antique or home built equipment. Check out our previous pages about 12 volt chargers--gasoline engines that produce 12 volt power directly. Every time you convert power to or from 12 volt DC and 120 volt AC, there are electrical losses involved. The less conversion, the better!

## Options for AC Battery Chargers:

### Build Your Own!

We converted a dead Heart Interface inverter into a super powerful battery charger by extracting the transformer and connecting it through a large bridge rectifier.

[Click here to see plans for our home built charger, made from a dead inverter](#)



### Hardware Store Chargers

(auto parts store, too)

These chargers function quite well, but are not very efficient compared to the new solid-state variety. They are very easy to find, any hardware store or auto parts store will sell you one. And they work fine, BUT--the ratings are generally inflated by quite a bit. This is a problem with the new low-cost inverters available from Taiwan, too. It might SAY 1000 watts on the case, but that's not what you are getting. Shame on them! Usually what you really have is a 30-amp charger in a big case that's mostly empty space.

Let WEIGHT be your guide as to the true amp rating of this sort of charger--big ones should be extremely heavy because of the transformer inside. Also, this transformer tapers the charging

current into your batteries. When the batteries are nearly empty, the charger will put out nearly its full current, which will gradually get lower and lower as the batteries fill.

### Surplus Industrial Chargers

Made for charging forklift batteries, these machines are brutally expensive when new, and a great bargain if you can find them used. Some are set up for 24 volts. This can be a problem with both efficiency and heat buildup if used to charge 12 volt batteries.

### Inverters with chargers built in

This sort of charger is very convenient--when your generator gets up to speed, the inverter automatically switches your house over from battery to generator power, and uses the excess capacity from the generator to charge your batteries. While not as efficient as a solid-state charger, these are usually quality components. If the inverter's charger is rated at 50 amps, you can bet that it produces that rating when the batteries are empty. We've never seen one of these chargers that suffers from "ratings inflation" like the hardware-store variety above. Since it's transformer based, it will automatically taper off the charging current as the batteries fill.

### Solid-state chargers

The latest thing in battery charging, these chargers are lightweight (no transformer) and very efficient, but expensive. The only 2 brands currently available are from Todd and Statpower. And if they say "50 amp," you'll get 50 amp into empty batteries.. Charging current is controlled electronically for best efficiency. One note--with Todd chargers (the brand we use here), be careful to unplug the charger from the generator when starting or stopping it, otherwise the charger can be damaged over time.

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# Home Built Battery Charger

## (made from a dead inverter)

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The battery charger pictured here is a real beast. It will dump 60 amps into a 12 volt battery bank that is low, and will taper down to about 10 amps charging current as the batteries fill. Total cost, \$20!



The basis of this charger is dead 1000 watt inverter from Heart. A lightning strike fried the electronics in this unit, but the transformer was intact. The owner elected to replace it with a new model, and we picked it up for \$20. The inverter case made a handy case for the charger, too, because of the handles. The whole unit weighs over 50 pounds.

At the time, we did not have a large enough bridge rectifier available, so we built one out of 9 car alternator diodes connected in parallel to a heat sink. The bridge gets hot in use, but the diode bus bar is a piece of unistrut that's massive enough to dissipate the heat produced.



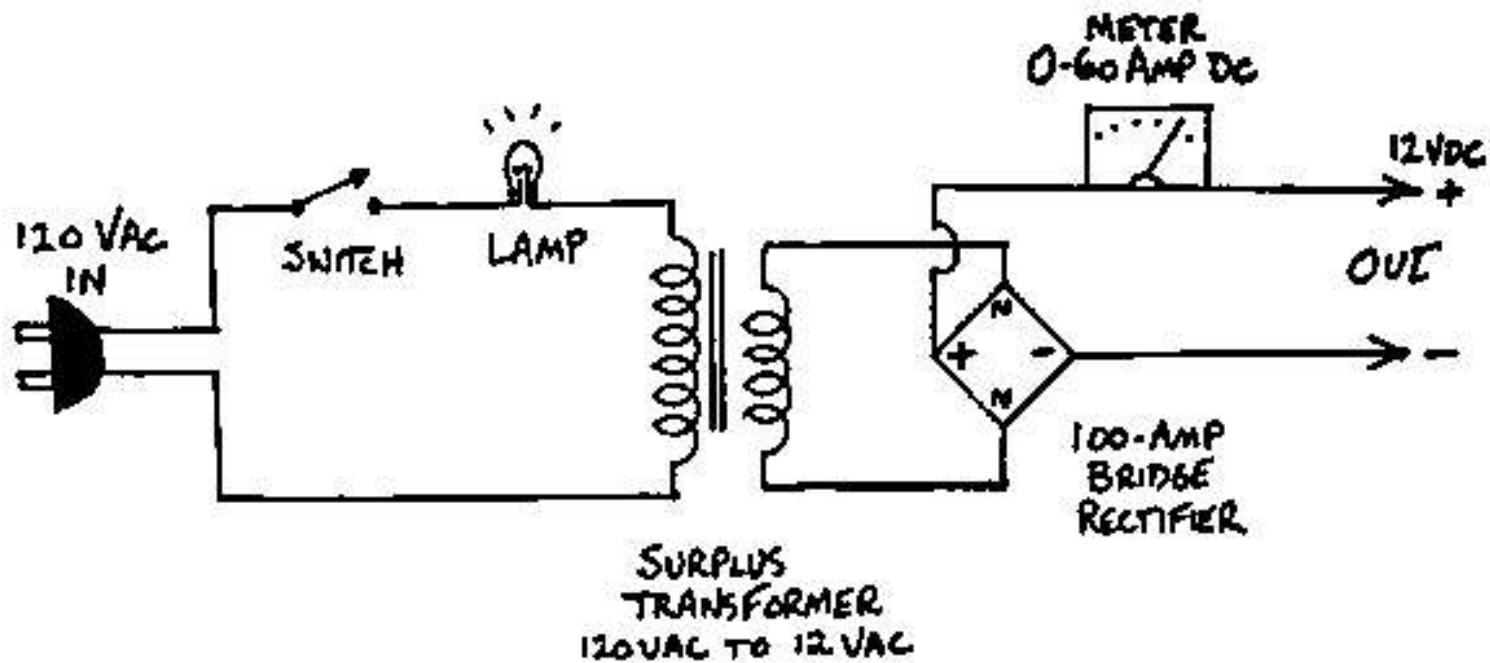
Close up of home built diode bridge



**home built diode bridge--note the insulated standoffs so the diodes don't ground to the case.**

**Here is the wiring diagram for the charger. Buying a bridge rectifier big enough to handle 70 amps would simplify construction...the home built diode bridge was the most complicated part of the project. Check our products page, we sometimes have large bridge rectifiers for sale.**

**Here is the circuit schematic for the charger conversion:**



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# Battery Bank Care

Most battery banks need maintenance only 4 times a year or so. But after you first install your system, check the batteries every month for a while just to make sure. If the electrolyte level gets below the plates, your batteries WILL be damaged. I remind myself to do this by performing maintenance on the solstices and equinoxes--quite appropriate for a solar energy system!

## **CHECK OUT THIS GREAT, INEXPENSIVE BATTERY REFERENCE BOOK!**

**Secrets of Lead-Acid Batteries by Thomas Lindsay is one of the best reference books on the subject that we've ever seen. Plus, it's cheap, since he doesn't waste any paper talking about irrelevancies. Available on our products page for only \$4.95!**

**Equalize your battery bank about 6 times a year.** Don't do this with gel cells, only with regular "flooded" lead-acid batteries. Equalization is basically a controlled overcharge that extends your battery life by knocking deposits off the plates. It's usually easiest to do this with a generator. Charge the batteries at your normal rate, but don't stop when your meter shows full charge. Keep charging for 2 or 3 hours longer. If you care to monitor the process, you can take specific gravity readings 30 minutes apart and continue the process until the readings stop increasing.

**4 times a year you should turn off the main power switch and::**

- Check the electrolyte level. Do this when the batteries are -not- discharged, and wait a couple hours after charging for the hydrogen bubbles to disperse. The batteries should have full and low marks--sometimes the full mark is an inner plastic "shelf" with a hole in it to see the electrolyte level.
  - Wear safety goggles and rubber gloves
  - Fill **ONLY** with distilled water to the "full" mark
    - **DO NOT** add acid!
- Clean the battery tops with rags dipped in a baking soda and water solution. **DO NOT** let this cleaning solution get into the batteries--be careful of the vent holes in the caps on each cell, as cleaning solution can enter the battery here.
- Check for corrosion on all the battery terminals
  - If any terminals are encrusted in green "stuff" you should
    - Make **SURE** your main power switch is off. If you don't have a main switch, turn off the inverter, all load circuits, and all charging circuits.
    - Carefully disconnect wires from the dirty terminal and clean off the gunk with a wire brush. Don't breathe in the dust! Wear a mask if necessary
    - Apply anti-corrosion paste to the terminal (available at any hardware store in the electrical department)
    - Reconnect the wires
- Relax and smile. Enjoy the fact that you don't have to read by candlelight anymore, or that



you no longer pay bills to the power company! Your maintenance is done for the next 3 months.

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# Battery Safety

Batteries demand lots of caution when you work around them or move them. They are very heavy, store enough energy to start a fire, are full of dangerous sulfuric acid, and emit explosive hydrogen gas. Fun stuff, eh? Here are some safety tips for working with your batteries. Note: These safety precautions are for standard lead-acid batteries, since nickel-cadmium batteries use a base--potassium hydroxide--instead of sulfuric acid for an electrolyte. Follow the manufacturers instructions instead of these with your NiCad batteries.

- Install your batteries in a vented battery box, they emit hydrogen gas when charging
- Never install electrical equipment in the same compartment as batteries due to explosive hydrogen gas
- No smoking around batteries for the same reason
- Wrap wrench handles in electrical tape to avoid shorting between battery terminals. A 6-volt golf cart battery can turn a wrench red hot in seconds
- Wear goggles and rubber gloves to protect yourself from sulfuric acid when moving or working on batteries
- Keep a box of baking soda and a jug of water around to neutralize any spilled battery acid
- **If you get acid on your skin, flush with lots of water**
- **In case of acid in your eyes, flush with water for 15 minutes and call a doctor**
- Make sure someone else is around when you work on or move batteries

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# Battery Metering

With proper care, quality batteries that are sized correctly for your application will last for years. If abused, an expensive battery bank may last only months. Taking out too much power without recharging is what kills most batteries. Also, batteries that are low will freeze easily, while a fully-charged battery is good to at least 30 below zero.

Battery capacity is measured in ampere-hours (amp-hours). In rough terms, a 100 amp-hour battery can give out 1 amp for 100 hours, or 100 amps for one hour, or 20 amps for 5 hours. However, see the first item below--you would actually never want to use the entire capacity before recharging.

Meters can be as simple as a voltmeter to measure battery bank voltage and an ammeter to show net gain or loss of power, or as complicated as a digital amp/hour meter. **We sometimes stock older, unique analog meters (the kind with a needle), check our products page for availability.**



[Click HERE for information on building analog meters at home!](#)

## For maximum battery life:

- If possible, never use more than 20% of your battery bank's capacity. If your capacity is 1000 amp-hours, start your back-up generator when the meter shows -200 amp-hours (80% of capacity remaining).
- Never use more than half your battery capacity without recharging.
- If you use 75 to 80% of your capacity without recharging, your batteries WILL be damaged, even if they are "deep-cycle" batteries.

**To measure battery state-of-charge**, there are 3 possible methods.

- **By Voltage:** This method is the least accurate, but requires only a cheap digital voltmeter. It will not work for NiCads or Telephone cells. Analog meters (with a needle) are generally not



accurate enough for this.

- Wait 2 hours after any charging or discharging to take your measurement (use your disconnect switches to stop all charging or discharging if necessary)



- Measure DC voltage across the main positive and negative terminals (where the inverter and/or solar panels are connected to the batteries).
- Compare to this chart
  - As batteries age, this voltage reading will gradually get lower (or quickly, if they are abused)
  - Measuring voltage across each cell can help diagnose failed cells. Divide the 12 volt reading from this chart by 2 for 6 volt batteries, and by 6 for individual 2 volt cells to figure state of charge (or amount of damage) for the cell. Example: An individual cell would show 2.12 volts at 100% charge when new.

percentage of charge	12 volt battery voltage	24 volt battery voltage	specific gravity
100	12.70	25.40	1.265
95	12.64	25.25	1.257
90	12.58	25.16	1.249
85	12.52	25.04	1.241
80	12.46	24.92	1.233
75	12.40	24.80	1.225
70	12.36	24.72	1.218
65	12.32	24.64	1.211
60	12.28	24.56	1.204
55	12.24	24.48	1.197
50	12.20	24.40	1.190
40	12.12	24.24	1.176
30	12.04	24.08	1.162
20	11.98	23.96	1.148
10	11.94	23.88	1.134

Chart from the Trojan Battery company for Trojan L-16 batteries

- **By Specific Gravity.** This is the most accurate method, but the most messy. You do not have to wait 2 hours to take this reading. It will not work with gel cells or NiCads. You'll need a good battery hydrometer--it will look like a footlong glass turkey baster with a glass float and thermometer inside. It's available from us, or at some auto parts stores.
  - Wear goggles and rubber gloves! Keep baking soda and water handy in case you spill!
  - Open up one cell on each battery and suck out enough acid to float the float (or measure every cell if you are ambitious enough)

- write down the reading
- average all these readings and compare to the chart
- **By Ampere-Hours.** This is best method to measure state of charge, both in accuracy and ease of use. The only drawback is price--plan on spending \$175 to \$200 for an amp-hour meter. But compared to the cost of replacing a quality battery bank, this cost is trivial. This also makes it easy for people not familiar with your system to avoid abusing the batteries. Our system uses 12 telephone cells with a capacity of 1080 amp-hours. These batteries should never be discharged below 80%, so even my kids know to turn off the TV when the meter shows -216, and yell for Dad to go start the generator..
  - Amp-hour meters keep track of all power moving in or out of your batteries by time. The efficiency of your battery bank is calculated by the meter while the system operates, and is automatically corrected.
  - Amp-hour meters can sense when the batteries reach full charge, and automatically reset themselves to zero (full) when that point is reached.
  - Any positive reading of amp-hours refers to power that was generated but not stored by the batteries because they were full. This power is in effect wasted, but switching systems can be built to divert the extra power to run water pumps, etc.
    - An amp-hour meter measures power running both ways in the main negative power cable through a "shunt". Any circuit or equipment that is on the wrong side of the shunt (the battery side) will not be metered--this will make your reading inaccurate. Connect all load and charging circuits to the side of the shunt away from the battery bank.
    - The shunt must be big enough to handle -all- power the system can produce, including the inverter. A standard 500-amp shunt is big enough for most systems. A 100-amp shunt can usually be used in a small system with no inverter.

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# A SIMPLE AMMETER

Here is a simple way to make a reliable, safe ammeter for ... ? I use mine to monitor power coming into/out of my batteries. Undoubtedly one could make many modifications; it would not be too difficult to convert this to a full function multi-meter. Mine shows DC amps, plus or minus 15. This meter is simple, and reliable enough to serve many applications. With just a little work, it could be a fine addition to any shop, or living room.



The meter consists of a wooden back, a long wooden needle(14" long), which pivots on a nail. To the bottom of the long wooden needle is a surplus computer hard drive magnet glued on with super-glue. You can get the magnet out of most computer hard drives, or...we sell them, between \$1 and \$12, depending upon the scale of meter you have in mind. (it would be great to make a BIG one)





**Pictured above is the surplus computer hard drive magnet. This is a NdFeB (Neodymium Iron Boron) rare earth magnet, the strongest permanent magnets currently developed. These are many times stronger than AlNiCo or ceramic magnets that we are all accustomed to, they make possible many new things! Without this magnet, this meter would not work nearly as well. The shape, strength, and polarization of these magnets make them perfect for a 0 centered ammeter. The steel back serves as a nice counterweight. Again, magnets similar to these can be found inside almost any computer hard drive, or...if you like, go to our products page and you'll find several sizes available.**

**Behind the hard drive magnet (attached to the wooden back) is a wooden peg, around which is a coil (3 windings) of 12 gauge romex (normal copper wire for wiring houses). In the picture below, I swung the meter such that you can see detail of the magnet, the pivot, the bottom of the needle, and the coil of wire that drives it.**



There isn't much resistance, the meter works well because of the extremely strong rare earth magnet. More windings on the coil could make the meter more sensitive, less windings would make it less so. It can also be calibrated/centered with a small weight on the back of the magnet or the needle. I have mine set up to read +/-15 amps, this is appropriate for my power consumption/generation. The meter shown in the picture is somewhat inaccurate, as the scale should compress, especially near the ends of the scale. Mine is accurate between 0 and 10 amps, after that it becomes conservative. Simple thing, I think it can make for a more attractive meter for monitoring power systems than most available...at very little cost, if one has a couple hours to spend on it! As somebody who enjoys making/using my electricity, I also enjoy watching it come and go. This meter is sensitive, and moves freely enough that it responds very noticeably to a small 12 volt car stereo, you can easily see it respond to music played at a reasonable level!

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# Rewinding a fan motor to get a slow speed DC Generator

Chuck Morrison ©2001

## The electric power plant.

There are two types of generators that we can employ for our wind generator. In the automotive world, we know these as generators and alternators. Generators are properly known as dynamos. The main difference between them is that dynamos utilize a commutator to transfer power from the coils on the armature to the outside world. A commutator is a multi-part cylinder made of copper which allows the brushes to pull energy from the coils only when they are in one position relative to the magnetic poles. In essence, this allows you to "skim the top" of the electric cycles to produce DC. Usually, there is a commutator section for each slot in the armature, although there may be an additional slot. An alternator differs from this in that it has two slip rings instead of a commutator. The alternator produces AC current, which is then usually run through a set of diodes to produce DC.

From the searching you've already done, you are probably aware of how difficult it is to find a generator or alternator that generates an appreciable amount of power at ~300 rpm. How many rpms you need will depend on how many blades are on your turbine and how well they are designed and constructed, but 300 seems to be a good ballpark figure. So how is the search going? Find any 300rpm motors out there? I've heard that there are such motors out there being used for computer tape drives (big tape drives, small wind turbines) and battery powered floor washers (I've never seen a battery powered one myself). My own experience is that these things are rare. Most plentiful are auto and truck generators, alternators and fans.

The first thing to do is to wander around some junkyards and see what's available. Check out the name plates for voltage, current and rpm information. You can check the state of bearings, but I would advise replacing these even if they appear to be OK. They are used and you're proposing to put several million more revolutions on them. If you find a generator, motor or alternator large enough, you may decide to go with it, even though it's rated at relatively high rpms. Now you have a problem you must solve before you can use it. For wind turbine use, you have to get the thing to generate a decent amount of power at a usable voltage at a relatively slow speed. It would be preferable that this be somewhere around 300 rpm or lower.

## Lowering the rpms.

The motor/generator you have is rated at a certain voltage, amperage and speed. These are all tied in together and changing one of them changes the others. A generator rated at 12 volts at 1750rpm, will generate power above and below this speed, but will only supply 12 volts at or above 1750rpm. With a load that draws 12 volts, it will supply power to the load at 1750rpm and above, but not below. This is called the "cut in" speed for that voltage.

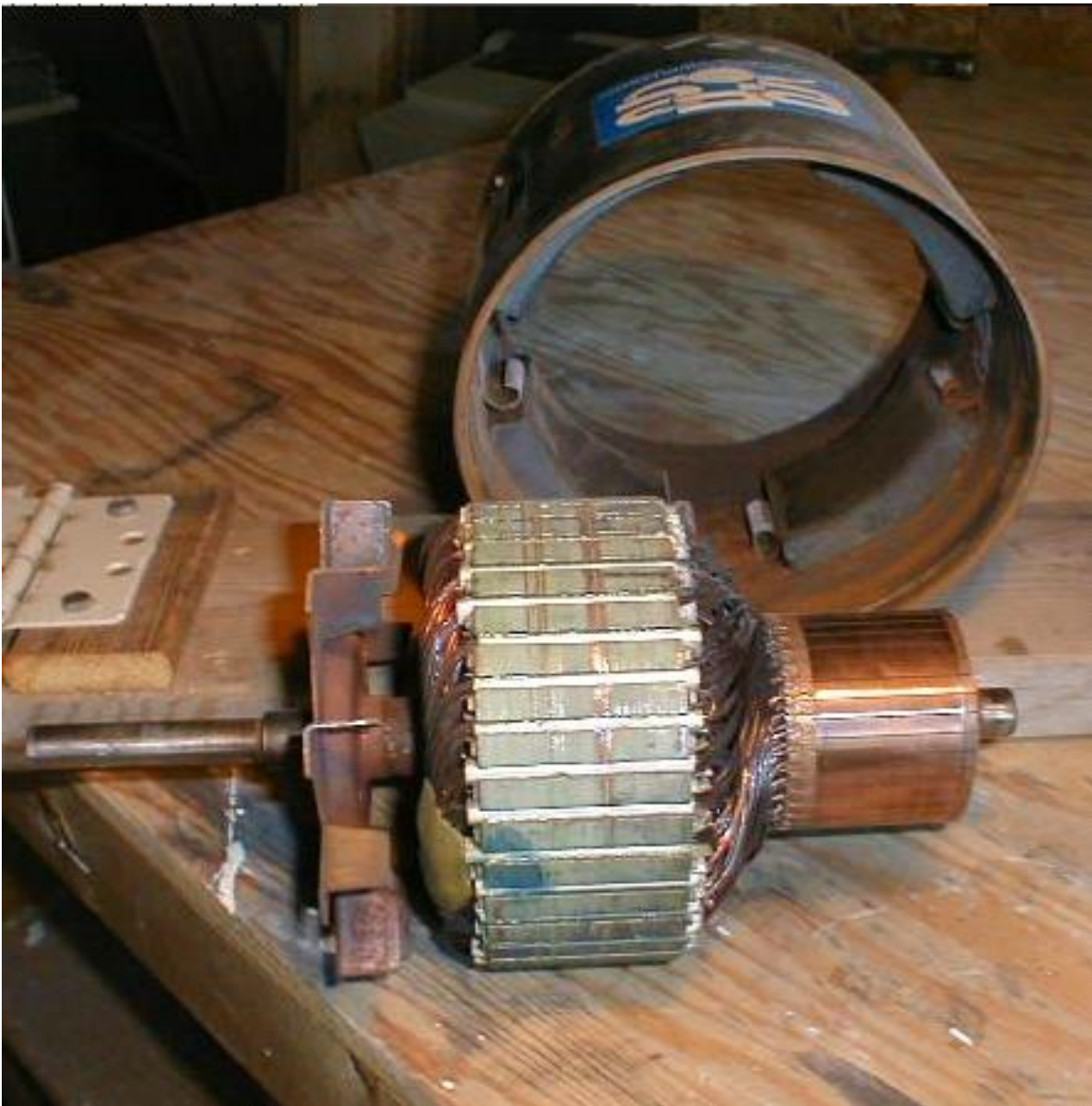
To change the cut in speed for a generator or alternator you can



1. Increase the field strength,
  1. Replace the magnets with stronger ones in PM generators
  2. Supply more power to the field coils in shunt generators and alternators. This may require replacing the field coils.
2. Increase the number of field poles,
  1. Replace the magnets with more magnets (in pairs) with the same flux. This may require resizing the armature coils.
  2. Add more field coils in shunt generators and alternators.
3. Increase the number of windings in the armature coils,
  1. More windings should give you more volts at a given rpm, all else being equal. You will probably lose power capacity if you have to reduce the size of the wire. Current is determined by wire size and since power (watts) = voltage x current (amps)... you lose if the current is reduced.
4. or a combination of the above.

PM generator/alternators are preferred by wind enthusiasts. I've rebuilt one for slower speed and was able to do by replacing the magnets and rewinding the armature coils. Let's use that experience to examine this subject.

The motor I found was a model 7600 from Electric Fan Engineering. It was rated at 12 Volts, 50 amps and was a four pole permanent magnet fan motor produced for heavy trucks. It had two rather noisy bearings, but ran very fast when connected to a 12 volt battery, or fairly slow connected to a 12 volt, 3amp battery charger - which was very hot after about 15 seconds of running this fan. I was able to get a reading of around 15 volts when running it off a 1725 rpm motor at roughly a 1-1 gearing. Calling EFE only gained me the information that it was rated somewhere around 2000 rpm. Below is a picture of the insides of this motor. The shell casing is ~8" in diameter (OD), although it isn't exactly round. Note the four large pole magnets inside the casing.



The photo doesn't show the brush assembly or the shell ends and bearings. The four magnets are  $\frac{3}{4}$ " thick and measure  $2\frac{1}{2}$ " deep by  $3\frac{1}{2}$ " long. The magnets are held in by double sided sticky tape and metal spacers. The entire motor weighed in at 45 lbs. The wire on the armature appears to be 15 or 16 gauge copper. It appears to have a rather complicated winding scheme which disassembling did little to demystify. I suspect that it utilized a frog leg winding scheme which is a combination of lap and wave coils. There were four wires coming from each commutator segment, completing two turns around 9 slots, giving a total of 8 turns (4 coils of 2 turns each). It was more complicated than this, but let's go with this simplified version to run through some calculations.

I did some quick calculations based on [Mick Sagrillo's paper](#), which gave the following for just rewinding and not adding magnets.

Volts	Amps	Watts	RPM	Wire Gauge	Turns per coil
-------	------	-------	-----	------------	----------------

12	50	600	1750	15	8
12	25	300	825	18	16
12	12.5	150	412.5	21	32
12	6.25	75	206	24	64

Since I had been really happy about finding a 600 watt motor, I was less than thrilled about putting all sorts of work into it and getting a 100 watt generator out of it. Now of course at higher speeds more power is produced, so this isn't 100 watts max. However, current is dependent on wire size and 24 gauge wire will handle a lot less of it than 15 guar. It will have larger heat losses, especially at only 12 volts. So while this may generate 12 volts of power at +/- 200 rpm, it isn't able to supply the power the original motor/generator could, speed not withstanding.

[Next - magnets](#)

# Rewinding the Armature

As it turns out, my reasoning was flawed concerning the windings and number of poles. According to the text books I was able to find, the coils should span 180 magnetic degrees, or from the north pole to the adjacent south pole. By adding magnets, but not rewinding the coils, I was using coils meant for 4 magnets, and thus spanning 9 armature slots ( $37/4 = 9$  and omit the remainder). This meant that each coil is now spanning 5 changes of polarity or 900 magnetic degrees. Turning the 20 pole generator without rewinding the armature yielded poor results. I thought it over, read a lot and decided I'd have to rewind the armature anyway.

A word about the steel spacers. I originally was going to put them facing the housing. However, in testing I discovered that the magnetic pull from the steel was considerable more than that from the ceramic magnet that it was glued to. I wanted that strength facing the armature. I also figured that if the air gap got too close, it would be easier to grind the steel down than the ceramic. As it turned out, the air gap is small, but when the casing is snugged up, the armature doesn't rub on the pole pieces.

## Adventures in rewinding

Before attempting to rewind the armature, I went to the local university library and took out a few books. The best of these IMHO was *Electrical Machines, Direct and Alternating Current* by Charles S. Siskind (McGraw-Hill, 2<sup>nd</sup> Edition 1959). Reading this helped me visualize what I had to do.

To begin with, I had to strip the old wire from the armature. This is easier said than done. I had hoped to trace the path of the old wiring, but this proved difficult. The wires were heavy and were varnished in place, making for a physically challenging task. It took the better part of a day to pull all the wires from the armature and my right arm was stiff for days afterwards.





When it was finally stripped of all wire, it looked like this:





The stripped armature showing the large copper commutator and the armature slots ready for new coils.

I left the plastic inserts in each slot to protect my own coils. I used the jig shown below to wind the new coils. I had no idea how many turns I'd be able to use and did a little trial and error before settling on 60 turns using 21 guage wire. I was *hoping* 21 guage copper wire would carry 10 amps or so at 60 to 90 volts retaining the 600 watt rating of the original motor at a much slower speed. Revisiting the tables from above, I made some rash assumptions and postulated the following, which turns out to be rashly optimistic, especially the part about gaining, not loosing, wattage.

Volts	Amps	Watts	RPM	Poles	Wire guage	Turns/coil
Original - 12	50	600	1750	4	15	8
Assuming - 12	50	600	354	20	15	8
Maybe - 60 to 90	12.5	612.5 - 900	354	20	21	60

Only testing would tell if I was totally out to lunch. It turns out that I was way off. See the [test results](#) to see how

far off this expectation really was.

In order to make 37 coils, I made the jig shown in the next two pictures. It is made from 1/8" masonite board, scrap 2x4 lumber, a few screws, a 1/4" dowel and a bolt. Epoxy was used on the end piece only, since it had to be disassembled 37 times to extract the coils.

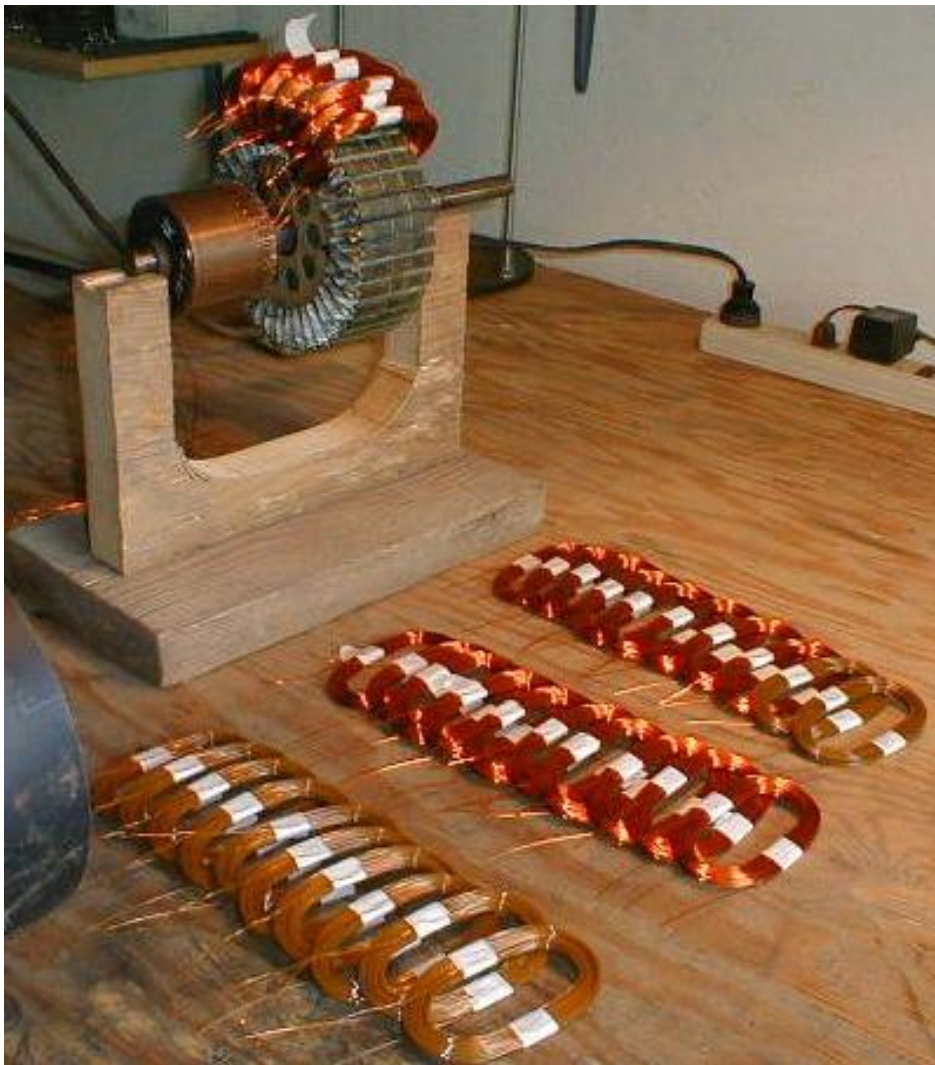






The motor serves only to hold the spool of wire. It isn't plugged in and does not run. Here are two other photos of the winding jig. [View 1](#) and [view 2](#).



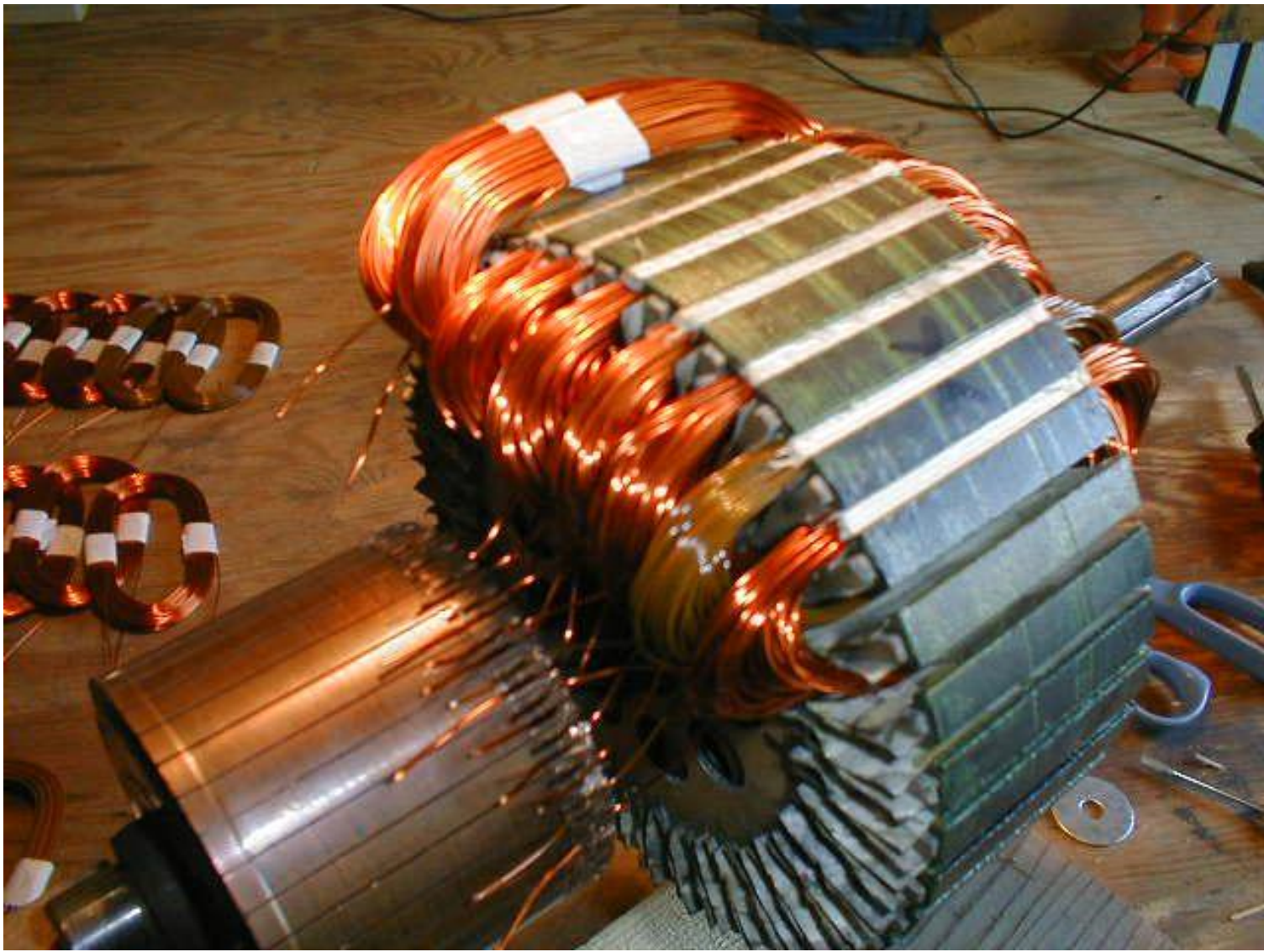


37 coils ready to be installed. Note the tape for holding the shape before installing. Each coil is 1/8" thick to fit into the armature slots. The tape is removed on installing so the wires can be moved around inside the slot. The coils are longer than the armature slots so they can go around each other.



The first six coils, lower ends installed. Tape secures the coils until they are installed in the slots.



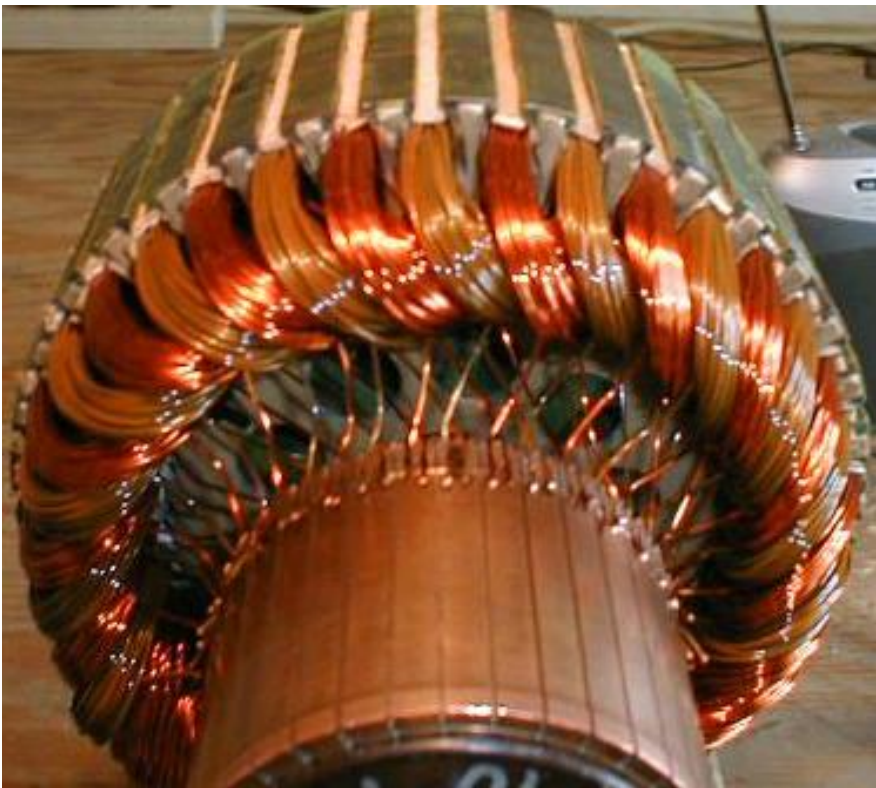


View showing that each coil skips a slot. Wood strips secure each slot. Each slot contains the front of one coil and the rear of another. Room must exist for the coils belonging to the slot in the middle to cross between the two coils.

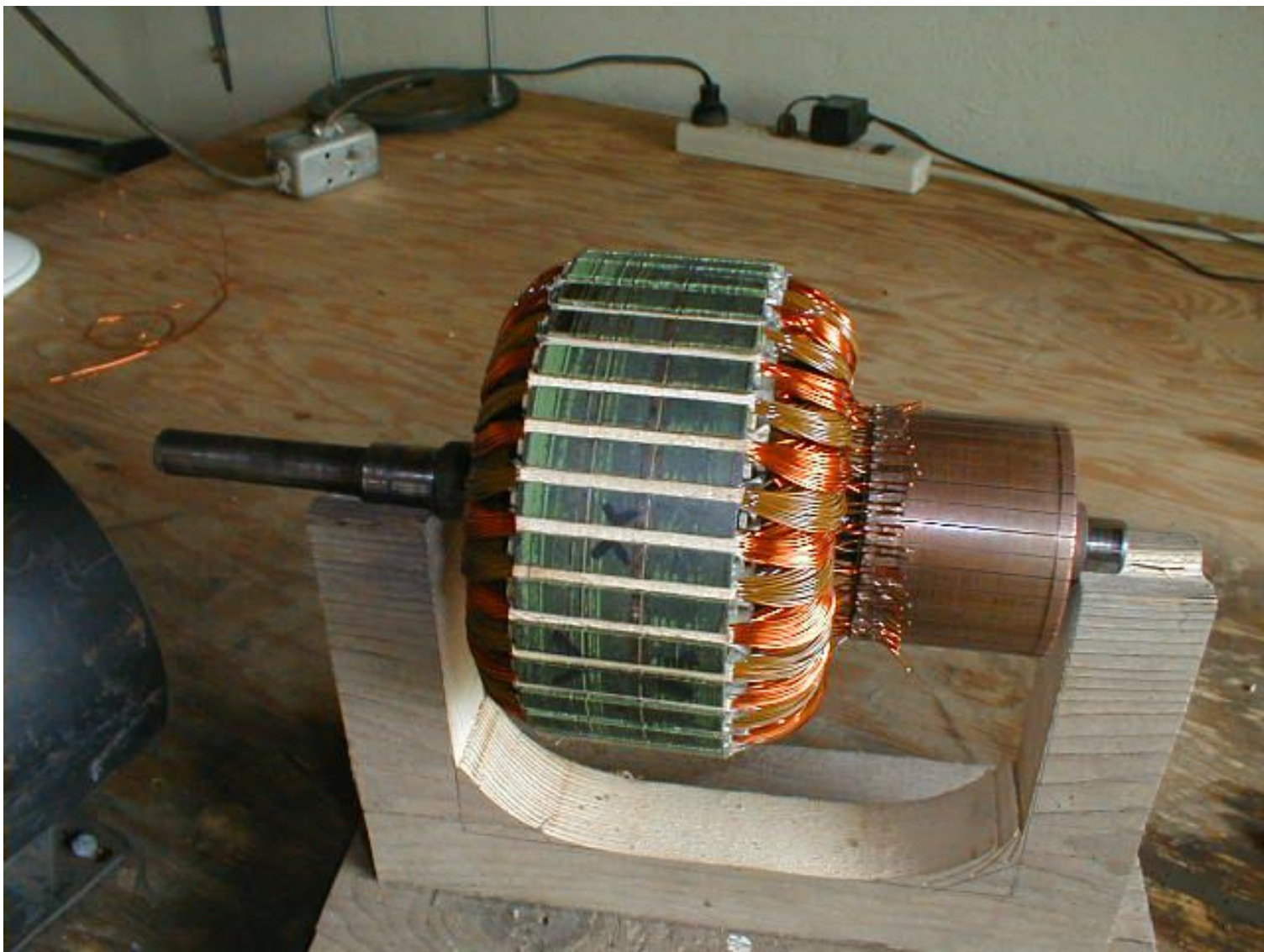


The semi finished back side of the armature. Note how the coils are bent over on each other to conserve space.





Commutator side of the armature, showing the connections to the commutator segments. There are two wires attached to each commutator section. When the last segment is connected, every segment is connected to every other electrically. I used [this wiring diagram](#) to determine the pitch (spacing) of the wire ends.



Side view before securing connections. The connections were secured by pounding on the slots holding the wires with a nail punch. I tried soldering, but my heat source wasn't strong enough. Since the slots in the commutator sections originally held much larger wire (15 vs 21 gauge) I wrapped the two wires together, pulled them through one of the two slots, and pounded a lot of brass to get a solid connection.

Next - [finished generator](#)

# Building a solar electric system

My entry into solar energy came as a direct result of my interest in wind energy. I started building a wind generator and purchased batteries so there would be something for it to charge. Then I ended up getting some solar panels because the wind generator wasn't finished. Learning more about how not to ruin batteries led me to purchase a charge controller. Then I had to get an inverter to be able to use all this energy. In the mean while I had to get a tower for the wind machine, install it, get the right kind of charge controller for it, get a diversion load for it, and so it seems to go on forever. It's a fun, if rather involved, hobby.



The 24 volt battery bank. Wieghing in at over 3000 lbs. These are lead cadmium telco UPS batteries. They are not meant to cycle more than 15% from full charge.



The PV combiner box and solar boost 3048 charge controller. These carry 48volts from the PV panels.





The Main disconnect box - 175 amps at 24 volts DC, and the 2.5Kw 24vdc/120vac inverter. This begins the 120 volt AC side of the system.





Here is the overall view of the system. The PV panels are outside the building on the left side. The wiring enters the combiner box and is fused with a 10 amp fuse per panel pair. A single pair (plus ground) leaves the combiner box and goes to the charge controller. 48 volts from the PV panels is converted to 24 volts and sent to the batteries via a 35 amp dual disconnect switch. The charge controller makes use of a temperature sensor connected to a battery terminal. Note that all wiring except for the shielded 2/0 guage wiring to the large Disconnect box and the system ground is in conduit.



















27





28



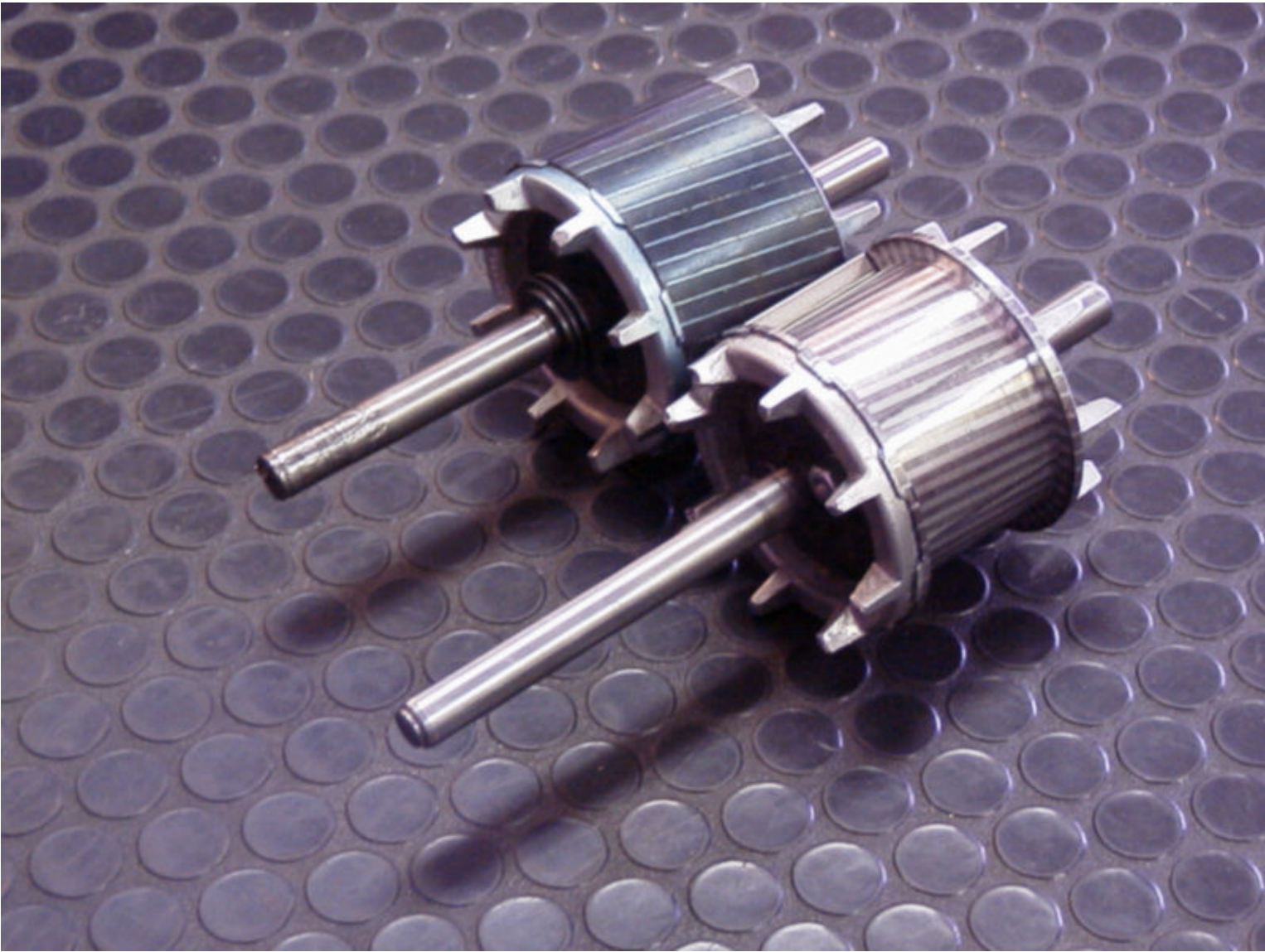




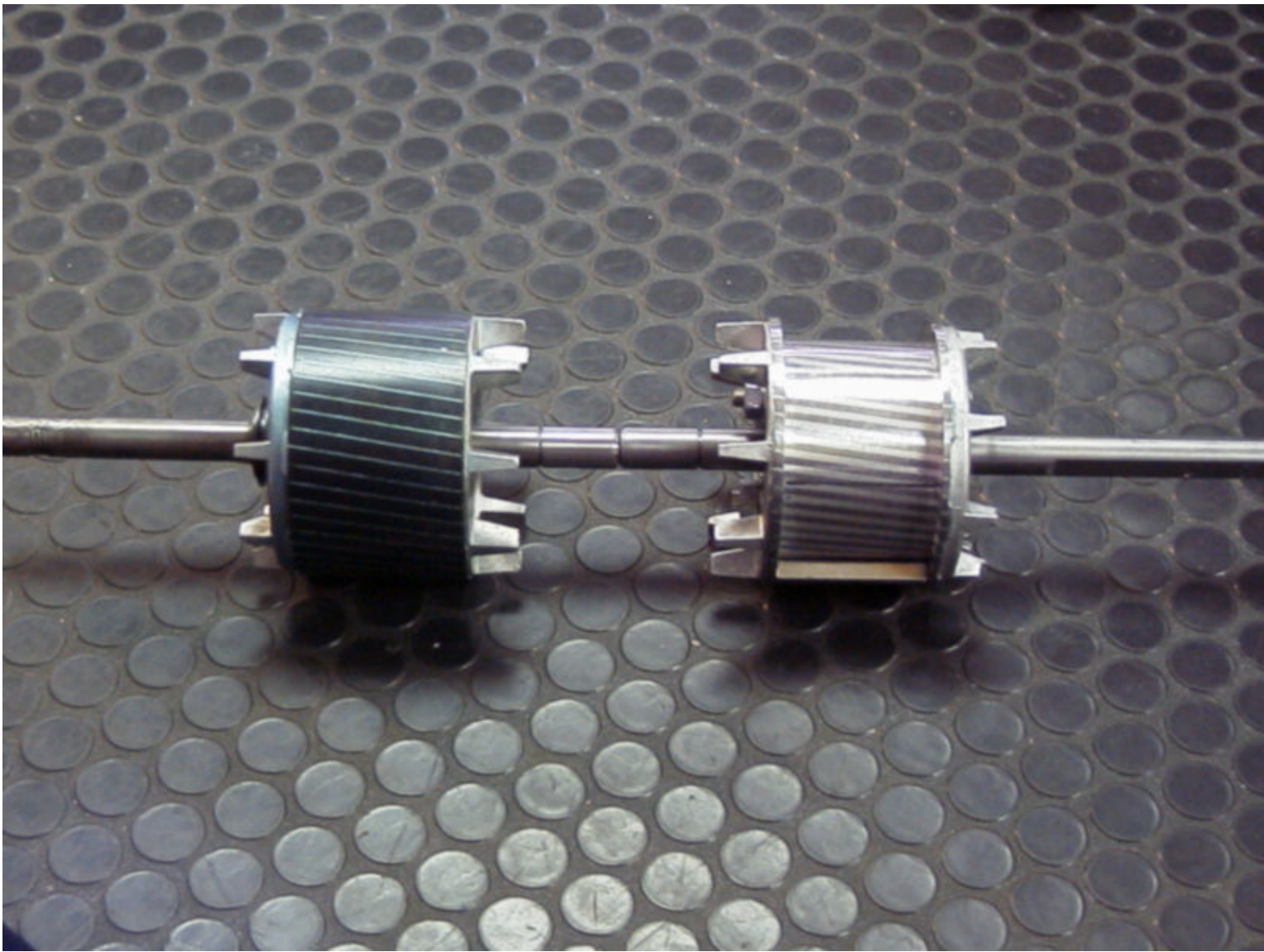


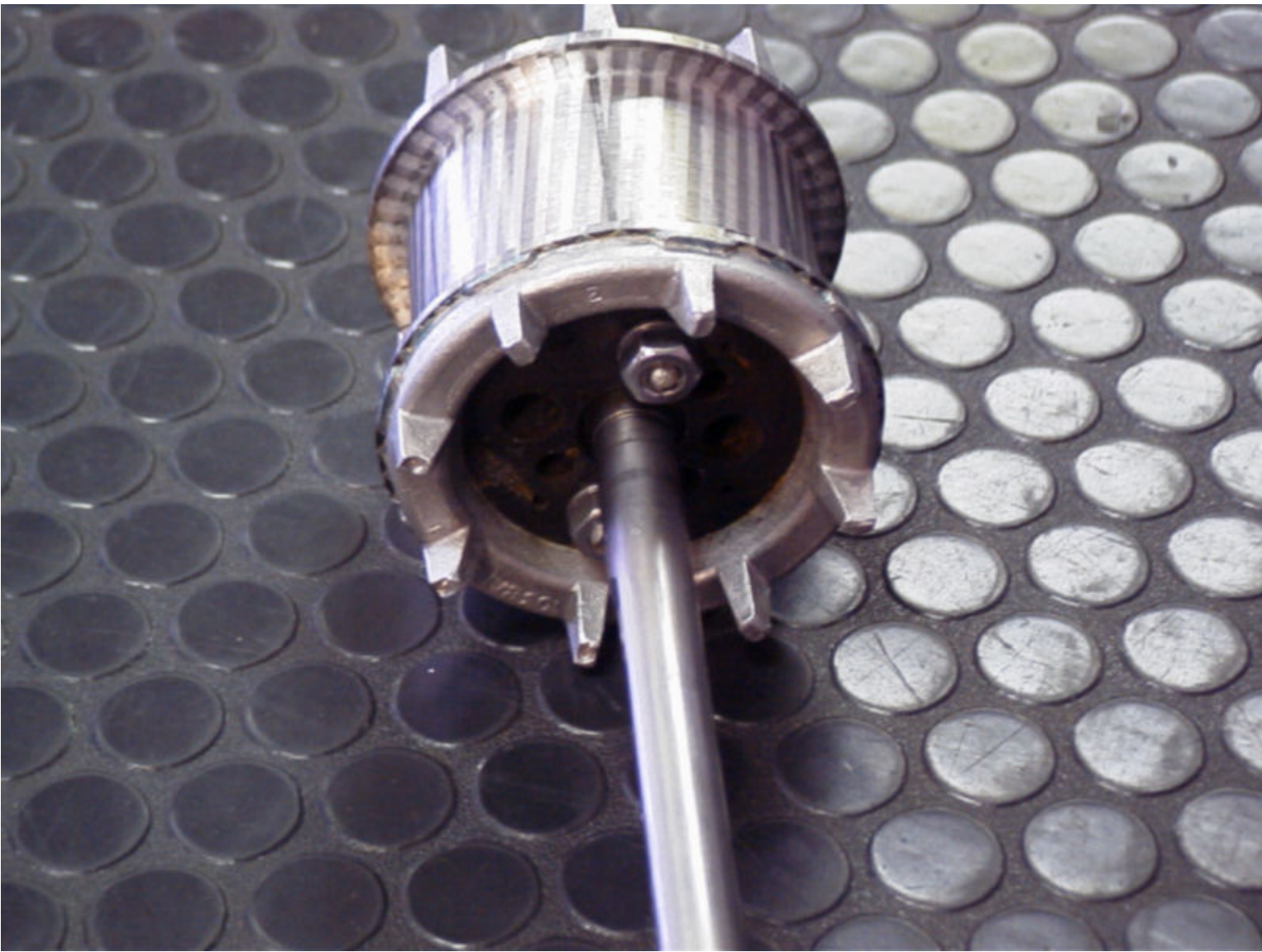




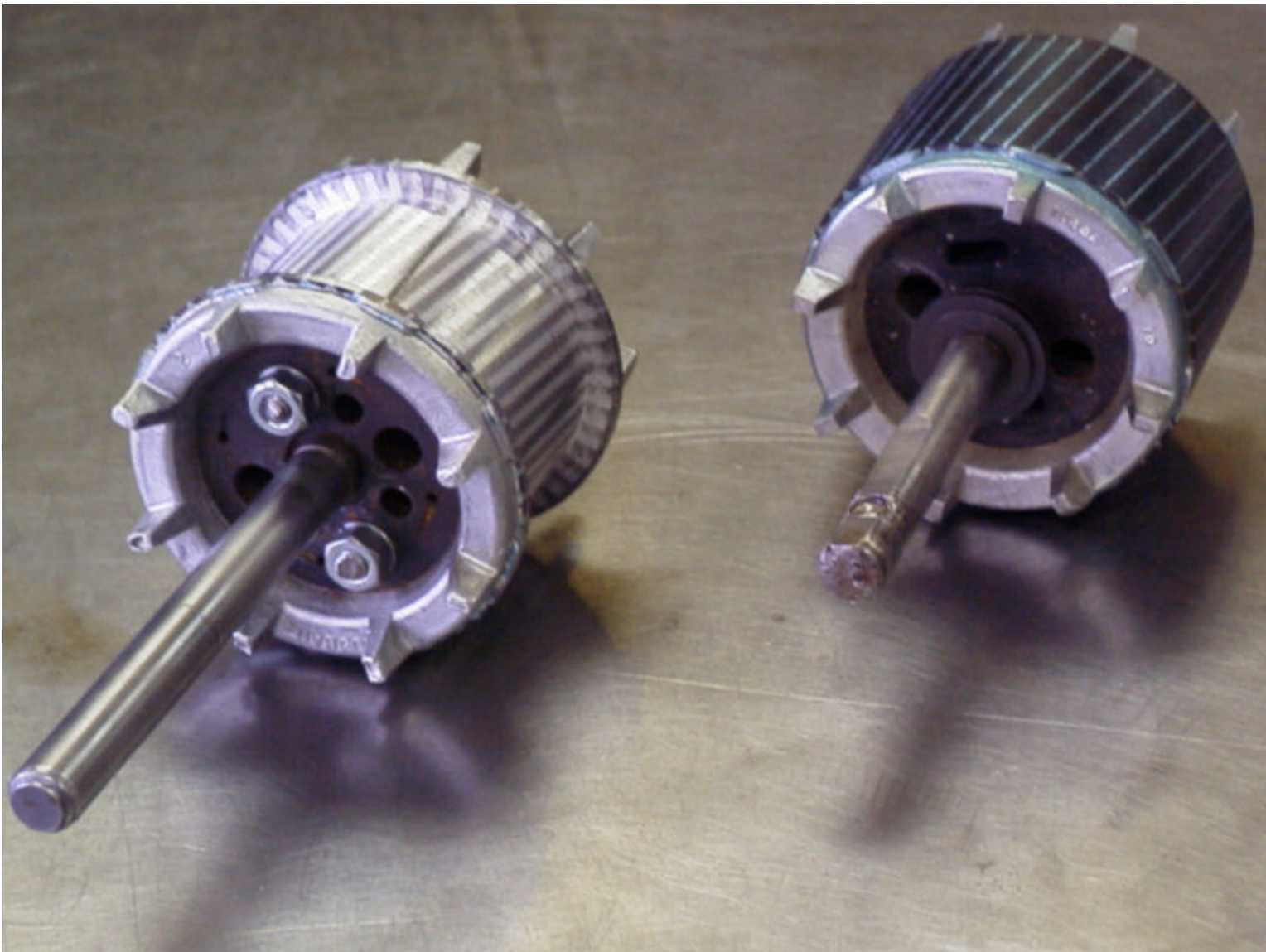


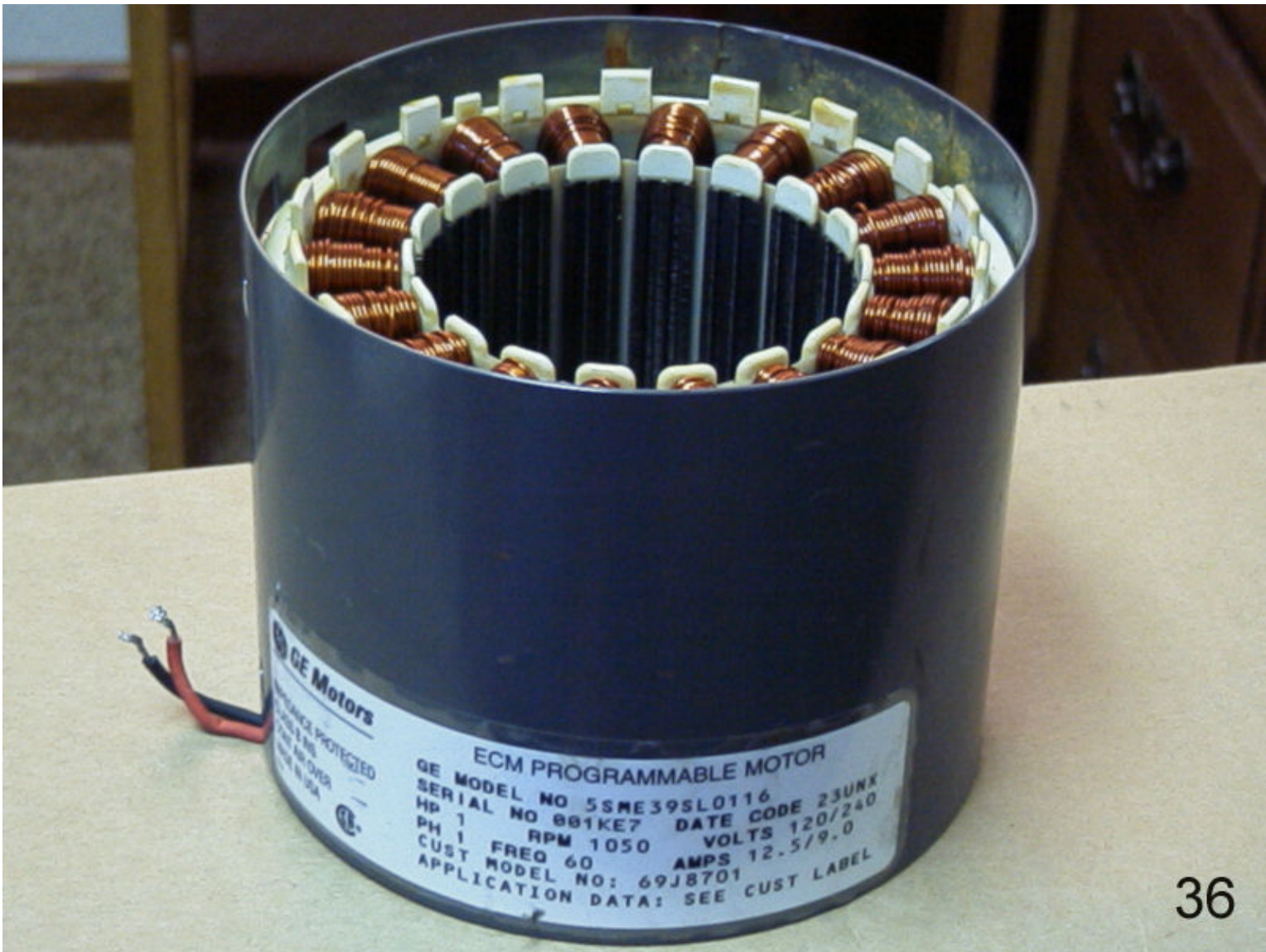




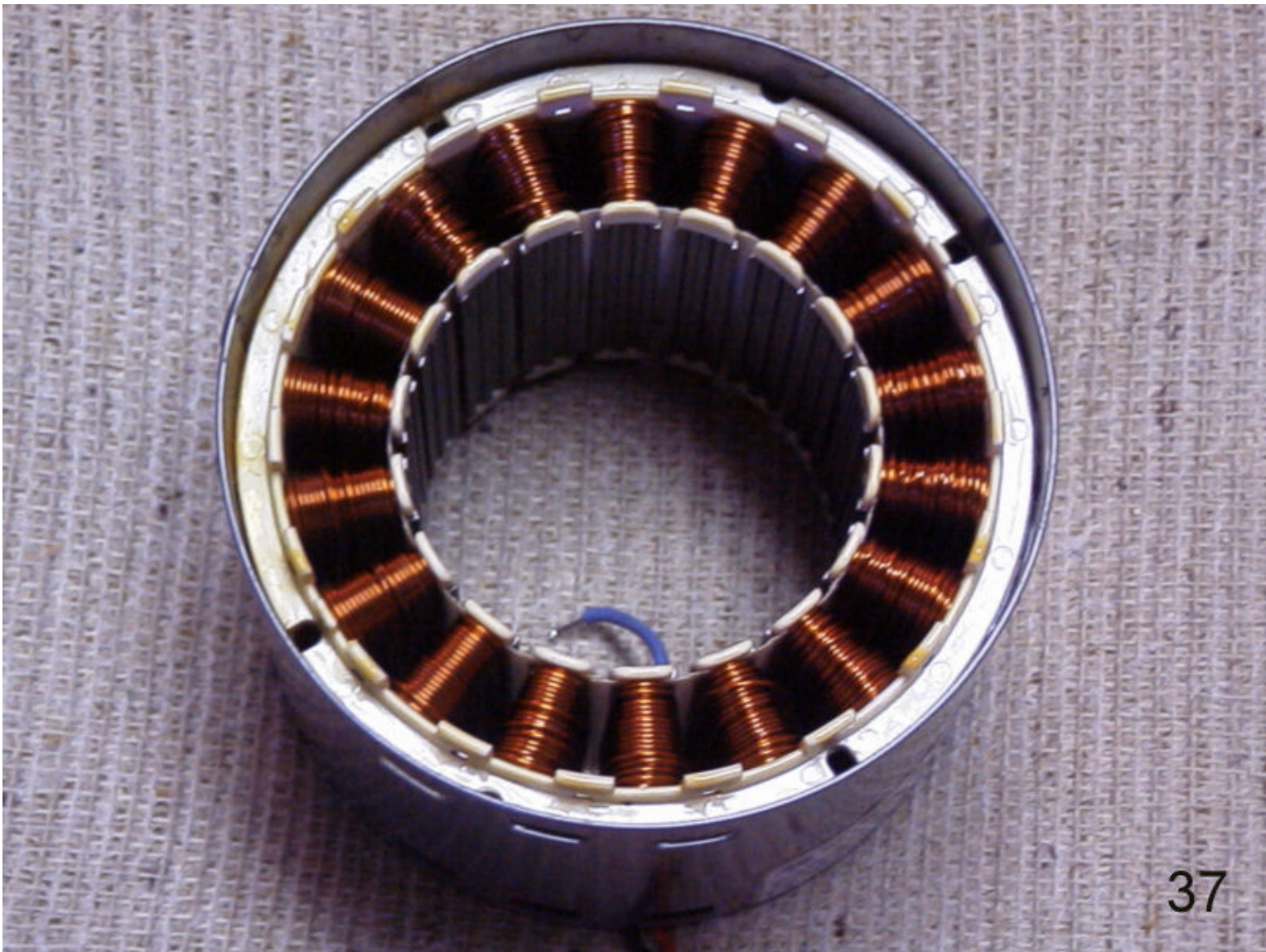




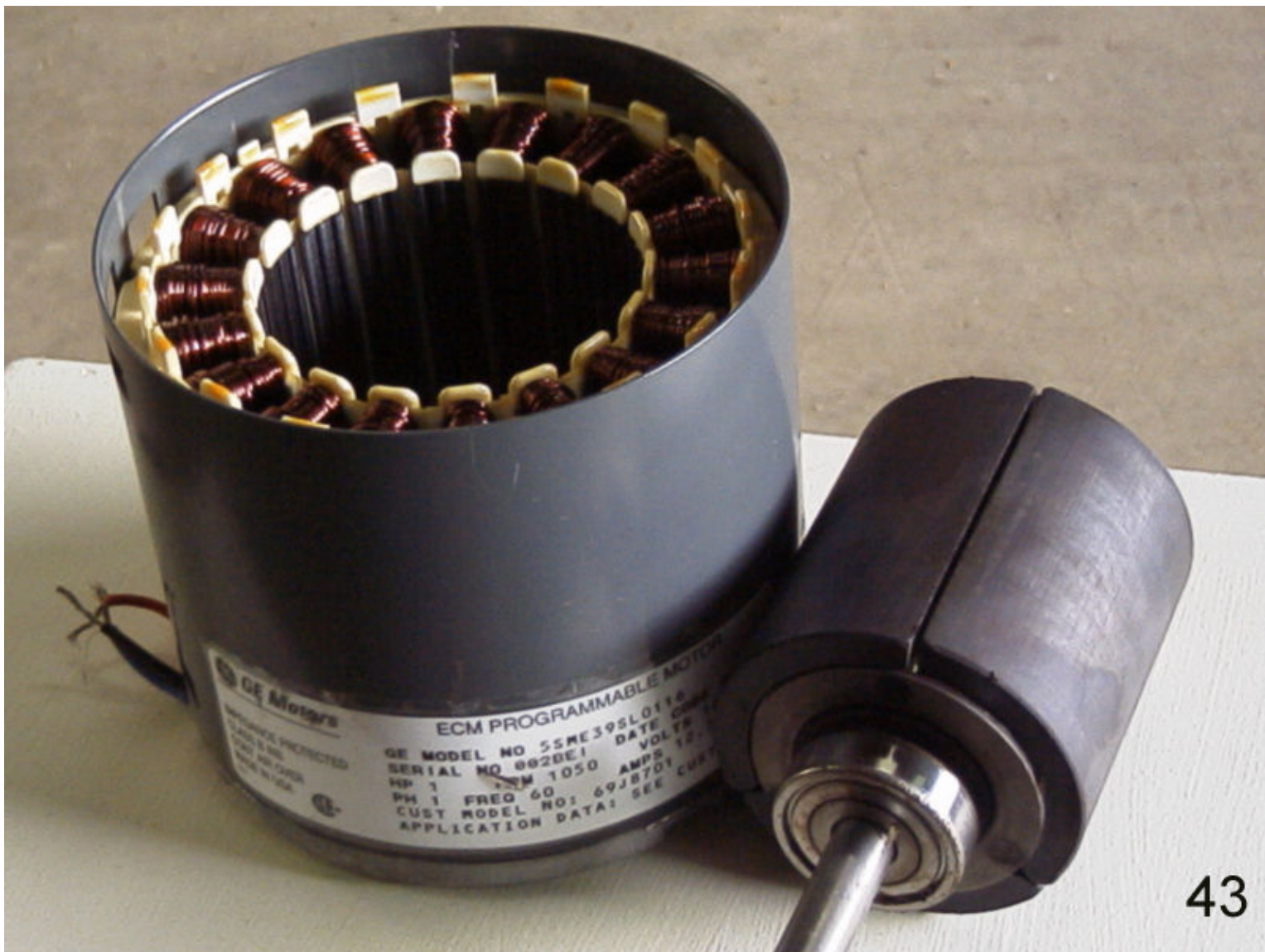








37







# ECM PROGRAMMABLE MOTOR

GE MODEL NO 5SME39SL0116

SERIAL NO 002BE1      DATE CODE 9PPX

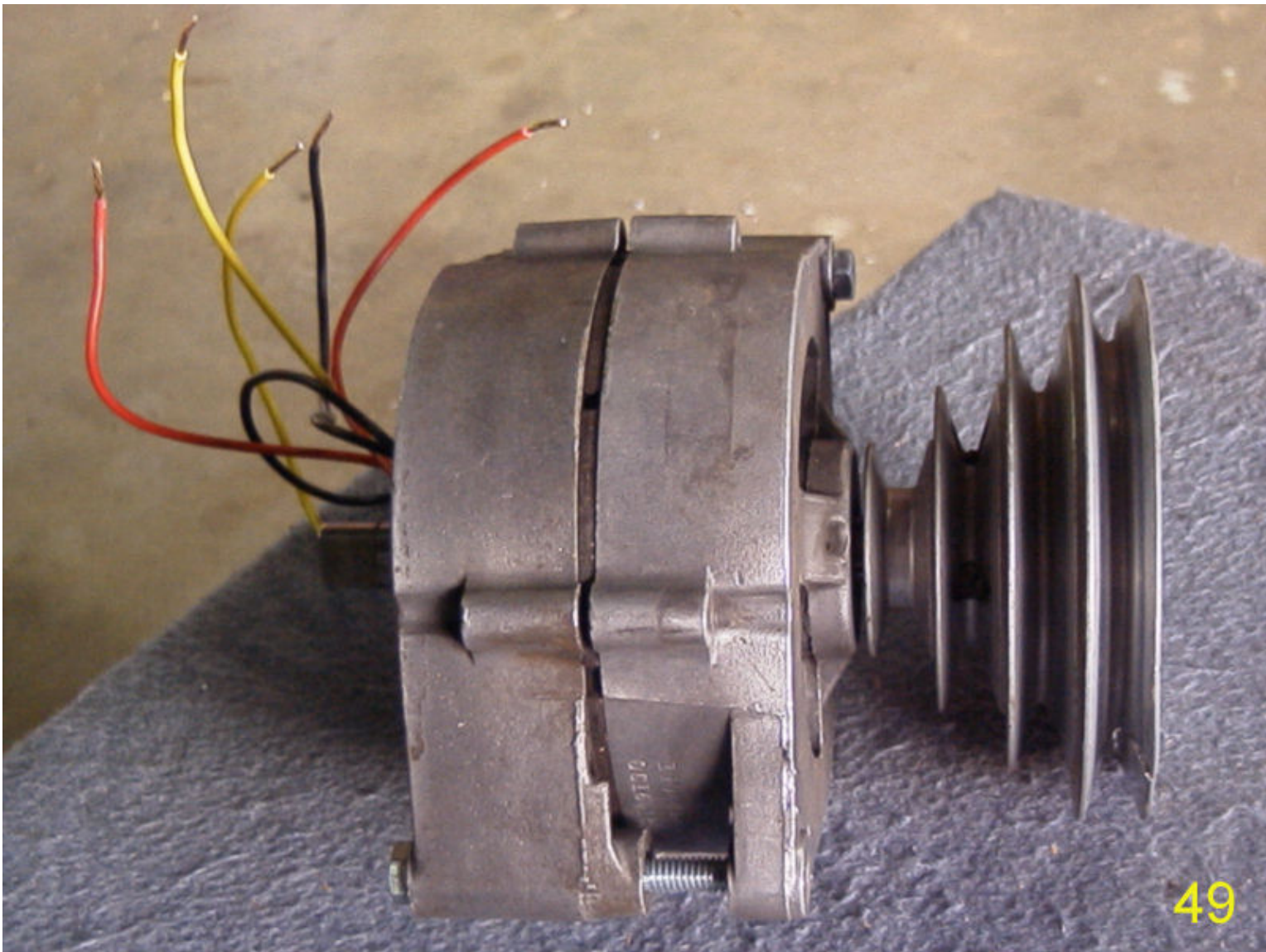
HP 1      RPM 1050      VOLTS 120/240

PH 1      FREQ 60      AMPS 12.5/9.0

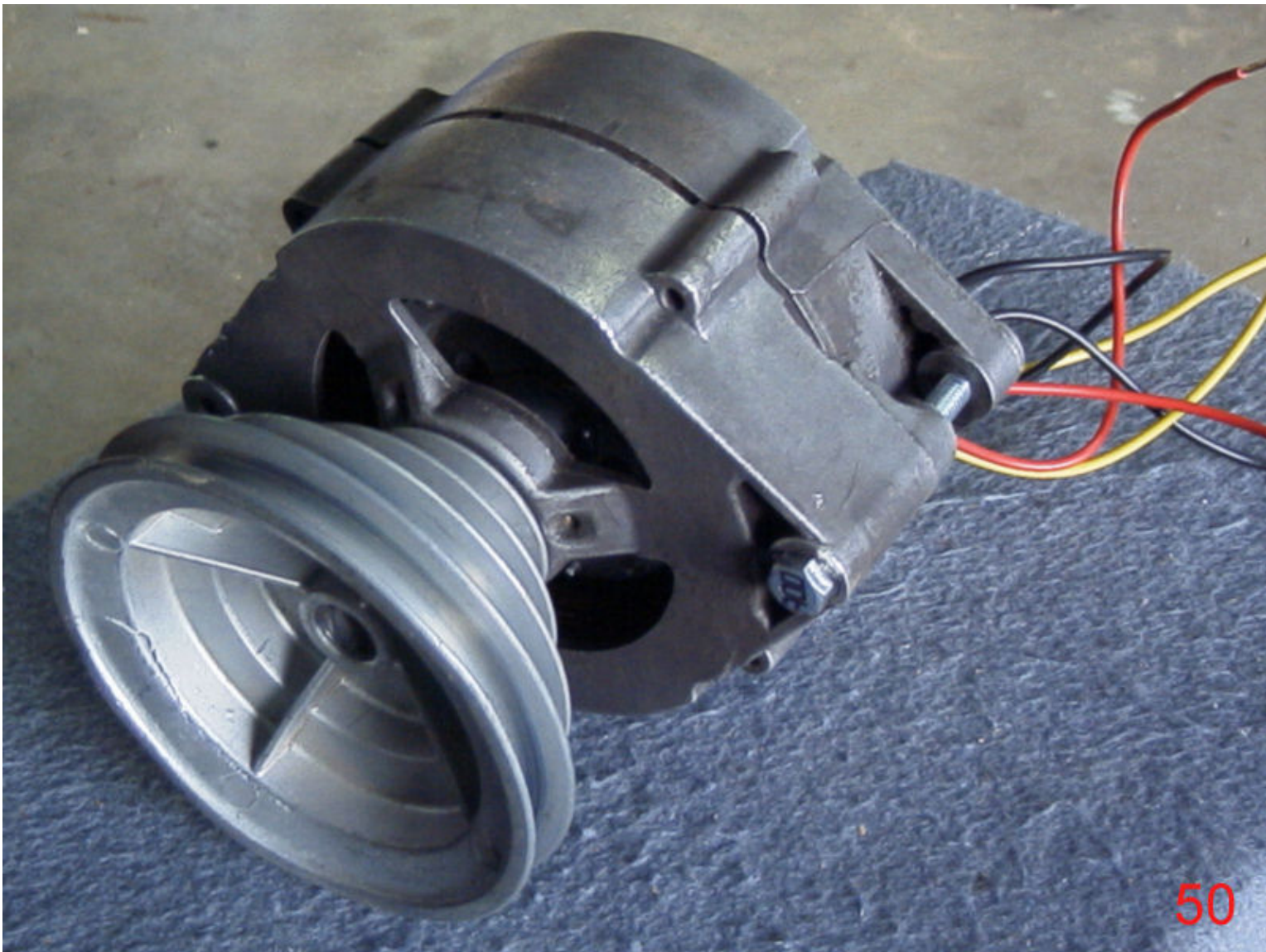
CUST MODEL NO: 69J8701

APPLICATION DATA: SEE CUST LABEL



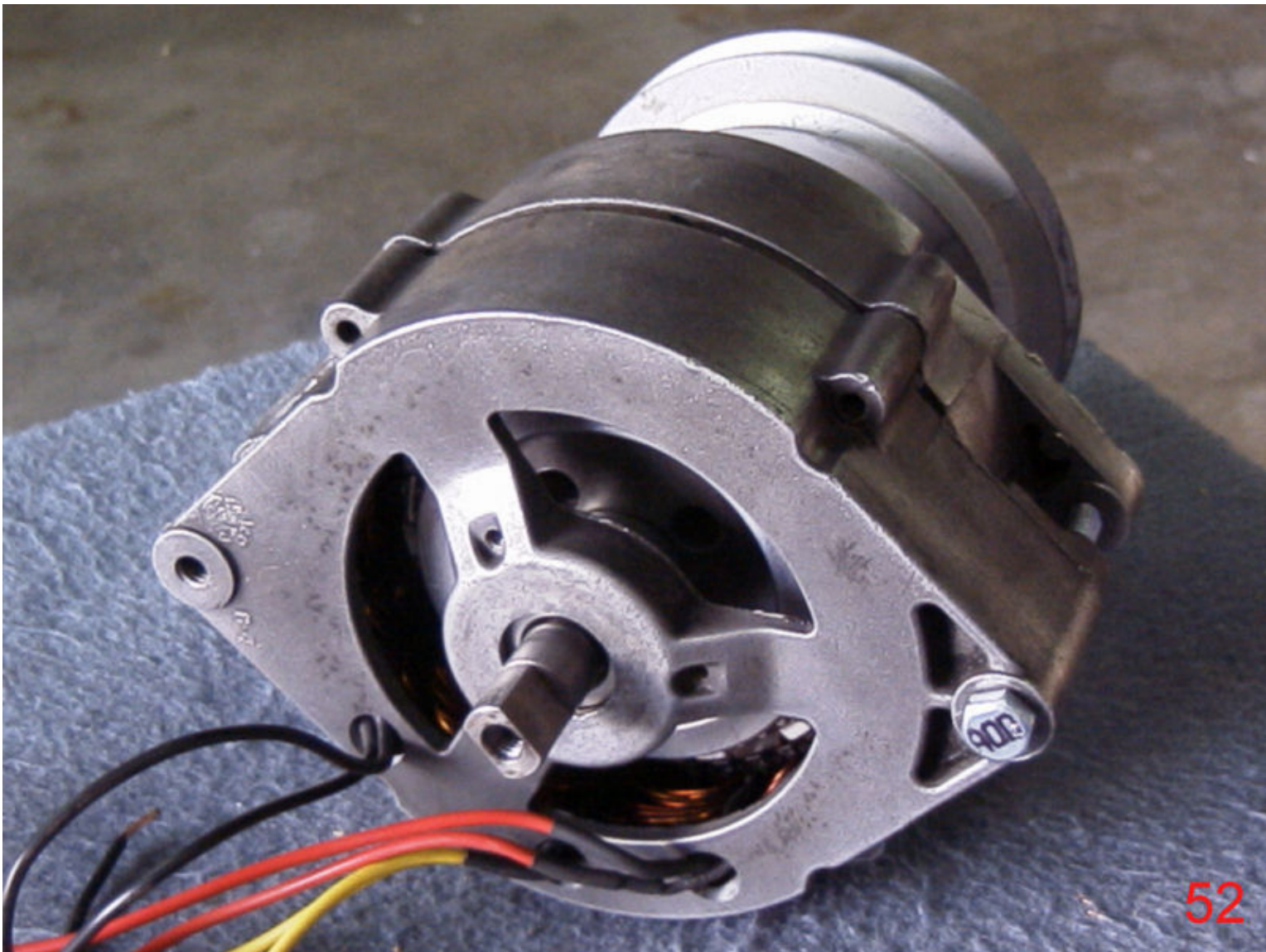


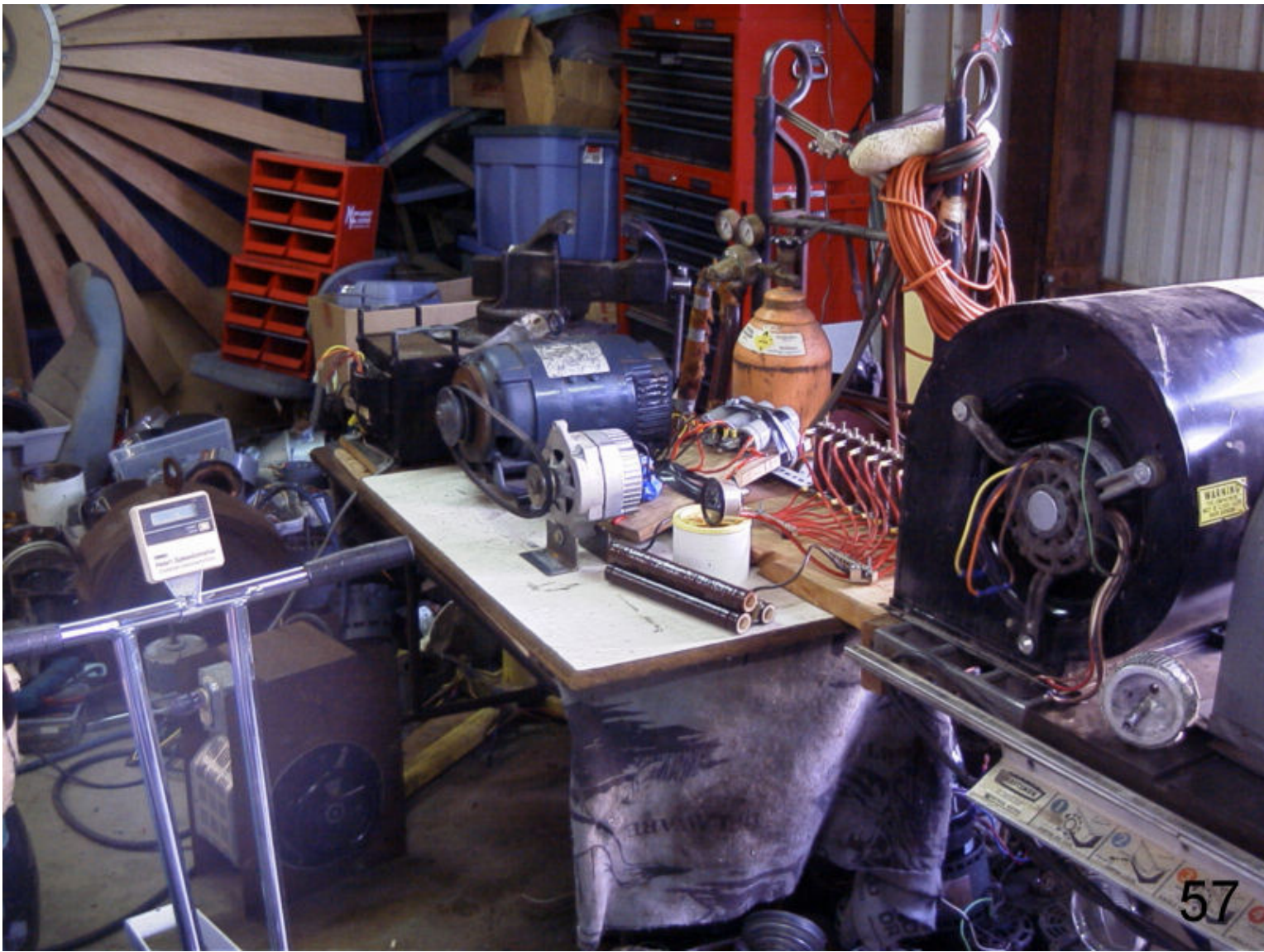
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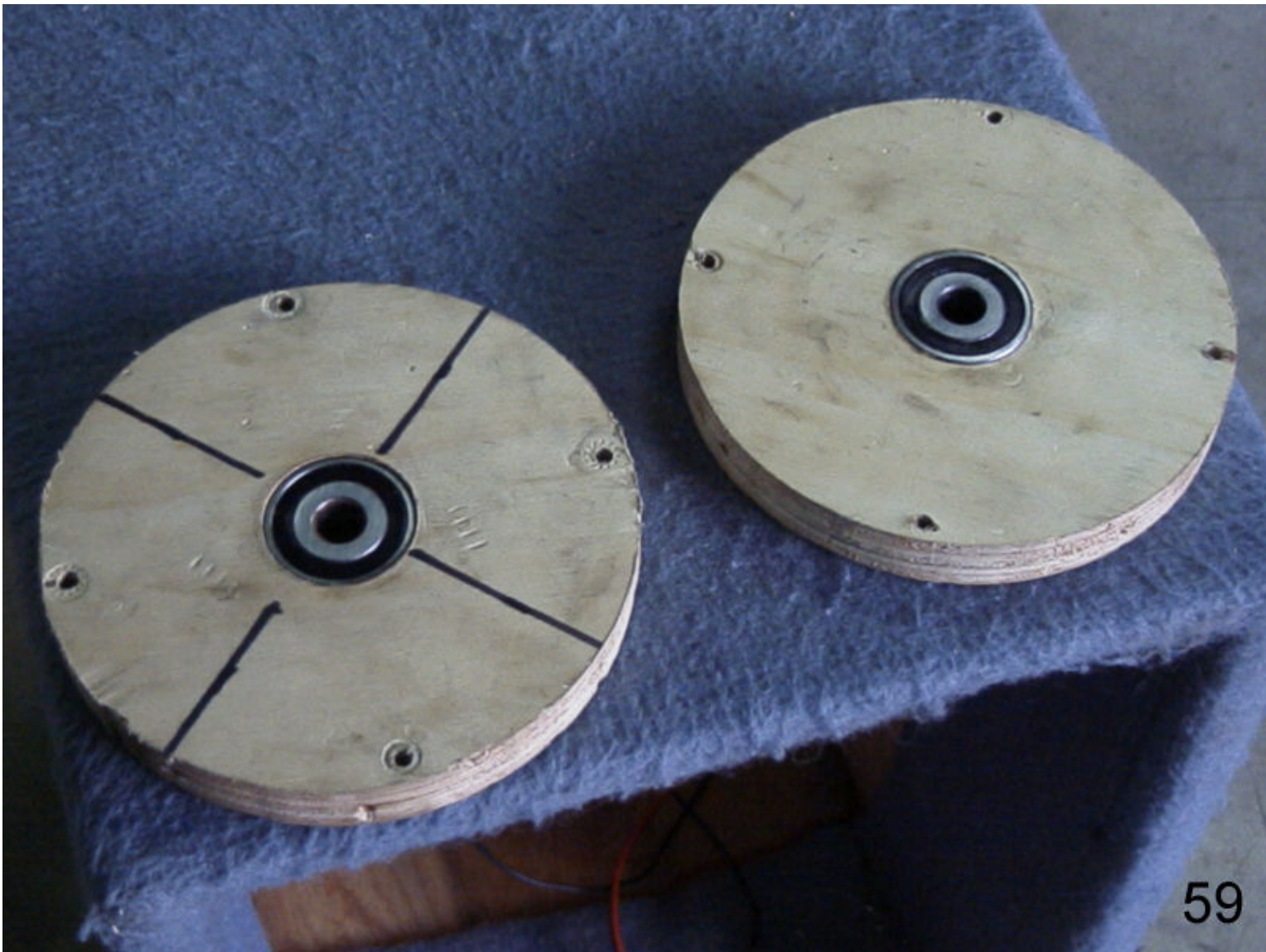






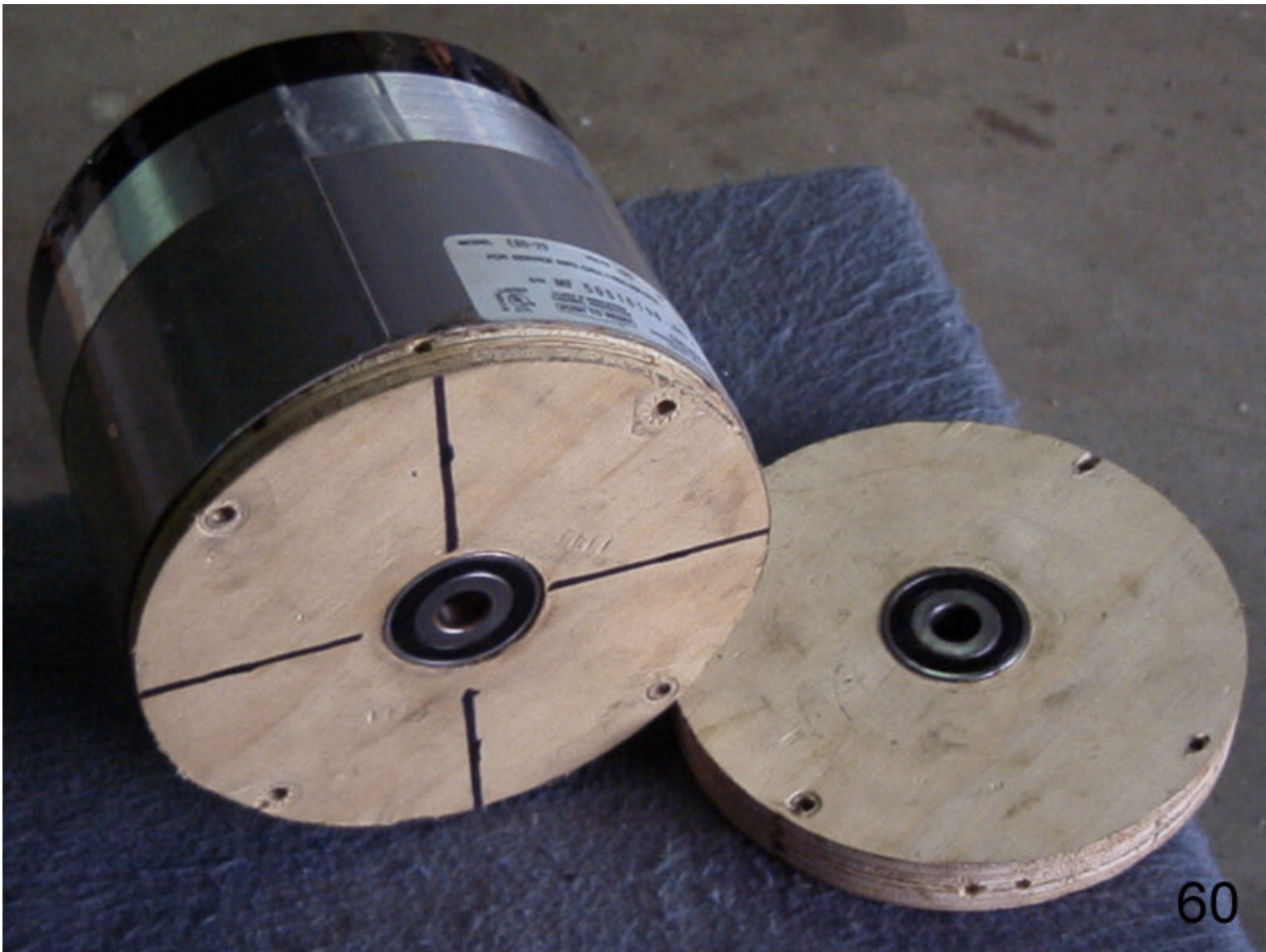






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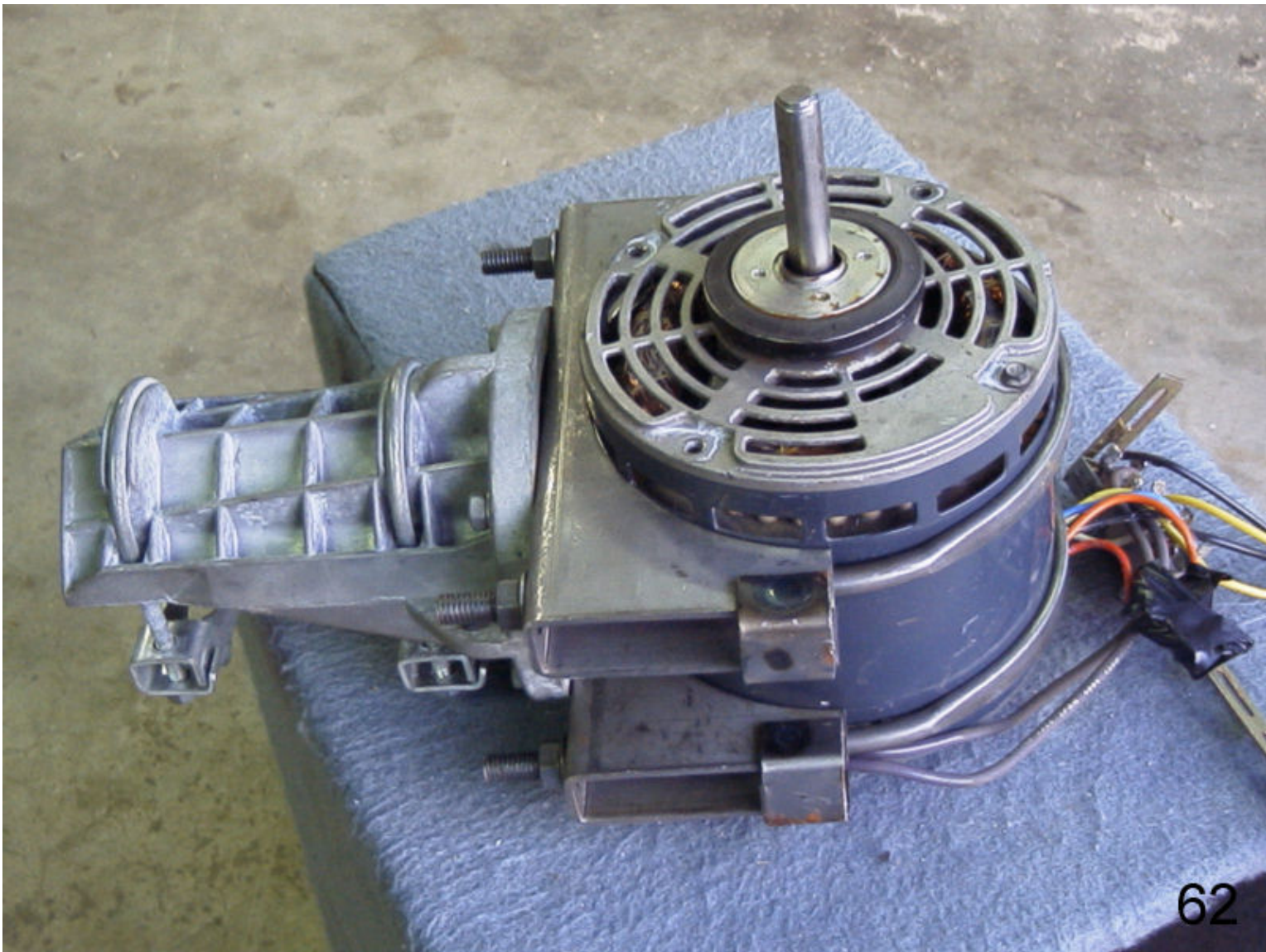


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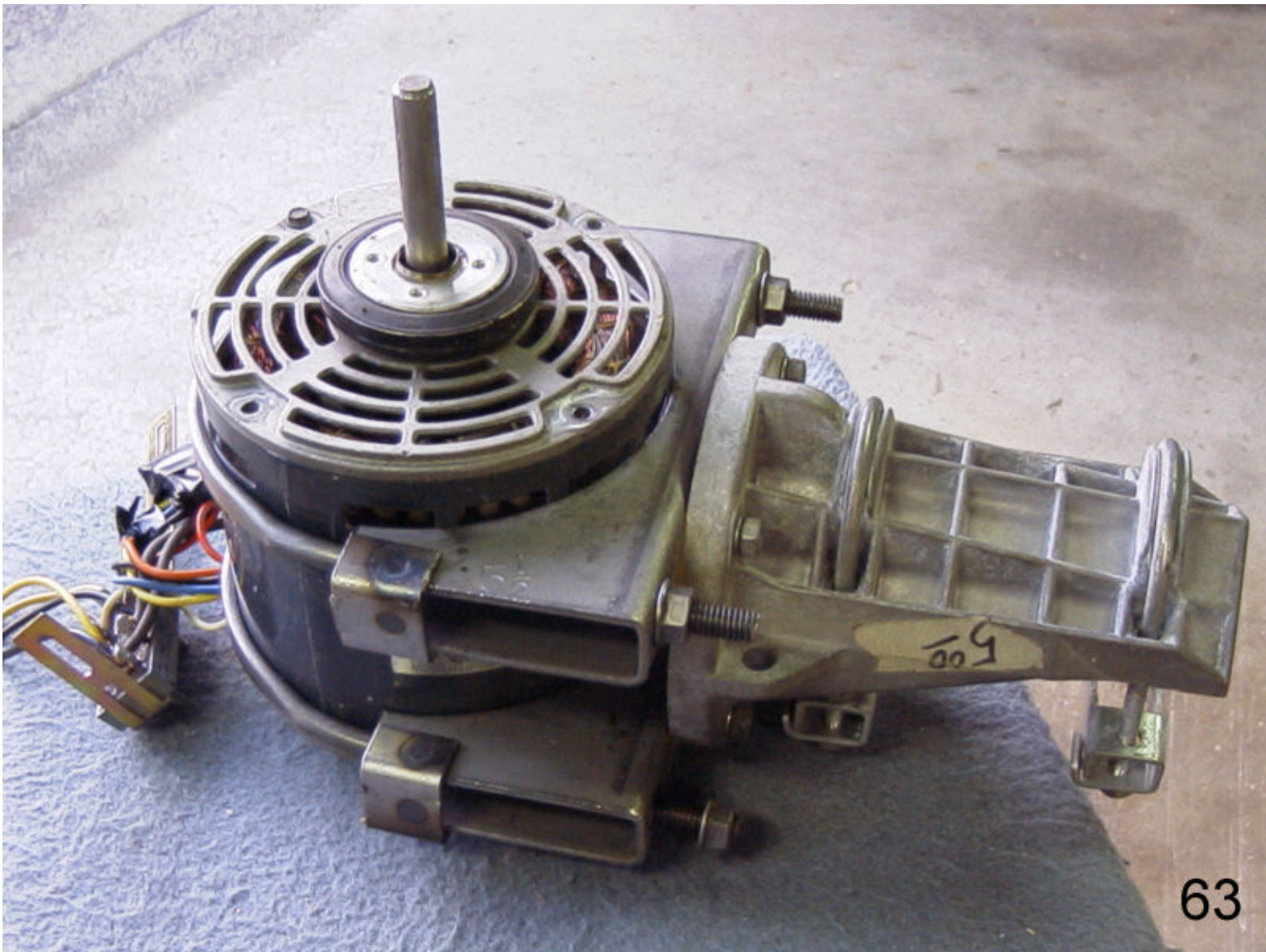


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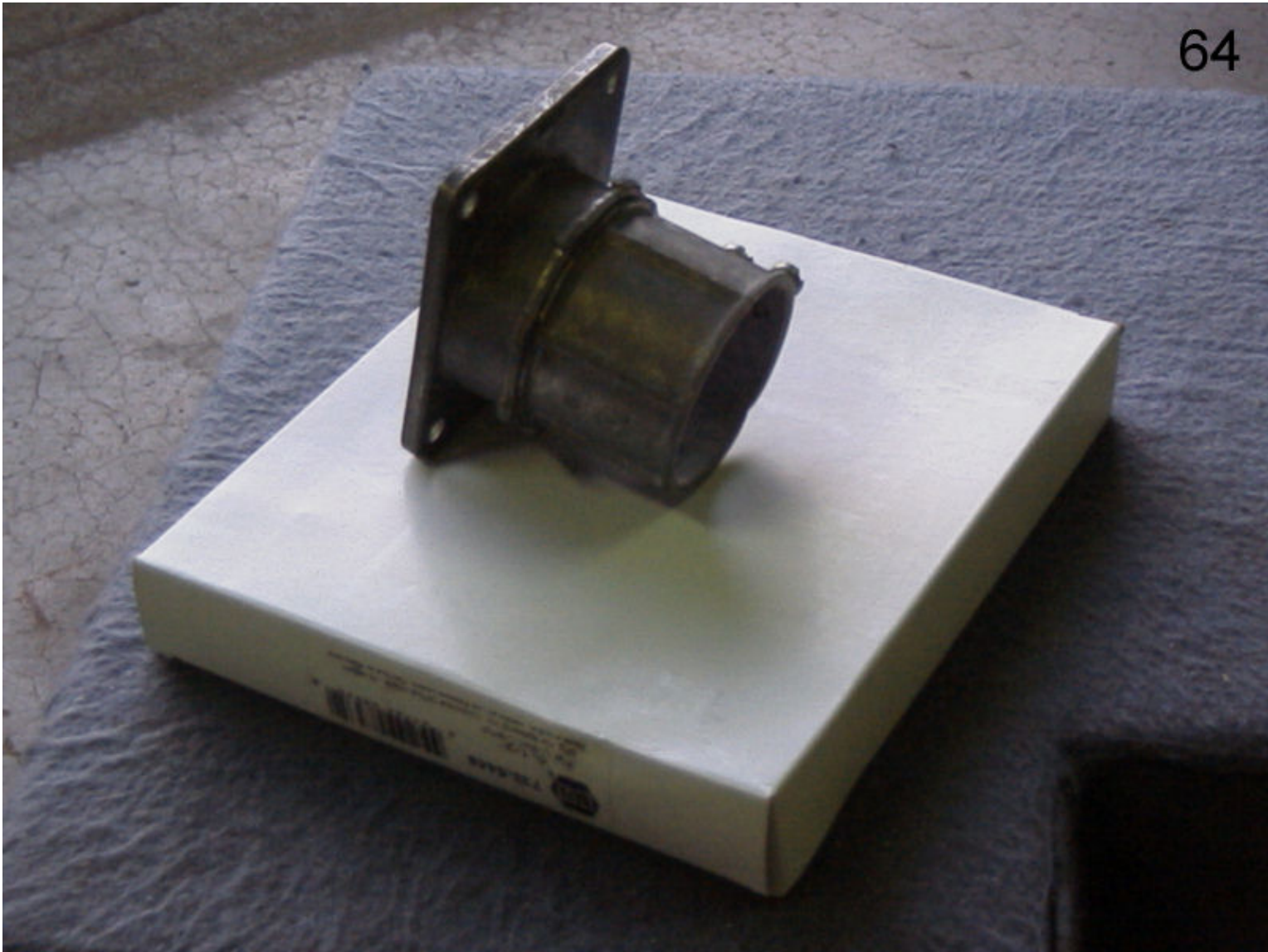


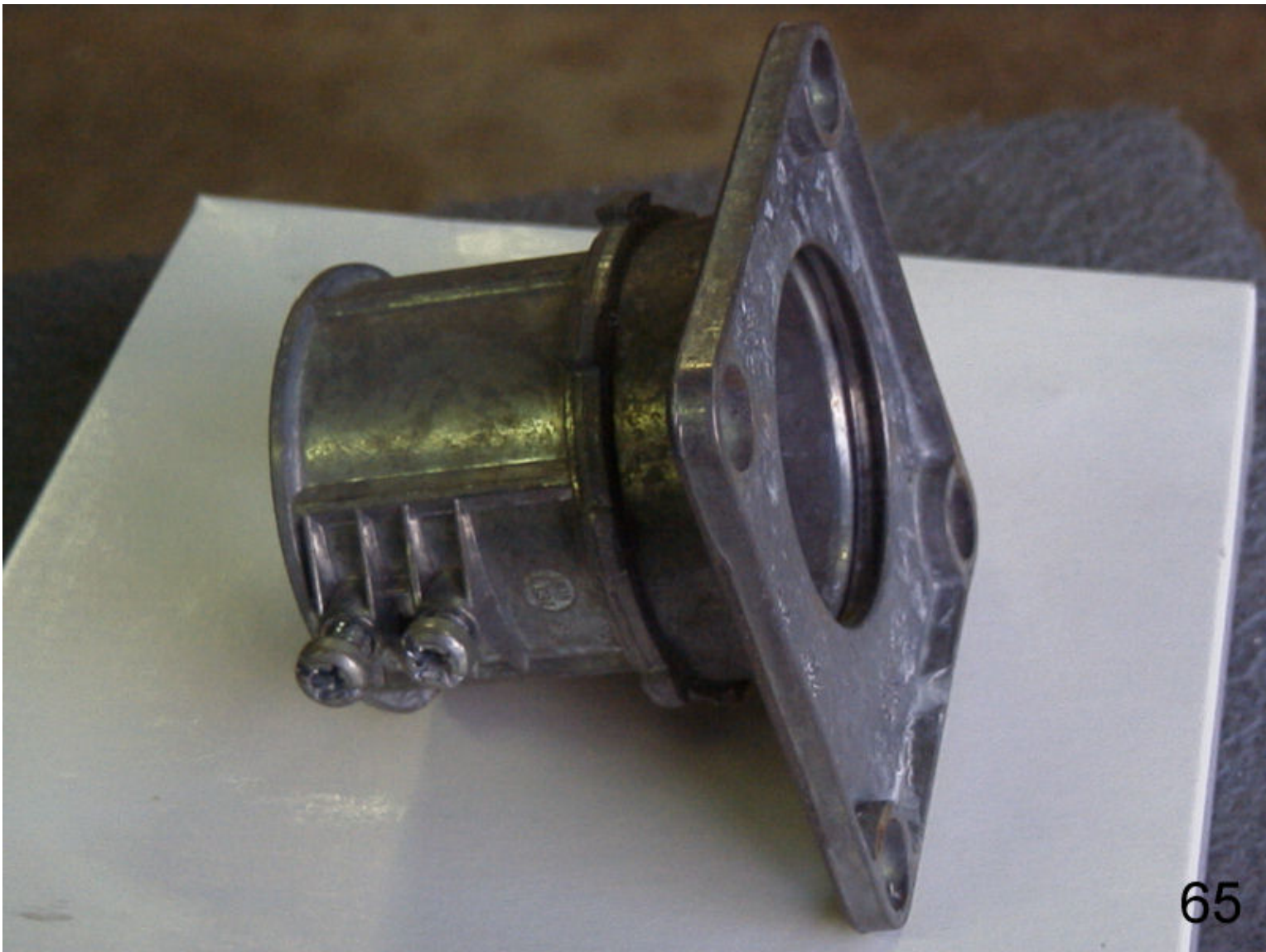


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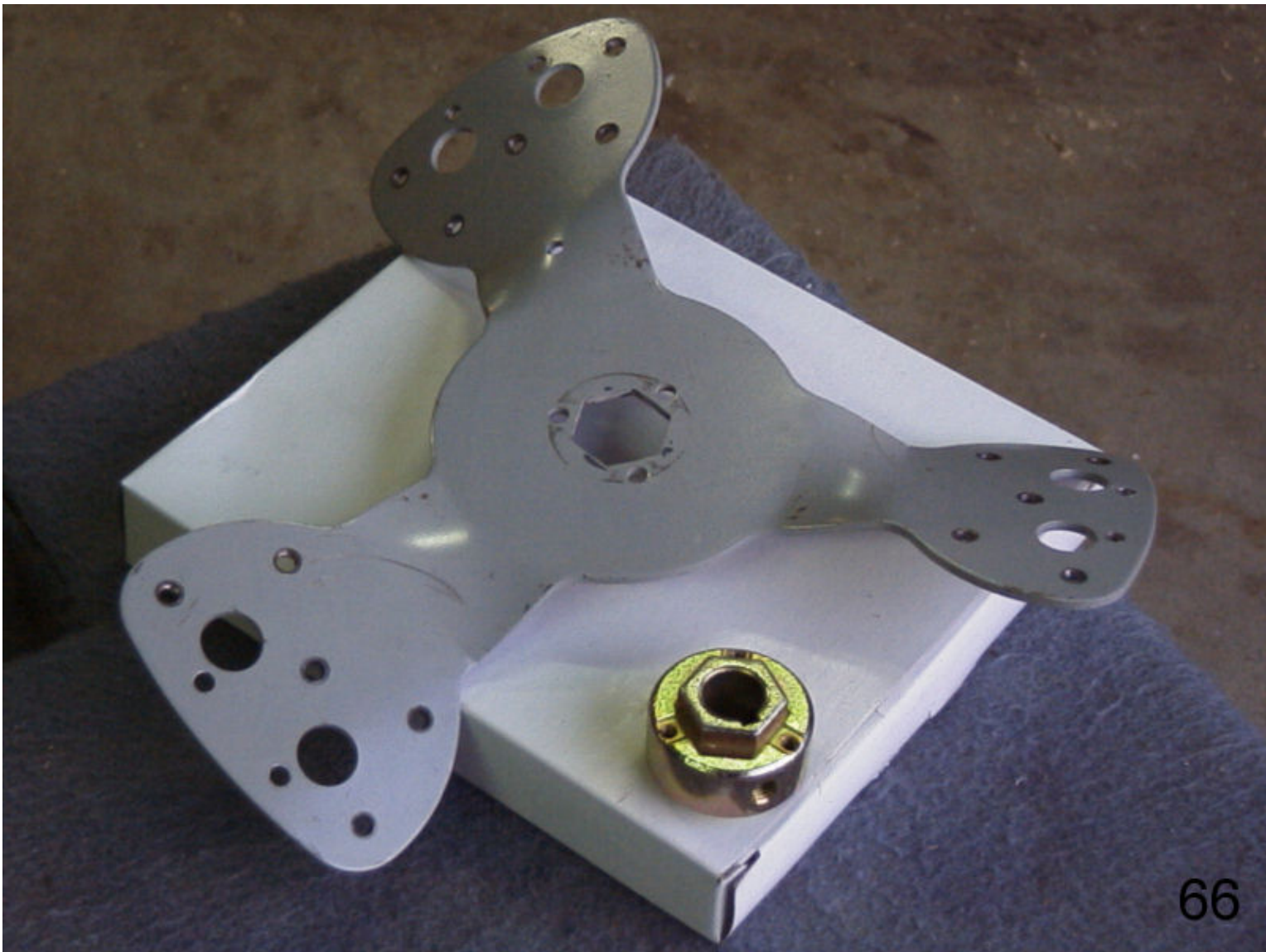






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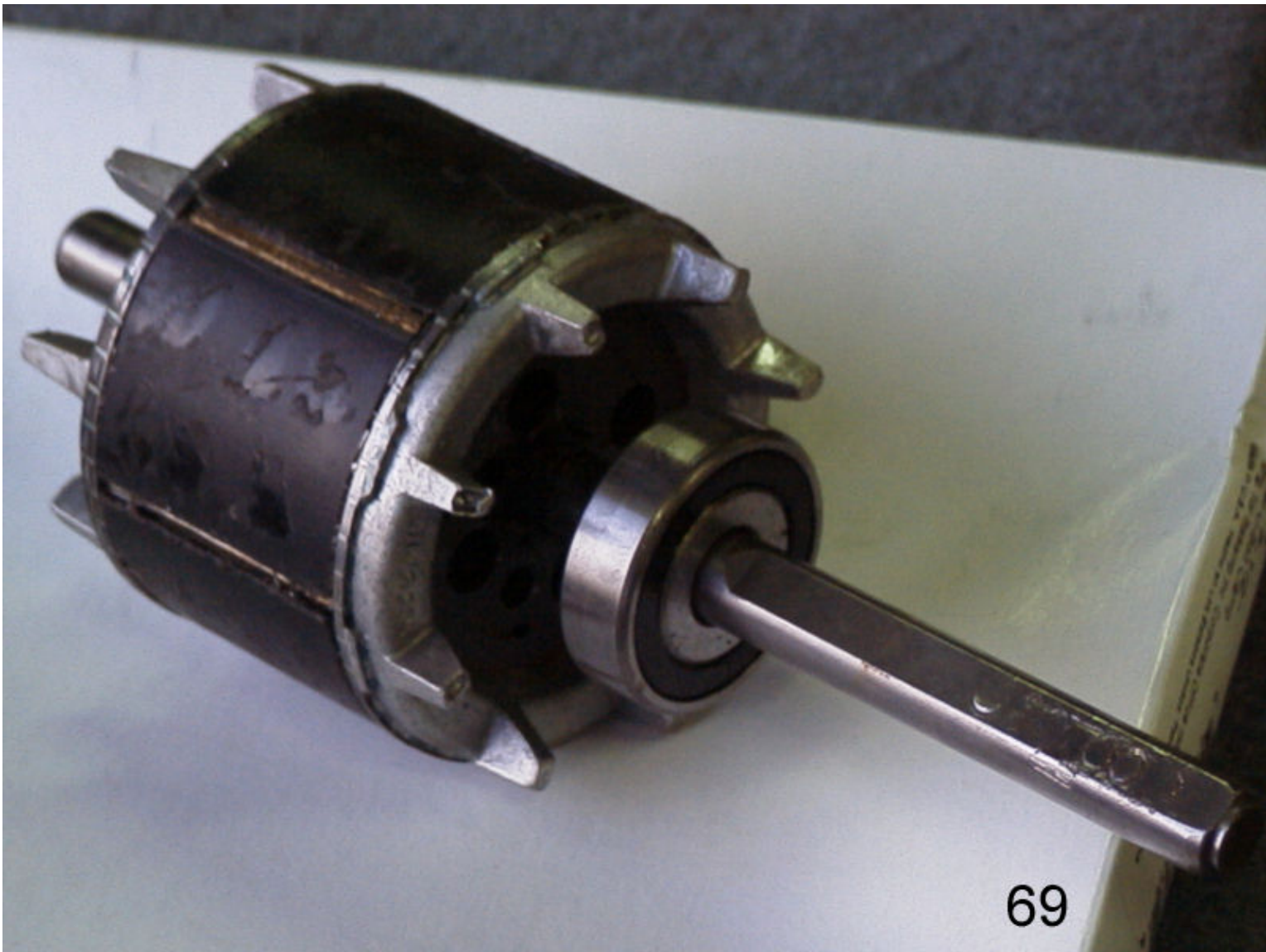




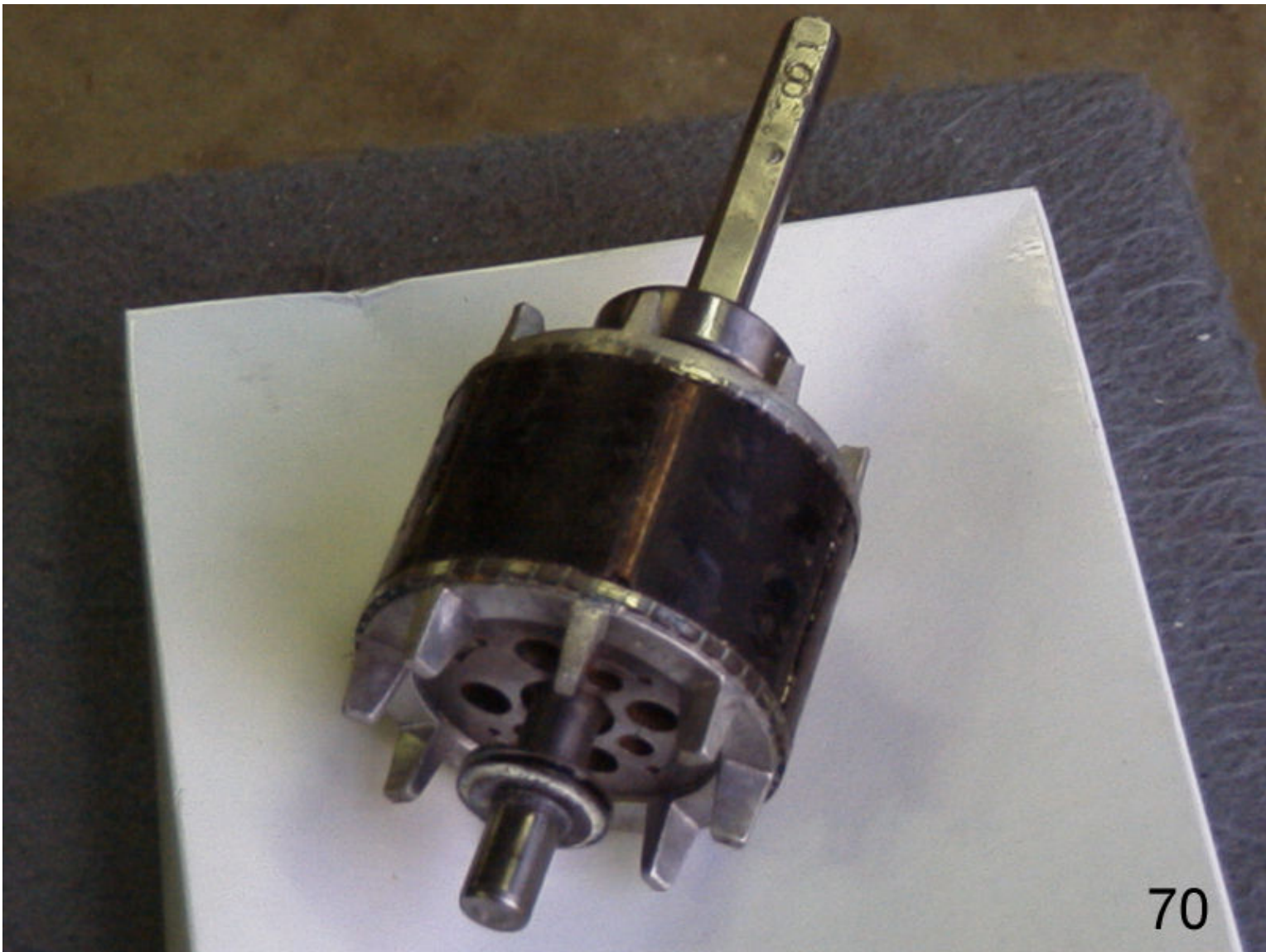


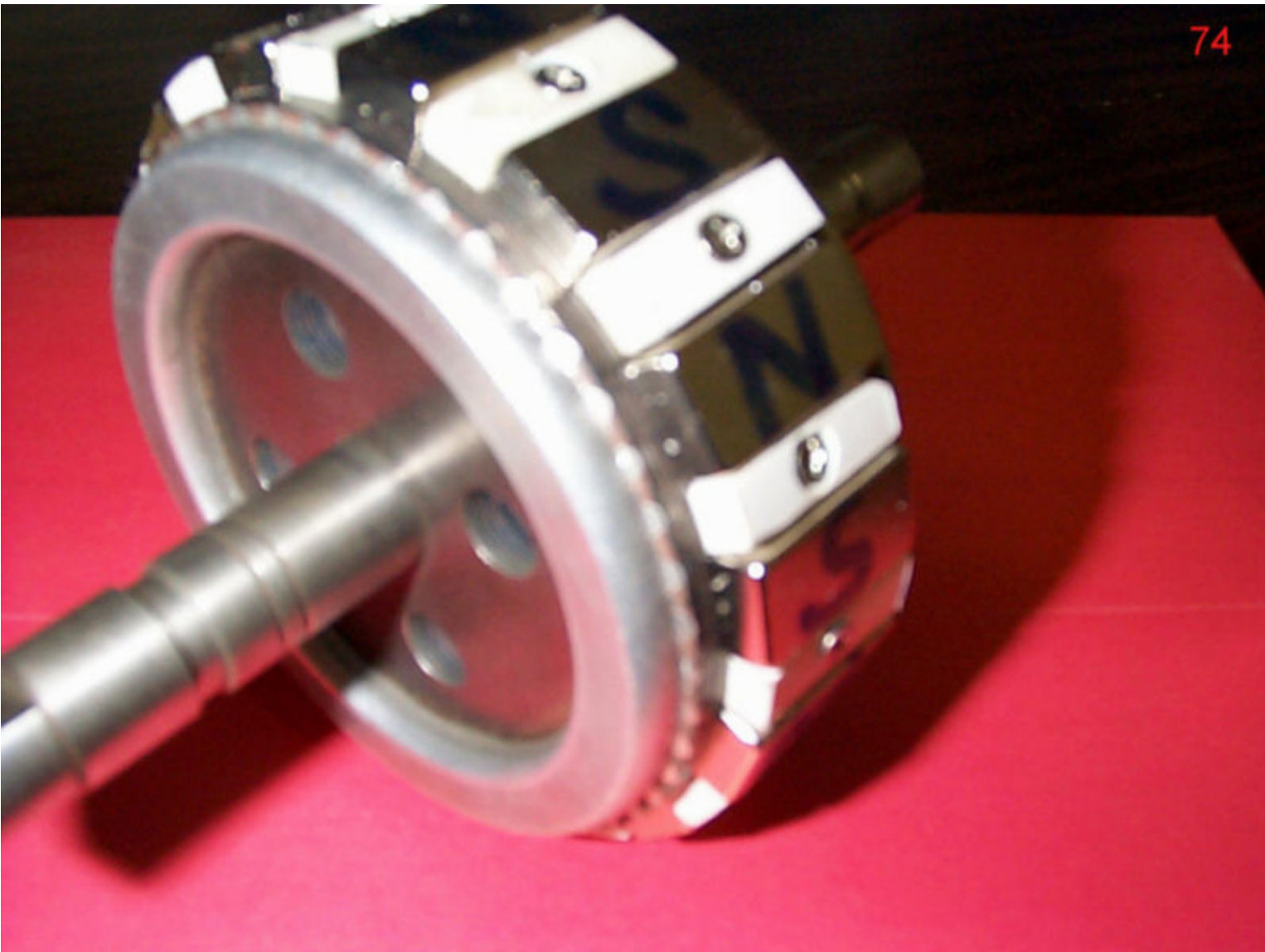














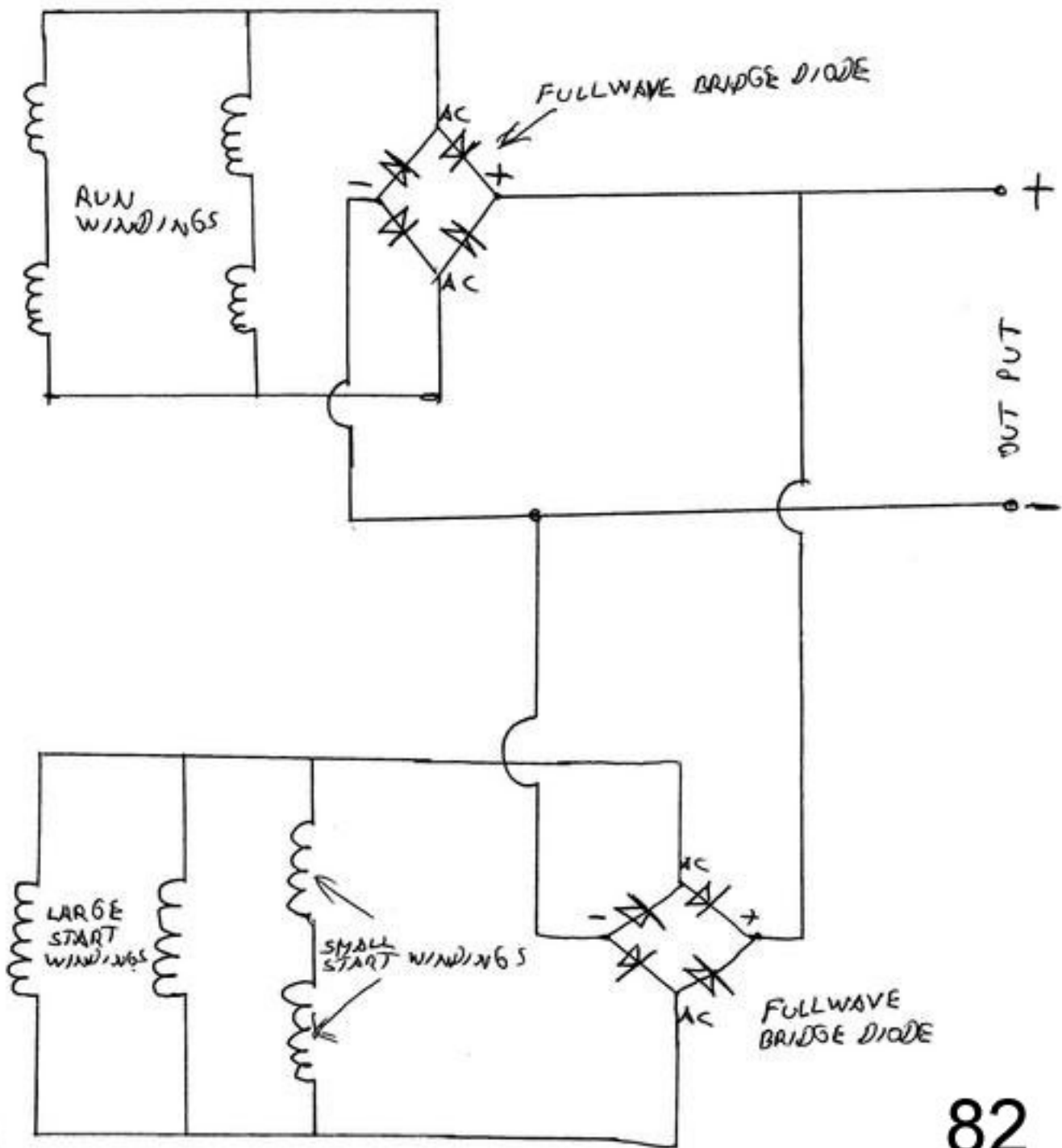








# GARBAGE/JERRY BLADE COMBO 12VOLT USE



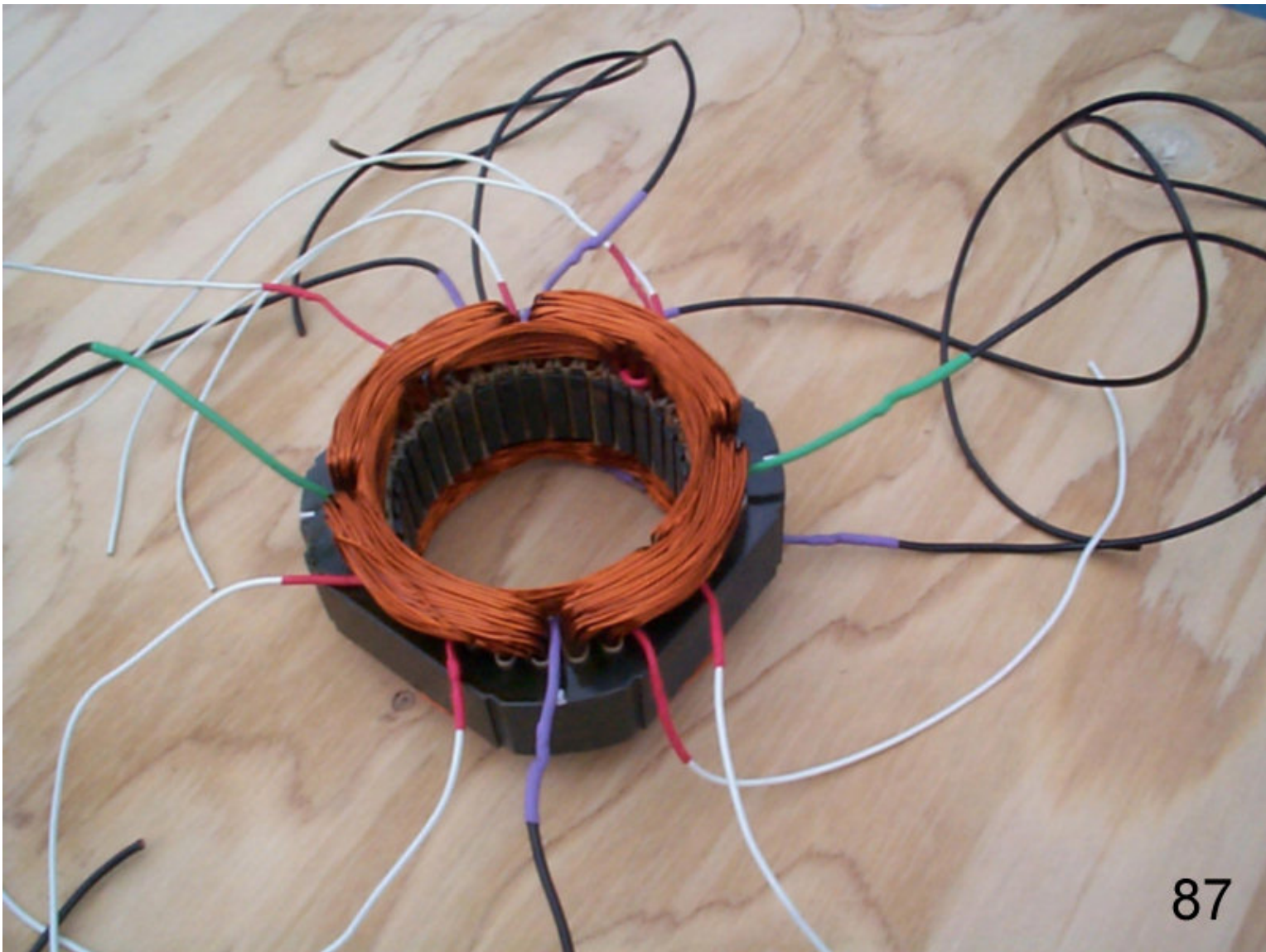


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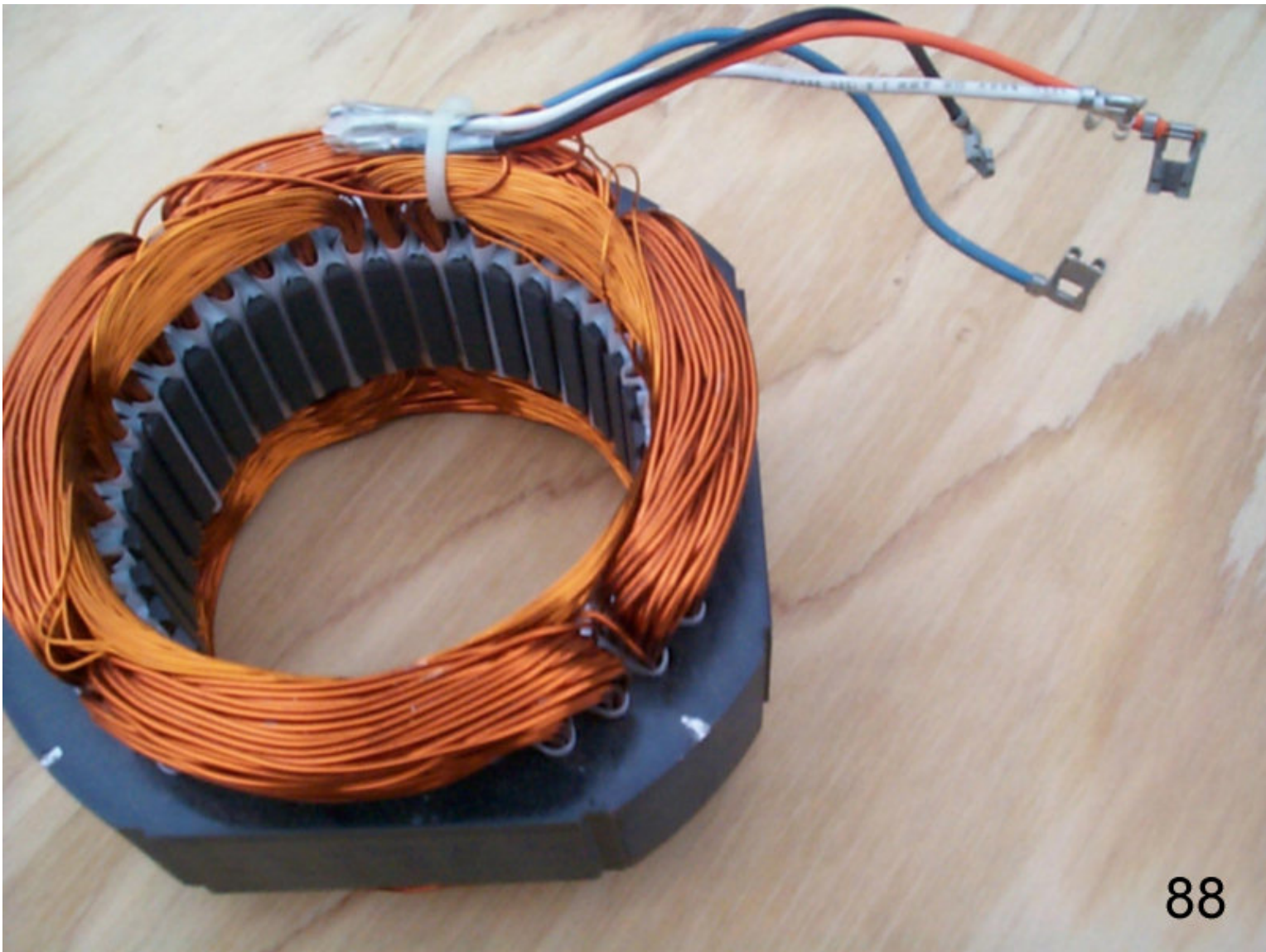








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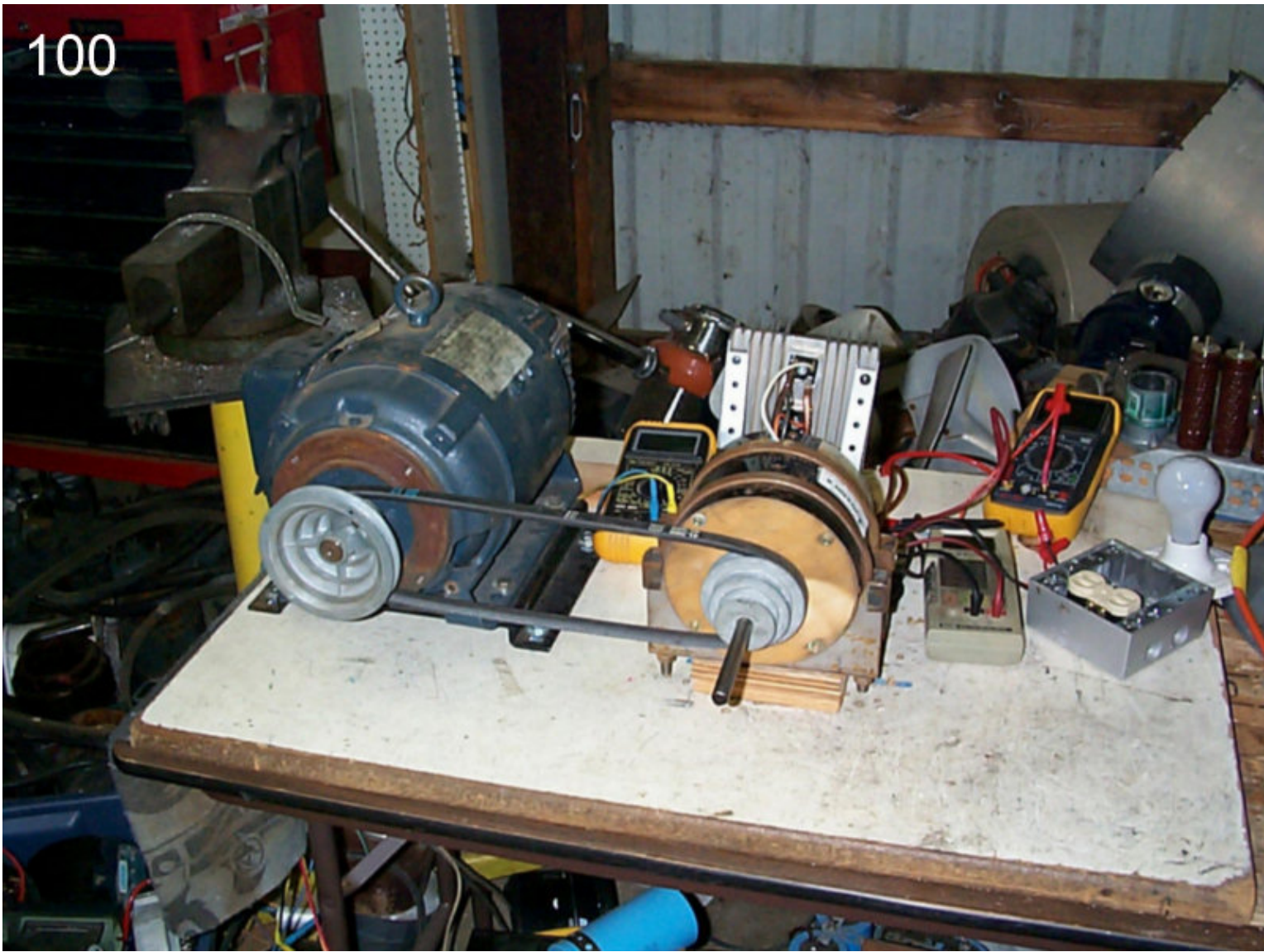






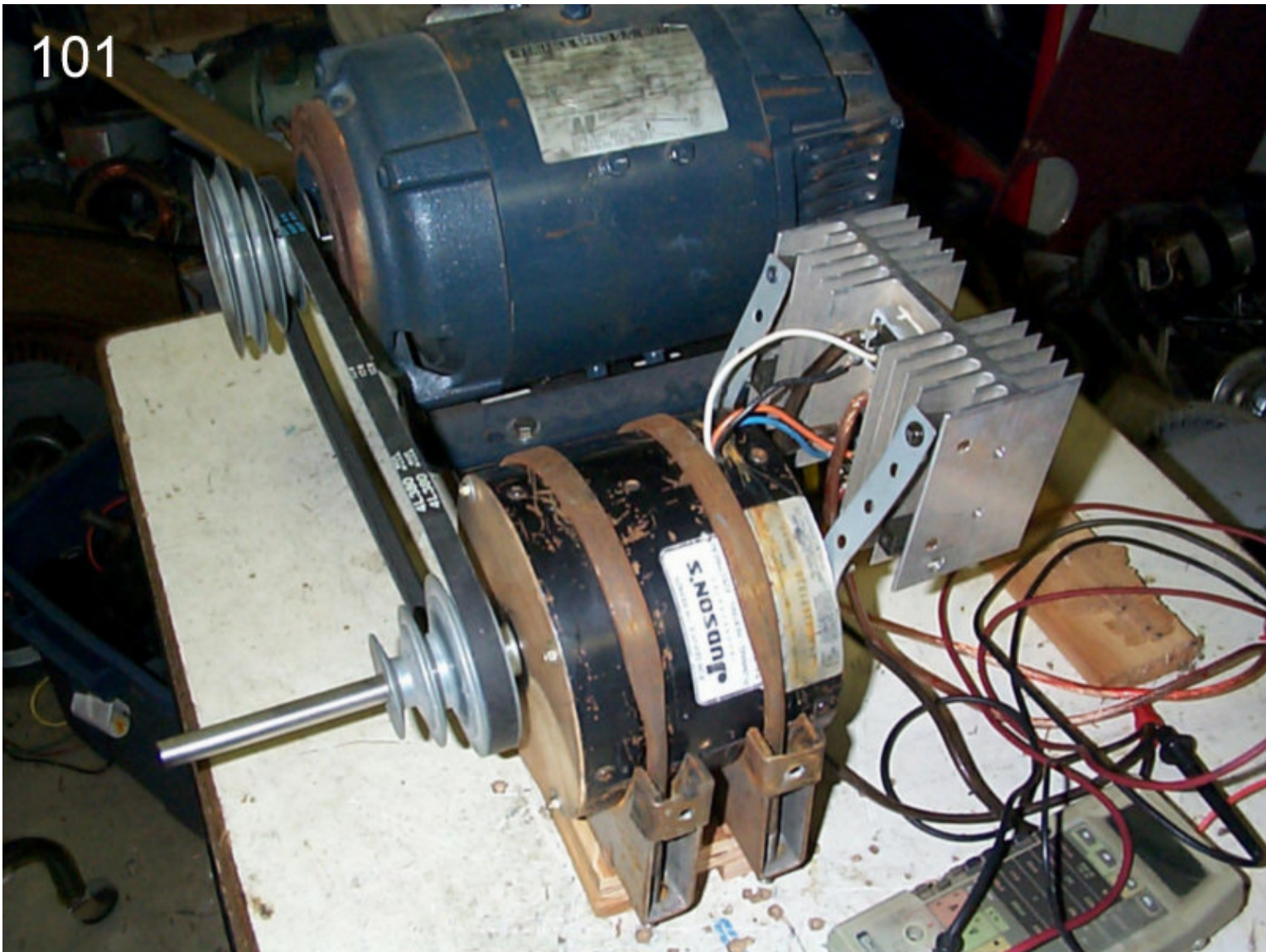
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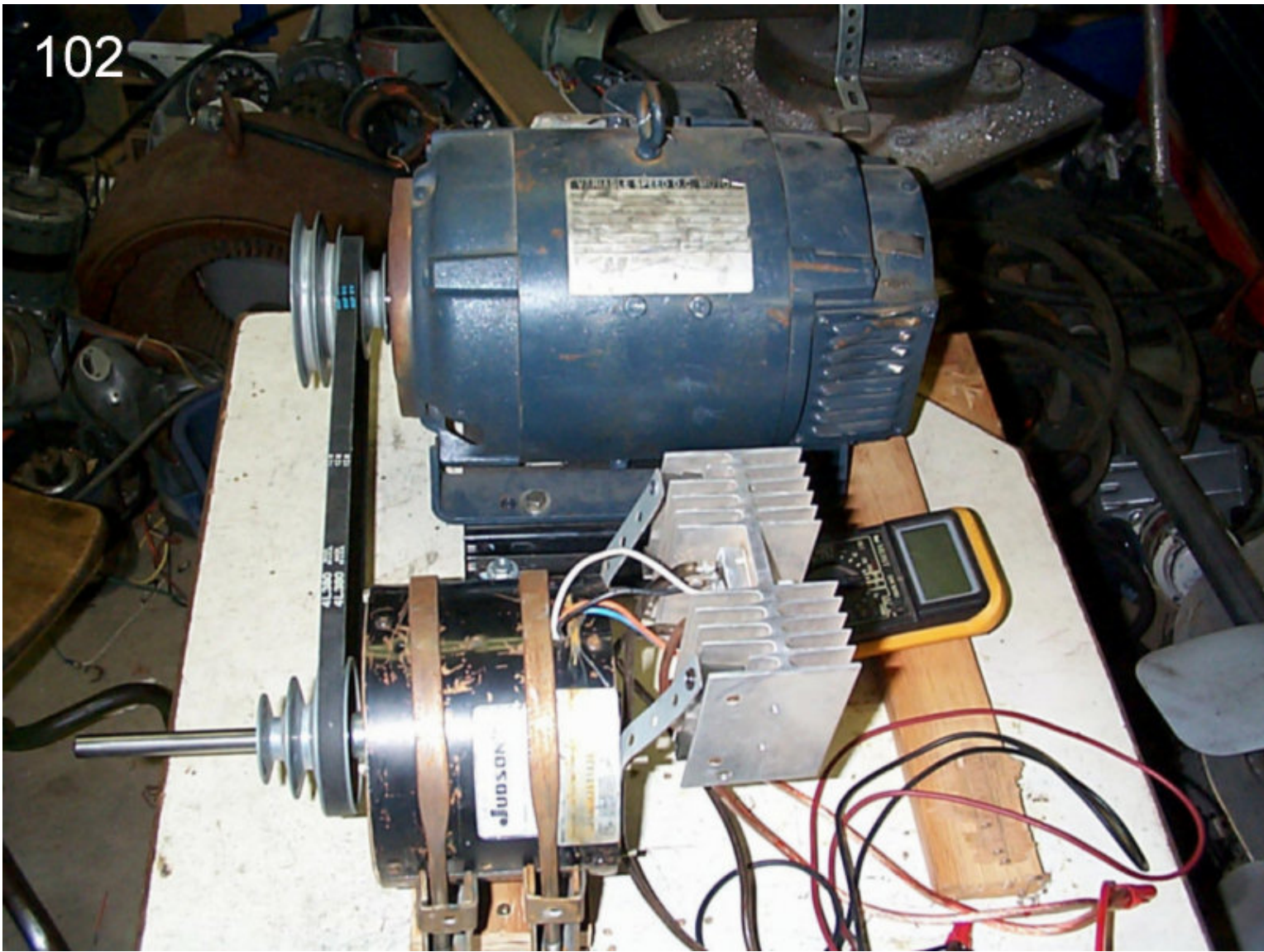




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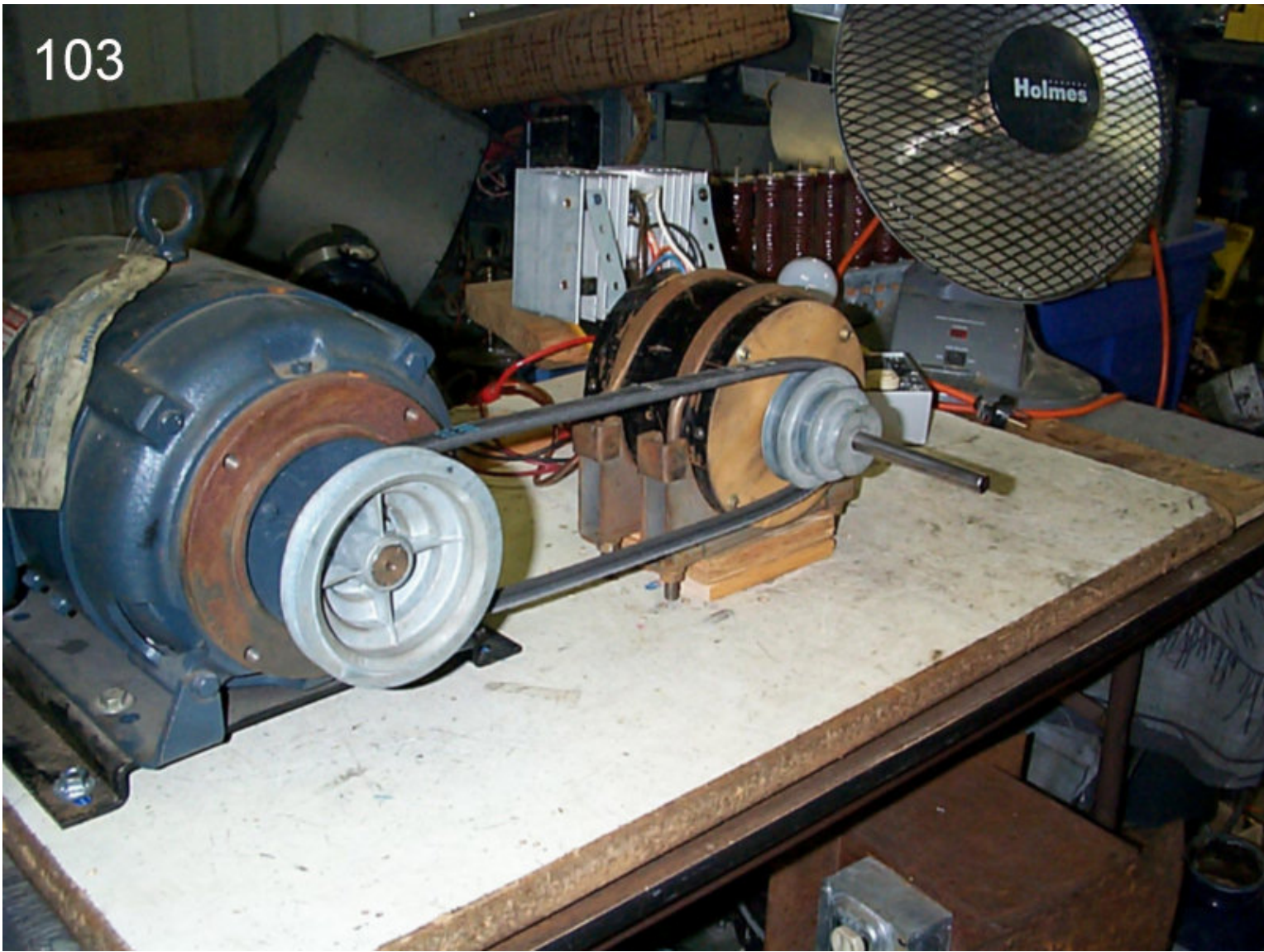


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# PMG's

Permanent Magnetized  
Generators

[\*\*PMG 300\*\*](#)

[\*\*PMG 600\*\*](#)

Price stated on the  
individual data sheets







4 kW Windflower

# WINDFLOWERS

We produced and sold some 40 samples of the 600 W and the 4 kW Windflowers. They are now history. [References](#)

Based the experience we have had with these machines, a new [1kW Windflower](#) has been developed. It goes up for testing in Autumn 2003. If this concept proves successful during the Winter storms, it might be used on a new 4 kW model.

[600 W Windflower](#) | [4 kW Windflower](#) | [Windflower design](#)

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Centennial Flight Celebration in Kitty Hawk, North Carolina: Wright Memorial (left), Under Secretary James E. Rogan with Apollo Astronaut Neil Armstrong, the first man on the moon (upper right), the failed attempt to recreate the first flight (lower right).

### Secretary Rogan Attends Centennial Flight Celebration

USPTO Director **James E. Rogan**, joined **President George W. Bush** and other members of the administration at a ceremony commemorating the centennial of flight on **December 17**. The Kitty Hawk, North Carolina event capped a year of celebrations honoring **Orville** and **Wilbur Wright** on the **100th anniversary** of powered flight. Under Secretary Rogan was invited to the event because of the key role the USPTO and the patent system played in the eventual commercial success of the Wright brothers.

From the beginning, the Wright brothers understood clearly that the credit for their work, and potential profits, would vanish quickly if they did not get a patent. Despite initial skepticism from the patent

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office regarding powered flight, the brothers eventually prevailed. They were issued a patent three years and two months after the filing of their application. The validity of the patent was upheld by the courts. The Wright brothers patent and company were sold for \$1 million in 1915. After the sale, Orville Wright (Wilbur had died in 1912) continued to collect substantial royalties from several foreign and domestic companies from the patented invention.


Under Secretary Rogan, spent two days in Kitty Hawk participating in the many functions and seminars held in conjunction with the centennial event.

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**awe-wind-home** · Home Energy Systems Discussion

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**Description**

**Category:** [Energy](#)

The Home Energy Systems Discussion list is intended for those with questions about household energy systems that include wind as a component. Questions about wind turbines, batteries, inverters, towers and other relevant equipment are welcome, and will be answered by persons with hands-on experience.

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- Jan 5 [Re: Backwards - Derek Conniffe](#)  
The hub might unscrew and fly off. Derek ... -- Derek Conniffe  
Rivertower Ltd T
- Jan 5 [Re: Wind generator voltage regulators Reply # 12204 - scorraigwind](#)  
... Diversion load controllers or shunt regulators or dump loads (all the same)
- Jan 5 [Re: Wind generator voltage regulators Reply # 12204 - Claus Nybroe](#)  
Tak Carl! Does the wind mill and the solar panel have seperate input-sockets on
- Jan 5 [Re: Domestic Wind Generation - chartrn@d...](#)  
I am an avid reader of this list and finally - a question I think I can answer.
- Jan 5 [Re: Wind generator voltage regulators Reply # 12204 - Claus Nybroe](#)  
Can you run a hybrid system (mill+panel) on a trace C-40? Best Claus

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Founded: **Feb 17, 1999**

Language: **English**

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1999		<a href="#">81</a>	<a href="#">303</a>	<a href="#">150</a>	<a href="#">188</a>	<a href="#">208</a>	<a href="#">119</a>	<a href="#">234</a>	<a href="#">160</a>	<a href="#">76</a>	<a href="#">60</a>	<a href="#">151</a>

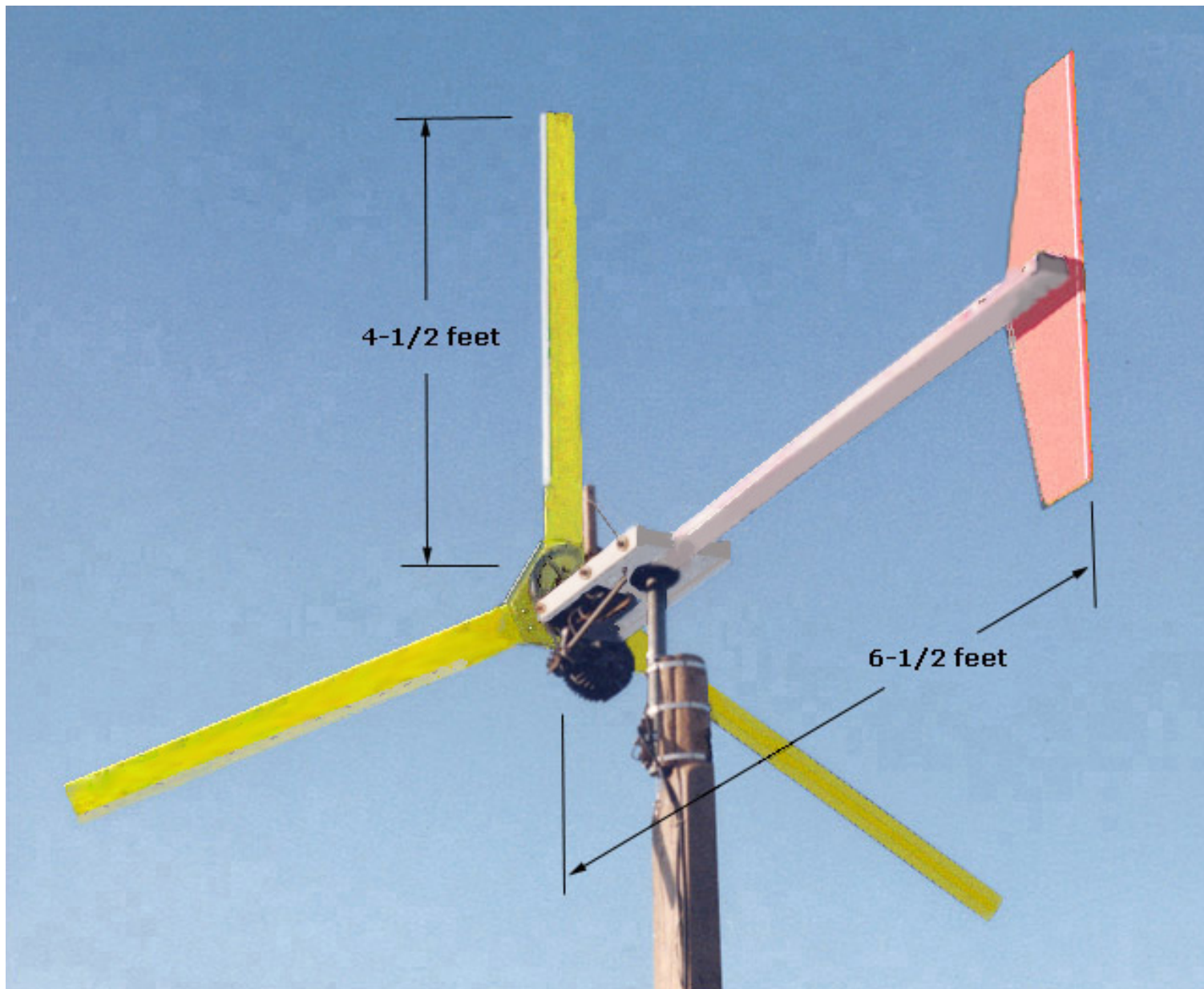
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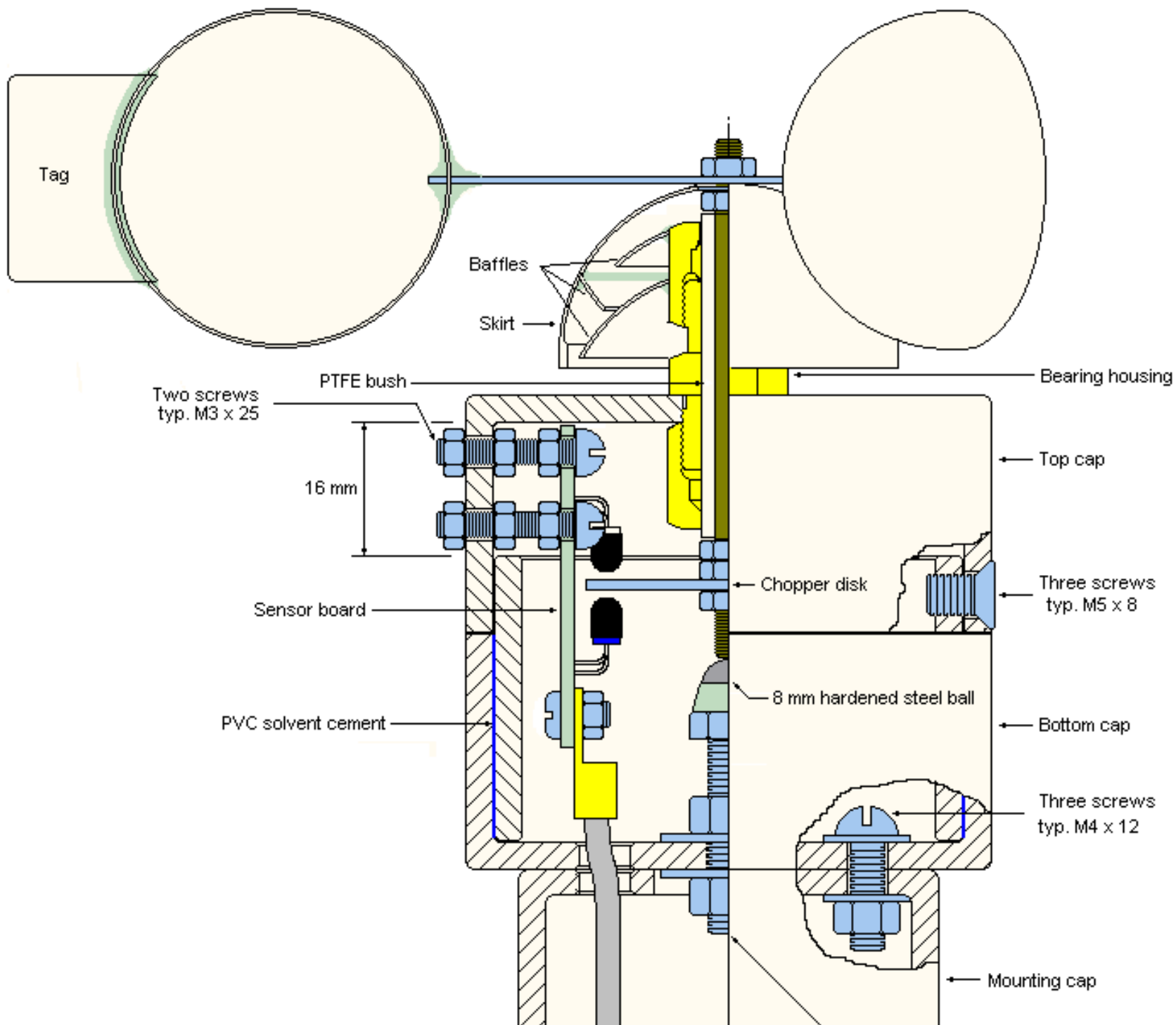
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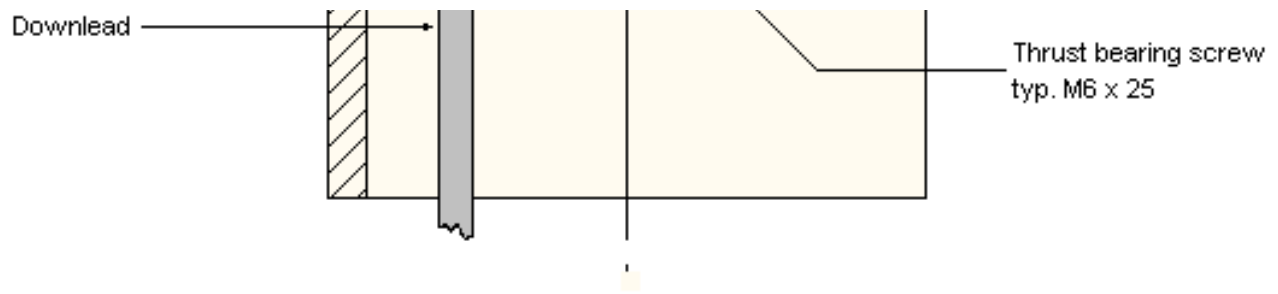
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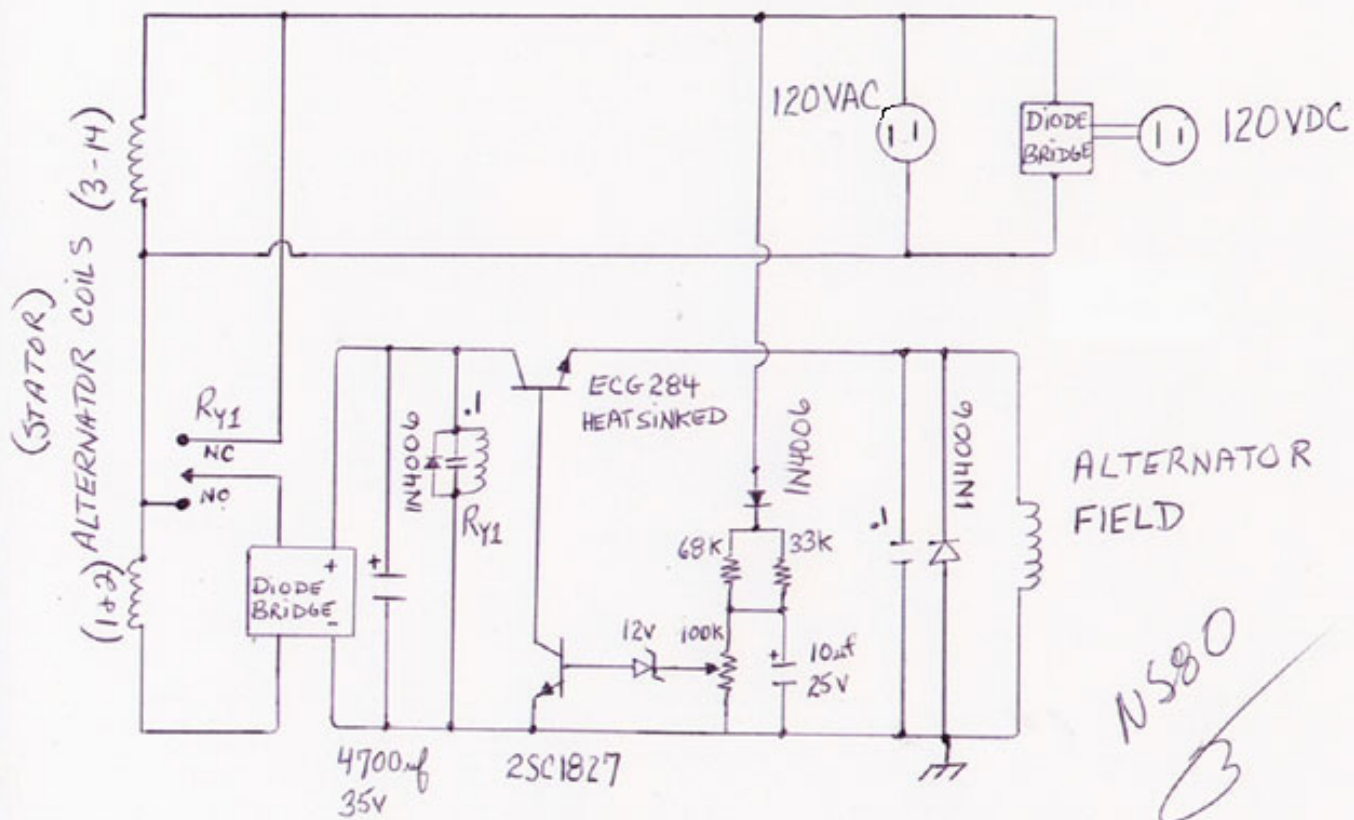












# Homebrewed Generators

## Page

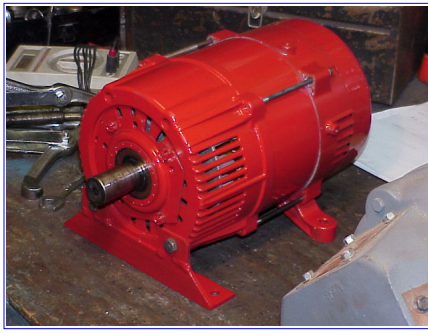
All of the following generators and engines are refugees from the junk yard. Most of them just needed some TLC and a bit of machine work to bring them back to life.

02 Feb 2001 Greg Weinfurtnner



Gasoline Powered Welder

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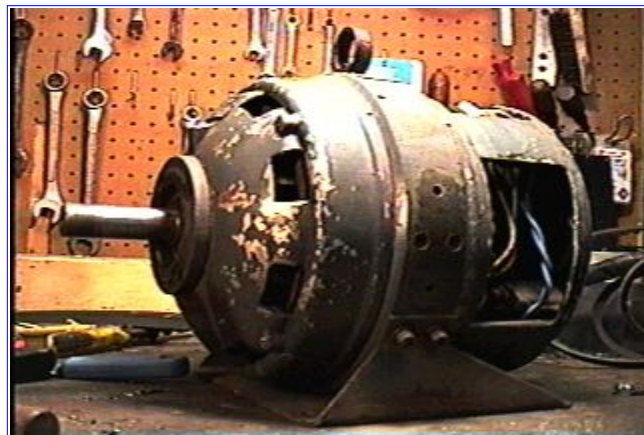
Homelight 4kw

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B&S/Chrysler Alternator 12 VDC @ 50 A

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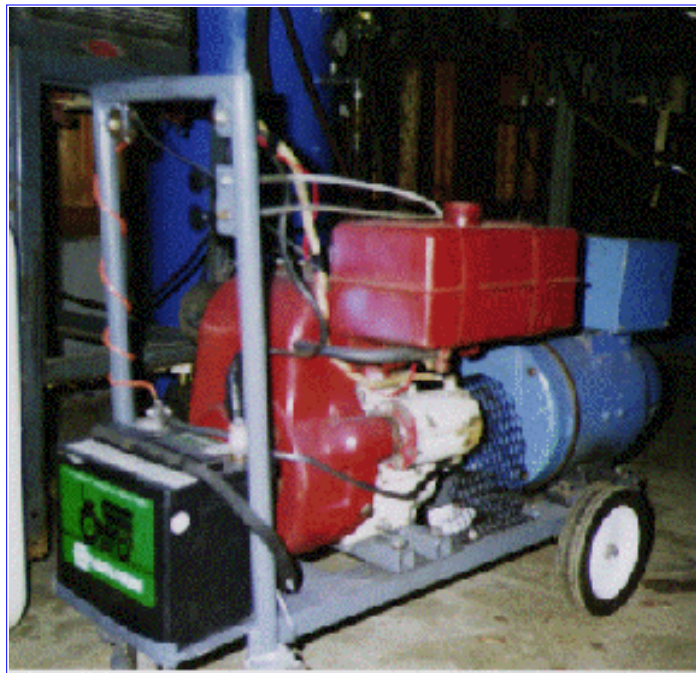


Navy Surplus Generator (New Update! Check it out!)



Dayton Generator No. 2M094

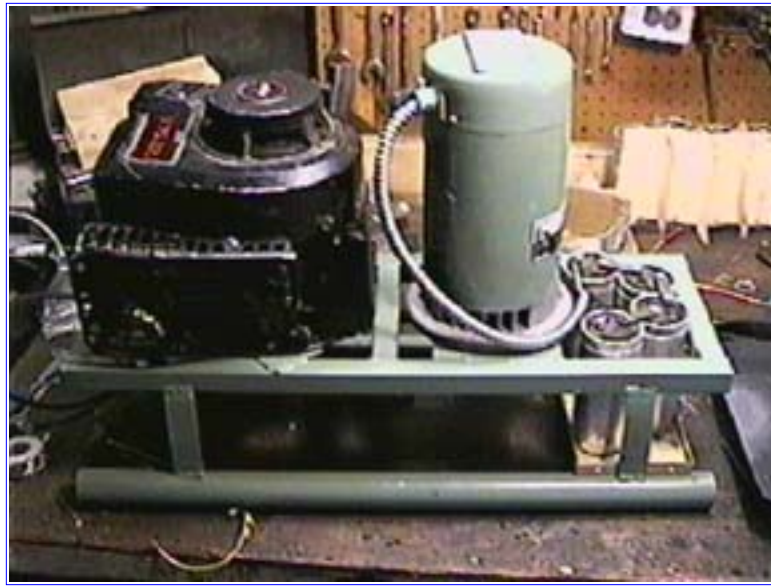
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Kohler/Tecumseh 5KW

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Induction Generator

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New! Dayton 1.5kw

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## Renewable energy experiments

# MAGNETS

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## Low RPM alternator tests with surplus hard drive magnets 9-13-99

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In the effort to build my own low RPM alternator for small wind/water power applications, these are some of the tests I've performed and their results. First step is the magnets. I used surplus hard drive magnets which I salvaged from scrap computer hard drives. These magnets 1.4" long, .80" high, and .090" thick. They are nickel plated Neodymium Iron Boron magnets of impressive strength. I sell surplus magnets on my web site. In this test used some of my smaller ones, due to their seemingly unlimited supply.



Item #2 on my magnet web site

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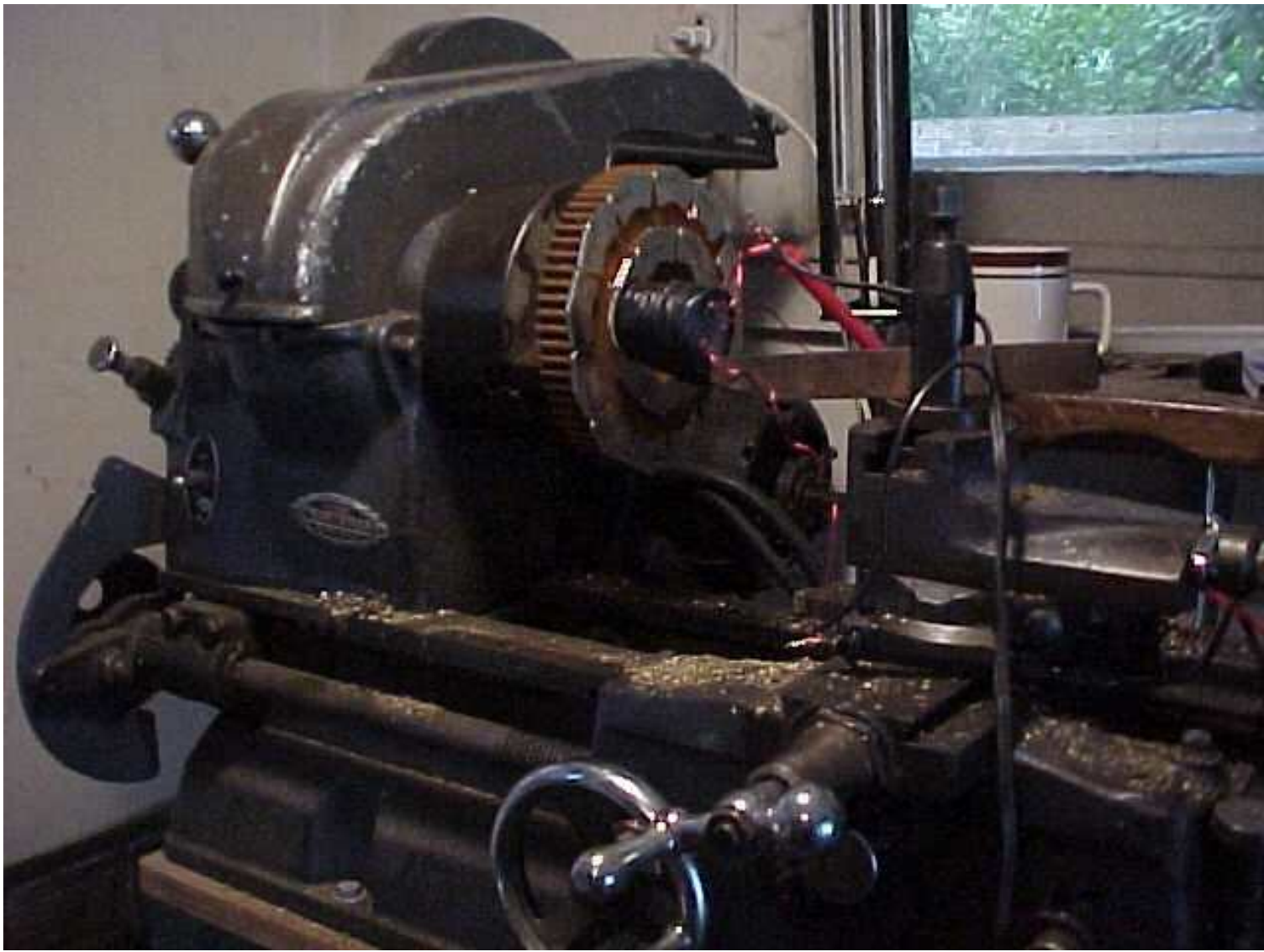
Next wound a coil from 23 gauge magnet wire. The coil is slightly under 2" long, and consists of 700 windings, with taps at 100, 200, 400, and 700 windings. The core for the coil is made from 20 2" long segments of enameled coat hanger wire, super glued together. This should reduce inefficiencies due to eddy currents through the core. I believe annealing the wire segments would probably improve performance, but I skipped that step here. The spool on which the wire is wound are made from paper, poster board, and super glue. There are certainly better materials to use here, although paper and cardboard worked just fine. The alternator I'm currently building will have spools made of phenolic sheet.



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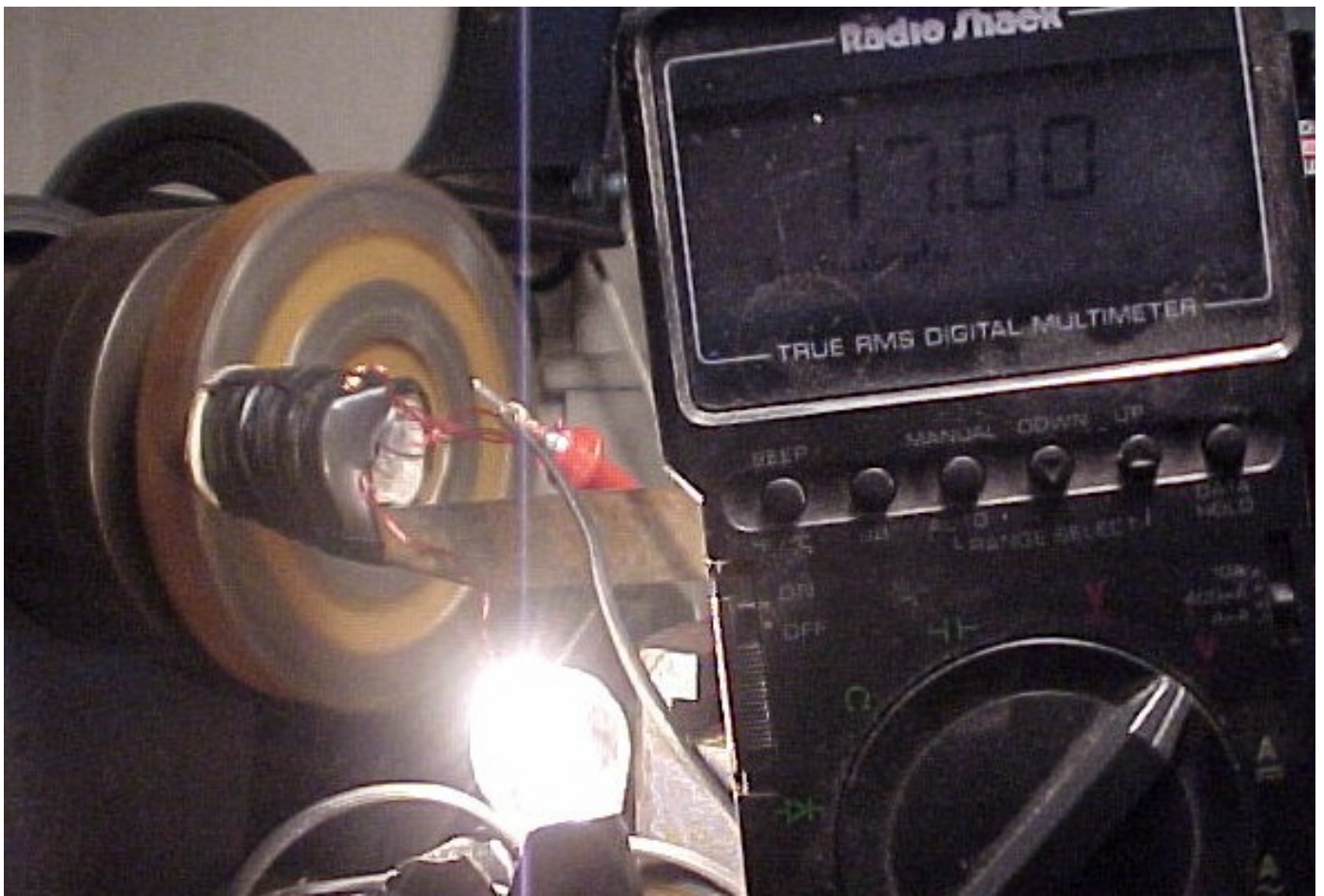
Next I took a gear, 5.5" diameter and placed two rings of surplus computer hard drive magnets on it. Each magnet has 2 poles on each face. 7 of these ones fit tightly together in a ring, having 14 poles. I placed two rings of magnets on the face of the gear, one ring containing 7 magnets(which fit together nicely), and the other ring containing 12 magnets(which don't fit as well). The inner ring of 7 magnets is a little over 3.5" diameter. The outer ring is a little over 5.5" diameter. I then placed the gear in a small metal lathe on which I performed tests at 3 different speeds.. I tapped the coil to a boring bar, so that I could adjust its position in relation to the two rings of magnets.





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Next step was to turn it on, and test the different taps on the coil, at 3 different speeds. I used a 12 Volt, 5 watt light bulb as a load, and tested the voltage of each tap on the coil, at each speed, with, and without the load. The tests were done at 200, 400, and 600 RPM.



INNER RING(7 MAGNETS-14 POLES)  
200 Windings

	200rpm	400rpm	600rpm
Light off	2.3 Volts	3.4 Volts	5.5 Volts
Light on	2.1 Volts	3.2 Volts	4.8 Volts

INNER RING, 400 Windings

	200rpm	400rpm	600rpm
Light off	4.4 Volts	7.3 Volts	11.3 Volts
Light on	3.8 Volts	6.1 Volts	9.1 Volts

INNER RING, 700 Windings

	200rpm	400rpm	600rpm
Light off	6.5 Volts	11.1 Volts	18.6 Volts
Light on	4.3 Volts	7.0 Volts	10.5 Volts

## OUTER RING(12 magnets, 24 poles) 200 Windings

	200rpm	400rpm	600rpm
light off	3.2 Volts	5.5 Volts	9.5Volts
light on	3.1 Volts	5.1 Volts	9.1 Volts

## OUTER RING, 400 Windings

	200rpm	400rpm	600rpm
light off	7.8 Volts	11.8 Volts	18.6 Volts
light on	6.5 Volts	9.9 Volts	14.6 Volts

## OUTER RING, 700 Windings

	200rpm	400rpm	600rpm
light off	13.9 Volts	19.2 Volts	30.9 Volts
light on	9.3 Volts	10.8Volts	14.6 Volts

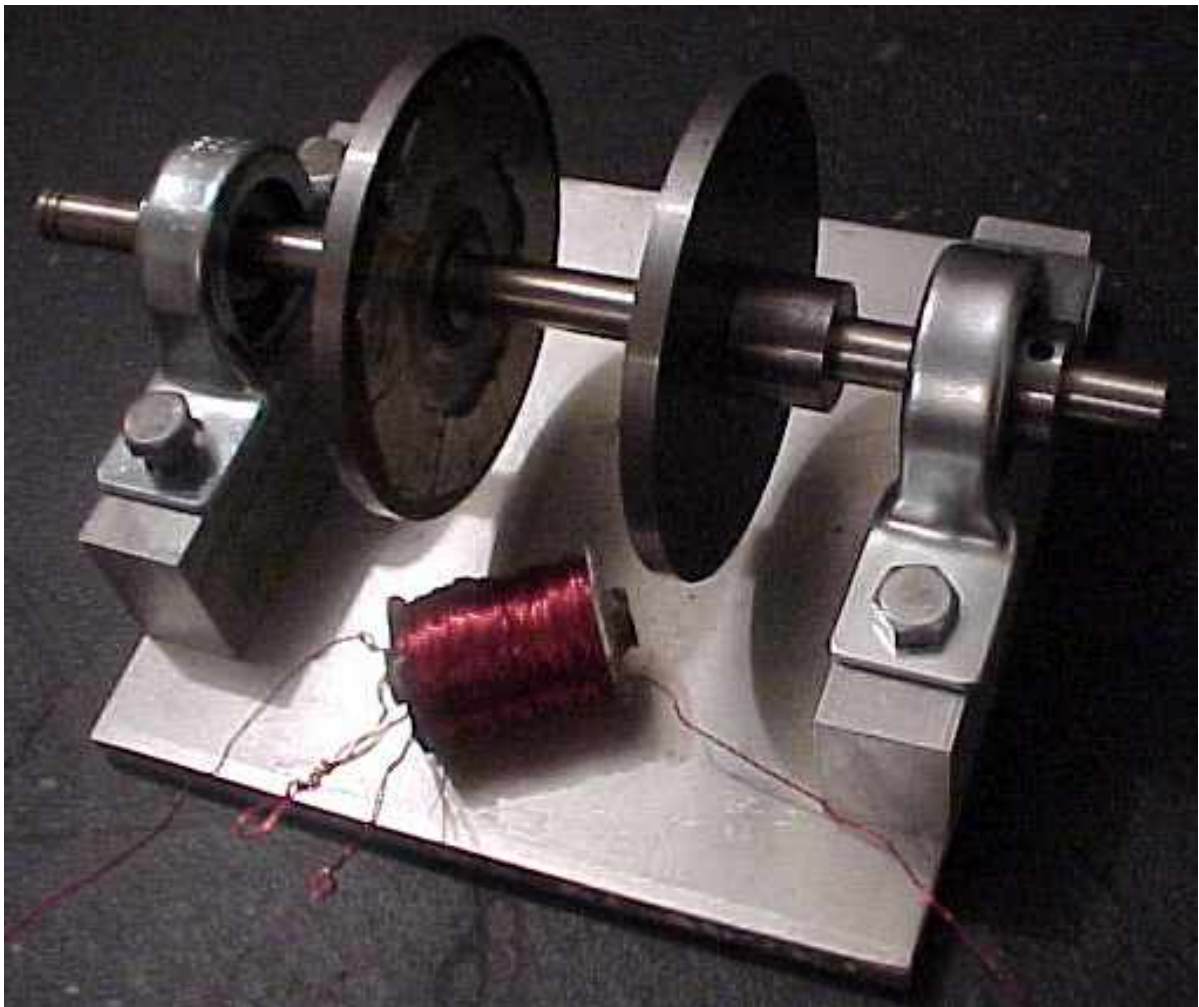
Considering this data, Its my guess that 400 windings is closest to ideal for charging 12 volt batteries. It surprised me, that in every test performed, the lightbulb did light-though it was rather dim on some. 1 problem with the test, is that the coil was tapped to a boring bar, attached to the compound rest of a rather cheap, old, and worn out lathe. As the machine ran, the coil would creep towards the magnets. Although I tried to keep the gap between magnets and coil consistent, I know this varied some throughout the testing. A slight change in gap has a causes a significant change in voltage. In another test, at 600 RPM with the light on and 700 windings used, output was at 18 volts. It was interesting, to be able to move the coil front/back, and side to side while observing the output voltage.

## IMPROVEMENTS?

There must be many improvements. I have no doubt a better iron core could be used. The length of the coil, I chose 2" off the top of my head, I doubt its perfect, but I'm using that because I am building an alternator that will employ two discs, each with a ring of magnets, on opposite sides of the coil. 2" seemed like a good distance. 23 gauge



wire was convenient, and seemed like a good starting point, though I have a feeling that fewer coils of thicker wire might work better. Stacking magnets? I didn't double up the magnets for fear of the lathe launching them like bullets off the gear. I'm sure that this would have a good effect though-but-it would add to the cost of an alternator. More coils-the coil is exactly big enough such that 7 of them could fit nicely in an alternator using the small ring of 7 magnets. At this point, seems to me like an alternator built with 7 coils hooked either in series or parrallel-(or a combination) would perform reasonably well at low rpm. I have no idea yet what the effect of adding a second spinning ring of magnets to the back side of the coil will be, but I'm sure it will be significant. Although already somewhat obsolete, (because of the base/bearing arrangement) you can see my current alternator project in the picture below. I intend to finish this one, and test the output. The next one will have a much improved bearing arrangement, larger discs, and more coils.



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[Homebrew Electricity](#) this is a site currently under construction about homebuilt, dirt simple-or antique power systems that may, or may not work!

[Matt's magnetic levitation page](#) shows a quick simple way to demonstrate magnetic levitation with a spinning aluminium disc.

[Pico-Turbine](#) - a great site offering books, plans-and valuable information on home-built alternators.

[Home made lightplants and generators](#) - another interesting site about homebuilt alternators.

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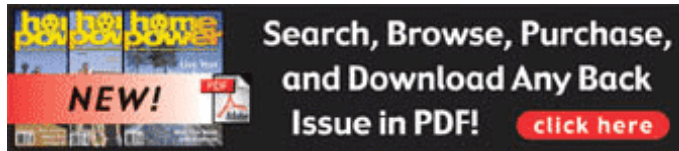
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Feature ArticlesOff-Grid Luxury

"Leap then look" has always been my subconscious motto. Sometimes this method has had definite pitfalls, but with my wife and my renewable energy system—so far so good. When I received the PG&E estimate for line extension, renewable energy became the obvious choice. The thought of paying US\$80,000 to the utility was a bit hard to swallow. With a distant background of having worked for the IBEW on two of the first solar-electric facilities in the U.S. in the early 1980s, I figured... [more](#)

PV Training

On a clear, sunny day in March 2003, a group of women were outside a California environmental science school talking shop—and that isn't short for shopping. Discussing everything from conduit bending to system voltage, these 25 women were at Walden West Center in Saratoga, California, installing a 1.5 KW solar-electric system. Walden West is an outdoor environmental science school in the Saratoga hills that hosts week-long science programs for 5,000 to 7,000 students each year. The women, who came from all across.... [more](#)

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Andy Kerr, Solar Tour host

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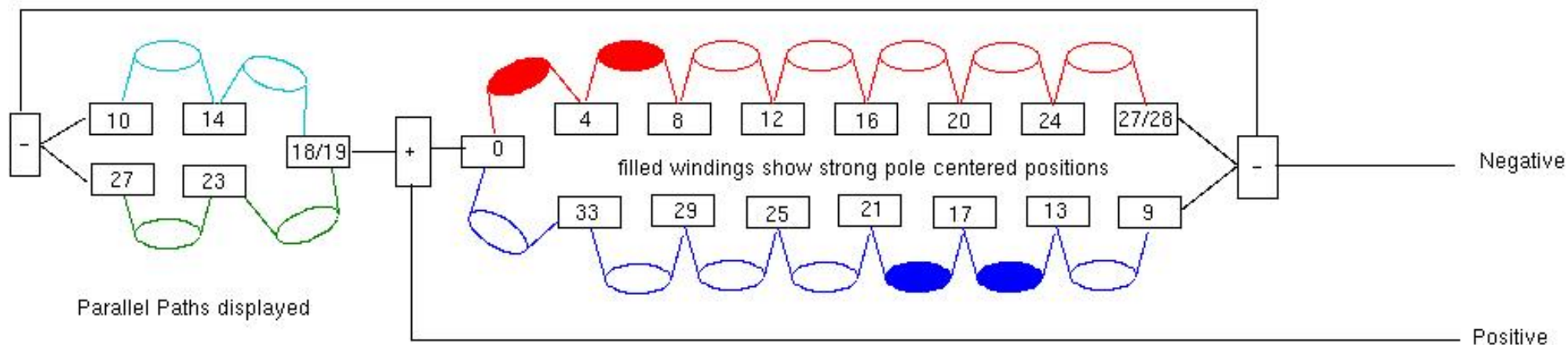
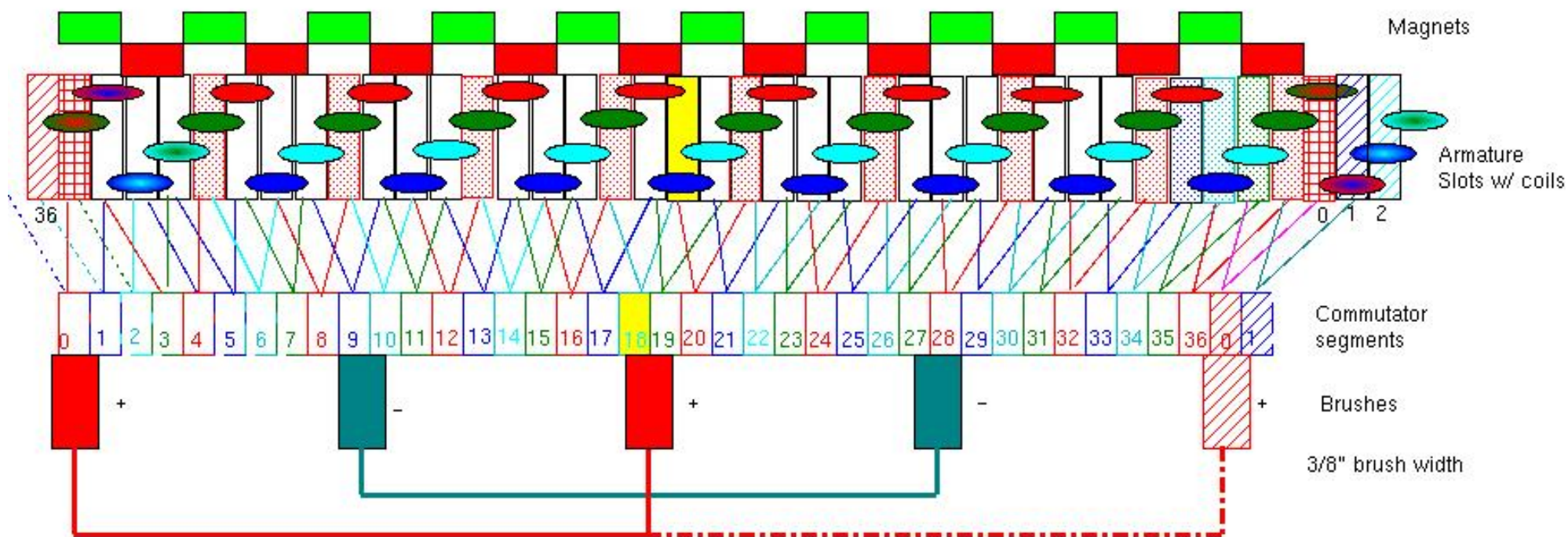








Winding diagram for 20 pole, 37 segment generator





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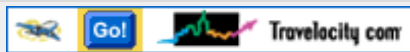
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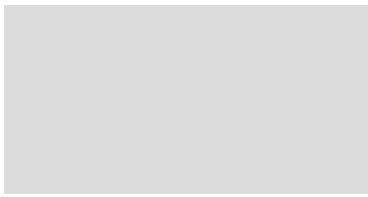
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# An Easy to Build and Operate Induction Generator

Believe it or not, nearly everyone you know has at least one induction generator and probably more. That's right! You say that is impossible... well, read on!

Within every home in America there are motors that can be operated as generators. They may not be labeled as generators, but they will function just the same. These motors are often called "squirrel cage motors" and are in washing machines, dryers, water pumps and other devices too numerous to mention.



.....  
**Typical electric squirrel cage motors**

Besides being numerous and cheap, they will generate AC voltage of the purest sinewave. They use no brushes and do not produce any RFI.(Radio Frequency Interference) A motor converted to an induction generator will power flouresent and incandesant lights, televisions, vcr's, stereo sets, electric drills, small power saws and other items.

**OK, what is so great about it?** There is nothing complicated about the conversion, no weird rewiring, no complicated math...nothing! There are no brushes to wear out.

They can not be overloaded; if too much of a load is applied to the generator, it simply quits generating. Removing the load will usually cause the generator to start again. Speeding up the motor will help if it doesn't start right away.

**Yes, but... are there problems?** Well, there is no active voltage regulation, but keeping it within a tested load rating can keep it within any voltage parameters that you set. I feel that a voltage range between 105 and 126 volts is perfectly reasonable.

A motor converted to an induction generator will not start another squirrel cage motor unless that motor is about 1/10 of the horsepower of the induction generator. In other words, a 1 horsepower motor used as an induction generator will start a 1/10 horsepower or less, squirrel cage motor. **It is best to NOT use an induction generator to drive motors. The added inductance of the motor will cancel out the capacitive reactance of the capacitors and cause the generator to quit producing electricity.**

The generator will not start under a load. Not a problem! You shouldn't attach any load to a generator until it is at running speed. This is actually kind of a fail-safe feature.

So far, that is about all of the problems that I've found and I consider those minor.



# How do you convert one?

By adding capacitors in parallel with the motor power leads, and driving it a little above the nameplate RPM, (1725 RPM ones need to turn at approximately 1875 RPM, and 3450 RPM ones at 3700 RPM) the motor will generate AC voltage! The capacitance helps to induce currents into the rotor conductors and causes it to produce AC current. The power is taken off of the motor power leads, or the capacitor leads, since they are all in parallel.

This system depends upon residual magnetism in the rotor to start generating. Almost all the motors I've tried begin generating just fine on their own, with the appropriate capacitor connected of course! If it doesn't start generating, try speeding the motor up. That will usually get it going. However, it is extremely rare to find one that doesn't start.

If a motor doesn't start generating on the **very first try**, then apply 120 vac or even 12 or more volts DC to the motor for a few seconds. That will usually work to magnetize the rotor and your generator will **start by itself from then on**.

**It is important to not shut the generator down with a load connected to it.** This tends to demagnetize the rotor and can cause it to not self-energize. That is, the motor will turn, but it will not produce voltage. It is not a serious problem since the rotor can be remagnetized by following the instructions in the paragraph above.

I've only found one motor that would not consistently generate (out of a dozen or so that I've tried over the years) and it was one with a bunch of wiring coming out of it; it may have been a multi-speed AC motor. I had a 120 volt AC relay in the circuit that temporarily added a 200 uf **starting** capacitor across the permanent 160 uf running capacitor (Using the Normally Closed contacts) to get it generating. When 120 volts was produced, the relay contacts opened up and removed the 200 uf from the circuit. That worked, but it was not dependable. I just gave up on that one.

The capacitors used must be the type designated as "running" capacitors and NOT "starting" capacitors. Starting capacitors are used for a very short time, usually less than a second or two, and would be destroyed by being connected across the AC line continuously. Running capacitors are designed to be connected while the motor is powered.

**NOTE:** Make sure the caps say, "NO PCB's". PCB's aren't used anymore for capacitor construction because it was a dangerous chemical composition. If the caps are old, and you are not sure, don't use them. Be safe!

It is necessary to experiment to find the best value of capacitance to get one working. Start with about 150 to 200 uf for motors 1 horsepower and under. More capacitance equals more voltage output. The final value should be able to produce about 125 VAC when it is putting out 60 hertz with no load. Then plug in 100 watt light bulbs until the voltage drops to whatever lower limit you set. Mine will do about 1050 watts before dropping to 105 VAC.



**Typical Running Capacitors...GOOD! .....Starting cap...Bad!**

---

In the following example, I used a 1 horsepower motor from a Sears water pump that I bought at a junk yard for \$10.00. This motor was capable of operating off of 115 or 230 volts at 13 or 7 amperes respectively.



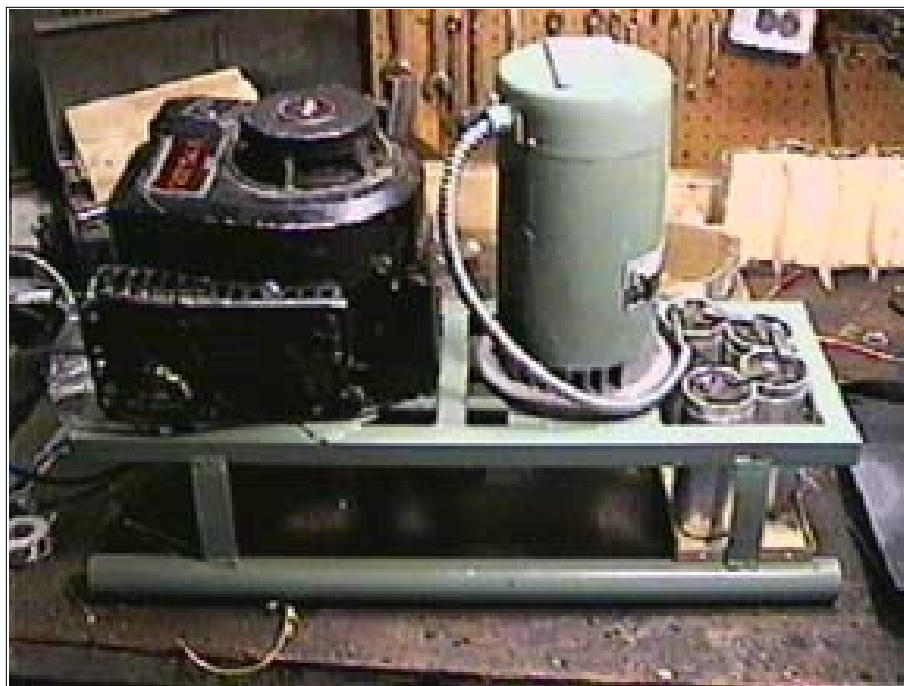
**Typical waterpump motor**

**Motor:** A. O. Smith 1 Horsepower : 115 / 230 VAC : 13 / 7 AMPS : 3450 RPM

**Capacitor:** 200uf 330vac. This was made by paralleling 4 capacitors that were 65uf, 35uf, 50uf and 50uf. All of these were rated at 330vac or better. All test results are from this capacitor set. (**NOTE:** The final version of this generator has 225uf of capacitance.)

**Output Capability:** This Induction generator has an no load voltage of 125.9 VAC at 60 hz. The generator successfully powered 1050 watts of lightbulbs with a voltage drop of 10.9 VAC to a full load voltage of 105 vac. During the power test, the generator was driven by a 1.5 horsepower electric motor and there was a loss of RPM when the load was increased. I attribute some of the voltage drop to this lack of driving power.

---



The ex-motor, now an induction generator is driven by a well used 3.75 HP B&S lawnmower engine. A total of 950 watts of lights were ran for about 15 minutes with the generator only getting warm. The voltage went from 126 volts open to 110 volts AC under this load.

Notice the capacitor set-up. Here I am trying a suggestion found in an old article, which stated that it is possible to use DC electrolytics connected in series, + to +, and - to - in an AC circuit. I have 4 capacitors rated at 850 uf, 400 VDC in series, for a total of 225 uf @ 1600vdc . The connection is like this:

AC Lead to motor 0-----+||-----+||-----||+-----||+-----0 AC Lead to motor

[Click here for schematic.](#)

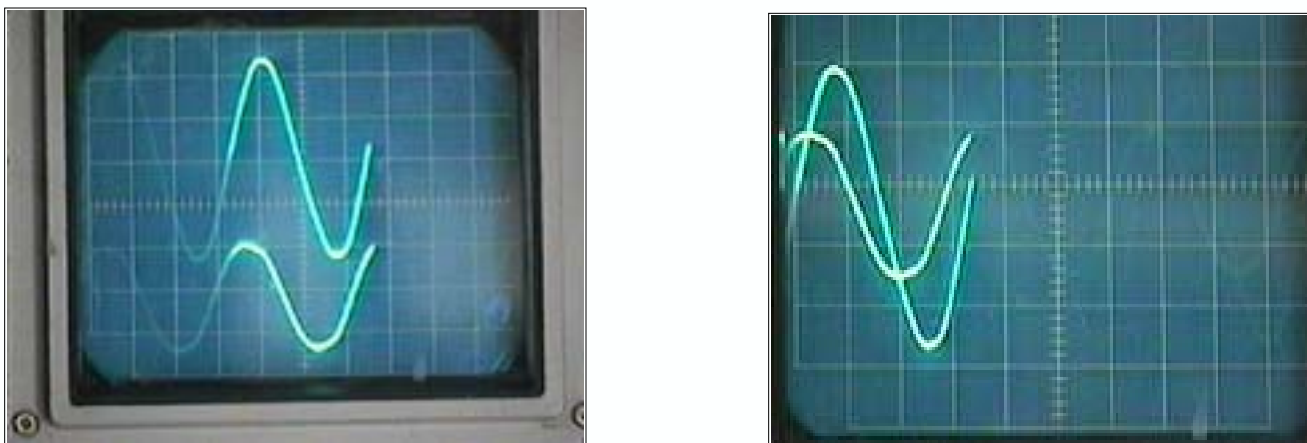
Will it work? They seem to be doing just fine, with no sign of heating at all. If they fail or deteriorate, I'll post the info here on the web page.

***New!New!*** I used this generator for 12 hours continuously in the NC8V field day in very hot temperatures and adverse conditions on the weekend of June 26, 1999. The capacitors did ***NOT FAIL OR CHANGE*** in the least. So



I can recommend this use of DC capacitors as a viable option. Of course standard disclaimers apply!

---



**Top Trace: 60 hertz / Bottom Trace: Capacitor phase shift. Overlaid waveforms.**

These traces show the phase shift within the capacitor/inductance combination. The inductance is from the motor windings. Traces were made by feeding a 10 v p-p 60 hertz voltage through a 47 ohm resistance to the capacitor/inductance combination. The top trace in the left picture is the input voltage to the resistor while the bottom trace is across the capacitor/inductance.

---



**Waveform at 950 watt load.**

---



**Note the enlarged gasoline tank. I made this modification in mid June of 1999. This generator was used at the [NC8V field day](#) event and performed perfectly where it ran approximately 12 hours. This one gallon tank allows the generator to run for 4 and 1/2 hours without refueling.**

---

## **Notes on gasoline engines:**

Make sure you get a reliable gasoline engine. Nothing is more frustrating that to have to fight with the engine while you need electricity!

Nearly all the B&S engines that are used on lawn mowers with a direct connected mower blade depend upon this blade to act like a second flywheel for the engine. They have a primary aluminum flywheel inside the engine cover. The aluminum flywheel does not provide enough inertia to work without the blade. The symptoms are backfiring, jerking starter rope and

difficulty in starting. You will probably have to change the aluminum flywheel to a cast iron one. The cast iron ones are pretty common in horizontal engines that are used in rototillers, etc. Usually junk yards or small engine shops will have them. (Also, make sure the magnet matches the one on the original flywheel; they have either one or two magnetic poles which are very obvious by sight.) However, if the generator rotor has enough mass, it may have enough inertia to keep the engine running fine with an aluminum flywheel. Just experiment.

Go with solid state ignition if possible. Ignition points were fine in their day, but the solid state magneto's are great!

Make sure the speed governor works and that the engine is cleaned and serviced reguarly.

The small gas tank on these B&S will give you at least an hour of power. If you need longer running time, then find an engine with a larger gas tank. A gallon tank will give you lots of time with a small engine, probably over 4 hours or so before refueling. Check oil levels at each gas refill, etc.

**If you experience static on radios or TV's that you are powering by your generator:** Sometimes ignition static can be a problem. Rubber boots should be placed over the sparkplug wire so that there is no wiring uninsulated, and then simply cover the sparkplug wire with braided wire and ground it near the magneto coil. Also clamp it around the sparkplug metal base. That will cure it.

Static can be caused by the generator rotor bearings. (I have yet to have that problem!) But, just in case you do: Simply mount a little contact brush against the shaft of the generator rotor and that will successfully ground it and eliminate the static.

---

**Once again I've got to thank Dewey King, NJ8V, for his never ending patience and help with the mechanical hurdles! His expertise in**

## **machining leaves me bewildered.**

All disclaimers apply. I can in no way guarantee that you'll have the same success, but they do work. Be careful too! There is a lot of good ol' AC here and it can be dangerous. I'm not responsible for anything you do!

---

### **Misc.**

- A. This motor exhibits an internal resistance of about 1.5 ohms of AC resistance and .5 ohms of DC resistance.
- B. The capacitor current is approximately 11 amps. Remember, this current exists whether there is a load or not. However it is not 100% "real power", but it is capacitive, with the current out of phase with the voltage. The current,  $I$ , leads the voltage,  $E$ , in this case. The reason this current exists is to keep the generator "excited" by inducing current into the squirrel cage rotor conductors. Calculations seem to put the exciting power at around 55 watts.
- C. The reactance ( $X_c$ ) of the capacitor (200 uf) at 60 hertz is 13.3 ohms.
- D. The reactance ( $X_l$ ) of the motor is (3.8 mh) at 60 hertz is 1.4 ohms
- E. The capacitance and the inductance, being in parallel, does exhibit a resonance. This frequency is 183 hertz.
- F. The engine needs to turn this generator at about 3700 rpm to give 60 hertz output. **(If your motor is a 1725 RPM one, then you'll need it to turn at about 1875 RPM)**
- G. I don't have a clear understanding of exactly why this works... but it does!
-



# Return to home

Modified Dec 8, 1998

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### Guerrilla Solar Manifesto

We hold these truths to be self-evident, that all energy is freely and democratically provided by Nature, that utilities both public and private have no monopoly on the production and distribution of energy, that this century's monopolization of energy by utilities threatens the health of our environment and the very life of our planet.

- We, the Solar Guerrillas of this planet, therefore resolve to place energy made from sunshine, wind, and falling water on this planet's utility grids with or without permission from utilities or governments.
- We resolve to share this energy with our neighbors without regard for financial compensation.
- We further resolve that our renewable energy systems will be safe and will not harm utility workers, our neighbors, or our environment.

signed

Solar Guerrillas of Planet Earth

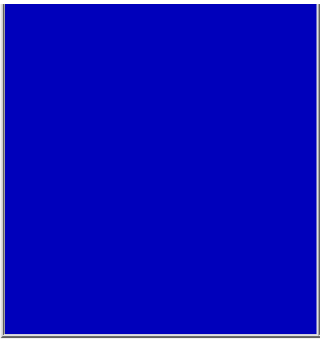
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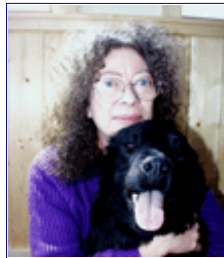


### [Richard Perez](#)

#### **Publisher & Digital Janitor**

While I facilitate the work of Home Power's editorial, art, advertising, production, sales, Web, and CD-ROM crews, my primary job is Digital Janitor. I maintain and upgrade Home Power's extensive computer systems, a monumental task. I also write articles and editorials. I've been living and working off-grid since 1970 with a photovoltaic/wind RE system. When I'm not working, I like tinkering with Macintosh computers, amateur radio (N7BCR) and electronics, and watching movies with my sweetheart, Karen.

My goal is to change the way people make electricity. Small-scale renewable energy can solve many of our environmental and human problems.



### [Karen Perez](#)

#### **Publisher & Business Manager**

My duties at Home Power include managing the money, paying the bills, keeping business ducks in their proper rows, being a database grunt, doing weird business research (paper, trademarks, UPCs, distributors, etc.), cooking for the crew, and acting as mediator and den mother. My love and joys are critters (currently three dogs and eight cats), gardening, playing with string (knitting, needlepoint, etc.) while listening to audio books or watching movies, loving my bear, and reading.



### [Joe Schwartz](#)

#### **CEO & Technical Editor**

My work life with Home Power is happily schizophrenic. In the office, I help organize the magazine's direction, projects, and crew. I write articles and equipment reviews, shoot photos, and edit text and graphics for technical accuracy. In the field, I install renewable energy hardware for testing, and collect performance data. I'm finishing up my licensing requirements for Oregon's Renewable Energy Technician program. Further afield, I'm busy homesteading an off-grid piece of land east of Ashland,

Oregon. I drive a biodiesel pickup, and I don't use petrol fuels for cooking, heating, or electric backup. In my spare time, I play guitar and ramble about in the backcountry.



### [Ben Root](#)

#### **Art Director**

My degree in graphic design prepared me for the workplace, but not for the shock of our ethic-less economy. I often found myself designing pieces to promote the very aspects of society that I think are its largest problems. Graphic design is about communication, and I didn't believe in what I was being paid to communicate. After selling everything but the VW van, and spending a magical summer in Colorado studying at Solar Energy

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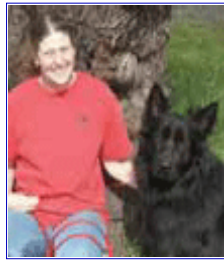
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International, I had a mission. By doing design, layout, and illustration at HP, I now have something of value to communicate information that interests me and benefits humanity and the planet.



**Linda Pinkham**  
**Managing Editor**

My job is to make sure the editorial and advertising components of the magazine are brought together into a finished and quality product. I am an editor, the keeper of the style guide, and the ring mistress of proofing. I focus on the details and keep track of corrections and suggestions from our editors, authors, and advertisers, without losing sight of our goal. I live and garden on four acres amongst the pear orchards outside of Medford, Oregon with my husband, three dogs, numerous cats, and a horse. We recently installed a 2.1 KW (rated) grid-intertie PV system. When I m not watching the meter spin backwards, I like to go backpacking in the Siskiyou and Cascades.



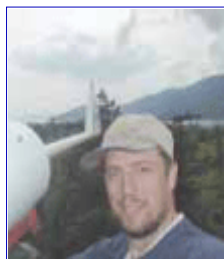
**Connie Said**  
**Advertising Manager**

I joined the HP staff in 1999 after finishing my degree in anthropology. My primary job is to manage all aspects of HP s advertising accounts, beginning with ad sales all the way through to final publication and billing. I am continually inspired by the passion our advertisers have about changing the way the world makes energy. I live with my 16-year-old daughter, who tells me to breathe as she jumps off mountains to go paragliding. My son is a grad student in engineering at Stanford University and likes to ski, very fast. My children are my joy, and they keep life interesting! My current hobby is collecting and growing heirloom seeds, and being part of a seed exchange to help preserve our plant biodiversity.



**Rick Germany**  
**Chief Information Officer**

I m responsible for all aspects of information technology (IT) and systems, including HP s Web site. I have more than ten years experience in Internet technologies and database integration. My goals include re-engineering Home Power s business processes and IT infrastructure to make them more productive and efficient for the end user and the HP crew. My job allows me to work with technology while supporting the growth of energy technologies that benefit our planet. Yes, I m a geek with a conscience, and a dabbling activist. When I m not plugging away at the computer, I enjoy exploring the outdoors with my wife near our home in beautiful Ashland, Oregon.



**Ian Woofenden**  
**Senior Editor & Word Power Columnist**

My primary job with Home Power is to edit the articles and columns. I take the rough text and try to make it clear and readable for you. I really enjoy working with the authors. Later I proofread the articles, columns, and other text to find the bugs we missed in edit. I write Word Power, do an occasional interview, answer reader inquiries, put together the Letters and Q&A sections, and evaluate articles. And I try (in vain) to keep up with the rest of my over-full life, which includes putting up wind generators, coordinating SEI workshops, trimming trees, singing, and trying to keep my large, off-grid family busy, fed, and laughing.



**Eric Grisen**  
**Graphic Designer & Article Submissions Coordinator**



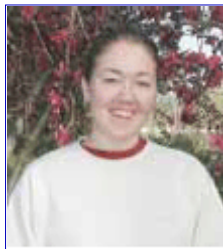
I work with images, words, and tools at Home Power. I split my time coordinating and soliciting new articles for the magazine, and working on the magazine's layouts, illustrations, and ads. I also write and work on progressive construction and RE projects. My publishing background includes reporting for newspapers, writing for whitewater paddling magazines, and managing editorial projects at a large publishing house. I enjoy traveling with my partner Tiffany, making our own biodiesel from waste vegetable oil, kayaking, mountain biking, Macintosh computers, recycling everything, stinky dogs, and staying active in local environmental and political arenas. I live with renewable energy and telecommute from the Siskiyou Mountains in Williams, Oregon.



#### [Michael Welch](#)

##### **Senior Research Editor & Power Politics Columnist**

My jobs at Home Power include editorial researcher and political commentator. I also answer most of the e-mail from our readers, and assist the editorial staff with indexing, editing, proofing, and other assignments as they come up. In 2003, I celebrated my fourteenth year of involvement with Home Power. My other work is a volunteer position with Redwood Alliance, a nonprofit that works strictly on energy issues. I do most of my work from Arcata, California. The rest of my life is well filled, including enjoying my wonderful daughter, Emily, a future solar bozo.



#### [Marika Rose Kempa](#)

##### **Customer Service/Circulation**

My duties at Home Power include sales of subscriptions and products, database management, and general office work. Being raised in the country, I was shown by my parents how to respect nature. My five siblings and I learned how to make our environment a playground. Away from work, my husband and I enjoy taking our three dogs camping and hiking. I am proud to be part of a company that makes a difference in our world.



#### [Shannon Ryan](#)

##### **Customer Service/Circulation**

I'm a relative newcomer to Home Power and love working for a company whose mission is to help preserve the planet and its resources. I help in our office doing circulation-related tasks, such as answering calls about subscriptions and other customer service matters. I pack orders for our products, back issues, and miscellany. After hours, I love gardening, walking in Oregon's beauty, learning to play the guitar, and spending time with my two rascally parrots. I'm passionate about animals, wildlife, and protecting our dwindling resources. I support various environmental groups attempting to constructively change the present course.



#### [Scott Russell](#)

##### **Marketing Director**

The newest crew member, I'm devoted full time to expanding Home Power's reach and making sure that we keep up with the diverse needs of a rapidly evolving readership. This means analyzing survey data, managing distributor relationships, creating marketing materials, juggling logistics for energy fair exhibitions, etc. I come from a broad background in business administration, information management, RE retail sales, and system installation. Recently back from a six-month stint doing PV work in Nepal, these days I'm busy nursing my very first crop of Oregon veggies, sussing out the local bike routes, and trying to remember the names of the crew's myriad dogs.



**AJ Rossman**

**Data Acquisition Specialist**

I am excited to have just joined the Home Power crew to help with data acquisition and product reviews. My academic background is in electrical engineering, geology, and environmental engineering. I teach a renewable energy design course at the University of Vermont, where I am a Ph.D. candidate researching the applications of renewable energy for groundwater remediation. I am also the president of Draker Solar Design, LLC, an electrical and ecological engineering firm that specializes in environmental data acquisition and display. My wife Kathy and I live in Burlington, Vermont and are eagerly awaiting the birth of our first child.



**Ken Olson**

**Solar Thermal Technical Reviewer**

I review solar thermal articles for Home Power. Practical training in solar energy has been my full-time occupation since 1981. At Solar On-Line (SöL), I teach practical workshops and on-line distance courses. I co-founded Solar Energy International in 1991, and have trained PV technicians for the World Health Organization since 1989. In 1999, I took my family (Barb, Kristin, Sander, and Kaitlyn) to Oaxaca, Mexico for a school year and a change in perspective. We discovered a new way of looking at things and have yet to find our way home to Colorado. My goal is to help more people use solar energy for a cleaner, safer, more prosperous, and peaceful world.



**Chuck Marken**

**Solar Thermal Editor**

I am a licensed electrician, plumber/gasfitter, and HVAC contractor, and I edit and author selected HP articles for technical accuracy. I started installing solar heating systems in 1979 and PV in 1983. New Mexico's multiple climate zones gave our business the opportunity to install and service virtually every kind of solar energy system. My wife Juanita and I have been married for 31 years, and our house and water are heated with solar energy. Our shop is also solar heated, and we use PV to offset utility electricity usage. Whitewater rafting, photography, video editing, cantina ambiance evaluation, and fooling with computers round out my life.



**Smitty**

**Solar Thermal Technical Reviewer**

I assist Ian and Linda by reviewing solar space and water heating articles for technical errors and clarity. I also contribute to What the Heck? features, Tips from the Pros sidebars, and Q&A answers. I actually wanted the HP janitorial position, but that was already taken. So they said, Why don't you clean up articles instead of bathrooms? I figured I've got to start somewhere, and said OK. When not adding to my 26 years in the industry, I put on my starving artist hat and add to my scar collection by playing with lava (blowing glass).



**Shari Prange**

**Transportation Editor & Author**

I grew up in Illinois, and moved to the San Francisco Bay area in 1978. In 1982, my VW was towed into Brown's Auto Service, home of Electro Automotive. By 1983, Mike Brown and I had joined both our personal and business lives. My auto education was on-the-job. In 1988, I put my background as a writer to use as Mike and I coauthored Convert It. My niche is taking technical information and turning it into simple language that a



nontechnical person can understand. We live and work in the Santa Cruz mountains, with our two cats and a boa constrictor. We solicit and consult on alternative transportation articles for HP.



**Mike Brown**

**Transportation Editor & Author**

I'm a Nebraska native, and I studied engineering briefly at the University of Wyoming before settling in the San Francisco Bay area in 1965. I worked as a mechanic at various auto dealerships, but my specialty was Volkswagens. In 1975, I opened my own auto repair shop and gas station. During the gas crisis of 1979, a customer asked me to build an electric car. I discovered a dearth of conversion parts suppliers. So I founded Electro Automotive, and eventually closed my gas car repair business to work full time on electric cars. I now live in the Santa Cruz, California area, and run Electro Automotive with my wife, Shari Prange.



**Kathleen Jarschke-Schultze**

**Home & Heart Columnist**

I had a great childhood in a large family in California's Napa Valley. Checkered past: Psychiatric Technician, EMT, Owner/Rider of a BMW R90/6, Restaurateur, and On-Grid Consumer. Now: Mail-Order Bride, Homesteader, Bee Wrangler, Organic Gardener, Vermi-Composter, Rose Rustler, Garlic Grower, Haus Frau, Cookbook Collector, Solar Cook, Basket Weaver, Self-Proclaimed Vidiot, Raconteur, Avid Reader, International Author, Workshop Presenter, RE Appliance Queen, Tai Chi Student, Trekker, Devoted Dog Mom, Tarot Reader, Fairy Sister Energy Park Electric Co. at OCF, Ham KB6MPI, Sainted Wife of Bob-O, Home Power's First Hired & Retired, Renaissance Woman, Optimist, Survivor.



**John Wiles**

**Code Corner Columnist**

I am a program manager at the Southwest Technology Development Institute at New Mexico State University. I assist the PV industry, electrical contractors, and electrical inspectors in understanding the PV requirements of the National Electrical Code (NEC). I drafted the text for Article 690 in the 2002 NEC Handbook, and serve as secretary for an NFPA-appointed task group involved with Article 690. I installed my first PV system in 1984, and live in an off-grid, PV/wind-powered home (permitted and inspected, of course) with my wife Patti, two dogs, and two cats.



**Don Loweberg**

**Independent Power Providers Columnist**

I was born in 1943 in Los Angeles, California. After being in the army, I completed an MS (Physics) on the GI bill. My wife Cynthia and I own and operate Offline Independent Energy Systems, and have been in business since 1983. The company is a licensed California contractor, specializing in the sale, design, installation, and service of RE systems. We have lived off-grid for 22 years with a solar and microhydro system. I research and write the Independent Power Providers column in HP. I also teach algebra part-time at a local junior college, and sit on the boards of IPP and CalSEIA.



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## Writing for Home Power

*Home Power* is a user's technical journal. We specialize in hands-on, practical information about small-scale renewable energy systems. We try to present technical material in an easy to understand and easy to use format. Here are some guidelines for getting your renewable energy (RE) experiences printed in *Home Power*.

### Informational Content

Please include all the details! Be specific! We are more interested in specific information than in general information. Write from your direct experience—*Home Power* is hands-on! Articles must be detailed enough that our readers can actually use the information. Name names, and give us actual numbers, product names, and sources. If you are writing about someone else's system or project, we require a written release from the owner or other principal before we can consider printing the article.

### Article Style & Length

*Home Power* articles can be between 350 and 5,000 words. Length depends on what you have to say. Say it in as few words as possible.

We prefer simple declarative sentences that are short (fewer than twenty words) and to the point. We like the generous use of subheadings to organize the information. We highly recommend writing from within an outline. Check out articles printed in *Home Power*. After you've studied a few, you will get a feeling for our style.

We edit all articles for accuracy, length, content, organization, and basic English. You can help by keeping your sentences short, simple, and to the point. Our editing crew will make your text shine.

### Photographs

We can work from good photographic prints, slides, or negatives. We prefer 4 by 6 inch color prints with no fingerprints or scratches. Do not write on the back of your photographs, since the ink can transfer to the front of the next photo. Please provide a comprehensive caption and photo credit for each photo. Include some vertical format photos—you might even find your system on *HP's* cover. People are nice in photos; a fuse box is only so interesting, even to solar nerds.

Digital photos should be at least 280 pixels per inch (ppi) at the final printed size. This means that a column width photo should be 1,000 pixels wide or more. A full page width photo should be at least 2,300 pixels wide. Basically, set your digital camera at its highest resolution, and crop thoughtfully. We prefer Photoshop files, but we can handle the following formats in descending order of preference—EPS, TIFF, and JPEG.

### Art, Schematics, & Tables

System articles must contain a schematic drawing showing all wiring. Our art department can make gorgeous diagrams, charts, and schematics from your rough sketches. If you want to submit a computer file of a schematic or other line art, please call or e-mail us first.

For system articles, we require a load table listing all loads, with wattage and run time. We also require an itemized cost table listing each system component and its cost. We prefer to have the tables come to us in Excel format. But we can use them from any word processor or spreadsheet

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### Computer Talk

We can take text from most word processors. Save all word processor files in "TEXT" or "ASCII TEXT" format. This means removing all word processor formatting and graphics. Use the "Save As Text" option in your word processor.

If you want to send files larger than 5 MB (such as digital photos), use removable media and snail mail it to us. We can read ZIP disks (either Mac or IBM) and CD-ROMs. You can also FTP your large files to us at [ftp.homepower.com](ftp://ftp.homepower.com), to the "incoming" folder. Please let [ben.root@homepower.com](mailto:ben.root@homepower.com) know after you have sent us files via FTP.

### Putting It All Together

We get many more articles submitted than we can print. The most useful, specific, organized, and complete get published first. Here are the basic components of a great *Home Power* article:

- Clearly written, well organized, and complete text, with a strong introductory paragraph, subheads for each major section, and a strong closing paragraph.
- Photos (plenty) with comprehensive captions.
- Cost table.
- Load table.
- Other tables, charts, and diagrams as appropriate.
- System schematic.
- Complete access information for author, installers, consultants, suppliers, and manufacturers.

Have any questions? Give us a call Monday through Friday from 9 to 5 Pacific and ask. Or send e-mail. This saves everyone's time. We hope to see your RE project in *Home Power* soon!

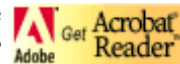
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## What the Heck?

Do you stumble on terminology and technical details in Home Power articles? Do you ask yourself, What the heck is a disconnect? or, What the heck does this dude mean by utility interactive inverter? You're not alone. We get lots of e-mail from new readers who read our articles but don't understand what the renewable energy (RE) pieces and parts are.

What the Heck? cuts through industry jargon and gives readers simple explanations of esoteric hardware terminology. They're written by in-the-know renewable energy professionals in easy-to-understand language. And if you have more questions, you can e-mail the authors they are there to help.

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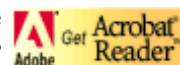


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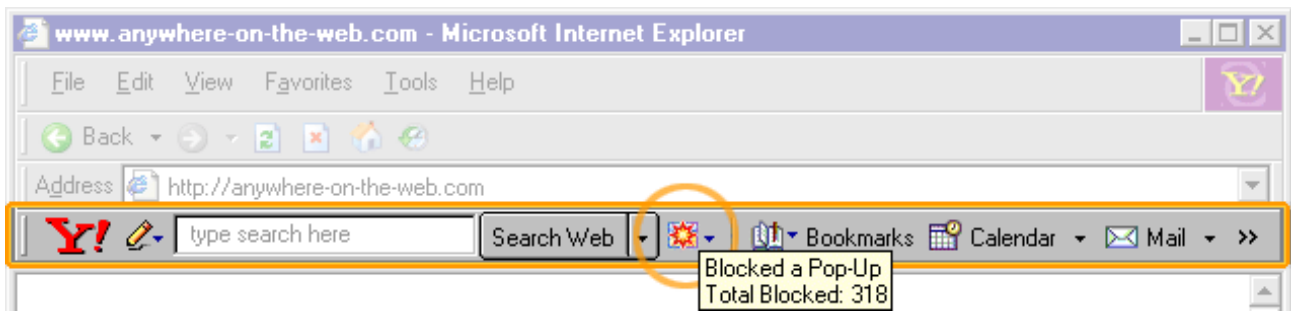
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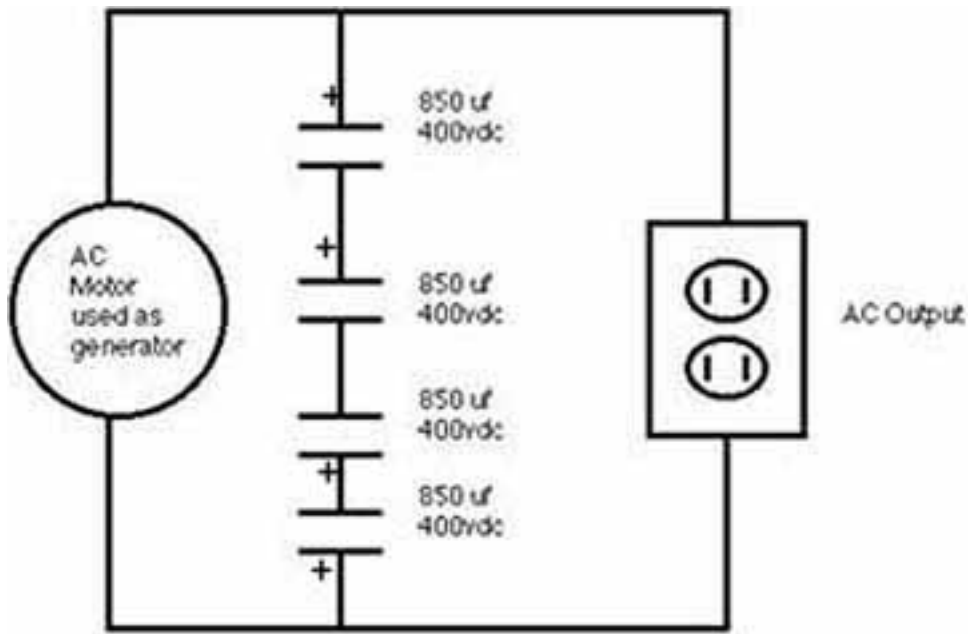
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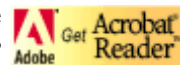
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# Another homebrew windmill from Volvo parts!



This page is about another homebrew windmill I built using the front strut, hub, bearings, and disk brake assembly from a Volvo 240. The Volvo 240 was built, and sold in large numbers worldwide from 1975 to 1993! There should be lots of cheap parts out there. Surely this design could be adapted to many front strut assemblies. The alternator is very similar to others and if you look at our other experiments, you'll see many similarities. There are a few points of construction which are not addressed in detail on this page, as many elements of it are redundant. Should anybody want further detail, they should read our other pages about the Volvo disk brake alternator, and other alternators we've made.

[Para Español, traducción de Julio Andrade.](#)



Pictured above is the front strut assembly. The only part not shown in this picture is the brake disk itself, which is necessary to make the armature for the alternator. The strut assembly, in the car, contains the strut (a shock absorber), front wheel bearing, hub, and brake rotor. It serves for the basic frame of a compact, and reasonably powerful wind generator. Once the strut is removed, it leaves a steel tube, which fits over pipe at the top of the tower. The wheel spindle is not at a perfect right angle to the tube in which the strut fit, so the prop will be canted back a few degrees from the mast. This may not be ideal in a windmill... Im not sure really - but I doubt it hurts much, and I suspect that more wind comes "down from the sky" than "up from the ground"! So it may be a good thing. It does allow for the blade to be very close to the pivot at the mast, yet well out of the way from the tower. It's actually such, that with a 7' 6" prop, part of it at the very top runs downwind from the mast! Considering that, and how close the prop is to the mast, the tail can be mounted much closer to the alternator than normal - which allows for a short, and stubby windmill! It's also good that the alternator can be based upon the very strong tapered wheel bearings. I feel confident, that if this assembly is strong enough to support the front wheel of a Volvo, it's more than strong enough for a windmill of this size.





The existing studs are knocked out of the wheel hub with a hammer, and replaced by bolts long enough to accommodate the armature, and the prop. A spacer (not shown) has to be made to hold the brake rotor out. The stator will replace the backing plate, and it is much thicker. The magnets in the rotor will also add thickness, and there will have to be somewhat of an airgap between the stator, and the armature (the brake rotor). The spacer will have to be thick enough to make room for all these things.



The stator is made up from a disk of 3/4" plywood 11.5" in diameter. In the center of it I cut a hole (3" dia) with a holesaw. This hole will allow room for the wheel hub. The steel laminates lay into a slot which is cut into the plywood 1/4" deep. The slot is a ring, inner diameter is 9.25" and outer diameter is 10.25". The laminates are made up of strips of cold rolled steel sheet metal, they are 1/2" wide, so they stickout of the stator by 1/4". The steel strips are first coated on 1 side with a coat of insulation - I used plastic tape, and then packed tightly into the slotted plywood disk and epoxied tightly. After they are glued in, I apply another coat of epoxy over the top - and especially around the sides. This insures that the coils will not short out to the steel laminates and they will be clamped on very tightly.



Pictured above is the plywood stator bolted on to the strut assembly. It bolts on exactly in place of the backing plate (the sheetmetal plate on cars which covers the backside of the brake rotor), in fact - I left the backing plate in place and put the wooden stator on top of it, because it fit perfectly inside and I figure the backing plate may provide some protection to the wood against weathering. The bolts that used to hold the backing plate on are too short to go through the plywood stator, but I found that the bolts which hold the ball joint to the strut assembly are exactly the right length! So.. if anybody tries this - save those bolts and try to find a strut assembly with the ball joint attached!



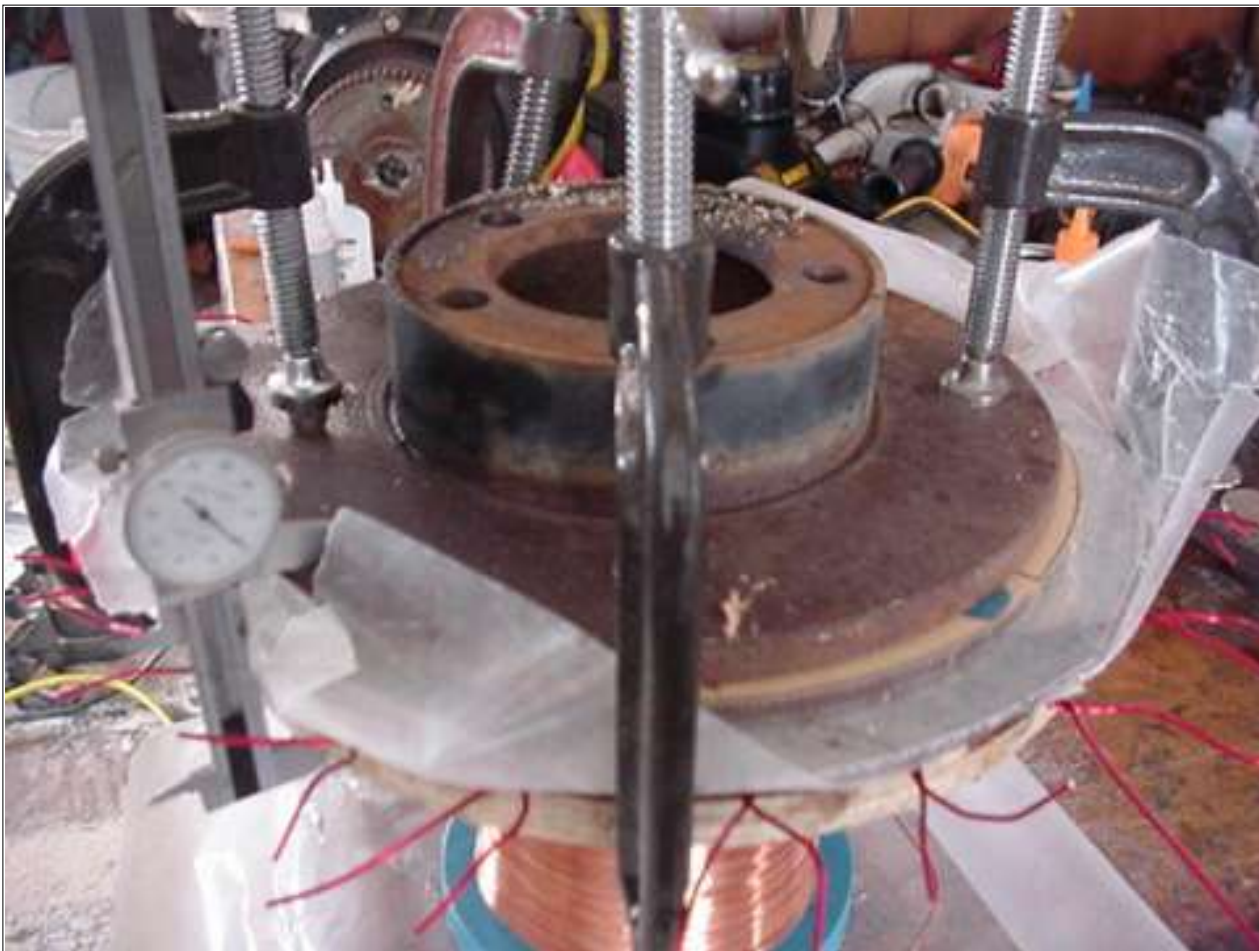


Above you can see the brake rotor with magnets installed. There are 20 magnets in this one, each one is 1.25" diameter X 0.5" thick. Its important that they be perfectly spaced. I cut a shallow slot (about 1/8" thick) in the brake rotor, with inner diameter of exactly 9.25" and outer 10.5" which holds the magnets in place. I spaced the magnets out perfectly, and epoxied them in place. This finished assembly is the "armature".





I made a simple coil winder to make the job easy and the coils consistent in size/shape. It was a quick job to wind up 20 coils. Each coil in this alternator has 20 windings of AWG 14 magnet wire. At this point, it should be pointed out that this is a "Single Phase" machine. It could probably be more powerful and offer some advantages if it were wound as 3 phase or even 2 phase - but this gets more complicated and it becomes difficult for me to maintain a thin enough airgap. So far I've had good luck with single phase, and I believe that this alternator will do an adequate job of getting a reasonable amount of power out of the 7'6" diameter prop.

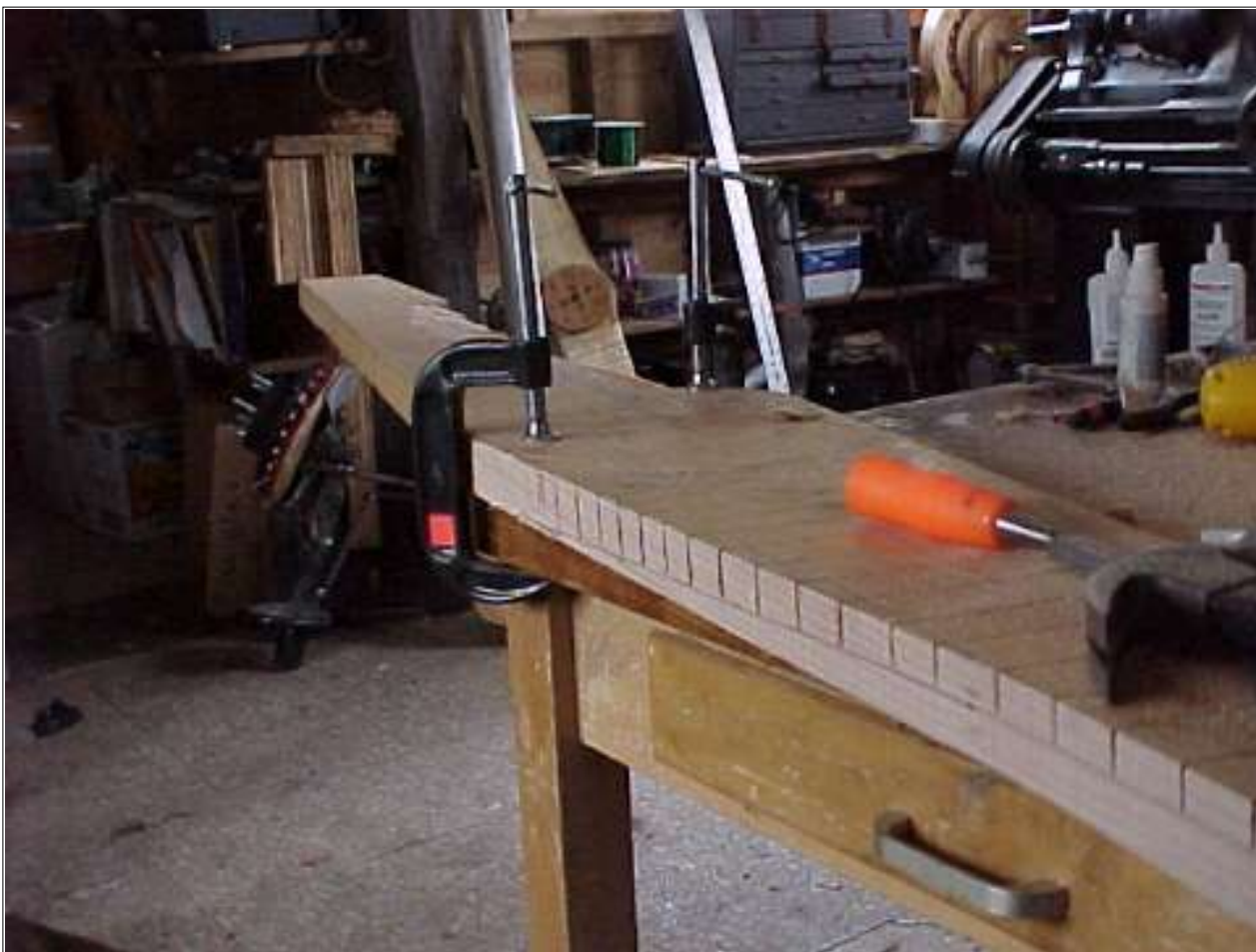


Once all the coils are made, they are laid out over the laminated steel ring on the plywood stator. They must be perfectly spaced around the circle. Once I was sure all 20 coils fit properly, I took them all off and laid a thin coat of epoxy over the steel laminates. I then put the coils back on - and exactly in place, and cover all the coils with a generous coat of epoxy. The assembly then gets covered with wax paper, and I used another disk brake rotor to lay over the wax paper - although anything which is flat, large enough - and none-flexible should work. I put C clamps around and clamped the steel rotor down over the coils. Once all the clamps are reasonably tight, the thickness of the "sandwich" is measured and the clamps adjusted until the stator is the same thickness all around. This will insure an even airgap when the alternator is complete.



Except for hooking up the coils, the stator is finished in the picture above. The only other thing I did later was coat the entire surface of the wood with epoxy to help the plywood stand up against the weather. This is a good time to carefully strip all the wire ends on the coils. As with other machines I've made, it turns out best to divide the stator in half, and hookup 10 coils in series on each half - then, those halves are hooked in parallel. This allows the alternator to reach cut in voltage (12 volts) at around 250 rpm. It would probably be better to use a heavier wire (like AWG 12 maybe) and make each coil only 10 windings, and hook all 20 in parallel, but this works fine.





The prop is 7' 6" in diameter, and for simplicity and lack of patience I made it a "2 blader". As it turns out - I've had a few problems getting it balanced well and it does vibrate some when it yaws. I'd have probably saved time in the end to make it a "3 blader". The prop is made from normal - mostly knot free 2" X 10" lumber (1.5" X 9"). At the tips, it's 1/2" thick at the thickest part of the airfoil, and the pitch is 5 degrees. At the hub, its the full 9" wide and the pitch is... as steep as the board will allow! Most of the other props Ive made were made from 1" thick or 3/4" thick lumber and worked reasonably well, however - this is the best one yet, it starts up real easily in the lightest breeze and I believe the extra work involved working the 2" thick boards pays off. Pictured above is the process of chizeling out the board. I first cutout the basic shape of the prop, and then draw lines so I know exactly which material to remove. I can cut down to the lines and the wood chizels out easily and quickly. It took about 4 hours to make this prop and it works great.





As stated above, using this assembly, with the prop canted back away from the mast - allows for a very short tail! On this the tail is supported by 2 bolts on a small frame I welded up from rhee-bar. It's very strong. The tail is cutout from 1/2" thick plywood.



All finished up. The performance of this alternator is very similar to the other Volvo disk brake alternator shown on this page. In 30mph winds I see about 50 amps, and I have seen over 100 amps in high winds. I like this one best as it was much quicker and simpler to build - the strut assembly provides a good start!. The finished project is an unusually short - and somewhat "cute" windmill! I built this for installation at my own house, and at the time of writing this page it's been up for about 3 weeks. I'm impressed with its performance, and I've seen it survive some incredibly strong windstorms. We live in a gusty... mountain environment - we rarely see sustained, constant strong winds. I've had no problems with needing a furling - or other system of protection to keep these from blowing up in high winds. It seems they can be built strong enough to hold up - and if they don't, they are usually an easy fix. However - in areas which do have high, sustained and constant winds, a furling system of some kind may be needed simply to keep the alternator from overheating! I'm not sure... one day I'll have to stick one of these down on the plains somewhere and see how it holds up!

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# Alternator and Generator Comparison for Wind Power

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[Para Español, traducción de Julio Andrade.](#)

## Vehicle Alternators

- **Advantages:** cheap, easy to find, pre-assembled.
- **Disadvantages:** high rpms required, gears or pulleys needed, low power output, slip rings need maintenance.
- **Suitability for Wind Power: POOR**

The biggest problem with using car alternators for wind power is that they are designed to rotate at too high a speed to be practical in wind power applications without significant modifications. Even a small, seemingly fast windmill might do most of its work at 600 rpm, not nearly fast enough for a car or truck alternator. This means that gearing up with pulleys or other methods is needed, so lots of power is lost to friction--a big problem with wind or water power, but not a problem with a gasoline engine. Check out how useful car alternators can be for building a small gas-powered charger [HERE.](#)

A standard car or truck alternator is electromagnetic-- meaning that some of the electricity produced by the unit must be used internally and sent to the armature through brushes and slip rings to make the magnetic field. Alternators that use electricity to generate the field current are less efficient and more complicated. They are quite easy to regulate, however, since the magnetic flux inside can be changed by adjusting the field power.

Also, the brushes and slip rings wear out, requiring more maintenance. Car and truck alternators can also be rewound to produce power at lower speeds. This is done by replacing the existing stator windings with more turns of smaller gauge wire. This project is not for the faint of heart, but check our [PRODUCTS](#) page for the inexpensive booklet *Alternator Secrets* by Thomas Lindsay if you are interested. The booklet is invaluable for any alternator experimenter! Also, some alternator/electric motor shops may have the knowledge to do this for you.



# Homemade Permanent Magnet Alternators

- **Advantages:** Low cost per watt of output, very efficient, huge power output possible, extremely sturdy construction
- **Disadvantages:** A time-consuming, somewhat complicated project, machining needed.
  - **Suitability for Wind Power:** GOOD



**Homemade Volvo Brake Disc PM alternator, 800 watts, \$150!**

[Hugh Piggott](#) in Scotland was the pioneer in building permanent magnet alternators from scratch. Much of our inspiration came from his designs. Thanks Hugh!

Our experiments have consistently shown that homemade PM alternators are the most powerful and cost-effective solution for building a wind generator. Their low-rpm performance is excellent, and at high speeds they can really crank out the amps thanks to their efficiency. Our more recent PM alternators have been based on Volvo disc brake assemblies, which are very sturdy and have thrust bearings built into the unit. Our larger units are "Disc" or "Axial" designs...a flat plate of magnets rotating next to a flat plate of coils. Our smaller PM alternators are "Radial" designs, where the magnets are fastened to the outside radius of the armature. Since all alternators produce AC, the output must be converted to DC with bridge rectifiers for battery charging.

Our designs to date have been single phase for ease of construction. Three-phase alternators have some advantages (they are somewhat more efficient, and make better use of available space), but

they are somewhat more difficult to build.

With a 7 ft diameter prop, our Volvo brake designs can put more than 60 amps into a 12 volt battery in a 30-mph breeze--that's about 700 watts. We've seen the Volvo design peak at over 100 amps during high winds! This gives these homebrew designs a big advantage over similar-sized converted induction motors, which become inefficient quickly and top out at 20-25 amps output with a 7 ft. diameter prop.

Check out all of our PM alternator projects on our [EXPERIMENTS](#) page!

## Induction Motor Conversion Alternators

- **Advantages:** cheap, easy to find, fairly easy to convert, good low-rpm performance.
- **Disadvantages:** power output limited by internal resistance, inefficient at higher speeds, machining needed.
- **Suitability for Wind Power:** OK



**Armature converted with permanent magnets**

A normal AC induction motor can be converted into a permanent magnet alternator at very low cost. Our experiments have shown that these conversions produce significant power at very low speeds, but become inefficient quickly at higher power levels.

An induction motor has a center core with no wires in it, just alternating plates of aluminum and steel (it will look smooth from the outside). If you rout a groove in this center core to accept permanent magnets, the unit becomes a permanent magnet alternator! We sell super-powerful neodymium magnets that are shaped and polarized perfectly for this application--check our products page.

In practice, our wind generators made with these do quite well until they reach 10-20 amps of output. At this point, they become inefficient quickly--it takes a large increase in windspeed to make only slightly more power, and the rest is wasted as heat inside the unit. The induction motors are wound with wire that's simply too thin for generating large amounts of power. In our tests, DanB's PM induction motor conversion windmill peaks at around 25 amps in 30 mph winds, with a 7-foot

diameter prop. By comparison, a 7-foot prop on an efficient PM alternator made from scratch gives peaks of 50-60 amps in similar winds! Converted motors also have the tendency to "cog" when starting...you can feel the resistance when you turn the shaft. This affects low-speed startup somewhat.

If the lesser output in high winds is acceptable to you, these units can make for a pretty easy wind generator project. Look for AC induction motors of the lowest rpm rating possible. 3-phase motors will perform better than single phase. Since alternators produce alternating current (AC), the power must be converted to DC with bridge rectifiers.

[Tips and photos--converting an AC induction motor into a permanent magnet alternator.](#)

## DC Generators

- **Advantages:** Simple and pre-assembled, some are good at low rpm.
- **Disadvantages:** High maintenance, most are not good at low rpm, large sizes very hard to find, small ones have limited power output.
- **Suitability for Wind Power:** POOR to OK

Generators make DC current, and batteries need DC for charging. Generators were used in automobiles until around 1970, when alternators became more practical (due to the availability of cheap, small diodes). Even old car generators must spin too fast to be practical for wind power, but there have been many good plans for modifying them. Check out our [PRODUCTS](#) page for the *LeJay Manual*, which contains many useful, though involved, plans for doing this. Generators are fairly complex compared to alternators. They must have brushes, and complex commutators.

Brushes require maintenance, and commutators can wear out. For most purposes, alternators are more practical today, although generators do have certain advantages at times. Certain low rpm DC motors can be purchased as surplus and work very well as 12 volt low rpm generators. These are from old mainframe computer tape drives, and are sometimes available in local and mail-order electronics stores, and on Ebay. Check out [Our tape drive motor page HERE](#). They don't make a whole lot of power...you can expect only 100-200 watts of output...but these motors are almost a science project in a box! Slap on a frame and a 3-4 ft prop, and you have a small working wind generator.



**Surplus tape drive motors can make a quick and easy generator for small windmills**

## Brushless DC PM Servo Motors

A brushless DC permanent magnet motor is really just a permanent magnet alternator! A special driver circuit provides AC power that is in phase with the rotation. If you are able to find a large one of these surplus, it's possible you might have an excellent start for a wind power project. They are used in robotics and precision control applications, and some use Nd-Fe-B magnets for high torque in a small space. As with surplus tape drive motors, we would not trust the bearings to stand up in a wind power application...add more bearings so you don't ruin the motor's original front bearing.

We have not yet been able to locate any of these surplus for experimentation. If you have tried this, or have more information on sources, please [Email](#) us! However, we do have a small version...our [Homemade anemometer](#) uses a small surplus brushless DC PM motor, which is available for cheap on our [Products](#) pages.



The inside layout of our tiny Brushless PM DC Motor looks just like the [Wood 103's](#) alternator!

## Induction Motors as Alternators

It's possible to make a 3-phase induction motor produce electricity, either 3-phase or single phase. This requires a controller and capacitor. The generator must run at a fairly constant speed. For this reason, this type of generator is more suitable for constant-speed hydro power installations than for wind, where speed varies--though it can be done. We have not experimented with this technique yet, since we don't have a suitable hydropower source. For more information, check out the book *Motors as Generators for Micro-Hydro Power* by Nigel Smith.

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# Witte engine battery charger



This is a brief page about a very effective battery charger I built from an old Witte log saw engine. This type of engine is often referred to as a "stationary" gas engine, most of them were built between 1900 and 1940. Unfortunately most of them were melted down for their cast iron during World War 2. Although I am unsure, I believe this to be a 1.5 horsepower engine, and it is a good match for a Delco alternator with a 14" pulley! This motor runs full throttle at about 300 rpm. The alternator is what folks call a 1 wire alternator. It only has 1 wire to worry about! The regulator is built in and its real simple to hook up. These are often sold as retrofits for tractors, old cars, etc and should be available at most parts stores for around \$50. It's rated 55 amps, and with this setup I get between 40 and 50 amps output!



Witte built this engine in the mid 1920's, specifically for use in a log saw. (see picture above!) This application explains the angled top on the water hopper. These type of motors, although very heavy have the advantage of developing reasonable horsepower at very low rpm (around 300 rpm). They also require a little more attention than the normal small engine. One must be careful to see they always have water in the hopper, oil in the oiler, and grease in the grease cups. Past that, they are reliable, quiet(with a good muffler) and lots of fun to watch. Although they are collectible, and might seem expensive, the price is reasonable when you compare them to a new engine this well built. Surprisingly, parts and support for engines of this type are real easy to find. Check out some of the links off our links page! To make a nice, slow running generator like this with a modern engine, one should look in the 8 - 10 horsepower range.





Since building this generator, I have not used my 120VAC generator. This is capable of putting 600 watts, into my batteries, which is adequate to make up quickly for large loads off my inverter. I'll admit, it's a little work in the morning to start it, but once started it can run for many hours with no maintenance short of adding water. It seems to use about a gallon of fuel every 4 hours, not bad in my opinion...a LOT better than my old Honda generator (which quit after two years) which pounded itself to death charging batteries with a battery charger. Although antique engines may not be everybody's preference, a good slow running charger like this should be an important part of any "off the grid" battery powered system. Something like this, a good battery bank, and a strong inverter can go a long ways!

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# Converting common induction motors to low rpm alternators



Induction motors are commonplace, you'll find them on tools, furnaces, blowers...etc. It is possible to convert them into effective brushless low rpm alternators by installing permanent magnets in the armature. We have performed experiments installing surplus computer hard drive magnets into the armatures. Undoubtedly, a "surplus" magnet is probably not optimized for the application, but the results have still been promising and we think it might be a cheap, quick, and practical approach to building a low rpm alternator. Unless extremely creative, one would probably need to have, or find somebody who does have, a metal lathe...that makes it a half hour project.

[Para Español, traducción de Julio Andrade.](#)

**NOTE 06/25/2003 -- We've stopped experimenting with these conversions. They work, but the windings of the motors are just not made for producing lots of power. The resistance is way too high, which makes them VERY inefficient once they reach higher speeds. They also cog, which causes slow startup. We've found**

**that it's the same amount of work to build an efficient alternator from scratch as it is to convert an induction motor, and the home-made alternators perform MUCH better. You can see some of our latest, most powerful, and most efficient from-scratch PM alternators on our [HERE](#).**

## **Magnets**



**Pictured above are the magnets we've used, though undoubtedly any small magnets could be arranged to work reasonably well. The magnets we used are rectangular, and arched such that 8 of them fit to form a ring approx. 3 3/4" diameter (pictured above), which seems to be a fairly good match for induction motors from 1/2 hp to 2 hp. The magnets come out of a computer hard drive, ours are surplus, and are available from our products page. They come magnetized with either the North or South pole on the concave surface. These are NdFeB (Neodymium Iron Boron) magnets, of extremely high grade - much stronger than normal ceramic or AlNiCo magnets.**

**UPDATE 6/25/2003 -- These magnets were surplus, and they have SOLD OUT. We cannot get any more. We do have some rectangular block magnets that should do the trick, and still fit inside the armature....you'll just have to turn out the slot differently. You can check out of magnet selection [HERE](#).**

## The Armature



The armature will need to have a slot cut, to accept the magnets. We think they should press in fairly tightly, and then glued applied(epoxy is probably best). Odds are the curvature of the magnets won't match up perfectly with the diameter of the armature, so the slot needs to be deep enough so that the highest point of the magnets is flush with the surface of the armature. In the armature above, there are 6 magnets used. We used feeler gauges to even up the gap between the magnets.

Undoubtedly one could drill out the armature to accept disc magnets, but disc magnets are not ideal, and some performance would be compromised. Of course, the number of magnets used depends upon the number of poles in the motor. A 3600 rpm motor would have 2 poles, 1800 rpm 4 poles, and 1200 6 poles. Voltage is dependent upon the speed at which the magnetic field changes, so...the more poles, the better candidate the motor would be for a low rpm alternator. The lower the rated speed of the motor, the better it will work at low rpm. In our tests, we always used the same number of magnets as poles, except in a 2 horsepower motor, which had 4 poles. In that motor we installed 8 magnets, but in sets of two such that there were 2 North and two South poles on the armature.

## Results...

The first motor we tested was a 1/2 hp furnace blower motor, rated at 7 amps and 1050 rpm. It had 6 poles and we installed 6 magnets in the armature, equally spaced. It cogs(when the magnetic field locks in with the slots in the motor stator) enough such that it is difficult to turn the shaft of the motor. It hits charging voltage(12 volts) at approx. 80 rpm! At 400 rpm, it will charge 12 volt batteries at



over 10 amps. We tested this with a wind generator propellor - [click here to see more on that!](#) Basically, it worked fairly well, but the wind speed had to hit about 10 mph before the propellor would start turning. Once it started turning...it kept spinning and generated well. We also hooked this one up to a bike- it would easily put 10 amps into the battery with pedal power. I suspect this one would probably peak at 15-20 amps, but it becomes inefficient after about 10. This could be changed if one could make a regulator which would take the coils in the motor(alternator) out of series and put them in parallel at a certain rpm. Another drawback of this motor...it was a fairly cheap furnace blower motor, with bronze bushings, it might last longer with higher quality bearings.

The second motor was a 2 hp single phase 1800 rpm, rated at 15 amps. In this motor we installed 8 magnets. Oddly, these computer hard drive magnets just happen to be a perfect fit, there are no gaps, and no overlap - the diameter of the ring is exactly that of the armature. The magnets on this motor are in sets of 2, so...we put 2 magnets with North up, then 2 magnets with South up...etc, so that there are 4 magnetic poles on the armature. This alternator doesn't cog nearly as bad as the first one, and would certainly work well on most windmills. It doesn't reach charging voltage until about 150 rpm, but...at 400 rpm it charges my batteries at over 15 amps, and would probably be efficient up to 20-30 amps.

Both of these test alternators become very difficult to turn by hand if the wires are shorted...even a couple of rpm by hand will produce a very noticeable spark at the leads. This might be an excellent alternative, considering the difficulty and labor required in making an alternator from scratch. Considering just how slow these alternators are charging, they may have the most potential of any low rpm alternator we have yet to run across. We'd like to know what other folks have done in this area, so please send us an email if you have any ideas/experience.

[Check out our homebrew windmill page!](#)

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# HOMEBREW WIND GENERATOR

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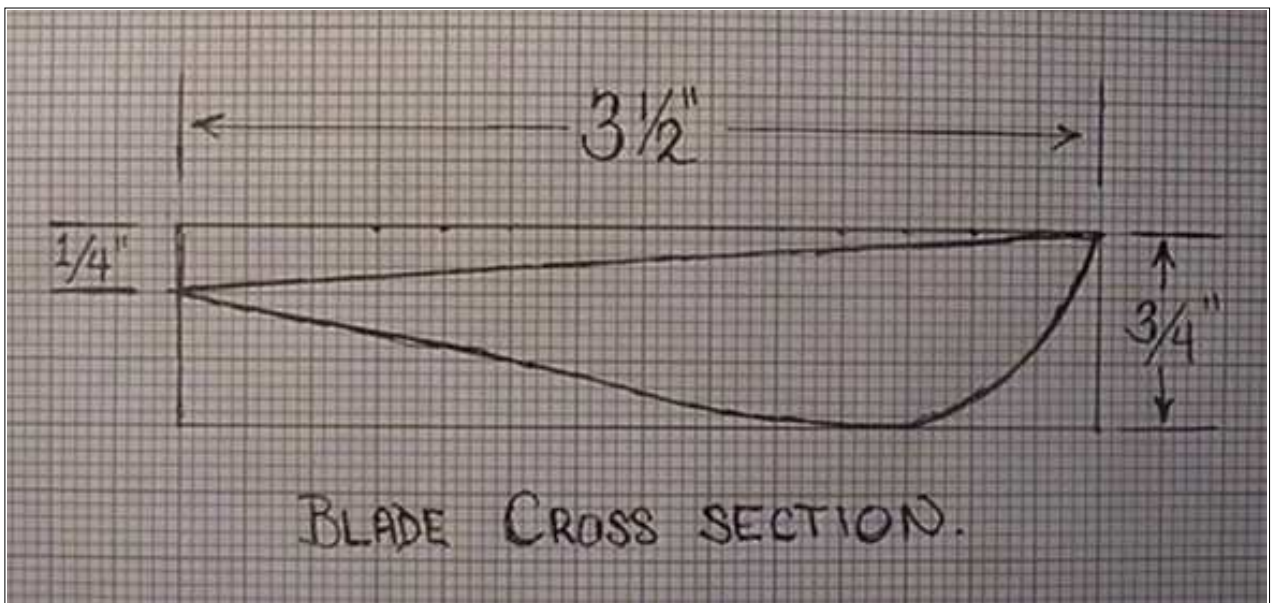
This page is about a windmill experiment. The windmill was built for under \$100, and although there is certainly much room for design improvement, it works fairly well and should provide some data to other folks who'd like to build their own from scratch! If time is money, and one has more money than time, it might be wise to buy a commercial machine, there are many good ones starting from about \$500 on up, however to build one at home is fun, and it can save a lot of money! It's my hope that "experts" (folks more knowledgeable than myself on this topic) will review this page and offer suggested improvements on our discussion board! This page will break down the components of the machine and in the end I'll discuss what I know about its performance!



## The Propeller

The propeller for this machine is a 3 bladed design. Although a 2 blade prop is simpler to build, they have the disadvantage of being harder to start. The other drawback is that when the wind changes direction, a 2 blade prop tends to vibrate

quite a bit while turning. This is hard on the prop, and the generator bearings. I made my prop out of spruce 1" X 4" boards. I tried to pick 3 boards which were knot free, had good vertical grain and seemed to have similar density. (they weighed about the same). Of course other types of wood could be used, this is what I had available. I've made very good props from redwood, ponderosa and lodgepole pine with no problems. I used 1" X4" (actually - it was planed down to about 3/4" X 3 1/2") because I wanted the prop to be light weight, I think this helps them start faster and preserves the bearings on the generator. It seems consistent with props I've seen on small commercial windmills. I carved my prop real fast, took about 2 hours. Undoubtedly, had I spent more time I'd probably have a better prop, but...I have seen folks spend a week on this stage and I feel it can be a fairly quick and simple project. I used "intuition" on both the pitch of the prop, and the airfoil shape. I simply marked 1/4" down on the thickness of the prop, so that over the 3 1/2" width the low end would be 1/4" below the high end. There is a LOT of information on prop carving, airfoil details etc on the Internet. The Lee-Jay manual, published in the 1930's also has good simple instructions for both propeller carving and building a windmill from scratch. See the picture below....



Once roughed out, I weighed each prop and planed them down so they were the same. I then bolted them together, two at a time, and further planed them down so they were reasonably balanced. Once all three blades were the same weight, I painted them, and bolted them to a hub (an old gear about 8" diameter). Once on the hub, I could put the whole assembly on a shaft, and spin it. I would observe the place in which the prop stopped, if it had tendency to stop in 1 place more often than others, I would plane down the heavy side(s) until it seemed perfectly balanced. (of course I had to paint those spots again!). The whole process of building this prop, and balancing it took less than 4 hours. It should be noted that all 3 blades, after being balanced, were NOT of the same thickness. At the tip, they varied from in thickness by over 1/8"! This could have been prevented by finding better wood, and taking more time in the initial carving of the prop. The main tool I used for carving this prop was a power planer. It should also be noted, this prop has NO twist, the pitch remains the same from the hub,



to the tip. Although unsure, I do not think this hurts, especially in a small machine. Total prop diameter is approx. 6 1/2'...although, to be honest, I never measured it! This is the same propeller I tested on my model A ford. [Click here](#) to check out that page! . It worked so well on the Ford test, that I figured it would hold up on a windmill. The only modifications I made since that test was to cut about 8" off the diameter and further balance it.



## The Alternator

The alternator used in this windmill is a 2hp induction motor which I took off a Taiwanese milling machine. I took it apart, and cut a slot into the armature with a metal lathe so that I could insert 8 Neodymium rare earth magnets, thus turning the induction motor into a permanent magnet low rpm alternator. The magnets are rectangular in shape, and curved such that they seem to be a good fit in the armatures of most induction motors 1/2hp on up. I cut a slot in the armature so that when pressed all the way down, the highest point on the magnets is flush with the outer diameter of the armature. The slot is cut so the magnets are a tight fit, and the magnets are glued in with epoxy. This is a 4 pole motor, so it requires 4 alternating poles in the alternator. To accommodate 8 magnets, I had to insert them in pairs, with two magnets of identical polarity beside each other. These particular magnets are surplus from computer hard drives and are available with both North, and South on the convex surface. See a picture of 8 of these magnets in a ring below. You'll find these same magnets for sale on our products page.



The alternator is wired so that it hits 12 volts at approx. 160rpm. Had I wired the motor differently it could have hit charging voltage at 80 rpm, but I was afraid this would limit the current too much. Of course, the output here is alternating current and it must be rectified before charging batteries. I used a 40 amp bridge rectifier to reach this end. We also offer large bridge rectifiers on our products page. It is very important that when using a diode, or a bridge rectifier in this application that it be attached to a suitable heat sink, or else it will get too hot and burn up! [Click here](#) to see our experiments page about converting induction motors into low rpm alternators.

## The Tower

The tower is probably the MOST important part of any wind machine, and is often the most neglected....this is probably the case here! I put this up in the middle of Feb, it was very cold, the ground was very frozen and I didn't have the ability to pour a proper concrete pad which I think would make for a nice tower base. I also have the disadvantage of being in a forest, with no level ground. Although this works OK, I feel a much higher tower would be appropriate. My windmill currently sits 36' feet above the ground. I removed one large pine tree, as I thought that would be the best place for the tower. I cut the stump off about 3' high, and notched it with a chain saw. The mast is made from a lodgepole pine. The base of it was drilled through so that it could pivot in the stump. The top of it has a steel assembly made from pipe, to allow support and pivoting of the windmill. I while assembling the windmill the tower was



supported off the ground by a small tripod made from lodgepole pine. A larger tripod was used for raising it. The tower is supported by 4 guy wires of 1/8" diameter aircraft cable with turn buckles on the ground for adjustment.



I simply used a truck, a long cable, and the large tripod to raise the mast, it went smoothly!



## The windmill chassis and tail

The windmill is really very simple. I started with a 3/8" thick piece of steel to which the alternator could be bolted. To that I welded a pipe, which fits over a smaller pipe on the top of the tower - this is what the windmill pivots on. There are no slip rings in this machine, I simply ran enough aircraft cable so that the machine could pivot several times before it gets tight. The power line from the alternator is slightly longer than this cable, the idea being that the aircraft cable will get tight just before the power cord. The tail sits back about 4' from the pivot, and is bolted into angle iron. Two 1/2" diameter steel rods serve to further support the tail. In home built windmills I've seen...tails breaking off seems a common problem. This part needs to be strong, and a well balanced prop will also help prevent metal fatigue. I offset the tail, and the alternator slightly from the pivot, in hopes that it would turn out of the wind should it get too fast. This was done intuitively, I have no specific data on how to do this right, but it was my intention to move in the direction of several home-built windmill I've seen before. See Hugh Piggots design!

## Performance

So far, so good. The alternator has a slight cogging affect, which keeps this machine from starting easily at low wind speeds (below about 10mph). This could be solved by a bigger prop, wider blades, or...more blades! I think should I try to improve this I



will use wider blades. Once started it keeps spinning well at very low speeds. We have very gusty winds, the direction changes frequently so it is difficult for me to offer specifics on output vs wind speed. Best output I've seen in high winds is approx. 25 amps, though typically it puts out 5-15amps (into my 12 volt batteries) in low, to medium wind speeds. It is possible that a regulator could be made with a matching transformer or possibly a linear current booster that would better match the load to the alternator and provide significantly more output, I've not tried this yet. This machine does perform much better than smaller ones I've made using surplus DC tape drive motors, and so far it has held up well to extremely high winds. It does seem to turn out of the wind somewhat in extreme conditions, although I doubt it needs to.

Again, building these at home is fun, and rewarding. Lots more fun, in my opinion than buying an expensive new machine! I hope that folks provide input about their own machines, and their comments about this one! This machine, although fairly quick and easy to build, is a culmination of several experiments....the prop, the alternator, the tower. Please check out our products page for a few of the items I used to build this machine and some interesting books!

### **April 8 update**

After about 8 weeks up, there was a breakdown! On the radio they were predicting 80+mph winds. I took care to go out, make sure all the guy wires were good and tight and did what I could to help insure its survival. At about 4pm I woke up to a most unpleasant sound. Although still running, and pegging the 20 amp meter it definitely had a problem. Turns out she threw a blade in extremely high winds. Considering the lack of time I put into them, it really came as on surprise and I was grateful for the data.



I found the piece of broken blade only 20' from the base of the mast. Turns out, the

blade definitely had a crack in it, before I even raised the windmill, I could tell by the paint which had seeped into the wood. The other two blades were still in fine shape, suggesting that the design would have been good, had I taken more care to use better wood in making the prop. This was especially surprising considering how long the machine ran in extremely high winds, with only two blades!



Rather than replacing the one broken blade, I decided to make a new prop all together. It's slightly larger, the diameter being just over 7 feet. These new blades are 4" wide at the hub, and 3" wide at the tip. The wood is much stronger. The pitch is similar, although this new blade has a little twist to it. Although it's been up for less than 24 hours, I can already tell it starts much easier. It's still real quiet even at high speeds. It should make for an interesting test, the tips of this new blade are only 3/8" thick. The blades are of good vertical grain pine, each one weighs exactly 11 oz.

Other good information from this breakdown...the tower. It came down and went back up very easily with no problems at all. I simply used an A frame built from lodge poles, my truck, and a cable. Total down time, 4 hours, thats how long it took to lower it, build a new prop, finish it and get her back in the air again!

In conclusion, I believe, judging from the improvements on the new props that this machine will probably hold up well over time. In watching it for a few weeks now it seems to do a find job producing up to 400 watts. In "normal" winds it produces between 100 and 200 watts. It seems to outperform some small commercial windmills, which I have also had opportunity to watch. It's very quiet even in high

winds. Overall I would say this experiment has been a good one! Please email us with comments, questions, or suggestions.

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# Computer tape drive motors



These may well be the best, most inexpensive, ready to go low rpm DC generator out there. They are *not* ideal for wind and hydro power, but they are very convenient! Check out our [Choosing an Alternator or Generator](#) page for more details on their advantages and disadvantages. Expect a maximum of 200 watts from the larger versions (about 4 inches diameter by 8 inches long) and 100 watts from the smaller ones. They are surplus, from large mainframe computer tape drives. The supply seems to be getting scarce--we had a few in stock at one time--but they sold out quickly and we have not been able to obtain any more. They seem to come in many sizes, the larger ones usually having higher output. We've built and seen many very successful wind generators made from these, usually capable of 150 watts at best. They seem to be well built, have robust bearings and can hold up for years. The bearings are not really designed for a thrust load, so adding another bearing and shaft might be wise. They are DC motors, so they do have brushes which do wear out. Some of these will generate 12 volts at less than 300 rpm! Even simply shorting out the leads makes them difficult to turn by hand (a good sign for a low rpm generator). These generators have 4 ceramic grade permanent magnets in them. Maximum current before demagnetization occurs is 24 amps. Weight, 10 lbs. +/-.

## Current Best Bets for obtaining these motors:

[Ebay](#) -- around \$50, lots available  
[C&H Sales](#) -- around \$60, available



## Surplus Sales of Nebraska (no website)

Local electronics stores -- many small mom and pop electronics stores have a couple of these around.

Our experience....a windmill with one of these might need taken down once every two years to replace the ball bearings and brushes. One of our neighbors built a very simple hydro system, out of a squirrel cage fan and one of these. They are also well-suited for direct connection to a small pelton or turgo wheel for hydro power, a bicycle for human power, a circular wire cage for dog or cat power...

**In a battery-charging application, you will need a heat-sinked diode in the circuit, otherwise the battery will simply spin the motor. We sell 35-amp diodes on our products page.**

Our test results from these motors appear below. Please note that these tests were approximate--the lathe we used for testing them started to bog down at about 9 amps. In our experience using these for windmills, they can produce much more current than this. The voltages given are OPEN CIRCUIT, the amperages were measured while connected to a battery bank. As with any generator or alternator for battery charging, the battery bank will hold the generator's voltage down to its own level during charging, until the batteries fill. At that point, you need some sort of regulation that does not allow a wind generator or hydro plant to overspeed and 'freewheel' -- in other words, a load of some sort must be kept on the motor after the batteries fill. These motors are ideal for charging 12 volt battery banks!

RPM	Large Motor Volts	Large Motor Amps	Small Motor Volts	Small Motor Amps
80	3.0	--	3.0	--
130	5.1	--	5.0	--
200	8.0	--	8.0	--
340	13.5	2.0	13.4	--
440	18.2	4.0	18.5	6.2
780	31.0	8.5	31.5	8.0
1260	48.3	12.0	50.5	9.0

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# The Wood 103

## All-Wooden Wind Generator

Built in a day



**Our article about this silly Wooden Windmill was published in issue #88 (April/May 2002) of Home Power Magazine! You can [Download the entire Wood 103 article HERE](#) in .PDF format. You'll need [Acrobat Reader](#) to view it. *The***

## ***article goes into much more detail than the text below...Please refer to it first!***

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**UPDATE (05/22/2003): We are now completely SOLD OUT of Item#7, the magnets we used to build this project.**

**They were surplus, and we can't get any more. We do have other magnets that could be used with a little adaptation of the design....check out NdFeB magnets on our [Web Shopping Cart](#).**

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This page is all about a rather silly, quick project where in about 1 day I built a small wind generator using the following items, and nothing else....

- (1) Wood
- (2) Copper wire
- (3) Surplus Neodymium magnets
- (4) Dirt
- (5) 10" piece of 3/8" steel shaft
- (6) Two bolts, but these are optional.

...and that's all, unless we count glue, and linseed oil which I used for finishing. Initially the project started out to simply be an alternator experiment. Once I had the armature finished and a couple of the coils wound on the stator, I realized it was definitely going to be a successful one, so I decided to build it into a small wind generator. Mostly simple tools were used, although a band saw, wood lathe, and drill press came in pretty handy.





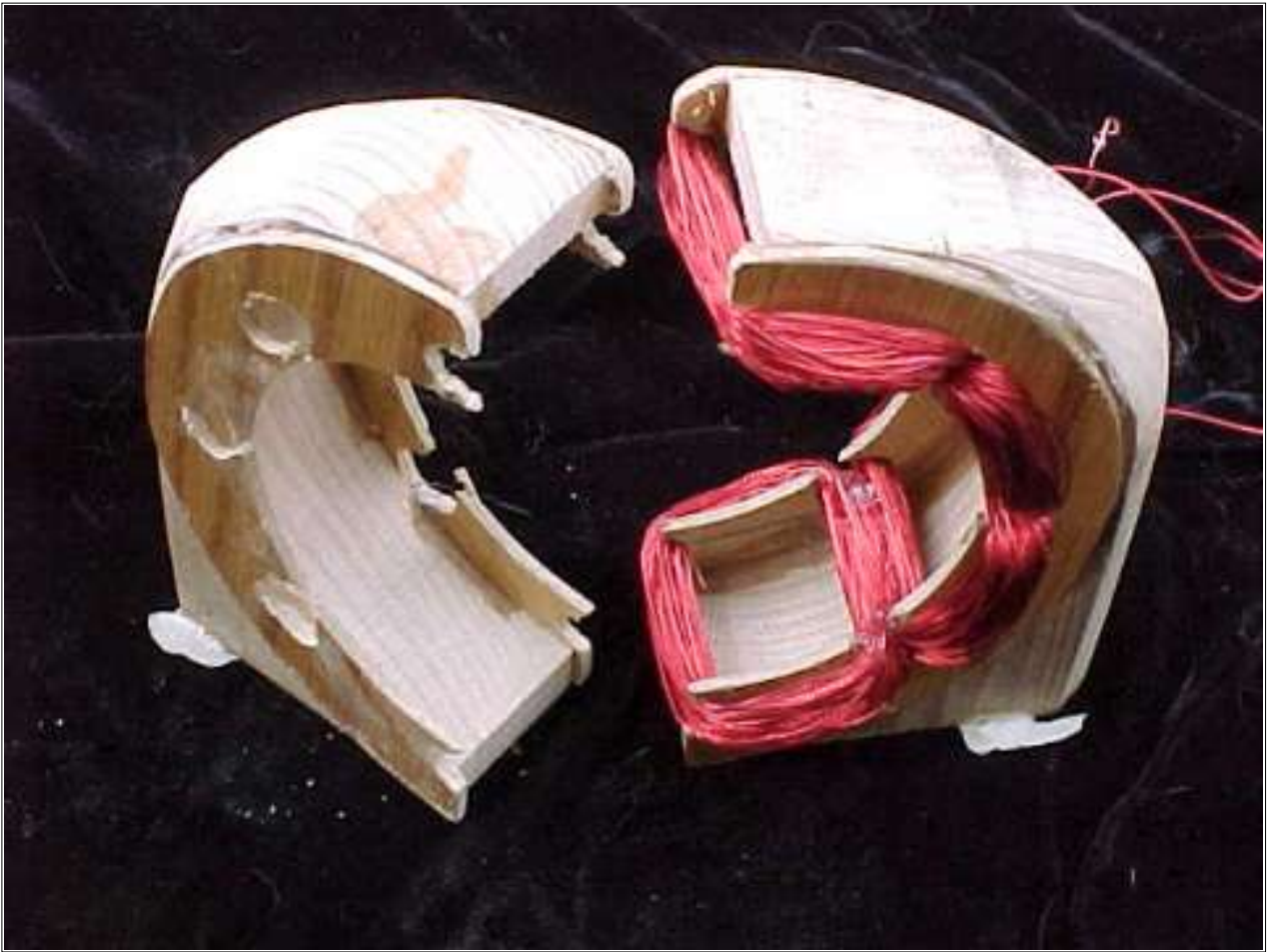
Pictured above is one of the magnets I used. These are surplus magnets from computer hard drives, one of my favorites for alternator experiments. They are about 1.75" long, 1.4" wide, and a quarter of an inch thick. 8 of them will fit together to make a ring. **We no longer have these magnets in stock. They were surplus, they are sold out, and we can't get any more. But this design could easily be adapted to use different size or shape NdFeB magnets.**



Above you can see the armature for the alternator. I simply laminated wood until I felt it was thick enough to hold the magnets securely. After they were glued together, I lathed the armature down to match the diameter of a ring of 8 magnets, I cut a slot so the magnets could be pressed/glued in. Epoxy is probably the best glue for this. In the center I drilled a hole and glued/pressed in the 3/8" diameter shaft. Keep in mind, this alternator has 8 poles, and the magnets must have alternating poles facing out.



Pictured above you see the wooden pillow block bearings. I simply drilled a hole, slightly under 3/8" diameter, and then using a gas stove, heated the shaft to almost red hot, and forced it through the holes. This makes for a good tight fit, and it serves to harden the wood, and the inside of the holes has a layer of carbon, which makes for a better bearing. These bearings are from pine, certainly a harder wood would work much better! In the top of the pillow blocks I drilled a small hole so that the bearings could be oiled/greased. Once the alternator was assembled, there was no play in the shaft at all, and it turned freely. Even after several hours of hard running, the bearings are holding up well. It's interesting information, although I would certainly encourage anybody building a windmill to use steel ball bearings. I just did wooden ones for the sake of fun, and simplicity. Odds are, on a slow running machine, like a slow water wheel, wooden bearings, properly made could last for years. This is actually a high speed windmill and I should think these would wear out quickly.



The stator, on which the coils are wound was cut from two pieces of 2" X 4" lumber. The inner diameter is 1/2" larger than that of the armature, and to the sides are thin plywood pieces with holes drilled for winding the coils. Inner diameter of the plywood pieces is only slightly larger than the diameter of the armature. This allowed for "hollow coils" into which I would have a "dirt" core to attract the magnetic field through the coils. These coils are wound with #22 AWG enameled copper wire, each coil is 100 turns. The coils are wound in opposite directions.

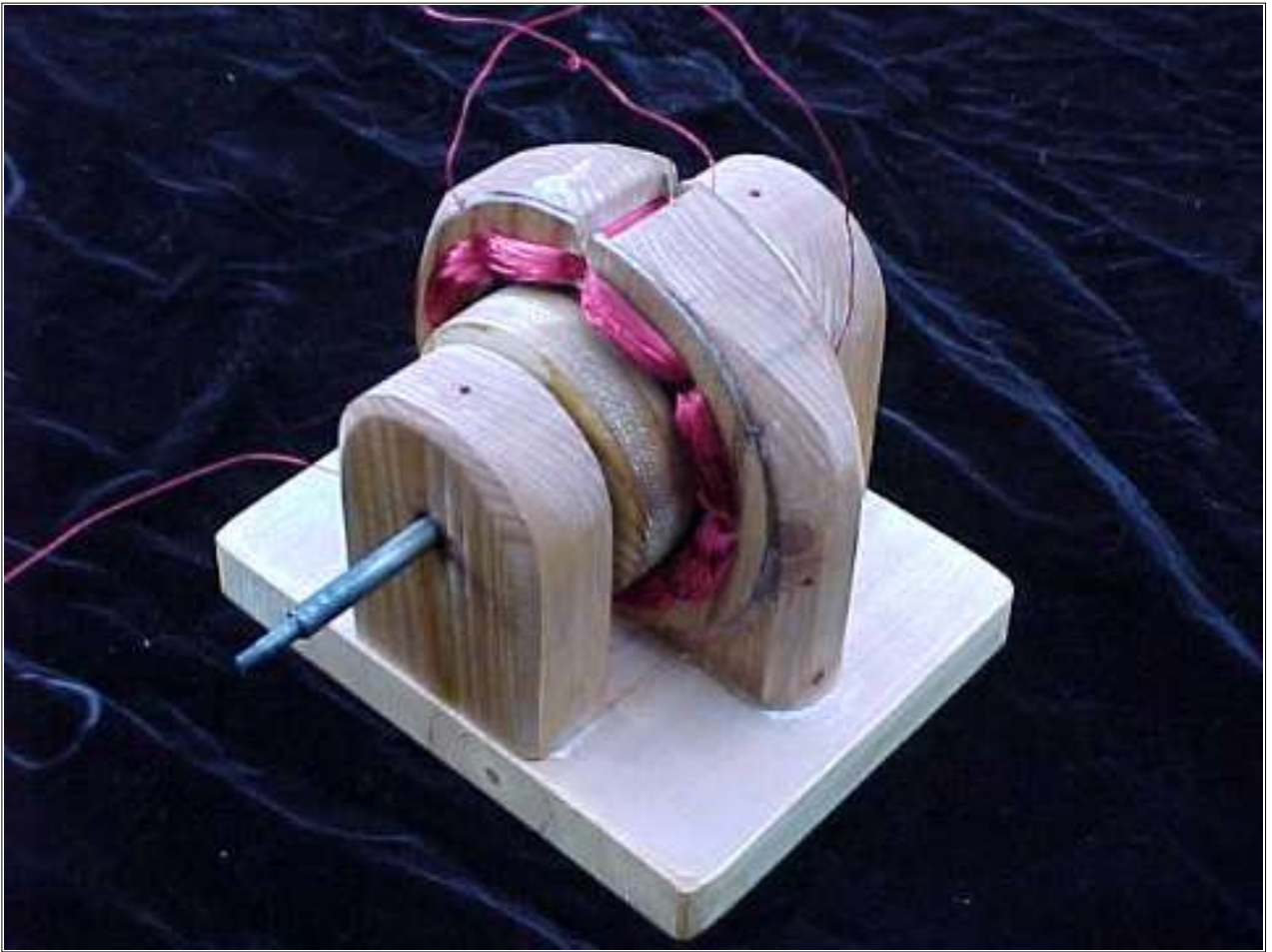




I dragged a magnet around in the dirt of my driveway, so that it would attract the magnetite sand. Pictured above you can see the pile I used, with a stack of magnets demonstrating its magnetic properties.



The dirt was mixed with epoxy, so that I had a thick paste. I simply spooned it inside the hollow space in the stator. This makes for a reasonable core, and although it does not work nearly as well as steel laminates, it's much easier. Making steel laminates is a nearly impossible task without significant time and tooling. The magnetite paste does a good job of attracting the magnetic field, and is non-conductive so eddy currents are not a problem.



The completed alternator! I was real surprised by the performance. I could easily spin it up with my fingers to produce over 12 volts. Attaching a cordless drill to the shaft, it would light up a 25 watt 12 volt light bulb easily! Although this may not seem breath taking, I thought it was, considering the simplicity of the project! It was at this point I decided it deserved a windmill for testing!





To stay with the "style" of the project I decided to build the whole windmill out of wood, it's a fairly simple design and should be self explanatory. It's glued and pinned, with wooden dowels, no bolts are used except to bolt the alternator on it. I cheated there.





The prop is wooden, made from 1" X 4" lumber. Each blade is 3.5" wide at the base, 2.5" at the tip, and 2' long, for a total diameter of 4 feet. The pitch of the blade is 10 degrees at the hub, and 6 degrees at the tip. The hub is simply made from 2" thick wood, and glued to the shaft with epoxy. The blades are held on by one small nut at the end of the shaft, and several wooden pins. So far its held up well! Hope I never feel like taking it apart, because it would be nearly impossible...



So there it is, all finished up! I took it for a test drive in the model A Ford. I didn't want to break it, so I never took it over 25 miles per hour, but it seems to perform well (considering). In a 25 mph wind it produces about 60 watts (5 amps into a 12 volt battery), so I think I can give it an optimistic rating of 100 watts...not bad for a 1 day project made entirely of wood. Obviously, it's not made to hold up over the long term, it was merely a fun little test, but I think the alternator provides some interesting data. I feel pretty sure now that with little work one could definitely build a very useful alternator completely from scratch. By simply increasing the diameter some one could get a LOT more output from a very similar machine. Of course, using better bearings would be wise, but I like the use of wood, because it is a material which is widely available, and easily worked with the simplest of tools. Thanks for dropping in and letting me show off this silly windmill!

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# The Wood 103

## A Wooden 100 Watt Wind Generator

Dan Bartmann  
& Dan Fink

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The Wood 103 was built mostly of wood in just a few hours, with very little number crunching. Producing 100 watts in a 30+ mph wind ain't bad for a weekend project!

**T**he initial goal of our project was to build a functional, permanent magnet alternator from scratch, primarily out of wood. When the alternator was together and working, it became clear that wind was the logical energy source for it. This unit (we call it the “Wood 103”) is not intended to be a permanent addition to a remote home energy system, but a demonstration of how simple it really is to produce energy from scratch—and to be a bit silly!

Many homemade wind generator designs require a fully equipped machine shop to build. Our wooden version, built in a day, can be made with mostly local materials and simple hand tools in any remote corner of the world. The alternator design is well suited to hydroelectric, human, or animal power. We plan to use it for a series of magnet and electricity demonstrations at

local schools, and for future experiments with different energy sources, windings, cores, poles, and rotors. This project will cost you only US\$50–75, depending on what you pay for magnets and wire.

### Alternator Basics

Electricity is simply the flow of electrons through a circuit. When a magnet moves past a wire (or a wire past a magnet), electrons within the wire want to move. When the wire is wound into a coil, the magnet passes by more loops of wire. It pushes the electrons harder, and can therefore make more electricity for us to harvest.

The magnetic field can be supplied by either permanent magnets or electromagnets. All of our designs use permanent magnets. In a permanent magnet alternator (PMA), the magnets are mounted on the armature (also sometimes called the “rotor”), which is the part that spins. It is connected directly to the wind generator rotor (the blades and hub). There are no electrical connections to the armature; it simply moves the magnets. Each magnet has two poles, north (N) and south (S). The magnets are oriented in the armature so that the poles alternate N-S-N-S.



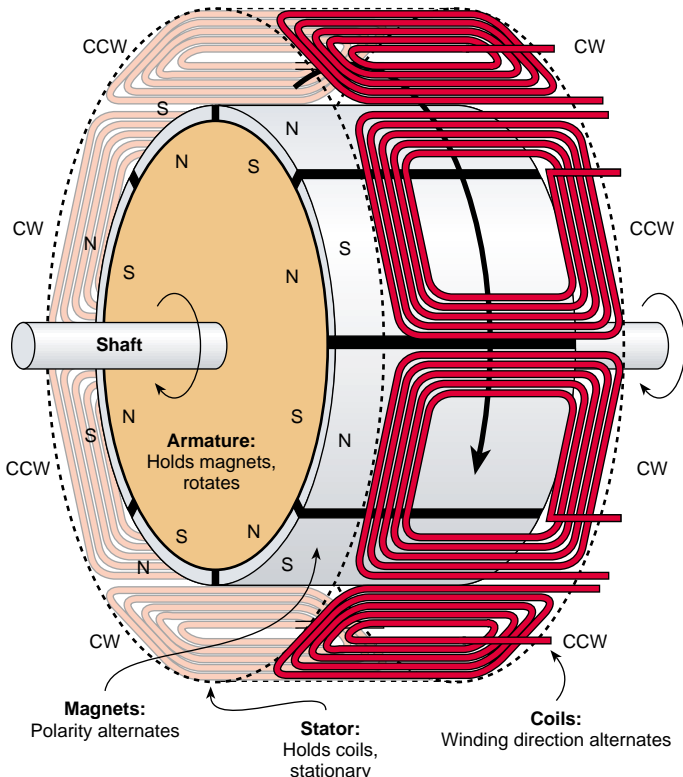


The Wood 103 has three, 2 foot, hand-carved blades, creating a swept area of 12.5 square feet.

The other half of a PMA is the stator, which does not move. It consists of an array of wire coils connected together. The coils in our stator alternate in the direction they are wound, clockwise (CW) and counter-clockwise (CCW). The coils and magnets are spaced evenly with each other. So when the north pole of a magnet is passing a clockwise coil, the south pole of the next magnet is passing the counter-clockwise coil next door, and so on.

The coil cores are located inside or behind the coils, and help concentrate the magnetic field into the coils, increasing output. The cores must be of magnetic material, but also must be electrically nonconductive to avoid power-wasting eddy currents. The air gap is the distance between the spinning magnets and the stationary coils (between the armature and the stator), and must be kept as small as possible. But the spinning magnets must not be allowed to touch the coils, or physical damage to them will occur.

**Permanent Magnet Alternator**



The more loops of wire that each magnet passes, the higher the voltage produced. Voltage is important, since until the alternator voltage exceeds the battery bank voltage, no electrons can flow. The sooner the alternator voltage reaches battery voltage or above in low winds, the sooner the batteries will start to charge.

Increasing the number of turns of wire in each coil allows higher voltage at any given speed. But thinner wire can carry fewer electrons. Using thicker wire allows more electrons to flow, but physical size limits the number of turns per coil. This also explains why enameled magnet wire is always used in coils. The enamel insulation is very thin, and allows for more turns per coil than does thick plastic insulation. Any alternator design is a compromise between the number of turns per coil, the wire size, and the shaft rpm.

The electricity produced by an alternator is called "wild" alternating current (AC). Instead of changing direction at a steady 60 times per second like standard AC house current, its frequency varies with the speed of the alternator.

Since we want to charge batteries, the wild AC is fed to them through a bridge rectifier, which converts AC to DC (direct current) for battery charging. The alternator may produce much higher voltages than the battery bank does, but the batteries will hold the system voltage from the wind generator down to their normal level when charging.

### Design

We had successfully converted AC induction motors into PMA wind generators before. But starting from scratch was truly a first-time experiment. Our design choices for wire size, number of windings, number of poles, blade pitch, and other factors were intuitive rather than calculated.

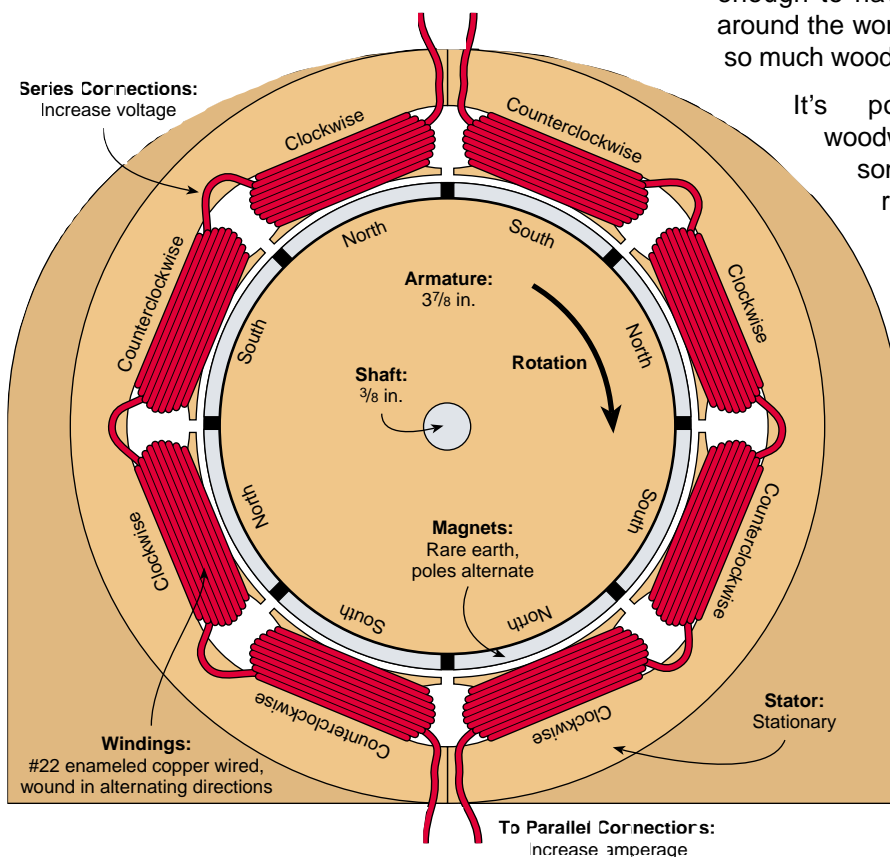
Every wind generator, waterwheel, and alternator we've built has produced usable energy, no matter how strange the design. The trick is matching the generator, rotor, and energy source. You can do a lot of study and calculation to get there. But if the design is quick, cheap, and easy to build, why not just make adjustments by observing the unit's performance?

If you try this project and change the wire size, magnet type, rotor design, and stator cores, you'd still be making usable energy and have a great starting point for further research. Just change one thing at a time until the unit performs to your satisfaction. We're aware that many design improvements could be made to the Wood 103—and we hope that others will experiment with variations.

### Wooden Alternator

The biggest problem with building most wind generator designs at home is the need for machine tools—usually

### Wood 103 PM Alternator: End View



## Materials Used

The materials we used are not hard to find:

- Wood, the harder the better. We used pine since it was locally available.
- Copper magnet wire, about 100 feet (30 m), enameled #22 (0.64 mm diameter).
- Eight surplus neodymium-iron-boron magnets, four with the south pole on the convex face, and four with the north pole on the convex face.
- Dirt (magnetite sand).
- A 10 inch (25 cm) piece of 3/8 inch (9.5 mm) steel shaft with a nut on the end to hold the hub on.
- Two, 3/8 inch by 2 inch (9.5 mm x 5 cm) bolts, but these are optional.
- Bridge rectifier, rated for least 15 amps, 100 volts.
- Other supplies—glue and linseed oil.

at least a metal lathe is required. Headquarters for our business, Otherpower.com, is high on a mountain, 11 miles (18 km) past the nearest utility line. We are lucky enough to have basic tools up here, but many folks around the world don't. That's the main reason we used so much wood in this design.

It's possible to build human-powered woodworking tools in almost any location. With some patience, only simple hand tools are required for this project. If you want to build it in a day, though, a lathe, drill press, band saw, and power planer can be very helpful!

### Building the Armature

The key to the Wood 103's armature is the neodymium-iron-boron (NdFeB) magnets. They are the strongest permanent magnets available. Ours are surplus from computer hard drives. They are curved, and measure about 1 3/4 by 1 3/8 by 1/4 inch thick (44 x 35 x 6 mm). Eight fit together in a 3 7/8 inch (9.8 cm) diameter ring. That's why we chose this particular diameter for the armature.

The magnets are available with either the north or south pole on the



**The wooden armature holds eight NdFeB (neodymium-iron-boron) magnets arranged in alternating polarity around its perimeter.**

convex face. For this project, you will need four of each configuration. Don't start tearing your computer apart to get these, though! They are from very large hard drives, and you won't find any inside your computer. Check the Access section at the end of this article for suppliers.

To construct the armature, we laminated plywood circles together with glue. The  $3\frac{7}{8}$  inch (9.8 cm) diameter wooden cylinder is  $3\frac{3}{4}$  inches (9.5 cm) long, with a  $1\frac{3}{4}$  inch (4.4 cm) wide slot cut into it  $\frac{1}{4}$  inch (6 mm) deep to tightly accept the magnets. To assure that the magnets would be flush with the armature surface, we cut the plywood disks a bit oversized, and turned them down on the lathe to the proper diameter. The same procedure was used to cut the magnet slot to exactly the right depth.

Using a firm grip, we carefully press-fit and epoxied the magnets into place. Remember that these magnets come in two different configurations—north pole on the convex face and south pole on the convex face. The magnets must have alternating poles facing out, and this is how they naturally want to align themselves.

Next, we drilled the shaft hole through the center of the armature using a lathe, though it could certainly be done with a hand drill if you are careful to align it perfectly. We roughed up the surface of the shaft with a file before epoxying it into the hole. It should be a very tight fit—we had to gently tap it through with a hammer. This may not be strong enough, and it might be wise to actually pin the armature to the shaft. Time will tell!

#### **Construction without a Lathe**

We did cheat by using a lathe to shape the armature, but a coping saw and sandpaper would work just fine. If a lathe is not available, our suggestion is to first cut out the disks, making sure that some of them (enough to

## **Safety Warning!**

The large NdFeB magnets in this project are extremely powerful, and can be dangerous. They are brittle, and if allowed to snap together from a distance, they can break and might send sharp shrapnel flying. They are powerful enough to cause painful damage to your fingers if you allow them to pinch you, and can cause malfunctions in cardiac pacemakers if brought too close.

Use safety glasses, gloves, a firm grip, and Zen-like concentration when handling these magnets. Do not get them anywhere near televisions, computer monitors, floppy discs, videotapes, credit cards, etc. They are not toys, and should be kept out of reach of children!

stack up to  $1\frac{3}{4}$  inches; 4.4 cm) are  $\frac{1}{4}$  inch (6 mm) smaller in diameter than the rest. Once assembled, the armature will then have a recessed slot for the magnets.

Otherwise some means of "lathing" the slot will have to be devised. It could be done on the alternator's pillow blocks with a sanding block mounted below, or in a drill press. It would also be wise to first drill a shaft hole into each plywood disk, and then assemble, glue, and clamp all the plywood disks together on the shaft before turning.

#### **Building the Pillow Blocks**

The pillow block bearings were made from pine, since that's the hardest wood we have available up here on the mountain. Certainly hardwood would be much better. First we drilled a hole slightly under  $\frac{3}{8}$  inch (9.5 mm) diameter in each pillow block. Using a gas stove burner, we heated the shaft to almost red hot, and

**Pillow blocks support the armature. Charred wood creates "carbon" bearings for the shaft to spin on.**





forced it through the holes. This gave a good tight fit, hardened the wood, and made a layer of carbon on the inside for better lubrication. We drilled a small hole in the top of each pillow block, down into the shaft hole, so the bearings can be greased.

After pressing the hot shaft through the pillow blocks, we were very pleased with how freely the armature turned and how little play there was. In a slow waterwheel design, wood/carbon bearings would probably last for years. This wind generator is actually a fairly high-speed unit, and real ball bearings would be a big improvement. Such bearings could be easily scavenged from an old electric motor of any kind. Wooden bearings were certainly simple, fast, and fun though!

### Building the Stator

The stator, on which the coils are wound, is made up of two identical halves. Each half is made from 2 by 4 inch lumber, 6 inches long (5 x 10 x 15 cm). A semi-circular cutout with a 5 inch diameter (12.7 cm) was made on each half. The tolerances are pretty tight, but this allows more than a 1/2 inch (13 mm) to fit the coils and core material inside.

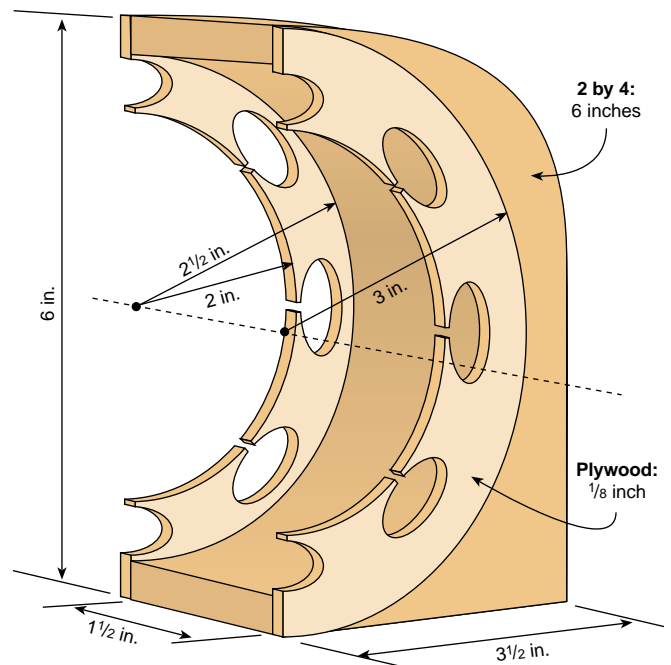
On the sides of the 2 by 4s, right over the cutout, we glued thin (1/8 inch; 3 mm) U-shaped plywood “half disks,” which have an inner diameter of 4 inches (10 cm) and an outer diameter of 6 inches (15 cm). They have slots cut large enough to accept the coils. These were made with a hand saw, 3/8 inch (9.5 mm) drill bit, and a rat tail file. The coils are wound in these slots, and the space inside and behind the coils is filled with the magnetite core material. There are four coils on each half of the stator, and they must be evenly spaced.

Our twin stator halves are wound with #22 (0.64 mm diameter) enameled copper magnet wire. Magnet wire

**The two stator halves—one wound with 100 turns per coil, and one ready to be wound.**



### Stator Construction



of this type is often available from electronics stores or electric motor repair shops. Each stator half contains four coils. Each coil is 100 turns, and every coil is wound in the opposite direction as its neighbor. It's important to wind the coils neatly and tightly, using a wooden dowel to carefully press each winding loop into place.

Most common alternators use thin steel laminates as cores, to help concentrate the magnetic field through the coils. Magnetism in motion pushes the electrons around in the steel too. The laminates are insulated from each other to block these eddy currents, which would otherwise waste energy.

These laminates are difficult to make in a home shop, so we chose dirt as our stator core—actually magnetite sand mixed with epoxy. It is not as effective as real laminates, but was very easy to use, and available for free by separating it from the dirt in our road. We mixed the magnetite with epoxy and simply spooned it into the open cores. If the cores were left empty (an “air core”) the alternator would still work, but with much less power.

Magnetite is a common mineral, a type of iron oxide. It is a byproduct of some gold mining operations, and can sometimes be purchased. As an alternative, we simply dragged a large neodymium magnet (just like the ones we used for the armature) around on our local dirt road on a string for a while, attracting all the ferrous sand, which stuck to the magnet.





**Magnetite sand collected from Dan's driveway by dragging a magnet around on a string.**



**The stator cores are filled with a mixture of epoxy and magnetite sand.**



**An exploded view shows the armature, stator, and pillow blocks ready to assemble into an alternator.**

We separated this somewhat magnetic sand into a pile, sifted it through a window screen, and sorted that with the magnet one more time. The remaining black sand sticking to the magnet was nearly pure magnetite. A quick test of any local dirt pile with a neodymium magnet should reveal whether your sand contains magnetite. If not, try dragging the magnet along the sandy bottom of a local river. Any deposits of black sand on the river bottom are most likely nearly pure magnetite.

The clearance between the stator coils and the armature surface is very important. It must be extremely close (within  $\frac{1}{16}$  inch; 1.5 mm) without allowing the magnets in the armature to touch the stator. Our model is actually a bit sloppy—the clearances are more like an  $\frac{1}{8}$  inch (3 mm). Tighter tolerances would produce more power.

**Wiring Configuration**

The completed stator consists of two identical sets of four coils. For our wind generator, we connected the stator halves in parallel for more current (amperage). Connecting them in series would double the voltage produced, but halve the amperage. For low wind speeds, a series connection would be the best—the alternator would reach charging voltage at slower speeds. At higher speeds, a parallel connection is optimum for producing the most amperage.

An ideal system would contain a regulator that switched the stator connections from series to parallel when the unit began to spin fast enough. As is the case with many

homebrew and commercial wind turbines, we eliminated this entirely, sacrificing a small amount of efficiency for much greater simplicity and reliability. Many people have experimented with such regulators, both solid state and mechanical.

**Alternator Performance**

We were really surprised by this alternator's performance. We could easily spin it with our fingers and get 12 volts or higher. A cordless drill attached to the shaft would light up a 25 watt, 12 VDC light bulb easily. This might not seem breathtaking, but considering the simplicity of the project and one-day construction time, we were quite impressed.

Our 100 watt rating for the Wood 103 is probably right on, considering the performance we got during testing,

**The finished alternator, ready for a power source.**





Almost ready—the wooden frame and tail are attached.

and the way commercial wind generator manufacturers rate their products. Our data acquisition system was pretty simple—multimeters and people with pencils and paper to watch them and record measurements.

With a series connection between the stator halves, the unit reached charging voltage for 12 volt batteries at around 300 rpm. With the stator in parallel, it took around 600 rpm to start charging. When installed on our wind machine, the parallel connection gave us 4.8 amps output in a 25 mph (11 m/s) wind.

### Building the Frame

To stay with the style of this project, we chose to build the rest of the wind generator out of wood too. It's a very simple design and should be self-explanatory. It's all glued and pinned with dowels. No bolts are used except to connect the alternator to the frame. We admit that we cheated here!

We did not make any provision for overspeed control, since this was intended to be a demonstration unit for all energy sources, not just wind. A canted tail and spring assembly could be added to control speed during high winds. And of course, making the frame out of surplus steel or aluminum angle would give great improvements in durability.

We also did not include slip rings for power transmission as the wind generator yaws. Instead, we used flexible wire for the first few feet, letting it hang in a loose loop. A piece of aircraft cable cut slightly shorter than the power cable was attached, so if the power wire gets wrapped around the pole too tightly, the connections won't pull loose.

Our normal winds are usually from one direction, and designs without slip rings seem to work fine up here. Wrapping the power wire around the pole is only rarely a problem, and this strain relief cable prevents any damage. Our experience is that if the power cable does wind up all the way, it will eventually unwind itself.

### Designing the Rotor

The "rotor" here refers to the blades and hub of the wind generator. We don't profess to be experts in blade design. Once again, we chose our starting point intuitively rather than trying to calculate the proper blades to match our alternator's power curve. Since the blade carving process took us less than an hour for the whole set of three, we figured that any design changes would be quick and easy to make. However, because we glued the blades to the hub, a new hub will be necessary for any blade changes.

There's a great deal of information out there about building blades. Hugh Piggott's Web site and his *Brakedrum Wind Generator* plans are some of the best sources around.

The rotor was built from  $\frac{3}{4}$  inch by 4 inch (19 mm x 10 cm) pine lumber. Each blade is  $3\frac{1}{2}$  inches wide at the base and  $2\frac{1}{2}$  inches wide at the tip (9 x 6.4 cm). The three blades are 2 feet long (0.6 m), for a total diameter of 4 feet (1.2 m). The pitch of the blades is 10 degrees at the hub, and 6 degrees at the tip.

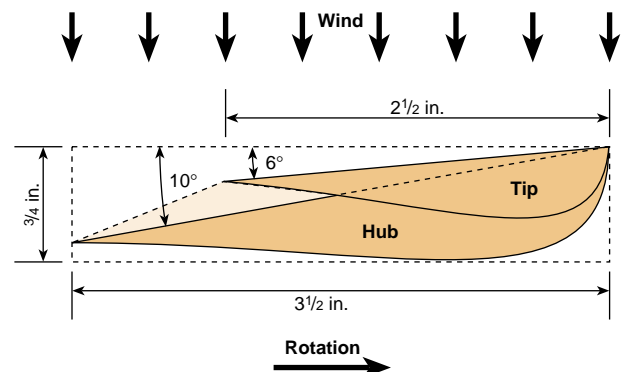
The hub is made from 2 inch thick (5 cm) wood, press-fit and glued to the roughed-up shaft with epoxy. The blades are held onto the hub by one small nut at the end of the shaft, and several wooden pins with glue.

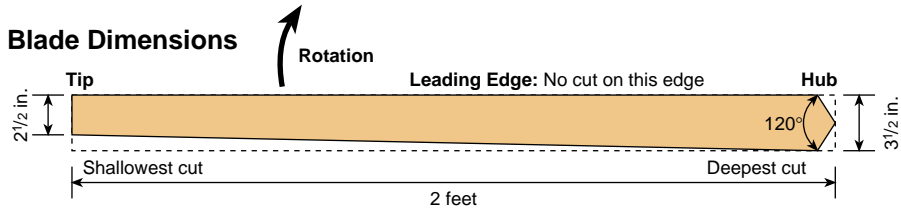
### Carving the Blades

To prepare the blades for carving, we simply drew a few lines so that we knew what material to remove. Each blade starts out life as a 2 foot (0.6 m) long, 1 by 4 (2.5 x 10 cm). Starting from the leading edge of the blade at the hub, we simply used a protractor to lay out how far into the wood 10 degrees of pitch would take us at the trailing edge—about  $\frac{5}{8}$  inch (16 mm).

At the tip, the pitch is about 6 degrees, so we removed about  $\frac{3}{8}$  inch (9.5 mm) of material on the trailing edge. We made both marks, and connected the two with a line. We then simply took a power planer, and followed the cut depth line all the way up the blade.

### Blade Cross Section





excellent testing facility for wind turbines. It has a perfectly accurate speedometer, which has been carefully checked by the Fort Collins, Colorado Police Department's radar machines!

For better accuracy (or if you don't have a power planer), you can use a hand saw to make cuts across the blade every inch or so, down to the cut depth line on the trailing edge and not cutting at all on the leading edge. Using a hammer and chisel, it's easy to break out the chunks of wood to the proper depth. Then smooth the blade down to the proper angle with a hand plane. When the saw kerfs disappear, the blade pitch is correct.

The blade width taper occurs on the trailing edge. We simply used a saw to cut the first taper, and used that first blade as a template for cutting the others. No calculations were made for the airfoil shape on the other side of the blades. We picked a likely looking profile and started cutting with the power planer. A hand planer is fine for this process, too. After everything looked good and even, we sanded the blades and treated them with linseed oil.

**Balancing the Blades**

To avoid vibration problems and enable easy starting, we made some effort to balance the blades. We considered them reasonably balanced when each blade weighed the same (about 8 ounces; 227 g) and had the same center of gravity. Adjustments can be made quickly with a planer.

Once this is done, and all three blades are assembled on the hub, balance can be double-checked by spinning the rotor and making sure it has no tendency to stop in any one place. This is a quick process, and we certainly were not concerned about great precision here. As it turned out, a small effort in balancing the blades yielded good results, and the machine seems well balanced and vibration free.

Truly, one could write an entire book on blade design, and it can get complicated. Don't worry, though. It is possible to make a very basic blade that will work quite effectively. Often a simple blade with a constant 5 degree pitch from hub to tip and a reasonable airfoil on the backside will work very nicely. If you are interested, explore the books and Web sites listed at the end of this article for more information on blade design.

**Testing**

For testing, we strapped the Wood 103 to our trusty Model A Ford. The Model A serves as a reliable daily driver, and with the bracket we made, it makes an

We carry a 12 volt battery, a voltmeter, an ammeter, and pencil and paper in the test vehicle. On a still day, we can observe the speedometer and take accurate windspeed versus output measurements on any wind turbine. We've used this rig with props over 8 feet (2.4 m) in diameter. The cost of a good Model A (about US\$4,000 if you don't mind a jalopy) is *not* included in the price of this project!

Wind generators should be installed high above human activity. For testing purposes, we've run our generator on low towers within reach of people, and on our Model A. Wind generators have parts that spin very fast! The blades could probably take your head off in a high wind if you were silly enough to walk into them. Make all installations well out of reach of curious organisms. You should treat any wind generator with a great deal of respect. This is not a joking matter, though we always shout "Clear prop!" before we fire up the test vehicle...

**Model A Ford—a high tech test vehicle for a high tech wind machine.**







**The next generation—the WoodAx is for permanent installation, and produces upwards of 300 watts in 30 mph winds.**

### Improvements

Many improvements could be made to this design. But the intention was to use mostly wood and hand tools, and keep it fast and simple. The wooden alternator is easy and quick to build, but for longest life, it would need to be protected from rain and snow. Maybe a small shingled roof over it?

Using real ball bearings would help friction loss and longevity a bunch. A metal frame and tail would improve high-wind survivability significantly. A furling system to keep the Wood 103 from destroying itself during a gale would be a great addition too. We plan to experiment with many improvements, and we hope this project piques the interest of others too.

### Trade-Offs

Designing and building a permanent magnet alternator involves a long series of trade-offs. For example, thicker wire in the windings would give more possible current, but less room for windings and hence lower voltage at the same rpm. Ceramic magnets might be cheaper, but would give far less power than neodymium magnets.

Series wiring on the stator would allow lower rpm at charging voltage, but parallel gives better charging current—and a regulator to switch between the two would be complicated. Using steel laminates instead of air or dirt stator cores would produce more power, but laminate production is extremely difficult.

The trade-offs involved in designing a complete wind generator (or water turbine, or bicycle generator) are even more lengthy and complicated. Wind speed, rotor diameter, number of blades, blade pitch, width and twist, optimum rpm for your winding configuration, generator diameter, and number of poles all factor into a perfect final design.

### Improvise, But Do it!

We've tried to demonstrate how easy it is to produce electricity from scratch. Don't let yourself get hung up on complicated formulas, calculations, and machine tools. Even if you make many changes to this simple design, you'll still almost certainly have a unit that makes usable energy for charging batteries.

Then, you can make small improvements until it performs exactly right for your application. And it could be powered by wind, falling water, a human on a bicycle, a dog on a treadmill, or a yak in a yoke!

### Access

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# Homebrew 700 Watt Wind turbine



We made a deal with our good friend Ward. Going into Dec, with only one solar panel, it seemed maybe he could use a bit more power! We agreed, that if he'd foot the cost of the tower, and wire, and help in the construction, we'd offer the shop space, parts, and some help to build a new wind turbine from scratch. It's an experimental design, and the alternator is designed around the front wheel assembly of an old Volvo 122s. [Click Here](#) to read about details and the construction of the alternator! Although it's not terribly efficient, we see about 60 amps into a 12 volt battery in a 40mph wind - so it makes significant power.

[Para Español, traducción de Julio Andrade.](#)

Please be patient, this page has a lot of pictures!

## The Alternator



It's a radial alternator, designed around a volvo disc brake, wheel hub, bearings, and spindle. The Volvo wheel bearings make for a very tough unit, which should hopefully stand up to severe abuse! The studs which used to hold the wheel on were replaced with much longer bolts, so that the prop could bolt on the disc brake in place of the wheel. Again, please see the page about the alternator for further details about building it, and testing it - and some discussion about problems it has!

## The Propeller



We actually had to make two props for this, since we accidentally dropped the machine in our first attempt to raise it! [Click here](#) to read about that failure! The first prop we made out of the very best, vertical grain knot free fur. The second prop we made out of some fairly clean Lodgepole pine we had on hand. Both worked well, the 2nd prop actually runs somewhat quieter due to reduced thickness. Otherwise, they are about the same and this page will document only the creation of the 1st one!





The prop is a 3 blader, 8 feet in diameter. The pitch at the tip is 4 degrees, at the hub it's about 8 degrees. At the hub, each blade is 7" wide, and at the tip they are 3.5" wide. The blades are 7/8" thick at the hub, and 5/8" thick at the tip. The airfoil is of an "intuitive" design, and the thickest part of the prop (the high point of the airfoil) is about 35% of the blades width, from the leading edge. Near the hub, we made relief cuts with a crosscut saw, and chiseled down to the line. After the first 6" away from the hub are chiseled out, it was an easy matter to finish the rest of the prop with a power planer.

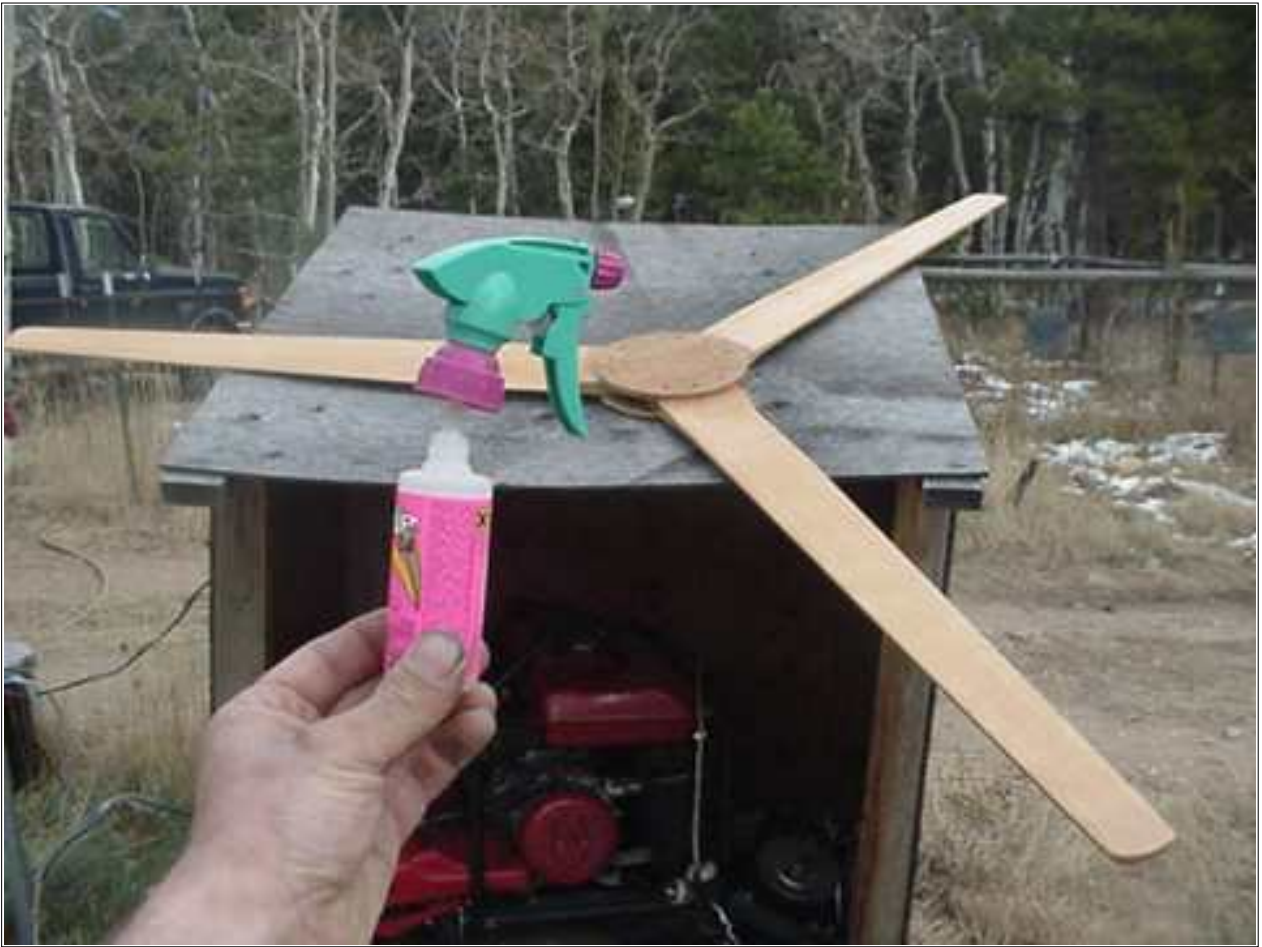




Once the blades were roughed out we had to balance them. The system I usually use (and please...any experts with a better idea let us know!) involves two things. I first find the blades center of gravity (the point at which the blade balances) and then weigh the blade, at that point. We didn't have a scale on hand which was sensitive enough, so we made a simple scale from some bandsaw blade! (show in picture above) I'm not in the habit of adding weights to blades (though I probably should be), but instead we plane material off the blades, untill they all weigh the same and all have the center of gravity located at the same location. It usually goes fairly quickly and I've always had good results with this system. It is true, that when finished some blades might be slightly thicker than others, but if each one is made from fairly similiar wood, which has similiar density, then the blades all turn out very close.



The hub for the prop consists of 2 10" diameter 1/2" thick plywood discs. One of them is routed out, into a ring (6" inner diameter)- so that into it we could inlay a 1/2" thick Aluminium disc, which was drilled out to accept the "studs" by which the prop would be bolted to the alternator. Once all the blades were finished, we coated both plywood discs with epoxy (on the inside) and laminated the discs together with the blades on the inside. The whole sandwich was tightly screwed together with a bunch of 1.5" wood screws.



Once the epoxy dried, we finished the prop with "Super Glue" - from a spray bottle. Neat way to put a tough finish on wood, but horribly toxic and very expensive! (about \$50!). As it turned out, we smashed this prop and the next prop we simply finished with a thick coat of Linseed oil.

## The chassis

It's very simple. About 5' of steel sign post make up the machine. The alternator is welded to the front of it. Even though it is welded on, all the important parts can still be removed, everything except for the wheel spindle, which should never wear out. The alternator's armature (brake disc) is removed easily with one cotter pin and 1 bolt. The stator can be removed by removing 4 bolts/nuts.





The tail I cut from thin sheet metal, which is bent, and folded over on the back side. Since I have no tin snips, we cut the tail out with an angle grinder. The tail is bolted to the signpost, and 1 heavy steel bracket is bolted to the top of the tail for reinforcement. As it turns out - this is inadequate. I've seen this machine running now for a couple weeks, the tail is NOT longed for the world. It should have been much stronger. We'll take it down soon and fix it.

\*\*\* update - since written, the tail has been replaced twice! 1st one too thin, 2nd one too heavy and large, the new one is smaller and made of plywood which is bolted to the frame \*\*\*

A 2.5" diameter pipe, about 20" long serves to mount the machine to the mast....it slips over a 2" pipe. A couple reinforcements are welded between the sign post, the pivot, and the alternator. It's very simple. I have no system of "overspeed" protection. We've made some good windmills up here without it, and many have held up for the long term. I'll be honest, I've seen this machine run in 80+ miles per hour now. Although it held up well, I would be a little more comfortable with some system of high wind protection, not only for the sake of the turbine itself, but also for the tower. I'll definitely look into some system of governing the next time I make a prop 8' or larger. This wind generator also has no slip rings (the commutator/brush assembly which allows power to flow from the wind generator (which pivots) to the mast). I've never made one with slip rings and it's never been a problem! Although slip rings are nice, they add some work to the project and they are not necessary. This machine has a piece of aircraft cable, which is tightly tied to the wind generator frame, and the mast, and allows for the machine to turn about 4 revolutions either way, before the cable gets tight. The power line, is even slightly more slack than this aircraft cable, so the power line can never get pulled tight. I, and my neighbors have built several machines this way. It has never failed, and you'll rarely if ever see the cable tight such that the machine cannot yaw in the wind. It's



a lot simpler, and probably less likely to fail than slip rings.

## The Test!



I bolted a piece of the same sign post we used to make the windmill onto the front of my '70 F250, and made some U clamps so that a 2" diameter pipe mast could be fitted. See in the picture above, I am wiring the alternator up for testing. This serves as an excellent test rig. On the passenger floor of the truck is a 12 volt battery, and enough meters on the seat to record what's going on! By watching the meters and my speedometer, and a still day, one can record good information about how the machine performs.



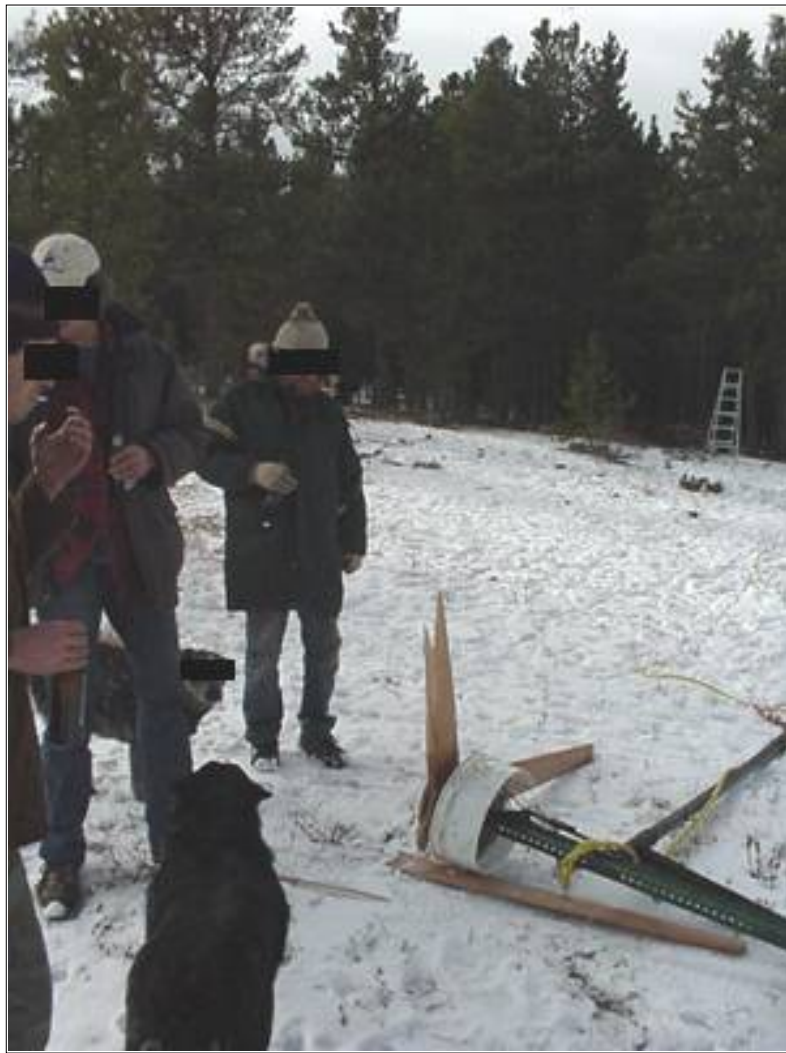
This windmill is a bit hard to start, it takes about 12 miles per hour for a couple seconds to really get it spinning good. When I made the alternator, I soldered the coils together in series in two sets of 9. The two "halves" of the stator could either be hooked in series (for the highest possible voltage) or parallel (for half the voltage and twice the current). When all 18 coils were hooked in series it had difficulty ever charging over 30-35 amps. I realized that there was very little lost (if any) at low windspeeds, and much gained at high windspeeds, to hookup the alternator with the 2 sets of 9 coils hooked in parallel. Again, it didn't start really spinning well until it saw 12mph for a couple seconds. After that the wind could slow and it would produce around 5 amps @ 10mph, about 20amps @ 20mph, about 35amps @ 30mph, and about 60amps @ 40 mph. At 40 miles per hour, there were wires melting into the seat of my truck and the cab smelt of burning diodes. I've never seen better than 60 out of it, and my guess is that is close to the limit unless some changes were made to the alternator.

## The Tower

As stated above, we failed in our first attempt to raise this, which resulted in a broken base, broken prop and a bent mast. In retrospect, it's a good thing we did forget to tighten guy wires, because had we put the mast up in it's original form, it would have surely failed.



Ward opted for a tower made from steel pipe. It's made up of sections of pipe, which fit tightly together. The bottom 15' is 3" diameter steel pipe, into which another 15' of 2.5" section is slid (About 1' overlap) and into that an 8' section is slid. It fits very tightly and all the joints were welded. At two points on the tower (15' from the base and 30') we welded links of chain around the mast so that the guy wires could be attached. The base was a "Simpson Strong Tie" bracket, which Ward had laid into a fairly large concrete base. At the bottom of the mast, I welded a small pipe, so that the mast was loosely hinged to the base on a 1/2" dia blot. At the bottom of the mast was welded a 2" pipe, 8' long to serve as a jin pole. The jin pole is reinforced with one steel brace at the bottom and a cable which runs up the jin pole 6' and up the mast 15'. Upon raising the mast (1st time) the jin pole immediately started to bend. We got it up a bit, and it stopped bending. We got it almost all the way up, and it fell to the side, because we had forgotten to tighten the guy wires on one side. The Simpson "strong tie" bracket was torn to pieces, and the top 8' of the mast was bent, and the prop was destroyed.



Otherwise, the alternator and everything looked fine. We stayed up late, made a much stronger bracket, and a new prop. Next morning we ground the old bracket out of the concrete, and bolted the new one on using 1/2" bolts and a rock drill so it would be set well in the concrete. It was obvious at that time, that the 2' pipe on the top 8' of the mast was NOT strong enough, it was easy for us to bend it back straight - by hand. We cut a piece of 2.5" pipe, 6' long, and slipped it over the existing 2" pipe - making the top section of the tower much stronger, and leaving only enough 2" pipe sticking out for the wind generator to fit on. The jin pole was straightened out and we reinforced it by welding 2 fence posts (which we had on hand) to it. Next time we raised it, we made sure to tighten the guy wire clamps, and things went smoothly with no problems.





## Inside the house!

Pictured above is the "inside" part of Wards "utility" system. The wood stove heats his whole cabin with no problems. The windmill runs through a couple of bridge rectifiers mounted to a heat sink on the wall. The antique ammeter shows any power coming in from the windmill. When the windmill has the batteries topped off (which doesn't take long), the power is diverted into the antique parabolic space heater, which is bolted to the wall to the right of the heating stove. Although this doesn't make much heat, it does make some on windy nights, and it keeps the windmill from running too fast (at least, that's the idea...).

## In Conclusion

The total cost of this installation came in around \$500, most of that was for the pipe tower, and the expensive extension cord Ward purchased to bring the power into his house from it. The windgenerator itself cost around \$200, including Volvo parts, magnets, glue....everything. Had we used a wooden tower (which I think would've been stronger) and less expensive wire the whole project could've come in around \$250-\$300. It's a pretty powerful windmill for that price! It does have some problems which I'm sure time will sort out. It would start easier if I'd picked better metal for the laminates, I used bandsaw blade material, and it's hystoreses makes the machine a bit hard to start in low winds. It surely also creates inefficiencies. If this were not the problem that it is, I would be able to decrease the airgap between the armature and the stator greatly, and it's output would be significantly increased. Read more about that in the [alternator page](#). The tail came apart, so a stronger tail than described above is necessary. I've watched it in super high winds and it seems to

hold up well otherwise. The tower looks a little rickety in high winds - I'd surely do no less next time, in fact...I'm tempted to further reinforce this tower! Although I believe an 8 foot prop, with no overspeed protection is risky, it's very strong and I believe no overspeed protection is needed. The bearings are more than strong enough and in watching the machine I believe it'll hold up! Only time will tell. If it were any larger, it would need some overspeed protection for sure. Otherwise, I have no complaints. The prop is very quiet, you cannot hear it at all till the machine is producing over 30 amps! I've seen it make 700 watts at 12 volts in high winds. I believe if the alternator were improved, with a better core material and a much smaller air gap, it would be capable of at least 1000 watts at 12 volts, probably much more at 24v. So, soon...I'll try to make one like this with some of these improvements in mind.

Be sure to check out [Hugh Piggot's](#) site! He's a pro at making homebrew windmills.... all of the problems I'm having are ones he's solved and his plans are excellent. You'll find some excellent alternator ideas, a good overspeed protection system, lots of info on blade design, and fun reading! Also be sure to check the many resources available on our [Links](#) page and feel free to email, or use our discussion board if you have any questions or comments about this stuff!

## Update! Jan 2002

This wind turbine has been up and down a couple times now. 1st failure - as you may have seen, we forgot to tighten the guy wires on one side and it fell over breaking the prop. 2nd failure, the tail cracked and blew off! We replaced it with a large (About 25" diameter) old circle saw blade, from an old shingle mill. It ran for a few weeks very nicely, and then in one night of ferocious winds, we woke up to a broken prop, a bent mast, and a missing tail! Not sure exactly what led to what, but - I'm starting to think we should seriously consider some way to shut it down in high winds! Again - the alternator held up fine though. We made a new 8' 6" two bladed prop for it - it's of very strong wood and somewhat thicker near the hub. We also built a new stator for the alternator, replacing the bandsaw blade material with 1/2" wide strips of 22 gage cold rolled sheet metal (which is a LOT better than bandsaw blade!). I rewound the stator with 18 coils of AWG 14 magnet wire, and I doubled up the magnets. (so the magnets are now 1.5" diameter X 3/8" thick). We've yet to raise it - still have to straighten the mast, but we have tested it's performance on the nose of my truck. It does somewhat better, and the prop seems to run a little slower (which is good). Kicks in around 10mph doing 5 amps and quickly rises to around 70 amps at 35 mph! I figure the odds be 50/50 that it will blow up in a high wind once we raise it!

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# Low-RPM Disk Alternator



**The completed unit. It's already been attached to a homebrew wind generator with an 8-foot diameter, 3-bladed rotor--and is up and flying! [See it HERE!](#) We've already seen peaks of over 60 amps into a 12 volt battery bank, and it survived 60-mph winds last week. Steady output of 30 amps in 28 mph winds, and reaches charging voltage at around 12 mph.**

After building a couple of reasonably successful alternators out of wood, I thought it would be fun to make one utilizing steel behind the magnets, and some sort of steel laminates. The most recent [wooden alternator](#) I built works great, but the lack of iron behind the magnets and coils severely limits its maximum output and may cause inefficiencies, especially at higher output levels. Iron behind the magnets nearly doubles the magnetic field density through the coils. Putting steel laminates behind the coils has the same effect, again nearly doubling the field density through the coils. The wooden pillow blocks and ball bearings in the wooden alternator also limit its strength and durability. This alternator uses a rock-solid Volvo wheel bearing, which is built to take thrust forces and abuse, and will hold up well to weather.





## **Parts/supplies required to build this alternator**

Front wheel assembly from Volvo 122s, including wheel spindle, wheel hub, bearings, and brake disc.

3 square feet of 1/2" thick plywood

5 pounds AWG 16 Magnet wire

18 NdFeB disc magnets, 1.5" diameter X 3/16" thick

1.5" drywall screws

Epoxy (lots of it!)

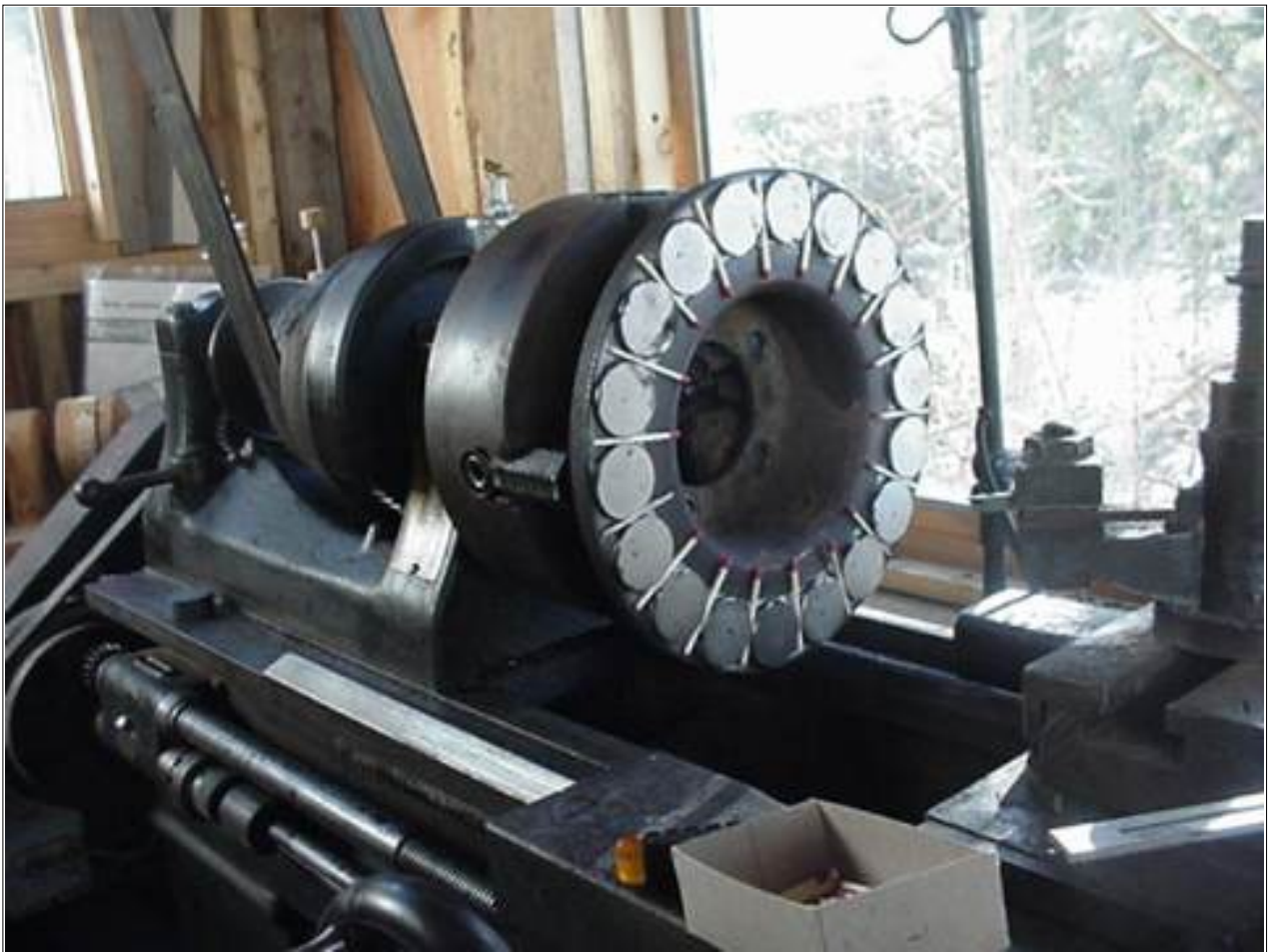
A bunch of steel banding material for the laminates (I used bandsaw blades!)

This alternator is built around the front wheel/disk brake assembly from an old Volvo 122s. I chose the Volvo parts simply because I had them on hand; this concept could easily be adapted to any front disk brake assembly. Odds are, another type might even work out better. The main advantages to using the front wheel hub and brake disk disc from a vehicle are: 1) Very strong bearings - the front wheel bearings are tapered bearings, they hold up well to thrust. 2) A nice steel disc to put the magnets on! 3) Cost, and time saved. Building this from scratch would be fairly expensive and involve a fair amount of machine work. Here, in one cheap package from almost any junkyard many

of the problems are solved.



This is the only machine work involved, very easily done by any automotive machine shop, or anybody with a metal lathe. I cut a slot 1.5" wide in the back of the brake disk very near the outer edge. (I left about 1/16" steel on the outer edge) This slot serves to hold the magnets in. It might not be needed, but at high rpm there is risk of the magnets flying off. This slot should hold them in tightly.



The magnets are N40 grade NdFeB rare earth magnets (available from our shopping cart). In this alternator, I installed 18 magnets. I put them all together side by side, and measured the gap. I then divided the gap and it turned out that there should be exactly 0.08" gap between each magnet. Wooden kitchen matches fit the bill, so I spaced the magnets evenly using kitchen matches! At a later time, after the magnets and brake disk are cleaned carefully, the magnets are epoxied down in the slot, and the kitchen matches removed. **One safety note: At this point we have 18 VERY powerful magnets stuck down to a perfectly flat surface, making for one heck of a strong magnetic assembly! Should this get stuck to another flat, steel surface, it could be IMPOSSIBLE to remove! If your fingers get stuck between the armature and another metal surface it would probably SQUEEZE them right off - so be careful if you try to build this, and keep it in a safe place!**





Pictured above is the beginning of the plywood stator. It is made out of laminated plywood discs. The total thickness is 1.5". The top layer, which is 1/2" thick, has a slot 1" wide at about 10" diameter so that steel laminates can be epoxied in. Over that will be the coils. (you'll see this later in the page!)





I made the "steel laminates" from old rusty 1/2" bandsaw blade. The reason for thin pieces of steel (laminates) is to prevent the low voltage, high amperage eddy currents which would be very problematic with a solid steel core. I annealed the bandsaw blade in a wood stove, hoping to make it more flexible and a better magnetic conductor. My thought was that coiling it up and sticking it into the stator (in the slot described above) would serve as a good magnetic conductor so the field density through the stator coils would be maximized. In retrospect, bandsaw blade is NOT the best choice. Although the alternator works well, the bandsaw blade I used is a relatively high carbon steel, and makes for a pretty good permanent magnet! So - although eddy currents are not a problem, the Neodymium magnets in the armature actually magnetize the metal, creating a noticeable drag on the machine. It's called "hysteresis," and it's definitely something to avoid in the steel laminates of an alternator. Anyhow...in tests, even after I built a complete windmill from this alternator, it still starts up reasonably well and produces plenty of power, so this setup, although not ideal, still works fine. In the future, I will find better metal to use than bandsaw blade. The main point here is that coiling up thin strips of metal behind the coils makes for a simple solution to the problem of having steel laminates behind the stator coils.



Pictured above you can see the plywood stator, with the steel "laminates" (strips of bandsaw blade) glued into the slot. Each layer of metal should be insulated from the ones next to it in order to preven eddy currents. Eddy currents in a steel core are very low voltage, high current in nature. With that in mind, I assumed that simply the corrosion on the bandsaw blade and the epoxy resin which I used to glue them in would provide good enough insulation. I believe it did - however, it would be "safer" to actually put a thin paper insulating material such as masking tape between each layer of metal banding to ensure that significant eddy currents do not develop.



Above is pictured Ward (my neighbor who we are building this machine for) winding coils on the same coil winder I made for the [wooden alternator](#). Each coil in this machine is 30 windings of AWG 16 magnet wire. The coil winder we used probably wound the coils a little taller than needed, so the unit could be improved by making the coils a little smaller. (In other words, these coils came out about 1.5" wide, and 2.5" tall - there would be less resistance in the stator if the coils were only 2" tall and some wire could have been saved) After each coil is wound, it is carefully set aside to be glued and clamped over the top of the stator at a later time.





Ward works well with his hands, but....the coil winder I made was quickly built, for a different machine and really only meant to be used once. He got a bit impatient with constantly gluing it back together, and its rather crude performance. After winding the last coil he threw it in the stove, so - our next alternator is bound to turn out a little better and we should get through the coil winding phase with hopefully a little more patience left over!





As I stated above, the coils come off the winder in rather delicate condition, and rough in appearance. The next step is to line them up around the stator and put them in exactly the right place. Since there are 18 coils, each one must occupy a 20 degree arc around the stator. This is actually easily estimated by first perfectly aligning the magnets around the armature (the brake disk), placing all the coils down around the stator (pictured above), and then placing the brake disc down over the stator, making sure that there is 1 coil located exactly under each magnet. Sometimes it was necessary to squeeze the coils by hand so that they would fit in the space provided. Once everything is lined up properly, I "tacked" the coils down with super glue so they would stay in their places.



Once the coils are tacked in place, I generously covered them with epoxy and layed wax paper over the top. I took a 12" diameter disc of plywood, and layed that over the wax paper. Then I took the brake disk (which is 11" diameter), centered over the stator, and clamped the whole thing together tightly. It is very important! When clamped, the thickness of all the coils around the stator should be the same. Otherwise, when completed the gap between magnets and coil will be wider in one part of the alternator than another. So, when one side had thicker coils than another, I would simply adjust the clamps until it was about even all around. As it turned out, I somehow missed and one side of this alternator does have coils about 1/8" thicker than another side...but it works fine anyhow!



While I had the glue out, I glued the magnets into the brake disk at the same time. Once the glue set up partially, I removed the matchstick spacers.





Above is pictured the stator, mostly complete, with the coils smashed down tightly and glued well. At this point, I coated the assembly (plywood front and back) with epoxy to weather proof it as best I could. I divided the coils in half, hooking 2 sets of 9 coils together in series and figured I would decide later whether to hook the two halves in series or parallel - this was not decided until a prop was made and I actually got to test it in known windspeeds.





When originally used on the car the wheel hub was in direct contact with the brake disk, which allowed for the brake disk to fit well with the brake caliper and the backing plate.

In this application, the backing plate is replaced by the stator, which is about 2" thick when you account for the thickness of the wood plus the coils! So I had to make a spacer which would allow for the brake disk to sit about 2 1/2" out away from the wheel hub in order to allow space for the wooden stator. Pictured above is that spacer, which I made out of some kind of white plastic that I had on hand (maybe Nylon but I'm not sure). In a bind, it could probably be made from wood - a hard wood like Maple or Oak would probably be fine. A machinist with lots of goodies on hand and a lathe could make it real nicely from Aluminium. If that is not available, it could be made from wood with a bandsaw and a drill press.



Pictured above, all the parts are assembled except for the armature. Note the long bolts sticking through the hub and spacer. These will hold the rotor on, and the armature will not be held down tightly until the rotor is tightened. Although other systems might work, in this case I decided to lightly tack weld the bolt heads to the wheel hub on the bottom, since it would be impossible to hold them with a wrench once the brake disk (armature) was installed.



So that's it, all finished up! At this point it becomes obvious that it will be an effective low rpm alternator. There is slight drag from the hysteresis problem of magnetizing the steel bandsaw blade as described above, but it isn't too bad. It spins fairly freely, and when the leads of the stator are shorted out it locks up and becomes very difficult to turn. When the stator is hooked up with all 18 coils in series, it is easy to spin it up to about 15 volts by hand. Next step is to chuck it in my lathe and get some real test results.





Pictured above is the "test rig." It's somewhat limited by the motor on my lathe - the max speed I could test it at was 500 rpm, and even at that speed it loads up the motor and slows it down. The problem is that my lathe only has a 1/2 hp motor on it. The reason for this is that I run my whole shop off my batteries and a "cheap Chinese" inverter! Someday I'll upgrade to a 1 hp motor, which my inverter should barely run...but for now my tests are limited.

I have an accurate tachometer (a DC generator hooked to a well-calibrated meter), a voltmeter, an ammeter, and a 12 volt battery for performing reasonably accurate tests.





Above are pictured the results. For this test, all 18 coils in the stator are hooked into series. It appears that the numbers (amps into the battery) are climbing quickly above 300 rpm, but unfortunately I could not make tests above 500. As shown in the picture, open circuit voltage is about 1 volt per 12 rpm. Shortly after making these tests, we built the windmill and put it on a "test mast" which was bolted to the front of my truck. In testing it became clear that the unit (with all coils hooked in series) became inefficient above about 30 amps (into a 12 volt battery), so we divided the stator into two sets of 9 coils in series, and wired the two sets of 9 in parallel. In this configuration, we lost very little at low windspeeds (it still put out power at 10 mph!) but saw 60 amps (about 700 watts) into the 12 volt battery at 40 mph. More information about these tests will soon be available on the follow-up webpage about the windmill we made from it!

In conclusion, I think this is a great way to make an alternator. Keep in mind that I put this together as I went, without a plan! Several improvements could be made. As tested, the average gap between coils and magnets in around 1/4"! With better core material and careful attention payed to the thickness of the coils, this gap could be reduced for improved output. Overall it's dirt simple, super strong and the output seems reasonable. The bearings in the Volvo wheel hub are huge, and should last practically forever. The cost? The magnets would run about \$100, the wire about \$40, the glue about \$15, and hopefully a wheel assembly could be had for next to nothing. It's not a bad price for an effective alternator probably capable of 1000 watts. Again, in the future I would NOT use bandsaw blade. The best bet would be to find the very same metal used in motor laminates, although I have a feeling that hot rolled sheet metal is not a bad way to go.

There's a good chance that the steel strapping material used to hold stuff down to pallets would also work fine. Overall, it's a good way to build a tough, useful alternator with minimal tools and highly available materials.

I owe some thanks here for the ideas involved!

Be sure to check out [Hugh Piggot's](#) site. His brake drum windmill inspired me to consider making use of available auto parts. His design is well proven, and probably the most popular "home brew" windmill plan available at this time. Hundreds have been built. He has recently been building a different sort of "radial" alternator - visit his page to check that out!

Dragon's [Wind Stuff Now](#) page has a very similiar 3 phase radial alternator, with details about the construction. His page is full of useful formulas, products and information, and his correspondance with me has been helpful and inspiring! Be sure to check it out!

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# The New Wind Generator is Flying!!!



**Yeee-HAH!!!! This may be a world record in fast recoveries...this mill smashed to the ground during erection less than 24 hours earlier, destroying the rotor and base hinge, and damaging the pole. After a 6-hour late-night rotor-building seminar and a bit of welding, it lives again. Of course, the erection of this wind generator immediately caused a complete, still, dead calm. And we worked all morning preparing it, freezing our \*\*\*es off in 40 mph winds! Launching a new wind generator seems to cause an abrupt stoppage of wind, no matter what the weather forecast says.**

**[See the whole sorry fiasco of the smashed windmill HERE!](#)**

**A new series of pages is in progress detailing every aspect of the design and construction of this new machine. Watch the Otherpower message board for details! We got 60 amps at 40 mph in tests...and a good 20 amps at 25 mph. The alternator is based on a Volvo disc brake, it has 18 homemade coils of #16 AWG magnet wire and 18 Neo magnets. The machine is on a 35 ft steel pipe mast, with an 8-ft. dia. 3-blade rotor.**

**MORE SOON!**

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# OOOPS!

## Always remember to tighten your cable clamps!

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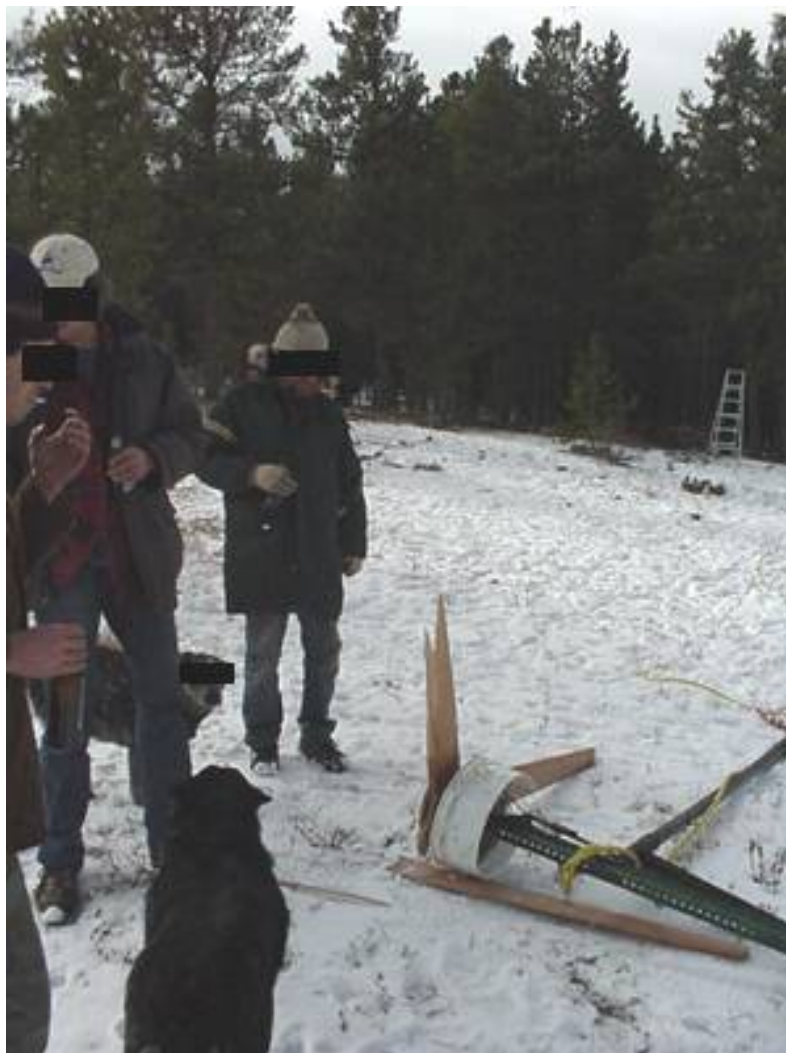


**The windmill ready to be raised...everything looks A-OK. The mast is 35 feet high with 3" steel pipe at the base, and a 1 1/2" pipe jin pole with a brace welded to the bottom. The windmill has an 8 foot 3-bladed rotor, powering our homemade permanent magnet alternator (in tests, 60 amps in 40 mph winds!).**

OOOPS - Always remember to tighten your cable clamps!



**We just about got it up! Note that the end of the jin pole bent from the stress, but held on past its point of maximum stress, enough to get things vertical. Everything appears to be going good, BUT SOMBODY FORGOT TO TIGHTEN THE CABLE CLAMPS ON ONE THE SIDE GUY WIRES. Everything tilted hard to the side opposite the unfastened guy wire, and the mill came crashing to the ground. No injuries to humans, dogs or trucks.**



**Fortunately, there was no damage to the alternator itself. The cowling, made from a plastic bucket and wooden spacers, saved the alternator's stator coils! Ward's nice rotor, lovingly crafted with flawless, knotless and very expensive Douglas Fir and finished with about \$40 worth of cyanoacrylate, is toast. Though one blade did survive!**

**The moral of the story?** Double check ALL your guy wires, anchors and cable clamps before starting to erect a windmill! And don't drink beer during or immediately prior to the erection. We plan to sue the breweries involved. ;-)

We are starting into another set of blades tonight. We plan to fix the hinged base (it was ruined also) tomorrow by drilling into the concrete and pinning in a new baseplate. So maybe in the next couple days we'll be able to try again!

**UPDATE! [We got it raised and flying. See the pictures HERE!](#) The problem now is that the wind has quit entirely, despite forecasts of 60 mph winds. Maybe if we loosened the bolts that hold down our solar panels, the wind would come up again!**

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# Wooden Low-RPM Alternator

After building the [all wooden windmill](#) I felt inspired to make a larger and sturdier version. The following page offers a brief description of building the alternator and testing it. I designed this alternator WHILE I was building it, using mostly intuition and working around supplies available. Undoubtedly many improvements could be made. If you have any ideas or thoughts about this, please share with us via email or our discussion board!

[Para Español, traducción de Julio Andrade.](#)

**Initial test results--wired in series, reaches 12 volts for charging at 120 rpm, with 6 amps charging current at 300 rpm. Wired in parallel, reaches 12 volts at 240 rpm, with 12 amps charging current at 350 rpm. At 500 rpm it produces about 500 watts. Unfortunately this is the limit of our current testing rig--we need to build a bigger one. More tests and a chart to come!**



## Parts and supplies used

To build the alternator I used the following:

10" long piece of shaft, 1/2" diameter.

2 1/2" inner diameter ball bearings

18 surplus NdFeB rare earth magnets

3/4" plywood

5 Pounds 18 AWG magnet wire

1 1/2" drywall screws

3" deck screws

Epoxy

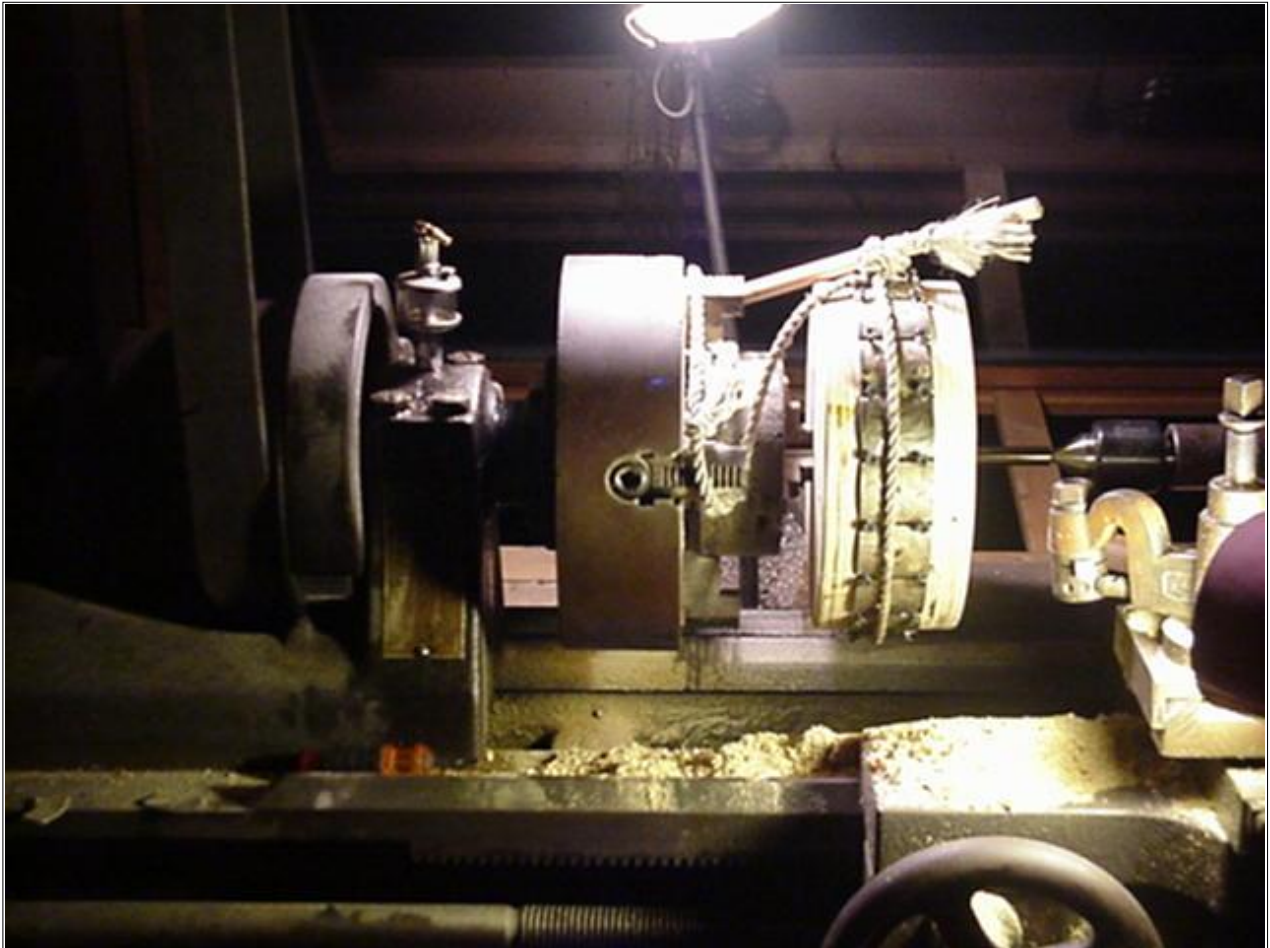
Super Glue

Fiberglass resin for final finishing



I cut out 5 plywood disks on a bandsaw, 9" diameter. In the center of each disc I drilled a 1/2" hole. These disks are laminated on the shaft to build up the armature. In order to hold the armature securely to the shaft, I drilled a hole about 4" from one end

1/8" diameter, and inserted the a pin, 4" long. On one disk I routed a slot, 4" long and 3/16" wide, 3/16" deep, to accept this pin so that it would be locked to the shaft. I generously coated the plywood discs with wood glue and clamped them together on the shaft, then screwed them together with 3" wood screws.



On the metal lathe (a wood lathe would work fine) I evened up the armature so that the diameter is approx 8.75". In the center of the armature I cut a slot 3/16" deep exactly wide enough to accept the magnets (1.74"). The magnets are laid in with alternating poles facing up. This particular magnet is available with either North or South on the outside. This alternator requires 9 of each variety. The diameter is such that the magnets stick out from the wooden surface of the armature, so the total diameter, magnets included of the armature is just short of 9.25". These magnets have an arc much more acute than that of the armature, so it looks kind of "lumpy"! I don't think this is a problem. Custom magnets simply cost too much, it often pays to work with that which is available. In order for 18 magnets to fit around the armature, there is a small space between each magnet (approx 0.10"). For spacers, I used 1" drywall screws, which were removed after the glue dried. Since they are tapered at the top, simply screwing them in deeper provides for a larger gap between the magnets, so...with a little patience, it is easy to adjust the screws and get the magnets evenly spaced around the armature.





Once all the magnets were pressed in place, properly spaced with screws, I glued them in with epoxy. As a clamp, I simply tied a rope around the magnets and tightened it with a stick through the knot. When the glue started to set up hard, I removed the screws and applied a new coat of glue over the entire surface of the alternator. This not only aids in holding down the magnets, but it will protect the alternator from moisture.



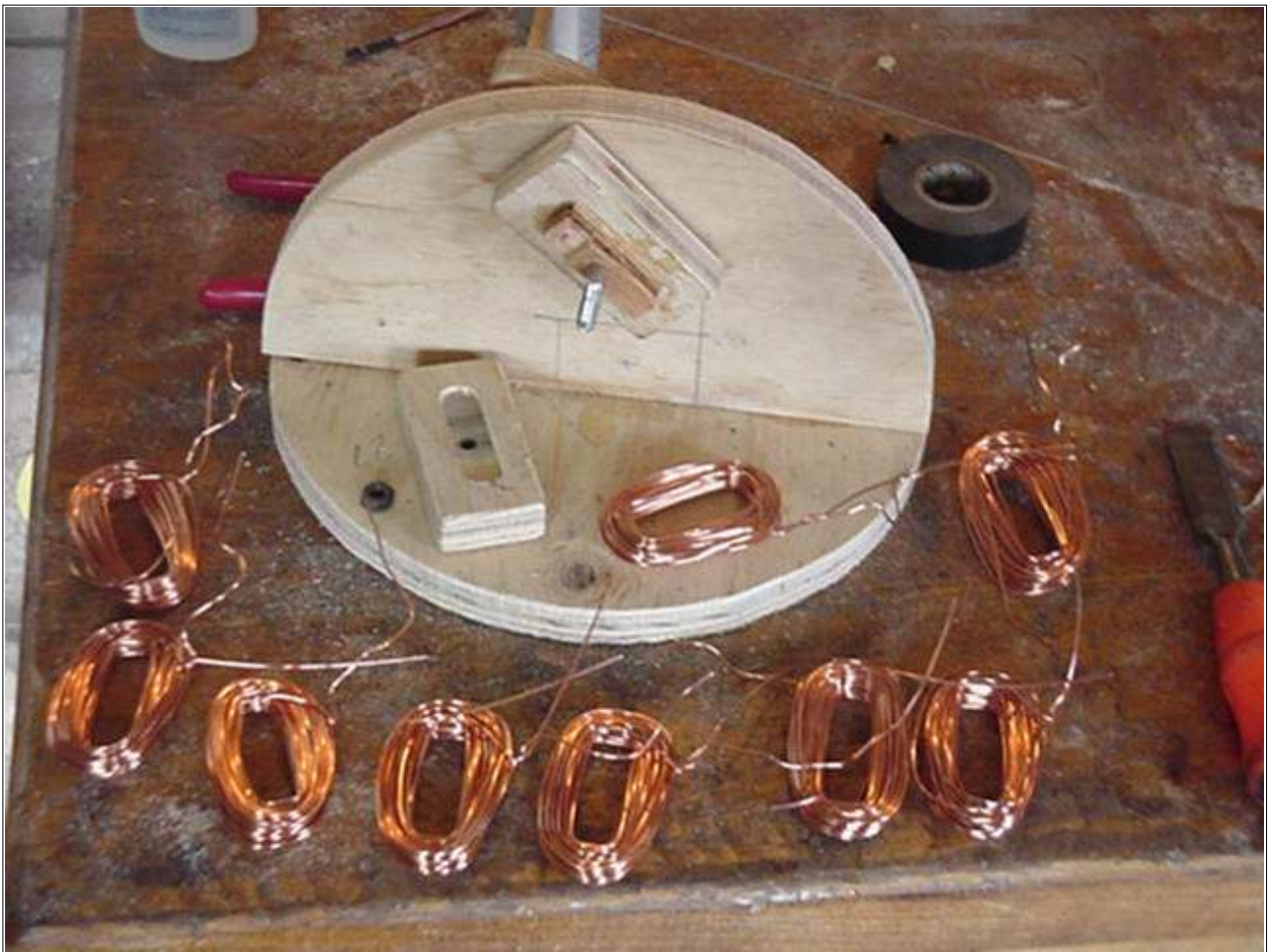


The stator (that part which will eventually hold the coils of wire) is built up of 3/4" plywood. The inner circle has radius of 5", which leaves room for coils between it, and the armature. The magnets protrude from the wooden alternator approx 1/8", so this allows for coils to be approx 3/8" thick and have close clearance with the magnets. A very small gap between coils and magnets is important, especially if the coils do not have a ferrous core. I cut pieces to build up the stator from the plywood and glued them together, clamped them tight and screwed them together with 1 1/2" drywall screws. Each piece is made up of 3 laminates, for a total thickness of 2 1/4".



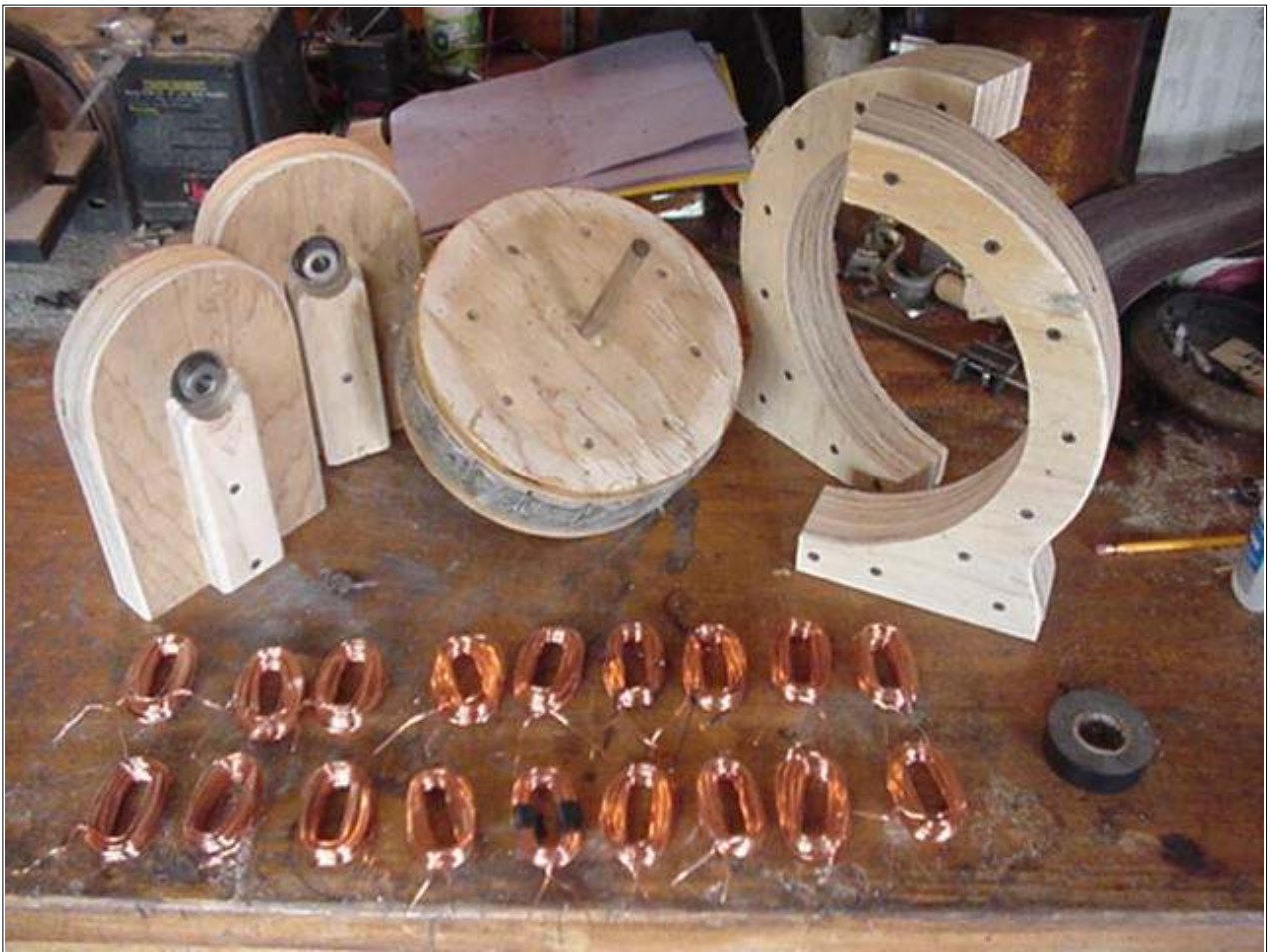
The shaft is supported by pillow blocks, also built up from 3/4" plywood pieces. I cut holes with a 1 1/2" hole saw to accept the bearings. Of course, the bearings have 1/2" inner diameter to accept the shaft. The outer diameter of the bearings is roughly 1.6" inches - a very tight press fit into the holes in the plywood. I coated the outside of the bearings with epoxy and pressed them in with an arbor press(a vice, or hammer should work fine too), as deep as possible so that I could still tighten the set screws. I was pleased with how well they fit the holes, and how straight they pressed in. I believe I got a little lucky here!





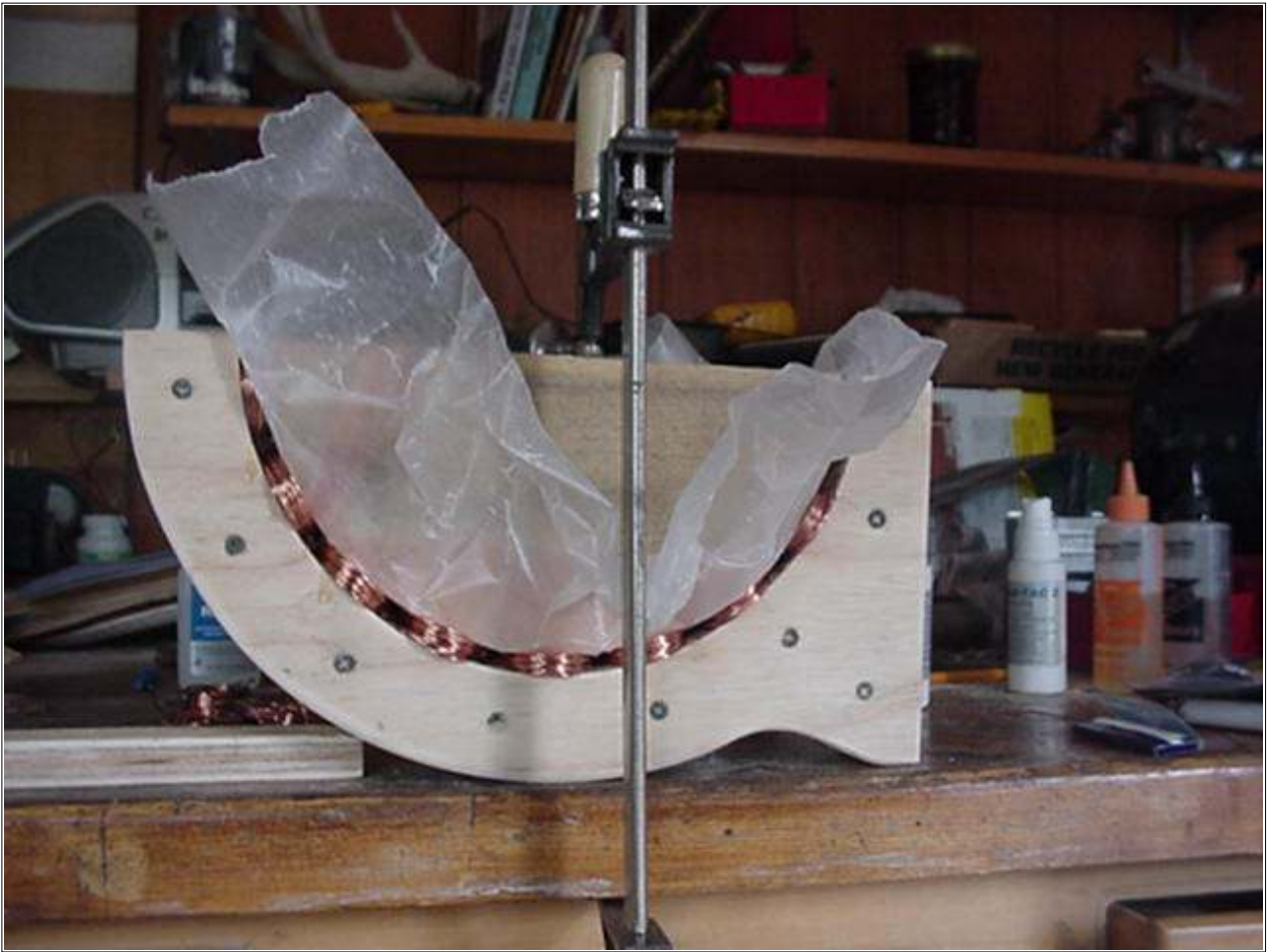
I built a simple coil winding device to speed production. It has a crank on one side, and a spool on the other. I used a long bolt as a shaft, and the end of the spool is held on with a nut. Each coil is wound on the form, then the nut is removed...so that the end of the spool comes off and the coil can be removed. It went very quickly! Since the alternator has 18 magnets, I wound up 18 coils. The coils are of AWG 18 enameled magnet wire, each coil has 50 wraps. The coils are approx 2.75" X 1.5" on the outside, and the hole in the middle is approx .5" X 1.5"....as per the size of the spool on the winding machine. I thought this was an appropriate size, considering the size of the magnets. Really - it's somewhat of an intuitive guess...

When the coils come off the winding machine, they are fairly loose, and delicate. I handled them carefully before gluing them into the stator laminates.



In the above image you can see all the parts of the alternator ready for finishing and assembly.





For the first step in attaching the coils (not shown in any pictures) I measured out their proper location (they must be spaced evenly) and lightly tacked them in with super glue. Then I generously coated them with super glue (epoxy would also work fine...it would just take longer), covered them with wax paper, and clamped them in using a form I cut from wood. This form forces them into exactly the right diameter to fit around the armature. Once the glue was dry, I removed the clamp, the wooden form and the wax paper, and was pleased to find they fit very well! In the future, I may fill the center of these coils with a mixture of magnetite sand and epoxy - this would help conduct the magnetic field through the coils, and increase the current output of the finished alternator. For now, I'm very curious to find out how it performs with nothing but air between the coils. There is also an advantage to "air cores" inside the coils--the alternator will not cog at all until under a load, which eliminates much vibration and will help the alternator start spinning in some applications. Cogging is a problem in permanent magnet alternators, especially for wind generators.



After the coils are glued in, all that remains is sanding and finishing. Thankfully I had some help from our head of research, development, and particle physics....Maya!



All the parts were generously coated with fiberglass resin - kind of like epoxy, it makes a thick, plastic coat and should make the alternator practically waterproof for years to come. The only drawback...it stinks real bad! You can get this stuff at any hardware or auto parts store. Difficult to see in this picture, but...the base of the alternator has wooden dowels in it, so that all the parts can be exactly located in their proper position whenever the unit is assembled. This allows for easy assembly and disassembly. When making the base, I put the parts together so that it spun easily--the coils were as close as possible to the magnets, and nothing rubbed. Then, I tacked the whole alternator together lightly with super glue and drilled 1/4" holes up from the bottom of the base into the pillow blocks, and both stator halves. I then glued into the base 1/4" dowel pins which assure that whenever assembled, all the parts will fit exactly into the right places.



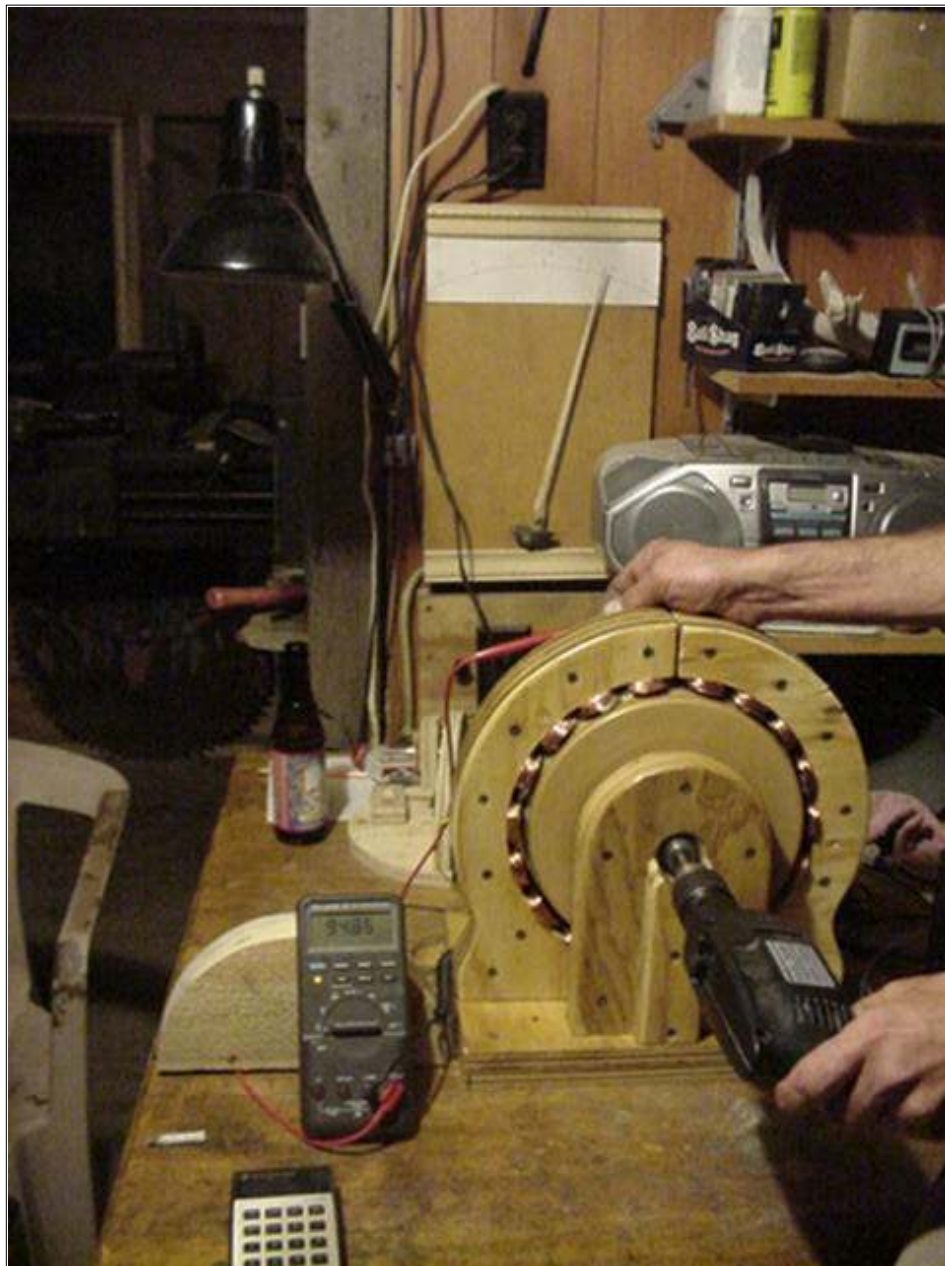


After the fiberglass resin set up, I assembled everything on the base. Everything fit well--the clearance between coils and magnets was excellent. Once all looked good, I screwed it together from the bottom with 3" deck screws. It seems very sturdy--nothing moves, rubs or vibrates that's not supposed to! At this point I wired all the coils on each stator half into series. The coils must alternate in the direction they are wound. It can seem confusing! Trial and error isn't the worst way to be sure it's properly wired. Simply spin it slowly by hand, and start measuring voltage, starting with one coil, and being certain that the voltage increases with each additional coil which is wired in series.



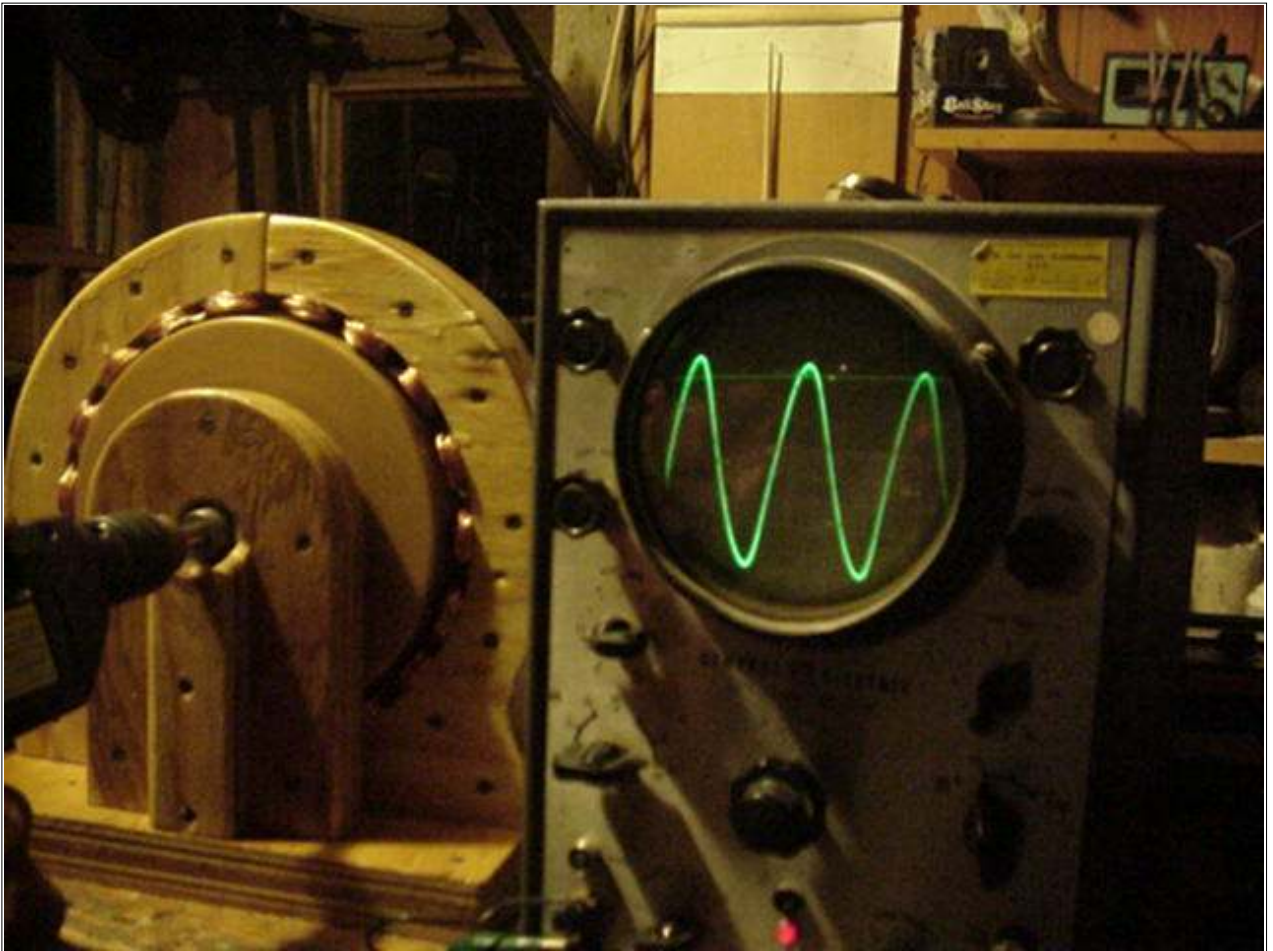


All the coils on each half of the stator are wired together in series. At that point, each half can be hooked in either series or parallel to most appropriately match the load with the alternator. Above is pictured the good old Taste Test, a sure fire way to test any battery, or generator, as long as it stays below about 10 volts! (otherwise it hurts--don't try this at home!)



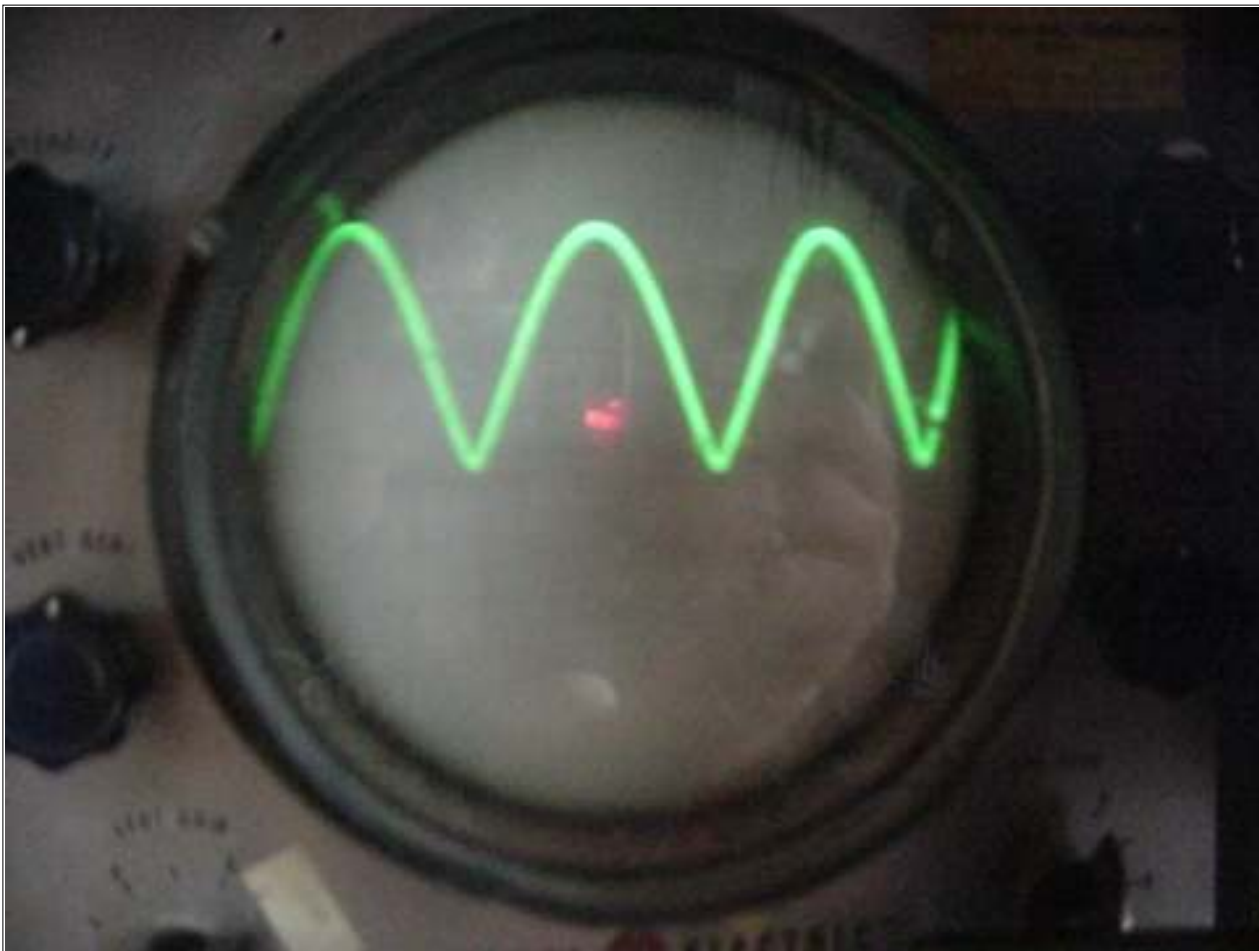
I don't have proper equipment to fully test this alternator. The best tool I have, since it will not fit on my lathe, is a hand drill with a 1/2" chuck. With a meter which reads frequency, I am able to accurately tell rpm. When both halves of the stator are hooked in series, the alternator will reach 12 volts at approximately 120 rpm. At approx 300 rpm, it charges approx 6 amps into my batteries (this is the limit of my hand drill!).

When I hook both halves of the stator in parallel, it hits 12 volts at approx 240 rpm, and at approx 350 rpm it's charging slightly over 10 amps into my 12 volt batteries. In the picture above you can see the frequency meter, and the large wooden ammeter on the wall. Clearly the limiting factor here is the power of the hand drill. I'll post a chart when I build a good alternator test machine and get some better results! All things considered here, I'm very pleased with the results.



I was curious what the output would look like on the scope, considering the close proximity to one another of the magnets, and the "lumpy" armature. Keep in mind, what is shown above on the scope, is Alternating Current, directly out of the alternator. In order to be useful in battery charging, it must be rectified into Direct Current. To do this a "bridge rectifier" (a simple arrangement of 6 diodes) must be used.





Shown above is the "rectified" output of the alternator. This is useful for battery charging, but - you'll notice how "lumpy" the Direct Current looks on the scope. Although this rarely causes problems, occasionally this sort of Direct Current will cause problems with radio and television reception (you'll hear a whine). To help smooth out the Direct Current available here, a capacitor can be used.





See above the nice, flat DC output after a capacitor is hooked up between Pos and Neg outputs.



Just for fun...I hooked it up to my stereo! This is a CD player, hooked to a '50's Fisher vacuum tube preamp, hooked to a Dynaco Stereo 70 vacuum tube power amp. If you add up the numbers on the back of these...it totals over 300 watts. To my amazement, this wooden alternator lit up the tubes and the CD player...played music and sounded just fine, when powered by the electric hand drill! The hand drill is rated to draw maximum current of about 3.5 amps...so this is a reasonably efficient transfer of power!

In conclusion... This whole thing took about two full days time, about \$100 in magnets and \$30 in magnet wire. (The shaft and bearings I had on hand) Not a bad price for an effective low rpm alternator. It was also fun, and the information obtained is useful. Using premade pillow block bearings would probably be wise, especially if one intended to really use the alternator! There are certainly easier ways to build alternators which would be just as, or even more effective. To build this really requires a lathe, bandsaw, drill press...etc. If one built a similiar machine using a disk type armature instead of a cylinder, it would be much simpler. I stuck with this design only because it seemed fun, looked neat - and was based upon my earlier wooden windmill. Keep your eyes peeled for our next alternator..it'll be even easier to build and much more effective. Overall though, I'm surprised with the performance fo this unit, considering it contains nothing but air between the coils and wood all around. Wood is a lousy conductor of magnetic fields! **Just goes to show...it doesn't have to be optimal, it just has to work!**

It seems that there may be some argument for not worrying too much about steel

laminates, or ferrite cores in the coils, and simply adding a few more magnets and wires and settling for a somewhat larger machine. One immediate benefit of having "air coils" is obviously the complete lack of cogging, which, if used in a windmill should result in a machine that starts very easily. I have no idea at this point what the maximum output of this alternator might be, but preliminary tests are impressive in my opinion! One could build a fine wind or hydro plant with such a machine. As with all our other alternator "experiments"...it is truly the magnets which make it possible!

Without these super high quality magnets, this alternator would not be nearly as effective. With normal ceramic or AlNiCo magnets, one would have to go to much greater lengths to build a alternator which efficiently produces this kind power at such low rpm.

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# Regulator for Permanent Magnet Alternators



[Click the Photo](#)

to check out a 15-second MPEG movie (343K) which shows the regulator in operation. Watch close, and you'll see the sudden change on the voltmeter as the regulator changes the wiring of the stator from series to parallel. This is clearly visible both on acceleration of the alternator and deceleration.

This page results from an effort I made to regulate the voltage from permanent magnet alternators. In making wind generators it is important to start with a good low-rpm generator/alternator. Generally, good low-rpm generators require permanent magnets to supply the field. The main reason for this, of course, is if the field of a generator is supplied by electromagnets, they require electricity (inefficient) and simply the space required by copper wire can make it impractical. By using permanent magnets, it is possible to have many strong magnetic poles, packed into a



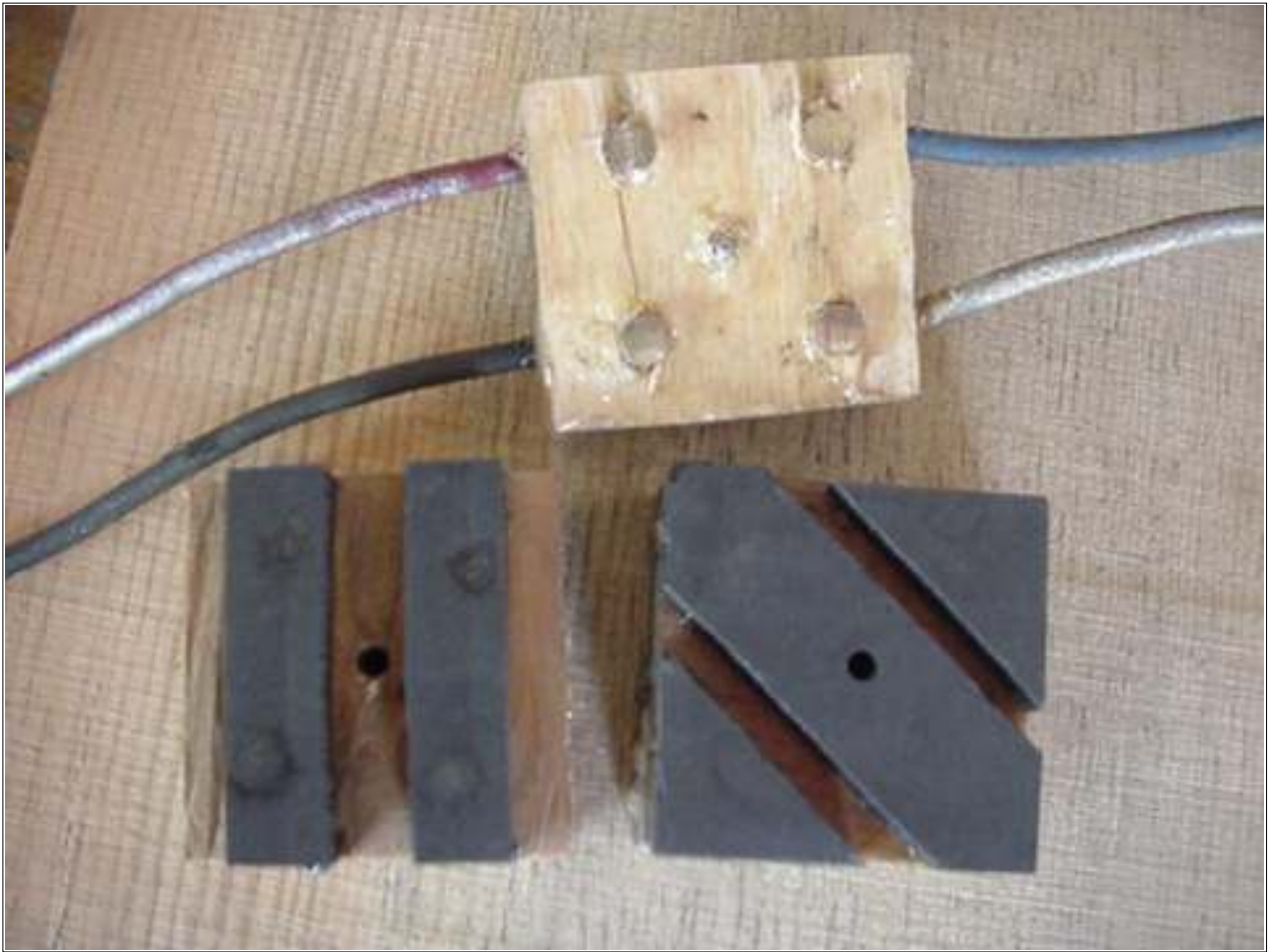
small space so that fairly low rpm can offer a fairly high output voltage.

The disadvantage of permanent magnet generators is that they are difficult to regulate over a range of rpm. In a normal generator or alternator, the voltage is regulated easily, by adjusting it to the field windings. In a permanent magnet machine, the strength of the field is predetermined and fixed simply by the strength of the permanent magnets used. When charging batteries, as in the case of most wind generators, the machine might be very efficient at a certain speed, but at high speeds most of the work done by the propeller is wasted by simply heating up the windings in the generator! For example, in this alternator which I used in this experiment, if all the coils are hooked into series, at 120 rpm it hits 12 volts, open voltage. At 1200 rpm, it's around 120 volts! When charging batteries (12 volts) it runs fairly efficiently at 200 rpm charging around 5-6 amps into the batteries. At higher speeds, it charges only a little more, and most of the work into the shaft of the alternator serves only to heat up the windings in the alternator.

If the alternator could be wired differently at higher speeds only, then it could serve efficiently at a wider range of rpm. This voltage regulator works in the following way.

The alternator stator is divided into two halves. Depending upon the speed of the alternator, the two halves will be hooked either in series (at low speeds) or in parallel (at high speeds). Such a regulator on any permanent magnet alternator could increase the usable output significantly at both low and high speeds. There is certainly argument that "simpler is better" and it may well be worth the lack of trouble to leave certain machines completely unregulated in the spirit of simplicity and reliability, but - I've thought about this problem for a while since making windmills and this is one possible alternative.

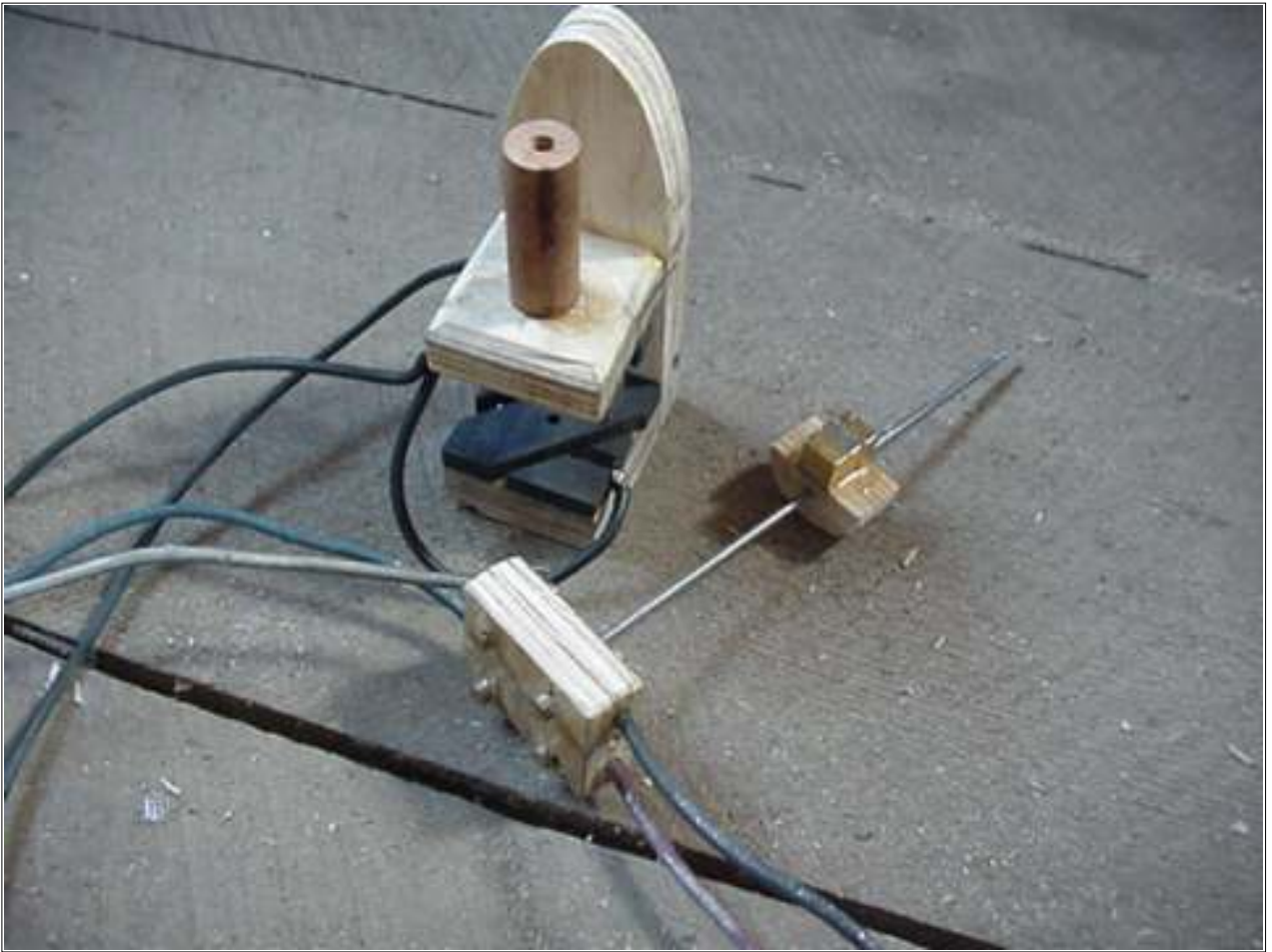
The regulator is really very simple. It consists of a set of contacts which in one position wire the stator in series, and in the other wire the stator in parallel. The whole thing is controlled by some magnets, in close proximity to an Aluminium (Copper would work even better) disc which is mounted to the alternator shaft. Of course, magnets are NOT attracted to Aluminium (or Copper), but...both are very good conductors. Spinning the disc in close proximity to magnets generates current, which is shorted out and has no place to go. This is called the "Lenz Effect." The magnets are pulled (and repelled) by the disc. It is the "pulling" force which is used here. Once the alternator is going a certain speed, the magnets and the electrical contacts they are attached to are physically pulled up to connect to the contacts above - thus re-wiring the two halves of the alternator stator into parallel, halving the voltage and doubling the current. This works exactly like a mechanical Relay, except it is triggered to switch by the Lenz Effect instead of an electromagnetic coil.



Above are pictured the contacts involved. They are carbon graphite, the same stuff they make motor brushes out of. I cut out the pieces on a saw, and they are arranged to hook two separate lines (the halves of the stator) into either series (for low rpm) or parallel (for high rpm). The piece with the brass contacts is the moving part and hooks directly to the stator. All the parts are made from plywood. The carbon graphite pieces are super-glued on. I drilled holes in the brass contact and pressed brass rod through them. All were sanded flat with the belt sander. It's very important that they be flat! This would've worked a lot better had I made the brass contacts somehow spring loaded, or flexible, so they could always be assured of making good contact with the carbon. As it is, I'm surprised that it works at all...it actually so far, works very reliably.



Again, a picture of the moving contacts. Notice the magnet in the center of the block. The rod (1/8" steel) that serves to move the block up and down, is attached **ONLY** by the force of this magnet. This allows for some flexibility between the block and the rod, to aid in making good contacts between the brass and the carbon. For my first try, I drilled out the block and the rod fit tightly into the brass contact block. I had real troubles getting it to work, and this "flexible magnetic coupling" solved the problem.



Above are pictured all the parts of the regulator, it's really very simple!





The photo above shows the regulator mounted to the back of the alternator. The Aluminium disc fits just perfectly between the back of the regulator and the magnets. The regulator works pretty well, though lots of little things could be done to adjust it. Changes which would affect performance include: More or less weight on the moving parts, a thicker(or thinner) Aluminium disc, more or less magnets near the disc, and distance between the disc and the magnets. Another thing I did to it (not shown in any pictures) is include a small magnet and a washer which it was attracted to, which serves to pull down on the moving contacts. It helped to insure a tight contact at low rpm, and also a much faster switching action! It actually makes a fast clicking sound, and it never floats between the contacts. As it is adjusted now, when the altnerator comes up from 0 rpm the stator is hooked in series, until it hits around 300 rpm (about 30 volts. It then changes to parallel, and the voltage drops to around 15 and available current doubles. The curve is different on the way down, due mostly to the magnet which holds the bottom contact tightly together. It stays hooked in parallel down to about 10 volts, and then switches back to series and the voltage jumps back up to around 20.

Again, there are a bunch of adjustments that could be made. Simple improvements should definitely include some spring loaded contacts - or some sort of flexibility there. Although my contacts worked in testing, slight wear could render the contacts I made useless. I believe that for currents over 10 amps they should be larger. I was surprised at how hot the carbon graphite got when charging my batteries at 15 amps! Overall though, I think if scaled up some and well made, this sort of regulator could

squeeze a good bit of extra power out of an otherwise unregulated alternator, giving better startup performance (starts charging at a lower rpm) and better high-speed performance (halving voltage to double current).

I know there are some alternative, solid-state approaches to solving this problem--but they involve high-power semiconductors, which I can't fabricate in my shop! As we learn more about other approaches we will certainly post information and links.

Please let us know via email or our discussion board if you have any ideas or experience with regulating permanent magnet alternators.

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# Wind Generator Testing

There is some advantage it seems to being able to test windmills, close to the ground, and find out exactly their output, and durability. We built a simple bracket of wood, and tied it onto our '30 tudor. This way we could monitor exact windspeed, and take down information. So far we used it to test only a 7' diameter 3 bladed prop, attached to a alternator built from an induction motor. The

results were definitely interesting, and the ride exciting. I didn't feel safe much over 20 mph, at which point the output was about 12 amps into a 12 volt battery. I doubt this prop, or the hub to which it was attached would have held together much past 20. At any rate, it's fun, exciting, and an excellent way to get information about a systems performance. It helps to have a co-pilot to monitor speed, voltage and amperage, and to jot down measurements.



***Do this only on a deserted country road. It would NOT be wise to let anyone pass you, either! Don't be surprised at the strange looks you receive, too!***

**[Click here to download a 15 second video of this test.](#)**

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# THE WOOD-AX



We've had lots of response in regard to the [wooden windmill](#) I built last spring. It was built almost completely from wood, and was actually capable of around 100 watts of output. It was good for fun, and demonstration - but only barely produced usable power and due to the wooden bearings and small shaft, it was not really suitable for permanent installation. This page is about a recent windmill I made, mostly from wood, and capable of about 3 times the output. Although mostly wooden, the ball bearings and thicker shaft should allow it to stand up to the elements for some time to come! The alternator is of an axial design. It's a smaller version of the [VOLVO DISK BRAKE ALTERNATOR](#) I built in the fall of 2001. It produces 200 watts in a 30mph wind - maybe not the most efficient wind generator in the world, but nice, simple and reasonably effective!

[Para Español, traducción de Julio Andrade.](#)



## Stuff I used

12" long 3/4" shaft

5 1/2" diameter steel gear for the armature

2 3/4" ball bearings on pillow blocks

AWG 18 magnet wire - about 2 pounds

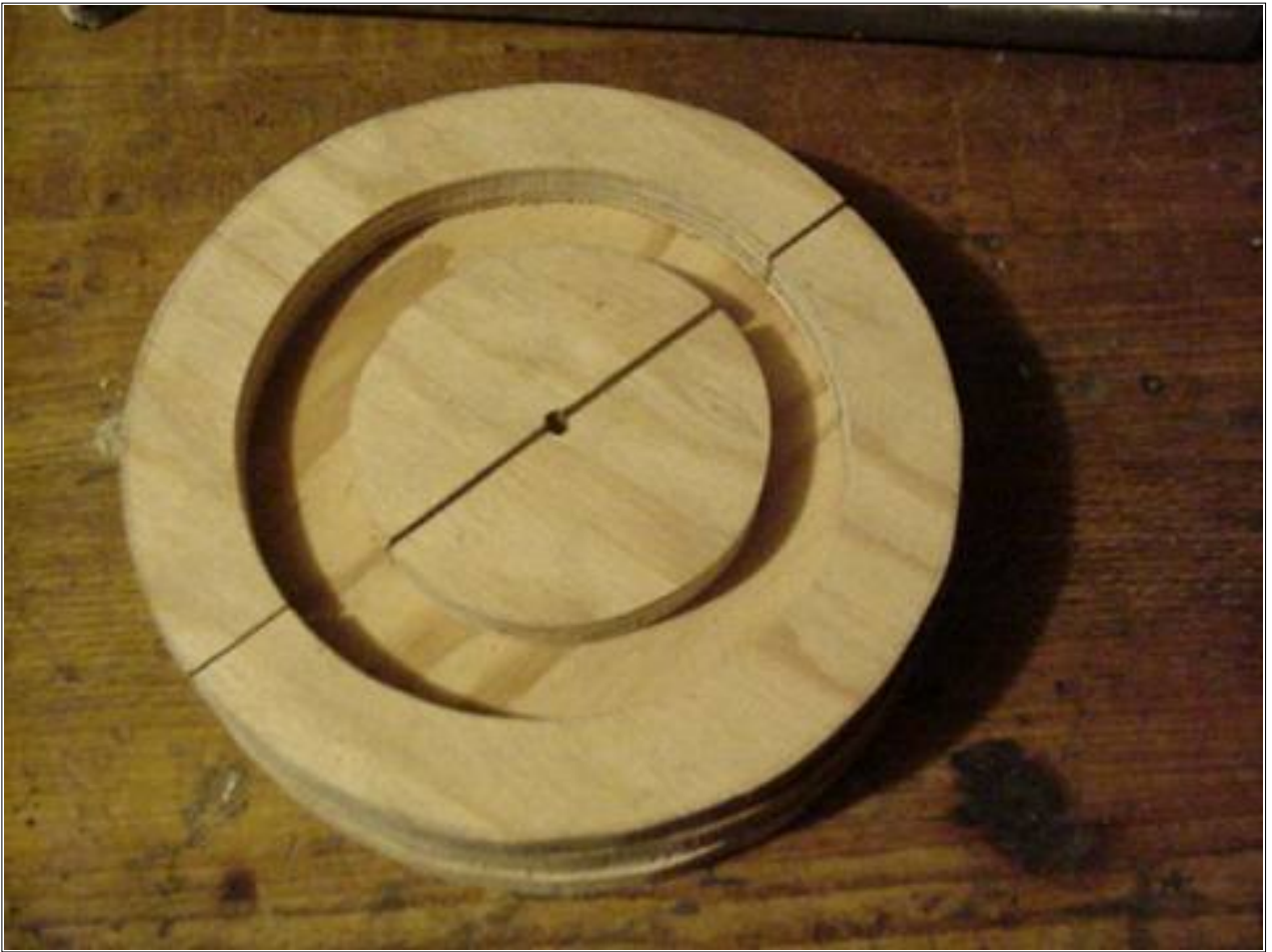
12 NdFeB magnets, 1" diameter X 3/8" thick

Some plywood and other lumber

lots of epoxy, wood screws and linseed oil



I cut a slot in the gear 1" wide, and about 1/8" deep to hold the magnets in. The magnets must be evenly spaced around the circle, and once they were, I glued them in with epoxy. This is very similiar to the Volvo disk brake alternator I made - so check that page out for more detail. The polarity of the magnets around the circle alternates, so each magnet has the opposite pole up as its neighbor.



The stator (part that contains the coils and does NOT move) is made up from plywood laminates. It includes 2 disks, each 6" diameter with a 1" hole through the center (to allow the shaft to pass through). There are also semicircular pieces which sit on the top to provide a cavity for the steel laminates to be glued in. The cavity for the laminates has a rough inner diameter of 4.5" and outer diameter of 5.375" - basically, it is immediately behind of the ring of magnets on the armature and a hair less than 1" wide.





Show above is the plywood stator, glued, and screwed together. You can clearly see the cavity into which the laminates will be glued in. The laminates are made up of 1/2" wide strips of 20 gage cold rolled steel sheet metal. The strips I used are 4' long, and before installing them, I covered 1 side of each strip with tape so that each piece would be insulated from the one beside it! This is very important to reduce eddy currents.



Pictured above you can see the stator, with the laminates glued in. I glued the strips in with epoxy, and when I could no longer fit 4' long coils in the slot, I started cutting shorter segments and tapping them in with a hammer. Unfortunately, gluing these in with epoxy is a nasty, sticky messy job, and I wish I could find a "nice" way to do it - all I can say, wear some rubber gloves and don't try gluing these in until you have a lot of patience! After the laminates are glued down, it is important to cover the whole surface of the laminates with a coat of epoxy. This provides some insulation between the laminates and the coils and makes it less likely that the coils should short out to the laminates! If 2 coils shorted out to the laminates - in the process of gluing/clamping them down - it would ruin the alternator.



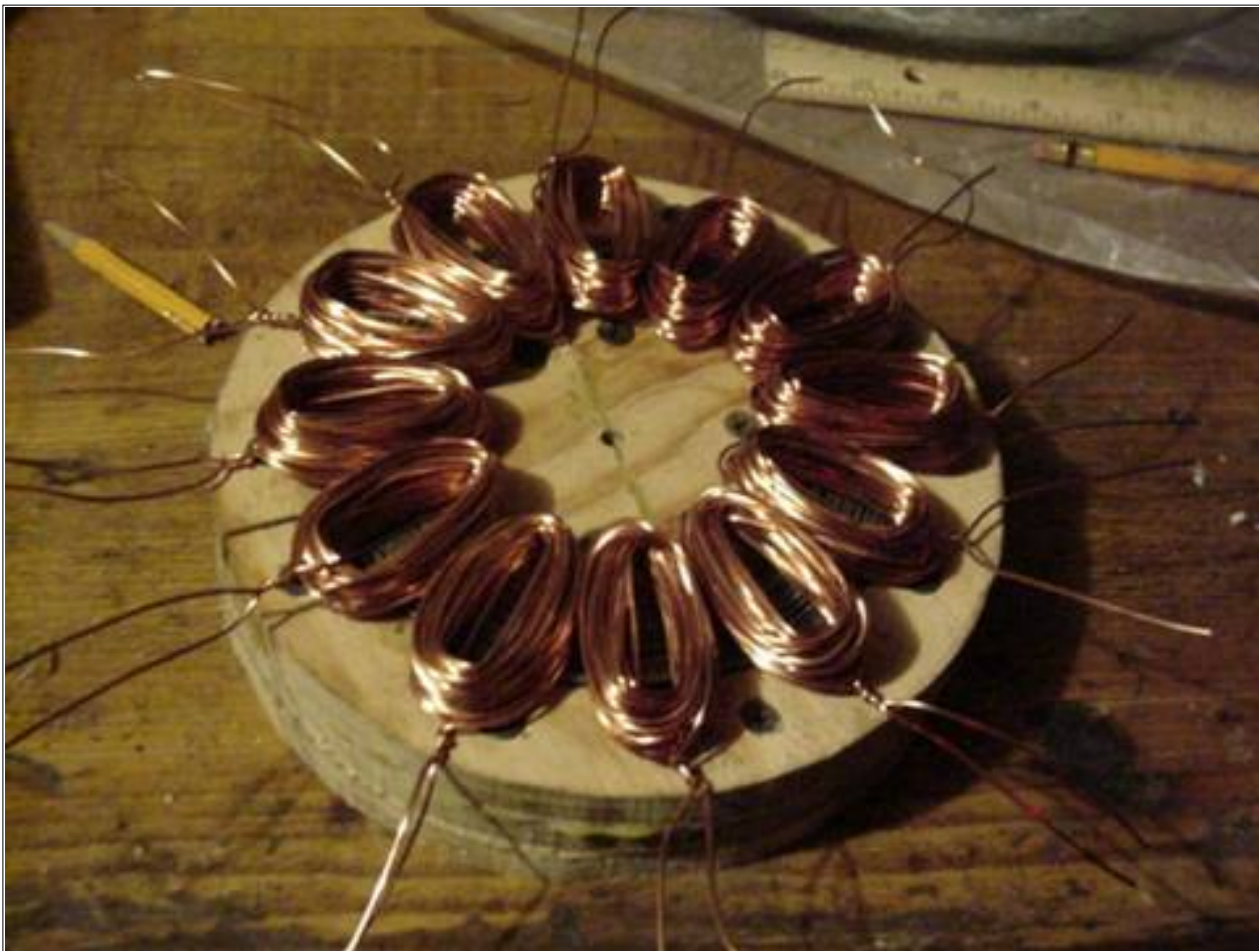
The coils are glued (with epoxy) on top of the stator - right over the top of the steel laminates. Before making the coils I made a very simple winding form - simply a handle, with a small plexiglass form on top (where the coils would be formed), and a cap, which is held on with a nut. I could hold it in one hand, wind the coils with the other, and when the coil is done the top is removed so the coil can slide off.





Above is shown the same coil winder with a finished coil on it. Each coil is made up of 40 turns of AWG 18 magnet wire. Once the coils are finished, I twisted the ends tightly together before removing them from the winder.





The coils are layed out in their places on top of the stator. It's very important that they be in exactly the right spot. One could lay out with a pencil exactly where they go, but I simply put a coat of epoxy down, lay out the coils as shown above, and then put the armature over them and carefully line up each coil with the magnet above it. This is not the most precision way of doing things - but it's quick, simple - and I've had fine luck with it so far. Once the coils are tacked in place, they are generously coated with epoxy. I cover the whole stator with wax paper, and clamp the coils down very hard - the point being to make them as thin as possible, as the gap between magnets, and the steel laminates behind the coils must be kept to a minimum! In the case of this alternator, the coils were smashed to about 1/4" thick. The thicker they are, the less effective the alternator will be, and a little difference in coil thickness will result in a big change in alternator performance.



Once the coils are glued down nice and flat and thin - the alternator is pretty much finished except for the base. In this case, the windmill is made from solid walnut, about 2.5" thick and 6" wide. The pillow blocks are bolted down to it, and the stator is glued, and screwed to the front of it. The shaft passes through the stator, and the armature is set on the end. It's important to keep in mind that the armature is full of very powerful magnets, and it's attraction to the steel laminates behind the coils (or anything else made of iron or steel) is very strong! So - the shaft must first be tightened down at the ball bearings. Then, a spacer (I used a compact disk) should be placed over the coils so that the armature can never touch them. Then, the armature is placed on the shaft, up against the spacer and the set screws tightened. Once everything is tight, then the spacer can be removed. Again - I used a compact disk, so the gap between the magnets and the coils just over 1/16". The gap must be kept as small as possible. Once all this is together and tight - it should be possible to test the alternator! One should easily be able to spin it up to around 6 volts by hand. Although the alternator is functional - it's not quite ready for the abuse a prop would put on it. Some further insurance should be added to make sure nothing can move - set screws are not enough! In my case, I welded a small tab on the shaft just in front of the rear bearing so the shaft could not be moved back, and I welded the armature (The gear) to the front of the shaft. These were light, "tack" welds. A better job would be to use key slots and keys, and make spacers - although welding is quick, easy - and it still allows for complete disassembly of the machine. Should the shaft need to be seperated from the armature, the welds are such they could easily be ground off.





The prop is a simple "two blader", 4' long and pitched 5 degrees at the tip with a likely looking airfoil on the back side. Again - I'm no expert at prop design, seems like everything I put up works reasonably well though. Two blad props are quick, and easy. This one is made from a board 1" thick and 6" long, made from lodgepole pine. The blades are 2" wide at the tips, 4" where they meet the hub, and the part in the middle that bolts to the hub is 6" wide. The picture above hopefully explains this.



Check out some of our other wind generator pages for a little more info on prop making! Or...for a lot more info - find our links page and check out Hugh Piggots website! Again, this prop is pitched 5 degrees at the tip, and as steep at the hub as a 1" thick X 4" wide piece of wood will allow! (the wood I started with is 6" wide, but only at the hub, as soon as the "blade" starts - I cut it down to 4". Most of the blades are quickly knocked out with a power planer - or a hand planer, but near the hub it is necessary to chisel as a planer will not fit in there! I make lots of relief cuts with a handsaw, down to the depth which I must chisel, and the material comes off quickly and easily.

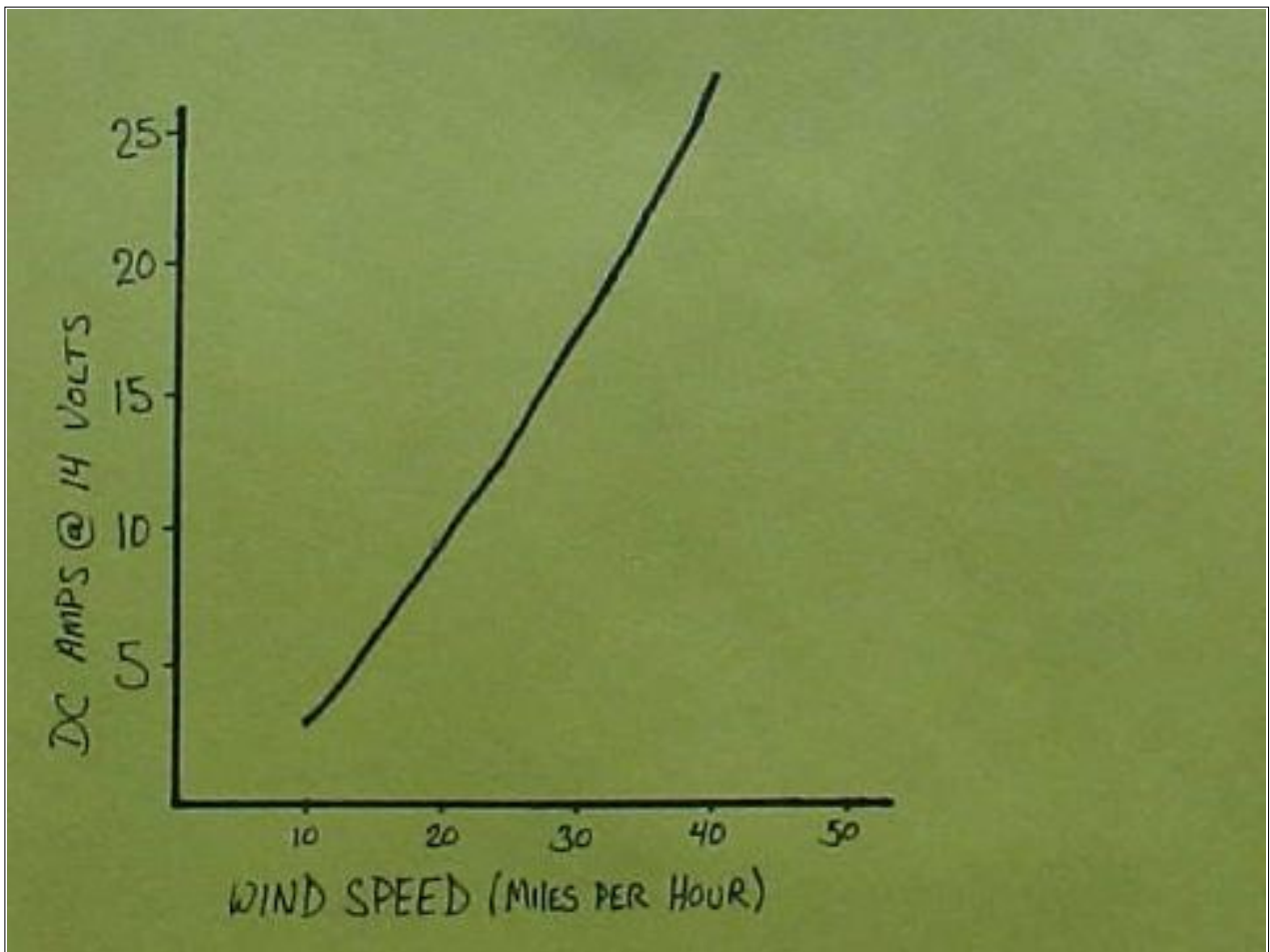
I drilled and tapped the armature to accept two bolts, with which the prop would be bolted down. The prop should be balanced well to avoid vibration, which would result in power loss and stress to the whole machine. A small 2 blade prop is easily balanced by simply hanging it from it's center. It will be obvious if one side is heavier than the other, and material should be removed until both sides weigh the same. Once balanced, the prop, and the rest of the wind generator are coated generously with linseed oil. It may not be the best finish, but I have lots on hand...





To test it we simply put it on the mast which I keep mounted to the nose of my '70 F250 and go driving on a still day! We had wonderful results when we tested this, all of our test results came out very consistent - they all fall exactly on a nice curve which we plotted on graph paper. In the truck, we carry a 12 volt battery, a volt meter, and an ammeter. We watch the speedometer, vs system voltage (between 12-15 volts volts when charging) and the ammeter. Here is the bottom line...

It takes about 15mph to get it running, but then once spinning - we could slow down and it would continue to spin and produce power all the way down to a 10 mph wind.



It's a fun little windmill! Nice, simple and small - and actually somewhat useful!  
We're installing this machine at my parents weekend airstream trailer to keep the batteries topped off. It's a good size for a small, remote power system that mostly gets used only on weekends.

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# Science Fair Wind Generators



The frame is made of PVC pipe, the tail from a video game CD, and the rotor from a computer fan. The generator is a small DC hobby motor. It will light a small bulb using an electric window fan for power.

## How to build some very simple demonstrations of wind-generated electricity

**UPDATE 12/2003 -- we have received all kinds of email about this project! Some folks have been successful ([CLICK HERE](#) to see pictures and graphs....) and others have had trouble. In almost all cases the problem is finding a suitable little motor.....if the motor needs very high rpms to generate power, it won't work for this experiment. Testing the motors you have available by spinning them by hand into a voltmeter will give you a good idea of if it will work or not. You want good voltage at low rpms.**

**You might also want to check out our Hamster-powered alternator. Since Skippy the Hamster could only produce low rpms on his wheel, [we custom-built this little alternator](#) to work in the 40-60 rpm range. This makes it very suitable for wind or hydro experiments.**

The intention of this project was a quick, small and easy windmill that would be buildable by a kid with very little adult supervision. It seems to be science fair season all year 'round up here at Otherpower.com headquarters. We get many requests for information about science fair projects,



and hope this page will help kids and adults alike...at heart, all the Otherpower.com staff are kids!

As a result of the experiments, we've come up with a variety of different ideas for science fair projects. The current projects on this page are very simple thanks to the use of small DC hobby motors as generators. The only test equipment you'll need is a cheap DC multimeter, available for \$5-\$15 at Radioshack. These projects are suitable for even a 3rd-grade science project (with adult supervision, of course). We hope to add some more complicated wind projects in the near future, involving more advanced students building their own alternator by winding coils, attaching magnets, etc. For more detailed research information regarding wind power (you'll need lots of background information for a science fair project!) we suggest searching [GOOGLE](#) for 'wind power,' and checking out some of the web pages listed in our [Wind Links](#).

### **The Basic Parts of a Wind Generator**

Even in a giant commercial wind generator that puts out thousands of watts of electricity, the basic parts are still pretty much the same as in a toy wind generator!

- **Rotor**--The blades and hub (the part that holds the blades on), which begin to spin when the wind gets above a certain speed. This is called "start-up" speed. The blades get their energy from slowing down the wind, extracting energy from it. Most commercial wind generators have 2 or 3 blades. Some only have 1 blade, and a counterweight for balance! More blades make a wind generator start up more easily in low winds, and give higher torque but with a lower rotation speed. Fewer blades mean harder start-up, but better performance at high wind speeds and faster rotational speeds. The backs of the blades have an 'airfoil' on them, shaped just like the top of an airplane wing or the front of an airplane propellor. This airfoil provides lift, which allows the blade tips to spin at a speed that is FASTER than the actual wind speed.
- **Generator**--The component that makes electricity when it is spun by the rotor. Some wind generators produce alternating current (AC), in this case the component is an 'alternator.' Wind machines that produce direct current use a 'generator.' In both cases, however, the electricity is produced by magnets moving quickly past coils of wire--or coils of wire moving quickly past magnets. The hardest part of selecting a generator for a commercial OR toy wind generator is the rotation speed required to put out the amount of electricity you need, at a certain windspeed. More on this later!
- **Tail and Yaw Bearing**--To effectively slow down the wind and harvest power, the wind generator must always face directly into the wind. The tail (properly called a 'vane') lets the wind itself point the machine correctly, and the yaw bearing is simply the assembly that lets it rotate.

### **Fan Power versus Wind Power**

The first consideration is, what do you want to DO with the wind generator? For our simple projects here, the objective is to make just enough power to light up a small flashlight bulb using wind provided with a multi-speed electric window fan...since for a science demonstration you'll probably be in a classroom or gymnasium. And of course remember the well-known 'wind anchor' phenomenon--as soon as you erect any size of wind generator, all natural wind will immediately stop for at least a few days!

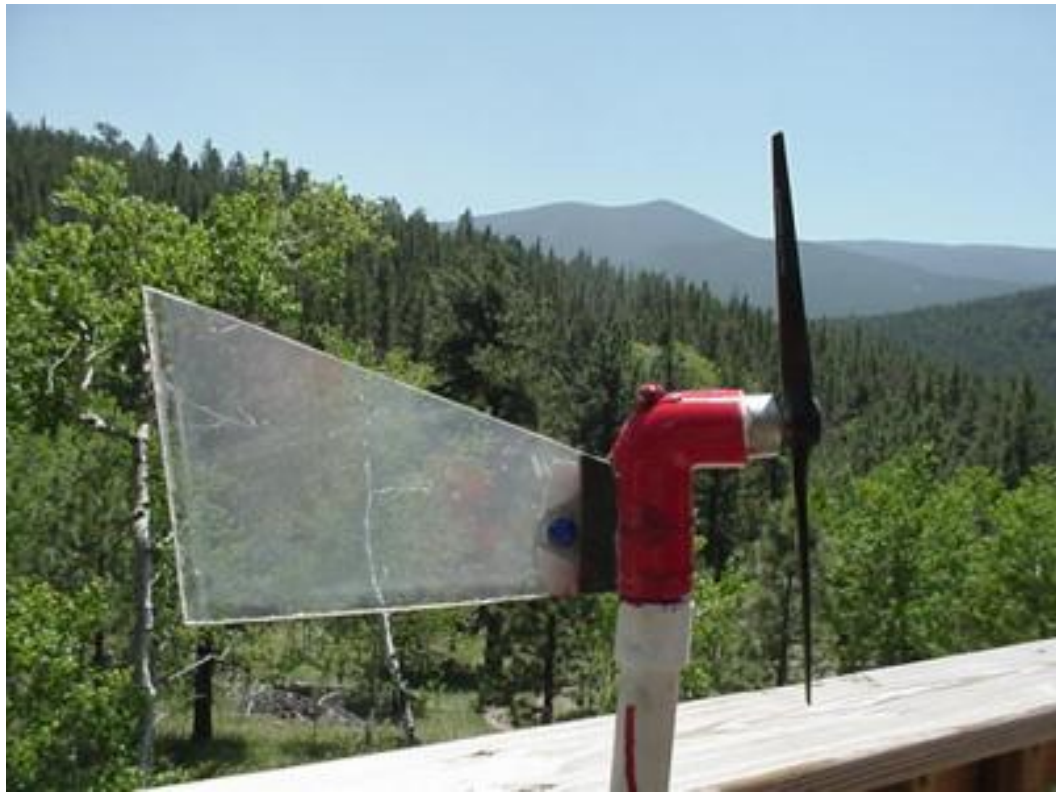
If your project allows you to use outdoor air flow such as an actual windy day or a vehicle, it will be much easier -- and all of the designs presented here will work. Even strange, unique, and silly designs will still start up and function with enough wind!

If your project must work indoors with a fan for power, you must design the unit to start up in very low winds. The air flow provided by a fan is VERY turbulent--it is difficult to make a toy windmill spin fast enough to make enough power. A combination of a many-bladed rotor and a free-spinning generator are needed to get enough rpms to light a bulb.

### Choosing a Rotor

We recommend having 3 or 4 rotors of different kinds and diameters available for testing. This will prevent multiple trips to the hobby store during your design and testing!

- **Model Airplane Propellers**--One of the simplest options is to buy an inexpensive (\$3 to \$6US) plastic or wooden 2-bladed model airplane propeller, and mount it backwards. It will style your machine like a commercial wind generator. Good sizes range from 8 to 12 inches in diameter. In a wind generator, the flat sides of the blades face into the wind, and the airfoil sides face away from the wind, the OPPOSITE of an airplane propeller. However, a quick experiment shows the problem with reversing the propeller...suspend the propeller on a straightened paper clip, and blow on the flat sides. The airfoil is pointed the wrong direction...it's opposite the direction of rotation! However, upon close inspection of the propeller, you'll also see that the airfoil carved into it is very minimal...just barely an airfoil at all. Because of this factor we've found that model airplane props still work just fine for this experiment. However, they are hard to get started with an electric fan because of having only 2 blades. You should be able to get one started at around 15-20 mph in a vehicle or in the wind, depending on the generator and prop size.



**Windmill built with 2-blade model airplane prop mounted backwards. Though this unit works while testing in the wind or from a vehicle, it will NOT start up in the wind from a box fan...for that you need to use a computer fan blade prop.**

- **Computer Fan Blades**--These multi-bladed units are an excellent and cheap option. The multi-bladed design allows them to start up very easily, at mere walking speed or in front of an electric box fan. Old computer fans are easy to scrounge up for free, and are also available at electronics stores. A diameter of 4 to 6 inches will work well. The hardest part is removing the blade from the fan assembly...since the assembly has to turn into the wind, you can't really use the bracket that contains the fan. Adult supervision is required for removing the fan blade, it may take some cutting and prying. But it's well worth it!
- **Portable Fan Blades**--Removed from cheap desktop electric fans, these usually have 4 or 6 wide blades, and also work very well. A diameter of 4 to 6 inches is just right. Again, supervision is needed for removal!

### Choosing a Generator

By far the simplest and easiest choice for a generator is to use small DC hobby motors, available at any local or mail-order electronics store, including Radio Shack. Once again, we recommend having a variety on hand for experimentation. They work as motors when you apply electricity to them, but they ALSO work as generators when you spin the shaft! Get a variety of different voltages and speeds if possible. Lower-voltage versions (such as 3 volts) start up the easiest, but their output will be limited to 3 volts at high speeds. 12-volt versions will make the most power, but may be harder to start up. Anything in between works just fine too! **The key thing with selecting a hobby motor is to buy the ones that have a toothed sprocket already attached to the tip of the shaft.** This will make securely mounting the rotor MUCH, MUCH easier for you. See picture below.



**Be sure to get hobby motors with a sprocket like this already attached -- it makes things MUCH easier!**

### Initial Assembly and Testing

Better to make sure things will work right for you before assembling the whole thing with glue! Carefully drill a hole in the EXACT CENTER of the fan blade hub, slightly smaller than the diameter of the sprocket. You want the teeth of the sprocket to catch the plastic or wood of the blade hub. Gently heating the plastic of the hub with a match will soften it and make this operation simpler, and allow you to test it before gluing it in place.

Now, connect the wires from the hobby motor to your DC voltmeter. Set up your fan, turn it to low speed, and hold the motor and blades up to the fan. Wear gloves and eye protection for this

operation! Once the blade comes up to speed, record the voltage you get. Turn the fan up to high speed, and again record the voltage you get. This information will allow you select your lightbulb for the demonstration.

Radio Shack has a huge variety of flashlight bulbs in different voltages. LEDs can also be used, but must be hooked up with the correct polarity. LEDs also light up with much less electrical current than incandescent flashlight bulbs. The polarity doesn't matter with flashlight bulbs however. Either one will burn out if you apply too much current from your wind generator! Pick a bulb that has a rated voltage very close to the **MAXIMUM** voltage reading you got, with the fan at highest speed.

Attach the bulb to the circuit in place of the voltmeter, and try the test again. If all goes well, the bulb should glow brightly at the fan's top speed, and glow dimly at lower speeds. This will let you show differing power output with different wind speeds. At this point, you are ready to assemble the final version of the wind generator.

### **Final Assembly**



**Details of frame construction are visible here, including the yaw bearing**

Our frames were built using PVC pipe and fittings. Since hobby motors come in different sizes, you'll need to pick a pipe diameter that allows you to slide the motor into a pipe end or fitting. In our designs, the motor fits into a PVC elbow fitting, and is held in place with epoxy putty. Once you find which pipe diameters you need, purchase a variety of components -- 2 or 3 feet of pipe, and a



few elbows, caps and reducers. Generally, the pipe and fittings fit together tightly without the use of glue, but you might wish to use PVC cement on your machine after it is together and working.

The yaw bearing can be built a number of different ways. Be sure it allows the machine to turn freely or it won't yaw into the wind correctly. Our design was very simple -- we ran a 4" long bolt down through the top, fastened underneath the yaw bearing to a pipe cap. There are undoubtedly many easy ways to improve this -- we simply used what fittings we had available to make things quick and easy.



**Top view showing yaw bearing bolt**

The tail should be made of thin plastic, and can be of a variety of shapes and sizes. Look at pictures of commercial wind generators for good ideas on proportions and lengths. The dimensions and shape are not critical--we found that a Playstation 2 CD made a fine tail, and it expresses DanF's opinions about kids, videogames, books and science experiments quite ironically!

To mount the tail, use a hand saw to carefully cut a vertical groove in the back of the right-angle pipe fitting into which your motor will mount. The groove should be wide enough for your tail material to slide into.

Securely connect your power wires to the connectors on the hobby motor. Depending on the kind of connector, it might be best to solder them on. Adult supervision needed for this please! Then, run the wires down through the 90-degree pipe fitting, and out a small hole you've drilled in the side of it.

Securely fit the motor into the fitting. You'll have to choose the size of pipe you use depending on the diameter of the motor you selected; that's why we don't give specific diameters of pipe here. Use a thin 'rope' of epoxy putty to secure the motor in place. This is the kind of epoxy that comes in a stick, and feels like modelling clay. You simply knead the 2 parts together until they blend, lay it in the gap between the motor and the fitting, and wait for it to set.

The easiest solution for how to run the wires is to mount the lightbulb directly to the upper frame or tail of the wind generator. If you want to have the lightbulb separate from the wind generator or want to use a voltmeter for your demonstration, just make a loose loop of wire near the yaw bearing, and use tape or a cable tie to keep it from hitting the rotor as it spins. This loose loop can wind itself

up around the pipe mount, but will also unwind itself when the wind (fan) changes direction.

## **Experimental Ideas**

There are a variety of different experiments that can be performed once your wind generator is operational. You can change the fan speed to show the increase in power using your voltmeter or by how bright your bulb or LED lights up. You can change the facing of the fan to show how the tail makes the unit yaw into the wind. If you want to charge small batteries with your unit, you'll need a small diode, available for under a dollar at Radioshack. Get a diode rated at around 1 amp. The diode acts as a one-way valve for electricity--without it, your batteries will simply spin the motor and prop. You want the power to flow into the battery, but not out.

A great way to test a small windmill is with a vehicle -- that way you don't have to buy or make an anemometer to measure windspeed. If you do test in a vehicle, either build a mount in the back of a pickup truck, or have someone hold the unit carefully out the car window. This could be somewhat dangerous! The person holding the unit should wear thick leather gloves and eye protection in case the prop flies off! If the unit starts to become unstable, have the driver slow down immediately. It helps immensely to have a third person in the vehicle to write down the speed of the truck as the driver calls it out, and write down the voltage reading at each speed.

**We urge you to have fun with your project and hope our ideas have helped. However, PLEASE be safe in your experiments and wear eye protection and gloves when you are near spinning props! And remember, adult supervision is required.**

### **About the project that was previously pictured on this page**

In that project, we attempted to use a small Brushless DC motor as an AC alternator to power a small bulb. However, the motor was incapable of producing enough current after rectification to DC with a diode bridge. That's why we switched to using DC hobby motors. We are also working on some more complicated science fair wind generator projects, with homemade alternators and carved wooden props....an example of which is shown below.



Not much more than a handsaw, chisel, and sandpaper is needed to carve a 16 inch prop!

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## Science Fair Wind Generator

By [MikeR](#), Section [Homebrewed Electricity](#)

Posted on Fri Nov 21st, 2003 at 05:41:23 PM MST

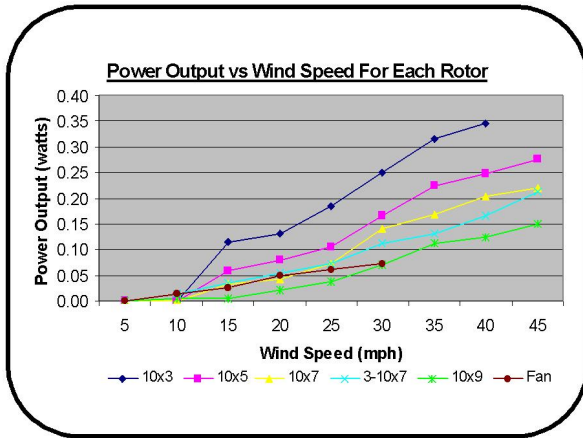
[Wind](#)

I am a fifth grade girl who built this.....

Hi, my name is Kathryn. I saw the small wind mill on your experiments page and decided to build a wind generator for my science fair project. My project was to find if different rotors make a difference and if so which rotors worked best. I used airplane propellers mounted backwards. I compared several pitches of two blade props, one three blade prop, and one blade from a desk fan. I used a hobby motor from Radio Shack for the generator. We tested it by mounting it out in front of my dad's car. It didn't make much power, but the purpose was to compare rotors. Here is a picture of my wind generator flying above my treehouse.



Here is a summary of the data results.



This was a really cool project and a lot of fun. Oh, by the way, I got 100! Now I want to build a bigger one.

Thanks for the great website.

[Science Fair Wind Generator](#) | 9 comments (9 topical, 0 editorial)

Re: Science Fair Wind Generator ([none / 0](#)) (#1)  
by [zubby](#) on Fri Nov 21st, 2003 at 06:24:25 PM MST  
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hello Kathryn!

i must say and i think that all will agree that your little genny is quite impressive. it is not so much the output that counts, but the experience of building it and bringing your ideas to a useful purpose. oh, and those few watts that you did get, well it may not charge a very big battery, but it was plenty to brighten my life a little.

keep having a great time! zubbly

Re: Science Fair Wind Generator ([none / 0](#)) (#2)  
by DanB on Fri Nov 21st, 2003 at 07:01:08 PM MST  
([User Info](#))

Thats super...

so am I to understand that the 2 blade prop with the flattest pitch wins here?

Pretty neat... as neat as the windmill is the good data you got on different prop configurations. Congratulations!!!!

Re: Science Fair Wind Generator ([none / 0](#)) (#7)  
by MikeR on Sat Nov 22nd, 2003 at 07:23:23 PM MST  
([User Info](#))

Dan,

Yes, the two blade prop with three inch pitch produced the most power. Maybe one with a lower pitch would be better, but I didn't have one to test. Also I learned that the airfoil on the back of the prop is backwards with the sharp edge leading.

Both of the three blade props started the soonest. The fan blade starts spinning with very little wind but is so inefficient the speed levels out very quickly, limiting the power output.

Kathryn

[ [Parent](#) ]

Re: Science Fair Wind Generator ([none / 0](#)) (#3)  
by kww on Fri Nov 21st, 2003 at 08:29:57 PM MST  
([User Info](#))

Great wind turbine Kathryn, I can tell you give most teachers a hard time. :-) Keep it up, it's those things YOU have an interest in that will lead you to your greatest potential.

Kevin

Re: Science Fair Wind Generator ([none / 0](#)) (#4)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Fri Nov  
21st, 2003 at 08:38:04 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

I must say Kathryn, thats far nicer than the ones I built  
when I started out!!! That's a fine piece of work... !!!

Keep up the great work! Most of all Have fun!

Ed

Re: Science Fair Wind Generator ([none / 0](#)) (#5)  
by cevonk ([cevonk\(atsignhere\)aol.com](mailto:cevonk(atsignhere)aol.com)) on Fri Nov 21st,  
2003 at 11:15:56 PM MST  
([User Info](#))

That is a very nice machine! The graph is very interesting  
to study, too. Now I see why fan blades are used on fans  
instead of propellers. I always wondered about that.

Thanks for teaching me something.

Keep at it!

Eric

Re: Science Fair Wind Generator ([none / 0](#)) (#6)  
by RobD on Sat Nov 22nd, 2003 at 03:39:36 AM MST  
([User Info](#))

Cool!  
RobD

Re: Science Fair Wind Generator ([none / 0](#)) (#8)  
by charged on Sun Nov 23rd, 2003 at 04:23:28 AM MST  
([User Info](#))

Nice work. It looks better then my first "wind machine".

I was 9 years old and trying to bring a thin sheet of  
plywood panelling into the garage from the pickup bed.  
Suffice to say that it was a very windy day and I got  
thrown about 15 feet sideways off the tailgate! I marvelled  
at the power in that one gust.

Thus was born my fascination with tapping into nature's  
fury.

You might want to try making a savonius turbine for one of  
your experiments. The simplest way is to cut a 5 gallon  
plastic drum (kerosene containers from Walmart) right  
down the middle. For these small ones you can use some  
wood, bolts and thin steel rod without too much worry of it  
coming apart.

Stay on the path.

Re: Science Fair Wind Generator ([none / 0](#)) (#9)  
by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Sun Nov 23rd,  
2003 at 10:37:04 AM MST  
([User Info](#))

I agree -- congratulations on your project. And even more  
congratulations on your data acquisition and graphing!  
Looks very professional. I'd go for a 4 footer next!  
ADMIN

[Science Fair Wind Generator](#) | 9 comments (9 topical, 0 editorial)

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[charging 12v batteries for inverter](#)

By [Jon Miller](#), Section [Homebrewed Electricity](#)  
Posted on Sun Jan 4th, 2004 at 02:21:02 PM MST [Wind](#)  
how do I charge 12v batteries for inverter

i have a 12v SLA battery that is 7ah how much electricity ie amps and volts do i need to charege this battiry from dead to full in a day or so? + what sort of motor can i use to do this as i can not make coils?

[charging 12v batteries for inverter](#) | 2 comments (2 topical, 0 editorial)

Re: charging 12v batteries for inverter ([none / 0](#)) (#1)  
by [drdongle](#) on Sun Jan 4th, 2004 at 05:45:27 PM MST ([User Info](#))

General rule of thumb is no more than 1/10th of the rated power so 700 Ma maximum.  
A TDM generator would be a good choice but your never going to get much use out of a 7 AH battery.  
Dr.D

Re: charging 12v batteries for inverter ([none / 0](#)) (#2)  
by [RobD](#) on Mon Jan 5th, 2004 at 06:04:38 AM MST ([User Info](#))

SLA batteries charge in, what is called, a two step process. The first step charges them to a specific voltage usually around 14.7 volts for 12 v batts. The second step maintains a float voltage of around 14.1 volts only after the 14.7 volt limit has been reached. Your battery won't last long if it's dead now. It's not good to let batteries drop below 11.5 or min. 10.7 volts before recharging. RobD

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## [New wind turbine on new tower!](#)

By [DanB](#), Section [Homebrewed Electricity](#)

Posted on Sun Jan 4th, 2004 at 12:02:35 PM MST

[Wind](#)

Yeah! I finally got a new tower together this week and put my 14' machine on it.

It's been a fun (cold and snowy too) week. I pretty much finished up my 14' wind turbine and made minor repairs to it after it [fell off its stand](#) last week.



Pictured above I've got it back in my workshop. Main damage was to the tail, which I had to straighten. As it turns out, I think it may still need a bit of adjustment.

This alternator used to cog a bit, as the magnets were attracted to the 3 bolts which suspend the stator between them. This made balancing the blade pretty much impossible, so I took this opportunity to replace the 3 pieces of allthread and all the nuts with stainless. This not only eliminated the cogging issue, but also reduced drag on the alternator which was being caused by eddy currents in the steel. Since the magnetic field is no longer attracted to the hardware, the eddy currents are much less.



Forgive my bad pictures... I'll hopefully reshoot some of it if I make a webpage about this fun project. The base of

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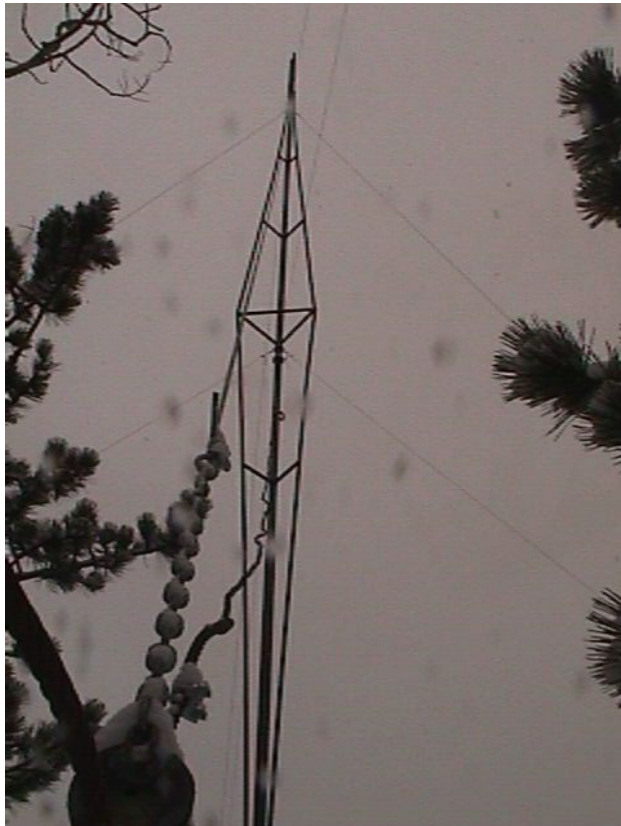
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my new tower is in the same location as my last tower.

My [old tower](#) was actually pivoted in a notch in a tree stump which I'd cut with a chainsaw. It was wooden, and built up from trees and chains. It was 45' tall and worked OK, but looked a bit precarious in high winds with my [9' diameter wind turbine](#) on it.

The pivot for this new tower is a 3/8" round steel plate (just like the ones I made the new alternator for this 14' windturbine from) with a hinge welded up. The hinge is simply a piece of 2" pipe slipped over 1.5" pipe. Onto that I welded a 1.5" pipe about 1 foot long which the jin pole slips over, and a 2" pipe the same length which the tower itself slips over. This made assembly easy. The plate is lag bolted to the stump of the tree which I cut off flat and level. Come springtime Ill probably remove the tree stump and pour concrete.



The new tower is 60 feet tall, and has a 21' jin pole. The tower is made from 3" pipe at the bottom, and then at 21' 2.5" pipe, and 2" pipe for the top 20'. It's braced for 42' up to the top with 1" pipe. The top 7' of the tower has smaller sched. 80 pipe run down through it to stiffen it and a little stub of it sticking out for the windmill to sit on. I've also welded 3 7' lengths of 1" pipe to the top 7' to stiffen it. It's quite stiff, when on the ground and braced up in the middle I can jump on it and it only bends a little. It's supported by 8 guy wires of 3/16" steel cable.



I welded a foot on the tower about 20' from the top which assures that the windmill can not touch the ground when I lower it. This also seves as a good place to mount an anememometer. In the picture above Rich and I are assembling the machine at the end of the tower. The bed of my truck makes a nice platform to stand on since I cannot reach it from the ground.



A closer shot of Rich and I hooking things up. Actually, a very cold day...



Like my last tower, I pull this up with my truck. Yesterday when we did this we had about 7" of snow, I got it half way up and the truck started sliding and lost traction. So we had to shovel snow and put down some ashes under the tires...





And then it pulled up with no problem! It seems very easy and rigid while raising and lowering. Of course, once we got it up the wind stopped and we had no wind for the rest of the day. This morning we've had a bit and it's been fairly interesting. It starts spinning around 5mph (maybe a bit less) and is actually cutting it at around 5mph making over 5 amps at 7 mph, which I think is quite good, but above that it's underperforming. I'd hoped to see cutin at more like 7 mph. Basicly, the alternator is producing too much voltage at too low of rpm I think.

Today weve had 25mph winds. At 25mph Im getting around 700 watts it seems, and rpm is around 160 (too slow!! - the blade is stalling). Id like to see more like 250 rpm at that speed and more current. I experimented by disconnecting one of the 3 wires from the machine, and it sped up quite a bit and made a good bit more power except in the very low winds. Of course... my line loss was worse and its not right that way. Its furling nicely. It starts to furl at about 25 mph I think - but if the blade was running faster and more efficiently that would come down a lot, so I believe a slightly heavier tail would be appropriate.

Ive not tried to get real windspeed vs output data yet (I can tell its not so good) - but I did get some interesting data on the alternator itself when its hooked to my batteries. These numbers take into account the whole line and at 12 volts my line losses are significant.

At 80 rpm Im charging at 7 amps  
At 90 rpm, 12 amps.  
At 95 rpm, 15 amps  
At 110 rpm, 25 amps  
At 160 rpm, 55 amps

I think I have a few choices to fix this machine so it's working well...

Best, would be make a new stator with fewer windings and heavier wire which would increase cutin speed and reduce



losses in the alternator.

Second best would be to actually increase the airgap in the alternator as it is. This would have a similar affect I think, but do nothing for my wire losses in the alternator.

I could add resistance to the line. This would speed it up and although my line losses would be worse, the benefits of the prop running at a more efficient speed would most likely outweigh the additional line losses.

I could make a bigger/slower prop! - but thats a lot of work, and I think a larger prop may very well burn up my stator in higher winds. As it is, its safe and slow and quiet and although it's not making the sort of power I'd expect from a 14' machine, I am getting a bit more than I used to from my 9' machine so it's OK. Furthermore, I'm elated that it works, and the tower seems solid and no catastrophies happened! I was never too happy with the way the stator came out in the first place, so I'm happy to make a new one, it takes 1 days time.

Here are links to the previous postings about this project:  
[Click here](#) to see the beginning of the project.

[Click here](#) for details about the alternator.

[Click here](#) to see the windturbine finished.

[New wind turbine on new tower!](#) | 6 comments (6 topical, 0 editorial)

Re: New wind turbine on new tower! ([none / 0](#)) ([#1](#))  
by zubbly on Sun Jan 4th, 2004 at 04:58:30 PM MST  
([User Info](#))

Hi Dan.

Great job on that genny. Sorry to hear that it does not perform (yet) the way you would like to see, but i am sure you will make the changes you need to do so. The only thing i don't like about odd number of coils per phase (in your case 3) is that the other alternative is to make a 3Y connection with the stator you have now. This would increase cut in speed to 3 times of what it is now. Probably a little too high for what you want.

have fun-Zubbly

Re: New wind turbine on new tower! ([none / 0](#))  
([#6](#))  
by DanB on Mon Jan 5th, 2004 at 08:38:22 AM MST  
([User Info](#))

Hi Zubby - yes, i know what you mean about having 3 coils per phase.

But - I dont mind. I think it'd be different a bit if we had slotted laminates directing the magnetic field exactly where we need it, but with a air core design like this - or, with laminates only beneath the coils, there are always problems with hooking coils in parallel - no matter how well you wind them there will be current flowing between them it seems. In past machines I made, I'd usually wire parts of the stator in parallel, and have numbers of coils which were divisable by lots of numbers so that I could hook things in parallel or series or a combination of the two so that I could match the alternator to the blades. This worked out OK, but in every case I noticed drag on the alternator as soon as the parallel connection was made. Sometimes not bad - and often times I'd bring the single phase down on 3 wires and rectify the seriesed parts BEFORE I made the parallel connection - which solved the problem. In this case though, with 3 phase, that would be tricky. Best is just get it right I think, making a stator is not a big deal.

Im fairly sure the most efficient alternator will definitely NOT have any parallel connections in it and if its 3 phase it will be wired in Star. Like Ed suggested, I could quickly wire this into Delta (perhaps I should give that a try...) - but I think it would be a bit fast then and there are inefficiencies associated with the Delta connection. Perhaps Ill try that though... just for fun.

Yesterday I did add some resistance to the line and it helped quite a bit, although she still needs a better stator.

[ [Parent](#) ]

Re: New wind turbine on new tower! ([none / 0](#)) (#2)  
by Old F on Sun Jan 4th, 2004 at 04:59:08 PM MST  
([User Info](#)) <http://www.oldf.homestead.com>

Dan

Great job as usual : )

I think you did you self a big favor reinforcing the pipe like you did.  
As there all ways is a bit of tweaking needed with home built machines at first .  
A more rigid structure make things a lot easier and safer when raising lowering .

And after all this should be a hobby an not an extreme sport : )

Old F

Re: New wind turbine on new tower! ([none / 0](#)) ([#3](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Sun Jan  
4th, 2004 at 05:15:19 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

You do some nice work Dan! Definately sounds like its stalling the wings. Once you work out the kinks your going to have lots of power! Would it take the cut in to high if you wired it in Delta? Might cure 2 problems with one wire...

You must be quite determined, I hate working outside in the snow and cold. It takes me about 2 hours to get motivated and dressed for it. Once the shop is warm its not a problem but first thing in the morning.... I hate winter can you tell?

Have Fun!

Ed

Re: New wind turbine on new tower! ([none / 0](#))  
([#5](#))  
by DanB on Mon Jan 5th, 2004 at 08:28:34 AM MST  
([User Info](#))

Hi Ed -  
I think Delta would bring cutin speed a bit high.  
Furthermore - after discussing it some with Hugh  
(and I think hes right on this...) - the Delta  
connection tends to be inefficient in low winds. Im  
also unhappy with the thickness of this stator, and...  
making stators is fun! So I'll just make a new one.

Yes, the cold is rough. As I sit here now, I think my  
shop is at about 5 below 0. Days like today - its  
impossible to heat my shop above about 40.

[ [Parent](#) ]

Re: New wind turbine on new tower! ([none / 0](#)) ([#4](#))  
by monte350c on Sun Jan 4th, 2004 at 09:28:37 PM MST  
([User Info](#))

Hi DanB,

That's a nice looking tower!

I'd love to see what a stator wound up for 120 VAC or  
higher would do with those killer magnets!

Keep up the great work.

Ted.

[New wind turbine on new tower!](#) | 6 comments (6 topical, 0 editorial)

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## [SMALL AXIAL ALTERNATOR](#)

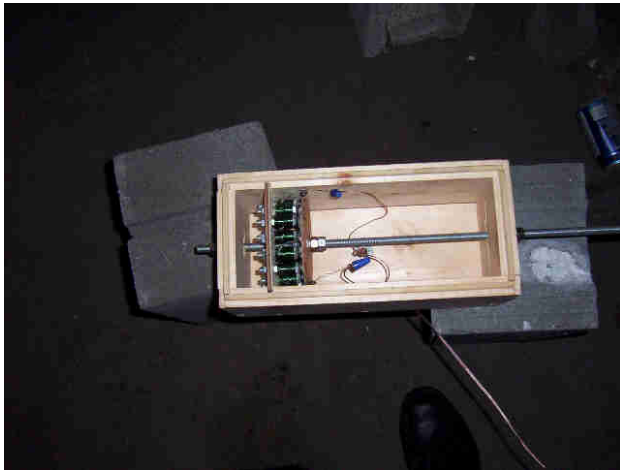
By [richhagen](#), Section [Homebrewed Electricity](#)

Posted on Sun Jan 4th, 2004 at 06:57:03 PM MST

[Alternators](#)

### SMALL AXIAL ALTERNATOR

I had told Zubbly and Mech last week that I would post some pics of a small axial alternator I had built. This is my first post, I hope the pictures turn out, if not, I included links to their current locations on the server.



It is downright primitive compared to some of the designs I've seen here, but I'm still pretty proud of it since I came up with it from scratch. This first prototype I built was simply 16 coils of magnet around bolts, mounted in a box, with 16 ceramic magnets mounted on a disk. I built it before I was aware of this site, it has losses from eddy currents, I'm sure, and it cogs significantly, but it works.

Currently, all coils are wired in series, this way, it generates a useful voltage (13V) at under 60 rpm, although not much current. I had tried 4 sets of 4 coils in parallel and two sets of 8 coils in parallel, and although they appeared to put out more current, they required much higher rpm's. In low winds, which I suspect are the most common, there would be no productivity.



I rigged it up for a temporary installation by mounting it

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on a small tower made of rebar and an inch and a quarter galvanized coupling. I used double sealed bearings around a threaded tube for the joint.

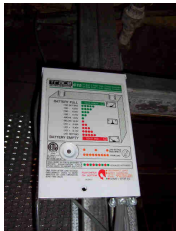


I fit those within an inch and a quarter copper coupling. It didn't fit perfectly, so I put a couple of layers of electrical tape around the outside of the bearings to snug them up.

I used a piece of inch and a quarter tube to hold the bearings in the fitting, holding it in place with screws drilled through the fitting and tube so that the wind couldn't pull the machine off of the tower. I checked on the turbine recently and found that there was a little play at the bearing where it mounts to the tower. I'll have to find something a little better for future designs.



I weighted this on a two story roof, added a small metal turbine modeled after an ornamental windmill, and tied it in with a pre-existing 12 volt solar system. This connects to a Trace C-12 Load controller.



This charges a 12V. Deep Cycle Battery,



which keeps a couple of white led lights on in my laundry room and a small utility closet. Excess power generated is wasted right now. At present, I leave these lights on all of the time. This fixture has 70 or so leds, I think, I would have to open it up and count them as I can't remember - its been up there more than a couple of years now. They are mounted on a pcb, three in series with a 120 ohm resistor. Probably not as efficient as a flourescent, but they are maintenance free.



I'm currently working on a smaller design built with more durable components that I can fit into a smaller tube rather than a box. I was shooting for a two inch diameter tube, and a 48 volt system, but have had difficulty generating the voltage and power at lower rpm's. I may try and design something to fit into a 4 inch pvc tube. I have a 4 story building in Chicago that I can mount them on, but they would have to be not so obtrusive,hence, several small machines vs. one larger one. Below is a picture of an experimental 3 phase stator that I have been working on for a dual rotor axial type machine. I will have to greatly increase the number of turns of wire for this design to work.



This gives you a rough Idea what I'm up to, so any advice, suggestions, criticism is appreciated.

Just trying to have fun. Rich

[SMALL AXIAL ALTERNATOR](#) | 2 comments (2 topical, 0 editorial)

Re: SMALL AXIAL ALTERNATOR ([none / 0](#)) ([#1](#))  
by zubby on Sun Jan 4th, 2004 at 07:25:01 PM MST  
([User Info](#))

hello Rich.

Thanks for making the post. That is a nice job for using such common materials. I would be proud of it myself. looks like you are definately on the right track. Also like the idea of you designing and building to suit your own needs.

I noticed your last picture. looks like you are a fan of using wave windings. keep at that area, as it is a simple and very good way to make easy multiple poles from one coil. I will also be using that technique in my next genny. But with a different twist lets say.

great job!  
keep having fun-Zubby

Re: SMALL AXIAL ALTERNATOR ([none / 0](#)) ([#2](#))  
by Harry Luubovv on Sun Jan 4th, 2004 at 11:47:08 PM MST  
([User Info](#))

Hi Rich,

I like what you did and do. It is always nice to see innovatively thinking persons.

Now my criticism if you don't mind. The wave winding is good to the point that it saves wires (And so saves weight) and also saves resistance counts. However, we have to be very careful as to phasing. Because, it is a wave winding so all the coils are wound as one giant coil spread all over the outer perimeter of the stator backing disc. And so all the magnet poles will have to pass the coils in a more precisely synchronized way. Meaning, you will have to have the same amount of coils against same amount of magnets and spacing would have to be



same between magnet poles and coils--more cogging. If these rules not observed, you will lose out pretty large due to waveform cancelling one another between coils obviously. In worst of cases, you might end up having zero volt ! If one pole happens to be North cutting while another pole happens to be south cutting at the same instant, both the peak and valley waveform will cancel out one another--Zero output !

And then, a complete closed-loop of a coil is more in efficiency than a half open coil.

It is known that multi phases are better for battery life than a single phase charging. Just imagine, the wave technique would entail longer wires again even though you can still employ the wave technique, just imagine the picture, I need to say no more because you simply would need to have running wires to bridge between coils of same phases.

This is all the negatives I can give you, now you can pleasantly see that I am that devil to ya :-

-No love loss-  
Luubovv.

[ [Parent](#) ]

[SMALL AXIAL ALTERNATOR](#) | 2 comments (2 topical, 0 editorial)

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### [Hydro Advice](#)

By [Salty](#), Section [Homebrewed Electricity](#)

Posted on Sun Jan 4th, 2004 at 05:48:38 PM MST

[Hydro](#)

Request for hydro info

I have a seasonal creek running an average of 5-6 months per year. The head is 4 feet with a flow varying from about 25 gal/min to a full 3 foot culvert. Can anyone here advise me on the best way to investigate the economics and practicality of installing a micro-hydro plant? Thanks

[Hydro Advice](#) | 1 comment (1 topical, 0 editorial)

Re: Hydro Advice ([none / 0](#)) ([#1](#))  
by kurt on Sun Jan 4th, 2004 at 05:50:34 PM MST  
([User Info](#))

- [http://www.otherpower.com/otherpower\\_hydro.html](http://www.otherpower.com/otherpower_hydro.html)
- <http://home.carolina.rr.com/unclejoe/menu.html#Hydraulic%20Water%20Turbines>
- <http://www.lcs.net/users/pinecrest/text/hydro.htm>
- <http://myhydro.freesevers.com/>



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posted by zmoz on 10/26/2003 06:10:33 PM MST  
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posted by ghettoride on 09/04/2003 12:49:02 PM MST  
4 comments

17. [Hydro system and how to setup](#) ([Homebrewed Electricity](#), [Hydro](#))

posted by shane on 09/02/2003 06:40:11 PM MST  
5 comments

18. [Homemade Air conditioner](#) ([Homebrewed Electricity](#), [Hydro](#))

posted by hayseed on 07/13/2003 12:04:57 PM MST  
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19. [New to power generation. Need help with best setup for hydro system.](#) ([Homebrewed Electricity](#), [Hydro](#))

posted by Anonymous Hero on 06/30/2003 08:43:41 PM MST  
5 comments

20. [Still Water Makes Deep Power for Cryonucleator](#) ([Classifieds](#), [Hydro](#))

posted by cryonucleator on 06/25/2003 04:47:30 AM MST  
18 comments

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posted by Anonymous Hero on 06/18/2003 01:23:45 PM MST  
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posted by Anonymous Hero on 05/22/2003 10:15:02 PM MST  
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posted by Johnny Cool Pants on 05/13/2003 03:58:21 PM MST  
1 comment

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posted by Anonymous Hero on 05/09/2003 09:55:47 PM MST



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posted by Juliang on 04/14/2003 05:02:26 AM MST  
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posted by Bruce Downunder on 03/30/2003 02:21:28 PM MST  
0 comments

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posted by Bruce Downunder on 03/30/2003 02:05:40 PM MST  
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28. [another test](#) ([Homebrewed Electricity](#), [Hydro](#))

posted by scadmin0 on 03/19/2003 09:08:19 AM MST  
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### [hydro power on a marsh](#)

By [Jon Miller](#), Section [Homebrewed Electricity](#)  
Posted on Sun Jan 4th, 2004 at 02:42:47 PM MST

[Hydro](#)

i have a dam and i want to make power !  

---

i live in england on a place called romney marsh flat for a long time. but there is a daming system on the marsh to keep water moving by the local athorityies but i can get to a dame just down the road from were i live. i want a simple idea to make power from a wter saply that can change over night. would it be best to use a water will with a altnator bulted strait on it?

[hydro power on a marsh](#) | 3 comments (3 topical, 0 editorial)

Re: hydro power on a marsh ([none / 0](#)) ([#1](#))  
by kurt on Sun Jan 4th, 2004 at 02:57:55 PM MST  
([User Info](#))

be a good idea to do a little research instead of posting every ? that pops into your head. try reading the re faq. [http://www.fieldlines.com/faq/re\\_faq](http://www.fieldlines.com/faq/re_faq)

and then read the links at the bottem of the <http://www.otherpower.com/> page. then try doing a search using <http://www.google.com/> then come here and post an intelligent informed question.



Re: hydro power on a marsh ([none / 0](#)) ([#2](#))  
by kurt on Sun Jan 4th, 2004 at 03:03:32 PM MST  
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Re: hydro power on a marsh ([none / 0](#)) ([#3](#))  
by [kell](#) on Sun Jan 4th, 2004 at 07:11:50 PM MST  
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Most important: how much head? That is, how far does the water drop. If you can get a meter or two you might be able to work up a pretty good system (just guessing; I actually have no practical experience). Somewhere on the otherpower.com site there is a picture of a super simple setup a guy made with some kind of ventilator fan driving a generator with a belt. It is basically just plunked down in a creek where the water runs over a log.

[hydro power on a marsh](#) | 3 comments (3 topical, 0 editorial)

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### [motor bike battery charger](#)

By [Jon Miller](#), Section [Homebrewed Electricity](#)  
Posted on Sun Jan 4th, 2004 at 02:34:29 PM MST [Alternators](#)  
how much can my bike charge?

I have just got a bike, 50cc. that puts out about 4 amps of power which goes through a regulator and then to a bulb 25w and a 5ah 6v battery. My question is there any spare amps to charge another 5ah 6v battery with the light on?

[motor bike battery charger](#) | 3 comments (3 topical, 0 editorial)

"OHM's Law" ([none / 0](#)) ([#1](#))  
by [wdyasq](#) on Sun Jan 4th, 2004 at 04:59:11 PM MST  
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Jon, If you find the formula for 'Ohms Law' it states the relationship between Volts and Amps. It will also show you have not given some important data anyone would need to answer your question. Good luck, ROn

Re: motor bike battery charger ([none / 0](#)) ([#2](#))  
by [drdongle](#) on Sun Jan 4th, 2004 at 05:52:57 PM MST  
([User Info](#))

Actually "Ohm's law" is the relationship between Voltage, Amps and Resistance. What he needs is the Power formula which is  $P \text{ (watts)} = A \text{ (Amps)} \times V \text{ (Volts)}$ . John needs to know the load the lamps provide and then he can calculate if he has any reserve available.

Dr.D

Re: motor bike battery charger ([none / 0](#)) ([#3](#))  
by [kell](#) on Sun Jan 4th, 2004 at 07:05:44 PM MST  
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Your lamp burns up 25 watts of power. You have a six volt system. Since watts=amps x volts, the amps drawn by the lamp would amount to 25 divided by 6, or at least 4 amps. Actually, the way these things work, the voltage regulator probably holds the system voltage at about 7 volts, so the lamp's draw would probably come to 25 divided by 7 or about three and a half amps. At the risk of confusing you, the wattage of your lamp can be expressed as a precise figure only for a precise voltage. Increase the voltage and the watts go up (lamp burns brighter), decrease it and the watts go down. The 25 watts figure on your lamp is approximate for the voltage on your bikes system. That voltage may drop at idle, for instance. Bottom line, your bike's charging system has to have some excess capacity above what the lamps and ignition draw, in order to be able to charge the battery. So yes you could put more battery capacity on there and still have it charge, but it might take a little longer to charge the extra battery capacity, since your charging system sounds like it doesn't have a hell of a lot of extra beef designed into it.

[motor bike battery charger](#) | 3 comments (3 topical, 0 editorial)

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### [3 Phase ???](#)

By [Hank](#), Section [Homebrewed Electricity](#)

Posted on Sun Jan 4th, 2004 at 10:53:34 AM MST

[Wind](#)

Confused about 3 Phase benefits vs. Single Phase

I'm considering building another genny. My first one is a single phase which I'm pleased with. All the postings I've been reading suggest a 3 Phase is better so here I go with some lengthy questions (I apologise in advance for this long post).

First I want to make some assumptions to level the playing field in comparing a single to a 3 phase unit. Both will be single rotor, all coils are the same wire and # of windings. Voltage given is at some arbitrary rpm but the same for both

	Single	3 Phase
1. # of magnets	12	12
2. # of coils	12	18
3. Resistance/coil	.1	.1
4. Total resistance Series/Star	1.2	1.8
5. Total resistance parallel/delta	.6	.6
6. volts/coil	2	2
7. coils/phase	12	6
8. Total v(series)	24 (12*2)	10.39 (6*1.732)
9. Total v (par/del)	12	6

Am I missing something in my understanding of 3 Phase? Based on the above assumptions a Single phase would be the way to go. You get higher voltage in either combination (series/star or parallel/delta) using single phase. I'm assuming current will follow the voltage and resistance so I don't see any 3 phase advantage here either.

Any clarification will be greatly appreciated as I think (dangerous) I'm missing something.

Hank

[3 Phase ???](#) | 6 comments (6 topical, 0 editorial)

Re: 3 Phase ??? ([none / 0](#)) ([#1](#))  
by 5kw on Sun Jan 4th, 2004 at 12:03:10 PM MST  
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Hank, The advantage of three phase the way it is usually done by people on this site is a smoother power flow, less vibration ect. However if you go 3 phase using the design shown in Electric Ed's recent drawing (thanks Ed) the huge advantage is putting copper inside of holes created by each coil, ie there is room for three times the copper by interleaving your coils, Yes, you have to have room on the inside and outside of the magnet ring for the coils to cross without increasing the air gap. If the magnets stand "proud" of the rotor disc the space is there. Ed of windstuffnow has done great work in this area using cast forms and slotted stators, I have not built any axial alternators only radial with iron cores where interleaving of phase coils is standard in "all" 3 phase machines. Hope this helps Make the wind fun!  
Victor

Re: 3 Phase ??? ([none / 0](#)) ([#2](#))  
by Hank on Sun Jan 4th, 2004 at 01:37:57 PM MST  
([User Info](#))

Thanks for the reply Victor.  
I understand the smoother operation aspect of a 3 phase and also being able to utilize the open space with more copper (coils).  
In the example I used above to compare the single and 3 phase units I did use more coils for the 3 phase unit (50% more, interleaved). Unfortunately when I do the math for power output somehow it does not add up for the 3 phase unit (even with more copper).  
I think, maybe, I'm missing something even though I read all the posts and links on 3 phase units.

To much time to think will get me into trouble!

Hank

[ [Parent](#) ]

Re: 3 Phase ??? ([none / 0](#)) ([#3](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on  
Sun Jan 4th, 2004 at 03:45:04 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Hello Hank,

It seems I'm the only one actually doing the "interleaved" coils on this site, although, Electric Ed may be using the same or similar technique.

The way I wind my 3 phase units... Think of the single phase you just made, 12 poles - 12 coils... add two more single phase coil sets offset slightly from the first. Now you have 3 single phase alternators in the same space.

Wire them in star or delta and your 3 phase is done. So in the above example... 2 volts per coil x 12 = 24 volts x 1.732 for star = 41.5 volts. For delta you'd end up with the 24 volts but you would divide the star wire by 3 for the ohms. ( in star as your example 1.2 ohms x 2 = 2.4 in star or 0.8 ohms in delta. Also by going this route you can lower your amount of turns

per coil to achieve the same output and lower the resistance in the wires thus increase output.

Also, you can change the configuration a bit and run it as 3 single phase units, each with its own rectifier. If you series them together you tripple the output voltage ( less phase offset ) or parallel them to tripple the amps ( again minus the phase offset). 3 single phase units run just as smooth as a 3phase unit ( basically the same thing ).

Take it a step farther, you can run 3 separate single phase units with different wire size and turns, having 3 cut in speeds ( like a low, medium and high gear). So many variations... so little time....

Lots of fun!  
Windstuff Ed

[ [Parent](#) ]

Re: 3 Phase ??? ([none / 0](#)) (#4)  
by Hank on Sun Jan 4th, 2004 at  
07:13:51 PM MST  
([User Info](#))

Thanks Ed I was hoping you would shed some light on this,

I guess the part that is stumping me or perhaps I don't understand is the total voltage.

In my example I used a single phase (the first column) and 3 phase (second column).

In the 3 phase example I assumed 18 coils for 12 magnets. These would be interleaved.

I used the info on your web-site as a teaching tool. Incidentally it is very good. If I understood it correctly, to find voltage you would measure any one phase then multiply it by square root of 3 (1.732). If that is the case, then there are only 6 coils (18/3) in any one phase and the resultant voltage (based on my assumption of 2 volts/coil) would yield 12 volts for that phase.

Therefore the total voltage for all three phases would be  $12 * 1.732 = 20.8$  volts. Is that correct?

wheras the single phase would produce 24 volts.

I did make a mistake in my voltage calculations in the first thread for 3 phase, star and delta!!! Sorry.

I can see the advantage in Delta as the resistance will be 1/3 as opposed to 1/2 for single phase in parallel with the same voltage.

You do bring out some interesting possibilities with 3 phase however. Getting the itch to build another one!



Hank

[ [Parent](#) ]

Re: 3 Phase ??? ([none / 0](#)) (#5)  
by windstuffnow  
([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Sun  
Jan 4th, 2004 at 08:23:35 PM MST  
([User Info](#))  
<http://www.windstuffnow.com/main>

Hi Hank,

I started using the 3 coils per pair of magnets a long time ago and your right the "alt from scratch" represents this. From experimenting I found I could basically increase the amount of wire in the stator by simply using 3 coils per magnet.

After building a couple that way it actually sunk in that I was making single phase alternators and wiring them into a 3 phase configuration.

It seemed almost too simple at the time. Since then I've been experimenting with different variations and found you can actually make a 1kw unit using small #20 wire, although, I wouldn't want to hold it there for extended periods of time. My downwind unit has 8 poles ( ceramic magnets) and 24 coils ( 3 sets of 8) on an 8" disc. Its topped out at around 60 amps in some gusty winds. After checking it, expecting to see some black coils they were all still bright and shinny.

It did quit working after that but It had burned out the relay on the star/delta switch. I replaced the relay and its still running!

I can only guess as to how many I've built using this method and almost all of them had smaller wire ( 20 - 18 - 15 gauge) all of them seem to work exceptionally well with the exception of my multi disc multi stator alternator which came in at about 1/2 of what I expected at a given rpm. I hadn't taken into consideration the magnets on both sides of the discs robbing flux from the silicon. A learning experience and it was fun.

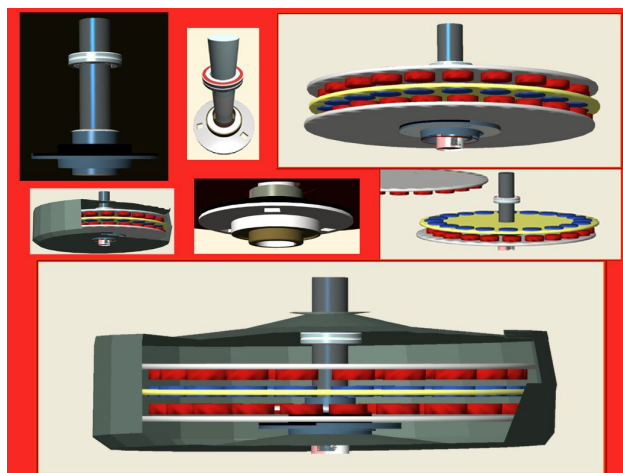
If you can imagine 3 single phase units each producing only 20 amps at a given rpm... In paralell you have 60 amps approx. Easy to do with #20 wire. Use #18 wire in the same configuration and each phase will deliver 35 amps or 105 amps... now your welding... use #15 wire ... well you get the picture... more coils, less turns, less resistance more power.

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## Another Alternator Ahhh!!!!

By [joe2012](#), Section [Magnets & Magnetism](#)  
Posted on Sat Jan 3rd, 2004 at 09:56:09 PM MST [Alternators](#)

Yes for the New Year ... Have a look a the picture and let us know what you think .



[Another Alternator Ahhh!!!!](#) | 2 comments (2 topical, 0 editorial)

Re: Another Alternator Ahhh!!!! ([none / 0](#)) ([#1](#))  
by Harry Luubovv on Sat Jan 3rd, 2004 at 10:51:26 PM MST  
([User Info](#))

I think the drawing is very nice. But where's the photo of a real generator ? :-

That's nice drawing really, thanks.  
Luubovv.

Re: Another Alternator Ahhh!!!! ([none / 0](#)) ([#2](#))  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Mon Jan 5th, 2004 at 08:14:13 AM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

I think your coils need to be larger and your magnets need to be spaced farther apart because the coils won't fit.

}=- W o o f -= {

[Another Alternator Ahhh!!!!](#) | 2 comments (2 topical, 0 editorial)

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## [generating electricity using Earth's magnetic field?](#)

By [dude8604](#), Section [Homebrewed Electricity](#) [Free Energy](#)  
Posted on Sat Jan 3rd, 2004 at 08:22:31 PM MST  
???

I'm working on a school science project and was wondering if any of you could help me. I'm doing a science fair project in which I will test the feasibility of using electromagnetic induction and the Earth's magnetic field to create electricity by moving a wire coil. Someone was telling me that if you take a wire coil and move it, power will be generated because of the Earth's magnetic field (because of electromagnetic induction. Does this actually work and how can I test this? I'm having trouble finding info on this. Anyone have any ideas of where to look or what to search for? I found out that there is a device called the Grove Earth Coil invented by an English scientist in 1900, but I can't find any more info on it. Thanks for any help!

[generating electricity using Earth's magnetic field?](#) | 2 comments (2 topical, 0 editorial)

using Earth's magnetic field? ([none / 0](#)) ([#1](#))  
by [drdongle](#) on Sat Jan 3rd, 2004 at 09:41:23 PM MST  
([User Info](#))

It works but the trick is the motion, that is finding a way to move the coil continuously through the natural magnet field and as that field is very weak producing enough power to be usefull.

Dr.D

Re: using Earth's magnetic field? ([none / 0](#)) ([#2](#))  
by [Harry Luubovv](#) on Sat Jan 3rd, 2004 at 10:02:26 PM MST  
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It's easier to build a giant compass, with the pointer connected to a gearing system that drives a generator. You have a couple of "Wings" or "Fins" built to capture the wind so that each time the wind blows on the wings, it turns the compass body away from magnet north, the pointer moves southwards of course correspondingly, and so the gearing underneath registers the movement, converting the movement into generated power. Simple and straight ! Heck it, cancel that wings stuff, you just move the compass body by your own hands, it is just a science project anyway, we don't need wind in this case !

Love, not hate  
Luubovv.

[ [Parent](#) ]

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posted by Static Lightning on 12/16/2003 04:28:52 PM MST  
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posted by Virgis on 12/16/2003 09:50:44 AM MST  
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posted by filico on 12/10/2003 07:56:28 AM MST  
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posted by filico on 12/08/2003 08:37:57 AM MST  
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posted by pexring on 12/05/2003 10:14:45 PM MST  
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posted by erne on 12/05/2003 06:52:04 AM MST  
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posted by wdyasq on 11/24/2003 06:43:14 PM MST  
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posted by Seth on 11/22/2003 05:51:37 PM MST  
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posted by bob golding on 11/19/2003 07:07:58 AM MST  
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posted by J Steele on 11/18/2003 08:41:08 AM MST  
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posted by erne on 11/12/2003 07:01:13 AM MST

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posted by gameman on 11/10/2003 08:39:14 PM MST

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posted by Sponge on 11/10/2003 11:43:13 AM MST

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posted by pazman on 11/08/2003 11:41:01 PM MST

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posted by gameman on 11/08/2003 08:53:45 PM MST

3 comments



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## [High voltage at very low rpm](#)

By [Moogly](#), Section [Homebrewed Electricity](#)

Posted on Sat Jan 3rd, 2004 at 04:02:48 PM MST

[Alternators](#)

### 1 big coil vs multiple smaller coils

Hi,

I want to build a small wind generator that will output only a few Watts (5-10W) to charge a 12V battery (I know that buying a small solar panel would be simpler but I'm interested in building a wind generator). I want it to be able to charge the battery in very low winds (10 mph). I don't care about getting high power in high winds.

I think that winding more turns of wire around a coil raises it's voltage at low rpms. But my question is: Is it better to have a big coil with a lot of turns or many smaller coils in series? Example: If I have a 10 magnets rotor, is it better to have 1 coil with 500 turns or 10 coils in series with 50 turns each?

Should I go 3 phase in star configuration to get more voltage at low rpms?

And what kind/size of rotor would be appropriate?

Thanks in advance and sorry for my poor english...

[High voltage at very low rpm](#) | 7 comments (7 topical, 0 editorial)

Re: High voltage at very low rpm ([none / 0](#)) ([#1](#))  
by [Budgreen](#) on Sat Jan 3rd, 2004 at 08:29:54 PM MST  
([User Info](#))

for just 5-10W it seems like a lot of trouble to go through. I have a small stepper motor that puts out about 6-8W into a battery in low winds I think that you might have better luck with something like this, but it is your call

Re: High voltage at very low rpm ([none / 0](#)) ([#2](#))  
by [Norm](#) on Sat Jan 3rd, 2004 at 09:36:05 PM MST  
([User Info](#))

It will have to be a very small 12 volt battery...5amp/hr. Well anyway try <http://www.picoturbine.com/> their more advanced alternator 3phase should work you wouldn't necessarily have to hook it up to a vawt. Have Fun! Norm.

Re: High voltage at very low rpm ([none / 0](#)) ([#3](#))  
by [dave123](#) on Sun Jan 4th, 2004 at 12:45:16 AM MST  
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I signed up on this board with the same basic question. Looking for a "portable" wind generator to be set up and used when camping, which will mostly be in the Oct-Dec timeframe, and out in the woods. Not good for wind generation, but not good for solar in the northern part of the U.S. either. My homemade furnished camper will be heated via a tent stove, it will have LED for basic lighting (at least to prevent stubbing a toe!), and possibly a radio. So my electrical loads should stay small. However, I would like to experiment for the learning experience as much as anything, not to mention having multiple sources of power for flexibility. So, being in the woods (major wind blockage) and having to stay portable, I am severely limiting the available wind to be harvested. Therefore, I would like to build something that is maybe the size of a box fan or slightly larger, that will at least contribute to battery maintenance. This raises another question; if the batteries are somewhat low, will the increased load of a low battery stall a small wind generator in low winds? I have recently built a lawnmower engine-powered GM alternator to do bulk recharging of batteries, but would rather not even use it at all. As it is, I had to build a variable pulse width generator to reduce the motor load on the tired ole garbage-picked lawnmower engine when the battery is low, or it would stall. Perhaps this pulse width modulation could be used for a small wind generator when used on low batteries? I have read many posts on this board as well as some other sites, and it is very confusing. Number of poles, phases, number of windings, number of prop blades and design, stator diameter, etc. Very hard to figure out for a small capacity battery maintainer that I would like to build. Any suggestions would be appreciated.

Re: High voltage at very low rpm ([none / 0](#)) (#7)  
by stm on Sun Jan 4th, 2004 at 10:33:39 AM MST  
([User Info](#))

Since your needs are very low, and you don't have access to either a good wind, or a source of good sunlight, you might want to use the possibility of using a bicycle connected to an alternator?

[http://www.otherpower.com/otherpower\\_experiments\\_bicycle.html](http://www.otherpower.com/otherpower_experiments_bicycle.html)

The owner of this site claims that he can get 60 watt without struggling, and 120 watt, when he is pedaling as fast as he can.

Your needs are very low, so if you could pedal while you are listening to the news or doing other things, and you would get an excess amount of power, - probably enough to power your lights and other things during the evening?

Look at the bicycles boat owners use - they are very compact. If you cut one of those apart, (remove everything you don't need, like the saddle and the wheels), and connect it to an alternator you would end up with a small human powered generator, which you can power while you are sitting in your chair.

/Steffen

[ [Parent](#) ]

Re: High voltage at very low rpm ([none / 0](#)) (#4)  
by RobD on Sun Jan 4th, 2004 at 06:04:11 AM MST  
([User Info](#))

Since your voltage is high and current needs low you might want to run single phase. RobD

Re: High voltage at very low rpm ([none / 0](#)) (#5)  
by Moogly on Sun Jan 4th, 2004 at 07:06:41 AM MST  
([User Info](#))

Thank you for your advice. I know that building a wind generator is a complicated way to get 10W and will turn out to be more expensive than simply buying a solar cell, but I'm interested in building my own alternator and maybe it will be a prelude for a bigger one eventually. There's still one question unanswered: Is it better to have 1 coil with a lot of turns or 10 coils with 10 times less turns each in series. Thanks

Re: High voltage at very low rpm ([none / 0](#)) (#6)  
by Electric Ed on Sun Jan 4th, 2004 at 07:36:43 AM MST  
([User Info](#)) <http://www.electric-ed.com>

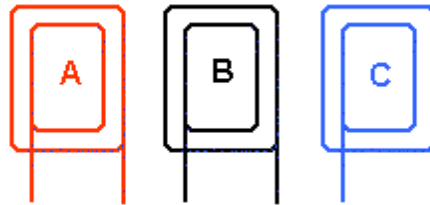
[quote]"Is it better to have 1 coil with a lot of turns or 10 coils with 10 times less turns each in series."

Yes. With your windings evenly distributed around the circumference of the machine, all of the available magnetic flux is acting on coils at all times.

I believe that the most efficient layout for an axial-flux machine is the twin-rotor three phase.

**Three Phase Winding - all coils identical**

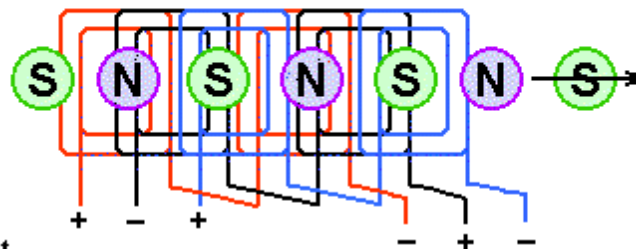
Connect the coils of each phase in series for higher voltage, and parallel for higher current



"Edge-on" View from here shown below

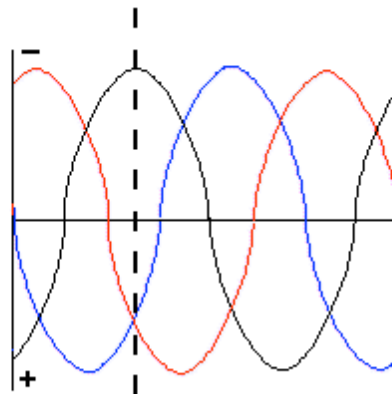
**Magnet Spacing - Equal to the coil span**

After interchanging the center phase leads, connect the phases in wye for higher voltage, and delta for more current



**Voltage waveforms at the instant when magnets are at position illustrated above**

Note - At any instant, one phase is always opposite in polarity to the other two



**Twin Rotor Magnet Arrangement**



Electric Ed

[ [Parent](#) ]

[High voltage at very low rpm](#) | 7 comments (7 topical, 0 editorial)

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### [Drawing Program for postings](#)

By [VermontMaple](#), Section [Weird Science](#) [Wind](#)  
Posted on Sat Jan 3rd, 2004 at 01:27:55 PM MST

I have noticed that most of the better postings are using what seems to be a same drawing program.

I would like to post a few things, however a picture or pictoral drawing usually gets the point across better. What is the drawing program that works best here? is it shareware? can I post PDF drawings here?  
I am going to try posting a couple pictures I took at the Searsburg Vermont Wind Farm (560KW per machine 40ish meter rotor)



I was working on the Wind Monitoring Tower there when I took this.  
I thought a few of you might like to see this.

[Drawing Program for postings](#) | 1 comment (1 topical, 0 editorial)

Re: Drawing Program for postings ([none / 0](#)) ([#1](#))  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Sat Jan 3rd, 2004 at 05:17:02 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

I post a lot of drawings. I use the Wondoze Paint program and convert the file to a GIF Image so the file size will be real small.

Small file size is important, I suggest you use GIF images for drawings and JPG images for Photos. And try to keep the pic size under 650 pixels.

}=- W o o f -= {

[Drawing Program for postings](#) | 1 comment (1 topical, 0 editorial)

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[Is 15.3 volts too high to leave my batteries charging?](#)

By [zmoz](#), Section [Homebrewed Electricity](#) [Batteries](#)

Posted on Sat Jan 3rd, 2004 at 01:15:14 PM MST

Is 15.3 volts too high for long term battery charging?

Sorry to keep bugging you guys about my batteries, but this is the first time I've actually had to store any. :) I have two automotive starting batteries that I am storing in the garage for the winter. One is brand new, the other is about 4 years old. Their voltage when charged is within .4v of eachother. I wired them in parallel and planned on leaving my 1 amp trickle charger on them for the winter. After the charger has been on for a few hours, however, the voltage is up to about 15.3, with about .3 amps going into each battery. Is this too high to leave them "floating" for the winter?

[Is 15.3 volts too high to leave my batteries charging?](#) | 2 comments  
(2 topical, 0 editorial)

battery charging - ([none / 0](#)) (#1)  
by VermontMaple on Sat Jan 3rd, 2004 at 02:05:49 PM MST  
[\(User Info\)](#)

Zmoz

Charging batteies is a tricky business. And floating them for an extended period is even a harder. I have had a lot of experience over the past decade floating lead acid batteries. Most trickle style battery chargers have some minimum current always being fed to the battery . This is fine for a short time (1 week or so) however if you are not cycling your batteries...like most off the off-grid poeple do, you will boil out the acid in your battery. Many years ago I had a very useful conversation with a battery engineer at C&D corporation about proper charging and maintenance of lead acid batteries. His advice is as follows. Never allow the float voltage of the charging device exceed the natural float voltage of the battery. The natural float voltage of the battery can be found by initaly charging the battery very hard for enough time that you are satisfied it is fully charged..The battery will usually be warm/hot...for a standard car style battery charge it at about 10amps (about 1/10 to 1/3 of the amp hr rating of the unit 60-100 amp/hrs for car batteries = 6 to 10 amps)

And charge it for about 24 hours. The voltage of the unit should be well above 14 volts at the end of the charge cycle. Now let the battery rest for 15 minutes after removing the charger, then measure the voltage of the battery (to 2 decimal places if possible). This is the natural charged voltage of this particular battery. Set the voltage out on your charging unit not to exceed this voltage. If the battery is kept at this voltage it will not evaporate its electrolyte, and be always ready for use.

As for paralleling batteries, one will usually discharge the other until the lowest voltage unit is at its natural voltage. If the battery have the same natural voltage (or very close

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+\_.1 volts) than they can be paralleled without a problem.

Stacking, paralleling batteries is a complex subject. Whenever possible stack/parallel batteries from the same lot if possible or at least the same capacity and age. There are tricks using fuses as swamping resistors (and safety devices) to help better stacking/paralleling...but I will save that for a future post if anybody is interested.

Re: battery charging - ([none / 0](#)) ([#2](#))  
by bob golding ([yubba at clara dot net](#)) on Sat Jan 3rd, 2004 at 04:38:59 PM MST  
([User Info](#))

you could try draining the acid after you have fully charged them. never tried it but batteries will keep for years like this. just pour the acid back in in spring. no charging, no freezing, and you can just forget about them till you need them. do a google on battery maintenance, its all there somewhere.:-) bob

[ [Parent](#) ]

[Is 15.3 volts too high to leave my batteries charging?](#) | 2 comments  
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posted by mmulzer on 01/01/2004 11:08:22 AM MST  
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posted by zmoz on 12/27/2003 07:26:33 PM MST  
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posted by Mike Wolak on 12/23/2003 04:30:04 PM MST  
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posted by iceman on 12/18/2003 08:34:23 PM MST  
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posted by zmoz on 12/18/2003 03:47:43 PM MST  
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posted by drdongle on 12/11/2003 07:03:27 PM MST  
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posted by Jerry on 12/09/2003 11:24:47 PM MST  
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14. [Electric Car?](#) ([Homebrewed Electricity](#), [Batteries](#))

posted by Mike Wolak on 12/08/2003 12:13:59 PM MST  
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posted by Reno on 12/07/2003 08:44:17 AM MST  
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16. [Chemical Rejuvenation Of Batteries](#) ([Homebrewed Electricity](#), [Batteries](#))

posted by bruce1 on 12/05/2003 07:37:42 AM MST  
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17. [Sharing info](#) ([Homebrewed Electricity](#), [Batteries](#))

posted by Mike Wolak on 12/04/2003 10:06:13 AM MST  
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18. [SLA batts](#) ([Homebrewed Electricity](#), [Batteries](#))

posted by RobD on 12/01/2003 07:49:22 AM MST  
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19. [Making a drill battery pack - can I up the voltage a little?](#) ([Homebrewed Electricity](#), [Batteries](#))

posted by zmoz on 11/27/2003 01:36:36 PM MST  
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20. [Do array of batteries want an equal distance to positives](#) ([Homebrewed Electricity](#), [Batteries](#))

posted by zbotrobot on 11/25/2003 07:54:02 PM MST  
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21. [how many volts dose it take to charge?](#) ([Quarantine Zone](#), [Batteries](#))

posted by scagger2002 on 11/25/2003 05:01:43 PM MST  
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22. [diy batteries](#) ([Homebrewed Electricity](#), [Batteries](#))

posted by bigdan on 11/23/2003 11:53:35 PM MST  
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23. [Dry Battery](#) ([Homebrewed Electricity](#), [Batteries](#))

posted by Tim C on 11/22/2003 10:26:08 PM MST  
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24. [Fork lift batteries](#) ([Homebrewed Electricity](#), [Batteries](#))

posted by Guerreiro on 11/21/2003 10:31:40 AM MST  
1 comment

25. [Forklift Battery](#) ([Homebrewed Electricity](#), [Batteries](#))

posted by bruce1 on 11/20/2003 12:23:26 PM MST  
3 comments

26. [Equalization charge](#) ([Homebrewed Electricity, Batteries](#))

posted by bruce1 on 11/19/2003 09:24:57 AM MST  
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27. [Batteries -- What voltage should my SLA battery read when fully charged?](#) ([Renewable Energy FAQ, Batteries](#))

posted by kurt on 11/19/2003 08:32:24 AM MST  
0 comments

28. [Full voltage of gel cell?](#) ([Homebrewed Electricity, Batteries](#))

posted by zmoz on 11/18/2003 03:39:15 PM MST  
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29. [proper battery venting](#) ([Homebrewed Electricity, Batteries](#))

posted by Budgreen on 11/17/2003 01:02:51 PM MST  
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30. [Will this battery ever recover?](#) ([Homebrewed Electricity, Batteries](#))

posted by Norm on 11/17/2003 04:25:18 AM MST  
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### [Automotive alternator used as motor](#)

By [Salty](#), Section [Magnets & Magnetism](#)  
Posted on Sat Jan 3rd, 2004 at 11:17:49 AM MST [Alternators](#)  
Alternator/motor

Can automotive alternators be modified to be used as motors?

[Automotive alternator used as motor](#) | 6 comments (6 topical, 0 editorial)

Re: Automotive alternator used as motor ([none / 0](#)) (#1)  
by [RobD](#) on Sat Jan 3rd, 2004 at 04:39:07 PM MST ([User Info](#))

Hi, Not easily or efficiently. Car alternators are designed with a narrow specific purpose and while they can be used in other applications they usually don't excel. RobD

Re: Automotive alternator used as motor ([none / 0](#)) (#2)  
by [rhud](#) on Sat Jan 3rd, 2004 at 07:10:28 PM MST ([User Info](#))

Hi, I seem to remember a pamphlet i received from linsay publishing telling how to easily turn an alternator into a motor, but there's a catch (there always is). you had to remove the diode pack and bring the three field winding wires outside the case. so now what you have is a three phase motor with slip ring feed to the rotor. (most of us dread a three phase motor) but in this case the idea was to also remove the diode pack from an alternator that was being used to produce power, there by turning it into a three phase generator that could feed the motor. i'll try to find the information, i'm too tired to think. but its a good tired, i just got back from North Carolina with my new GM-90 engine from Mike. I'm going to post the experience when i can think (better).

Re: Automotive alternator used as motor ([none / 0](#)) (#3)  
by [kell](#) on Sat Jan 3rd, 2004 at 07:48:29 PM MST ([User Info](#))

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Interesting to think about... putting three-phase ac into the stator would set up a rotating magnetic field? Seems like you would still have to put direct current into the field. And what about the voltage regulator? Like to hear more.

Re: Automotive alternator used as motor ([none / 0](#)) (#4)  
by Harry Luubovv on Sat Jan 3rd, 2004 at 10:20:11 PM MST  
([User Info](#))

You can forget about the regulator, you just turn the alternator as fast/slow as you want, to generate the amount of voltage you want. But of course if you want a specific amount of current and be able to hold to a certain voltage, then you will need your own electronics regulator. But for simplicity, it is not necessary at all to have the regulator, just adjusting the RPM is enough. You can also rectify the AC output to feed the rotor current requirement. Or have Neo Mags fitted to it and forget about drawing unnecessary electricity from the output for the rotor all together !!!

I like something what I read in this board, so I'll repeat what other person said :  
"Put the bunny back in the box". Or was it supposed to be "Put the bus back in a cage !" ?? :- Gettin' old, cannot remember too well.

Ciao.  
Luubovv.

[ [Parent](#) ]

Re: Automotive alternator used as motor ([none / 0](#)) (#5)  
by Harry Luubovv on Sat Jan 3rd, 2004 at 10:32:55 PM MST  
([User Info](#))

See what I meant ? Gettin' old really .....  
because, I said to rectify the AC output to feed the rotor. I was still thinking to use the alternator as a generating source. But in true fact, you can rectify the same AC that feeds the alternator to supply the rotor need. Or you can try to have a separate small coil fitted to the rotor, and let this coil generate some current as the generator/motor turns, to feed the rotor. You will also need a couple of diodes here too. This contraption is rightfully called " Self excited circuitry" All of these are totally and entirely possible !!

Put the bus back in the page !  
"Page" or "Cage" ? ..... Couldn't rememebr too well again :-  
Luubovv.

[ [Parent](#) ]

Re: Automotive alternator used as motor ([none / 0](#))  
(#6)  
by [kell](#) on Sun Jan 4th, 2004 at 07:32:45 PM MST  
([User Info](#))

The \$64,000 question: would it run as an induction motor or a synchronous motor? The rotor on an alternator is very different from the rotor of an induction motor. It could work, but probably very, very inefficient.

Theoretically you could make it run like a synchronous motor, but you would have to put in an alternating current to the rotor that's synchronized with the current going into the stator, and chances are the phasing you would need for that current would not be precisely in phase with any of the three phases going into the stator. Maybe if you use a capacitor to shift your rotor current 90 degrees from one of the phases of the stator, the magnetic fields of the stator and rotor would be close but just off enough to give you some torque. Otherwise you might have to do something like installing hall effect sensors to register angular position of the rotor and signal a controller to apply power of the necessary polarity to the rotor. In that case it would be running like a brushless dc motor and you might use dc in the stator... now I'm confusing myself. Ha ha.

But you see the problem. An alternator is just not designed like a backwards motor.

[Automotive alternator used as motor](#) | 6 comments (6 topical, 0 editorial)

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## [Help with Induction Motor](#)

By [wildbill hickup](#), Section [Homebrewed Electricity](#)

Posted on Sat Jan 3rd, 2004 at 05:56:18 AM MST

1/3 HP Sump pump Motor, HELP

[Wiring](#)

I need help, this will be my first attempt with an induction motor. Before I get started tearing everything apart (and making more work for myself than I have to) I thought I'd ask some questions.

First, Is it worth it? This pump fell over on the well and was not discovered for a few weeks. It turns freely but will not start, switches and contacts shot, windings seem to be in pretty good shape.



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Second, specs: 1/3 HP, 1725 RPM, 115 volts, SFA 6.7( I assume amps), single phase







Observations: 36 segments on stator, 2 sets of windings one smaller wire one bigger wire (startup and run I would imagine) not sure of gauge size. Connections Blue wire one thin one thick winding wire, Red wire one thin winding wire, White wire one thick winding wire, 2 thin winding wires connected together. There seems to be 4 groups of each size wire around stator. Tried to get picture of the way it is wound, hope this helps.

Questions:

How is the best way to proceed (ie does this have to be completely rewound, how many poles, can I make use of both sets on windings (low and high speed) etc.

How much power and at what speed should I expect.

I haven't even considered blade design yet I figured I get these questions out of the way first.

Thanks for any guidance in advance

Wildbill

[Help with Induction Motor](#) | 6 comments (6 topical, 0 editorial)

Re: Help with Induction Motor ([none / 0](#)) ([#1](#))  
by 5kw on Sat Jan 3rd, 2004 at 08:14:54 AM MST  
([User Info](#))

Wild bill, It is presently a four pole motor, to use more poles than this it would have to be rewound, twelve poles would be an obvious choice. Is it worth it? At low speeds this would yield a very low power unit. Most induction motor conversions start with a much larger motor. I think Jerry uses 3/4 or one horse motors for his garbogens which have only about 4' diameter blades. Make the wind fun! Victor

Re: Help with Induction Motor ([none / 0](#)) ([#2](#))  
by Jerry on Sat Jan 3rd, 2004 at 08:54:00 AM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi WildBill I have some wind test results from a very similar 6.7 amp, 1725 rpm, 1 ph., 120 volt garbage disposal motor. 10 mph 5 amps, 15 mph 8 amps, 20 mph 12 amps, 25 mph 23 amps, 30 mph 25 amps, 40 mph 40 amps, 45 mph 45 amps. This is using 3 of my plastic blades at 49 inches tip to tip. These same blades have done 1200 watts top end on the 1 hp. If you were using a 1 hp motor the out put above 15 mph would just about double. Your motor has 4 start and 4 run windings. The starts may be aluminum wire. Also it appears the starts have the typical coil sizes. That is 2 of the start coils are small and 2 are large. Reassigning the coil arrangements will yeald proper results for 12 volt charging. Tom W has a scimatic on his web page. My alt have been made with the old Wondermagnet #29 curved neos. They fit the lamination bore perfect. However the amature in this motor is to short for these magnets. I take the armature from a furnace blower motor. All these motors are free at your Heating and air conditioning shop or at your plumber or at motor rewind shop or at your garage door shop. And Harbor Freight has nice new unit 3/4 hp \$60. I'll post more latter I must go to work now but there is much more I'll share with you on this subject. JK TAS Jerry

[Airheads Page](#)

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Re: Help with Induction Motor ([none / 0](#)) ([#3](#))  
by wildbill hickup on Sat Jan 3rd, 2004 at 11:02:48 AM MST  
([User Info](#))

Thanks for the info Jerry. While I was sitting around this morning I decided to check windings. They are both aluminum. Large winding shows open circuit, connecting ohm meter between where small wires connected together and red wire shows open, same connection between small wire splice and blue wire is the only one shorted resistance reads.3 ohms. Correct me if I'm wrong but there should be continuity in all, yes? I guess it spent to much time under water. I might as well unwind, maybe I'll learn something. I have some difficulty picturing how these are wound. I'm still very interested in doing the induction motor conversion I guess I'll just have to find another test subject, this one seems to be shot.

Wildbill

P.S. In one of your postings(I think it was you)I read that it was getting hard to get those curved magnets. Are they still hard to get or was that just a temporary shortage?

[ [Parent](#) ]

Re: Help with Induction Motor ([none / 0](#)) ([#4](#))  
by Jerry on Sat Jan 3rd, 2004 at 09:04:58 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi WildBill All Electronics has the cuved neo magnets for \$5.50 each. the problem is they woun't garranty N,S, pairs. If you ordered 4 magnets you may end up with any combination like 3 Ns 1 S or all S or all N or who knows what?. For a 4 pole motor you need 2 N and 2 S. It impressive to see just 4 little \$5.50 magnets do 1200 watts. And even more exsitting when powered by 3 \$10 blades. I have very clean 4 pole stators for \$10 each. These range from 5.6 amps to 7.6 amps. The diferance on the garbage disposal motor is an unusual large diameter bore. This is partly why they preform so well compaird to standard motors of the same HP rating. They are also very easy to reconect the coils for bettery operation as a wind genny. JK TAS Jerry

[Airheads Page](#)

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Re: Help with Induction Motor ([none / 0](#)) ([#6](#))  
by monte350c on Sun Jan 4th, 2004 at 09:13:04 PM MST  
([User Info](#))

Hi Jerry,

Have you seen these guys?

<http://www.rare-earth-magnets.com/SearchResult.aspx?CategoryID=21&Keywords=Segment&All=True>

They list some arc shaped magnets and have separate part numbers for North and South magnets.

But I'm not sure if they are the right size for the induction motors or not?

Have a look and if they are I might try one of these too!

Ted.

[ [Parent](#) ]

Re: Help with Induction Motor ([none / 0](#)) ([#5](#))  
by kell on Sun Jan 4th, 2004 at 08:18:12 PM MST  
([User Info](#))

That thing with All Electronics bums me out. To get the mags in pairs you would have to know somebody that lives in L.A. and willing to go to their store to pick the mags. I know it's doable that way because I talked to somebody in L.A. that went to the store and picked out mags by polarity. But really All Elec should just get a clue and put the mags in two big piles. I tried talking to them but they just won't listen.

[Help with Induction Motor](#) | 6 comments (6 topical, 0 editorial)

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posted by thegingerone on 10/30/2003 05:06:50 PM MST  
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([Classifieds](#), [Wiring](#))

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posted by headhunter on 10/23/2003 05:07:38 PM MST  
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posted by kww on 10/19/2003 09:55:10 PM MST  
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16. [coil winding data](#) ([Homebrewed Electricity](#), [Wiring](#))

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([Homebrewed Electricity](#), [Wiring](#))

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10 comments

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posted by paulpic on 09/11/2003 06:48:27 AM MST  
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([Homebrewed Electricity](#), [Wiring](#))

posted by dwhit on 09/10/2003 10:37:17 AM MST  
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posted by Dave B on 08/25/2003 10:40:41 PM MST  
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posted by headhunter on 07/23/2003 10:03:29 AM MST  
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posted by storrence on 07/20/2003 03:59:47 PM MST  
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posted by pearl on 07/18/2003 08:45:15 PM MST  
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[Pictures on my small experiment :\)](#)

By [Putte](#), Section [Homebrewed Electricity](#)

Posted on Sat Jan 3rd, 2004 at 05:34:27 AM MST

**Induction generator**

[Wind](#)

Hi just wanted to share a picture on a small 2 meters experiment..its legal in Sweden no building permit needed ..and i have no wind so testing have to wait :( Its a 1000 rpm (50 HZ) self-excitation induction generator gearing 3.5/1



Have a nice day :) Putte from Sweden

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[Pictures on my small experiment :\)](#)  | 3 comments (3 topical, 0 editorial)



Re: Pictures on my small experiment :) ([none / 0](#)) ([#1](#))  
by drdongle on Sat Jan 3rd, 2004 at 07:18:46 AM MST  
([User Info](#))

Both machines in the picture look to be very professionally constructed, how about some more information on both.

Dr.D

Re: Pictures on my small experiment :) ([none / 0](#)) ([#2](#))  
by Putte on Sat Jan 3rd, 2004 at 10:09:37 AM MST  
([User Info](#))

Hello DR.D :) The bigger 3 meters is a 16 poles pmg and with 2.18/1 gearing i am using it for heating and that in a series resonant circuit with capaciteters it works perfekt.





And i am using a volt and amp meter as a power grid meter 172kwhours so far..But its a tricki to meter the watts, have sen 450 volt and 3.5 amp, max power i think is 700-800 watts ???



put it upp yesterday for testing...

For the small 2 meters i havet got so far with





[ [Parent](#) ]

Re: Pictures on my small experiment :) ([none / 0](#)) ([#3](#))  
by [drdongle](#) on Sat Jan 3rd, 2004 at 09:32:10 PM MST  
([User Info](#))

Very nice Putte, let us know how they work out.

Dr.D

[ [Parent](#) ]

[Pictures on my small experiment :](#) | 3 comments (3 topical, 0 editorial)

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### [Coils "Shorting out laminates"](#)

By [Sponge](#), Section [Homebrewed Electricity](#)

Posted on Sat Jan 3rd, 2004 at 04:28:26 AM MST

[Alternators](#)

Something that is a bit vague on all experiment pages :)

Hi,

A few times I see mentioned that there should be another glue like layer on top of the laminates, because otherwise coils can short out the laminates. if 2 coils would do that, it would "ruin the alternator". Now, what is exactly what isn't allowed?

The copper of the coils touching the metal of the laminates?

Or:

Are coils not allowed to touch laminates at all (should there be a airgap between?)

I'm not sure, and I couldn't find it on this forum either. And I prefer to try to do this right the first time, :)

Regards,  
Sponge

[Coils "Shorting out laminates"](#) | 3 comments (3 topical, 0 editorial)

Re: Coils "Shorting out laminates" ([none / 0](#)) ([#1](#))  
by Electric Ed on Sat Jan 3rd, 2004 at 05:55:11 AM MST  
([User Info](#)) <http://www.electric-ed.com>

The sharp edges of the steel laminations could wear through the thin enamel insulation on the copper magnet wire, and short out the coils, so there must be insulation between the two. Motor rewinders use a material they call "fish-paper".

Here is a photo (thanks to zubbly), showing the slots insulated, and ready for the coils, for one of his induction motor conversions.

[http://www.otherpower.com/images/scimages/253/us\\_stator\\_insulated.jpg](http://www.otherpower.com/images/scimages/253/us_stator_insulated.jpg)

Electric Ed

Re: Coils "Shorting out laminates" ([none / 0](#)) ([#2](#))  
by Sponge on Sat Jan 3rd, 2004 at 06:20:12 AM MST  
([User Info](#))

Aha! That makes sense, thanks!

(And yeah, I've figured the sharpness of my material is near razor blade :) (some cuts in my hands.. :P))

Regards,  
Sponge

[ [Parent](#) ]

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Re: Coils "Shorting out laminates" ([none / 0](#)) ([#3](#))  
by zubbly on Sat Jan 3rd, 2004 at 08:48:44 AM MST  
([User Info](#))

hello Sponge.

Magnet wire on its own does have an insulative coating. this coating is intended to only serve as electrical insulation between turns of the coil only. It should never be relied upon to insulate the coils from the laminates.

the material i use is DMD 180 degree celcius(dacron-mylar-dacron) which is intended for this purpose. thickness available ranges from .003-.025 inches. you should be able to obtain some from any electric motor rewind shop or another suitable material. if insulating stator slots, you just cut it to size. if insulating a flat laminate surface, i suggest using a thin coating of 5 minute epoxy on the laminates and applying the insulation in one thickness layer.

hope this helps

Zubbly

[Coils "Shorting out laminates"](#) | 3 comments (3 topical, 0 editorial)

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## [coil shape and size for pm axial field alternator using donut magnets](#)

By [Oliver](#), Section [Magnets & Magnetism](#)

Posted on Fri Jan 2nd, 2004 at 12:00:11 PM MST

[Alternators](#)

### coil shape and size for pm axial field alternator using donut magnets

Hi all, I'm planning on building an axial field type alternator using donut shaped permanent magnets. The magnets have a diameter of 5.5cm and a hole of 2cm and I am thinking of using 12 of these on the rotor. I know that the poles of these magnets are on the face's of theses magnets, but not sure of the field lines. What would be the best coil shape, size and design? I am only using one rotor, so I am thinking thin and flat - but not sure on the shape and size? Thanks for your help!

[coil shape and size for pm axial field alternator using donut magnets](#) | 7 comments (7 topical, 0 editorial)

Re: coil shape and size ([none / 0](#)) ([#1](#))

by Electric Ed on Fri Jan 2nd, 2004 at 04:44:35 PM MST

([User Info](#)) <http://www.electric-ed.com>

Some of the basic principles are illustrated below.

I believe "straight sided" coils, preferably a trapezoidal shape, so that the coil sides are aligned with the radius of the machine, will give good results.

To maximize the field flux density, I recommend that you use two mild steel rotor discs, even if the second one does not have magnets on it.

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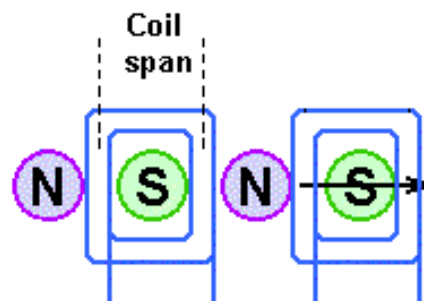
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## Magnet / Coil Spacing

In order to connect coils in series or parallel, so that the voltages, (or currents in parallel) will add instead of cancelling, the voltages induced in the coils must be "in phase" with each other.

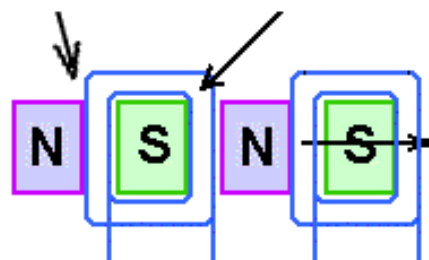
The only way to ensure that the coil voltages are in phase is by accurate magnet / coil spacing.

Magnet center-to-center spacing should equal the coil "span".



The objective is to have the leading edge of a NORTH pole reach one side of the coil - -

- - just as the leading edge of a SOUTH pole reaches the other side of the same coil.

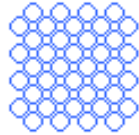




## THINNER IS BETTER - - - -

Three cross-sectional views of  
one "leg" of forty turn coil construction

OK



BETTER



BEST



Electric Ed

Re: coil shape and size for pm axial field altern (none / 0) (#2)  
by Oliver on Sat Jan 3rd, 2004 at 03:11:47 AM MST  
([User Info](#))

Hi Electric Ed, Thanks for your reply, very nice diagrams! So should the inner diameter of the coil be the same as the outer diameter of the magnet? I was originally thinking of having the coils the same size of the magnets to get the most flux passing through them. Thanks for your help Oliver

Re: coil shape and size for pm axial field altern (none / 0) (#3)  
by Electric Ed on Sat Jan 3rd, 2004 at 06:05:59 AM MST  
([User Info](#)) <http://www.electric-ed.com>

That depends on the magnet and coil sizes.

Refer again to my diagram. The important part reads - "Magnet center-to-center spacing should equal the coil span"

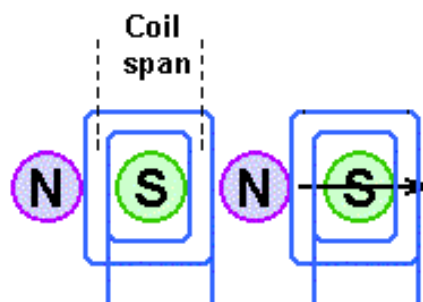
Does that make sense?

## Magnet / Coil Spacing

In order to connect coils in series or parallel, so that the voltages, (or currents in parallel) will add instead of cancelling, the voltages induced in the coils must be "in phase" with each other.

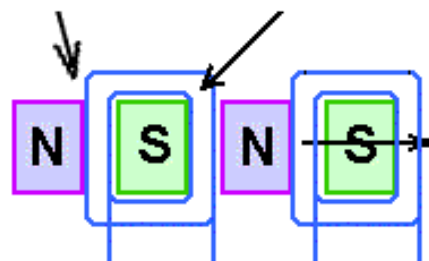
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The objective is to have the leading edge of a NORTH pole reach one side of the coil - -

-- just as the leading edge of a SOUTH pole reaches the other side of the same coil.



Electric Ed

[ [Parent](#) ]

Re: coil shape and size for pm axial field altern ( [none / 0](#) ) ( #4 )  
by Oliver on Sat Jan 3rd, 2004 at 06:34:27 AM MST  
( [User Info](#) )

Yes, that makes sense that the coils and magnets must be spaced accurate to limit any phase difference in the output of the coils. Thanks for your help Oliver

[ [Parent](#) ]

Re: coil shape and size for pm axial field altern ( [none / 0](#) ) ( #5 )  
by Oliver on Sun Jan 4th, 2004 at 04:48:18 AM MST  
( [User Info](#) )

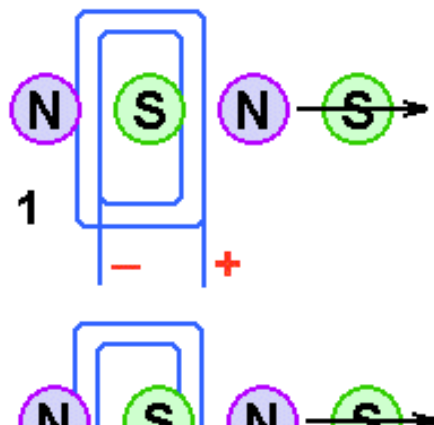
Electric Ed, when is the emf induced in the coils? - when the whole coil is over one pole e.g. N OR when one leg of the coil is over N and when one leg of the coil is over S? Thank you.

[ [Parent](#) ]

Re: coil shape and size for pm axial field altern ( [none / 0](#) ) ( #6 )  
by Electric Ed on Sun Jan 4th, 2004 at 06:50:02 AM MST  
( [User Info](#) ) <http://www.electric-ed.com>

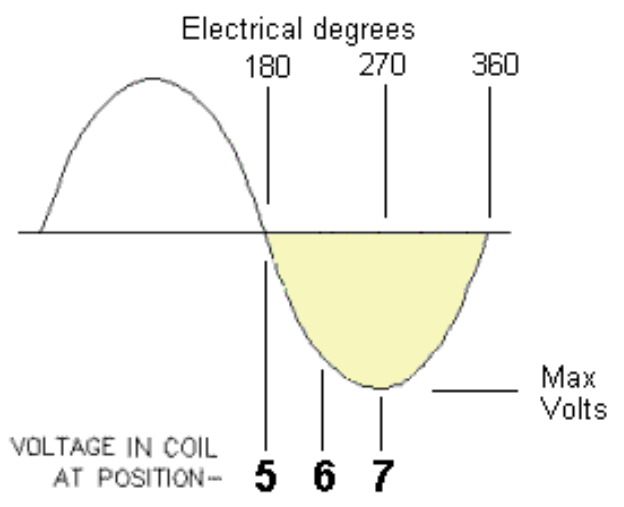
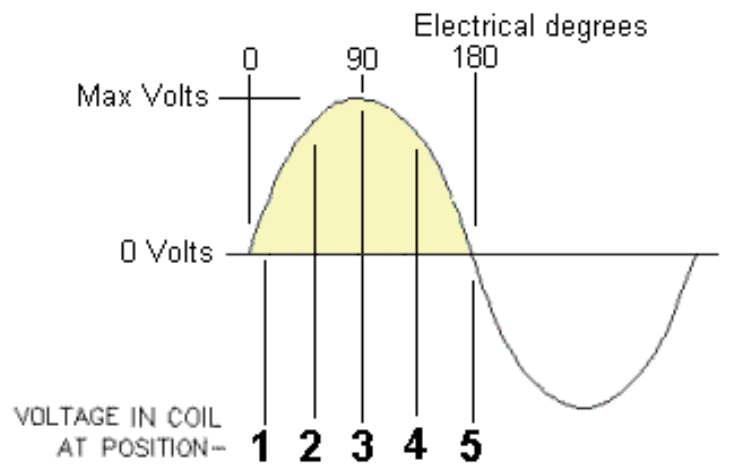
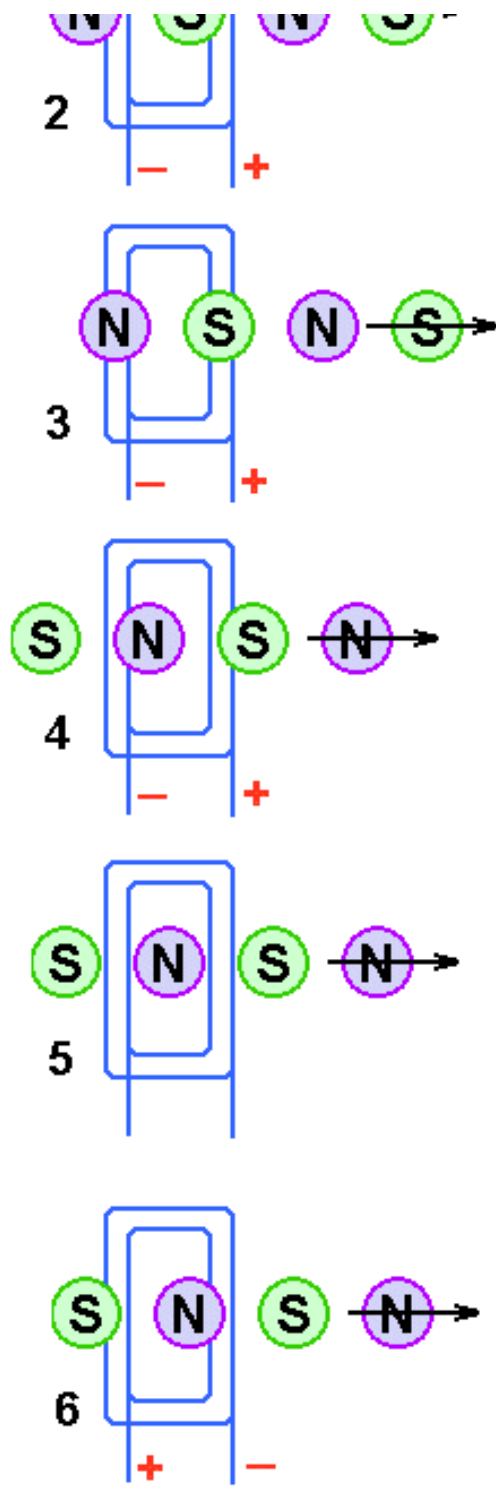
Voltage is induced when one leg of the coil is over a North, and the other leg of the same coil is over a South.

Electric Ed

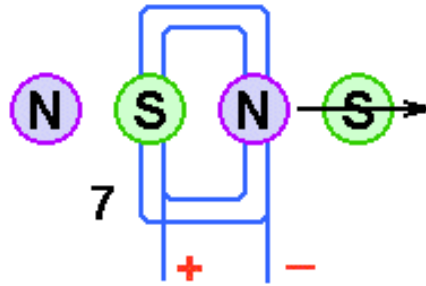


### Generation of an Alternating Voltage

Views 1 thru 7 represent the positions of the magnet poles as they move in relation to the stationary coils.







[ [Parent](#) ]

Re: coil shape and size for pm axial field altern ([none / 0](#)) (#7)  
by Oliver on Sun Jan 4th, 2004 at 11:34:46 AM MST  
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Thanks for the clear reply Ed, I may have to re-think my coil design as at the moment it will do the following both legs of the coil will be over the same magnet (n-pole), then one leg over north pole - other leg over air (gap between magnets) one leg over north pole - other leg over south pole one leg over air (gap between magnets) - other leg over south pole both legs of coil over south pole on same magnet I assume this would cause a problem with the sine wave i.e a positive half cycle - a space until coils line up - then a negative half cycle and so on. My coils are already quite big due to the size of the magnets - might have to make the even bigger? Cheers Oliver

[ [Parent](#) ]

[coil shape and size for pm axial field alternator using donut magnets](#) | 7 comments (7 topical, 0 editorial)

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[Bicycle lights \(batteryless, No friction, No drag\)](#)

By [iwico](#), Section [Classifieds](#)

[Lighting](#)

Posted on Fri Jan 2nd, 2004 at 10:39:39 AM MST

Use two magnets, a coil. light up 3-20 Leds without any batteries on your bike.

This bicycle safety flashing light system is based on a newly invented electrical generating system, NO battery needed, No friction on any parts of the bicycle. No drag. Very bright. Get the energy almost free (at least on bicycle). Standby light. Details: [www.freelights.co.uk](http://www.freelights.co.uk)

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posted by gameman on 09/05/2003 08:47:37 PM MST  
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## [1.5 hp induction conversion](#)

By [zubbly](#), Section [Homebrewed Electricity](#)

Posted on Fri Jan 2nd, 2004 at 10:11:04 AM MST

[Alternators](#)

last one for a while

Hello everybody.  
This shall be my last induction conversion, at least for a while. This genny is made from a 1.5 hp US ELECTRIC, 4 pole, 575 volt, 1.77 amp, totally enclosed fan cooled motor. The test results shall be at the end of the posting. Sorry, but some of the pics are not the best quality.

The first pictures are of the rotor conversion. I used the same method as the previous ones. It does work well. I started with making the fibre glass cage which holds the mags in place and also serves as a mold to later fill with resin. On this one i filled it with fibre glass resin to see how it would turn out. It did work well but my preference is still epoxy resin, as it has much more strength and thermal conductive properties.

I used a piece of ABS drain pipe to make the mold. I first turned the pipe in a lathe to to the inner dimation that i want the cage to be. I then covered it with one layer of waxed paper so that i will be able to get it off the pipe. I built up multiple layers of fibre glass cloth and resin larger than the outside diamater that i want the cage to be. After it had hardened well, i turned it in the lathe to the outside dimation that i want. I then cut to length, marked out the spacing for mags with a skew of one stator slot, and drilled 48 3/4 inch holes with a hole saw. There are 48 neo mags, 3/4 inch wide by 3/8 inch long.



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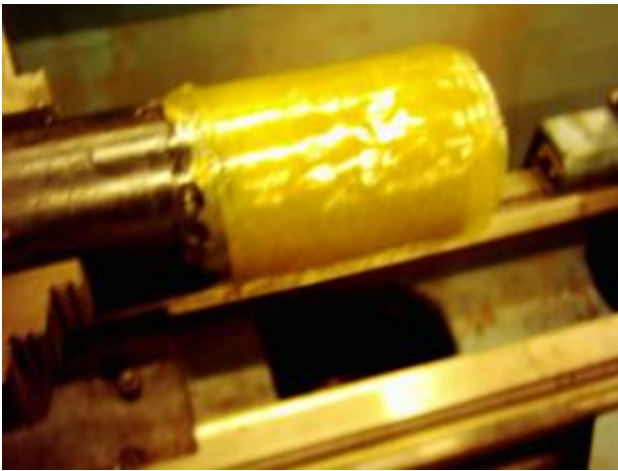
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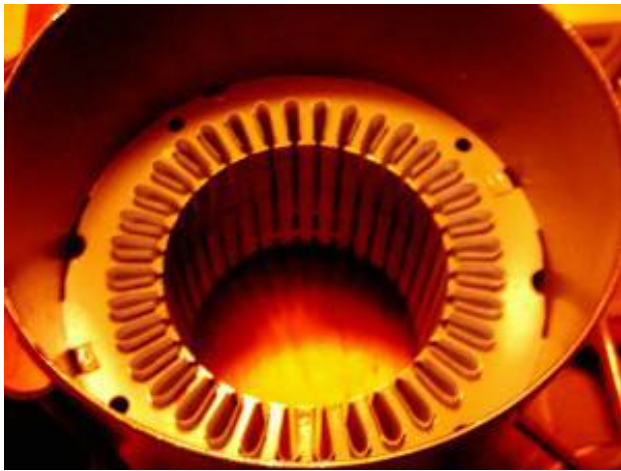
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- [Also by zubbly](#)



The next pictures are of the stator insulated for the new winding, insertion of the coils, connecting the winding, and of the finished winding ready to be dipped in electric motor varnish and baked.

I had before the permanent winding, wound by hand a complete test winding with only 5 turns of 1 #19 magnet wire to get my preliminary data with which i calculated the permanent winding.

The permanent winding has 12 poles, 3 phase consequent pole, 18 coils, 6 per phase, with 65 turns turns per coil. I used 1#22 and 1#23 magnet wires in parallel which is the same as using 1 #19 1/2 wire. The connection has 12 lead wires which give me the capability to connect either 1 Y, 2 Y, 1 Delta, or 2 Delta. This gives me a very broad range to connect for various driven speeds and voltage outputs.







**TEST VALUES: OPEN VOLTAGES AT VARIOUS CONNECTIONS AND SPEEDS. AC volts.**

All testing done in a lathe.

1. Y: @70 rpm-22.5 volt, @115 rpm-41.0 volt, @190 rpm-67.0 volt, @300 rpm-105.2 volt
2. Y: @70 rpm-10.1 volt, @115rpm-19.7 volt, @190 rpm-33.2 volt, @300 rpm-52.4 volt
1. D: @70 rpm-11.0 volt, @115 rpm-22.5 volt, @190rpm-37.5 volt, @300 rpm-59.1 volt
2. D: @70 rpm-3.0 volt, @115rpm-10.3 volt, @190rpm-18.4 volt, @300 rpm-29.3 volt

**TEST VALUES UNDER LOAD:**

The loaded tests were carried out using a lathe at various speeds, a 12 volt truck battery, 2 bridge rectifiers to make DC voltage, and amperage was based using a 1 foot length



of #10 lead wire in the positive output lead with millivolt readings taken at the 1 foot spacing. Each millivolt represents 1 amp. The voltage at the battery terminals was also taken at each test to determine the wattage output. Wattage output was determined by multiplying millivolts times the battery voltage. The values for each speed and connection will be given in wattage output, millivolts representing amperage, and battery voltage.

1. Y: @70 rpm-29-2.1-13.6, @115rpm-63-4.6-13.8, @190 rpm-132-8.2-16.15, @300 rpm-204-13-15.7
2. Y: @70 rpm-12-.9-13.01, @115 rpm-77-5.1-15, @190rpm-210-12.7-16.5, @300rpm-377-22.3-16.9
1. D: @70 rpm-17-1.3-13.44, @115rpm-85-5.8-14.7, @190rpm-203-12.5-16.25, @300rpm-351-21.4-16.4
2. D: @190 rpm-186-12-15.5, @300 rpm-492.6-29.5-16.7

The best output was achieved at 300 rpm, 2-DELTA, and 492.6 watts. I had hoped to get more output from this genny. Perhaps if i had used longer magnets I would have achieved more wattage. The benefit i have gained though is getting some watts at very low rpm's. In the long run, perhaps it will make up for the lack of output.

#### CONCLUSION:

I think induction motors are still a very good source for making gennys. I have gained many new friends on the IRC HOMEPOWER chat line, and after many discussions have come to the opinion that rewinds are not in the capability of everyone wanting to do it. This leaves me with the option of putting forth a little effort in instructing those interested on how to re-connect the existing winding for multiple Y-D connections. I think this would give many more possible outputs over a varied speed range. This I think is very possible using a numbering system which can be applied to most 3 phase motors. A littl feed back from those who would be interested in this would be most helpful.

I hope these efforts have been of interest and useful to you.

Zubbly

[1.5 hp induction conversion](#) | 3 comments (3 topical, 0 editorial)

Re: 1.5 hp induction conversion ([none / 0](#)) ([#1](#))  
by zubbly on Fri Jan 2nd, 2004 at 03:50:15 PM MST  
([User Info](#))

Hello again.

There is one important piece of information that I forgot to include with the posting concerning the multiple connections.

The winding was wound with 1#19 1/2 magnet wire. As you change connections, so does the number of magnet wire conductors to make up the connection. As you increase the number of circuits, the amount of copper handling the amperage also increases. Also, this makes it more versatile to match your battery voltage system. This is the added value of using multiple connections.

For this particular winding, here is how the magnet wire adds up.

1. Y-1 #19 1/2
2. Y-1 #16 1/2

1. D-1 #16 1/2
2. D-1 #13 1/2

Hope this makes it easier to understand my use of multiple connections.

Zubbly

Re: 1.5 hp induction conversion ([none / 0](#)) ([#2](#))  
by RobC on Fri Jan 2nd, 2004 at 06:11:37 PM MST  
([User Info](#))

Very nice job and alot of good info.  
Thanks RobC

Re: 1.5 hp induction conversion ([none / 0](#)) ([#3](#))  
by bill541 on Fri Jan 2nd, 2004 at 08:47:18 PM MST  
([User Info](#))

That is a nice looking piece of hardware you have there. I especially like the machining you did on the rotor. Great stuff. Bill

[1.5 hp induction conversion](#) | 3 comments (3 topical, 0 editorial)

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## [Energy from sound?](#)

By [stop4stuff](#), Section [Homebrewed Electricity](#)

Posted on Fri Jan 2nd, 2004 at 05:52:37 AM MST

[Alternators](#)

a solution to urban green energy?

Happy New Year everyone.

My primary interest in whats happening on Fieldlines is to have a better understanding of motors,coils,generators,magnets and how they all work...  
...my goal is to build a micro 5-way electronic compressed air actuator that I can use in conjunction Lego Mindstorms and Lego Pneumatics to control air powered devices on my Lego robot J5 (see. <http://www.stop4stuff.com/lego/technic/mindstorms/new-j5/> for a build diary.)

Whilst browsing threads and absorbing input...  
No-one seems to be discussing the extraction of electrical energy from sound.  
...a microphone generates electricity.

Also I have read and understood the reasoning why linear alternators are inefficient...  
...isn't a microphone a linear alternator?

speculation over with... try this...

1. obtain a car stereo speaker, the bigger the better.
2. attach an LED across the speaker terminals.
3. gently, but quickly tap the speaker cone

you should see the LED flash intermitantly (if it doesn't, swap the LED connections over)

Tapping on a steel coffee tin placed open end over the speaker also makes the LED light up.

I haven't a clue what voltages or currents are involved... but the LED lights up.

Sound can be focused, in the same manner as sunlight, onto the collector by means of reflectors... like the old fashioned 'ear trumpets' often seen in old black & white slapstick comedies (Charlie Chaplin, Laurel & Hardy, etc).  
Nature can produce devices that mix sounds to a level of white noise... listen to a sea shell!

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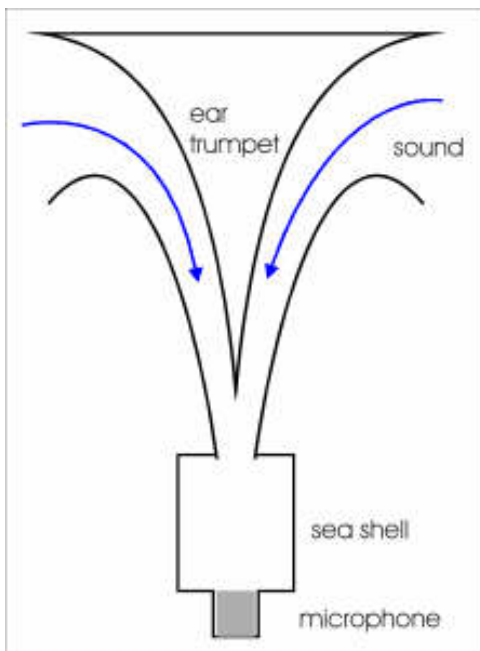
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the 'ear trumpet' is a spun shape, a large inverted cone with a smaller inner inverted cone.

I understand a little about electronics, however I think that there would be a whole load of different frequency sounds (and ac voltage frequencies generated)...

...could the sound coming in be split by physical filters to separate different frequency sound before it got to the collectors (microphones), or be used to create powerful harmonic frequencies?

...could the different frequency voltages be collected separately and then converted to an average frequency before final smoothing out and frequency reduction?

Why could electricity generated from sound be useful?

...wind generators are good for sparsely populated areas... more space to put them up.

...the noisiest places are often places where it would be impossible to put up a wind generator.

and no I've not forgotten about solar power...

could the underside of a motorway (freeway) bridge be covered with solar panels?

Generating electricity from sound could be an addition to other green energy solutions, who know's maybe one day we'll have fence panels that provide power to white LED street lighting.

About transformers and sound...

a transformer hums...

it makes a noise...

Can it be vibration that makes a transformer hum?

...a transformer has no moving parts to create the inertia to make it vibrate!

...so why does a transformer put out noise energy?

The trick with a sheet of aluminium and a neo magnet is cool... even near vertical the magnet creeps down the ali sheet.

sorry to go on.... first timer poster... fresh with enthusiam :)

p.s. love the hamster powered alternator on theotherpower.com... we tried something similar with Angel (my daughter's Syrian hamster) in a ball running on a Lego setup... friction vs hamster... friction won

[Energy from sound?](#) | 10 comments (10 topical, 0 editorial)

Re: Energy from sound? ([none / 0](#)) ([#1](#))

by Rich G on Fri Jan 2nd, 2004 at 07:23:50 AM MST

[\(User Info\)](#)



The ear is a very sensitive and broad range detector. I believe that the energy of the least sound detectable by the human ear is something like 10 to the minus 12th watts/meter squared. For those who are not comfortable with scientific notation that is .00000000001 watts spread over a one square meter area (if I got the zeros correct). That is, I think the reference level for sound Db comparison. At 100 Db hearing damage is a threat. This level of sound energy is still less than 1 watt/meter squared. You are absolutely right, of course, that sound can be converted to electrical energy. As you observed, microphones do just that. I suspect that the reason that ambient sound is not tapped as an energy source is the low energy density. I may have this all wrong. These days, I am not an expert in anything -- just check with my wife! The world is a fun place to explore! Rich

Re: Energy from sound? ([none / 0](#)) (#4)  
by stop4stuff on Fri Jan 2nd, 2004 at 09:01:41 AM MST  
([User Info](#)) <http://www.stop4stuff.com>

hey Rich,  
thanks for the input...  
my father (a V E R Y serious person) once tried explaining Db's...  
something like...  
for every 1Db increase the noise level increases by a factor of 10  
i also remember somewhere people melt at around 220 Db  
I hear what ur saying about the low energy density of sound...  
These days, appliances are smaller and use less energy.  
I once owned a Radiogramme... a beautiful piece of 1950's furniture  
that had a record deck and a LW/MW/SW radio built into it, 240v (UK)  
mains only and soaked up loads of juice.  
Now i have a mobile phone that can store+play 60+ mins of MP3 music  
and recieve FM radio... the phone does the same job on much less  
power (and can be hooked up to an amp in car or home.) + i can talk to  
ppl too!  
places like under motorway bridges get very loud, as well as airports...  
sound may be low density energy... tap it and it's free energy for low  
powered devices :)

[ [Parent](#) ]

Re: Energy from sound? ([none / 0](#)) (#2)  
by wooferhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Fri Jan 2nd, 2004 at  
08:03:35 AM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

Sound does not contain very much power. In order to get power from a speaker you must move it mechanically like you were doing when you were tapping the speaker cone. I never hooked an LED up to a speaker, but I find it hard to believe an LED would light just from sound. Even if you could light the LED with sound, That is not very much power and you will want to run it through a Bridge Rectifier in so you can store the power in a battery. the bridge rectifier will pull the power down by 1.2 volts and you won't have anything left coming out.

I messed around with trying to get power from a speaker

<http://www.fieldlines.com/story/2003/10/11/204029/79>

But I could never figure out how to get enough 1/2 inch motion to generate anything usable.

}=- W o o f -= {

Re: Energy from sound? ([none / 0](#)) (#3)  
by Harry Luubovv on Fri Jan 2nd, 2004 at 08:50:13 AM MST  
([User Info](#))

Well now of course as you all know, that the day will come one day, that we could use sound as energy source. Just look back not very long ago, scientists got themselves killed trying to fly in the machines they built. Others laughed. Now everyone takes flying for a normal thing, noone says if it wis possible or not possible. Time is a funny thing ! Mankinds will advance in technologies until the world explodes oneday ! !

Happy New Year.

Luubovv.

[ [Parent](#) ]

Re: Energy from sound? ([none / 0](#)) (#6)  
by stop4stuff on Fri Jan 2nd, 2004 at 09:19:06 AM MST  
([User Info](#)) <http://www.stop4stuff.com>

i checked out ur item...  
i didn't find it b4  
I then shouthed AARRGH into my speaker (bought the wife running and got a sore throat)... the LED gave no response.  
I then tapped the speaker some and found ur right... it takes about 1/2 movement to light up the LED...  
The coffe can didn't work 2nd time round :(  
isn't learning fun!

[ [Parent](#) ]

About transformers and sound ([none / 0](#)) (#5)  
by Norm on Fri Jan 2nd, 2004 at 09:10:52 AM MST  
([User Info](#))

A transformer has moving parts....same as a guitar string, if something is humming its vibrating and if its vibrating ....whatever is vibrating is a moving part. Norm.

Re: About transformers and sound ([none / 0](#)) (#7)  
by stop4stuff on Fri Jan 2nd, 2004 at 09:37:46 AM MST  
([User Info](#)) <http://www.stop4stuff.com>

thanks Norm, good input!  
does that mean a transformer could be made much more efficient by stopping bits from moving and not lose energy through vibration?  
does a transformer vibrate as a complete unit or are there internal parts that disipate energy by banging against each other?  
so many questions have i...  
need more good input...

[ [Parent](#) ]

Re: About transformers and sound ([none / 0](#)) ([#8](#))  
by Electric Ed on Fri Jan 2nd, 2004 at 10:01:40 AM MST  
([User Info](#)) <http://www.electric-ed.com>

The sound is created by the core laminations vibrating. Transformers are given "sound ratings" by the manufacturers, and quieter models cost more. The laminations have to be clamped together more securely.

Electric Ed

[ [Parent](#) ]

Re: Energy from sound? ([none / 0](#)) ([#9](#))  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Fri Jan 2nd, 2004 at 12:40:19 PM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

Transformers buzz because the magnetic fields interact with the windings and the magnetic relationships between the wires that are next to each other in the winding. So the wires may all be attracting each other at one instant and then all repelling each other at another instant. And of course all of those magnetic forces are interacting with the iron core.

} = - W o o f - = {

Re: Energy from sound? ([none / 0](#)) ([#10](#))  
by E man on Fri Jan 2nd, 2004 at 11:17:57 PM MST  
([User Info](#))

Speaking of sound, check out this cool article:

<http://www.memagazine.org/backissues/march98/features/sound/sound.html>

MacroSonix Corp. (Tim Lucas) has built these oddly shaped vessels to concentrate sound energy to be used as compressors, particle seperators, and combustion [generator] devices. The devices don't "receive" energy from the ambient noise around us; instead, they are driven with a solenoid at about 400 - 500 cycles per second, and although they are only displaced about 100 microns the gas inside is accelerated to generate resonant sound waves that build into enormously powerful compression waves. The resulting compression waves can then be valved for various uses. These guys also ganged up with Los Alamos National Labs to do interesting work with Acoustic Stirlings, apparently lending a hand with a resonance chamber that could be used for liquifying gases particularly natural gas that would normally be tossed while drilling for oil.

Happy New Year Everyone!

I love this website just as much as the day I found it.

-Elliott Bell

[Energy from sound?](#) | 10 comments (10 topical, 0 editorial)

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## [60 mpg Chevrolet](#)

By [windstuffnow](#), Section [Rants & Opinion](#)

Posted on Thu Jan 1st, 2004 at 07:02:11 PM MST

[Rant](#)

Would you like to own one?

Chevy has a group of new models out this year, me being a chevy fan most of my life, and gave 30 years of my life in experimental as well as a service tech... I saw an ad on USA for their new models... Talk about disappointed !! But for all us gas mileage misers... guess what ??? GM is building a new model that gets super gas mileage! It has a 3cyl 800cc engine and tops out at around 120 mph. 60 mpg on the highway! Oh... I should mention... You CAN'T buy them in the US.

Have you ever tried to find out about different auto models of other countries? It's like some kind of military secret...

Anyway do a search for Chevrolet Spark.

No more S-10's the Colorado is replacing it, just another gas guzzler... Anything to keep us below 30mpg... I guess my Chevy days are over...

My Rant for the week  
Windstuff Ed

[60 mpg Chevrolet](#) | 12 comments (12 topical, 0 editorial)

Re: 60 mpg Chevrolet ([none / 0](#)) ([#1](#))  
by [monte350c](#) on Thu Jan 1st, 2004 at 10:18:23 PM MST  
([User Info](#))

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Yup!

It's true - they often hold back the best for other markets. Check this one out - it's from where I used to work. I had this thing doing 155 mph at least once a week, not really even breathing hard.

V8, rear wheel drive, all independant suspension - puts a lot of high performance offshore stuff to shame.

[http://www.gmarabia.com/content\\_data/LAAM/SA/en/GBPSA/chevrolet/models/lumina/lumina\\_coupe.htm](http://www.gmarabia.com/content_data/LAAM/SA/en/GBPSA/chevrolet/models/lumina/lumina_coupe.htm)

Oh well one can always hope!

Ted.

Re: 60 mpg Chevrolet ([none / 0](#)) (#2)  
by zmoz on Thu Jan 1st, 2004 at 10:47:02 PM MST  
([User Info](#))

Yeah, 60mpg would be nice, but I certainly wouldn't be caught dead driving anything that looks like this.  
;) Why not just get an old honda and strap in a Briggs V twin? :)



Re: 60 mpg Chevrolet ([none / 0](#)) (#3)  
by RobD on Fri Jan 2nd, 2004 at 03:39:55 AM MST  
([User Info](#))

60 mpg, it looks good to me! RobD

Re: 60 mpg Chevrolet ([none / 0](#)) (#4)  
by Norm on Fri Jan 2nd, 2004 at 05:33:31 AM MST  
([User Info](#))

60 mpg don't look so good when a blonde in a red Pontiac Firebird passes 2 other cars in a no passing zone, hits your corner bumper, as you're making a left turn (turn signals on and clearly visible)....spins you, your wife and the '70 olds that you are driving 180 degrees. (slew'd the back bumper over about 2 inches hardly a scratch on the chrome (good chrome back then) demolished the whole front end of her car) it was determined by the skid marks that she was doing about 70 in a 35 mph no passing zone (but thank goodness she was wearing her seat belt (her words)) She had been in an accident a month prior and had just got it back from the shop...worried about her insurance premiums...cops came she wasn't cited.

The Olds only got about 18mpg and gas cost about 75 cents a gallon back then. ....but we're still here. I don't know if we had been driving a 60mpg car like the above??? I think the better gas milage you get the more the gas is going to cost...they have to get x amount of dollars from us.....Norm.

[ [Parent](#) ]

Re: 60 mpg Chevrolet ([none / 0](#)) (#5)  
by wildbill hickup on Fri Jan 2nd, 2004 at 05:44:42 AM MST  
([User Info](#))

Cops didn't need to give her a ticket, they should have torn up her licence and told her to by a horse!!!!!! :)

[ [Parent](#) ]

Re: 60 mpg Chevrolet ([none / 0](#)) (#6)  
by kww on Fri Jan 2nd, 2004 at 07:25:22 AM MST  
([User Info](#))

That's nothing, I've got a Mazda Rx-7 that needs no fuel at all, only a hill. :- ) Kevin

Re: 60 mpg Chevrolet ([none / 0](#)) (#7)  
by RobC on Fri Jan 2nd, 2004 at 12:38:22 PM MST  
([User Info](#))



I think the geo metro that is available here gets 50 to 60 mpg. Most people who have them really like them. RobC

Re: 60 mpg Chevrolet ([none / 0](#)) (#8)  
by wind pirate on Fri Jan 2nd, 2004 at 03:56:33 PM MST  
([User Info](#))

If I have to be in an car as unsafe as that one looks to get 60 mpg, I'll just ride a Harley. WP

Re: 60 mpg Chevrolet ([none / 0](#)) (#9)  
by zmoz on Fri Jan 2nd, 2004 at 04:22:14 PM MST  
([User Info](#))

Yeah, I had an accident recently and if I had been in a car like that I'd probably still be in the hospital, or dead. I completely smashed the front end of my jeep, but I wasn't hurt, just a little sore.

Re: 60 mpg Chevrolet ([none / 0](#)) (#10)  
by RobD on Sat Jan 3rd, 2004 at 06:01:18 AM MST  
([User Info](#))

It's not necessarily size that protects the driver. The Germans came up with crumple zones for a reason. They found that what damages the human body is G forces and the more you can reduce those forces by gradual body collapsing the better the individual's chances of survival are. Larger vehicles are no safer than small vehicles built safely. Small cars have better maneuverability and can avoid accidents better and the distance you travel upon impact in the cab of larger cars is greater also. This combined with the forward inertia of heavier vehicles ( $F=ma$ ) and their tendency to flip over from the higher center of gravity make them less safe in many accident conditions. Take a look at the safest cars and also look at the formula one racers that drivers walk away from after high speed accidents. The damage to the vehicle doesn't necessarily equate to the damage to the driver. The safest thing you can do is drive slower regardless of the car you are driving. Speed equals higher impact. RobD

Re: 60 mpg Chevrolet ([none / 0](#)) ([#11](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Sat Jan 3rd, 2004 at 07:35:23 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Great point RobD, I thought I was the only one who thought this way. I don't believe we need 300 hp hauling a 5000 lb auto to go to the store. Manufacture's seem to dictate what they want us to buy and drive. I can remember when most cars and trucks were quite distinctive, Now they all pretty much look the same. Nissan seems to be quite daring with the inovative body styles the've come out with.. cool but costly.

I guess, to get what I really want, I'll have to build it myself....

Ed

[ [Parent](#) ]

Re: 60 mpg Chevrolet ([none / 0](#)) ([#12](#))  
by bambamn on Sat Jan 3rd, 2004 at 10:43:08 PM MST  
([User Info](#))

This would be the ultimate SUV. Its a hybrid using a 4cyl diesel. Im trying to do the same thing using a F150. <http://evworld.com/archives/conferences/evs14/humvee.html>

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## [Fun with trees and chains](#)

By [DanB](#), Section [Homebrewed Electricity](#)

Posted on Sat Jun 7th, 2003 at 10:06:35 AM MST

[Wind](#)

Was getting bored and worried about my 35' tower...

---

I spent yesterday "upgrading" my old pivoting tree tower which used to be about 35' tall (barely enough to get the prop above most of the trees around here). In the last windstorm we saw 55 mph gusts and it obviously needed some work. So.... I ran up and got Ward to give me hand with it (we kind of have an agreement, that we always help each other with windmill projects).

My old tower (which is still part of my new one) pivots in the stump of a tree. It consisted of one lodgepole pine with a gin pole and I'd pull it up with the truck.

I looked for a taller tree near the road with no luck, so decided to go for the "modular" design...

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Pictured above is my new tower arrangement, you can see how 3 trees are strapped together to make things stronger and taller. At the very top you can see a "T" made of pipe. This is a sort of "foot" so that when the tower comes down it comes to rest upon that so that the wind turbine never touches the ground. In the past I'd land my tower on a barrel... which worked so long as it came down in the right spot!





The trees are strapped together with short bits of chain. I wrapped the chain around the trees as tightly as I could by hand, and left about 4" between the ends which I took up as much as I could with 3/8" dia allthread. This really squeezed the gaps out between the trees and made things very tight! Once the chains were tight we pounded nails in the links and bent them over - so that should things ever get loose the chains (and hopefully the trees) would stay put. I should add, that this whole design amused my very skeptical neighbors greatly and seemed very much against the odds... it's a case of making due with what you've got (or being a cheap skate??) ... I've got about \$100 into this, and the whole cost is in guy wire and cable clamps.





Above you can see the gin pole setup (which is also of "modular" design so more trees can be added as necessary). The gin pole is attached very near the top of the tower with a very heavy (1/2" diameter roughly) cable, so that when raising and lowering all the force is pretty much on the cable and straight down on the poles into the pivot.





Here you can see the gin pole hooked to my truck, this is how I raise and lower it. This works well enough that I can easily hold the wind turbine 6 inches off the ground with the truck and lower it very gently. It's interesting to note... lots of folks will say that you must have level ground for a tilt up tower so that the side guy wires stay tight on the way down. I'm not even close to level here, one of the side guys is about 10' higher than the other. What happens, is that one set of guy wires stays tight on the way up and down - the other gets more and more slack as it gets closer to the ground. So when going down, the tower is held tight by only one set of wires, and it leans a good bit to the side. It looks funny - but it works fine.

Is it strong???... don't really know yet as I've not seen high winds on it yet. It is guyed at two places (8

guy wires total) and seems much more rigid going up and down than it used to. Furthermore... we did have one good test yesterday. Before putting the turbine on top, we raised it once to test it and everything looked good. Then I went to lower it. I unhooked the back guy wires and had the truck hooked to the gin pole - with just enough slack so that we could get it slightly tipped by pulling on the far guy wires (opposite the truck). It tipped nicely... but never stopped like it was supposed to! It crashed to the ground, pulling my truck into a tree and smashing out the pass. side headlight and slightly denting the front. Some quick forensic investigation of the disaster turned up the fact that I'd left my truck in neutral. Amazingly though... the tower took absolutely 0 damage, and we simply put the windmill on and raised her back up with no problems. This really looks rigid, compared both to my old tower, and Wards steel pipe tower. Nothing bends much - no creaks, no cracks...

When working on this sort of thing, we try to be careful and act as though everything could fall at any time. This policy pays off.. especially with a space cadet like myself! At least the dent in my truck has a fun story behind it...

Too much fun!

[Fun with trees and chains](#) | 3 comments (3 topical, 0 editorial)

Ugly is as ugly does... ([none / 0](#)) ([#1](#))

by troy on Sat Jun 7th, 2003 at 11:39:35 AM MST

[\(User Info\)](#)

That's what my mama used to say.

Forrest Gump

No seriously, to a scrounger like myself, your mount is both beautiful and inspirational. Imagine what the outcome would have been if you'd dropped a pretty little high priced trussed tower. It would have been metal spaghetti and your checkbook would still be crying.

Best Regards,

troy

Re: Fun with trees and chains ([none / 0](#)) ([#2](#))

by Demetri ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Sat Jun 7th, 2003 at 03:27:26 PM MST

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DanB, TELL me that's not SNOW I see! Tell me it's just a weird optical phenomenon, that it's pollen, that it's the funny cottonwood fuz, that I'm crazy. If it is, I'm gonna stay with you for a couple months, my thermometer outside says 103.....

Demetri  
Always be the lead dog.

Re: Fun with trees and chains ([none / 0](#)) ([#3](#))  
by Gorilla Boy ([No Spam/gwmorris@fgisp.com](mailto:No Spam/gwmorris@fgisp.com)) on Sat Jun 7th, 2003 at 08:49:50 PM MST  
([User Info](#)) <http://www.livetheword.info>

You better make room for a family of four while you're at it. Just kiddin.

All I could do when I saw that beautiful white stuff was dream of days long ago when we used to live further north. Aaaah those were the days. Maybe some day we'll get back up to higher ground. Maybe, just maybe.

Be blessed! Gary  
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[Fun with trees and chains](#) | 3 comments (3 topical, editorial)

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[Fun with trees and chains](#) | 3 comments (3 topical, editorial)

Re: Fun with trees and chains ([none / 0](#)) ([#2](#))  
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[Fun with trees and chains](#) | 3 comments (3 topical, editorial)

Re: Fun with trees and chains ([none / 0](#)) ([#3](#))  
by Gorilla Boy ([No Spam/gwmorris@fgisp.com](mailto:No Spam/gwmorris@fgisp.com)) on Sat Jun 7th, 2003 at 08:49:50 PM MST  
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[new wind turbine](#)

By [DanB](#), Section [Homebrewed Electricity](#)

Posted on Thu Dec 4th, 2003 at 07:20:52 AM MST

bigger and ?

[Wind](#)

I started on Thanksgiving day, after we had the house cleaned, food underway - I had a few hours to kill till the guests showed up! It's been moving along quickly since then.



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As usual I'm working with the front volvo wheel bearing and hub. This time I've got 2 disks, 14" diameter cut from 3/8" steel. I had these plasma cut by a shop in town, they cost \$20 ea.



I cut out the center hole 3" diameter with a hole saw. A good hole saw has no problem cutting through 2 disks at once so long as it runs slow enough and has enough oil on it. The holes for the studs are 1/2".





Pictured above the two disks are done, and they fit the hub pretty nicely.



The magnets for this machine are pretty large. 16 of them fit together to form a ring with 8" inner diameter and 14" outer diameter. They are wedge shaped. In this machine I'm using 12 per rotor so there is a bit of space between them (about 3/4"). I worked out what seems a reasonable coil shape/size and made the coil winder which is shown above.

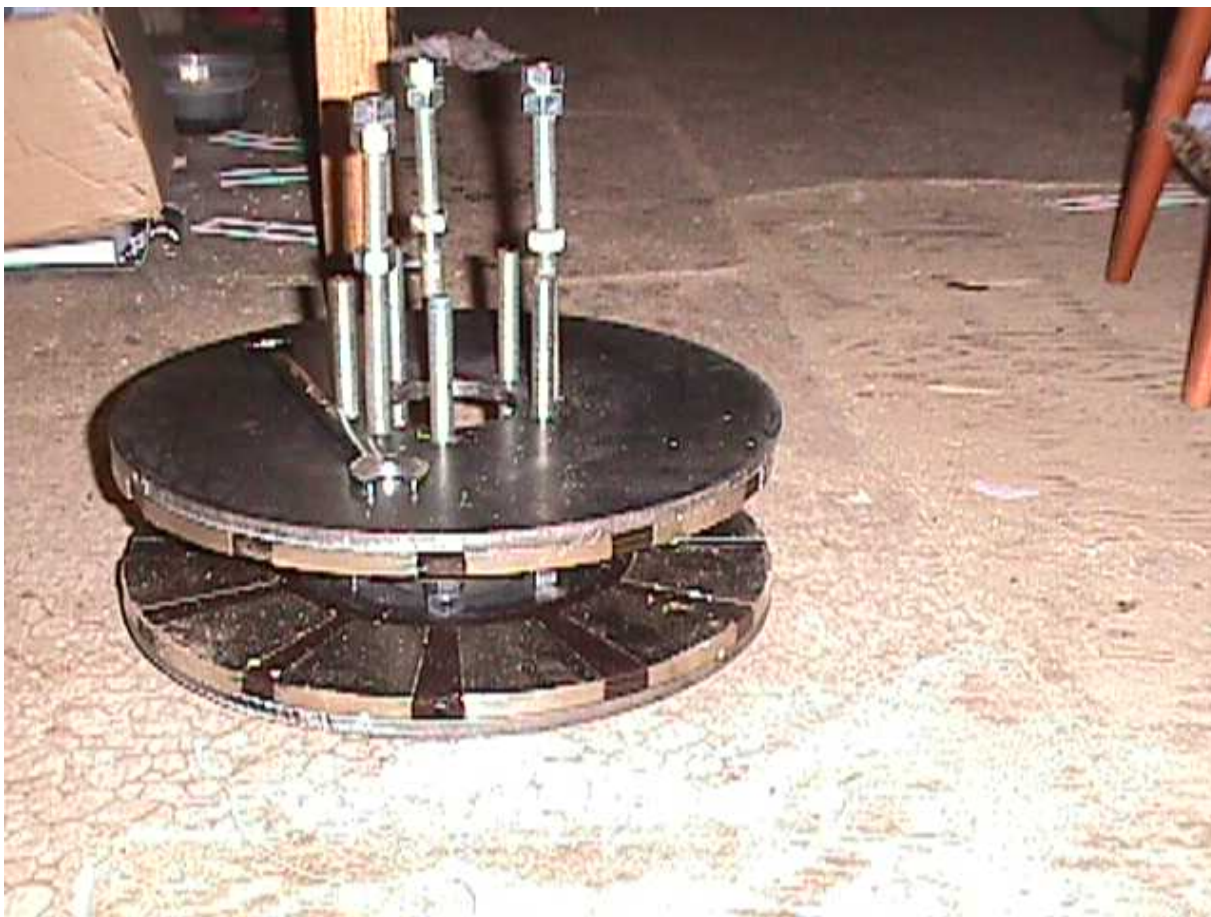


I layed out where the magnets go and used a center punch to mark their locations. Placing them went pretty quickly. As each magnet went into it's place I used super glue to tack them there so they'd not be sliding around on me as I placed more.



I cast the magnets in resin as shown above, and mounted the back rotor to the wheel hub.





I drilled and tapped 3 holes in the front rotor so I could have 3 jacking screws to make lowering and raising this hopefully a safe and smooth operation. So far it seems to work nicely - takes a bit of time, but it goes very easily!



I got most of the metal work done on the main chassis here. It's about the same as the last ones... hope it's strong enough!





Another shot of the same thing...

The tail boom is 7' long right now. My goal here is a 14' prop, although once I start testing coils I may find that slightly smaller is more appropriate. My biggest concern right now are the forces on the tail pivot. It pivots on 1" shaft (instead of pipe like the last ones) and seems quite strong, but after seeing some bending/stress on my current 9' dia machine I'm wondering a bit. This will be a 12 volt machine, so I'll probably (hopefully!) be dealing with a lot of current. Well see what happens... it'll be fun no matter what!

[new wind turbine](#) | 16 comments (16 topical, 0 editorial)

Re: new wind turbine ([none / 0](#)) (#1)  
by Guerreiro on Thu Dec 4th, 2003 at 07:34:19 AM MST  
([User Info](#))

Great job. I'm building one wind system myself and I'd like to know, when you finish this Generator, how much power is it outputing.  
Continue the magnifig work.  
Miguel

Re: new wind turbine ([none / 0](#)) (#2)  
by monte350c on Thu Dec 4th, 2003 at 07:40:09 AM MST  
([User Info](#))

Hi DanB,

Nice One!

What are the details on those wedge-shaped magnets you're using on this one? Also I've been looking for some definitive info about how much temperature fiberglass resin will take in the stator before bad things start to happen.

I was able to find some info on the web about epoxy resin - there's instructions on the West systems site about how to remove epoxy/cloth - you can heat it to 200 F and it will start to soften. But I haven't been able to find anything about plain old polyester resin, the type I've been using in stator casting.

I've seen several mentions of adding talc to the mix, and one site that said this helps increase the resin's capabilities to withstand temperature. Have you had any experience with stator problems due to heat?

What wire guage will you be using in this stator - or have you decided yet?

Very interesting project, I think there might be a lot of mileage in the increased diameter units!

Ted.

Re: new wind turbine ([none / 0](#)) (#3)  
by DanB on Thu Dec 4th, 2003 at 07:49:16 AM MST  
([User Info](#))



Hi Ted -

like I said, the magnets are such that 16 will form a "ring" 8" ID and 14" OD, and they are 1/2" thick. It's interesting to note, that even the 3/8" steel is not quite thick enough... they are slightly magnetic on the back side. I've got 120 of these - they were (unfortunately) rather expensive.

REgarding the resin and heat - I think about this sometimes. Fortunately making a new stator is not too difficult!

But I believe it really boils down to keeping things within reason with the coils. I can wind it for whatever cutin speed I want, but the resistance must also be low enough so that too much heat is not generated while it's handling the power from whatever size prop I put on it. If resistance is too high, that'd mean I probably wound it for too low a cutin speed, put too big a prop on it - and at higher power outputs I'd expect it might melt! So it'll take me a bit of trial and error poking coils in there while the rotor is on the lathe to figure out what's appropriate. (I hope!!) Another issue of heat is obviously the furling system - to have it turn away from the wind in time. There is a lot of talk about stator cooling etc... Im really not sure if it's an issue or not yet to be honest. I've not seen any problems with it yet on past machines. My guess is folks have problems with it when resistance is too high. Im sure you could push the limits a bit more by cutting holes in the stator or some means to improve cooling, but my guess is that the "limits" are already well within reason so long as the coils are wound well, and the machine furls at the right time.

Time will tell...

[ [Parent](#) ]

Re: new wind turbine ([none / 0](#)) (#5)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Thu Dec 4th, 2003 at 09:37:25 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Nice machine Dan! Just tossing some numbers around and the size of the magnet sections I believe a 7kw machine could easily be built with them. ( single rotor with silicon laminants ).

Using 12 of them as you have I calculate 2kw at 300 rpm and 4kw at 500 rpm. My numbers were using 36 slots and 8 turns of #12 wire per coil. If it went beyond 2kw for extended periods of time it may require some cooling but its all do-able. I take it your looking for 2kw+ from it?

Looks like fun to me!!!!

Ed

[ [Parent](#) ]

Re: new wind turbine ([none / 0](#)) ([#10](#))  
by DanB on Fri Dec 5th, 2003 at 07:09:33 AM MST  
([User Info](#))

interesting numbers Ed... Im really not quite sure what to expect from the dual rotor, and I suspect Ill have less than perfect coil design. If it works out to be 14', and I think thats what Ill shoot for, then I suspect top speed will hopefully not be more than about 350 rpm.

I've messed with it a bit this morning trying to figure how to wind the stator up. It's fun after building a few one starts being able to make a "good guess" - and my good guess seems to be very nearly confirmed by actually testing a coil in it this morning on the lathe. I think what will fit (barely) and get a good cutin speed around 75 rpm is 32 windings made up of 3 strands of AWG 14 wire. (I think thats close to AWG 9 wire). And there'll be 3 coils/phase (total of 9 coils) and it'll be wired in star. Since AWG 9 wire would be pretty difficult to wind, I'll make it up from 3 strands of 14.

Should be fun, well see how today goes. If I'm ambitious perhaps I'll have the stator done by days end. Lots of fun ahead!

[ [Parent](#) ]

Re: new wind turbine ([none / 0](#)) ([#13](#))  
by monte350c on Fri Dec 5th, 2003 at 09:49:25 PM MST  
([User Info](#))

Hi DanB,

At the risk of sounding heretical - why not try a setup that produces some higher voltage AC for this unit? Like around 120...

If you were using a 3 phase stator, wound with 14 AWG, it should be able to handle 17 amps without excessive heating.  $17 \times 120 = 2,040$  watts  $\times$  3 phases = 6,120 watts.

Then transform, rectify, heat, or otherwise use the power at the source of the load. You could probably use a run or two of inexpensive 12 / 3 to convey the power from the pole to the load.

Just a thought!

ps. when I asked about details for those magnets - I was mainly interested in how much \$\$ and if you'd be putting them on wondermagnet.com for sale!

On cutting disks - I had the pair made for the alternator I built at a local machine shop, though by abrasive water cutting not plasma. The water cutting machine is pretty cool - it uses garnet (like on sand paper) fed into a high pressure water jet. The whole thing is run by computer so I had 4 pie-shaped holes cut into the 17" disks to lighten it somewhat, and the center hole and bolt holes done at the same time. It didn't cost any extra either.

I'm finishing up a set of foam-core epoxy / fiberglass blades also in 14' diameter right now. The cores are cut with a hot wire, then covered with epoxy and fiberglass cloth, then vacuum bagged. Sounds like a lot of trouble, but the whole process is actually quite easy and makes a very light and strong blade. Mine will have a 24" diameter "hole" in the middle to clear the alternator assembly. So the blades themselves are 6' long, and start 12" out from the center of the hub. This really is a lot of fun - good luck with this project and looking forward to your next posts!

Ted.

[ [Parent](#) ]

Re: new wind turbine ([none / 0](#)) ([#14](#))  
by DanB on Sat Dec 6th, 2003 at 07:05:35 AM MST  
([User Info](#))

Hi Ted -

you asked... "At the risk of sounding heretical - why not try a setup that produces some higher voltage AC for this unit? Like around 120..."

If you were using a 3 phase stator, wound with 14 AWG, it should be able to handle 17 amps without excessive heating.  $17 \times 120 = 2,040$  watts x 3 phases = 6,120 watts.

Then transform, rectify, heat, or otherwise use the power at the source of the load. You could probably use a run or two of inexpensive 12 / 3 to convey the power from the pole to the load."

- I could, and it would make some sense for sure. Like everything I think doing that would have its pros and cons. The transformers would be expensive and have their own losses. I think most of my power is in the low winds, so probably 90% of that which comes in will be under 500 watts - here, 12 volts is reasonable. And, my tower is pretty close - only 100' from the house. But yes - should I ever build a large machine that is a greater distance away, I think seriously about playing with transformers. could be that I should be doing that now... hard to say.

You asked about the magnets - Ill list what I have (not many of them) on our shopping cart soon for \$20 ea. These are kinda expensive - special shapes cost more than normal disks or blocks, and I only got 120 of them so they are costly.,

[ [Parent](#) ]

Re: new wind turbine ([none / 0](#)) (#4)  
by cevonk ([cevonk\(at\)signhere\(aol.com\)](mailto:cevonk(at)signhere(aol.com))) on Thu Dec 4th, 2003 at 07:57:05 AM MST  
([User Info](#))

And they say size doesn't matter.....

It looks very nice. From the dimensions you gave regarding the diameter of the magnet placement, it sure sounds as if these are very large magnets.

Excellent pictures! I can't wait to hear how it works.

Re: new wind turbine ([none / 0](#)) (#6)  
by Barnac ([barnac@videotron.ca](mailto:barnac@videotron.ca)) on Thu Dec 4th, 2003 at 12:16:02 PM MST  
([User Info](#))



DanB,

Why didn't you ask the plasma shop to cut the 3" hole and the 5 1/2" holes for you ? A friend of mine owns a sheet metal laser cut shop and it's seem to me that it doesn't take much more time or effort for them to cut additional holes. The most time consuming part is to set the sheet or plate on the X Y table. Its only a little more of info to put in the program, since its all computer driven. Maybe they are not using the same technology. Just wondering...

Keep the good work.

Barnac from the cold Montreal today. Winter is really knocking on the door. Go habs habs go :-)

Re: new wind turbine ([none / 0](#)) ([#7](#))  
by zubbly on Thu Dec 4th, 2003 at 06:21:25 PM MST  
([User Info](#))

hello DanB.

only one thing to say, Beautiful job. i hope it works great.  
i have one question and just one concern.

are those neo magnets? i just didn't see where or if it said.

my concern is those huge magnets. the size so large and the ATTRACTION to each other on opposite plate so powerful, i am wondering if the resin is sufficient in strength to keep them in place once the alternator peaks out on its temperature rise.

every genny is a step closer to a greener world-----zubbly

Re: new wind turbine ([none / 0](#)) ([#12](#))  
by DanB on Fri Dec 5th, 2003 at 04:29:02 PM MST  
([User Info](#))

Hi Zubbly -

the magnets are Neo's. I don't share your concerns here (perhaps I should!) for a couple reasons. first - they are neos and they are stuck down very tightly all by themselves! The resin surely helps. secondly - being a larger machine, it hopefully will run pretty slowly, 400 rpm would hopefully be very top speed, - hopefully a bit less actually. Lastly - the magnets, and the magnet rotors don't heat up much I shouldn't think. All the heat is in the stator and the magnet rotors are isolated from the stator by a layer of moving air, so I doubt they get very warm at all. Fun stuff.. time will tell.

[ [Parent](#) ]

Re: new wind turbine ([none / 0](#)) (#8)  
by BruceDownunder on Thu Dec 4th, 2003 at 07:10:04 PM MST  
([User Info](#))

Bloody lovely job Dan, well done -- and your pictures just add that special touch- I'm thinking (well, actually, have sawn the blanks) , of a 12 foot mill -three 6 foot blades--a bit slow , but could develop a fair bit of power for my dual F&P stators--when I get around to it.

Congratulations on your lovely work

Bruce.

Re: new wind turbine ([none / 0](#)) (#9)  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Fri Dec 5th, 2003 at 12:50:35 AM MST  
([User Info](#)) <http://www.internetfred.com>

Nice, REALLY NICE! Thanks for sharing Dan! This stuff is tooooo addictive!! It looks that that thing is going to put out some serious power.. Let us know how this turns out! Good Luck!

Re: new wind turbine ([none / 0](#)) ([#11](#))  
by JW on Fri Dec 5th, 2003 at 09:24:40 AM MST  
([User Info](#))

Looking at windstuffnow's post and falls over in chair. Personally I would not doubt these numbers could be possible. Thinking about some of Electric Ed's post's, noticing the spacing of the magnets (with 12) on the rotors. Reminds me of this day along time ago, sitting in class, with a collage professor telling us "there is no way to improve the efficiency of an automotive alternator" then he went on with some mumbo jumbo about the superior waveform that the stator produces blb bla bla. then theres the non-clogging aspect of these dual rotor machines.

Considering DanB is using a star wiring pattern, AC could be the intended output. Great Job DanB, your work is very impressive...

-JW

[ [Parent](#) ]

Re: new wind turbine ([none / 0](#)) ([#15](#))  
by RobD on Sat Dec 6th, 2003 at 01:34:21 PM MST  
([User Info](#))

Nice Job Dan!,  
what do you expect the final weight to be and how high is it going up?  
RobD

Re: new wind turbine ([none / 0](#)) ([#16](#))  
by Harry Luubovv on Wed Dec 31st, 2003 at 11:34:00 PM MST  
([User Info](#))

Congratulations DanB !! You do wonderful jobs with this large mill ! Hope I am able to do as far as you do ..... oneday.

Work the good, good to Keep.

Keep up the G/W !! ... and ... H N Y !

Harry Luubovv.

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[new wind turbine](#) | 16 comments (16 topical, 0 editorial)

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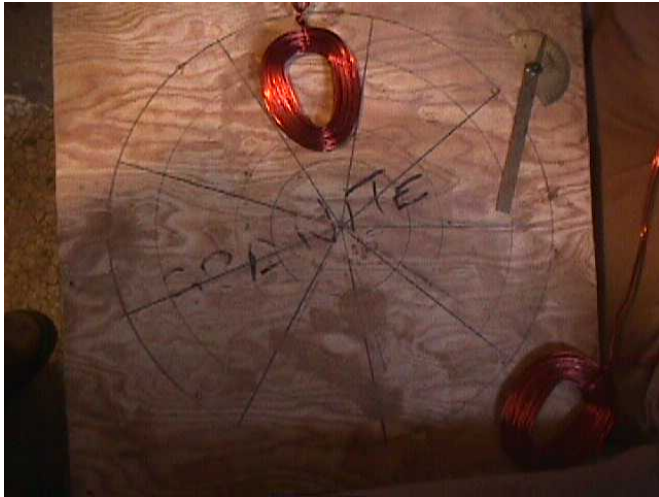


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should start charging between 6 and 7 mph I think with if it runs at a TSR of around 6. The lathe is great for this sort of thing, it makes it very easy to hold a single coil in exactly the right space and gives me a range of rpm to play with. I welded 4 nuts to the back of the back rotor so that I could get this thing in the 4 jaw chuck on my lathe... the rotors are 14" diameter, my lathe has a 14" swing.



I figured from my tests that, if it's wired in Star, which I was planning, that 32 windings per coil would be just right. As it turned out, 31 windings of 3 strand of AWG 14 wire worked out perfectly, so I went with that... close enough. Pictured above I've layed out the areas where the coils must fit on plywood. This will later become the bottom of the mould.



Above you can see the coil winder in the front, and in the back there is a stack of 3 spools of magnet wire from which I wound the coils. Doing it this way is much easier than trying to wind with really heavy gage wire. I also suspect that with very heavy wire, in a dual rotor machine like this - we might actually get eddy current losses within the thick copper wire. This should help. The other option would be to just wind my coils with 93 windings of 14 gage, and rather than wire my coils in series - I could've wired them in parallel. But - past experience has shown that wiring coils in parallel creates losses, because certain windings are slightly out of phase with others and this allows current to flow between the coils when they are wired in parallel. So I believe series is the best way to go - and at low voltage, the current becomes so much that I have to either use very heavy wire, or a bundle of finer wire. I've opted for the bundle...

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## [Alternator finished](#)

By [DanB](#), Section [Homebrewed Electricity](#)

Posted on Mon Dec 8th, 2003 at 08:20:54 AM MST

[Wind](#)

I got my alternator tested and almost finished

As per my [last posting](#) I'm trying to build a larger 14' diameter wind turbine.



Again, the steel rotors for the alternator are 14" diameter, and the magnets are such that 16 of them form a ring 14" outer diameter and 8" inner diameter, so the magnets are 3" tall, and about 2.5" wide at the top. I'm using 12 of them, so there is about a 3/4" gap between the magnets.



I wound up one coil with 120 windings of AWG 14 wire - I knew this wouldn't be right, but I figured that by poking this one coil between the magnet rotors on my lathe I could get a pretty good idea exactly how many windings I needed per coil to get an appropriate cutin speed, and once I knew that I could figure the thickest possible wire that could be used to fit that many windings in the limited space available. I figure for a 14' prop, it should start charging (cutin) at around 75 rpm if I'm running with a reasonably slow tip speed ratio. This

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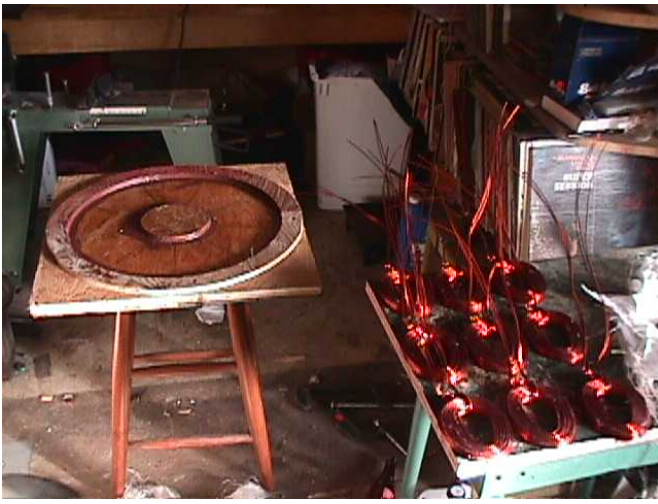
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In this picture all 9 coils are wound and the mould is ready (in the background). I'm out of nice large pieces of fiberglass mat, so I've cut lots of little squares and strips to work with. This worked out fine.



Above is the stator. It actually came out OK, but not great. Kind of lumpy on the back side and a bit thicker than I'd hoped. The stator is about 5/8" thick. I was concerned that this extra thickness would compromise my airgap and raise the cutin speed above that which I'd hoped for... meaning I'd either have to make a new stator, or use a smaller prop. (or run with a 14' prop and a high TSR which is an option I would probably not feel comfortable with... too fast.)



Yesterday I got the whole thing together. My total airgap at this time is around 7/8", but cutin speed is right at 75 rpm... just about perfect I think! It was interesting assembling it. When I had only the back rotor on with the stator, it cogged pretty badly against the 3 bolts that hold the stator. This is typical - and usually goes away almost completely when the 2nd rotor is placed on. Of greater concern however was that not only did it cog - but it had a lot of drag on it! I was fairly certain at that point that there must've been currents flowing between the parallel strands of wire in each coil, in which case I'd have had to start over - probably build a higher voltage machine and use transformers or something. As it turned out, after the top rotor was placed on - all this drag, and all the cogging disappeared. So I figure the drag must've been due to eddy currents in the bolts that hold the stator. Kind of impressive at any rate, because the drag was very significant, I'd not have thought that 3 bolts could've been responsible for so much - but they must've been, because it's fine now. Lots of fun - tomorrow I'll hopefully find some nice boards in town to start carving on!

[Alternator finished](#) | 7 comments (7 topical, 0 editorial)

Re: Alternator finished ([none / 0](#)) ([#1](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon Dec 8th, 2003 at 10:12:47 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Looks very nice Dan! What was the ohm reading on your coils when completed? To bad the gap came out larger than you wanted, thats going to eat up some power but should still kick out some good power.

I'm designing an alternator to work with a slow turning VAWT. The idea is to have the unit start charging at low rpm's ( around 30 to 45) but produce full power with very small rpm changes. ( full output by 100 rpm's or so) It's been quite challenging and I'm still a bit off for the final product. I'll be using similar magnets ( my smaller segments - which are only 2" tall x 1.57 top ). I may steal your idea using strands of smaller guage wire as opposed to one heavy strand. This may help reduce copper losses by reducing the eddy currents and I believe, not sure yet, I may be able to get more copper in the magnetic path this way. Interesting idea anyway...

Keep us posted on your output data when its together!!!

Have Fun  
Ed

Re: Alternator finished ([none / 0](#)) ([#2](#))  
by DanB on Mon Dec 8th, 2003 at 10:59:12 AM MST  
([User Info](#))



Hi Ed - when I hook the meter to it it says .1 ohms (and beeps at me). So it must be somewhere between .1 and .2 ohms/ phase.

The airgap is kind of a bummer, but on the bright side, the cutin speed came out exactly where I wanted it and the stator is a bit stronger/less flexible - which is good I think because it's large enough - and the coils all pretty much touch each other, that weakness in the stator was a concern. It came out this way because I used a bit more fiberglass than normal on both sides, and I heated the resin up a bit much before I started (and mixed it a bit too hot) so that by the time I was putting the top on my mould it was already setting up. (I should've been more patient!).

Perhaps next time I'll have the resin go a bit more slowly and then perhaps I could get away with slightly thicker wire and a few less windings (maybe 4 strands of AWG 15 wire) so that resistance is a bit lower.

I wonder if, in your case there would be any advantage to using multiple strands (other than that they are a bit easier to handle). Would eddy currents in the copper be an issue with you, since you'd be burying the windings inside slotted steel laminations? It seems the laminates might take care of the eddy current losses in your case.

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Re: Alternator finished ([none / 0](#)) (#3)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on  
Mon Dec 8th, 2003 at 03:01:25 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Hi Dan,

Just playing with numbers and what you've given in data. I've calculated between 1100 and 1400 watts in a 25mph wind not including any losses... let me know how close I came...

After calculating out the differences in wire sections it actually takes up more space using smaller wire to make up a larger equivalent. I thought it might come out a little more efficient since the air gaps between wires would be more filled in... Fun figuring it out though... back to the bar stock...

Have fun  
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Re: Alternator finished ([none / 0](#)) (#4)  
by DanB on Mon Dec 8th, 2003 at 05:55:47  
PM MST  
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Re: Alternator finished ([none / 0](#))  
([#5](#))  
by Jerry on Mon Dec 8th, 2003 at  
06:15:48 PM MST  
([User Info](#))  
<http://www.dplusv.com/Photo-03.html>

Hi DanB  
I asked this ? a while back. I thought i could get more copper in a coil of the same physical size if i used smaller gauge wire.

Then the group consensus was. Big wire , small wire the copper amount would be the same. I thought I could squeeze more wire in with the small stuff and parallel the coils rather than series?  
DA-NO?

JK TAS Jerry

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Re: Alternator finished ([none / 0](#)) ([#6](#))  
by DanB on Mon Dec 8th, 2003  
at 08:13:58 PM MST  
([User Info](#))

I think it should be the same either way... except for the thickness of the extra insulation on the smaller wire. In this case - I had to do it, because the thought of winding a coil like this with something between AWG 9 and AWG 10 wire seems daunting - and I'm certain I'd have had some eddy current losses in the thick wire.

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Re: Alternator finished ([none / 0](#)) ([#7](#))  
by Bach On on Mon Dec 8th, 2003 at 09:13:24 PM MST  
([User Info](#)) [change AT: bach\\_on AT hotmail.com](#)

DanB,

Do you twist the 3 wires together to form a single cable as you wrap? Or do you just wrap the three somewhat side-by-side?

Seems like with the twist things might be tighter though a tougher job to do. But there may also be some danger of damaging the insulation as you twist and wrap the coils.

Pretty work! You said the magnets were expensive. Are you guys going to offer them on the Wondermagnets site? Would we need to float a loan to be able to afford them? You already have some magnets for \$45 each on there. A few folks might be willing to go for \$80-\$100 magnets, especially those who are completely off the grid.

Bach On

- I'm just as happy as if I had good sense! -

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[Alternator finished](#) | 7 comments (7 topical, editorial)

Re: Alternator finished ([none / 0](#)) (#2)  
by DanB on Mon Dec 8th, 2003 at 10:59:12 AM MST  
([User Info](#))

Hi Ed - when I hook the meter to it is says .1 ohms (and beeps at me). So it must be somewhere between .1 and .2 ohms/ phase.

The airgap is kind of a bummer, but on the bright side, the cutin speed came out exactly where I wanted it and the stator is a bit stronger/less flexible - which is good I think because it's large enough - and the coils all pretty much touch each other, that weakness in the stator was a concern. It came out this way because I used a bit more fiberglass than normal on both sides, and I heated the resin up a bit much before I started (and mixed it a bit too hot) so that by the time I was putting the top on my mould it was allready setting up. (I should've been more patient!).

Perhaps next time I'll have the resin go a bit more slowly and then perhaps I could get away with slightly thicker wire and a few less windings (maybe 4 strands of AWG 15 wire) so that resistance is a bit lower.

I wonder if, in your case there would be any advantage to using multiple strands (other than that they are a bit easier to handle). Would eddy currents in the copper be an issue with you, since you'd be burying the windings inside slotted steel laminations? It seems the laminates might take care of the eddy current losses in your case.

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Re: Alternator finished ([none / 0](#)) (#3)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon Dec 8th, 2003 at 03:01:25 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Hi Dan,

Just playing with numbers and what you've given in data. I've calculated between 1100 and 1400 watts in a 25mph wind not including any losses... let me know how close I came...

After calculating out the differences in wire sections it actually takes up more space using smaller wire to make up a larger equivalent. I thought it might come out a little more efficient since the air gaps between wires would be more filled in... Fun figuring it out though... back to the bar stock...

Have fun  
Ed

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Re: Alternator finished ([none / 0](#)) ([#4](#))  
by DanB on Mon Dec 8th, 2003 at 05:55:47  
PM MST  
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Re: Alternator finished ([none / 0](#)) ([#5](#))  
by Jerry on Mon Dec 8th, 2003 at 06:15:48 PM MST  
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<http://www.dplusv.com/Photo-03.html>

Hi DanB  
I asked this ? a while back. I thought i could get more copper in a coil of the same physical size if i used smaller gauge wire.

Then the group consensus was. Big wire , small wire the copper amount would be the same. I thought I could squeeze more wire in with the small stuff and parallel the coils rather than series? DA-NO?

JK TAS Jerry

[Airheads Page](#)

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Re: Alternator finished ([none / 0](#)) ([#6](#))  
by DanB on Mon Dec 8th, 2003 at 08:13:58 PM MST  
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 by Jerry on Mon Dec 8th, 2003 at 06:15:48 PM MST  
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Re: Alternator finished ([none / 0](#)) (#7)  
by Bach On on Mon Dec 8th, 2003 at 09:13:24 PM MST  
([User Info](#)) [change AT: bach\\_on AT hotmail.com](#)

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Seems like with the twist things might be tighter though a tougher job to do. But there may also be some danger of damaging the insulation as you twist and wrap the coils.

Pretty work! You said the magnets were expensive. Are you guys going to offer them on the Wondermagnets site? Would we need to float a loan to be able to afford them? You already have some magnets for \$45 each on there. A few folks might be willing to go for \$80-\$100 magnets, especially those who are completely off the grid.

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- I'm just as happy as if I had good sense! -

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## [New wind turbine fun!](#)

By [DanB](#), Section [Homebrewed Electricity](#)

Posted on Fri Dec 19th, 2003 at 10:04:06 PM MST

[Wind](#)

Almost finished my 14' machine today.

I wish I'd got better pictures, but here today I pretty much finished my 14' wind turbine which was started on Thanksgiving day. The start of the project can be seen [here](#), and some details about the alternator are [here](#).



This picture shows how the back rotor of the alternator fits on the spindle.



Above is shown the stator. In this alternator, the back rotor is mounted well behind the hub, so that the wheel hub is actually centered in the stator. The studs between the two rotors are very short, and strong (I hope!).

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### Poll

Whats going to happen?

I think the tail will fall off.

I think the blades will explode.

I think the stator will melt.

I think all of the above will happen!

I think it will work fine!

Votes: 3

[Results](#) | [Other Polls](#)

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Here the whole alternator is assembled. It's quite heavy - I'd guess this assembly here weighs close to 100 pounds. I figure close to 25 pounds of magnets (maybe even a bit more), and somewhere around 10-12 pounds of copper - not to mention the steel.



My shop is a 10 X 50 mobile home with a small hole in one side where I made an addition (for my lathe). A 14' diameter prop is quite a tight fit! Of course, it cannot be turned over, brought outside, or hardly moved at all without being disassembled. This prop is similar to others I made. The width at the tips is 3.25", at the root it's 9.5". The pitch at the tip is 3 deg, it's 6 deg half way out and tapers down to whatever the thickness of the board allows at the root. The prop is made from almost perfect, vertical grain knot free fur. The board was a 2X10 (so 1.5" X 9.5" after being planed).



Above I've put all the pieces together to make sure it fits OK, before painting it. It's looking rather large and daunting to me now... the tower project concerns me a bit - as do the forces that a machine this large will have to endure!



Here I've painted it up and slathered the blades in lots of linseed oil. Picture doesn't show too well (perhaps Ill get my better camera out tomorrow)... it's green with a red alternator (holiday spirit!) and the hub and tail is painted black. In the background you can see the 10' 48 volt machine we're just finishing up for my neighbor.



Theres another shot from the back. I may change the tail (it may be a bit too small Im thinking...). Otherwise it's done though, and I can clean my shop and think about a tower. Yesterday I had lots of pipe delivered, so at least I've got the materials.

[New wind turbine fun!](#) | 3 comments (3 topical, 0 editorial)

Re: New wind turbine fun! ([none / 0](#)) ([#1](#))  
by [windstuffnow](#) ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Sat Dec 20th, 2003 at 07:13:55 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Nice Job Dan! I'm anxious to see some data on your 14' machine. Looks like your definately haveing a good time!

Windstuff Ed



Re: New wind turbine fun! ([none / 0](#)) (#2)  
by billf on Sat Dec 20th, 2003 at 01:44:21 PM MST  
([User Info](#))

Wow...looks great. You will need a substantial tower with heavy guys and anchors to handle this beast. Can't wait for the results.

billf

Re: New wind turbine fun! ([none / 0](#)) (#3)  
by Old F on Sat Dec 20th, 2003 at 08:36:21 PM MST  
([User Info](#)) <http://www.oldf.homestead.com>

Looking good Dan!

As for a tower . I just mite have a Christmas present for you : )

Things are falling in to place and hopefully in a few days. I will have the first 10 foot section built and will have some pics.

It is based on the Wind works plans an is a octahedron. It will be a guyed tower using ten foot sections that bolt together.

This makes things a lot simpler than the free standing tower in the plans.

My gut is telling me that I could meet my design goal of a tilt up tower that is ridged enough to support its own weight plus 200 pounds of wind generator when raising or lowing.

The guy wires will act as safeties and not a important part of the structure during the lift as in a pipe tower.

When the tower is up the guys would be tighten and supply the bulk of the wind load strength.

The very best of the holidays to you and yours

Old F

[New wind turbine fun!](#) | 3 comments (3 topical, 0 editorial)

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## [Moby the windmill](#)

By [DanB](#), Section [Homebrewed Electricity](#)

Posted on Fri Nov 21st, 2003 at 09:27:00 AM MST

[Wind](#)

**we've been chipping away at a 48 volt Machine**

Over the last week our neighbor Adam has been coming up to build a 48 volt machine for his cabin which is a couple miles down the canyon. This machine is nearly identical to the last [few wind turbines](#) we made recently with a couple changes which will hopefully be improvements.



Pictured above Adam is wiring up the stator. Being a 48 volt machine this stator is a bit different. The coil form is the same one we used on [Moe, Curly, and Larry](#). Those machines were 12 volt, and we wired each coil with 65 turns of AWG 14 wire, each phase consisted of 3 coils in series and the stator was wired up in Delta. Some discussion with [Hugh Piggott](#) helped me to understand that wiring the stator in star (which changes how we'd wind the coils) would make things a bit more efficient, especially at lower output levels (low winds). So this machine (Adam named it Moby) is wired in Star, and each coil is made up of 140 windings of AWG 17 wire. The magnets are identical as the last machines we made, 12 2" diameter X 1/2" thick disks on each rotor. The rotors on this machine are slightly larger, these measure out about 11 3/8" which is also a slight improvement.

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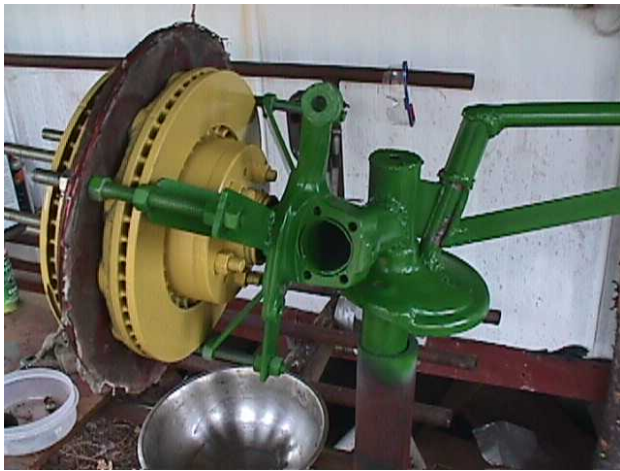
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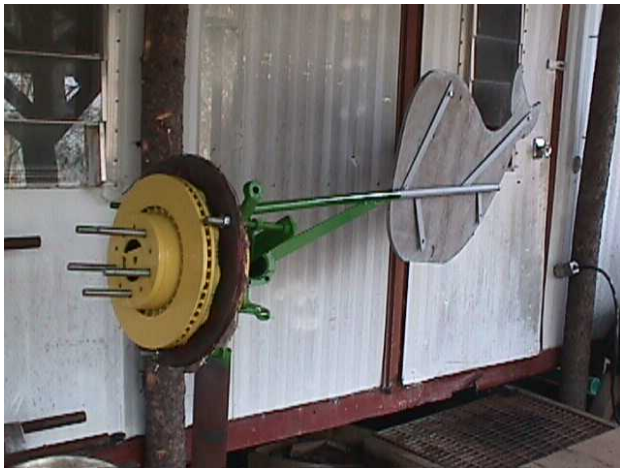
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After some thought about vibration, and watching how quickly shorting the alternator stops it (and seeing how the stator bracket gets slightly twisted), I decided to beef up the stator bracket a bit over the last machines. This arrangement is much stronger. There have been no failures in past machines over this yet, but I feel more comfortable with a stronger bracket. The picture above shows to some degree how this has been strengthened.



Above we have it almost painted. Adam liked the idea of a whale for a tail, (which is only in primer right now but will be painted white) hence the name Moby! The only other improvement on this machine over past ones is that we welded part of the hub puller into the center of the front magnet rotor to make pulling (and lowering back down) the magnet rotor a bit smoother. This works really nicely this way... much safer I think. As it is I think we can still take almost 1/8" of airgap up by adjusting the front rotor. Cutin speed (measured as DC through rectifiers) is 140 rpm right now, so I think it will run nicely with a 10' diameter prop which hopefully we'll start on today!

[Moby the windmill](#) | 0 comments (0 topical, 0 editorial)

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## [Fun with meters and graph paper](#)

By [DanB](#), Section [Homebrewed Electricity](#)

Posted on Thu Nov 6th, 2003 at 10:06:49 AM MST

[Wind](#)

I spent a while yesterday watching meters on my windmill.

I started out yesterday by dropping my [single rotor brake disk windmill](#) again. I had it down a couple days ago for [repairs](#), and found that the bolts holding the prop on were not so tight anymore, so I really tightened them a bunch.

The airgap was pretty tight on one side, because when I was building it I clamped the lid tightly on the mould, and the mould broke while the resin was setting up... making for a somewhat less than flat stator. So the airgap is tigher on one side than the other. Tightening the prop evidently squeezed just a touch out of the airgap, because it started clunking up on the tower and was having a bit of difficulty starting. Normally this machine seems to startup easily below 5mph. Once down, it was clear that the magnets were lightly rubbing a high spot on the stator. So I took it all apart, and widened the airgap by a little more than 1/16" and stuck it back together.

One interesting thing to note, which I'd not really payed attention to when I built it (and it's not been apart since), this machine has removable laminates that stick to the back side of the stator by the attraction of the magnets only. The airgap (distance from the magnets to the laminates) is pretty wide, about 5/8". This is made up for somewhat by the fact that I used rediculously large/thick magnets. But - it was interesting to note how easily the alternator spins when the laminates are off, and what significant drag they added to the alternator when I put them back on. This is the good stuff.. really thin silicon steel laminates, and still the drag on the alternator is very noticable. In this case, it doesn't seem to be a problem, because the machine does startup just fine, but you can sure feel the iron losses when you spin it by hand.

It was only two days ago that I hooked up the [Vortex anemometer](#), so yesterday was really the first time since I built this machine in May that I've had opportunity to watch output vs windspeed. I don't know how accurate it all is since I cannot verify that the anemometer is accurate. At our elevation (8200'), I suspect that changes things a little bit.

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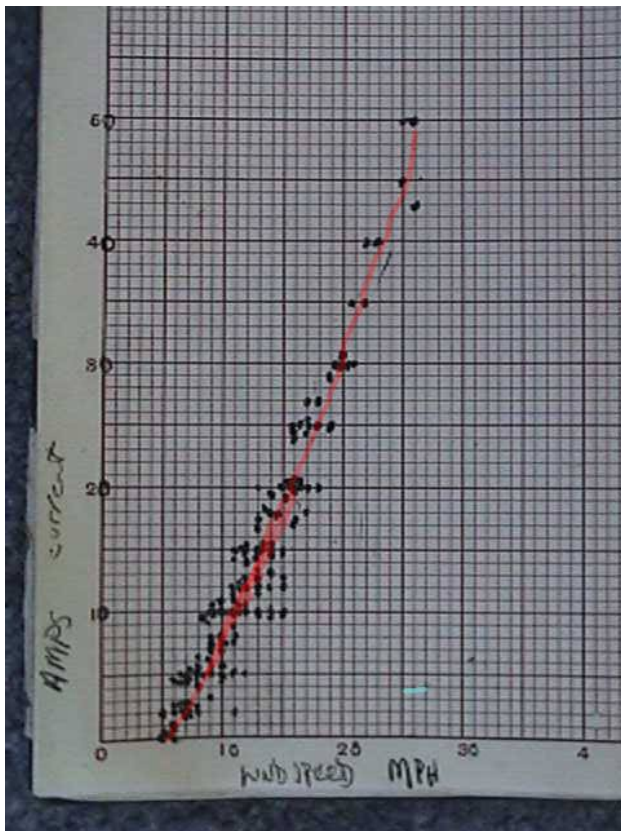
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Pictured above you can see my primitive power system and the meters I love to watch! Top one is an old Weston voltmeter. It's in full agreement with the voltage readings I get off my Trace inverter, it amazes me how accurate many of these very old meters still are. The bottom analog meter is my ammeter, it shows 0-80 amps - it also is quite accurate, pretty much in full agreement with my Fluke clamp on. Top and left is the readout for the anemometer (A bike speedometer). The yellow meter hanging off the wires to the left is my Fluke 377 clamp on meter which does a great job of reading frequency on my windmill so I can now get pretty accurate rpm readings.

I'd always been of the impression that this wind turbine ran a bit too fast. It's quite fast compared to the dual rotor machines I've built since. Working it all out - after watching frequency, and windspeed on the anemometer for quite a while and writing down lots of figures/taking averages - this windmill is running at a TSR (tip speed ratio) of 6.3, in a 15 mph wind, and... also, exactly 6.3 in a 20 mph wind. So, I guess it's not too fast... it seems quite within reason.





Yesterday was a good breezy day, with winds from the West and SW, so the anemometer on my tower was in a good place. The max windspeed I ever saw was 26mph. Average was around 10. The machine starts to furl right around 25 mph it seems. I wish we'd have had more wind (we will... if I'm patient!) so that I could see this power curve reflect that. I've seen this machine peg my 80 amp meter on occasion - my guess is that happens when a violent gust hits it briefly from a weird direction, because the furling system shouldn't really allow that. I basically watched the ammeter and the windspeed indicator and put dots on my graph, the red line is an approx average. A few readings were very consistant throughout the day and I would've put gobs of dots in the same spots. 2.5 amps @ 7mph, 8 amps at 10mph, 20 amps at 16 mph, 30 at 20mph. Didn't ever see lots of wind much above 20, but it seems to be in the 40-45 amp range at 25mph.

Hard to say how accurate all this really is, but I doub't the anemometer is reading high, simply because it's hard to believe my machine would be running at a TSR much below 6.3 (it seems to spin pretty fast!) An optimistic reading on the anemometer would mean that I was running at a lower TSR, which is hard to believe. So.. I kind of feel lucky - this machine seems to be running a little bit better than I actually thought it was, slightly better than my truck tests indicated.

The anemometer is fun... I'm dying for a REALLY windy day now!

[Fun with meters and graph paper](#) | 0 comments (0 topical, 0 editorial)

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## [Windmill Repairs](#)

By [DanB](#), Section [Homebrewed Electricity](#)

Posted on Sun Nov 2nd, 2003 at 10:43:18 AM MST

Yesterday I lowered my windmill for repairs and inspection....

[Wind](#)



I lowered my wind turbine yesterday for repairs. It's been up for about 6 months now, and as per my last posting - we had very high winds over the last week. One guy wire had broken, and I could hear the weight rattling up on the tower.



Pictured above is shown how the weight (a bunch o' washers) was bolted to the front of the prop and it had come loose. Actually, even though they were very tight when I raised it, and locktightened, all 5 of the nuts holding the prop on were surprisingly loose. Even if the weight had stay'd put, I think the prop would've started rattling soon. This time I put lock washers in, re-tightened it and used locktight. I also put a couple wood screws in to help hold the weight in its proper position. Hopefully this will last till spring! (at which time I'll hopefully build a better tower and replace the machine with another one)

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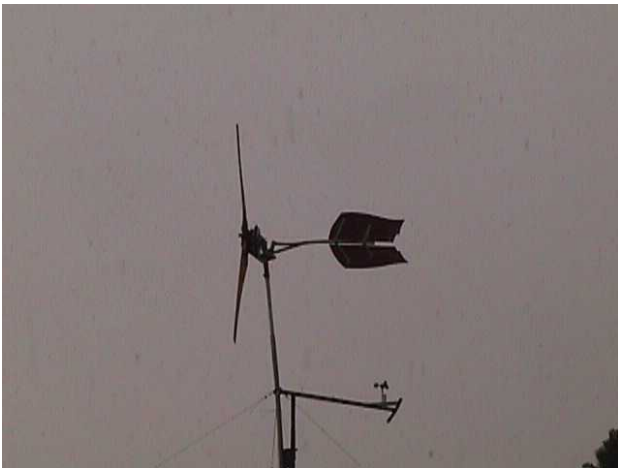
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This picture shows the tail pivot, and the notch which sets the stops for both unfurled, and furled position. I'd taken care when I built the machine to reinforce this notch around the sides and the top with additional metal. Still not strong enough, the pipe has flared out at the bottom some. I didn't do anything to fix this for now, I think it'll last through winter, but perhaps next time we'll use even more reinforcement or larger pipe for the pivots, or both...



We fixed the broken guy wire, and added a Vortex anememometer which was sent to us as a sample for testing. So... it'll be fun to get some sort of windspeed data here at my house! As it looks now.. obviously the anememometer is running in the wake of the blade... it's very unusual for us to get winds from the East, but at the time of taking this picture that was the case. Most wind is from the west, and the anememometer is about 3.5' in front of the prop in that situation. Still, far from ideal... but it should give some kind of rough idea! Fun stuff... it's interesting to see how these hold up. Had I not lowered this machine (or had I not been home on Wed morning) I suspect it would've completely failed soon. We'll see how the tail pivot holes up! For now, it looks happy... new grease, new linseed oil on the blade. At this time (after only 6 months) the blade looked pretty much like new with no signs of wear or warping.

[Windmill Repairs](#) | 5 comments (5 topical, 0 editorial)

wood crushing? ([none / 0](#)) ([#1](#))  
by wdyasq on Sun Nov 2nd, 2003 at 10:53:21 AM MST  
([User Info](#))



Dan,

Could the loose bolts be the result of the wood crushing? I have had that happen on some wooden tooling I have built.

It is always amazing what Mother Nature can do to somethingone thinks of as -bullet proof-

Thanks for the update,

Ron

Re: Windmill Repairs ([none / 0](#)) ([#2](#))  
by scoraigwind ([magnet@scoraigwind.co.uk](mailto:magnet@scoraigwind.co.uk)) on Mon Nov  
3rd, 2003 at 02:14:03 AM MST  
([User Info](#)) <http://www.scoraigwind.co.uk>

Hi Dan,

Thanks for the close up views.

I would say that the blades probably expanded and contracted with moisture. When they expanded (in wet weather) the wood was crushed, and when they contracted they came loose. That's why you should not leave the axe out in the rain. (the handle gets loose)

I was surprised by the state of the low end stop. There is not usually much stress on that. Either there has been some heavy turbulence, causing the tail to slam down on its stop, or there has been some heavy vibration perhaps.

I wonder is that a single phase machine? Vibration from the alternator could also work things loose.

I am surprised you can get away with such thin pipe between the guys and the windmill.

The anemometer position is a constant problem. Too far below the machine and it as less wind. Too close and it is influenced by the windmill. You will find that the relationship between windspeed and power depends a lot on wind direction.

The best place for the anemometer is on a separate tower upwind. Easier said than done though.

Hugh Piggott <http://www.scoraigwind.co.uk>

Re: Windmill Repairs ([none / 0](#)) ([#3](#))  
by kww on Mon Nov 3rd, 2003 at 06:59:51 AM MST  
([User Info](#))

Hi Hugh,

About the thin pipe, it seems like to me if the turbine turns out of the wind early/with low rotor thrust a much smaller pipe would work. Dan's turbine appears to prove this, since that's how he makes them I've read. I like the idea of such a design since it seems like to me you can get a lot more out of a small setup, except for the rotor, since a large rotor will make a significant amount of power for a small alternator in LOW winds. And, it's not really much harder, time consuming, or expensive to make a 10 footer as opposed to a 6. I'm just hoping my design can hold up to the high winds using smaller pipe, guy lines, etc. like Dan's does. Btw, great book (Windpower Workshop), thanks for writing it as it's come in very handy. Now you just need to write one for us electrically challenged. ;-)

Kevin

[ [Parent](#) ]

Re: Windmill Repairs ([none / 0](#)) ([#4](#))  
by DanB on Mon Nov 3rd, 2003 at 07:16:35 AM MST  
([User Info](#))

Hi Hugh - yes, I have no doubt it's due to moisture that the prop nuts are coming loose. The wood is definitely crushing beneath them... the nut's have not turned, they were still locktightened in their original position. I expect this will be something to watch for on all the machines we put up this summer. I've noticed we don't have this problem on Wards (the old one I made a couple years ago for him) because we made a solid steel plate to cover the front of the prop that went between the nuts and the wood. Everytime we check that it's still good and tight. I thought washers would be good enough (perhaps they are)... making the plate takes a bit of extra time, although I think in the future it may be worth the extra trouble.

The tail pivot... it would not be hard to make it stronger. I think part of the problem is that the notch was not landing in full contact with the stop... it was making contact at the very bottom first so all the forces used to be at one point. I think it has "worn in" so to speak and suspect it may not get much worse. Time will tell...  
It is a 3 phase alternator, this is the machine I made in May, with a single magnetic rotor and laminates, so I don't think alternator vibration is a significant issue. It is however a very turbulent place. The tower is 45' high... I think even 100' would not get me out of the turbulence here too well. We have hills fairly close on both the North, and the South sides and lots of tall trees. It's fairly mountainous and the wind rarely comes from one direction for very long. I believe this is the main problem... to get out of this turbulent situation on our property would probably be impossible, but surely a taller tower would help.

Regarding the small pipe above the guy wires. I agree... it's very much pushing the limit. I never see it flexing, but it still makes me nervous. It is however stronger than it looks. The pipe is fairly thick walled stainless steel, which is much stiffer than

common steel water pipe. There is also tight fitting steel pipe, the next size down - pounded down inside it all the way, and there is a 1" steel pipe (which you cannot see in the picture) welded to the back side.

(kind of a conglomeration of junk...). I have no doubt that a single piece of steel water pipe this size would bend over immediately, I know this just from testing machines on my truck! (I've bent a few pipes over on my truck while testing!) Hopefully next spring I'll have the time/resources to build a stronger, taller tower - I'd not feel comfortable putting any larger machine than this on my current tower.

[ [Parent](#) ]

Re: Windmill Repairs ([none / 0](#)) ([#5](#))  
by veewee77 on Mon Nov 3rd, 2003 at 01:37:24 PM MST  
([User Info](#))

Here is a thought on how to fiux the anemometer/downwind thing. . .

Put the anemometer on a swiveling arm and put a tail out the other direction a foot or two more than the anemometer. The tail will keep the anemometer upwind of the genny at all times.

just my \$.02 and worth!

Doug

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## [Wind turbine update!](#)

By [DanB](#), Section [Homebrewed Electricity](#)

Posted on Thu Oct 30th, 2003 at 09:26:16 AM MST

[Wind](#)

We've had the first real good windy week of the season up here!

---

Its the first chance we've seen good high winds on all the machines we made since spring. Lots of days in a row with winds 20-40mph and gusts as high as 80!

The machine I made for myself in May: <http://www.otherpower.com/bdwm53.html>  
Has done fairly well. It starts up easily and produces well and the furling system works smoothly. The winds started to subside yesterday, but I took a couple pictures of it from right below the tower to show a bit of how it's furling.

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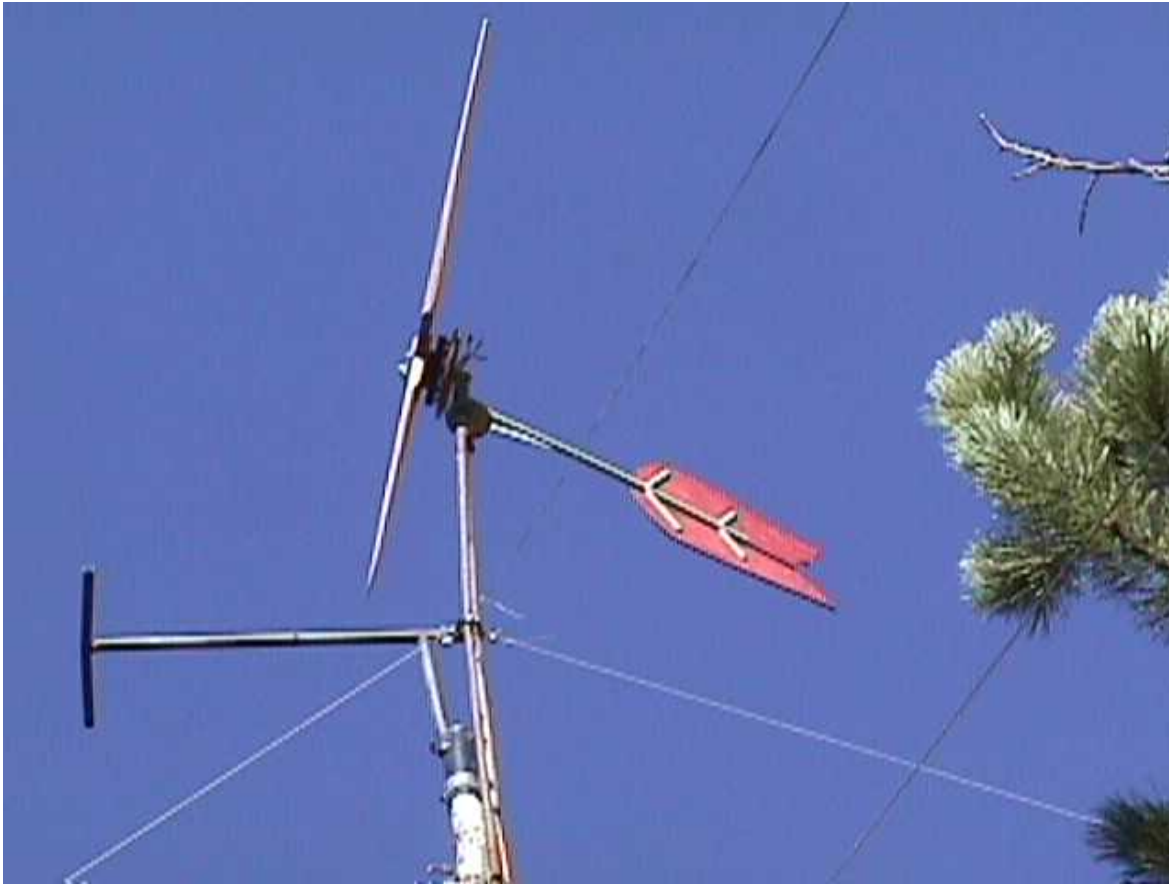
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The picture above shows it in it's normal "unfurled position".

- <http://www.otherpower.com/bdwm53.html>
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In this picture we're having reasonably strong winds, probably about 30mph and you can see the alternator/prop is starting to turn away from the wind. Again, with this system.. the tail is always with the wind, the prop and the alternator pivots away and the tail gets raised.

This machine, on it's primitive [tree and chain](#) tower looks a bit precarious in high winds, but it's held up OK through the 80mph gusts. On windy days it seems to produce a pretty constant 200-500 watts with peaks well over 1KW (my meter shows 80 amps and I've seen it pegged often). I think the prop on this one runs a bit fast... a bit faster than I'd like. After this week of strong winds, I've had two minor failures... either of which could've been major! (I got lucky...). Yesterday morn the tower was moving around a lot, and one of the top guy wires had broken at the turnbuckle. Why??... when I put the tower up I ran out of good cable, so I doubled up some stuff that was too thin and it snapped. The other failure is that the weight which I used to balance the prop is bolted to one of the studs that holds the prop on. Evidently it's coming loose, because I hear it rattling up there. For now the machine is shorted out (shut down) and hopefully today I'll find the time to lower the tower and fix it. Considering how the tower is made... that in and of itself could be an adventure!



This machine we put up a couple months ago... one of the [triplets!](#) It's been looking very solid and safe and slow all week. It's doing very well in the lower winds, but it's hard to say in higher winds because we only had a 25 amp meter when we installed it, which is often pegged. Yesterday (as the winds were dying down) I brought up my new DC clamp on meter and watched it for a while. The machine basically runs too slow to get the sort of output we'd expect from a 10' prop. Part of the reason is how close the tower is to the batteries (8' away!)... so the line loss is almost 0. Yesterday I cut about 25' of AWG 14 extension cord and added it to the line. The result was impressive, it sped the machine up significantly and it was much quicker to produce higher currents. In seemingly mild winds we were seeing 25-30 amps with peaks of 45, but at the time we were no longer having strong winds. Before adding resistance to the line, it took a huge gust to make this machine furl because the prop was turning too slow to really catch the wind as it should. After adding some resistance, it started furling much sooner. It was a fun experiment, but in the end we removed the resistance, because the machine was already producing more power than Tom could use and we figured that with that in mind, there was no sense in running it

any faster than necessary. Should Tom figure out how to use the extra power, we can improve output significantly by putting the resistance back in the line... or... making a larger prop, or widening the airgap in the alternator a bit so it doesn't load the prop up so much!



[Wards wind turbine](#) has been hanging tough through it all. He does shut it down sometimes on windy days when he's gone, but hes getting a bit less careful about it now that we kind of feel it's obsolete. This is the 1st brake disk windmill we ever made. It's a bit slow to start, it takes a constant 10mph for a few seconds to get it spinning up, but once running it does pretty well. He actually mounted an [anemometer](#) to his tower recently, so it's been fun to get some data on it. Seems like he's seeing around 5 amps in 10mph winds from it, and since it has no furling system he occasionally sees peaks around 120 amps in very strong winds. Knowing what I know now... I'm kind of surprised how reliable this machine has been and that it's actually still standing!





[The Caboose](#) windmill has seemed very solid so far. It's another case of too much power... Dave really can't use it all. He's got 1 solar panel, between that and the wind turbine his batteries are always full and it seems his windmill is shut down more than half the time. His machine is also 12 volts, and the line between the windmill and the batteries is about 400' long! We've got 4 strands of 10-3 romex running from it to the batteries (for a total of 12 strands of AWG 10 wire) and should be adding more, but as it is it doesn't seem to overspeed and has no problem getting 500 watts (sometimes more) down to his batteries.

It's been a fun and interesting week to see how all these hold up! I think the only failures are at my house and thankfully I shut the machine down before disaster struck. I was rather afraid I'd wake up yesterday morning and find a few windmills down after the 70-80mph gusts we had, I'm glad that was not the case.

[Wind turbine update!](#) | 11 comments (11 topical, 0 editorial)

Re: Wind turbine update! ([none / 0](#)) ([#1](#))  
by Barnac ([barnac@videotron.ca](mailto:barnac@videotron.ca)) on Thu Oct 30th, 2003 at 10:46:16 AM MST  
([User Info](#))

Dan,

There is something in your post that I don't get. My poor brain can't figure it.

Usually we say that a windmill will overspeed in strong wind if not loaded (free wheeling). When loaded a windmill will slow down right ?

What I don't get is that you stated in your post that one of the reason your mill was running slow was lack of line lost and that by adding line lost your mill speeded up ? (In my perspective, lower line lost imply less load while higher line lost imply more load) What is that I don't get ? Can someone enlighten me ?

Regards Barnac

I am neither for, nor against, but quite to the contrary ;-)

Re: Wind turbine update! ([none / 0](#)) ([#2](#))  
by DanB on Thu Oct 30th, 2003 at 11:17:57 AM MST  
([User Info](#))

By line loss... we mean resistance in the line.

Imagine if we short the line out... then the resistance in the circuit (except for that in the alternator) is 0 for all practical purposes... and it loads up the machine hugely causing it to turn very slowly. When it's turning this slowly.... the blade is basically forced to go much more slowly than it would like to, or need to in order to produce good power from the wind. (it's stalling...)

Instead of shorting it... we could unhook it completely for any load which would be pretty much infinite resistance and it would free spin, running dangerously fast and probably making lots of noise and not being very efficient.

The batteries are a load, but in our case the load was too much - it took too much. Just a small increase in rpm at the alternator resulted in a big increase in current and that curve didn't match up well with the power available from the prop over a range of windspeeds. By adding resistance it can increase in rpm some (to keep with the prop) and not have such an immediate increase in current, so the prop is able to maintain at a higher, and more efficient speed over a range of windspeeds.

On the downside, were losing more power in the line. Basicly we've sacrificed a small bit of efficiency in the electrical end of things to allow the prop to run much more efficiently... in the end we come out way ahead on the deal. Our added line loss doesn't hurt us hardly at all in the low winds (7-10mph) where were getting 10 amps or less anyhow, but we do lose a lot of power when current gets higher. At 12 volts, when we see 40 amps current flowing (480 watts into the batteries), we are losing about 400 watts into heat just in the xtra line I added.... (not very efficient) - but were still gaining in the end. I actually think I will change the line and instead of 25', go to about 15', because that added line really allowed the windmill to speed up a bit too much I think.

Somewhere is the perfect balance! Again though... in the end we don't use it that way, because the machine does well anyhow in low windspeeds and if Tom cant use the extra power anyhow, there is little point in running it faster than necessary. It was a fun week watching/playing with these things...

[ [Parent](#) ]

Re: Wind turbine update! ([none / 0](#)) ([#5](#))  
by Barnac ([barnac@videotron.ca](mailto:barnac@videotron.ca)) on Thu Oct 30th, 2003 at 01:40:14 PM MST  
([User Info](#))

Thanks Dan four your time explaining me. I got what you meant now.

[ [Parent](#) ]

Re: Wind turbine update! ([none / 0](#)) ([#3](#))  
by Wolfie1 on Thu Oct 30th, 2003 at 12:36:35 PM MST  
([User Info](#))

Dan, what's the horizontal, black tee-shaped thing in the first two pictures?

Martin.

Re: Wind turbine update! ([none / 0](#)) ([#4](#))  
by TomW on Thu Oct 30th, 2003 at 12:39:32 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Wolfie1;

Not to answer for Dan but I asked about that and he said its the foot to keep the genny clear of the ground when they lower it.

Cheers.

TomW

[Stuff I have Online](#)

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[ [Parent](#) ]

Re: Wind turbine update! ([none / 0](#)) (#7)  
by Dave B on Thu Oct 30th, 2003 at 10:08:09 PM MST  
([User Info](#)) <http://www.madbbs.com/users/bruggelog>

Dan,

Knowing what you know now I'm looking for some advice. I'm the one who has built the Volvo alternator for pre-heating water. Can you tell me the width of your blades at the root of your 10' rotor ? Also an approx. TSR ? I notice that for ease of carving I'm sure that not too many people carve the root area and "drop" to the specs. given in the Excel blade program for most any given TSR & length. I understand that once the blade is turning the root area may not have much affect on performance but ONLY if the load is such that the added torque is not needed. This could be the case more times than not for charging batteries. In my application (and testing proves this out) I will want, and need all the torque and speed I can get at any speed as I will be adjusting the load to "crank" the power. I would rather see my mill turning slower with the torque needed than to have it stall or be hard starting. Can you guess or do you know the rpm range of your 10' rotor for various wind speeds unloaded ? I'd like to hit 400-425 rpm in 25-30 mph furling say after 30 mph. Do you think the Volvo design is capable of spinning a 12' prop at these speeds or should I stick with whats been tested say the 10' and carve that root to spec. to get that torque I need ? Great information and thank you for sharing your thoughts based on your experience. Dave B.

[ [Parent](#) ]

Re: Wind turbine update! ([none / 0](#)) (#10)  
by DanB on Mon Nov 3rd, 2003 at 07:52:22 AM MST  
([User Info](#))



Hi Dave -

The width at the root depends sometimes on what lumber I find available. Usually about 8" wide, and I prefer to find wood 2" thick, but usually its 1.5" thick. At the tips, I've been making them about 2.5" wide and about 3/8" thick, and on all mine the thickness has tapered to full board thickness at the root, and that taper has been a straight line. (not really proper at all... \*) At the root the pitch is as much as the board will allow. About half way between the root and the tip it's about 5 or 6 deg. So far... my blades have not been very scientific!

I've not done good measurments of rpm, but I'm guessing that my 9' machine (single rotor alternator) is probably running with a TSR of around 10. I believe the 10' dual rotor machines are running with a TSR between 5, and 7 in low winds (each one is different and the TSR changes depending on line loss and the nature of the battery bank). The 10' machines are stalling, probably around 15 - 20mph I think, so as windspeed increases the TSR gets less and less... and the blades become less and less efficient. Adding resistance to the line, having a wider airgap, using smaller magnets next time, putting on a larger prop OR rewinding the coils for higher cutin speed... any of these things would change that and allow the blades to run at a more efficient speed.

So I think really... we try to make blades that \*like to run at a certain TSR when loaded by the alternator, but in the end it's the loading of the alternator that will determine what TSR they actually run at. My 9' machine runs a bit on the fast side, and the 10' machines are running a bit on the slow side, and changes in the line - and/or the alternator would bring them into more efficient operation. Actually - I think my 9' machine is running with reasonable efficiency over the range of windspeeds, and slowing it down would make it safer - but may cost me a bit of power. None of these machines make much noise - probably the only one I hear any sound from the prop on is Daves (the one at the caboose) - where we had a 4, or 5 deg (cant remember) pitch at the tips. Hugh advised me to try a bit less - and they became almost totally silent. Even the caboose windmill is very quiet, but you do always hear a slight whooshing sound when its running.

When I make blades generally... I tend to work from blades I've made in the past that worked OK, - and I look at other peoples blades. I have a nice set here that Ed made which I use for "inspiration"... although I believe I make some compromises for strength. Mine are a bit wider and thicker at the tips than perhaps they should be... but I get nervous with wood when it gets too thin. I also keep my old windcharger in mind when I make blades, it had a straight pitch from root to tip, the thickness remained the same, from root to tip - and you couldve made the whole blade from a 1 X 4. (it was 6' in diameter if I recall). Bergy blades also have constant thickness and constant pitch from root, to tip - and they are quite efficient.

I could be wrong... but I think that blades are quite forgiving if you're not looking for absolute maximum efficiency... I think anything in the "ballpark" can be reasonably efficient. If you are usin the spreadsheet - I'd just design the prop for a reasonable TSR (like 7), and tune your alternator and your load untill it runs best. Since your not charging batteries here, I should think you have a lot of flexibility by changing the load to get things matched up nicely.

[ [Parent](#) ]

Re: Wind turbine update! ([none / 0](#)) (#11)  
by Dave B on Mon Nov 3rd, 2003 at 10:48:43 AM MST  
([User Info](#)) <http://www.madbbs.com/users/bruggelog>

Dan,

Thank you for your response on the blade info. Like you say, I will have quite a bit of flexibility with adjusting my load(s), cut in speed etc. as I will be designing a variable load controller circuit using solid state relays. I really will need the torque to keep things turning most efficiently in higher winds with my load adjusted properly. Hopefully through basement testing with my 2 hp electric motor set up running the alternator I can design an efficient auto load circuit depending on rpm. This is fun stuff. I think I may take it a step up to a 12' rotor after reading your comments or possibly a 10' with TSR 7 and carve it to spec. including the "extra" drop needed at the root for torque and startup. Thank you again for sharing your info. and photos. You guys have got me hooked. Dave B.

[ [Parent](#) ]

Re: Wind turbine update! ([none / 0](#)) (#6)  
by kww on Thu Oct 30th, 2003 at 08:42:27 PM MST  
([User Info](#))

That's quite a tower Dan, looks like something I'd make myself. :- ) I've got giant timber bamboo(4" diam., 50 foot tall) planted, when that gets big enough I'll trade you a load for some magnets. ;- )  
Anyway, I was wondering what size pole you use at the top to mount your 10 foot turbines too and kind, thin conduit, thick water, steam, or gas pipe? Also, you wouldn't happen to have any idea of the force needed on your 10 foot turbines to get them to furl?  
Kevin

Re: Wind turbine update! ([none / 0](#)) (#8)  
by DanB on Fri Oct 31st, 2003 at 07:49:38 AM MST  
([User Info](#))

Hi Kevin -

At the top there's 2" pipe going all the way to the top (almost) with 1.5" pipe inside that, and the very top stub is 1.25" pipe which is dropped down inside the whole thing, but sticks up about 10" and the wind turbine sits on that. All the pipe is shed 40 water pipe except the 2" which is stainless. (junk I had on hand...)

Then, on the outside of the whole thing, there is a length of 1" pipe which is welded to the side, and drops below all the pipe by about 4' and its chained to the tree...

It doesn't seem to flex much... but a little. When I drop this next time (didnt get to it yesterday) I'll be strengthening things.

[ [Parent](#) ]

Re: Wind turbine update! ([none / 0](#)) ([#9](#))  
by kww on Fri Oct 31st, 2003 at 04:31:56 PM MST  
([User Info](#))

Hi Dan,

Sounds like if it's going to break it'll be at the top, right where the 1.25" goes into the rest. That seems really small, based on Hugh's book and the hint of power available I saw in my own turbine, but if it furls easily (with little trust on the rotor), it seems ok. Especially since you've already had it in 80mph winds. :-). The reason I'm so interested is that I'm going with a 1.75" pole at the top 7 or so feet, then 2" the rest of the way down. I'm using 4 1/8" galvanized steel guy wires. I figure this is way more than enough to support the tower since it only takes around 70 lbs of thrust to completely furl the rotor, we'll see. :-). Thanks.  
Kevin

[ [Parent](#) ]

[Wind turbine update!](#) | 11 comments (11 topical, 0 editorial)

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## [Motor generator Grid tie?](#)

By [DanB](#), Section [Homebrewed Electricity](#)

Posted on Sat Oct 11th, 2003 at 09:29:13 AM MST

[Wind](#)

Wonding if a motor-generator might be a reasonable option.

I've been thinking about how to grid tie a wind turbine which charges a 12 volt system. Nobody currently (that I know of) is making a grid tie inverter for 12 volt systems.

It's got me wondering if we couldnt simply drive an induction motor with either a 12 volt DC motor, or a 120AC motor through an inverter to "dump" power into the grid. Of course we'd need a cutoff switch to make it all safe/legal etc... bt it seems a reasonable option. I used to run my power tools off an old 1500 watt 12VDC - 120AC honeywell motor generator (back when inverters were expensive) - it seems like under full load it was reasonably efficient, like 70% or something. To grid tie a system, it seems like a fairly small motor generator could be turned on when battery voltage got over a certain point, and turned off... below a certain point, and it might make for a reasonable system.

I've not yet messed with using induction motors as generators. I wonder how much faster than the rated speed we'd need to run an induction motor in order to have most efficient output - and how all this would work out.

[Motor generator Grid tie?](#) | 4 comments (4 topical, 0 editorial)

Re: Motor generator Grid tie? ([none / 0](#)) ([#1](#))  
by 5kw on Sat Oct 11th, 2003 at 11:49:54 AM MST  
([User Info](#))

Hi Dan,

Your idea will certainly work, whether it is worth the trouble or not depends on the fun factor of, spinnin the meter backwards.

An induction motor behaves as a generator when connected to the line and spun above its synchronous speed, ie a four pole motor typically rated at 1725 rpm on 60 hz, will start looking like a generator above 1800 rpm and reach full or rated power at approxamatly 1875 rpm ,or the same % slip above synchronous speed as it had below it as a motor. Note the slip is a function of load, the 1725 motor will run slightly under 1800 rpm with no load. All above speeds are for 60 hz power on 50hz sync speed would be 1500 for a four pole motor

To impliment the motor generator I would think torque, not speed, as the induction generator will hit a wall of torque at its rated slip. It is possible to push past this speed with enough horsepower , at which time the generator will become unstable, hoever if your pime mover has limited torque this is not an issue.

As far as safety goes, although the utility will insist on UL

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listed safety cut out relays, in the real world it would be nearly impossible to generate into a dead line with an induction machine as the machine requires lagging current for excitation but can only produce leading current. A capacitive line ( rare) could supply the lagging current but the electrical load would have to be very low to keep from damping out the whole process. Normally a utility failure would present a very high load. In any case a line failure would lose freq and voltage regulation within a few cycles( this is what trips the safety relays) .

Make the wind fun!  
Victor

Re: Motor generator Grid tie? ([none / 0](#)) (#2)  
by monte350c on Sat Oct 11th, 2003 at 07:27:53 PM MST  
([User Info](#))

Hi DanB,

Seems like a pretty good idea, a fairly straightforward circuit could be designed to set the on/off points for the motor generator. A while back I found a pretty good book (free!) online - <http://www.eece.ksu.edu/~gjohnson/> there's some info and ideas especially in chapters 5, 6, 7. The whole book is a good read with detailed calculations on a wide variety of wind topics, but it reads well not at all like a dry tech book. Keep us posted on your progress with this one. I have been thinking about trying an induction generator with a small gas engine to charge batteries. There's a site somewhere where a fella uses capacitors parallel with the motor. If I find it I'll post again.

Re: Motor generator Grid tie? ([none / 0](#)) (#3)  
by JW on Mon Oct 13th, 2003 at 01:11:29 PM MST  
([User Info](#))

DanB,

I have looked into doing this with engine powered generators for sometime. Once I contacted an engineer at tech support for ELLOT MAGNETEC. I was auditioning as a perspective buyer of a 155kw generator element. I asked the guy how do I connect to the grid with this thing? He then asked me what do you intend to drive the the gen-element with? I replied a 400hp V8 engine. He replied that the engine might be kind of underpowered for the application, but said I could do it, and the engine might wear out in a year or less.

I was told a "VAR POWER CONTROLLER" would keep the freq in phase. He said it will actually throttle or govern the engine based on the freq in the main line.

There is also another way to do it with an inverter, but its much more experimental, you must use a Isolation Transformer thats rated for the "KVA" of what you expect the power company to buy. And apparently the the "VAR" reads the incoming modified sinewave and reads the output sinewave to the grid and interups the voltages to

keep everthing "in phase"

to do this your output must be in the "neighborhood" and the isolation transformer helps in both cases. but I believe the "VAR" makes sure all the power you want to go "upstream" goes out to the grid correctly and in phase.

My best advice would be to find someone who "cogenerates power" with a diesel gen-set. And ask some questions about how they get "all" there output up into the grid. I have run across several people who have done this. but they are moving big power, over 50 to 500kw. They say they can just break even, between the cost of fuel and there needs in there factory, assuming they dont pay taxes on the power they use for themselves.

By the way I happen to have a 500kva isolation transformer just laying around, and will probnably be thrown out pretty soon. what I think is neat about these Isolation transformers is that they will put 3kw into the grid, or 400kw just as easily. depending what the control electronics tell it to do providing you have that much output. and the disconnects are inbetween to Isolation transformer and the grid.

If you want the Isolation transformer I have let me know you can have it, but it weighs about 1000lbs, and is in a nice indoor type cabinet with a control screen.

-JW

Re: Motor generator Grid tie? ([none / 0](#)) ([#4](#))  
by Beui ([REMOVE~beui@yahoo.com](mailto:REMOVE~beui@yahoo.com)) on Tue Nov  
4th, 2003 at 11:30:53 AM MST  
([User Info](#))

I found a bunch of information concerning VAR's and other items specific to phase matching from this manufacturer:

<http://www.basler.com/html/rscacc.htm>

This might help you with understanding how the pro's do it!

I'm thinking of doing something along these same lines with a diesel motor running on veggie oil and grid-tie the output! I might just break down and buy a whole diesel genset from ebay.

-Beui

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[Motor generator Grid tie?](#) | 4 comments (4 topical, 0 editorial)

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### [New Webpage about the triplets.](#)

By [DanB](#), Section [Homebrewed Electricity](#)

Posted on Fri Sep 26th, 2003 at 12:29:26 PM MST

[Wind](#)

It's almost done!

I finally got the page made for otherpower.com about the dual rotor machines we've been playing around with. It takes time... when you start out with about 200 pictures.

It's fairly redundant - about the same as the caboose windmill, but hopefully a bit more detailed. Hopefully I didn't make anything too awful confusing or get my math all wrong or something. There are still a few spelling errors at this time, and we're actually scanning all my "dancad" pictures so they can be seen more easily! (instead of shooting them with my antique Sony Mavica).

Some of that should be fixed by tomorrow. Of course... just like I am about my windmill blades, I don't worry too much about the little things.

<http://www.otherpower.com/trips1.html>

Building the windmills is the fun part! Making the webpage takes just as long it.. well, it's pretty fun too!

Now I can knock a couple items off my "honey dew" list and get back to bigger and hopefully better windmills!

[New Webpage about the triplets.](#) | 10 comments (10 topical, 0 editorial)

Re: New Webpage about the triplets. ([none / 0](#)) ([#1](#))  
by [troy](#) on Fri Sep 26th, 2003 at 02:33:58 PM MST  
([User Info](#))

Hey guys,

Awesome pictorial guide to building a mill. You're approaching book status you know...

Hugh Piggot watch out, Ha Ha.

Keep up the good work.

Best regards,

troy

Re: New Webpage about the triplets. ([none / 0](#)) ([#2](#))  
by [Reno](#) on Fri Sep 26th, 2003 at 02:40:59 PM MST  
([User Info](#))

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Nice job

I was wondering about the shape of the coils in relation to those 2 inch magnets as I have been curious as how to wind a coil for that magnet.

Another thought/question

After seeing your 3 stators in a pic for the three machines it got me thinking.

If you were building a three phase machine could you build 3 single phase stators then adhere them together to get you 3 phase stator. this would definitely make it easier, also each phase could be check prior to assembly and could be seperated if one phase ever needed changing.

Just a thought

Re: New Webpage about the triplets. (none / 0) (#3)  
by sean on Fri Sep 26th, 2003 at 04:17:48 PM MST  
([User Info](#))  
<http://homepage.ntlworld.com/s.amesbury/homepage.htm>

Very,very, very interesting but myself can only take so much in from books or reading web pages and probably like yourself need that hands on class room enviroment to ask those questions which i need answers to. But i got to give it to you, you put the work in and got the output from that work and they look good...wish i could have something with big prop but not where i live (Damn!!!!). Theres mainly two things i dont grasp and thats the building of the props and how the furling system works, hey maybe i need to attend a course by Hugh!!! It has crossed my mind more than once and one day it might just become realality. I dont know how big your community is up there at otherpower but have you ever wonder of building a wind farm and having your own grid? Keep building them gennys cos i will for sure, even though mine look like toys in comparison they still have a purpose and that is to charge batteries. Love the site and the things you guys make.....sean

<http://homepage.ntlworld.com/s.amesbury/homepage.htm>

Re: New Webpage about the triplets. (none / 0) (#4)  
by RayW on Fri Sep 26th, 2003 at 09:41:23 PM MST  
([User Info](#))

Congrats to all involved in making the wind turbines and web page. Very nice and informative. The pictures are worth thousands of words.

RayW

Re: New Webpage about the triplets. (none / 0) (#5)  
by Norm on Sat Sep 27th, 2003 at 10:18:16 AM MST  
([User Info](#))

Just out of curiosity how much current does one of those produce at say 120 rpm? Well actually how fast would it have to spin to light something like a 40 watt CF? Norm.

Re: New Webpage about the triplets. ([none / 0](#))  
(#6)  
by DanB on Sat Sep 27th, 2003 at 10:54:50 AM MST  
([User Info](#))

Sorry Norm - I've not tested for that yet... I don't have a powerful enough test setup to test current over a range of rpm yet. A 40 watt CF though... wouldn't take much. I suspect probably you'd do that easily at 110 rpm or so, right after it hits 12 volts.

It seems that a very small increase in rpm = quite a current increase into the batteries. I don't think I've seen these ever exceed much over 400 rpm before furling out, just judging from the sound of the alternator. You can hear the alternator start humming shortly after cutin. I've sat/listened even on windy days, and I've heard it on occasion cover about 1 octave (the faster it goes the higher pitch hum).

My digital multimeter, which can measure frequency, doesn't seem to do well at very low frequencies.. the readings I get are chaotic, so Im unable to determine rpm that way when it's up on the tower.

I really need to make a good test setup where I can drive these with a gas engine or something to get some good data.

[ [Parent](#) ]

Re: New Webpage about the triplets.  
([none / 0](#)) (#8)  
by Norm on Mon Sep 29th, 2003 at 06:42:48 AM MST  
([User Info](#))

DanB, That high pitched hum...I'll bet...is music to your ears! Fun! (:>) Norm.

[ [Parent](#) ]

Re: New Webpage about the triplets. ([none / 0](#)) (#7)  
by brainiac61 on Sun Sep 28th, 2003 at 04:20:25 PM MST  
([User Info](#))

Excellent job! Excellent web page too. I only have one question. Exactly how much air gap do you have between each of the rotors and the stator?

Re: New Webpage about the triplets. ([none / 0](#))  
([#9](#))  
by DanB on Mon Sep 29th, 2003 at 08:49:59 AM  
MST  
([User Info](#))

generally about 1/16" on each side, a bit less perhaps.... so the total airgap from magnet to magnet is about 5/8.

We actually made one machine with a smaller tail and a smaller 8' diameter prop. On that one we had to have a higher cut-in rpm, and allow the alternator to spin up faster. So on that one we opened it up quite a bit - almost 1/4" on each side! This brought "cut in" rpm to about 165 and allows the alternator to run faster without generating so much current, basically an attempt to "match" the alternator to a smaller prop.

Not very good use of magnets though - if I was going to build an 8' machine I'd use smaller, or fewer magnets. We did it this way thinking that someday we'd probably want to upgrade the machine to a larger prop once DanF builds a stronger/bigger tower.

[ [Parent](#) ]

Re: New Webpage about the triplets.  
([none / 0](#)) ([#10](#))  
by dconn on Tue Sep 30th, 2003 at 03:59:28  
AM MST  
([User Info](#))

Hi DanB,

On the smaller prop do you think you would get away with only one disk of magnets and have, say, the front disk with no magnets at all instead of the bigger air gap? I'm thinking this because the magnets are probably the biggest expense and they could be added later with a new prop as an upgrade.

All the best,

Derek

[ [Parent](#) ]

[New Webpage about the triplets.](#) | 10 comments (10 topical, 0 editorial)

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## [Disk Magnet spacing in axial flux alternators](#)

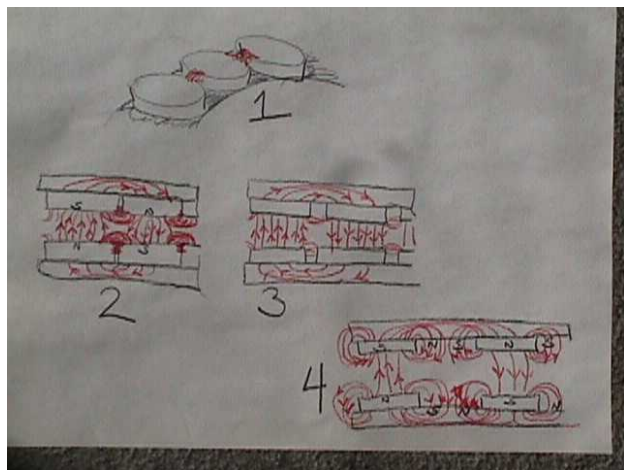
By [DanB](#), Section [Homebrewed Electricity](#)

[Alternators](#)

Posted on Tue Sep 16th, 2003 at 10:39:08 AM MST

Reno's last posting made me think about this...

There is some speculation here, I wonder if others have opinions about it.



Picture #1 shows disk magnets in close proximity.

Anytime magnets are very close there will be leakage from pole to pole (lines of force which are not going through the coils but rather from magnet to magnet). This becomes more of an issue the wider the airgap gets. In a laminate machine, with the coils down in slots, the airgap can be very thin (like 1/16" or less) and leakage is minimized. In a laminate machine with coils on top of the laminates, or a dual rotor machine - the airgap gets wide and leakage becomes more of an issue. To avoid leakage, and make better use of the magnets, we might want to put some space between the magnets. With disk magnets I think it's less of an issue because most of the leakage will be at the point where the magnets are closest - as shown in picture #1.

Picture #2 shows about the same thing - leakage between magnets which are practically touching. I think this arrangement might compromise coil shape a bit too, hard to say.

Picture #3 is basically a compromise - there is some space between the magnets, but much less than their diameter.

I think this is a good compromise and allows for nicely shaped coils.

Picture #4 shows what I think might happen if you space the magnets too far apart! You could get leakage from the top of the magnet to the bottom, actually creating more poles than you planned on and causing some problems.

Kind of speculating about this, but it makes some sense - if your airgap is a bit over 1/2" in a dual rotor machine, and you have lots of space between the magnets, it seems like some flux will not go through the airgap, and go

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straight to the pole on the back side of the magnet. This is not ideal...

I think (speculation) that ideally, in a machine with a wide airgap - that disk magnets should be spaced not touching, but not as far apart as they are in diameter. In practice, there are nice numbers of magnets to use in a 3 phase alternator, like 8, 12, 16...etc. If using disk magnets, I would choose ones that have reasonable diameter, and choose a number that allows for some space, but not too much space between them. Just speculating as usual! Opinions?

[Disk Magnet spacing in axial flux alternators](#) | 14 comments (14 topical, 0 editorial)

Re: Disk Magnet spacing in axial flux alternators  
([none / 0](#)) ([#1](#))

by E man on Tue Sep 16th, 2003 at 12:05:38 PM MST  
([User Info](#))

Number four up there...never thought of that one. I wonder if a gaussmeter would be a good candidate for testing possible leakage in the area you're describing; or even just holding a small nail or paperclip on the steel in these zones to check for leakage?

E-man

Re: Disk Magnet spacing in axial flux alternators ([none / 0](#)) ([#2](#))  
by DanB on Tue Sep 16th, 2003 at 01:17:24 PM MST  
([User Info](#))

yes - a gaussmeter would tell. Perhaps if I get a few spare min. today I'll do some tests.

[ [Parent](#) ]

Re: Disk Magnet spacing in axial flux alternators  
([none / 0](#)) ([#3](#))  
by electronbaby ([electronbaby@hotmail.com](mailto:electronbaby@hotmail.com)) on Tue Sep 16th, 2003 at 02:05:44 PM MST  
([User Info](#))

It seems to me that pic #4 would only be the case if the steel backing that actually was used for the rotor was too thin and allowed to saturate with flux. If the steel disc was thick enough, it should neutralize the flux path throughout the entire steel rotor. Isn't this what you want, ... enough strength in the magnet to hold itself to the rotor and not slide around. You want to focus the flux path very sharply between rotors. You do not want the magnets flying off of the rotors so that's why it is important to use a steel rotor that is thick enough to allow for the flux path from the back side of adjacent magnets to complete the 'outside' circuit'. When I say outside circuit, I mean the side of the magnet touching the rotor and not the side facing the stator. But your right Dan, this would only be a problem if the air gap was allowed to get too large. RoyR

Re: Disk Magnet spacing in axial flux alternators ([none / 0](#)) ([#4](#))  
by DanB on Tue Sep 16th, 2003 at 04:23:23 PM MST  
([User Info](#))

Well - I should just test it...  
but I think, no matter how thick the steel, some magnetic field would leak back around the side of the magnet to the back side.. or to the steel surrounding the magnet. The lines of force should look for the shortest path "back home" - if the airgap is wide, right around to the back side of the same magnet might be the shortest path. It would be moreso the wider the airgap, or the further apart the magnets I think. Just guessing :-).. I need to get out some iron and test it I guess.

[ [Parent](#) ]

Re: Disk Magnet spacing in axial flux alternators ([none / 0](#)) ([#5](#))  
by zubbly on Tue Sep 16th, 2003 at 05:36:39 PM MST  
([User Info](#))

try using a compass to check for other "phantom" poles.  
have fun. zubbly

Re: Disk Magnet spacing in axial flux alternators ([none / 0](#)) ([#6](#))  
by DanB on Tue Sep 16th, 2003 at 07:05:53 PM MST  
([User Info](#))

that would surely work, except I think it would be a bit large to poke in between the two rotors. It also doesn't give a real good idea of the "strength" of the pole. It would definitely give some idea on a single rotor though.

The Gaussmeter works a lot like a compass, but has a very small probe. It tells polarity though, and field density.

[ [Parent](#) ]

Re: Disk Magnet spacing in axial flux alternators ([none / 0](#)) (#7)  
by zubbly on Tue Sep 16th, 2003 at 07:09:35 PM MST  
([User Info](#))

gonna get me a guauss meter.  
zubbly

[ [Parent](#) ]

Re: Disk Magnet spacing in axial flux alternators ([none / 0](#)) (#8)  
by hvirtane on Wed Sep 17th, 2003 at 08:01:40 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

I think that your pictures are qualitatively correct.

But I'm wondering about the picture 4. if there really is that kind of flux much with thick plates.

I'm more concerned about the empty space between the magnets in that sense that there is no flux at all in that area to hit the coils.

It means that you need higher speeds, when the gaps between magnets are bigger?

I think that there isn't any perfect layout, which is always the best and only good measurements will tell, what is the best configuration using different kinds of magnets.

With every layout there are some compromises to be made?

- Hannu



Re: Disk Magnet spacing in axial flux alternators ([none / 0](#)) (#9)  
by DanB on Wed Sep 17th, 2003 at 08:45:28 AM MST  
([User Info](#))

I would agree - no matter what you do, especially if were having a wide airgap... then some compromises are being made. Every move has its pros and cons.

[ [Parent](#) ]

Re: Disk Magnet spacing in axial flux alternators ([none / 0](#)) (#10)  
by troy on Wed Sep 17th, 2003 at 11:47:03 AM MST  
([User Info](#))

Yet another interesting discussion. I would point out that a dual rotor alternator is allowed to have TWICE the "air gap" from magnet face to magnet face (compared to a single rotor, from magnet face to lams) with no degradation in performance or flux loss to adjacent magnets. In a dual rotor setup, each facing magnet of a pair contributes to the transmission of the flux. Think of it as the one magnet pushing the flux and the opposing magnet pulling the flux. But if you have a single rotor, the lams can't produce any "pull", but only contribute a better conduit for the push of the single magnet.

I don't have a gaussmeter, but it would be fun if the Dans could do a quicky experiment to confirm the flux readings between to neos 1/2" appart vs one neo (same size, etc) 1/4" space from lams. You would need a small hole in the lams to measure the flux at the face of the laminations.

Anyway, keep up the excellent work,

troy

Re: Disk Magnet spacing in axial flux alternators ([none / 0](#)) (#11)  
by DanB on Wed Sep 17th, 2003 at 01:06:55 PM MST  
([User Info](#))

I dont have a good enough 9V battery for my Gaussmeter! Tried....  
Maybe after my next trip to town.

[ [Parent](#) ]

9V battery woes ([none / 0](#)) (#12)  
by TomW on Wed Sep 17th, 2003 at 01:32:21 PM MST  
([User Info](#))  
<http://oneota.net/~earthsourcepowr/>

DanB;

I dont have a good enough 9V battery for my Gaussmeter!

When I started messing with data logging with an RS232 meter to the PC I almost immediately dug out a 9 volt DC wall wart and a battery clip from the junkbox. Since the PC runs off AC I simply plug the wall wart into the power strip the PC runs off of. When the PC is powered up the meter is automagically on too.

Seems like in your case you generally would be using the meter in an area where AC is available so this may help. If you use a 9 V battery clip you can always pop a battery in there if you need to go roam with it. Those 9 volt batteries seem to go bad at the worst times. Just my \$0.02. Be aware that the polarity is "backwards" from how the clip may be marked when you use it this way! Mine had red for + and black for - which is good when it will hook to a battery but opposite when you use it as the battery.

Cheers.

TomW

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Re: Disk Magnet spacing in axial flux alternators ([none / 0](#)) (#13)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Wed Sep 17th, 2003 at 02:31:21 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

I've run some similar tests using my magnets for a dual rotor system. The magnets alone show 3200 gauss, on steel show 4500 gauss. Between two rotors and a 1/2 " gap I'm getting about 6800 gauss.

The same set up using 1/2" thick coils over a lamination I get about 4800 at the lamination.

Another setup with a slotted stator and the air gap is .02" reads 9800 gauss in the air gap. Doubling the magnets over the slotted stator jumps to 1.3 Tesla in the gap.

The dual rotor system is much better than the coil over iron system but still falls behind in the overall power you can achieve with a slotted stator. There are advantages and disadvantages to both systems but for the simplicity in building, coil over lams is the simplest, the dual rotor comes in second and of course the slotted stator last. Power wise and efficiency the order is reversed.

I've been contemplating a way to decrease the gap between the two rotors by using the overlapped coils 3phase wiring. I think that has bothered me most about the design. The inline 3phase version has to create all the voltage in fewer coils which makes the amount of turns high and the gap between the rotors larger. By spreading the coils out you need fewer

turns thus keeping the magnets closer to the flux.

I haven't built one as yet but my idea was cut out a ring in plastic. Drill the holes around the outer diameter that would represent the slots in the stator and saw through the top layer of each hole just wide enough to get the wire through. Once wired you would have a very thin stator. From there you would make a mold to make the mounting tabs and pour over the wire in those areas. Still working out some details on the idea but you get the picture. Another idea was to build 2 rings with hooks and wire it to the hooks, It would look like spokes in a bike but the wires would be allowed to spread out a bit that way so the later is still prime in my mind.

Have Fun  
Ed

[ [Parent](#) ]

Re: Disk Magnet spacing in axial flux alternators ([none / 0](#)) ([#14](#))  
by troy on Thu Sep 18th, 2003 at 10:08:36 AM MST  
([User Info](#))

Hey thanks Ed, excellent food for thought. A slick easy cool strong overlapped thin three phase stator seems to be a very elusive beastie. But I keep thinking about it...

Also, if I embed a 3/8" copper tube for cooling around the outside edge of the stator next to the coils, will the flow of electricity in the coils induce eddy current in the cooling pipe?

Best regards,

troy

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[Disk Magnet spacing in axial flux alternators](#) | 14 comments (14 topical, 0 editorial)

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## Wiring up the 3 phase stator

By [DanB](#), Section [Homebrewed Electricity](#)

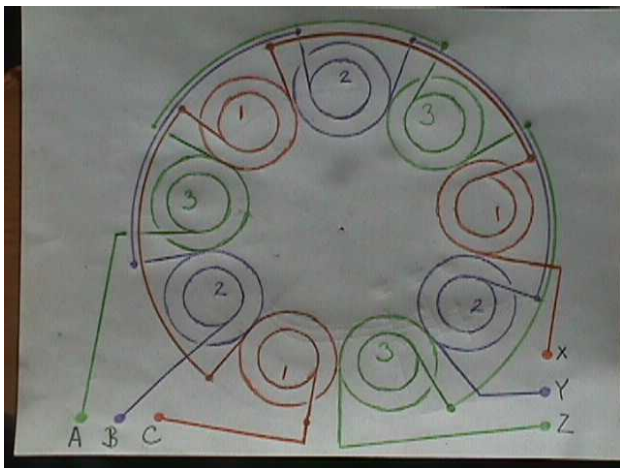
Posted on Thu Sep 11th, 2003 at 08:47:41 AM MST

[Wind](#)

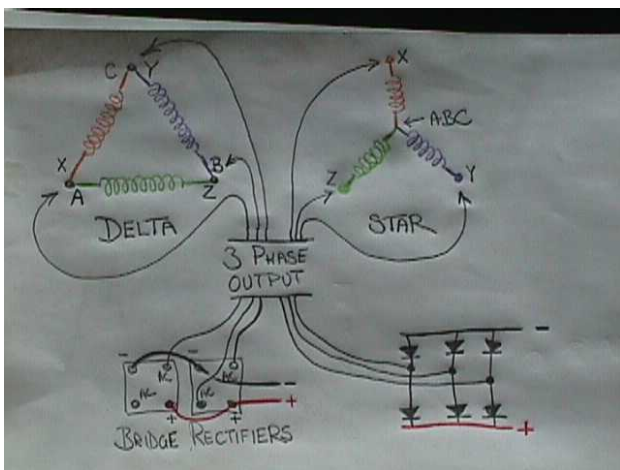
more fun with DanCad!

In the last couple windmills I made I took lots of pictures but never made things very clear about exactly how they are wired up.

In response to Paulpics posting, and lots of email about how to wire up the 3phase stator where we have 12 magnets, and 9 coils I made these drawings.



Each coil is numbered - and colored, according to which phase it's in. Each coil has a "start" - which is the inside, and an "end" which is the outside. The "starts" are labeled A, B, and C, and the "ends" X, Y, and Z.



So we have the choice to wire the stator into Delta, for lower voltage and lower resistance... and higher current, or Star for the opposite. The windturbines I made recently are all wired in Delta and the picture above shows the connections. Then we can either use 6 diodes, or 2 bridge rectifiers to rectify the 3 phase alternating current into direct current which we hook to batteries for charging. In practice - I actually use 4, or 6 35 amp bridge rectifiers -

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hooking them into parallel to simply increase the current rating since two are not enough to handle the output of these wind turbines. [Click Here](#) to visit Ed's 3 phase basics page for a better description about how, and why!

[Wiring up the 3 phase stator](#) | 6 comments (6 topical, 0 editorial)

Re: Wiring up the 3 phase stator ([none / 0](#)) (#1)  
by lands on Thu Sep 11th, 2003 at 08:53:32 AM MST  
([User Info](#))

Great pictures Dan. That clears up a lot of questions.  
Les M

Re: Wiring up the 3 phase stator ([none / 0](#)) (#2)  
by yossarian on Thu Sep 11th, 2003 at 03:04:28 PM MST  
([User Info](#))

They say a picture's worth a thousand words, but these pictures are 10,000 worders. Thanks.

Re: Wiring up the 3 phase stator ([none / 0](#)) (#3)  
by troy on Thu Sep 11th, 2003 at 05:03:11 PM MST  
([User Info](#))

Thanks guys,

DanCad rules! I have a feeling this page is going to get referenced a lot...

Keep having fun!

troy

ps, are you guys quietly plotting to produce an FAQ with DanCad illustrations??? This one would be a must have.

Hope so,

tr

Re: Wiring up the 3 phase stator ([none / 0](#)) (#4)  
by TomW on Thu Sep 11th, 2003 at 05:05:17 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Dan;

Got a copy of that CAD program ??

Looks like a good one!

Cheers.

TomW

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Re: Wiring up the 3 phase stator ([none / 0](#)) (#5)  
by JB on Thu Sep 11th, 2003 at 07:49:49 PM MST  
([User Info](#))

Thanks Dan The Pictures are great. What kind of voltage are you getting from them guys wired thata way. JB

[ [Parent](#) ]

Re: Wiring up the 3 phase stator ([none / 0](#)) (#6)  
by DanB on Thu Sep 11th, 2003 at 08:24:42 PM MST  
([User Info](#))

You can get them at Toys R Us....  
yellow boxes that say "crayola" on them. (crayon  
aided design) Its the most advanced CAD system I've  
ever had the patience to try :-)

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[Wiring up the 3 phase stator](#) | 6 comments (6 topical, 0 editorial)

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### [Triplets!](#)

By [DanB](#), Section [Homebrewed Electricity](#)

Posted on Thu Aug 14th, 2003 at 07:32:41 AM MST

[Wind](#)

3 new wind turbines to test!

---

We finally finished up 3 machines yesterday. The first couple days of construction are here:

<http://www.fieldlines.com/story/2003/7/31/23486/2284>

Hopefully Friday we'll find time to test them all. These are all very similar to the Caboose windmill we made earlier this year: <http://www.otherpower.com/davesmill.html>

The only real difference being slightly shorter coils and slightly lower resistance. The stators all have 9 coils, each 65 windings of AWG 14 wire. They are dual rotor alternators, so each half of the alternator has 12 magnets 2" diameter X 1/2" thick for a total of 24 per machine. DanF named them early in their construction, Curly, Moe, and Larry :-).

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Curly is a 10' diameter machine. The alternator cuts in at 110 rpm. This was the first machine to be finished, and all along the way it kept 1 step ahead of the other two. This machine will actually get installed down near town. We're looking into the possibility of grid tying it... just for fun! I wonder if anybody has any good advice about the best, and most cost effective way to do this.





Moe is also a 10' diameter machine almost identical to Curly! This will go up at TomH's house and hopefully help out his batteries some, 'cause they need it especially in the winter time.



Larry is basically the same as the other two, but due to his tower situation... and for fun, we made this one smaller. It's got an 8' diameter prop on it and the tail is shorter (4' long boom) and smaller. In an effort to better match the alternator to the 8' prop, we actually widened the airgap about 1/4" which increased the cut in speed to 160 rpm. This will go on a tower which DanF is building on the side of his house... it's a small lattice tower suspended in the center of tires which he's got bolted to the house. It'll be interesting to see how that works... find out how much noise it makes inside!

Friday we'll do some truck testing to get rough output figures and make sure they run reasonably square to the wind and furl at reasonable windspeeds before we put them up. Next week we'll start on some towers!

[Triplets!](#) | 3 comments (3 topical, 0 editorial)

Re: Triplets! ([none / 0](#)) (#1)

by sean on Thu Aug 14th, 2003 at 07:51:05 AM MST

([User Info](#)) <http://homepage.ntlworld.com/s.amesbury/homepage.htm>

Wow looks like a production line you going there, the way you Dans are going you could have your own community wind farm up with power supplied to all the houses up there. Of course that depend on the distance between houses and could get costly in cable.....sean

Re: Triplets! ([none / 0](#)) (#2)

by Chuck on Fri Aug 15th, 2003 at 02:39:47 PM MST

([User Info](#)) <http://www.greeleynet.com/~cmorrison>

Looks good guys ! I especially like the lines of your blades. You're starting to look like real wood workers now.

I look forward to seeing what the power outputs on these stooges are.

Chuck

Re: Triplets! ([none / 0](#)) (#3)

by scoraigwind ([magnet@scoraigwind.co.uk](mailto:magnet@scoraigwind.co.uk)) on Sat Aug 16th, 2003 at 01:08:02 AM MST

([User Info](#)) <http://www.scoraigwind.co.uk>

Great to see those 3 reaching completion. Looking frward to hearing about them cranking out the power.

As for grid intertie, the simplest solution is probably a Trace SW or a 'power station'. That would do a god job of turning the DC into grid AC. I am not sure if Outback have a product to do that for you yet. Hugh Piggott <http://www.scoraigwind.co.uk>

[Triplets!](#) | 3 comments (3 topical, 0 editorial)

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## [Too much fun! 3 windmills...](#)

By [DanB](#), Section [Homebrewed Electricity](#)

Posted on Thu Jul 31st, 2003 at 11:48:06 PM MST

[Wind](#)

Lots of pictures...Hope you have broadband!!

We set out this week to build 3 wind turbines along the lines of the [Caboose Windmill](#) which we made last month. TomH, who is scraping by with about 250 watts worth of solar panels, and DanF, who is doing somewhat better but needs a lot more power year round, each get one, and there will be one extra. So mostly DanF and TomH worked with me on this, although other neighbors dropped by and helped out some too. Two of these machines will have 10' diameter props, and DanF's will be somewhat smaller due to the nature of his tower. We're building all the machines identical, except DanF's will have a shorter tail, and we'll probably wind up making the airgap extra wide so that it allows a smaller prop to spin up to a reasonable speed.



We started out with lots of pipe, allthread, and iron bar. Each windmill takes about 5 1/2' of 3/4" steel pipe, 7" of 1" steel pipe, and 70" of 1/2 - 13 allthread. Each machines also requires 42 1/2-13 nuts.

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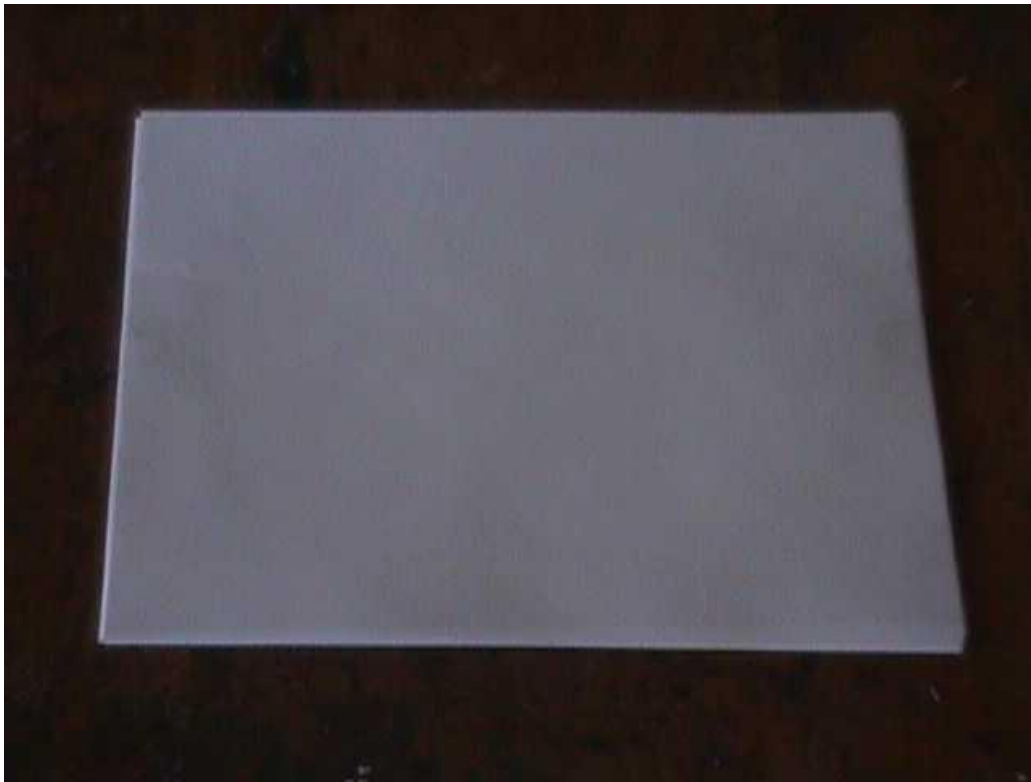


For each machine we'll need 24 magnets 2" in diameter and 1/2" thick. Each one will have 9 coils of AWG 14 magnet wire, 65 turns each. This comes out to almost exactly 5 pounds of wire.



Of course, each machine requires some Volvo parts. I like to look for the 11" brake rotors off more modern cars... they will replace the 10" rotors which come with the struts we'll use to make the machines from. Since these are dual rotor alternators, we'll need 2 11" brake rotors for each machine.





Pictured above you can see the set of plans we started with!... these will be almost identical to the caboose windmill, although I'm making slight modifications to the coils and taking notes along the way.



I picked up 6 strut assemblies in town, we'll only need 3 of them now. We'll have to completely strip all the parts off these. One must be careful taking these apart, the spring is under great tension! Best is to have a spring compressor for the job, but if not... be very careful! I undid these with a pipe wrench and aimed them out my door. Some of the springs flew over 20'!

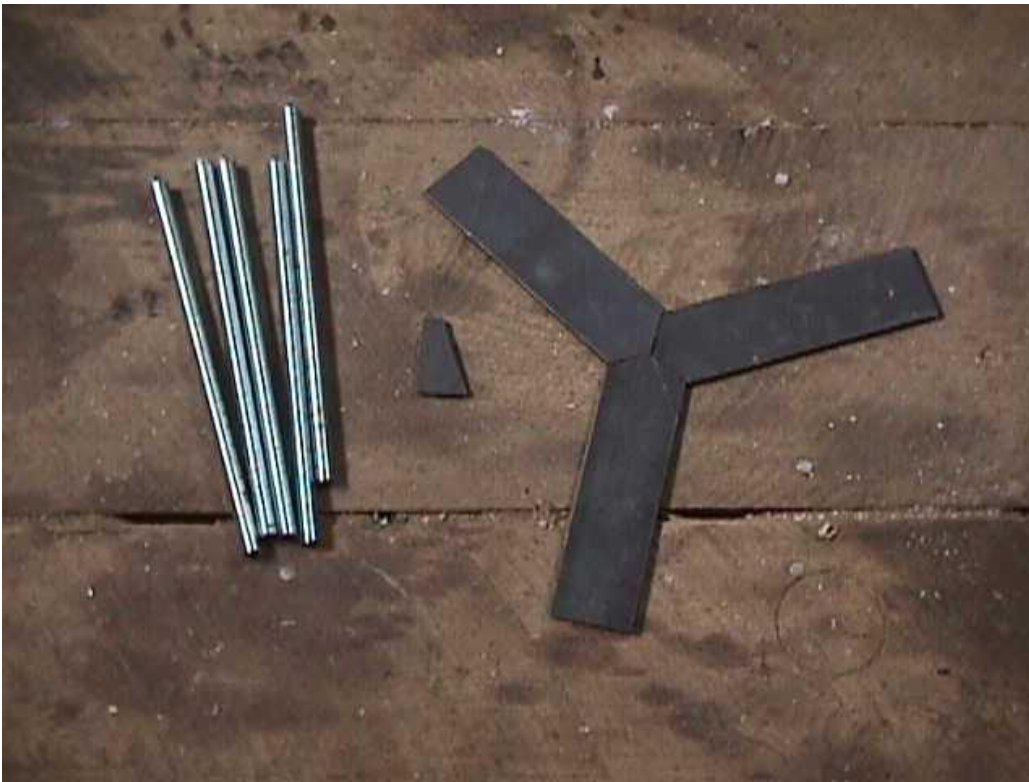


DanF is turning the rotors down flat, and leaving a slight lip on the outside edge to help hold the magnets in. Half these rotors will have to have the center hole turned out to about 3" diameter, since the back rotor has to fit over the back side of the wheel hub, and the hole is too small. .



Pictured above Tom is cutting up allthread for the studs, and making the brackets for the stator. We'll also have to cut the strut assemblies, and several pieces of pipe for the tail assembly





Above is shown the studs which hold the alternator together, and the brackets for holding the stator on. The small wedge shaped piece sets the angle for and holds on the tail pivot.



We cut the strut so that the spindle could be welded to the side and offset from the tower about 5". Pictured above Tom is welding all this together.



Pictured above we have 3 main windmill frames welded up. You can see how the tail pivot is angled at about 20 deg.



DanF and Tom are working on the mold. It's basically a 3/4" piece of plywood 18" square, and on top of that we have 1/2" material with a hole 14" in diameter in it. In the center of the mold there is an island (Aslo of 1/2" material) 5.5" diameter. I think next time we'll reduce that to 5", as it would fit around the studs and make the coils fit a bit better. This worked fine though. The lid for the mold is simply a disk of 3/4" plywood 14" in diameter.





I drilled through all 9 stator bracket pieces at one time. The stator bracket is made up of 3 parts, each of 2" X 3/16" steel bar cut 7" long with a 120 deg angle so they fit together nicely. A half inch hole is drilled in each one at 6.25" from the center of the bracket. Once the bracket is assembled and tack welded together, we drill a hole in the center 1 7/8" diameter with a hole saw. This allows it to fit right over the wheel spindle. Once that's on, we'll weld it on there.... you'll see in the following pictures.



Pictured above is the finished stator mold. You can see where we drew lines to help locate the coils properly. We caulked all the seams between the wood, and before we actually use the mold we'll grease it carefully with axel grease.



Pictured above are all the brake disks which DanF turned down on the lathe. Doing this leaves the nice lip to hold the magnets in, and also leaves a nice rough surface to help glue the magnets in with. I think it's important, especially with used brake disks which often get worn down to a smooth, hard - shiny surface... not good for gluing to, and magnets would slide all over it. After we turn them it's quite rough - lots of friction, yet flat. We clean them carefully with gasoline or laquer thinner before we glue the magnets on.



Pictured above you can see the assembled stator brackets. We've only drilled the center hole (1 7/8") in one and layed it on there, the other two still need finishing.





I'm starting to wind coils for the 1st machine in the picture above. The spool of wire is laying on a bolt which is held in the vise, and I'm keeping fairly tight tension on the wire with one hand while I crank with the other. Again, each coil is 65 turns of AWG14 wire. This goes quickly, each coil takes about 1 minute to wind. Once wound up, we use thin viscosity super glue to hold it together, with accelerator to dry it quickly. Once the glue is dry the coils lift right off the form. It's important to wind every coil the same, and keep them tight. It's wise to leave the leads on each coil about 12" long.. since this a 3 phase machine, each coil is hooking to another coil which is 120 deg around the stator from it, so there is some distance to be covered!



Here you can see the coil winder. It's heavily waxed with crayola crayons... this keeps the super glue from sticking to the wood and helps the coils come off easily.



DanF is spacing out the magnets on the back rotors. We do the back ones first, and then we can pretty much assemble the alternator with only 1 rotor. We then will put the 2nd rotor on without any magnets, and mark out where the magnets must go. This is important, because wherever there is a magnet on the back rotor, there must be a magnet with the opposite pole on the front rotor facing it. We pretty much lay out the 12 magnets on each back rotor by eye, there's about 3/8" between them. We then take playing cards (as shims) and go around making sure that the space between each magnet is the same... our tolerance here is the thickness of 1 playing card!





Tom is wrapping tape around the outside of the magnet rotors. This serves as a sort of mold, so that when we pour resin in it won't leak out the sides! Not real pretty, but it seems to work out OK.



DanF is using the mold to trace the size of the ring he'll have to cut out of the fiberglass fabric which we'll use to reinforce the stator on both sides of the coils. The ring he's cutting is 14" outer diameter and 5 1/2" inner diameter so it fits exactly the size of the stator.



Pictured above I'm gluing up the inner part of the mold for the magnet rotors, made of a tinker toy can and playing cards. This holds the resin from leaking to the inside.





Here we're greasing up all the molds with ordinary axel grease.

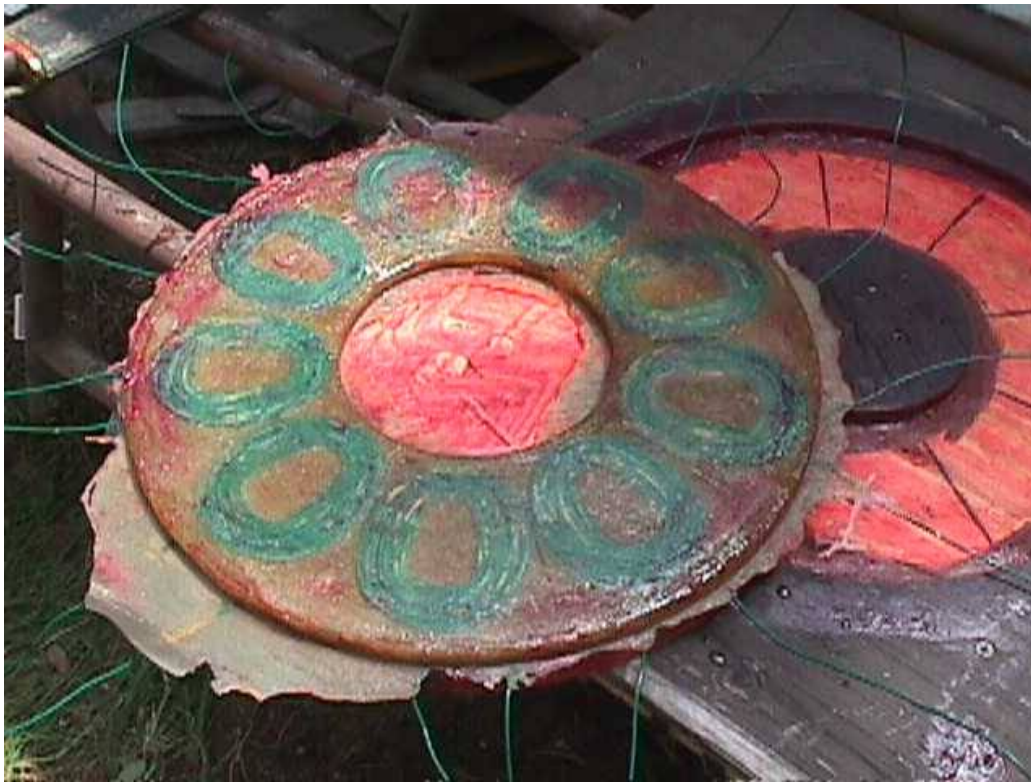


We're getting ready to cast one stator and 3 of the back rotors.



We've poured the resin, and the stator mold cover is on, with lots of weight on top of it!





After a couple hours we removed the stator from the mold. It came out easily and looked just fine!



This brought us to about the end of our first day. We got 3 of the struts completely welded up and ready to go with stator brackets and everything.





We also finished molding all 3 stators on the 1st day. They all turned out OK, and it was a bit surprising to me that we never scrapped any parts.



We started the 2nd day with some coffee, and got right to pounding the studs out of the wheel hubs.



The studs are replaced with 10" pieces of 1/2" - 13 allthread.



I'm holding down the wheel hub while Tom carefully lowers the magnet rotor



onto the back of it. This can be a bit tricky, since the powerful magnets are attracting it to the sides. Two folks makes it somewhat easier, although it can be a 1 person job with some patience and focus.



Above is pictured how the back rotor fits over the back of the hub. Now it is easy to see why we had to turn the center of the brake disk out some... before it would not fit on in this way, the hub was larger than the hole.



We clamped the stators to the stator brackets, and got them centered. After that we drill through the 1/2" holes in the steel bracket into the stator so that the mounting holes line up perfectly. It's important while clamping to make sure that the holes will go through resin only and not hit the copper coils! Once these are drilled out, we mark them so they always go back on the same

way.



Above we have the back rotor and the stator on one machine. At this point, with 1 rotor on, the alternator can be wired up and tested to some degree. It won't work nearly as well as it would if it had both magnet rotors on, but it works well enough to test.



A great way to strip magnet wire is with a propane torch... the enamel burns off quickly and light brushing with sandpaper leaves nice shiny copper ends.





In the picture above we have the stator completely wired in Delta, with the leads coming out to 3 brass screws (1/4-20). It's a 3 phase alternator. Each phase consists of 3 coils wired in series.



This picture shows the tail pivot with the notch which sets the stops. These will pivot over the stubs on the machine, and the tail is welded to them.



When the studs are tightened (very tight) to the hub, they bend a bit. Since they are 10" long, they never wind up fitting through the holes of the 2nd magnet rotor by themselves. Pictured above Im using an inverted (Im putting in on backwards to avoid the attraction of the magnets) brake rotor to determine how badly the studs will fit the holes! In the end we'll have to adjust them all... which is sort of a trial and error process of putting the rotor up, seeing which ones need bent, and bending them best we can.



Here I'm bending the studs with a long pipe. This actually goes pretty quickly.





Once the studs are straight, I drop a blank (its got no magnets on it) rotor onto the alternator, and carefully mark where the magnets need to go and what the polarity should be. Again, if there is a North pole on the back rotor pointing out, then there must be a South pole on the front rotor facing in towards it. We carefully mark for this, and then we mark 1 stud, and 1 hole - so that from now on it must always go together the same way.



After all the front rotors are marked and the magnets placed, we glue them in same as we did the back rotors. Tom and Rich are doing this in the picture above.





We snapped the front rotors on, and here Tom and Rich are testing the first alternator. We didn't check rpm, but this seems to be about the same as the last caboose windmill we made... generating 12 volts at around 100 rpm or so. They all seem very similar and very effective at slow speeds.



That's pretty much where the end of the 3rd day got us! Mostly it's been 3 people working for 3 days on this and we pretty much have 3 machines done except for paint, props, and tails. We're having too much fun!

[Too much fun! 3 windmills...](#) | 15 comments (15 topical, 0 editorial)

Re: Too much fun! 3 windmills... ([none / 0](#)) ([#1](#))  
by RobD on Fri Aug 1st, 2003 at 08:59:58 AM MST  
([User Info](#))

Great stuff guys!  
RobD

Re: Too much fun! 3 windmills... ([none / 0](#)) ([#2](#))  
by Chuck on Fri Aug 1st, 2003 at 09:27:51 AM MST  
([User Info](#)) <http://www.greeleynet.com/~cmorrison>

Good work guys!  
Mass production comes to otherpower. Who'd a thunk it.  
Chuck

Re: Too much fun! 3 windmills... ([none / 0](#)) ([#3](#))  
by xeroid ([centurion27@lycos.com](mailto:centurion27@lycos.com)) on Fri Aug 1st, 2003 at 09:42:58 AM MST  
([User Info](#))

Dan B, Dan F and the Otherpower guys:  
Way to go! As always, I continue to be fascinated by your innovative and practical solutions for alternative power systems.  
Looking forward to seeing the test results!  
Regards, XEROID.

Re: Too much fun! 3 windmills... ([none / 0](#)) ([#4](#))  
by electronbaby ([electronbaby@hotmail.com](mailto:electronbaby@hotmail.com)) on Fri Aug 1st, 2003 at 11:49:52 AM MST  
([User Info](#))

Very nice Dan and thanks for the cobalt mags. :- ) Im currently working on that machine. I just wanted to say that there is another way to make sure the faces of the mags match up on both rotors. What I do in assemble the dual rotor machine so that it has the rear rotor in place and then the stator just like you do. I then do all the common tests. When it comes time to match up the mags before gluing the second rotor, I mount the front rotor on backwards so that the magnet side is facing out (except of course there is no mags glued yet). I then take a paint pen and mark the two rotors so they only will go on in one direction only. I then take a "T" square and hold it perpendicular to the two rotors (edge wise). I hold the inside of the square to the rear side of the rear rotor so that I can follow and trace a center line to the front rotor. I do this all the way around the front rotor so that I have perfect increments around the side of the front rotor that line up with the mags on the rear rotor. I then remove the front rotor and lay the square across the face of the front rotor and follow my trace in to the center. This will allow you to see where the center of each mag should go on the face of the front rotor. You just have to make sure that you follow the poles over and write on the rotor "N" or "S" depending on which pole should face in (it will be obvious with the square when you follow across to the second rotor). You then should place your mags and space them with the shims and thats it (well, glue and resin of course :- ) ). Wish I had

a pic of how I did it. Hope you can visualize. Sounds like your having fun!!!  
RoyR

Re: Too much fun! 3 windmills... ([none / 0](#)) ([#5](#))  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Fri Aug 1st, 2003 at 12:21:19 PM  
MST  
([User Info](#)) <http://www.internetfred.com>

Nice job guys!!! But I have a question, you don't have a backing material in the back behind the coils... why not and whats up with this ???  
Good Luck!  
Fred.

Re: Too much fun! 3 windmills... ([none / 0](#)) ([#6](#))  
by xeroid ([centurion27@lycos.com](mailto:centurion27@lycos.com)) on Fri Aug 1st, 2003 at 01:29:51 PM  
MST  
([User Info](#))

Hi Fred.

The machines are all dual rotors, meaning that there are magnets in the front and back of each set of coils. No laminates are needed for such a set up since the magnets of the rotor in front are being attracted to the magnets of the rotor on the other side of the coils.

Aren't you working on a double rotor machine yourself? Same principle.

Xeroid.

[ [Parent](#) ]

Re: Too much fun! 3 windmills... ([none / 0](#)) ([#7](#))  
by DanB on Fri Aug 1st, 2003 at 02:05:11 PM MST  
([User Info](#))

There is fiberglass fabric on both sides of the coils, so hopefully the stator is strong enough! I'm not sure, but was that your question?

[ [Parent](#) ]

Re: Too much fun! 3 windmills... ([none / 0](#)) ([#8](#))  
by zubbly on Fri Aug 1st, 2003 at 06:34:33 PM MST  
([User Info](#))

great job,you guys make it look so easy. keep having fun!

zubbly



Re: Too much fun! 3 windmills... ([none / 0](#)) ([#9](#))  
by JB on Fri Aug 1st, 2003 at 11:02:27 PM MST  
([User Info](#))

Howdy Dan. I take it these magnets arent as thick as the first one the caboose you built a few weeks ago. what is the approximate thickness of the goop you put over the top of the actual magnets themselves once you put the tape around the rotor. This should be a good comparison on the magnet strength. Looking forward to the results and the finish wiring . Thanks JB Dayton Nevada

[ [Parent](#) ]

Re: Too much fun! 3 windmills... ([none / 0](#)) ([#10](#))  
by JB on Sat Aug 2nd, 2003 at 12:19:27 AM MST  
([User Info](#))

My mistake there Dan. The magnets are the same. Im getting a clearer picture on this now. the bearings and everything on the back driving the front hub through the long all thread studs.i like it. I was wondering i got some delrin here or some kind of plastic about 3/4 inches thick. i was wondering if i might drill some big holes in the put the coils in the center and cover both sides with some thin aluminum. i guess the stator could be square and you could use 4 studs also. One thing I forgot is how much is one magnet supposed to cover in coil area. a coil and a third? i guess that is what it works out to be. 9 magnets 12 coils is that right. Getting late . Time to stop thinking. Later on. JB

[ [Parent](#) ]

Re: Too much fun! 3 windmills... ([none / 0](#)) ([#11](#))  
by DanB on Sat Aug 2nd, 2003 at 10:16:12 AM MST  
([User Info](#))

Hi JB -  
you could probably make the stator from delrin, insert the coils, and glue them in there, that would work fine.  
Aluminum covers would be a bad idea though... you'd have serious eddy current problems! You might be surprised when the alternator barely wants to turn at all.

Making the mold from plywood is really easy, and we simply place the coils in the right spots (or try) and then bring all the wires out. When we mold the stator, we first grease the mold, then put down some polyester resin (I get it from Autozone in 1 gallon cans for about \$20), then we put down some fiberglass fabric to reinforce it, then we put in the coils over the top of the fabric. Then we mix up new resin and mix it with talcom powder and pour that over the coils so it pretty much fills up the mold. Then we put down more fiberglass fabric, and pour resin over that - and put the lid on the mold.  
It's real easy, probably a lot less work than messing with delrin and I think a bit stronger and less flexible.

You don't want any metal other than your copper coils in the stator...

[ [Parent](#) ]

Re: Too much fun! 3 windmills... ([none / 0](#)) ([#12](#))  
by JB on Sun Aug 3rd, 2003 at 12:15:42 AM MST  
([User Info](#))

Thanks Dan. Got ya covered on the stator . Ill make it all resin and fiberglass. another ??? Im not real hot on the wiring yet, in fact im a little slow on it. lets Call any of the nine coils #1. do we start off with one wire of 1 coil at a copper lug and then it is serised thru number 4 coil 120 degrees away then seriesed thru #7 coil 120 degrees from #4 coil then finished of with the remaining wire of #1 coil at the same copper lug we started with. Is this correct???????? and you do the same for coils # 2 -5 and 8 and 3 -6 and 9 taking them coils to their respective lugs for the total you got on this one of 3 lugs. If this is correct where do you go from here and where do you pick up the ground wire. I noticed on the papoose windmill you had 6 lugs but i dont want to confuse myself more on this. can you clue me in. JB

[ [Parent](#) ]

Re: Too much fun! 3 windmills... ([none / 0](#)) ([#13](#))  
by JB on Sun Aug 3rd, 2003 at 12:17:12 AM MST  
([User Info](#))

Thanks Dan. Got ya covered on the stator . Ill make it all resin and fiberglass. another ??? Im not real hot on the wiring yet, in fact im a little slow on it. lets Call any of the nine coils #1. do we start off with one wire of 1 coil at a copper lug and then it is serised thru number 4 coil 120 degrees away then seriesed thru #7 coil 120 degrees from #4 coil then finished of with the remaining wire of #1 coil at the same copper lug we started with. Is this correct???????? and you do the same for coils # 2 -5 and 8 and 3 -6 and 9 taking them coils to their respective lugs for the total you got on this one of 3 lugs. If this is correct where do you go from here and where do you pick up the ground wire. I noticed on the papoose windmill you had 6 lugs but i dont want to confuse myself more on this. can you clue me in. JB

[ [Parent](#) ]

Re: Too much fun! 3 windmills... ([none / 0](#)) ([#14](#))  
by Seth on Mon Aug 4th, 2003 at 03:37:04 PM MST  
([User Info](#))

Make a mpg of the furling in action.. it would help for understanding greatly!!!  
Even if it was by hand.....

Re: Too much fun! 3 windmills... ([none / 0](#)) ([#15](#))  
by DanB on Tue Aug 5th, 2003 at 09:24:04 AM MST  
([User Info](#))

Seth... we're fixin' to do that soon. I think that will really make it clear for folks!

[ [Parent](#) ]

[Too much fun! 3 windmills...](#) | 15 comments (15 topical, 0 editorial)

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## [Furling system](#)

By [DanB](#), Section [Homebrewed Electricity](#)

Posted on Wed Jul 23rd, 2003 at 09:19:25 AM MST

[Wind](#)

Broke out my CAD program and am attempting to explain this again!

---

I was reading the post below about it, and I've also recieved some email so I thought I'd try my best to explain how it works. It's a bit of a balancing act between offset, tail boom length, prop diameter, tail weight... A good idea would be to buy Hughs plans or check out Ed's software unless you enjoy lots of trial and error (like I do!).

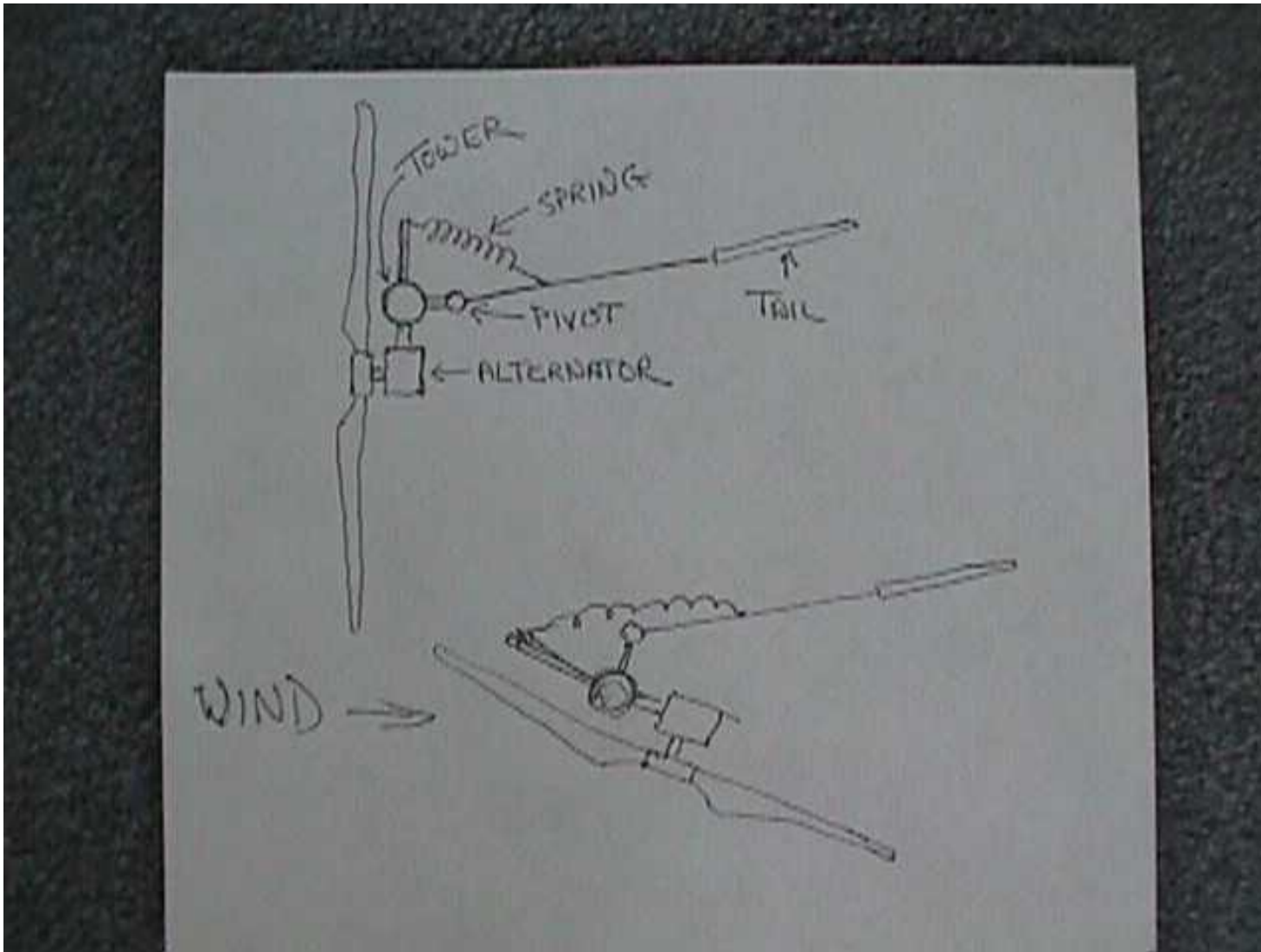
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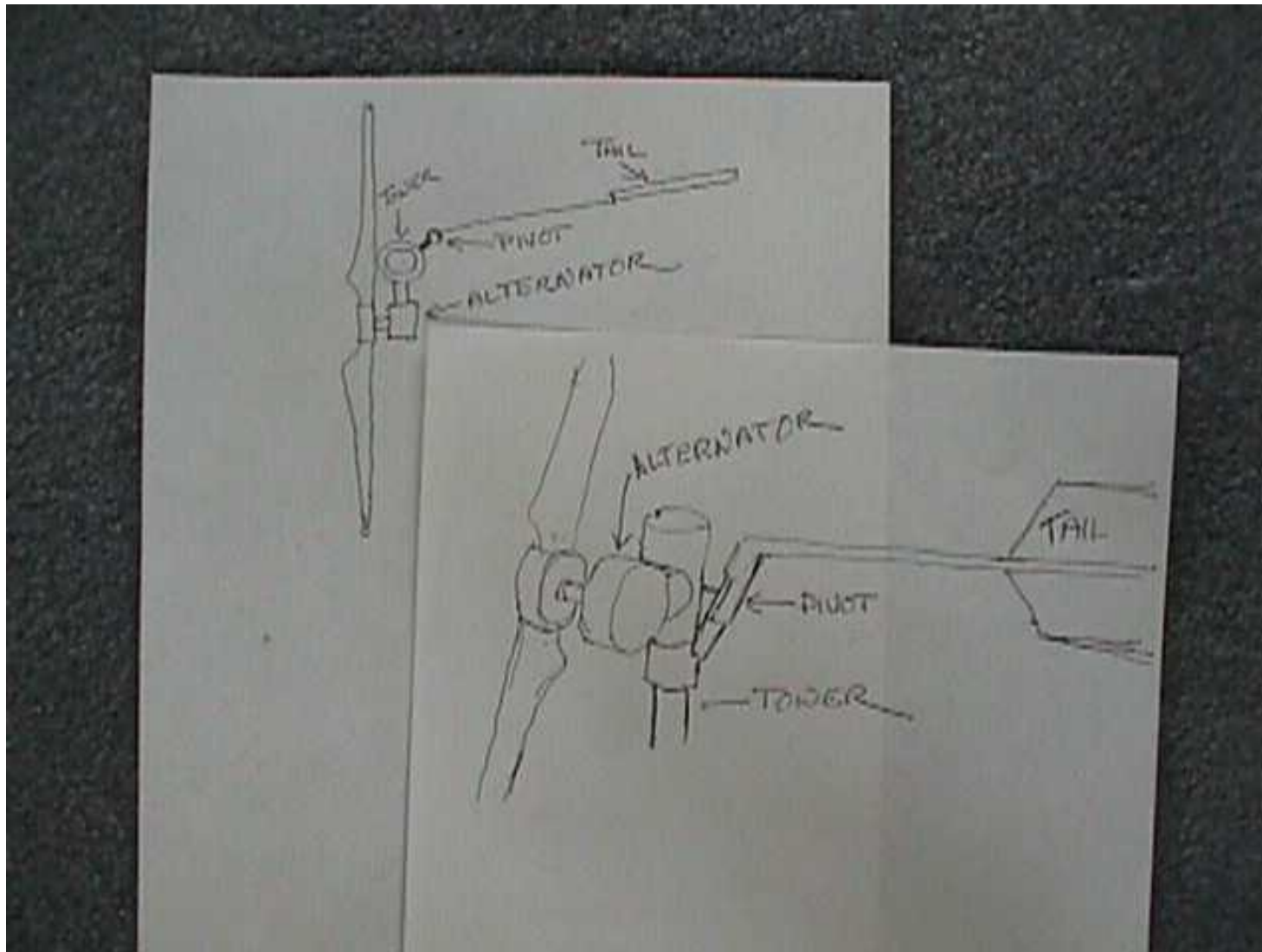
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Pictured above is a very simple furling system that uses a spring. The tail ALWAYS stays with the wind, but when the wind gets too strong, the prop, and the alternator pivot on the mast and turn away from the wind. In this case, the force of the wind against the prop has to overcome the tension on the spring. You can see the tail is slightly offset to one side to compensate for the fact that the alternator and prop are offset to the other side. The length of the tail boom, and the size of the tail, and the angle at which the tail is slightly offset must be proper in order to compensate for the offset of the alternator and the diameter of the prop. The tail is mounted on a vertical pivot (so the pivot for the tail is parallel to the tower). So the picture on the top left is of the machine during normal operation, and the lower picture shows how it would be if it was furling out of a high wind.



Above is another CAD drawing of a very similar system, this is pretty much what Hugh Piggott has perfected.

Just like the spring system above, the tail is mounted on a pivot. In this case however, the pivot is offset to one side, and it is at an angle (about 20 deg usually) to the tower. The tail is always in the wind, and in order for the rest of the machine to turn away from the wind, the tail is raised because it is pivoted at an angle. So this works exactly like the spring system, except that instead of the force of wind on the prop having to stretch a spring in order to furl, in this case it must overcome the weight of the tail in order to furl. The system is easily adjustable by changing the weight, or length of the tail. It's nice because it is simple, and reliable. Springs make noise, rust... wear out, and break... gravity will never let you down!



There's a bad... but kind of fun picture of my machine in a violent storm. You can barely see... the tail is up high (and with the wind) and the rest of the machine is turned almost completely out of the wind, yet still spinning nicely and producing reasonable amounts of power. It all works very quietly, reliably and smoothly.

[Furling system](#) | 17 comments (17 topical, 0 editorial)

Re: Furling system ([none / 0](#)) ([#1](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Wed Jul 23rd, 2003 at 09:45:56 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Great drawings Dan! This must be the notorious DANCAD software that everyone needs to have. I like it!

I've tried alot of different ways to furl these systems. Side furling, tilt, spring and a few stupid ideas of my own. The spring system works but has a built in problem... as the spring stretches it progressively adds more tention which means higher winds to achieve a reasonable furling. I must say that hugh's gravity system is the best I've seen (and used - with several under my belt). The simplicity and functionality of the unit makes it about the best choice for home building.

Have Fun!

Ed

Re: Furling system ([none / 0](#)) (#2)  
by Wolfie1 on Wed Jul 23rd, 2003 at 09:51:23 AM MST  
([User Info](#))

I would agree that it is probably the best but has anyone managed to create one without having to do any welding? If so, pictures would be nice.

Martin.

[ [Parent](#) ]

Re: Furling system ([none / 0](#)) (#3)  
by DanB on Wed Jul 23rd, 2003 at 09:58:51 AM MST  
([User Info](#))

I think, no matter what you do a bit of welding is necessary. I suppose you could figure a way to bolt it all together, but it would be a bit tricky...

[ [Parent](#) ]

Re: Furling system ([none / 0](#)) (#8)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Wed Jul 23rd, 2003 at 12:18:48 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>



I built one out of wood , "U" bolts , and hinge that worked out quite well. It was a small machine with a 6 ft prop. Used an Amtek motor U bolted to plywood with a 1.25" water pipe U bolted to the same plywood. The hinge was bolted on at a 20 degree angle and the tail bolted to the hinge. A steel tail stop was bolted to the top. A quick and fun project. Kind of a "windmill in a day" project.

Too much fun...

Ed

[ [Parent](#) ]

Re: Furling system ([none / 0](#)) (#4)  
by DanB on Wed Jul 23rd, 2003 at 10:01:47 AM MST  
([User Info](#))

yes, I do like that system very much. I tend to wonder what the "upper limit" is for prop diameter used with this system. Undoubtably there are strange forces on the blades while it's furling, and while it's furlled... I suspect that in very large machines it might not work so well.

Hopefully... we'll never find that limit!

[ [Parent](#) ]

Re: Furling system ([none / 0](#)) (#5)  
by Bach On on Wed Jul 23rd, 2003 at 10:53:19 AM MST  
([User Info](#)) [change AT: bach\\_on AT hotmail.com](#)

DanB,

BOINNNNNG!!! I think I finally see the crucial piece of information that I've been missing!

Dan wrote:

"the tail is mounted on a pivot. In this case however, the pivot is offset to one side, AND IT IS AT AN ANGLE (about 20 deg usually) TO THE TOWER."

I had understood that the tail was not mounted perpendicular to the plane of the blades. I had assumed that was the 20 degree angle. But that is really what you are calling "offset to one side." THERE ARE ACTUALLY TWO ANGLES INVOLVED.

Viewed from the top - the tail is offset from the plane of the blades by some number of degrees. But the hinge is also mounted at an angle from the straight up of the tower. So the tail doesn't go straight up and down like a see saw. It's leaning.

This means that the tail vane may not really be exactly perpendicular to the ground. It may actually lean to one side at 20 degrees (in your example). So wind can exert force that gets under the vane to push it up.

What had totally flumoxed me was that I couldn't understand where the lift was coming from? I had missed the fact that the tail doesn't move up and down exactly perpendicular to the ground.

Sorry to waste so much bandwidth on this, but I just wasn't grasping the situation accurately. I'd missed the second angle.

Thanks Dan. You're my hero - (just not an anonymous one.) ;-)

Bach On

- I'm just as happy as if I had good sense! -

I think he's got it ! ([none / 0](#)) ([#6](#))  
by Chuck on Wed Jul 23rd, 2003 at 12:01:10 PM MST  
([User Info](#)) <http://www.greeleynet.com/~cmorrison>

yes, I think you have it now.

For a little further illustration, or to confuse things more, depending... I show below my wind generator viewed from below during a calm. You can see some of the angles involved. Note that I didn't bother to make the tail perpendicular to the tower and it serves to highlight the furling angle.

Also, since someone asked, there is no welding on this particular machine's furling system. In fact there's no welding on this machine at all. I used a couple cheap pillow blocks and a 12"x1/2" bolt to hold the tail.



Chuck

[ [Parent](#) ]

Re: Furling system ([none / 0](#)) ([#7](#))  
by DanB on Wed Jul 23rd, 2003 at 12:15:44 PM MST  
([User Info](#))

Ideally the tail could, and probably should (but it doesn't really matter) be perpendicular to the ground in normal operation. The angle of the tail doesn't give it any lift... or at least, it's not necessary for that to happen. The tail is lifted only by the force against the prop.

[ [Parent](#) ]

Re: Furling system ([none / 0](#)) ([#9](#))  
by electronbaby ([electronbaby@hotmail.com](mailto:electronbaby@hotmail.com)) on Wed Jul 23rd, 2003 at 01:00:37 PM MST  
([User Info](#))

AHHHH!! Thank You Dan!!! hehehehe Good pic and thanks for explaining it. :-)

RoyR

[ [Parent](#) ]

Re: Furling system ([none / 0](#)) ([#13](#))  
by Chuck on Wed Jul 23rd, 2003 at 05:18:07 PM MST  
([User Info](#)) <http://www.greeleynet.com/~cmorrison>

Actually Dan, I think it does matter. Angled the way it's shown in the picture the tail does provide lift itself, which is not desirable. My experience has been that this machine furls too soon and part of that I blame on the tail surface being at that angle. This is one of things I'm fixing this week.

Chuck  
Chuck

[ [Parent](#) ]

Re: Furling system ([none / 0](#)) ([#14](#))  
by DanB on Wed Jul 23rd, 2003 at 05:24:32 PM MST  
([User Info](#))



Yes... I guess mainly I meant.. that if the tail is not square with the tower it doesnt matter too much, it means that it's probably got less surface area since it should be with the wind all the time, so if the tail is not vertical it has to be a bit larger. If in its resting position it's both not vertical and tipping down (or up I suppose) then it could get some lift from the wind which would not be ideal. So.. it should be vertical...

Itll be fun to see yours after that's fixed... it would benifit in both performance and appearance! I'm dying to see your next one too!

[ [Parent](#) ]

Re: Furling system ([none / 0](#)) ([#16](#))  
by Wolfie1 on Thu Jul 24th, 2003 at 05:35:01 AM MST  
([User Info](#))

Chuck, since it is coming down this week for the tail fix, could you take a picture of it up close and post it? Please please.

Martin.

[ [Parent](#) ]

Re: Furling system ([none / 0](#)) ([#11](#))  
by Barnac ([barnac@videotron.ca](mailto:barnac@videotron.ca)) on Wed Jul 23rd, 2003 at 02:01:23 PM MST  
([User Info](#))

Hi Bach on

I actually never built myself one of these furling system.

I guess you have a grab on it now, but the fact that the tail vane rise is not caused by the wind exerting a force that gets under the vane to push it up, but simply because It's mounted on a pivot at angle relative to horizontal axis (22 deg relative to the tower or 68 deg relative to the ground).

In the spring system the pivot on wich the tail vane is monted is not on an anle relative to the vertical plane. It's parrallel to the tower and vertical to the ground (0 deg to the tower; vertical plane, 90 deg to the ground; horizontal plane) so when the system is furling the tail vane rotate around the vertical axis, staying in the same plane relative to the ground (horizontal).

Like a garden gate does when you open it. It's rotating around the vertical axis staying in the same plane relative to the ground (horizontal plane). Now imagine that the stupid snow plower strucked the gate post and bented it 22 degree from the vertical axis (the tower)and the edge of the gate is now barely touching the ground when close. Now what happens when you try to open the gate, the edge of the gate will rise relative to the ground... wright? The more you open it the more it rises relative to the ground. Cause now the gate rotate around an axis who is no longer vertical to the ground so the edge of the gate doesn't move in the horizontal plane anymore but keep going away from it the more you open it. Now what happens if you let go ? the door will close by itsel (well helped a bit by gravity ;-)).It's the same thing with the fridge's door when the fridge is not level i.e. on an angle relative to the vertical plane.

Now in the second furling system when the force of the wind against the prop rotate it away from the wind and as the tail vane always stays with the wind, the tail vane as no choice but to rotate around that 22deg of vertical axis and the edge of the tail rise relative to the ground.

Anyway, it's only my perception of the thing and I may be totally wrong...

P.s.: please furling guru if I'am wrong tell me :-)

[ [Parent](#) ]

Re: Furling system ([none / 0](#)) (#10)  
by hvirtane on Wed Jul 23rd, 2003 at 01:06:47 PM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

Basically this gravity system of furling is the same as used with Marlec small wind chargers for example.

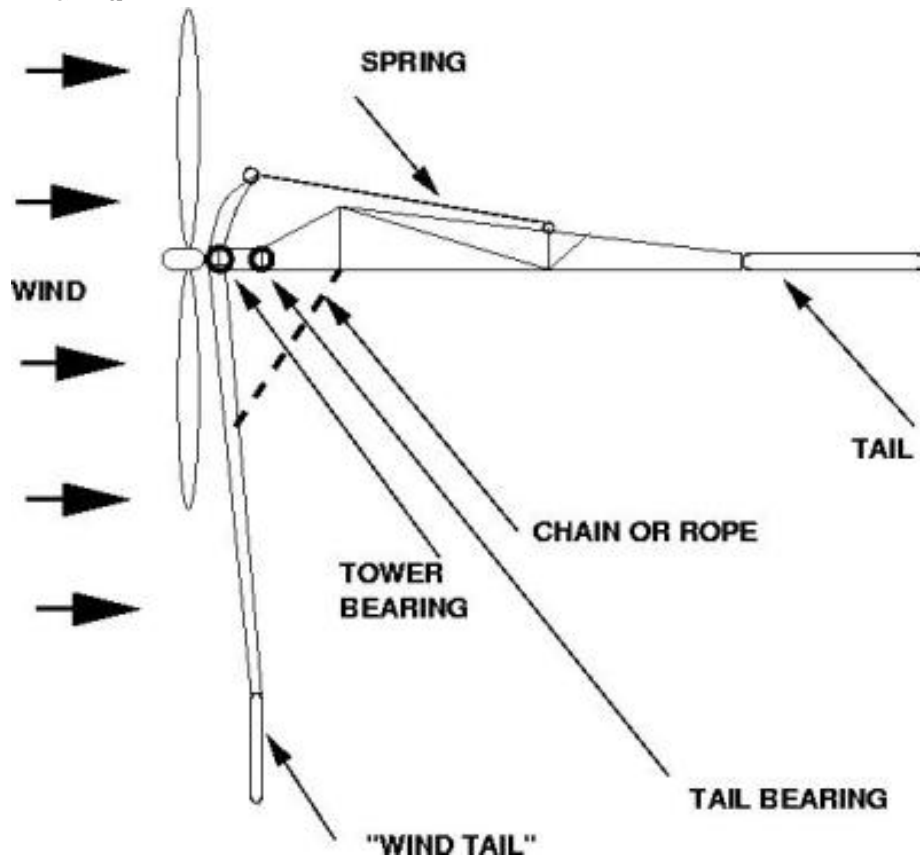
With Marlec the hinge is on the far end of the tail boom.

My friends here are complaining that the system is not really good, when water goes in between the tubes in the hinge and so during the winter there is ice.

I'm still not sure, if the gravity system is better or worse than the old German system with another tail on the same plane as the prop.

I made small drawing of that system during an earlier discussion.

- Hannu



Re: Furling system ([none / 0](#)) ([#12](#))  
by [scoraigwind](#) ([magnet@scoraigwind.co.uk](mailto:magnet@scoraigwind.co.uk)) on Wed Jul 23rd, 2003 at 03:54:06 PM MST  
([User Info](#)) <http://www.scoraigwind.co.uk>

Thanks for such a clear explanation, DanB. So many people ask me about how that works.

There are problems with getting the best angle for the hinge. Each setting has some side angle and some back angle. I usually set it so the side and back angles of the hinge are almost equal so that the power output stays about the same over a range of winds. But the output peaks a little in the middle where the tail is climbing most steeply.

So when I get really fussy I use a different type of hinge with a cam at the top. The tail hangs off a belt or chain, that wraps around the cam, so that the axis of the hinge changes. That allows full control over the tail furling forces.

The Marlec version with only the vane hinged works after a fashion for a while until the force of the wind on the boom alone is enough to pull the rotor back into the wind.

The system with the side vane is great for a type of pump that needs the crank shaft over the well, but has no other advantages compared to the offset rotor systems. The side vane is unstable in operation and ugly.

My perspectives :-)

Hugh Piggott <http://www.scoraigwind.co.uk>

Re: Furling system ([none / 0](#)) ([#15](#))  
by [JW](#) on Wed Jul 23rd, 2003 at 08:13:30 PM MST  
([User Info](#))

The level of professional courtesy around here should be some form of development model. Dude,,, When I saw the DANCAD drwg#2 I started to salavate. What a fantastic design. On top of the fact the everyone is doing everything right. My hat goes of to you Hugh.^ You are correct the asthetic part is crucial

-JW

[ [Parent](#) ]



Re: Furling system ([none / 0](#)) ([#17](#))

by Smithson on Thu Jul 24th, 2003 at 04:06:02 PM MST

([User Info](#))

The fact that the lowest setting for the tail is actually [according to Hugh's plans] 100 degrees from the rotation of the blades is what puzzles me. Or 80 degrees [10 degrees off perpendicular]. In other words if the blades were 3 o'clock and 9 o'clock then the tail would be sitting at 11 o'clock not 12 o'clock with no wind. I read some where else that as the wind first hits the machine it settles it tail in the 12 o'clock position with the blades at 3 and 9 o'clock.

What I'm wondering is if you can actually use this to start the machine turning more easily? Let say that the root of the blade is 27 degrees. With the tail at 100 degrees [11 o'clock] would this actually for that time as the wind first hits the blades make the root of the blades 37 degrees and help with starting thr blades in light winds? Now I haven't fully figured this out but off the top of my head it would seem that you would have to have a counterclockwise rotation, but would that help?

[Furling system](#) | 17 comments (17 topical, 0 editorial)

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## [Otherpower.com Garbage sale!](#)

By [DanB](#), Section [Classifieds](#)

Posted on Wed Jul 9th, 2003 at 10:55:13 AM MST

Trying to pawn off some junk here!

---

[For Sale](#)

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- [More on For Sale](#)
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My Yard is getting filled with JUNK! I thought I'd post a bit of it here and help keep our classifieds section rolling some. Some of this stuff is going to be pretty much the price of shipping, other stuff a bit more. Keep your eyes peeled in the near future, as we'll surely be coming up with more JUNK in the next few weeks as we clean up a bit!

First come first serve on this stuff! - and I'd rather one person didn't take it all. One item per person... Just send me an email: [danb@starband.net](mailto:danb@starband.net), and make the subject of the email "Garbage Sale" (so I don't accidently erase it along with gobs of spam!) I don't want send any of this out of the US.





Lot #1: There's been lots of discussion in the past about playing with ceiling fans! If any fan has potential, this may be the one! It's very large, and heavy, with nice looking castings of iron. Might make a neat wind turbine... or slow hydro alternator. The rotor runs on a bushing, which probably wouldn't hold up long to high rpm. The inner diameter of the stator is almost 9", and the rotor is slightly smaller. I suspect one could make a pretty interesting alternator with this. It may need re-wound, or it's possible that the coils could be wired together differently and used as they are with proper magnet placement. A fun project, but one of those things I'll never get to. I'll send it to the first interested party for the price of UPS shipping... about \$15 in the US.





Lot #2: Here's an old servo motor with something on the back (maybe a tach?). The motor itself is 4" diameter and about 7" long. It might make a good small windmill, but I'm not sure - there are not voltage or rpm ratings anywhere on it. It appears to be a fairly typical PM DC motor with brushes and a commutator. I think we could ship this out for \$12.00 within the US. I've not tested it - don't know if it works or anything!



Lot #3: Bargain Alternator Kit! These are some old Samarium Cobalt magnets from old hard drives. The Samarium Cobalts are not quite as strong as the NdFeB, but fairly close. These could make a nice alternator. They are about 1" wide, 1.5" tall and 3/8" thick. I've got 15 arranged here in a partial circle (About 10.5" diameter) and there are 20 more in the assemblies which need to be taken apart (Phillips screwdriver) to get the magnets out. You could build one tight ring (and have a few magnets left over) with all the magnets touching, or... put some space between the magnets and have enough for a dual rotor machine. I'll also throw in an old, dirty 5 pound roll of AWG 16 magnet wire! \$40 includes shipping.





Lot #4: Too lazy to build your own windmill? Here is a SW windpower Air 403. It's complete... the rubber gasket might need replaced. Here is the thing... I helped a neighbor fix his up last year, and SW windpower got confused (when they fixed his) and put the wrong stator in! So we swapped stators around a bunch and found that his machine worked better with my stator in it! And.. mine has his stator in it. His stator is for an Air 303 - so this doesn't work right. But... I did get a brand new Air 403 stator for it from SW windpower, and all it needs is to be installed which is pretty easy. You'll need allen wrenches and a bit of mechanical talent, but not much... all the parts are here, it's a 5-10 min fix. There is a small chip out of the nose cone near one of the blades that shouldn't affect anything. \$250 includes shipping, and I'll let the buyer return this if not satisfied for a refund.



Lot #5: This a "converted" 2hp single phase induction motor, same one I used in one of my old windmills: [http://otherpower.com/danb\\_windmill.html](http://otherpower.com/danb_windmill.html)

It still works fine. It cogs a bit, and the steel hub (a gear) is welded on the shaft, so you'd have to grind that off if you need to replace the front bearing. Pretty heavy, I think it'll be about \$20 to ship - so, \$20 includes shipping.

So.. if you want any of this \*junk\* send me an email, or just reply to the posting letting me (And everyone else know) which LOT # is "sold" and as soon as we get payment (or we can do COD for an extra \$5) we'll ship it out!

[Otherpower.com Garbage sale!](http://otherpower.com) | 6 comments (6 topical, 0 editorial)



I'll take Lot #2 ([none / 0](#)) ([#1](#))  
by TomW on Wed Jul 9th, 2003 at 11:07:02 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Dan;

I'll take #2 old servo motor

Email is on its way, Dan.

Cheers.

TomW

[Stuff I have Online](#)

[Contact Me](#)

Re: Otherpower.com Garbage sale! ([none / 0](#)) ([#2](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Wed Jul 9th, 2003 at 01:09:49 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

What is the green thing with the flywheel on it in picture one? I want the flywheel or possibly the whole thing depending on exactly what it is...

Ed

Re: Otherpower.com Garbage sale! ([none / 0](#)) ([#3](#))  
by DanB on Wed Jul 9th, 2003 at 01:12:03 PM MST  
([User Info](#))

Sorry Ed... That's my 6hp Fairbanks Morse "Z" engine.... runs like a top!  
can't let that one go :-)

[ [Parent](#) ]

Re: Otherpower.com Garbage sale! ([none / 0](#)) ([#4](#))  
by [electronbaby](#) ([electronbaby@hotmail.com](mailto:electronbaby@hotmail.com)) on Wed Jul 9th, 2003 at 01:41:29 PM MST  
([User Info](#))

Dan, I will take item # 3. I emailed you earlier today. Thanks. I hope its still available. :)

RoyR

Re: Otherpower.com Garbage sale! ([none / 0](#)) ([#5](#))  
by [RobD](#) on Wed Jul 9th, 2003 at 03:39:54 PM MST  
([User Info](#))

Hi Dan, Having a little trouble getting to the out house? RobD

Re: Otherpower.com Garbage sale! ([none / 0](#)) ([#6](#))  
by [jimu](#) on Wed Jul 9th, 2003 at 04:05:58 PM MST  
([User Info](#))

Hi Dan..

Ill take Lot #5 , the induction motor conversion , as per the email I sent..

JimU

[Otherpower.com Garbage sale!](#) | 6 comments (6 topical, 0 editorial)

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 posted by gameman on 12/08/2003 09:04:40 AM MST  
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 posted by mckee on 11/29/2003 08:31:52 PM MST  
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 posted by MrLister on 11/29/2003 11:13:59 AM MST  
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5. [Turns Counter](#) (Classifieds, [For Sale](#))  
 posted by Jerry on 11/16/2003 09:12:54 PM MST  
 5 comments
6. [SALE: 50 lbs #10 GUAGE 0.1051" DIA. ESSEX ALLEX 240 DEGREES C MAGNET WIRE : \\$6/lb](#) (Classifieds, [For Sale](#))  
 posted by Christina on 11/07/2003 12:09:06 PM MST  
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7. [Heat Sink for sale.](#) (Classifieds, [For Sale](#))  
 posted by Jerry on 11/06/2003 10:56:34 PM MST  
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8. [5hp Honda engine](#) (Classifieds, [For Sale](#))  
 posted by windstuffnow on 11/02/2003 08:26:23 AM MST  
 2 comments
9. [early Bergey generator for sale](#) (Classifieds, [For Sale](#))  
 posted by 5kw on 10/26/2003 03:55:58 AM MST  
 4 comments
10. [Neo magnets for sale](#) (Classifieds, [For Sale](#))  
 posted by paulc on 10/09/2003 07:25:21 PM MST  
 5 comments
11. [Batteries Inverters for sale](#) (Classifieds, [For Sale](#))

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- Anonymous Users: 14

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posted by Garry on 09/17/2003 06:24:40 AM MST  
11 comments

12. [Link 10 Amhr/Voltage/Current monitor](#)  
(Classifieds, For Sale)

posted by Eviljosh on 08/27/2003 01:20:48 PM MST  
0 comments

13. [garbage disposal stator](#) (Classifieds, For Sale)

posted by jemitch on 07/23/2003 07:25:49 PM MST  
2 comments

14. [Otherpower.com Garbage sale!](#) (Classifieds, For Sale)

posted by DanB on 07/09/2003 10:55:13 AM MST  
6 comments

15. [Wincharger Parts](#) (Classifieds, For Sale)

posted by winchargerman on 05/09/2003 09:20:26 AM  
MST  
4 comments

16. [BIG Genny for sale](#) (Classifieds, For Sale)

posted by Gorilla Boy on 04/29/2003 10:42:12 PM MST  
0 comments

17. [10KW Windmill System For Sale](#) (Homebrewed  
Electricity, For Sale)

posted by Anonymous Hero on 04/14/2003 12:30:55 PM  
MST  
0 comments



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### [Anonymous postings](#)

By [DanB](#), Section [Site News](#)

Posted on Tue Jul 8th, 2003 at 11:07:06 AM MST

[Scoop](#)

All users will have to sign up an account.

Due to some problems we've had recently, and the fact that this board is getting more use lately, we've decided to require that all folks posting on the board sign up for a user account.

We've had to delete a couple of REALLY bad spam and postings lately - fortunately we caught them quickly before too many folks saw them! It's kind of unfortunate, but it will have it's benefits.

Anybody with a user account can easily upload pictures onto our server and use them in their postings. Folks who have been regularly posting without an account may not be aware of this.

Getting an account is easy.

- Use the 'create new account' link in the login box on the right side to start. You just need to enter your desired username and a valid Email address. This REAL email address will never be posted to the board unless you do it yourself...on your User Preferences page you can enter an email address that will be displayed. Many people use Hotmail or Yahoo addresses for this.

- In a couple minutes you'll receive an Email from Otherpower.com containing your username and a cumbersome (but strong) random password. Log in and you'll see whole bunch more menu choices available to you.
- You can change your password with the 'user preferences' link in the menu. Be sure to check out 'display preferences' and 'comment preferences' too -- there's some powerful features in there.

Sorry we had to do this, and I hope folks realize ... were not trying to drive anyone out here! Requiring a bit of accountability for postings should hopefully drive away some of our troubles, and make things a little easier for us in the end. We like to take days away from the computer everynow and then, but lately that has not been possible as we've had to keep on top of this board, and Anon postings are pretty much the problem.

If anybody has problems setting up an account, or simply wants us to do it for them - just send us an email: [admin@otherpower.com](mailto:admin@otherpower.com) - we'd be happy to setup your account, and email you your password. (sometimes it might take us a day or two, but we'll get to it!)

[Anonymous postings](#) | 15 comments (15 topical, 0 editorial)

Re: Anonymous postings ([none / 0](#)) ([#1](#))  
by [xeroid](#) ([centurion27@lycos.com](mailto:centurion27@lycos.com)) on Tue Jul 8th, 2003 at 12:57:57 PM MST  
([User Info](#))

No more cloak and dagger users. Cool. All too often anonymity is used by those who don't wish to be accountable for what they say or do.

It is unfortunated for those users who just don't have a great deal of computer saavy, but in the end, I think this is the right move.

Well done guys.

Xeroid

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Re: Anonymous postings ([none / 0](#)) (#2)  
by electronbaby ([electronbaby@hotmail.com](mailto:electronbaby@hotmail.com)) on Tue Jul 8th, 2003 at 01:07:05 PM  
MST  
([User Info](#))

I think that is a great move also. Even though I had trouble in the beginning of this new board, I feel all the worthwhile people will figure it out and join us. Thats what this is all about anyway, right?? figuring things out?? This board is too valuable to all of us to allow spammers, solicitors and instigators to intervene. Good move!!  
RoyR

Re: Anonymous postings ([none / 0](#)) (#3)  
by elvin1949 ([elvin1949@wmconnect.com](mailto:elvin1949@wmconnect.com)) on Tue Jul 8th, 2003 at 06:12:59  
PM MST  
([User Info](#))

i agree  
i don't say much here  
came to learn  
tired of the garbage  
later  
elvin1949

[ [Parent](#) ]

Re: Anonymous postings ([none / 0](#)) (#4)  
by troy on Tue Jul 8th, 2003 at 06:28:27 PM MST  
([User Info](#))

Dear Admin,

I couldn't help but notice that things have been particularly cheery, cooperative and productive lately. I support your decision.

Best regards,

troy

Re: Anonymous postings ([none / 0](#)) (#5)  
by WetinOR on Tue Jul 8th, 2003 at 10:52:22 PM MST  
([User Info](#))

Thanks Guys! You gave the anonymous postings a fair shake and some just had to spoil it for the others who did behave themselves.

George

Re: Anonymous postings ([none / 0](#)) (#6)  
by hvirtane on Wed Jul 9th, 2003 at 01:23:18 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

While this move is maybe the only thing you can do at the moment, it probably will affect the quality of the board as well.

It is quite certain that there are many such people, who for different reasons don't want to give to you any valid email address, but anyway wanted to be involved in these discussions.

But it might as well create counterattacks. It is quite easy to obtain all the time new email addresses, create an account and to make even worse spams?

It anyway creates harm to such people, who don't want you to know their address and who anyway enjoy the company somehow to change their email addresses regularly.

- Hannu

Re: Anonymous postings ([none / 0](#)) (#7)  
by RobD on Wed Jul 9th, 2003 at 08:15:25 AM MST  
([User Info](#))

Hi Dan, I didn't see a place on the new board for profiles like the old board. Did I just miss it? I like the new board, by the way. RobD

Re: Anonymous postings ([none / 0](#)) (#8)  
by TomW on Wed Jul 9th, 2003 at 08:46:47 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

RobD;

I know you addressed the question to Dan but I'll take a shot at answering it.

I think the closest thing to "profiles" would be either "user info" or the Diaries Section with the Diary being the only thing a user can really edit.

So if you want to share your personal info like general location, contact info, etc thats the best option I can think of.

Personally I have found that my info from the old board has been used to sign me up to spam lists and everything from the gun-owners action committee, Republican national committee list to the Libertarian Party Newsletter. Not to mention several emails threatening everything from legal action and computer attacks to personal injury.

I leave it to you to figure out who might be doing it. I certainly wouldn't want to be in his, er, pants when the authorities investigate the source of said email threats.

Just noting a valid reason for not posting too much personal info online.

Cheers.



TomW

[Stuff I have Online](#)

[Contact Me](#)

[ [Parent](#) ]

Re: Anonymous postings ([none / 0](#)) (#10)  
by hvirtane on Thu Jul 10th, 2003 at 06:35:09 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

-----  
"Personally I have found that my info  
from the old board has been used  
to sign me up to spam lists and everything  
from the gun-owners action committee,  
Republican national committee list to  
the Libertarian Party Newsletter.  
Not to mention several emails threatening everything  
from legal action  
and computer attacks to personal injury."  
-----

Yes, these are some of the things, why some  
people wanted to stay 'anonymous heroes' and  
anyway develop these technologies further.

It is quite easy to see that a kind of fight between fossil  
oil industries and renewable energy industries is among  
the most important issues of our time concerning  
the world politics, not only usa inner politics.

(For example: It is quite common in Europe to have an  
opinion that the main reason or even the only one  
for mr bush and his allies  
to attack iraq was just the oil available there.)

- Hannu

[ [Parent](#) ]

Please explain ([none / 0](#)) (#11)  
by TomW on Thu Jul 10th, 2003 at 06:50:32 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Hannu;

Damn, I know we have a bit of a language barrier but just what  
the hell does that have to do with my comment? You can easily be  
a registered user without other users knowing your info. I openly  
posted my information and it was used as a weapon against me.  
This has absolutely nothing to do with internal or external US  
politics it has to do with a person with bad manners and a worse  
education acting like a spoiled child.

Since you seem to be his only active supporter perhaps its time  
you started a board for him to misbehave on or just let it drop.

I sure hope you and Kevin enjoy your relationship but I think he  
will NOT be missed here.

Cheers.

TomW

[Stuff I have Online](#)

[Contact Me](#)

[ [Parent](#) ]

Re: Please explain ([none / 0](#)) (#12)  
by wpowokal on Thu Jul 10th, 2003 at 07:31:51 AM MST  
([User Info](#))

Bugger I was even offered the JCP good morning show here in OZ via 'e' mail, not impressed, but I guess you get that.

Unfortunately some excentrics are hell bent on destroying this venue.

regards Allan

[ [Parent](#) ]

Re: Please explain ([none / 0](#)) (#14)  
by hvirtane on Fri Jul 11th, 2003 at 03:44:23 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

Hello,

it is unavoidable that there always are some disagreements, which kind of technology to develop and how to develop it.

I'm myself a kind of anarchist, who thinks that it is not so good idea to make very many people dependent on big companies' rule, who again themselves are dependent on the people, who are forged to pay them. You see that this is the case with power companies, oil companies, weapons industries, etc.

The maybe most cited example of anarchist literature concerning power companies worry about self made energy comes from France in older times, in the age of windmills. Windmills were banned, because they give to some people a possibility to make energy themselves.

Please see somehow the other side of the coin as well, JCP and the other defenders of the anonymity have got their point, too.

<http://www.fighting.org/discus/messages/71/437.html>

- Hannu

[ [Parent](#) ]

Re: Please explain ([none / 0](#)) (#13)  
by hvirtane on Thu Jul 10th, 2003 at 09:05:34 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

I'm generally getting quite a lot of garbage mail.  
I just tried to guess, why you got it.

I started years ago to get a lot of  
garbage mail, when made some notes  
concerning some world politics issues.

My message had nothing to do with Kevin.  
Just trying to find out, why  
you got all that garbage mail.

There are different reasons for different people  
to want to stay anonymous.  
There is no way to secure this kind of board from  
experienced hackers to find out your email address  
if it is given to the board admins.

This is the reason I think that it is not so good  
to stop anonymity here.

But for me it means quite little.  
I'm already used to garbage mail.

Lately is has been increasing quite a lot.  
I'm quite sure that it has very little to do  
with anyone posting here, maybe something  
to do with some people  
reading this board, however.

- Hannu

[ [Parent](#) ]

Re: Please explain ([none / 0](#)) ([#15](#))  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Fri Jul  
11th, 2003 at 04:39:38 AM MST  
([User Info](#))

????????????????????????????????????  
Did I miss something?

-Andrew

[ [Parent](#) ]

Re: Anonymous postings ([none / 0](#)) ([#9](#))  
by Brian on Thu Jul 10th, 2003 at 12:47:02 AM MST  
([User Info](#))

I'm gone for a week or so and come back to this. All I can say is THANK YOU!!!

[Anonymous postings](#) | 15 comments (15 topical, 0 editorial)

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## [More tower fun!](#)

By [DanB](#), Section [Homebrewed Electricity](#)

Posted on Fri Jun 20th, 2003 at 10:43:41 AM MST

[Wind](#)

The caboose windmill is up!

We spent the better part of last week building a new [10 foot diameter wind turbine](#) for my neighbor Dave, to help power his [caboose](#) and his future building site.



It's about 200 feet, straight up a steep hill and a wonderful site for a wind turbine. To the east, there is no obstruction... you can see parts of town over 20 miles away, and to the west he's clear for at least a half mile. Tricky thing here though, there is no flat ground at all. I don't care to climb trees and we couldn't afford a crane, so a tilt up tower seemed the only way to go.

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After careful thought about location, we decided to try putting a strong, and wide pivot between these rocks, so that it would tip down to the east and he could pull it up either with a winch or his truck down his driveway to the west. The pivot is about 2.5 feet wide and made up of 1 piece of 1.5" pipe inside of another piece of 2" pipe. The tower will be welded to the 2.5" outer pipe, which will pivot over the smaller pipe. It needs to be strong! Since there is no flat ground here, we cannot count on guy wires to hold things up while raising and lowering the tower. It will need to be free standing while it goes up and down.



Here DanF is cutting bits of pipe and rebar that we'll need with the torch.





We cut the rebar at about 10 inches long, and used a hammer drill to make 6" deep holes in the rock. We covered the rebar with epoxy and hammered it in.



Rich beat on the bars with a hammer so that we could get the pivot in level.





Once a couple were spot welded, we hammered the other bars, and the pivot so that everything could be perfectly level and we'd have reasonably tight joints for welding.



Pictured above I'm welding up the pivot to the rocks as best I can with my little 120VAC mig welder!





Dave is jumping on the pivot to see if it moves at all. Of course, it didn't. In the end, we'll do some concrete work under the pivot and around the rebar.





Our neighbor Tom came by and helped do some very professional welding with the torch! (and gave us some pointers)



Above I'm arc welding on the gin pole and assembling the tower. The tower is 30' tall. The 1st section (15feet) is 2.5 inch ID schedule 40 steel pipe. The 2nd section slides in and is made of 2" pipe, it's about 13 feet long. Then it tapers down to 1.75" pipe and a little stub of 1.5" pipe which the wind turbine fits over. The gin pole is 2" pipe, and its attached at the pivot, and connected to the top of the tower via steel cable.



Pictured above the tower is pretty much done. I did not catch our guy wire mounts in pictures. At the top of the mast, I simply welded chain around the pipe and hooked 3/16" guy wire to that on 4 sides. At the bottom, we found

bedrock for 3 of the locations, and one is attached to a chain around a big tree! (this is a temporary measure - Dave is going to make a more permanent anchor for that one). To go into the bedrock, we did the same as for the pivot. We drilled 1/2 inch holes down 6 inches deep into the rock, and hammered rebar (coated with epoxy) down in. We welded chain to the rebar so that the guy wires could be easily attached.

At this point we test raised the tower with no guy wires attached. It went up smoothly, and we then could attach the guy wires and tighten them up. Once that was done we unhooked the guy wires and lowered it. (it seemed that some of the guy wires might tighten on the way down). After it was down, we checked the length of the wires and found that one gets pretty loose, and another one to the south was just about perfect! So, as it turns out, we can safely raise this tower with the guy wires attached! This was a bit of a load off my mind.



Dave assembled the wind turbine on the end of the tower. Notice how we hold it off the ground with a barrel. This will protect the blades and the tail when it's lowered. We ran the power cord for the wind turbine right down the inside of the tower, so that it can yaw easily. There is a big 3 prong plug at the bottom so that it can be occasionally unplugged and untwisted should it be necessary.





We then pulled it up with the truck and everything went smoothly. The machine started turning in the first breeze and was making power immediately. We figure the cost of this tower... about 2 folks worked 2 days on it. (half the work was just moving a ton of tools from My house to the top of the hill and back again!) We spent about \$125 on pipe, and about \$100 for guy wire - we used fairly expensive steel cable for that. Time will tell how it holds up!

[More tower fun!](#) | 9 comments (9 topical, 0 editorial)

Re: More tower fun! ([none / 0](#)) ([#1](#))  
by billf on Fri Jun 20th, 2003 at 07:55:47 PM MST  
([User Info](#))

Impressive! You guys sure know how to improvise. Looks good.

Re: More tower fun! ([none / 0](#)) ([#2](#))  
by scoraigwind ([magnet@scoraigwind.co.uk](mailto:magnet@scoraigwind.co.uk)) on Sun Jun 22nd, 2003 at  
01:26:35 AM MST  
([User Info](#)) <http://www.scoraigwind.co.uk>



Thanks for the story, Dan.

It's fun to see you finding the same solutions - I have also used pipe within pipe for a tower base hinge, and I have put rebar into rock with epoxy. I wonder how it worked out with welding so close to the epoxy resin. I would normally do the welding first and the epoxy after, but that is not an option for your pivot pipe anchoring.

Where possible I like to drop the tower uphill. That means it has less far to go, and the side guys have a better chance of being on a level. You could then use a pulley to redirect the lift vehicle rope, or better still get yourselves a griphoist. Much more relaxing.

I also find it helps to use cheap polypropylene rope (blue rope) as temporary guys during the first lift. I can fiddle about with them more easily, and they stretch if necessary. I can then adjust the permanent guys once it is erected.

I'd hate to try erecting it without any guys (too scary).

Hugh Piggott <http://www.scoraigwind.co.uk>

Re: More tower fun! ([none / 0](#)) ([#5](#))  
by DanB on Mon Jun 23rd, 2003 at 09:04:11 AM MST  
([User Info](#))

Thankyou for the comments Hugh! Unfortunately we didn't have many options for tower placement, and as it worked out, it sits on top of about a 10' tall rock outcropping! So there was no possible way to tilt it uphill on this site! (trick is making sure the machine doesn't fall off the end when we lower it!) The rope guy wire idea is a good one, I think I'll get some of that for next time! Something with a bit of stretch would be good. Fortunately - due to lucky placement of the wires here, we can keep the side ones on while raising and lowering which eases my mind greatly. Regarding welding and epoxy... yes, it kinda worried me a bit too! I guess time will tell! We'll be putting concrete around it too, and under it so it will pivot in a concrete "bearing" soon... In the end, we'll probably add another 5-10' to this tower. Right now there are a couple trees to the west which are a problem, and the choice is either killing them, or adding some to the tower. I think adding to the tower is the best solution here.

[ [Parent](#) ]

Re: More tower fun! ([none / 0](#)) ([#3](#))  
by Anonymous Hero on Sun Jun 22nd, 2003 at 05:56:32 AM MST

Caboose  
Beautiful Mountains  
Windmill

You all ran away at age 12 to live in a Story Book. I sure wish I had done the same.

Awesome Life!

Re: More tower fun! ([none / 0](#)) ([#4](#))  
by Gary D on Sun Jun 22nd, 2003 at 08:47:02 PM MST  
([User Info](#))

Dang it, in Southern Pa. no one seems to know anything about tilt ups. Wish I could see and help raise a few to understand it. Would seem to me you would need to run your gin pole wire to a pully on the ground then up to the truck bumper. Otherwise when the gin pole gets closer to the ground, you would be putting sideways stress instead of down pressure. I guess I'm dense or something here. Dan has all the fun!! :-)  
Looks great tho... Have to do one and then maybe then I'll understand it. Beautifull views!! Gary D.

[ [Parent](#) ]

Re: More tower fun! ([none / 0](#)) ([#6](#))  
by DanB on Mon Jun 23rd, 2003 at 09:13:05 AM MST  
([User Info](#))

Hi Gary - you're absolutely right, a pully on the ground where the gin pole comes down would probably be a good idea. In this case (and with other tiltups I've done)... there is some side pulling force on things when it gets near the ground, but not so bad as you'd think. Once the tower is near vertical, the weight of the gin pole does the work and it will simply fall into place without any pulling from the truck. As it approaches that "balance" point - the pulling force required is very light... so for these reasons a pully is not necessary... (but it would be ideal!) A winch is better too. I find it very easy with my tower to raise and lower the tower, it is a big old F250 with 4wd, very low gears and a fairly small 6 cyl engine. Dave has a somewhat newer truck without such low gears, and a big V8 engine with a real grabby clutch! He had no problem raising it... but in our test run, he scared the heck out of me lowering it! So... Ill either do the driving next time, or we'll get him a winch of some kind.

[ [Parent](#) ]

Re: More tower fun! ([none / 0](#)) ([#7](#))  
by Hank on Mon Jun 23rd, 2003 at 05:24:41 PM MST  
([User Info](#))

Good Post and very usefull information. I do need some prof. advice on towers. I am ready to construct a 40 ft. tower and raise a Volvo type genny with an 8 ft. rotor. My first stab at a tower was to use 20 ft. Of 3" sched. 40 into which I'd insert 20 ft. of 2.5" pipe and top it off with 2" (all sched. 40) and welded. Reading your post I'm wondering if this will not be an over-kill. The genny will have a furling system for high wind protection. With this set up I was also thinking of using only 4 1/4" cable guys set at about 35 ft and extending out about 100 ft. As you have one whole hell of a lot more experience with towers I'd be very gratefull for any advice. ( I realize that the stronger the better, but there is such a thing as over-kill and that's \$\$\$\$). Also, if you have any pointers on welding these sections together I'd like to hear that as well. Do you use any sleeves for re-enforcment? or do you just run a bead where the pipes are inserted? Thanks, Hank

Re: More tower fun! ([none / 0](#)) ([#8](#))  
by DanB on Tue Jun 24th, 2003 at 01:02:41 PM MST  
([User Info](#))

Hi Hank...

please know... I'm not a professional!! (see my fun with logs and chains posting...)

I've put a few homebrew machines up with resources that were available. Most of them stayed up.

But - specifically to answer your questions about what Ive done....

(1) I think using the 3" pipe is probably wise. I think were pushing it with this one.

(2) I slide the pipes together, and I didn't do a bead all the way around, just in spots. The reason... you weld all around the pipe and I think you'd weaken it!

(3) I think the 1/4" is probably OK, but I think with a 40' pipe tower, Id have two sets of guy wires. The lower set could probably be thinner stuff... but the pipe towers are really flexible! Then... I wouldnt guy it at equal lengths! We did Wards at even 15' increments, and it vibrates because the middle guy wires were midpoint between the ground, and the upper ones,... it was a harmonic point! WE had to move the lower set up a bit. On Wards, we've got the lower set up at 20', the top set up at about 32, and the machine sits up at about 37'. At first it was at 15, and 30, and it was much less stable.

For a 40' tower, to go out 100' from the base is too much I think. I think you'd be safe to go our about 30' - 40', but there is nothing to be gained (I dont think) by going out further from the mast than the guy wire is tall!

[ [Parent](#) ]

Re: More tower fun! ([none / 0](#)) ([#9](#))  
by Hank on Tue Jun 24th, 2003 at 08:19:15 PM MST  
([User Info](#))

Thanks DanB, You have been really helpfull. I realize none of us are pro's on this subject but there is a lot to say for experience ( I've modeled most of all of my genny on your design). I guess using mid guys will be the way I'll go and I never considered the harmonics. Good point!! The reason I was thinking of going out 100 feet or so was to reduce the tension on the cable (under load) and the anchoring system. Will have to run the math again if I will use mid guys (the longer the guys the less tension they are subjected to). Also didn't realize that pipe towers were so flexible. Thanks again, Hank

[ [Parent](#) ]

[More tower fun!](#) | 9 comments (9 topical, 0 editorial)

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## [Good deals on BIG magnets](#)

By [DanB](#), Section [Homebrewed Electricity](#)

Posted on Fri Jun 20th, 2003 at 01:22:04 AM MST

[Alternators](#)

I just put up some bargains for alternator builders.

To help keep some of these wind turbine projects affordable, I've listed some of our larger magnets in lots of 12 and 24 on our shopping cart at the lowest possible price. I'm listing these only in our electricity/components and electricity/renewable energy categories! (you won't find them under magnets).

[http://www.wondermagnets.com/cgi-bin/edatcat/WMSstore.pl?user\\_action=list&category=Electricity%3BComponents](http://www.wondermagnets.com/cgi-bin/edatcat/WMSstore.pl?user_action=list&category=Electricity%3BComponents)

[Good deals on BIG magnets](#) | 8 comments (8 topical, 0 editorial)

Re: Good deals on BIG magnets ([none / 0](#)) (#1)  
by [electronbaby](#) ([electronbaby@hotmail.com](mailto:electronbaby@hotmail.com)) on Thu Jun 19th, 2003 at 11:14:38 AM MST  
([User Info](#))

I wish you could have did this a week sooner. :) I just ordered a batch from you guys.  
Oh well. :) RoyR

Re: Good deals on BIG magnets ([none / 0](#)) (#2)  
by [dagnew](#) on Thu Jun 19th, 2003 at 11:40:27 AM MST  
([User Info](#))

Kinda new here, but that's great. I really need radially magnetized ring magnets or arc segment magnets for work I am doing on a linear alternator. Dick

Re: Good deals on BIG magnets ([none / 0](#)) (#3)  
by [Andrew](#) ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Thu Jun 19th, 2003 at 04:06:41 PM MST  
([User Info](#))

Keep wind turbine projects affordable! \$75! Dammmmm It would put you broke before you could ever complete it. Maybe there is a way to make a 1 pole alternator. Just a thought.... -Andrew

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Re: Good deals on BIG magnets ([none / 0](#)) ([#4](#))  
by wiredup on Thu Jun 19th, 2003 at 10:53:20 PM MST  
([User Info](#))

thanks danb. i ordered 24 today, getting it at half the price. it is a good deal helps me futher my education.was going to order anyway,great timeing....thanks again...staples

Re: Good deals on BIG magnets ([none / 0](#)) ([#5](#))  
by Gary D on Fri Jun 20th, 2003 at 06:24:02 AM MST  
([User Info](#))

Gee, wish you could do a deal on the 1 inch by 3/8 magnets too. Can fit more of them in a 10 inch disc. Would love to try several duel disc's with the inchers. Have low windspeeds in Pa. here and more magnets should mean lower startup. If only I could decipher windstuff's great prop- wire sizing program, I'd feel better ordering it too. Realize you have to make a profit, so if not, I'll still be ordering some anyway. Thanks Gary D.

Re: Good deals on BIG magnets ([none / 0](#)) ([#6](#))  
by DanB on Sat Jun 21st, 2003 at 07:37:24 AM MST  
([User Info](#))

Gary - hard to say. More poles doesn't necessarily mean higher voltage if you are compromising surface area.

We are actually way overstocked on that size right now and I probably will do some kind of qty discount deal on them soon.... but - I think you might do well to go slightly larger than 1" in diameter, depending on your goals!

I wouldn't get too intimidated by the prop! (working out the stations with Ed's software or Hughs book is not difficult, you would also do fine to just run a straight pitch from root to tip - or some compromise between the two.)

[ [Parent](#) ]

Re: Good deals on BIG magnets ([none / 0](#)) ([#7](#))  
by DanB on Sat Jun 21st, 2003 at 07:46:32 AM MST  
([User Info](#))

There -just got that done! I added a deal on the 1" X 3/8".

[ [Parent](#) ]

Re: Good deals on BIG magnets ([none / 0](#)) ([#8](#))  
by Wolfes ([wolfes--@-netzero.net](mailto:wolfes--@-netzero.net)) on Sat Jun 21st, 2003 at 12:47:29 PM MST  
([User Info](#))

There is no "Lot quantity" for the square magnet, item 0202....Are they \$140 each..???

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By [DanB](#), Section [Homebrewed Electricity](#)

Posted on Tue Jun 17th, 2003 at 01:01:34 PM MST [Wind](#)

I just assembled a webpage about the caboose windmill...

It's basicly the same as my postings from the last week, all put together in one nice long page.

<http://www.otherpower.com/davesmill.html>

Tomorrow we're going to build a tilt up pipe tower for it in a super location at the very top of a high hill! It should be a blast...

[New page](#) | 0 comments (0 topical, 0 editorial)

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## [Caboose windmill, Day 4.](#)

By [DanB](#), Section [Homebrewed Electricity](#)

Posted on Sat Jun 14th, 2003 at 07:10:56 PM MST

[Wind](#)

Today we got some rough numbers anyhow...



That's pretty much where we left off on the 3rd day of work on this project. It was basically together, and done - but the blade needed balancing, the front rotor on the alternator wobbled a bit, the airgap needed adjustment... etc. We spent a few hours making these adjustments, and repeatedly putting it together and taking it apart so that it got easy and we felt confident that it would go back together the same way every time.

I also spent some time carefully measuring the resistance of the stator (or trying to) with batteries, a volt meter, and an ammeter. I was kind of worried that it might be on the high side, and the shape of the coils bugged me a bit (they are a bit too tall and not quite as wide as they could be). Testing a single phase of the alternator consistently came in around .8 ohms it seemed. This wasn't quite as bad as I'd thought - and although it could surely be improved, it should work fine for this machine since we were really worried about getting good output in 10-20mph winds.

I also checked it with a voltmeter and a tachometer - I thought it was cutting in below 100 rpm, but as it turns out it seems to be hitting 12 Volts AC right around 115 rpm which seems reasonable for the 10 foot diameter prop we made. So, I decided not to make a new stator!.... maybe someday we'll make a better one.

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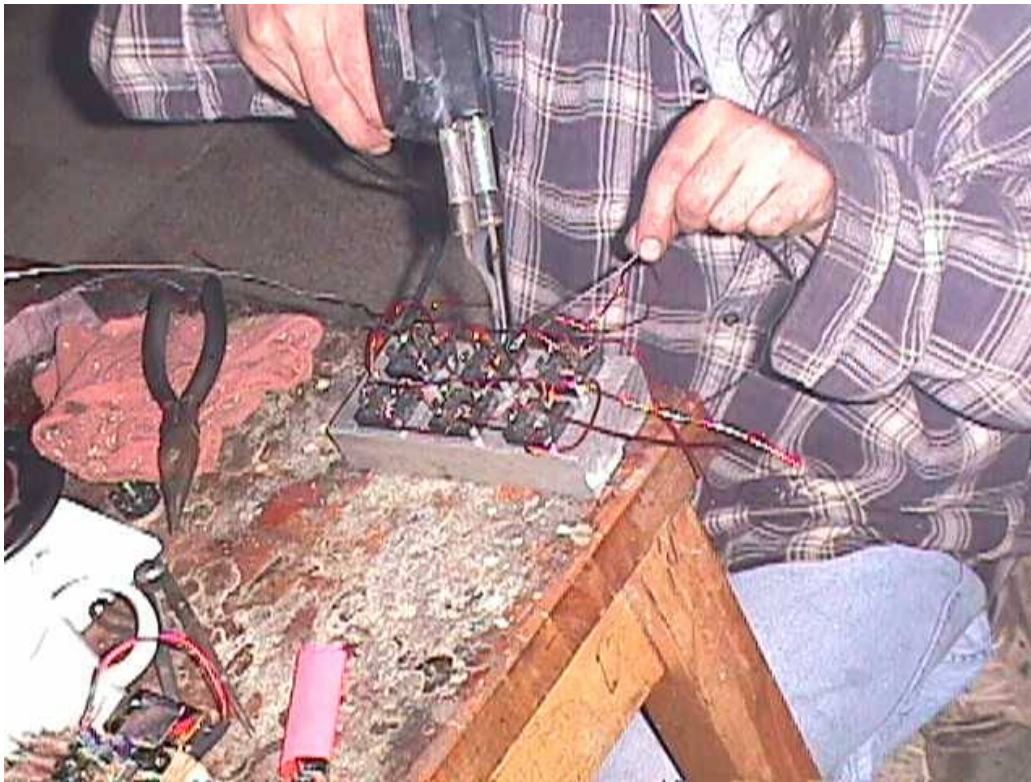
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Here Dave is soldering up 6 bridge rectifiers we'll need in order to convert the 3 phase AC current into DC current useful for charging batteries.



We made a short tower that fits the front of my truck. In the end, this short tower will go on top of Daves (probably wooden) tower down at the caboose. The machine weighs too much to lift it up this high, so we had to disassemble it, and reassemble it on the truck for testing.



It was a pretty good calm day for this sort of testing today, although the more I do it the more I'm starting to take this sort of data with a "grain of salt". We get pretty consistant readings at higher speeds, but lower speeds (like 10mph) come in all over the place. When testing like this, I have a 12 volt battery on the floor of the truck, a volt meter, a frequency meter, and a DC ammeter.

The frequency meter always gives numbers that bounce around and I don't trust it fully, but the numbers did seem to make some sense this time, so I'll write down the rpm as we got it and it may.... or may not be right! This battery was about half charged - and we ran the power to it with about 20' of AWG 14 extension cord (I figured this kind of simulates a longer line from the windmill to the battery made of better wire, plus... it was handy). When we do this, we always run one way down the road at a certain speed, turn around and go the other way at the same speed - so that we can kind of average the numbers out. Even the lightest breeze will cause it to do much better one way than the other.

So here's what we come up with roughly in the truck test...

Our neighbor Tom is in the Volvo pacing us (his speedometer works... mine doesn't) with his flashers on to warn oncoming traffic.

Remember, it starts charging at around 110-120 rpm and the frequency meter in the truck was in agreement with the tachometer I used on my workbench.

At 10mph we were getting readings ranging between 5 - 20 amps, 10 amps seemed a pretty close average, so a little over 100 watts. At 10 mph the frequency meter didn't seem to be working so we got no rpm readings. (we later found it a wire had come loose)

At 15 mph it was producing about 15 - 20 amps consistantly both directions. At 20 mph 25-30 amps, and it was just starting to furl. At 20 amps output it seems to be running right around 400 rpm. At 30 amps output it's running right at 500 rpm.

At 25 mph we seemed to be getting around 30 - 35 amps and it was furled out some all the time.

At 30 mph we got consistant readings of 37-40 amps and it was quite furled out by this time (I'd say it was at about 45 deg to the wind). At 37 amps output we recorded around 550 rpm.

I've certainly seen higher numbers from past machines which did not furl

before - but I don't think I've ever done so well at very low windspeeds, which is what's important. Output could be increased I think by adding weight to the tail (so it furls a bit later) and making a better stator. I think it's fine as is though. It runs square with the wind - the tail seems of fairly reasonable size and overall it runs pretty well. I like the double rotor design, it's a bit more work than others I've made, but it has 0 load on the bearings, and 0 losses in the laminates. I can give this alternator a good spin by hand, and then walk across my shop and give one of my old laminate alternators a good spin. The old ones will rotate once or twice and then stop... this one will keep turning for 10 or 20 seconds. Time will tell how it holds up! Sure was fun though.

We've got 4 days into it now since we started with the front strut assembly off a Volvo and all that's left to do is get it into the air down at the caboose.

[Click Here](#) to see progress on the 1st day.

[Click Here](#) to see day 2.

[Click Here](#) to see progress on the 3rd day!.

[Caboose windmill, Day 4.](#) | 2 comments (2 topical, 0 editorial)

Re: Caboose windmill, Day 4. ([none / 0](#)) ([#1](#))  
by Bach On on Sun Jun 15th, 2003 at 07:43:00 AM MST  
([User Info](#)) [change AT: bach\\_on AT hotmail.com](#)

Looking really good. What a treat to see the progress step-by-step!

One thing I did wonder about:

Are you going to leave the stator and rotor exposed? Or do you intend to make some type of cover for them? Seems like up your way that snow and ice getting in there could be a problem.

Bach On

- I'm just as happy as if I had good sense! -

Re: Caboose windmill, Day 4. ([none / 0](#)) ([#2](#))  
by troy on Mon Jun 16th, 2003 at 10:21:50 AM MST  
([User Info](#))

Are you running a pair of bridges in parallel on each phase for capacity reasons?

Thanks for the awesome work!

troy

[Caboose windmill, Day 4.](#) | 2 comments (2 topical, 0 editorial)

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[caboose windmill, Day 3!](#)

By [DanB](#), Section [Homebrewed Electricity](#)

Posted on Fri Jun 13th, 2003 at 11:46:56 AM MST

[Wind](#)

we're almost ready to strap it on my truck!

Here's what we did yesterday on Daves new wind turbine project! Again, the alternator on this is a dual rotor 3 phase machine designed for the 12 volt system in his caboose. We started this project on Tues June 10th, and this posting reflects what we did on Thurs June 12. By Wed night we had the alternator pretty much together, the chassis for the machine welded together, the tail made and the blades were cut out and the front side roughed out with the draw knife.

[Click Here](#) to see progress on the 1st day.

[Click Here](#) to see progress on the 2nd day!.



Here we are finishing up the front of the blades with a power planer. We did most of the work with the draw knife, but the power planer does nicely to finish things up quickly.

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While Dave was planing on the blades I made up a cable with lugs on it and wired the alternator in Delta. For more details on Star, or Delta wiring and 3 phase alternators, checkout Ed's 3 phase basics [here](#).



Here Dave we are roughing out the back side of the blade (making an airfoil) with the draw knife.



Same as above, working over the back side of the blades with a draw knife, but here you can really see things coming together! This blade is nearly done.



Once the blades were carved and sanded fairly smooth, we put them together - measuring from tip to tip to make sure the distance between tips is equal. Then we used 10 inch diameter plywood disks, one half inch thick, and screwed one on each side of the blades with a ton of wood screws to hold them together.





This is a simple tool I made to go with the machine. Notice my beautiful welds... (I have one of those cheap 120 AC mig welders which barely work on good power. Up here I have to run it off my generator which stalls quickly when I start welding. Welding here is very frustrating...)

Once you get two magnet rotors like these made up, and close to each other, it become impossible to pull one off without a tool. This makes the job easy. It should also be said... one of these rotors is a very powerful and dangerous thing! Two is twice as bad... anything that gets between them gets smashed. This tool does a nice job of removing the front rotor, but it's not so useful for putting it on gracefully! On this machine we've simply been lining it up and letting it snap into place which works fine as long as you keep your fingers clear! (I did get my thumb in there yesterday and my thumbnail is turning black today) Better would be for me to weld a nut right in the center of the front rotor and then we could use this same setup for smoothly lowering the front magnet rotor onto the alternator. I may do this today.



Here is a picture of the wheel puller in action. It doesn't pull it quite straight, but it does a good enough job to make it very easy to pull the rotor off by hand once it's a few inches back.



We pulled the whole thing apart in preparation for painting. Here you can see all the alternator parts on my workbench.





Here Dave is putting primer on the machine. First we ground off some of the uglier welds and then cleaned it carefully with gasoline to remove any oil.



That's pretty much where we wound up at the end of day 3! We used wood stain on the hub and tips of the prop, and on the tail. The rest is good old Avacado green epoxy appliance enamel just like on my last machine. Today we'll work on getting the wobble out of the front rotor, balancing the blade - and hopefully doing some tests on the alternator. Just turning it by hand, I'm thinking it's probably hitting cut in voltage around 80 rpm or so - which may be a bit too slow, and the resistance in the stator seems a bit high, but I've not measured it properly yet. At this time, I'm very tempted to re do the stator. The coils are a bit taller than necessary (meaning extra resistance) and since the cut in speed seems pretty slow, I'm thinking that fewer windings

of heavier wire might be appropriate here. But it would probably work OK as is and we'll probably drive it around on the truck as is and find out! (Maybe later today or tomorrow).

[caboose windmill, Day 3!](#) | 2 comments (2 topical, 0 editorial)

Re: caboose windmill, Day 3! ([none / 0](#)) ([#1](#))  
by troy on Fri Jun 13th, 2003 at 03:35:25 PM MST  
([User Info](#))

In addition to the nice mill, you have a lovely Volvo in the background. Don't steal the spindles off that one.

Best Regards,

troy

PS, if you want a treat for welding, get the portable DC ReadyWelder. Runs off 12-36 volts and has a 100% duty cycle. Makes the cheapie welders look like rubbing two sticks together for fire. They say it can do aluminum too, but haven't tried that yet. A little pricey but this is an industrial quality tool. Only takes the small spools, so that's something of a drawback, but man does it weld. I'm not that good as a welder since I don't practice much, and it makes me look good.

tr

Re: caboose windmill, Day 3! ([none / 0](#)) ([#2](#))  
by Demetri ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Fri Jun 13th, 2003 at 10:11:43 PM MST  
([User Info](#))

Fantastic machine!

You might also look into a converting Delco alternator for use as a welder. They're seriously cheap of course, and although mine didn't weld wonderfully, it was quite passable; the trick was in setting welding amps with engine speed. I couldn't find a big enough engine to power it though, I wound up using two cheapy 3.5 hp engines belted together, with pulleys off of A.I.R. pumps on the engines.

Demetri  
Always be the lead dog.

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## [Dual Rotor Brake Disk Windmill, Day 2!](#)

By [DanB](#), Section [Homebrewed Electricity](#)

Posted on Fri Jun 13th, 2003 at 08:44:01 AM MST

[Wind](#)

Another fun day on the caboose windmill!

This posting is about the 2nd day of work on Dave's "caboose" wind turbine.



This is where we left off on the first day, with the chassis mostly welded up, the stator done, and one magnet rotor finished. The first day's work is [here](#).

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Here we were putting allthread and nuts into the stator bracket to hold the stator on. The allthread is 1/3" diameter.



Pictured above you can see the notch in the tail hinge which determines the angle of the blade during normal operation and when it's furling in higher winds. We reinforced the pipe around the notch to make things stronger, my guess is it might crack eventually if we didn't.





Here Dave is putting the stator on over the first magnet rotor. It's interesting to note here... with one magnet rotor on the machine, and the 3 long pieces of steel allthread which hold the stator on, that the magnets are somewhat attracted to the allthread and at this point the machine cogs a bit. When we attended [Hugh Piggot's seminar in Guemes Island](#) in April, we used stainless bolts for this, so the magnets would not be attracted to it. I kind of wondered if this cogging would get worse with the 2nd magnet rotor on (since there'd be twice the magnets and the top rotor might be getting attracted to the nuts on the front of the stator)... or better, since the magnetic circuit would be completed and the lines of flux would be concentrated between the magnets. As it turned out, when we did put the 2nd magnet rotor on the front of the stator this cogging disappeared completely. I was planning to replace this steel allthread with stainless, but as it turns out I think it is not necessary.



Here we're gluing magnets on the 2nd rotor. It is very important that the 2nd rotor line up perfectly with the 1st one. In other words, wherever we have a North pole facing out on the 1st rotor, we must have a South pole facing it on the 2nd rotor. Keeping in mind that there are 5 studs which hold the 2nd rotor on, we have to take care to position the magnets exactly. What we did, is put the 2nd rotor on without any magnets, and made some marks around it noting the position and polarity of the magnets on the 1st rotor. We then positioned the magnets on the 2nd rotor accordingly. This worked out well.



Here we basically have the whole alternator together. At this point we could spin the alternator by hand. We're getting about twice the voltage at any given rpm now with two rotors than we were with only one before. We didn't have a tach, or even a clock with a second hand.... so no real numbers yet.



But it seems to be hitting cut in voltage (12 Volts) perhaps a bit below 100 rpm.



We soldered all the connections on the stator and made 6 lugs (2 for each phase) from brass screws and brass nuts.



Here the alternator is pretty much done, and the tail is finished! (If you look real close at the ammeter on the wall, you can see that my [last wind turbine](#) is putting out about 40 amps. It was a breezy day!)



I drew up and cut out the profile for one blade, and Dave is tracing it onto blank boards in preparation for making the other two. The wood here is 6/4 (an inch and a half thick) Eastern White pine. It's pretty lightweight, but fairly dense and strong. We have a couple knots to work around here, but not too bad.



Here Dave is cutting out the blades on the bandsaw.





Since the blades get very thin (in this case about 3/8") at the tips, it saves time to remove some of the thickness of the board with the bandsaw.



Pictured above we are roughing out the front of the blades with the draw knife.



At the end of the 2nd day we had the front side of the blades roughed out. Each blade is 5 feet long, for a total diameter of 10'. The pitch at the tips is 5 deg, and it gets steeper to about 6 deg in the middle of the blade, at which point it gets steeper quickly towards the root (near the hub) until we pretty much take up the whole thickness of the board. No real scientific blade design here, just going with what feels good and what's worked fairly well in the past! I'm a day behind now... we put our 3rd day in yesterday and I'll get those pictures up soon!

[Dual Rotor Brake Disk Windmill, Day 2!](#) | 5 comments (5 topical, 0 editorial)

Re: Dual Rotor Brake Disk Windmill, Day 2! ([none / 0](#)) ([#1](#))  
by [electronbaby](#) ([electronbaby@hotmail.com](mailto:electronbaby@hotmail.com)) on Fri Jun 13th, 2003 at 08:58:32 AM MST  
([User Info](#))

Very cool!! Wow, twice the voltage with two discs?? Cant wait to see it finished. Im currently working on a dual rotor also. Ill post it when Im finished. Im just curious what kind of spacer you made up to hold the discs the right distance apart or did you just use nuts on the allthread adjusted to the same height? Do you notice any wobble in the discs when the stator is loaded down? Im wondering if using just nuts on the allthread would be stable enough to keep the vibrations down at high rpm as opposed to a solid aluminum or stainless machined spacer?? Have fun!! RoyR

Re: Dual Rotor Brake Disk Windmill, Day 2! ([none / 0](#)) ([#2](#))  
by [DanB](#) on Fri Jun 13th, 2003 at 09:03:56 AM MST  
([User Info](#))

were just using nuts and half inch allthread.

Time will tell! I think it'll be fine, but if we must make a space then that's what we'll do. At this point, there is a bit of wobble in the front disk - although it is running flat so we could take it out with a weight.

We'll be playing with that today I think.

[ [Parent](#) ]

Re: Dual Rotor Brake Disk Windmill, Day 2! ([none / 0](#)) ([#3](#))  
by [electronbaby](#) ([electronbaby@hotmail.com](mailto:electronbaby@hotmail.com)) on Fri Jun 13th, 2003 at 09:33:08 AM MST  
([User Info](#))

A weight should work as long as its running flat. Let us know what happens :) Oh, and one more question. In the post you show a pic with your ammeter in the background and your new turbine is putting out 40A. At what windspeed do you think it was doing 40A? just curious. Have Fun! RoyR

Re: Dual Rotor Brake Disk Windmill, Day 2! ([none / 0](#)) ([#4](#))  
by [troy](#) on Fri Jun 13th, 2003 at 10:38:03 AM MST  
([User Info](#))

This is a very similar design to what I am currently working on, so I am obviously anxious to see what she'll do.

The biggest difference is that you have those enormous huge 1/2" thick magnets, while I am using the recycled big hard drive mags (39's I think).

So much fun, so little time.

troy

[ [Parent](#) ]

Re: Dual Rotor Brake Disk Windmill, Day 2! ([none / 0](#)) ([#5](#))  
by [ADMIN](#) ([admin@otherpower.com](mailto:admin@otherpower.com)) on Sat Jun 14th, 2003 at 09:59:41 AM MST  
([User Info](#))

By our rough estimate, I'd say it's doing 40 amps at 30 mph and above (thanks the furling system). We've built a couple of Bike Speedometer anemometers, but there are a couple bugs in the design we are working out. Ward is coming up this weekend with his (that broke) and we hope to finalize the design. One of them is slated to mount on DanB's windmill tower, so we'll have better data soon! DANF

[ [Parent](#) ]

[Dual Rotor Brake Disk Windmill, Day 2!](#) | 5 comments (5 topical, 0 editorial)

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## [Dual Rotor brake disk windmill!](#)

By [DanB](#), Section [Homebrewed Electricity](#)

Posted on Wed Jun 11th, 2003 at 08:46:52 AM MST

[Wind](#)

Were having too much fun this week!



Yesterday my freind and neighbor Dave came up to start building a wind turbine for his small power system. Currently he's got 2 105 watt solar panels setup which do OK, but his site is not excellent for sun. He does have a pretty good wind site up the hill from his caboose. His system is 12 volts, so were building the machine for that.

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As usual, we started with some Volvo parts (just have too many around...). We're using the front strut assembly off a Volvo 240, and two 11" diameter brake disks which fit the wheel hub. This machine will be very much like the last one I made. [Click here](#) for more details about that. The main change we're making here, is that this will be a dual rotor machine. The tail will also be slightly larger and longer. It should be slightly more powerful at lower rpm than mine was, we're using slightly more magnet and exactly the same 3 phase stator design as I did last time.



To make the furling tail assembly, I cut the strut about 6" from the wheel spindle. We want the spindle (and therefore the alternator and the prop) to be offset from the tower about 5" to the side.





I ground it out so its a good fit for welding. It will be welded on at an angle to provide more contact between the two pieces making the joint stronger. I also like to weld it on so that the spindle (and therefor the alternator and the prop) is pointed up about 2 deg to help keep the tips of the blade away from the tower.



Pictured above you can see what I described a bit better. You can also see the wedge I was setting up on the back side to hold the tail pivot out at about 20 deg.



I like to cut the brake rotors down so that there is a slight lip (about 1/16 inch) to hold the magnets in. This helps a bunch too in spacing the magnets out evenly later. Pictured above Dave is doing this on the lathe.



Here Dave is learning to run the lathe and his freind Fred is cutting up various metal pieces which we'll need.





This is how the brake rotors look after cutting them down to make a lip on the outside which holds things together. I don't think this step is necessary - but it's easy and provides some insurance against magnets flying loose. It also makes a nice clean flat surface to put the magnets down onto.

You'll notice that the rotor on the right side has a larger hole in the middle than the one on the left. We turned it out a bit so that this rotor could actually fit on the back side of the wheel hub! (where I put the stator on past machines...). This way the back rotor sits behind the wheel hub with its magnets pointing forward towards the stator.



Here Dave is struggling with strong magnets trying to lay them down with about a quarter inch between each one. They kept sliding together - he was

getting a bit frustrated! These magnets are 2" diameter X 1/2" thick. They go down with alternating poles up. Were using 12 of these on each rotor. Once they get placed down and approximately evenly spaced, we used playing cards as shims to make sure the space between each magnet was exactly the same. Its kind of trial and error, but it goes very quickly. Once they are right - a few spots of super glue on each magnet holds them in place untill we pour polyester resin around them.



Since this is a dual rotor machine, the stator will not be able to bolt on in place of the backing plate like I've done in the past. The stator will have to be in between two rotors, and held on by a bracket which ties into the outside of the stator. These are the pieces I made up for this bracket. The bracket will actually bolt on in place of the backing plate (to the strut assy behind the wheel spindle). These 3 pieces are cut from 3/16" thick X 3" wide steel, and they are 7" long.





Above you can see how those go together. After this we drilled holes in the center to bolt it down, and a large 1.75" dia hole in the center for the wheel spindle to pass through. We also need to drill holes out at the ends to accept allthread so we can mount the stator to it.



Pictured above Dave is winding up some coils. Just like my last one, each coil occupies the space of about 1 and 1/3 magnets (so 3 coils take up space occupied by 4 magnets, so there are 9 coils in the stator). Its 3 phase, so each phase consists of 3 coils in series. The coils are made up of 65 windings of AWG 14 wire.



Here Dave is putting duct tape around the inner and outer diameters of the magnet rotor. This simply serves as a "quck and dirty" sort of mold, so that we can pour the resin around the magnets and it hopefully wont run out the sides!



Pictured above is the mold we made for the stator, and we're putting some fiberglass fabric in the bottom to strengthen it.





We first poured a bit of resin in the bottom of the mold (got the fabric saturated) and then placed the 9 coils in. Then we cover the coils with more fabric, and pour resin over those and put the lid on the mold.



Here we are pouring resin (mixed with talcom powder) into the magnet rotor. We'll have to make 2 magnet rotors, but for now we're just doing one. It is possible the alternator will work OK with only one magnet rotor and the other rotor simply serving to conduct the field of these magnets (like laminates except it'll be rotating) - so we're not doing the 2nd rotor until we test the alternator. We may even decide to use different magnets on the 2nd one.



Pictured above the main chassis of the wind turbine is pretty much together. You can see now how the stator bracket bolts on.



Here you can see the magnet rotor, and the stator mold while the resin sets up. The battery serves as a weight to hold the top of the mold down tightly.





After about 2 hours we opened the mold and took the stator out.



Above you can see how we replaced the studs in the wheel hub with long (10 inches) pieces of allthread. The allthread will serve to hold the magnet rotors, and the prop securely to the wheel hub.



That's where we were at after 1 day (About 8 hours of work). You can see things starting to come together! My guess is we'll have this done in another day or two. It should be said, this machine is very similar to the one we built at the [SEI Wind turbine workshop on Guemes Island](#) in April. It's very much along the lines of Hugh's [Axial Flux Windmill Plans](#). If I really wanted a guaranteed good machine, I'd probably follow them to the letter, but I like to play with junk I have on hand and experiment a bit. I should also say - again, we have about 8 hours into this so far, and I believe we'll have it completely finished in about 20 hours. But it might come out a bit cleaner, prettier - and possibly a lot better if we took a little more time on certain steps. Time will tell! It's fun though, and since I have limited time to put towards this sort of thing, and Dave only has a few free days available, we're trying to move things along quickly.

[Dual Rotor brake disk windmill!](#) | 4 comments (4 topical, 0 editorial)

Re: Dual Rotor brake disk windmill! ([none / 0](#)) ([#1](#))  
by [electronbaby](#) ([electronbaby@hotmail.com](mailto:electronbaby@hotmail.com)) on Wed Jun 11th, 2003 at 09:25:50 AM MST  
([User Info](#))

Very nice Dan!!! Looks like its coming along very nicely. Cant wait to see what she puts out. Good luck and have fun. RoyR (electronbaby)

Re: Dual Rotor brake disk windmill! ([none / 0](#)) ([#2](#))  
by [troy](#) on Wed Jun 11th, 2003 at 09:54:15 AM MST  
([User Info](#))



Can't wait to see the numbers! Also anxious to see data from the "passive" second rotor idea in lieu of lams or a second set of magnets.

Those are some scary big magnets by the way...

Best Regards,

troy

Re: Dual Rotor brake disk windmill! ([none / 0](#)) (#3)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Wed Jun 11th, 2003 at  
07:05:26 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Looks great Dan! I sure wish we lived closer... I could become a pest with projects... Is there a law in Colorado about haveing to much fun? You'd better hope not!!!

Great Fun... waiting for some numbers...

Ed

Re: Dual Rotor brake disk windmill! ([none / 0](#)) (#4)  
by scoraigwind ([magnet@scoraigwind.co.uk](mailto:magnet@scoraigwind.co.uk)) on Thu Jun 12th, 2003 at  
03:47:09 PM MST  
([User Info](#)) <http://www.scoraigwind.co.uk>

I love it.

I especially like the simple stator mounting bracket.

You could make the magnet positioning easier by whittling some pieces of stick to fit between them as you put them in. You can start removing the sticks once you have got some way into it because the magnets do not wander so eagerly once they have partners on each side.

I think some cars have flat disks that would be much esier to mount because you don't have to allow for the deep offset when you come to mount the disks apart.

Get some rpm data for the machine this time :-)

can't wait for the next instalment.....

Hugh Piggott <http://www.scoraigwind.co.uk>

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## [Whole new can O' Worms....](#)

By [DanB](#), Section [Remote Living](#)

Posted on Fri Jun 6th, 2003 at 09:20:20 AM MST

Earlier this week I traded a solar panel for this...

---

[Free Energy](#)

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It's a modern 1 hp Mike Brown steam engine. When I got it the bolt that held the crank to the crank shaft had sheered off. Took a couple hours to disassemble it, easy-out the bolt and fortunately I had the right part in my bolt bucket.

Lots of cleaning, it was almost stuck due to very hardened grease in the packing glands and the crosshead. But now it runs great on 80 pounds of compressed air and it's surprisingly powerful and runs for a surprisingly long time off my small air tank.

Now I get to learn about boilers and all the good stuff in between! I've been wanting to do this all my life, so it should be fun. Fortunately the engine came with a couple videos and the book which came with it when new. These Mike Brown engines seem really well made, with good bearings everywhere and tight tolerances. New they cost around \$1000, a bit out of my league for a "toy" - but in xchange

for a solar panel I couldn't turn it down. Although I don't really need the power - I'm dying to see it spin and generate some power off a wood fire!

Mike Brown seems an interesting fellow judging from his website!

<http://www.mikebrowsolutions.com/1hpapic.htm>

[Whole new can O' Worms....](#) | 3 comments (3 topical, 0 editorial)

Re: Whole new can O' Worms.... ([none / 0](#)) ([#1](#))

by TomW on Fri Jun 6th, 2003 at 04:33:09 PM MST

([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Dan;

Pretty neat. I would love to make power from wood as we have a lot of renewables in the timber resource here.

If I wasn't scared to death of steam explosions I might try one.

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Re: Whole new can O' Worms.... ([none / 0](#)) ([#2](#))

by Norm on Wed Jun 18th, 2003 at 06:55:23 AM MST

([User Info](#))

Afraid of steam explosions, you must read a lot more of the website that Dan gave a link to in his story, like he said he mentioned compressed air, pressure cookers. I started reading some of his articles they were very interesting. very refreshing after wading thru muck and mire of 'free energy' (free energy...Yuk!) (:>) Norm.

[ [Parent](#) ]

Re: Whole new can O' Worms.... ([none / 0](#)) ([#3](#))

by 12volt dan ([dan12v@hotmail.com](mailto:dan12v@hotmail.com)) on Fri Aug 22nd, 2003 at 10:28:28 PM MST

([User Info](#))



As a fellow Dan and a internal combustion mech i can say that you will probably recover more energy with that engine than a 100 watt solar panel during the winter ( when the stoves running)

enjoy and keep us informed  
7 years off the grid and counting

[Whole new can O' Worms....](#) | 3 comments (3 topical, 0 editorial)

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## [Furling tail](#)

By [DanB](#), Section [Homebrewed Electricity](#)

Posted on Mon Jun 2nd, 2003 at 07:11:20 PM MST

[Wind](#)

We had some good winds with 50+ mph gusts this evening...

---

OK.. sorry they're dark and blurry, I'll try to get those photography lessons soon :)

We had some real good winds and high gusts over 50mph this afternoon and I got to see the furling tail working very well. Had it not been furling out, I suspect my wooden tower would've broken today.

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This picture is from behind the machine, you can see how the alternator rotates 'round so the blades become more parallel with the tail.



Pretty bad picture... it was raining on me and really windy, but you can see how she was really getting nailed by the wind here...

After watching this, it was clear my tower needs a bit of work if it's going to support this 9' diameter machine. Shortly after taking these pictures I ran in and shorted out the machine to shut it down and protect the tower. It was producing about 40 amps when I shorted the 3 leads, and it stopped very quickly and never turned more than a couple rpm after that even in very high gusts. I made a couple changes and added some fun pictures of testing this machine on the truck last week to the page: <http://otherpower.com/bdwm53.html>

[Furling tail](#) | 8 comments (8 topical, 0 editorial)



Furling tail ([none / 0](#)) (#1)

by Gary D on Mon Jun 2nd, 2003 at 08:22:49 PM MST

([User Info](#))

Hi Dan, the pic's show the furling great! Never understood the "lifting" effect explained and shown like this before. Very understandable (at least to me). Was looking at your furling setup pic. and wondered if a washer was used as a stop to keep the tail from coming around into the blades? Is this design in Hugh's Book?

Also wondered if you are going to get any more 1 inch by 3/8 disc's in or are they history?

Thanks and great workmanship as usual Gary D.

1" disks... ([none / 0](#)) (#3)

by DanB on Mon Jun 2nd, 2003 at 09:43:27 PM MST

([User Info](#))

we should have those...

if the shopping cart shows were out - Ill check tomorrow when Im in town and see. usually - when the SC says were out its not true :)

Its kind of a safety thing so we dont sell more than we have.

[ [Parent](#) ]

and the washers... ([none / 0](#)) (#4)

by DanB on Mon Jun 2nd, 2003 at 09:50:19 PM MST

([User Info](#))

the washers serve both as a stop for the tail and to reinforce the tail pivot. It's exactly Hughs design except he used a somewhat tidier piece of steel which was cut at the 20 deg angle and served the same purpose. I just didnt have the patience to find and cut the steel - the washers were handy and reasonably thick, so it is strong.

[ [Parent](#) ]

looks good ([none / 0](#)) (#2)

by billf on Mon Jun 2nd, 2003 at 09:29:00 PM MST

([User Info](#))

Great job on the mill and it looks good! I'm glad you have added furling and Hugh's design seems to work well for us homebrewers. I can't over emphasize the importance of having some sort of self limiting system designed into each mill. After a year I think I've hit on a good combination of tail size and weight to control output on mine and limit the lateral loading on the tower. It's still hairy though watching the tower sway and the mill furl in a strong thunderstorm.

billf

very dynamic pics ([none / 0](#)) (#5)

by Chuck on Tue Jun 3rd, 2003 at 09:36:46 AM MST

([User Info](#)) <http://www.greeleynet.com/~cmorrison>

Dan,

Boy, you really get a sense of the violence in the wind from your shots. And yes, that was some storm. When it came through here it just about flattened some of our small trees. Just for reference, Here are some shots of my test mill unfurled and furled on a much more pleasant day.



This is sitting at rest without any wind.



Here in about a 20mph wind the tail is partly furled.  
Chuck

Question regarding the T arm.... ([none / 0](#)) (#6)  
by TomW on Tue Jun 3rd, 2003 at 11:23:10 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Can you explain that T arm thing just below the blade tips?

Cheers.

TomW

[Stuff I have Online](#)

[Contact Me](#)



the T Arm... ([none / 0](#)) ([#7](#))

by DanB on Wed Jun 4th, 2003 at 06:48:22 PM MST

([User Info](#))

I should make a page about my tower so everyone could have a good laugh...

The "T Arm" is actually a foot - so the tower comes to rest on it so I dont smash the machine when it comes down.

in the past, with "non-furling" wind turbines, I always made them tail heavy so they'd come down on the tail. (lots easier to fix a tail than the prop!)

I actually plan to stick an anemometer up on there probably tomorrow (on the foot).

[ [Parent](#) ]

Re: Furling tail ([none / 0](#)) ([#8](#))

by labinnah on Tue Jun 17th, 2003 at 08:45:43 PM MST

([User Info](#))

DanB when you shut your windmill down because of the high winds you stated that you shorted the 3 leads, causing the blade to not turn anymore. Could you please elaborate on this on why that works that way. I am looking to design a windmill that will have to live in hurricane area and am curious as to what design features I can add that would help it's survivability. Any other comments on high wind conditions would be welcome as well, for I am a novice in these matters. Thanks

[Furling tail](#) | 8 comments (8 topical, 0 editorial)

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## [Latest project](#)

By [DanB](#), Section [Homebrewed Electricity](#)

Posted on Sat May 31st, 2003 at 05:04:00 PM MST

More fun with Volvo parts!

[Wind](#)



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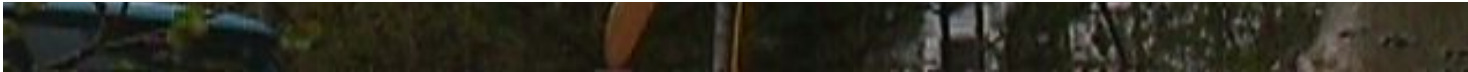
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This is the machine I made last week after making all those coils tests. Thankyou Ed for the laminates, and Hugh for lots of ideas!

This machine doesn't represent a huge increase in power over the last one I made with a 9' prop... it's probably about the same. But it turns much more freely and is very quick to respond to very light breezes. Very rarely do I catch it not turning, even on seemingly still nights. In 7mph it's definitely turning and making an amp or two and about 8 - 10 amps at 10mph.

There are more details about it here: <http://otherpower.com/bdwm53.html>

It took the better part of a week (5 days) to put this together, probably about 30 - 40 hours.... and it was a fun week! I got it on my tower and erected at 1am thursday morning.

[Latest project](#) | 9 comments (9 topical, 0 editorial)

Nice Job Dan!!! ([none / 0](#)) (#1)

by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Sat May 31st, 2003 at 06:56:26 PM MST

([User Info](#)) <http://www.windstuffnow.com/main>

You definately put some elbow grease into that one! You probably have just as much time in the web page for it... took me a while to read and look at all the pictures. I like that, quite complete. Thanks for all the mentions also.

Keep up the great work!

Having fun yet?

Ed

Use some of that power for....Lighting ([none / 0](#)) (#2)

by Wolfles ([wolfles-@-netzero.net](mailto:wolfles-@-netzero.net)) on Sun Jun 1st, 2003 at 12:24:36 AM MST

([User Info](#))

Dan, please get some lighting for your pictures or take a photo course. I can't see what you are dis-cribing. ....I like what I can see and would be able to interupt better with light. ....

Thanks for sharing,.....

MyWattsWorth,...

Les

very nice ([none / 0](#)) ([#3](#))  
by scoraigwind ([magnet@scoraigwind.co.uk](mailto:magnet@scoraigwind.co.uk)) on Sun Jun 1st, 2003 at 03:20:12 AM MST  
([User Info](#)) <http://www.scoraigwind.co.uk>

what a lovely job, Dan

I wonder why you made the blades turn counter-clockwise?

Also - what grade are the magnet blocks? They are huge! I guess they would be expensive?

I wonder how you get mph data? Is this from the truck test? Is it flat acm or how do you prevent background windspeeds influencing the data?

I have put a link to that diary on my homebrew windpower page. I have just been updating the page anyway.

Thanks for the lovely pictures. If they get dim I just tilt the screen on my laptop a little. I could probably also adjust the brightness in a control panel. Or download the picture and adjust it in a graphics package.

Hugh Piggott <http://www.scoraigwind.co.uk>

Counterclockwise?? ([none / 0](#)) ([#7](#))  
by DanB on Sun Jun 1st, 2003 at 08:20:26 AM MST  
([User Info](#))



I don't know Hugh - I never really think much about that actually. I suppose the only reason to go one way or another would be the nature of the wood in the prop.. if one was avoiding some blemishes it could determine clockwise or counter.

Yes, I tested this on the nose of my truck. Kind of rough data, but I've tested them all this way so it's kind of becoming a good comparison now! My guess, is on the truck, although there is little to interfere with wind coming at the machine (its up about 15 feet and 8' roughly above the hood) and located in the very front) I suspect air could pile up against the cab some and affect it - probably for the worse but it's hard to say.

Yes, the magnets are huge, and would be kind of expensive. I guess, overall they have about the same overall mass as the magnet you're using in your dual rotor machine - although I believe your alternator is more effective because I know that using magnets half as thick on each side gives much better results over an airgap like this than using full thickness on one side and laminates on the other. I tested that...

Overall I'm happy with it. A couple hours I could change it to be a dual rotor machine (the stator was made with that possibility in mind), but as it is it's performing reasonably well in very low speeds which is what I want.

[ [Parent](#) ]

It is really nice job ([none / 0](#)) ([#4](#))  
by hvirtane on Sun Jun 1st, 2003 at 03:21:14 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

I looked at your pictures and texts.

I'm sharing the comment that your pictures are really dark.

You've made most of the improvements, which were there waiting for your earlier machines.

I think that the furling system is really important.

The work you've done testing different coils is very valuable for others as well.

For the area, where I'm living we need machines, which will generate good power even under 5 m/s wind. That might be possible to achieve by changing the design by adding more blades and moving the laminates nearer the coils...?

- Hannu

Sorry about the dark pictures... ([none / 0](#)) (#8)  
by DanB on Sun Jun 1st, 2003 at 09:22:27 AM MST  
([User Info](#))

Lots of my pictures were taken at night... it gets tricky :)

Yes, I think the furling is system is wonderful. Truly I've not had real problems up here with machines breaking down due to a lack of it, but we rarely see high and sustained winds. For me, in this environment - the furling system allows a much larger machine on a smaller tower. In the setups I've made which do not furl, the tower is the scary part in high gusts.

Regarding generation in low windspeeds... I'm not sure, but this one does seem to do well I think. A bit over 100 watts at 10mph it seems, and it starts up and spins freely well below that. Although there is a bit more power there to be had... I don't think there is much. Tweaking the blades a bit might get more - I don't think more blades would be the answer as it has no problem spinning up quickly and cutting in below 10mph. Slightly faster blades might help, but I tend to doubt that because I see it start up in the slightest breeze and it comes right to cut in voltage and sits there most of the time, making a little bit of power as it becomes available from the wind.

Too much fun - I can spend hours listening to the breezes and watching the meters! We've pretty much gone into summer and the windy season is over so I'm getting a good feel for how this one runs in very light breezes.

[ [Parent](#) ]

pics ([none / 0](#)) (#5)  
by Johnny Cool Pants on Sun Jun 1st, 2003 at 04:23:59 AM MST  
([User Info](#))

Wow! What a beauty!

Pics looked okay to me,  
nice kem traes in the background by the way.

JCP

PS ([none / 0](#)) ([#6](#))

by Johnny Cool Pants on Sun Jun 1st, 2003 at 04:28:08 AM MST  
([User Info](#))

on your other page I mean

--> <http://otherpower.com/bdwm53.html>

Dan make me some blades, I'll give you an original painting.

Worth big buck\$\$\$\$\$\$ cause I'm

Johnny Cool Pants

[ [Parent](#) ]

First Class! ([none / 0](#)) ([#9](#))

by troy on Sun Jun 1st, 2003 at 02:47:57 PM MST  
([User Info](#))

Hey Dan,

An excellent and inspiring mill. Every mill that you make reduces our need for polluting fossil and nuke fuels, along with reducing our dependence on the middle east.

And I'm sure it has a multiplying effect. Every additional successful mill on the website is going to inspire a dozen other successful mills out there, which will inspire other mills...

Anyway, keep up the wonderful work.

From the very hardheaded and unreasonable legalist,

troy

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## [PMA Efficiency](#)

By [DanB](#), Section [Homebrewed Electricity](#)

Posted on Tue May 27th, 2003 at 01:01:08 AM MST

[Alternators](#)

What is the best one can hope for...

What is the best one can hope for in a wind turbine that uses a permanent magnet alternator at say... 30 mph, assuming the machine "cuts in" (12 V) at a reasonable speed, say 10mph? Seems like if open voltage on the alternator at 10mph is 12 volts, then it should be around 36V at 30 mph - assuming the machine has a fixed prop that runs at a fairly constant tip speed ratio. So by nature it seems like the alternator that produces efficiently at 10 mph must be fairly inefficient at 30 if it has enough resistance to allow the prop to run where it wants to. Seems like the only way to avoid this would be the use of some electronics to change the wiring configuration of the alternator... Or possibly a 4th diode in the center of the star in a multiphase setup like I posted earlier?

[PMA Efficiency](#) | 19 comments (19 topical, 0 editorial)

PMA efficiency ([none / 0](#)) (#1)

by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Tue May 27th, 2003 at 08:26:53 AM MST

([User Info](#)) <http://www.windstuffnow.com/main>

Are you talking about overall efficiency or simply alternator efficiency? The best unit I've ever seen was an axial flux unit making an efficiency of 96%. This was a motor/alternator combination. Extremely low resistance and very little heat was created while the alternator was in operation. The best I've achieved to date is 90%, this was an axial flux unit with silicon slotted stator, low resistance and N35 neo's. Air gap of .025". Conventional wiring. The only reason, I can see, that the efficiency drops is because of heat losses. Once the unit starts heating up the efficiency drops progressively as heat increases. The resistance in the wires provide a perfect place for the heat to build up. On the other end of it, the stator itself will build heat to a certain degree. The thinner the steel strips in the stator the less heat will be created. The stators built with standard sheet steel used .030 created a considerable amount of heat under load, I switched to .019 silicon and the heat was considerably lower. I'm now using .014 silicon and the heat problem is just short of going away. Most of the heat now is in the wires. I'm building a multi disc, multi stator axial flux unit now, which I hope to have completed by this coming weekend barring any interruptions. Basically 4 alternators in series. A 3 phase unit. It's proven quite challenging to this point in design.

On your "4th diode", I'm not sure what your suggesting here. In a star configuration the ends are tied together the starts are the output. In delta the starts and ends are together and the ends of each are outputs. Basically two different wiring schemes. I've used relays to run both on a mill which works out very nice, at least on a small scale.

This is the configuration on my small downwind using RobD's star/delta switch control. You'll have to explain the "4th" diode idea in greater detail or post a drawing... much better for me to understand a drawing than it is picturing words. Delta wiring also has its drawbacks for efficiency because it has a tendency of back cycling current through one phase while in operation but still offers benefits, especially on higher resistance units.

Another fun subject... Lets hear more on this... Lets get lots of opinions going

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Have Fun  
Ed

Thanks Ed... ([none / 0](#)) (#2)  
by DanB on Tue May 27th, 2003 at 08:53:33 AM MST  
([User Info](#))

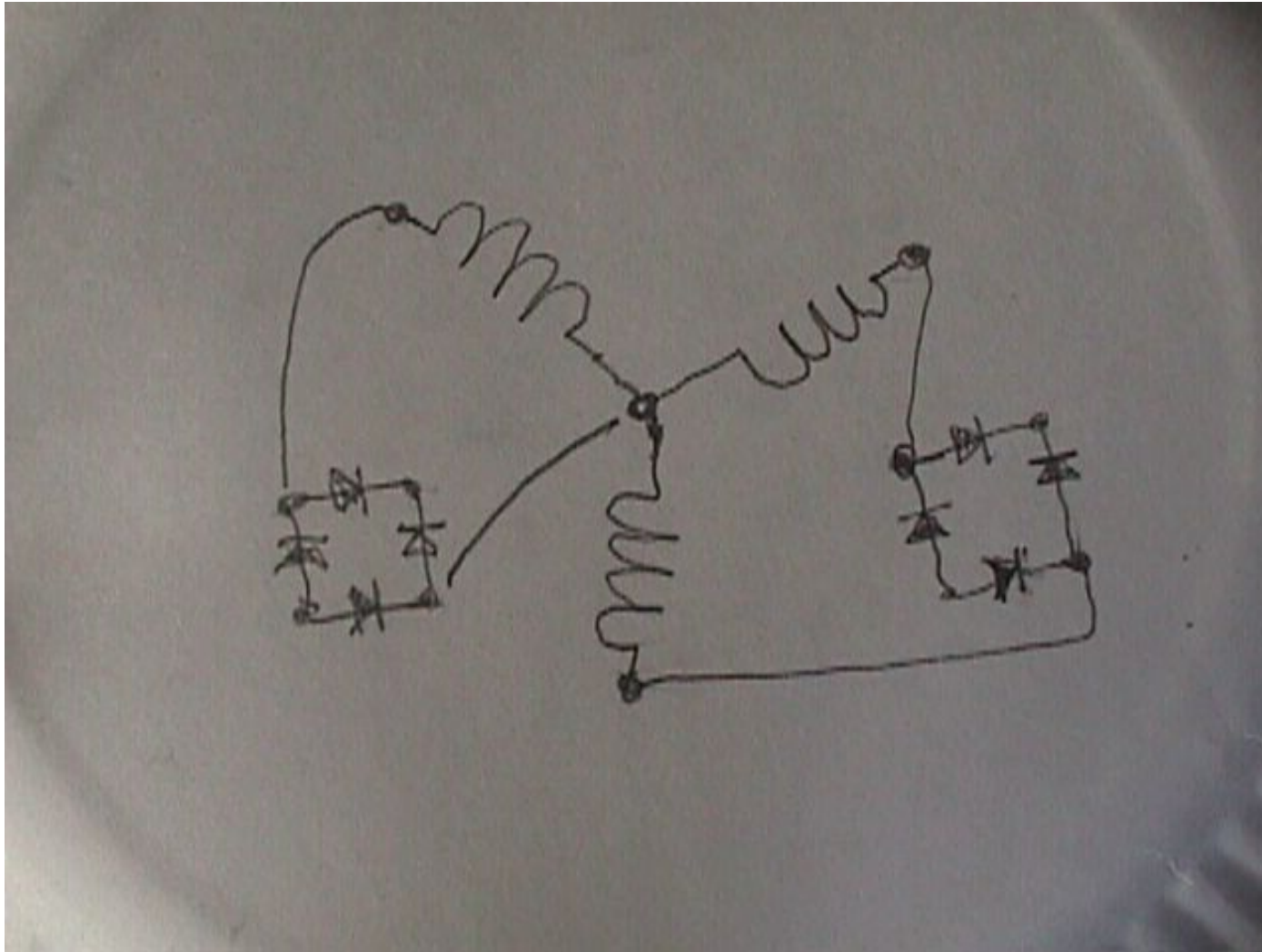
Thankyou for the reply. I guess what I'm saying... relates to matching the alternator to the load.

If the load is a battery, and the alternator is well matched to the battery at a low rpm (like 10mph) - where it is probably most efficient. Wouldn't you agree that they must be most efficient at low outputs?

If the prop has a fixed TSR of say... 7, then the alternator must run at 3X the rpm @ 30mph than it does at 10mph, and in order to allow the prop to do that, there must be some resistance in the alternator (if there was 0 resistance then it would take an infinite amount of energy to speed it up past cut in right?) - so either the alternator must allow the prop to speed up and be... fairly inefficient since the battery voltage doesn't change - or the prop would speed up very little at higher speeds and become inefficient (or go into stall).

So if we have an alternator which is producing 15 volts open in a 10mph (a good match for charging a 12V battery), then in must be producing 45 volts open at 30mph and it must have enough resistance in it to allow the prop to run at that speed, so therefor it must be fairly inefficientt at 30mph.

Regarding the 4th diode.... In a star connection, the terminals - like you said, are at the starts of each phase, and the phases are basicly in series. What if we added the 4th rectifier in the center of the star connection (this would be at the "end" of each phase where all 3 phases are connected). It would be lower voltage (like Delta) so the machine would cut in early due to the star connection, but then when rpm got up a bit you'd have available current between the center of the star and each leg. Does this make sense? - it would have to come down on 4 wires. Something like this:



So the output off the legs which we normally get would be higher voltage and "cut in" early - but current would start to flow from the center at higher rpm and be very low resistance. Does this make sense at all? (I'm showing off my lack of understanding here....)

[ [Parent](#) ]

4th dimension... ([none / 0](#)) (#3)

by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Tue May 27th, 2003 at 10:20:47 AM MST

([User Info](#)) <http://www.windstuffnow.com/main>

I see what your doing... Just looking at the drawing, wouldn't you need 3 rectifiers? All going from center connection to end connectors...? This would allow the ends of the star to produce voltage then you'd have to switch to the output of the 3 rectifiers at speed. Thus reducing the resistance by 2. In Delta configuration you basically reduce resistance by 3 or 1/3 of star so your gains would be higher.

It seems to me... and this is just a theory at this point... that the wind coming through the prop is cubed and the alternators are linear. With less resistance in the wires and slower turning props we can just about match the cubed input. Since say a TSR of 1 on an 8ft prop changes the rpm very little as the wind increases and low resistance reaps large gains with minor rpm changes there would be a simple match. On the other end of it, we don't necessarily need speed to generate power we need torque. The speed change would only be relevant when torque is needed (power increase). ( Thus the Free wing idea). As an example... say we have an alternator with extremely low resistance, A large prop turning very slowly and the increased wind would only change the prop speed by say 1 or 2 rpm but the power coming through the prop is cubed so the change in speed is absorbed as torque into the alternator.

Even though the alternator only changed 1 or 2 rpm the increase in power is significant. Its hard to envision from words but when you work out the numbers in an extremely low ohm alternator the change is quite significant. For instance lets say we build an alternator that makes 12V at 30 rpm and has a wire resistance of .1 ohm. So its making 2.5 rpm per volt. At 35 rpm (only 5 rpm difference) its making 20 amps... when it jumps to 40 rpm its making 40 amps and so on... Since windspeed and rpm are linear through the prop we can make an alternator that produces cubed output in relation to input power. Its an interesting subject and I've been trying to work out some details about the relationship for years. My Freewing design utilizes pitch change instead of speed to overcome the linear speed relationship to the cubed power input. This offsets the low resistance problem and torque needed to get the speed. But I'm not convinced its actually needed with the right fixed pitch prop and alternator configuration.

More Food for thought... Don't ya just love working through complex problems? Its easy to build a complex machine but its more difficult to build a simple machine.

Still having fun!

Ed

[ [Parent](#) ]

Star/delta switch ([none / 0](#)) (#4)  
by Gary D on Tue May 27th, 2003 at 09:50:15 PM MST  
([User Info](#))

can the star/delta switch be used in a single phase machine? On the website, it's stated it is for 3 phase machines. As for Dan's thought of increased resistance, if you had say 20 coils in sections of 5, all starting in series. at a set voltage couldn't you split it to 2 sets of ten, then at another voltage setpoint cut it to 4 sets of 5 coils? Wouldn't that help keep the heat away a certain ammount from the coils? Match the coils to the blade rpm, so to speak? Just rambling here, no hands on yet. Gary D.

[ [Parent](#) ]



efficiency and speed cahange ([none / 0](#)) (#5)

by scoraigwind ([magnet@scoraigwind.co.uk](mailto:magnet@scoraigwind.co.uk)) on Wed May 28th, 2003 at 01:12:22 AM MST

([User Info](#)) <http://www.scoraigwind.co.uk>

Dan, you have put your finger on the big design challenge. It is not hard to design an alternator to cut in at the right speed. and the speed will increase as you put a load on and thtorque and current go up. But an efficient alternator will only need a little extra open circuit voltage to push plenty of current out so it will only increase in speed by a small amount.

Very efficient alternators work at near constant speed and this presents a probelm for the blades. Blade performance is best if the speed varies in proportion to windspeed. We do want the speed to rise to about 3 times the cut in speed before we get full power.

There are several possibilities.

Settle for a less efficient alternator (easy to do in the days of ferrites and still very possiblle if you make a small one and cool it well.) We'd like to do better, though.

Or you can switch star/delta. I have done this but neither of the two is very well matched and I always seem to like the star connection better. Delta goes rather too fast when the wind dips.

Using a DC-DC converter like Bergey windpower and some others is probably the ideal solution but you need to know your power electronics pretty well. then you can let the speed rise and the voltage rise at the alternator and convert the extra volts into extra amps with electronics.

Or you can try to make the blades work better at varying tip speed ratio. This solution appeals to me becuase it is nice and quiet if you hold the speed down. It also has a better chance of working well if the wind keeps changing.

Finally on the question of the rectifier, it is fine the way you have drawn it but it can cause some confusion where people think that only two AC wires are usable because they are on a single phase bridge. A better way to draw it is to show that each AC wire has a diode to the positive and a diode to the negative. so you can get circuits between any two AC wires and the battery. The physical layout of the diodes may be as shown but in fact the AC wires are all connected in the same way and so Ed need not worry.

Hugh Piggott <http://www.scoraigwind.co.uk>

[ [Parent](#) ]

My two cents' worth is only water ([none / 0](#)) (#6)

by hvirtane on Wed May 28th, 2003 at 03:51:47 AM MST

([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

While I'm thinking that Ed's comment is quite much on the right track and waiting impatiently for results of his new projects (multiple disc alternator and the 'free wing' design) I wanted to ask for your comments on my old idea as a solution for the problem.

a) Controlling the speed of the windwheel makes it not efficient on broad ranges of wind speeds.

So it is maybe best to change the speed of the windwheel according to the speed of wind. (Fixed TSR)  
(Ed's 'free wing' might have a solution to this problem.)

b) Varying the RPM of a generator with the speed of the windwheel creates another problem. Generators are efficient only at narrow band of RPM.

-----

So why not to use water as 'a transmission gearbox'?

If the windwheel is running a pump to pump up water in reservoir and the power is taken out by a water turbine, when the water is running down:

1)

a) Water turbines can be made more than 90% efficient.

b) The water wheel (maybe pelton) can run at a fixed speed so that the generator can run at its best efficiency speed. (We can collect water in the reservoir, when we get it more from the windpump than we use in the waterwheel to generate electricity.)

2)

a) I think that pumps are even more efficient than water turbines, but are they efficient at different speeds?

b) If they are we can let the windwheel to change its speed according to the speed of the wind so that it is reasonable efficient at different wind speeds.

- Hannu

[ [Parent](#) ]

Gravity issue ([none / 0](#)) (#7)

by Bach On on Wed May 28th, 2003 at 07:00:16 AM MST

([User Info](#)) [change AT: bach\\_on AT hotmail.com](#)

That's an interesting concept.

But isn't there some theoretical or practical limit on how high a standard pump can raise water? Seems like it was 32 feet. Modern pumps overcome this for deep well systems, but they do it at a cost - substantial \$\$\$.

Is this going to be practical for a wind ginny?

Bach On

- I'm just as happy as if I had good sense! -

[ [Parent](#) ]

practicalities ([none / 0](#)) (#8)

by wpowokal on Wed May 28th, 2003 at 08:34:15 AM MST

([User Info](#))

Yes 32' in theory at sea level, decreases with altitude.

I'm not sure if the discussion is around pumping water with electric pumps or the classic windmill to reciprocating pump.

Having had experience with windmills I suspect that is not an option, and if electric pumps are to be used then we are still talking about a wind generator.

Water storage could have applications in "low" of batteries, power utilities that have hydro systems use this principal. They pump water up overnight while system load is low and generate with the stored water during peaks in power demand.

So yes the idea has merits in my humble opinion, but not for all, the additional infrastructure would negate the benefits for many.

regards Allan

[ [Parent](#) ]

Water lift VS, water push ([none / 0](#)) (#10)

by Gary D on Thu May 29th, 2003 at 07:16:55 AM MST

([User Info](#))

I think you are comparing lift (suction) versus push. A pump can much more easily push water than suction it. It doesn't take a strong submerged pump to push water uphill. Likewise even a jet pump with a foot valve can push water much further but not as effeciently. Just a thought. The Dan's and anyone associated with fire equipumnt or plumbing can back me up if they wish. We always put the portable pumps as close vertically to the water supply for this reason. just my 2 cents take it or leave it sit . Gary D.

[ [Parent](#) ]

lift vs suction ([none / 0](#)) ([#12](#))  
by troy on Thu May 29th, 2003 at 11:44:44 AM MST  
([User Info](#))

You are fully correct. Lift (vacuum driven) is limited to ~32' at sea level, less at altitude. But pushing water (pressurized) is a whole different matter. Pressure can go up forever, albeit at higher cost eventually. You can pump water up a thousand feet in a skyscraper. Positive displacement pumps tend to be more efficient than rotary/centrifical pumps, but have more moving/wearing parts.

The general idea of using water for energy storage is a sound one, as some utilities use big resevoirs for exactly that purpose, using the stored water to drive generators during peak demand, then pumping the water back uphill during low demand (overnight).

The Achilles heel with this system is the size of the water storage needed to generate any significant amount of electricity. Plus, any time you use a multistep approach, each little conversion in the system costs you some efficiency. So we have added pipe friction and pump friction and eventually we still have to spin an alternator, which has its own losses.

Again, not that it won't work, just that it adds a certain complexity and some loss of overall efficiency.

Best Regards,

troy

[ [Parent](#) ]

Efficiency? ([none / 0](#)) ([#13](#))  
by hvirtane on Thu May 29th, 2003 at 05:31:24 PM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>



First:

It is true that suction pumps have got a limit how high they can pump. It is as well true that pressurized pumps don't suffer from that limit.

It is of course certain that this kind of system with water reservoirs can be built.

-----  
The question is  
if it is more practical, more  
efficient and/or simpler and/or cheaper  
than for example running  
a generator directly by the windwheel  
charging batteries.  
This is the question I'm rising.  
-----

My proposition was that  
a) generators are efficient only on  
a narrow band of RPM and  
b) windheels are efficient  
only if we let them run much faster  
at higher windspeeds.  
c) These two things don't match.

But :  
1) if we run with the windwheel a pump directly, we can run  
the windwheel efficiently all the time?  
2) if we run the water down with constant speed  
through the waterturbine as well the generator is  
running all the time efficiently.  
3) So water is not only a reservoir,  
but it adds the efficiency of the system?

"The Achilles heel with this system  
is the size of the water storage needed  
to generate any significant amount of electricity."

Yes we need some amount of water.  
 $P(\text{kW}) = 10QH$   
where P is Power in kW , Q is the flow of the water  
in cubic meters per second  
and H is the height of the water in metres vertically

From this you can easily see that in practice for a  
small system, which uses less than 1 kW power  
the amount of water is not that big, if you have got  
a place, where the height, H can be made reasonable big.

The system can of course be made

as a closed circuit system.

"Plus, any time you use a multistep approach, each little conversion in the system costs you some efficiency.

So we have added pipe friction and pump friction and eventually we still have to spin an alternator, which has its own losses."

As said before the efficiency problem is the main problem, which I'm trying to solve by using this water system.

Generators can be made more than 90% efficient if run with constant speed. If their speed varies a lot,, they are not so efficient.

On the other hand

to make windwheels even reasonable efficient

it is necessary to vary their speed a lot?

And pumps can run efficiently on a broad range of RPM?

"Again, not that it won't work, just that it adds a certain complexity and some loss of overall efficiency."

My proposition is that it adds overall efficiency.

It certainly adds some complexity because man must build the water reservoir, pipes and the waterwheel, but it as well lessens some complexity, because generators running with constant speed can be made simpler than generators varying their speed. And batteries are not needed.

At present the only practicable and economically viable way to store electrical energy in very large quantities is to use it to pump water up to mountain.  
(Renewable Energy,  
Oxford University Press 1998, p. 219)

Maybe the only practicable way to store wind energy is to do the same?

- Hannu

[ [Parent](#) ]

Stand alone water generator ([none / 0](#)) (#14)  
by Gary D on Thu May 29th, 2003 at 09:36:14 PM MST  
([User Info](#))

Hannu, as I understand it the main problem with stand alone A.C. generators is the frequencies change as more or less load is applied. Homepower.com has a good article of someone who has been using this exact setup for years. The best way I see to overcome this obstacle would be to produce D.C. into a battery bank, then run everything needing A.C. from an inverter. That way you keep the hertz or frequency at 50 cycles per second. Forgive me if it's 60, not sure what your country's system is set up for. The battery bank would stay mostly charged and be there for evening out the fluctuations. Sorry for the long post, but this is a simplified answer. Someone else may have a better explanation. always enjoy your posts. Gary D.

[ [Parent](#) ]

Where to find this article? ([none / 0](#)) (#15)  
by hvirtane on Fri May 30th, 2003 at 02:45:06 PM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

"Homepower.com has a good article of someone who has been using this exact setup for years. "

How can I find this article?

I've got the index of the Homepower magazine, but can't find an article, which could fit.

- Hannu

[ [Parent](#) ]

Hannu- A.C. Hydro ([none / 0](#)) (#16)  
by Gary D on Sat May 31st, 2003 at 08:23:37 PM MST  
([User Info](#))

Hannu, sorry for not posting the article. Not sure how to add it on this system yet, so you'll have to write it down then type it in yourself. The address for the article is:

<http://www.homepower.com/files/overshothydro.pdf>.

I hope this article explains the issue of needing to use all the power produced, or else using a battery bank as a safety device. Hope the url works for you. Have a pleasant evening. Gary D.

[ [Parent](#) ]

I've seen the article ([none / 0](#)) ([#17](#))

by [hvirtane](#) on Mon Jun 2nd, 2003 at 06:25:22 AM MST

([User Info](#))

<http://www.cc.jyu.fi/~hvirtane/cooker/>

Hi,

the address worked perfectly and I've read the article.

Thank you a lot for the address of the article.

However this article is only about waterwheels. Their water wheel is running constantly with the full power.

I've got a friend here with the technology (self made) with a waterheel so that it automaticly adds the power when more load is applied. His technology is very advanced, however with a Kaplan turbine etc.

There is an old pond in his place, it was some tens of years before powering a watermill.

I think that it would be easier to build a quite simple crossflow (Francis) turbine with a simple automatic adjustment for the waterport.

In addition:

Probably the easiest method would be to use a battery



in between so that the water generator would automatically charge the battery when needed.

So that the battery would be almost fully charged all the time. The battery could be quite small ( 100 Ah - 200 Ah).

And the power for the appliances would be taken from the battery. So that the system would work a quite similar way as normal car electronics, but instead of the car alternator powered by the car engine there would be the hydrogenerator.

The friend of mine mentioned above is planning to use his big wind turbine later to pump up water (besides directly heating the house) to his pond to use the pond as 'the energy battery'.

- Hannu

[ [Parent](#) ]

Re: Efficiency? ([none / 0](#)) ([#19](#))  
by elvin1949 ([elvin1949@wmconnect.com](mailto:elvin1949@wmconnect.com)) on Wed Jun 18th, 2003 at 09:05:50 AM MST  
([User Info](#))

why not put a torque converter between the prop and gennie [like auto motor and tranny] later elvin1949

[ [Parent](#) ]

understandin ([none / 0](#)) ([#9](#))  
by wpowokal on Wed May 28th, 2003 at 08:39:49 AM MST  
([User Info](#))

notwithstanding Hugh's explanation, if the + & - were marked on the bridges then the circuit operation becomes more aparent.

regards Allan

[ [Parent](#) ]

Re: Thanks Ed... ([none / 0](#)) ([#18](#))  
by jubalearly on Tue Jun 10th, 2003 at 03:55:40 PM MST  
([User Info](#))

You need 6 diodes (three pairs) for conversion of all three phases to DC. Note that using those bridges gives you 2 diodes in series which will cost you another .5-.7 volts drop & hurt your efficiency. I know the bridges are cheaper & easier to find than 3 phase bridges or high amperage individual diodes. But a half a volt can add a lot of amperage at 12 volts. My 30 amp charger is just about that much higher under load (low battery, charging at around 12v) than my 10 amp charger.

The alternator's efficiency should be relatively constant for 1/2 to full output in amps (or better, watts). Output voltage shouldn't affect it much except as it relates to the amperage output (and it does - I'm just not sure how). Of course your overall charging efficiency will go down if there is a big mismatch in alternator vs. charging voltage, which you have in your example. But at 3 times the speed (30 vs. 10 mph) you could generate 9 times the power. (it's a cube function). I don't think anyone is getting all of that power out, anyway.

So what you want to know is how to best get rid of the voltage mismatch & maximize the power you can use. Probably the best way is to use a switching power supply as a DC to DC converter. It's relatively easy to input from 15-60v and get out a regulated voltage for charging your batteries. You could do that with a linear supply, also, but there are some advantages to the switching supply. These are cheaper to buy than build (computer power supplies) although it may be difficult to determine just what the safe maximum input voltage is.

Switching from star to delta to get a better match is a good, inexpensive way to get better efficiency, with practicaly no additional losses. Using the DC to DC converter (85% eff.?) or an autotransformer (85-90% eff.?) might be worthwhile in certain situations.

[ [Parent](#) ]

.014 lams ([none / 0](#)) ([#11](#))  
by Gary D on Thu May 29th, 2003 at 07:32:17 AM MST  
([User Info](#))

Hey Ed, doing a few very rough calculations using .014 steel for lams, with .003 for the insulator (tape or whatever) on an 11" disc, it would come out to about 75 to 80 feet of 1/2 inch steel. That is on a 1 inch diameter lam. thickness. Twenty five to thirty wraps. Am I in the ballpark? or have you found a thinner insulator? This is very interesting. Was hoping (wistfully that 3 wraps of 1/8 cold rolled would work) but you very easily shut that thought out of my head. Thanks for the great info. Maybe this will help me get a good first genny off the ground finally. Gary D.

[ [Parent](#) ]

[PMA Efficiency](#) | 19 comments (19 topical, 0 editorial)

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Re: Solar Stirling opinions wanted ([none / 0](#)) ([#3](#))  
by charged on Fri Dec 26th, 2003 at 02:23:41 PM MST  
([User Info](#))

First, don't get thrown by this. It works. It will be worth your time to learn it and make use of it.

Use electrostatic power transmission and you can use thin lines with nearly zero loss.

There's been much confusion in the engineering world about exactly WHAT constitutes an "electrostatic" charge. Simply put, it's a pure potential with little or no electron current involved.

Any inductor can generate a massless emf pulse and transmit what amounts to an RF transient spike. Those spikes only manifest as current once they "land" in a capacitor. A 400v EMF spike and a 400v step-up transformer are NOT the same thing. EMF is electrostatic in nature. That's why it has advantages over using standard issue inverter systems.

Here's what you do.

Rewind a power transformer so that it's 1:1. Just get two spools of #23 wire and wrap about 400 turns in a bifilar fashion. This means they're both wound at the same time.

Make your windings of a suitable gauge wire to handle whatever the maximum power output of the generator is.

Since this is a 1:1, matched impedance transformer, any AC you put into the primary will be duplicated, out of phase in the secondary, same:same. But, we're not using AC. It's inefficient.

If you put a full-wave bridge on the secondary (made from 1kv diodes) and you pulse DC into the primary, you'll see two things coming out of the secondary side. First, you'll see your input DC voltage pulse. THEN you'll see an emf "spike" immediately after.

If you place a high voltage capacitor, like a photoflash type after the rectifier, you'll see it's voltage rise with each input pulse on the primary. If you keep pulsing, the cap will keep rising in voltage WAY beyond the input voltage. Everything ABOVE the input voltage is an electrostatic pulse. It's something like RF. Tesla called these longitudinal pulse waves. They are electrostatic, not "transformed" in a conventional sense.

Here's how you drive the transformer for high efficiency.

You need a pulse-width modulator. This can be something as simple as a 555 timer with it's output driving an optocoupler. The optocoupler is connected between the collector and base of a large power transistor/MOSFET/IGBT/etc...

Your generator output should charge a large capacitor at low voltage, right AT the generator site.

The capacitor positive goes to one lead of the transformer primary. The other transformer lead goes to the transistor collector. The transistor emitter goes to the capacitor negative.

The PWM must be set so that the "ON" pulse to the transistor only allows the transformer field to build to about 1/3 strength, then shut's off. This very efficiently produces an emf spike from the secondary winding that goes through the 1kv rectifier bridge.

The positive and negative outputs of the rectifier bridge connect to the power-leads to the house.

INSIDE the house, you place about 1000uf of 400v photoflash capacitors RIGHT AT the point where the wires come in. Then you run lead from those HV capacitors down to a larger, lower voltage capacitor bank.



You'll need a scope to set the transformer pulse-width correctly. For the next calibration, hook your indoor capacitor leads directly across your batteries. This will hold the emf spikes low and the capacitor collection will widen the emf pulse a bit. Turn up the pulse frequency until you just have a VERY small gap between the end of the emf pulse and the beginning of the next input pulse.

There, you're all set. The 555 pulse circuit will draw minimal amounts of power and the power transistor and optocoupler are a common current path avalanche arrangement. Very efficient since all the current used to control both of them ALSO goes through the transformer primary.

So I don't repeat anything more, read my posts in this other thread for the description of HOW to use the power once you've transmitted it to the house.

<http://www.fieldlines.com/story/2003/12/16/221841/32>

Re: Solar Stirling opinions wanted ([none / 0](#)) ([#4](#))  
by RobD on Fri Dec 26th, 2003 at 09:32:58 PM MST  
([User Info](#))

The greatest power is equal to the greatest temperature differential from the center of your dome (I'm assuming your using this as the focal point of your heat for the engine). So if you can get the center of the dome up to cooking temp you will be generating usable power even with the losses of the Stirling. I've thought about the idea myself but you need a large engine and it's all moving parts that wear out.  
RobD

Re: Solar Stirling opinions wanted ([none / 0](#)) ([#5](#))  
by kell on Sat Dec 27th, 2003 at 08:26:30 AM MST  
([User Info](#))

How will you track it, any ideas yet?

Re: Solar Stirling opinions wanted ([none / 0](#)) ([#6](#))  
by hvirtane on Sat Dec 27th, 2003 at 03:19:47 PM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

Hi,

a really interesting project.

The simplest stirling I've found in the Net:  
<http://www.emachineshop.com/engine/>

Another way to start is to use Ed Lenz's drawings, which are very good. (<http://www.windstuffnow.com>)

For the tracking I would use a pole at the same angle as the axle of the earth. The mirror could run round the the axle at the same speed as the earth rotates. You could make the seasonal adjustment of the axle by hand or make even automatic using a clock mechanism...

We had some discussions about tracking systems here:  
<http://www.fieldlines.com/story/2003/6/26/10248/0825>

Instead of making the stirling hot area to be in the focus point of your mirror you might as well heat with the mirror hot water or hot oil and circulate that fluid on the hot part of the stirling. The advantages would be that you would

have no need to move the engine and the engine could work even if there are some clouds on the sky... My concept to heat fluid using the sun:

<http://www.cc.jyu.fi/~hvirtane/through.jpg>

You might as well make the mirror of flat mirrors, something similar as the 'teton' concept:

<http://www.ida.net/users/tetonsl/solar/solarhom.htm>

A high voltage transmission using electric pulses (charged) and condensators sounds really interesting.

Hannu

Re: Solar Stirling opinions wanted ([none / 0](#)) ([#7](#))  
by [qwerty172](#) on Sun Jan 4th, 2004 at 09:33:05 AM MST  
([User Info](#))

Look at the sun power patents for stirling engines. They produced the best designs in the early eighties and still hold the record for conversion of solar energy to electricity (38% efficiency). They did it using a differential stirling engine based on Senft design I believe.

Also look at free piston stirling engines hooked up to a linear alternator. Its the simplest design possible for a generator, and it can be seaaled completely allowing for high pressure engines.

[Solar Stirling opinions wanted](#) | 7 comments (7 topical, 0 editorial)

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[Propellers, what is the max number of blades?](#) | 3 comments (3 topical, 0 editorial)

Re: Propellers, what is the max number of blades?  
([none / 0](#)) (#3)  
by DanB on Thu Dec 25th, 2003 at 07:12:28 AM MST  
([User Info](#))

Hii -  
"Everything I see uses three blades."

There is a reason for that. Typically fewer blades run faster and more efficiently. Two blades runs (as a general rule) a bit faster - and even more efficiently in many cases than three but the drawback is vibration. (they shake when they yaw). Sometimes the shaking can be overcome with weights - or sometimes it may seem un noticable, but any time you have two heavy spots a wheel and turn it (like a windmill yaws) its going to shake.

More blades generally have a bit mroe surface area and start more easily. 3 blades is a good compromise, probably the best compromise.

"I will be building an alternator that will need a twelve foot three bladed prop. Can I use, say (just for discussion) a six bladed 6 foot prop? "

No. Your 3 blade 12 footer would run at a reasonable speed and probably have lots of power. Your 6 blade 6' would probably have too many blades - a bit mroe torque - but it would be inefficient - even for a 6' prop. Power is related to the square of the diameter (the area). Your 12' blade covers a bit over 100 square feet. Your 6' prop covers about 30. The 12' prop (done well) should make 3 X the power of a good 6' prop. A 6 bladed 6' prop will have lots of xtra drag, so itd be even less powerful I suspect.

the 6 bladed 6' prop might have a bit of xtra torque to get your big alternator turning, but it will not have the power to spin it up to the sorts of speeds itll need to go to make power as it would if it had a 6' blade.

Hope that makes sense... (havent had any coffee yet this morning, its dangerous for me to do, or write anything before coffee!)

[Propellers, what is the max number of blades?](#) | 3 comments (3 topical, 0 editorial)

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## [Propellers, what is the max number of blades?](#)

By [South Dakota Farmer](#), Section [Homebrewed Electricity](#) [Wind](#)

Posted on Wed Dec 24th, 2003 at 06:10:10 PM MST

I am trying to find out if a smaller diameter multiblade (6 blade) prop will work on an alternator that would be spec'ed with a three blade 12 footer?

Everything I see uses three blades. I will be building an alternator that will need a twelve foot three bladed prop. Can I use, say (just for discussion) a six bladed 6 foot prop? Am I going to end up dealing with twice the tip speed? thus a lot more noise? Or am I going to raise the starting wind speed to a point that it isn't worth it? or, or, or? Obviously I don't know squat about the physics of props and wind, but I have a lot of it! The other night on the ridge we had sustained wind speeds of 86 mph... and that is not unusual. Ripped a \$400 door off of one of the tractors! and those doors are designed for this type of thing. I don't expect to have this kind of wind all the time, but am wondering if anyone has a handle on or can point me in the right direction on propeller design or the pitfalls of experimentation. I am planning on building a few Axial flux alternators. Thanks for the help

[Propellers, what is the max number of blades?](#) | 3 comments (3 topical, 0 editorial)

Re: Propellers, what is the max number of blades? ([none / 0](#)) (#1)

by Kevin L on Wed Dec 24th, 2003 at 09:44:58 PM MST ([User Info](#))

Three blades are used because as you increase the number of blades you increase the leading edge and blade tip resistance. At half the diameter you wil reduce the tip speed by half. The power output will be much lower at 6 ft because the increase in power exponentially increases with diameter. A 6 X 6 ft blade will produce much less power then a three bladed 12 footer. Use caution if you are dealing with 86 mph winds. I don't have enough high wind speed experiance to say weather it should or shouldn't be done, but you certainly would want the system a safe distance from the house, as lossing a blade in 86 mph winds could send that blade very far. Use caution expecially if the house is downwind! You will also want a very good furling system. Good Luck

Re: Propellers, what is the max number of blades? ([none / 0](#)) (#2)

by desertratjack on Wed Dec 24th, 2003 at 10:22:14 PM MST ([User Info](#))

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You have located the place where art and science mix. I believe there is a point where blade number controls the rpm but I don't know where this is (1000 blades?). 100000? Currently I run 6 blade and 3 blade mills. Thin high aspect blades with optimal helical pitch turn very fast in 6' diameter mills (probably near 2000 rpm in 35 mph breeze (the permanent magnet alternators characteristics matter too). Great fun to experiment with! Mostly, I deal with 20 to 50 mph here in the canyon. Two of my mills tilt back beginning at 30 mph or so and are able to take 60 mph (they look and sound like monsters at these higher wind speeds. The other two use 6 blades and do not tilt back and I am experimenting with them above 40 mph. One of these mills was on a 1 1/2 " pipe threaded into a 2" union with a 5' lever arm to the guy point. It broke through the threads at about 45 mph. I never found two of the blades! The present lever arm is 2 feet with 1 1/2" pipe and I think it will hold to 50 mph and more. 80 mph is a big difference from 50 so take it slow and make it strong :- ) I've resigned myself to furling/feathering/tip back or swing out of the wind mechanisms for these higher speeds but I don't like wasting those winds. If I can be of help

jacknl7s@hotmail.com

Re: Propellers, what is the max number of blades?  
(none / 0) (#3)  
by DanB on Thu Dec 25th, 2003 at 07:12:28 AM MST  
(User Info)

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[Help, DanB](#) | 13 comments (13 topical, 0 editorial)

Re: Help, DanB ([none / 0](#)) (#11)  
by DanB on Wed Dec 24th, 2003 at 09:32:40 AM MST  
([User Info](#))

I think you have to make a judgment (gamble?)... totally knot free is rare and hard to find. Knots are acceptable depending on how they run through the board - how large they are, where they are etc....

The 10' machine we recently finished is from Eastern White pine and has a few knots in the wood - one of them worries me a bit, but I think itll be fine. The fir Im using on the 14' experiment is totally knotless... but also quite expensive.

[ [Parent](#) ]

[Help, DanB](#) | 13 comments (13 topical, 0 editorial)

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[Help, DanB](#) | 13 comments (13 topical, 0 editorial)

Re: Help, DanB ([none / 0](#)) (#11)  
by DanB on Wed Dec 24th, 2003 at 09:32:40 AM MST  
([User Info](#))

I think you have to make a judgment (gamble?)... totally knot free is rare and hard to find. Knots are acceptable depending on how they run through the board - how large they are, where they are etc....

The 10' machine we recently finished is from Eastern White pine and has a few knots in the wood - one of them worries me a bit, but I think itll be fine. The fir Im using on the 14' experiment is totally knotless... but also quite expensive.

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[Help, DanB](#) | 13 comments (13 topical, 0 editorial)

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### [Help, DanB](#)

By [Garry](#), Section [Homebrewed Electricity](#)

Posted on Mon Dec 22nd, 2003 at 11:34:41 AM MST

[Wind](#)

In a previous story you wrote...

"The prop is made from almost perfect, vertical grain knot free fur. The board was a 2X10 (so 1.5" X 9.5" after being planed)."

Could you please tell me where this material is available and approx. how much it costs. My previous mill (below) has a twelve foot rotor made from spruce from a big box lumber retailer. I have a new mill under construction that needs a thirty foot prop. My choice would be wood but I have been told the type of wood you used is unavailable except at an aircraft supply company. If I can't get fir I will build one of truck tarp material an steel pipe like Hannu's friend in the forest. Thanks for the help.  
Garry



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[Help, DanB](#) | 13 comments (13 topical, 0 editorial)

Re: Help, DanB ([none / 0](#)) ([#1](#))  
by Garry on Mon Dec 22nd, 2003 at 11:43:57 AM MST  
([User Info](#))

I forgot to tell why I wouldn't use spruce from around here again. ;) The tips on my rotor change pitch at will when the humidity changes. Sometimes one sometimes all. LOL When the prop is going about 5 rpm you can see the angles from the side. The prop I carved before from this stuff had one blade that would go negative on a hot dry day.  
Garry

Not Dan ([none / 0](#)) ([#2](#))  
by wdyasq on Mon Dec 22nd, 2003 at 05:37:50 PM MST  
([User Info](#))

Gary,

Good wood is where you find it. The last vertical grain, clear Doug Fir I bought was from an architectural supply company. It came in 20 foot lengths. I paid ~\$4 a board foot.

Almost any straight grained wood will make a good prop. Selecting pieces of wood has more to do with it than species. The species that are 'aircraft aproved' grow in long straight lengths and tend to be light for their strength. Beyond that, there is growth ring orientation, ring count per inch and runout. There are also some other quailits spar material must possess.

Spar grade material is not necessary for windturbine propellers. It is pretty from a working standpoint.

Proper moisture exclusion is something else that will keep wooden things 'stable.'

Ron

Re: Not Dan ([none / 0](#)) ([#4](#))  
by Ironman on Mon Dec 22nd, 2003 at 06:59:44 PM MST  
([User Info](#))

Been working with wood for years and moisture is the main enemy.

[ [Parent](#) ]

Re: Help, DanB ([none / 0](#)) (#3)  
by [cevonk \(cevonk\(at\)signhere\)aol.com](#) on Mon Dec 22nd,  
2003 at 06:22:51 PM MST  
([User Info](#))

Not an answer to your question, and not from Dan B....

Have you considered building up a blade from scarfed sections of wood, or even laminated sections of veneer or very thin plywood? I used to laminate kayak paddle blades this way and had good success with them, particularly in not having them warp or twist with long term exposure (immersion) to moisture. I know that propellor makers sometimes use this technique to build props. One advantage of the lamination process is that the waste is minimized: as a corollary it is less difficult to find the large sized stock that is necessary to produce a propellor from a single piece of wood. By stacking the laminates in a progressive fashion, as in a spiral staircase, the "dead" area that has to be cut away to achieve a wing shape is reduced.

Traditional kayak paddles (the "Eskimo" kind -- not the kind that looks like two canoe paddle blades stuck together by a handle) are shaped much like a windmill blade, and function in the same manner as a wing. Because they are a symmetrical foil, however, it is the angle of attack at which the blade is pulled through the water is what generates lift. The leading edge presented to the water changes depending on how you happen to pick up the paddle, so having a regular leading edge shape just on one edge would be impractical. With a traditional kayak paddle, you kind of fly the blade in the water. Hard to explain, but intuitive once you get past thinking that you have to struggle to pull a blade through water to move forward.

Regular polyester resin is a good glue, providing both waterproofing and high resistance to delamination due to applied stresses (the glue joint will have a greater tensile strength than the wood itself.) If you were to construct the wing out of 1/16" veneer thoroughly impregnated with resin, you could probably overcome all the problems associated with changing humidity.

General suggestions based on kayak paddle building experience:

Prepare a jig to hold the laminate sections in place.

Cut the laminate sections to final dimensions (i.e. before shaping..."rough" dimensions.)

Sand the laminate sections with a medium grit paper, and blow them clean -- the idea being to create an open pored surface into which the resin will soak.

Coat all sections with a coat of resin...BUT...don't mix the resin very hot (use less catalyst than normal.) This will give you time to handle the sections. Use plenty of resin so that it soaks into the laminate sections. Allow the resin to set to the "tacky" stage.

Coat the mating surfaces of the laminate sections with a layer of regular resin and place them into place in the jig.

Clamp them firmly using clamps and cauls (clamping boards used to spread pressure evenly) covered in wax paper or Saran wrap (won't stick to resin.) Clamp firmly

enough so that the resin begins to squeeze from between the laminate sections, but not so firmly as to drive the resin out of the joint. Unlike regular glue, resin works better with a thicker (than wood glue) joint.

Wipe excess resin from the surfaces before it hardens.

Once the wing is set and has cured for a day or two, you can shape it. A rasp, Sureform, and spokeshave are handy tools to use.

Cut a piece of 6 ounce fiberglass cloth to the rough shape of the wing, plus 2" (50mm) extra around the edge.

When you have the shape you desire, finish sand the wing and coat ONE SURFACE with a layer of resin.

Drape the pre-cut 6 ounce fiberglass over the resin-wet surface of the wing. Wet out the glass until the depth of the weave is 1/2 filled with resin.

Be sure to wet out the 2" (50mm) extra fiberglass around the edge. The weight of the wet cloth will help to keep the fabric in contact with the edges of the wing (leading and trailing.)

When the surface has set to the "tacky" or "firm green" stage, use a razor knife to trim away the extra 2" all around. Then add additional coats of resin to the glass fabric until the weave is filled, waiting for the resin to reach the "tacky" stage between coats.

Once one side is finished, turn the wing and do the other side the same way.

On a paddle, the fabric does not wrap around the edges of the blade, but simply lies flat along the trailing/leading surface. On a propellor, where the leading edge is rounded, I think I would apply fiberglass to the upper layer first, so that the extra cloth would drape down enough to wrap around the leading edge to the bottom of the wing.

Then the lower surface's layer of cloth could simply be laid so that it reached from the trailing edge (after trimming the edges, and filling the weave) to the point where it just overlapped the wrapped portion of the upper layer at the bottom of the leading edge. The lap-joint could be sanded smooth once the glass had cured.

If you wanted to, you could take a length of fiberglass or graphite tape (or nylon webbing -- the thinnest you could find), soak that in resin, and apply it to the leading edge of the wing to add abrasion resistance.

I used to use small diameter nylon rope soaked in resin and laid along the edge of the rounded end of the paddle blade as an extension for abrasion protection. I would put it on before the fiberglass cloth, so that the cloth would lie across the upper and lower edges of the rope.

A very good description of how to cover paddles with fiberglass in a book called "Building a Strip Canoe", by Gil Gilpatrick. You can probably find other similar instructions in other canoe building books.

JUST FALSE ([none / 0](#)) (#5)

by wdyasq on Mon Dec 22nd, 2003 at 07:58:51 PM  
MST

[\(User Info\)](#)



-Regular polyester resin is a good glue, providing both waterproofing and high resistance to delamination due to applied stresses-

This is just a false statement. There are resins, epoxy, that are good glues. Polyester will allow water to pass if left in immersion. So will epoxy - but, most epoxy formulations have been modified to resist this.

You can get away with a lot for things in temporary use. But if a polyester/wood lamination is left in water, strange, not so good things, start to happen.

If one values their labor at all, they will opt for the proper materials to built a windturbine. I'm not going to live long enough to be able to repair things I made with the wrong goo. And I hate to do things twice because I got the wrong information.

Ron

[ [Parent](#) ]

Re: JUST FALSE ([none / 0](#)) (#7)  
by [cevonk\(atsignhere\)aol.com](#) on  
Mon Dec 22nd, 2003 at 08:57:19 PM MST  
([User Info](#))

Well, it is certainly a matter of degree....

Polyester resin will allow water to pass if left immersed constantly, as in boat hulls that are left in the water. There is a process called blistering that takes place wherein water gets through the resin and into the laminate creating blisters. This takes a long time with constant immersion. You don't see it on trailer sailers that spend most of their time out of the water. Blistering is the bane of folks who bought fiberglass boats built in the ~ = first half of that industry's history. For something like a paddle, where "immersion" is frequent and continuous, but not constant, polyester's disadvantages don't outweigh its advantages: it's cheap, it's easy to work with (again, relative), and it comes in gallon cans at Wal-Mart.

I forgot to mention, that I would also paint a windmill blade that was covered with polyester resin. It is not 100% resistant to UV by any means. And if you want to pick an expensive material that the sun will destroy after a couple or three years or 5 years, by all means, go with unprotected Kevlar -- I have an old Kevlar racing canoe that you can almost poke a finger through. It only weighed 30 pounds (partly because it had no coloring in the epoxy), and was fast as the dickens, but 10 years seems to be well past the lifespan of Kevlar subjected to a lot of UV. Fortunately, I got it used -- it was getting about as much damage from using it as a guide boat as the sun was dishing out.

The epoxys available are certainly good, but cheap, they ain't, and they don't come in gallon cans at Wal-Mart.

[ [Parent](#) ]

Gallon cans of resin?? ([none / 0](#)) (#8)  
by Norm on Tue Dec 23rd, 2003 at  
11:40:55 AM MST  
([User Info](#))

OK Does Epoxy come in pint cans for about \$8 in the car repair section at Walmart or K-Mart along with fiberglass cloth? Norm.

[ [Parent](#) ]

Re: Gallon cans of resin??  
([none / 0](#)) (#9)  
by cevonk  
([cevonk\(at\)signhere\(aol.com\)](#)) on  
Tue Dec 23rd, 2003 at 12:04:51  
PM MST  
([User Info](#))

I haven't seen epoxy resin sold at Wal-Mart. The only thing I have seen there is polyester resin. I could have missed it, though, so it might be there. I think the kits of resin and fabric that you get in the auto repair section (which is where I used to get stuff to make paddles) have polyester resin in them.

Bondo is one of the brands that market such kits, IIRC. They should have big gallon cans of it, too, and little tubes of MEK (methyl-ethyl-ketone) catalyst that is used with polyester resin. MEK is a very toxic substance, by the way, so working with polyester resin does raise issues of personal safety. Epoxy resins also raise safety issues -- some people have had allergic reactions to them.

Be sure to read the MSD (material safety data) sheets that come with any chemical products you use.

[ [Parent](#) ]

Re: Help, DanB ([none / 0](#)) (#6)  
by DanB on Mon Dec 22nd, 2003 at 08:50:57 PM MST  
([User Info](#))

Wow - 30 feet! (love to see/hear more about that one!)

I got mine from a local yard that sells nice tools and wood mostly for fine wood working - interior finishing and cabinet making folks. You can spend about however much money you want there. Mine was not cheap - for the prop I spent about \$160 for the wood. The eastern white pine they normally carry is about 1/4 the price and is often just as good in my opinion - it just happened they didnt have any that was knot free at the time so I went for the fur.

Good luck! - Thirty feet seems... quite daunting! I hope I have that much courage some day!

Re: Help, DanB ([none / 0](#)) ([#10](#))  
by doubter3 on Wed Dec 24th, 2003 at 07:36:39 AM  
MST  
([User Info](#))

In looking for lumber for blade use (and I've been looking at construction grade lumber for the most part), I haven't found anything that is "knot free". When you guys with experience say that you're using knot free wood, is it really completely knot free, or are the smaller knots (1/4" to 1/2") alright? I've been able to find material that doesn't have the large obviously not good knots, but there is always a multitude of the small ones. Acceptable or not?

Thanks,  
Matt

[ [Parent](#) ]

Re: Help, DanB ([none / 0](#)) ([#11](#))  
by DanB on Wed Dec 24th, 2003 at 09:32:40  
AM MST  
([User Info](#))

I think you have to make a judgment (gamble?)... totally knot free is rare and hard to find. Knots are acceptable depending on how they run through the board - how large they are, where they are etc....

The 10' machine we recently finished is from Eastern White pine and has a few knots in the wood - one of them worries me a bit, but I think itll be fine. The fir Im using on the 14' experiment is totally knotless... but also quite expensive.

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Re: Help, DanB ([none / 0](#)) ([#12](#))  
by Garry on Wed Dec 24th, 2003 at 11:06:22 AM  
MST  
([User Info](#))

DanB, Thanks for the info. At those prices my prop would be in the 1200- 1500 dollar range. I built a deck in Crested Butte in the early eighties for a friend and the lumber we used was beautiful and cheap. I guess those days are gone. I am trying to get some pictures of my new project in its current stage. I will be needing a bucket of neos to convert a one of the 15HP motors to PM alternator. The other one will feed the grid directly.  
Garry

[ [Parent](#) ]

Re: Help, DanB ([none / 0](#)) (#13)  
by DonG on Wed Dec 24th, 2003 at 04:48:57  
PM MST  
([User Info](#))

I'm building an 11ft, one piece, two blade prop for an old Wincharger 32v 1000 watt that I'm restoring. I got four 2"X6"X12' boards at Home Depot and cut them in strips to get rid of the knots then alternated the grains when I glued them together. I'm going to paint the prop and put those airplane epoxy strips on the leading edges of the blades to protect them. There is a guy that sells the copper strips like were used on the original Wincharger prop, but it's too much bother to nail them on.

[ [Parent](#) ]

[Help, DanB](#) | 13 comments (13 topical, 0 editorial)

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"WIND's KID - 5" from Lithuania | 3 comments (3 topical, editorial)

Re: "WIND's KID - 5" from Lithuania ([none / 0](#)) ([#1](#))  
by DanB on Tue Dec 23rd, 2003 at 07:48:00 AM MST  
([User Info](#))

Pretty neat! It seems like quite a large machine to mount to a roof top. Does it vibrate the house?

What is the blade diameter? Is this the one you said was using helicopter blades? - what is the hub/planetary gear setup from?

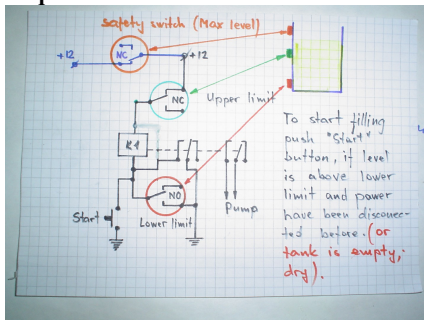
The furling system is interesting - you said its like the whisper? It seems as though lifting only 20 deg might not protect the machine enough in higher winds. I think the whisper actually tips up, and to the side.

It's fun to see so many approaches to windpower. Sounds like quite a neat group of kids.

Re: "WIND's KID - 5" from Lithuania ([none / 0](#)) ([#2](#))  
by Virgis on Tue Dec 23rd, 2003 at 08:41:53 AM MST  
([User Info](#))

Hi DanB,

the "WK-5" isn't noisy and it doesn't vibrate too much. Blades are balanced statically and dynamically very carefully. The blade diameter is 3.35 meter. The weight of each one is 1.870 kg. Total weight of prop with spindle - 6.420 kg. Blades are made of wood and laminated with fiber glass. For hub / planetary gear we used an old boring machine gear. Blades aren't helicopter blades. The windmill with helicopter blades is located about 200 km away from my city. I hope to tell about this monster A.S.A.P.



The picture above explains our furling system of "WK-5".

Virgis

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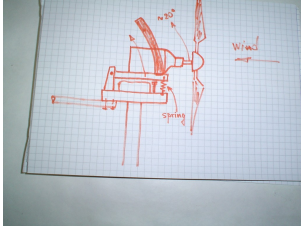
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Re: "WIND's KID - 5" from Lithuania  
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by Virgis on Tue Dec 23rd, 2003 at 08:47:52  
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Virgis



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["WIND's KID - 5" from Lithuania](#) | 3 comments (3 topical, 0 editorial)



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["WIND's KID - 5" from Lithuania](#) | 3 comments (3 topical, editorial)

Re: "WIND's KID - 5" from Lithuania ([none / 0](#)) ([#1](#))  
by DanB on Tue Dec 23rd, 2003 at 07:48:00 AM MST  
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It's fun to see so many approaches to windpower. Sounds like quite a neat group of kids.

["WIND's KID - 5" from Lithuania](#) | 3 comments (3 topical, 0 editorial)

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## ["WIND's KID - 5" from Lithuania](#)

By [Virgis](#), Section [Homebrewed Electricity](#) [Free Energy](#)

Posted on Tue Dec 23rd, 2003 at 05:23:03 AM MST

A story about our windmill "WIND's KID - 5", made by members of pupil's club from Naujoji Akmene.

Hi all,  
I have promised to tell about the last our project translated into reality. Now I have a free time to do it. Our turbine have been a little damaged (blades) during the last storm, we lowered our windmill and I have a chance to show our windmill in detailes much more better.

Below is shown general view of "WK-5".



Lowered "WK-5"



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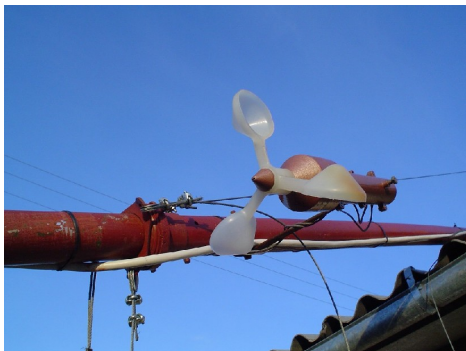


Above is shown alternator with simply furling system. It is similar to WISHPER furling system. Turbine lift up 20 deg.



Above is prop 3.35 m diameter.

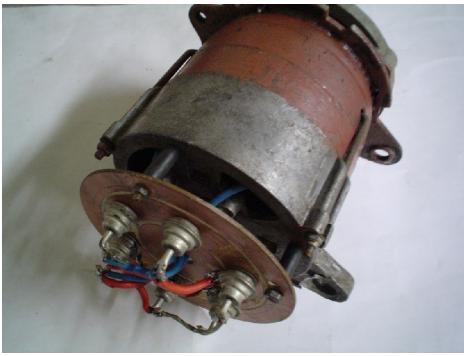
To excitate alternator we use control unit with anemometer. Excitation starts at 5.0 m/s wind speed. The value of excitation current depend on wind speed.



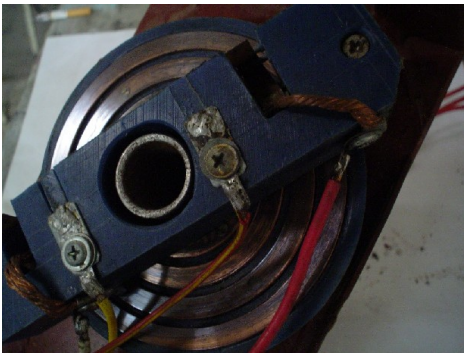
Picture below shows alternator. It is 3ph 160 VAC rewinded tractors 850 W 24 V alternator.



3 ph AC / 160 V DC rectifier is shown below.



Gear box ( ratio 1:6)



Here is showh assembled brush and sliding ring system.



This picture shows hoisting unit.  
In the older wind turbines we made there was no system  
by which turbine could turn away from high winds. Now  
we are going to modify our "WK-5" and to make furling tail

like it is done by DanB.

Best regards  
Merry Christmas for all!  
Virgis

["WIND's KID - 5" from Lithuania](#) | 3 comments (3 topical, 0 editorial)

Re: "WIND's KID - 5" from Lithuania ([none / 0](#)) ([#1](#))  
by DanB on Tue Dec 23rd, 2003 at 07:48:00 AM MST  
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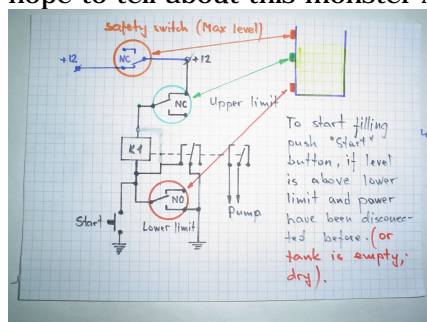
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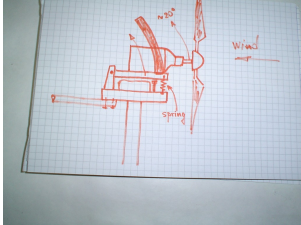
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[Really thin coils.](#) | 5 comments (5 topical, editorial)

Re: Really thin coils. ([none / 0](#)) ([#1](#))  
by DanB on Mon Dec 22nd, 2003 at 11:05:30 PM MST  
([User Info](#))

Im not quite sure I follow you.... but heres my thoughts.

"Imagine a sandwich - plexiglass on the outsides, with a 1/4 inch thick wood core."

Im not sure why you'd want plexi in there.... it would serve as an alternative to casting things perhaps, but in the end... that plexi is taking up extra thickness or.. space where you could have copper!

"The wood core is thin enough that the thickness can't get but so large. After winding, I'd seal it with some form of epoxy, or maybe use resin."

That kind of almost describes the coil winder that I use. its a sandwich - plexi on the outside and wood on the back and a wooden form in the middle. Before I loosen the nut on the end, and take the coil off - I put glue (super glue) into the coil which sticks it together and makes it hard so that when I take it out it doesn't get any thicker. There are other ways to do this too - making the form so that you can tie, or tape the coils tightly before you remove them.

Hard for me to say - and perhaps Im misunderstanding, but It shouldn't be difficult to wind good thin coils, and inch is quite a lot! But I don't often hear of this being a problem. I think your idea of plexi would surely work - but Im doubtful that it would make things easier and in the end I think you'd wind up with possibly an even larger airgap - because the plexi occupies space where you could have copper wire.

Re: Really thin coils. ([none / 0](#)) ([#2](#))  
by Bach On on Tue Dec 23rd, 2003 at 04:48:16 AM MST  
([User Info](#)) [change AT: bach\\_on AT hotmail.com](#)

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Dan,

Thanks for the response. I've tried 1 by wood as the core for my coils. I've also tried dowels. The quarter inch thick wood seems a better thickness. I might even try to plane that down to something like 3/16 of an inch.

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After molding and setting the coils in whatever glue/resin to hold them together, that plexi and wood would be removed and probably discarded. Pure copper would remain.

Then there would be one thickness of plexiglass to which my nine coils would be glued. This should leave me with a stator in the range of 3/8 to 7/16 inches thick.

A difficulty I always seem to have is that my fiberglass molded stators often vary in thickness. This often forces me to have a wider gap to accomodate the less than "plumb" and uniformly level surfaces. I just haven't found the right process to end up with a level molded surface. The plexiglass should be uniformly level, while adding minimally to the thickness.

The plexiglass I have is about an 1/8 of an inch thick.

Bach On

- I'm just as happy as if I had good sense! -  
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[Really thin coils.](#) | 5 comments (5 topical, 0 editorial)



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[Really thin coils.](#) | 5 comments (5 topical, editorial)

Re: Really thin coils. ([none / 0](#)) ([#1](#))  
by DanB on Mon Dec 22nd, 2003 at 11:05:30 PM MST  
([User Info](#))

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[Really thin coils.](#) | 5 comments (5 topical, 0 editorial)

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[Really thin coils.](#)

By [Bach On](#), Section [Homebrewed Electricity](#)  
Posted on Mon Dec 22nd, 2003 at 10:35:57 PM MST [Alternators](#)  
Speculation:

I've now tried different techniques for winding coils. Most end up being an inch thick by the time they are set in Fiberglass resin. Even with dual magnet disks, that's quite a gap.

I've been toying with an idea. I'd appreciate any feedback. First, the goal is 9 coils with 12 pairs of 1 inch by 2 inch by 1/4 inch thick magnets. I'm anticipating a 16 inch diameter set of magnet rotors.

My wire is 18 gauge. I got it from a motor rewinding shop. Here's the idea:

Imagine a sandwich - plexiglass on the outsides, with a 1/4 inch thick wood core. I might also include fiberglass cloth in the sandwich. The coils would be 50 - 60 turns of wire. The wood core is thin enough that the thickness can't get but so large. After winding, I'd seal it with some form of epoxy, or maybe use resin. My stator would be made of plexiglass. Each of these nine sandwiched coils would be glued to this plexiglass stator. Providing there are few screw holes to produce stress fractures, do you think this might hold up?

Yes, plexiglass can get brittle. But by keeping things as thin as possible, my hope would be to keep the gap between my magnets relatively thin.

Suggestions and comments would be appreciated.

Bach On

[Really thin coils.](#) | 5 comments (5 topical, 0 editorial)

Re: Really thin coils. ([none / 0](#)) ([#1](#))  
by DanB on Mon Dec 22nd, 2003 at 11:05:30 PM MST  
([User Info](#))

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That kind of almost describes the coil winder that I use. its a sandwich - plexi on the outside and wood on the back and a wooden form in the middle. Before I loosen the nut on the end, and take the coil off - I put glue (super glue)

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into the coil which sticks it together and makes it hard so that when I take it out it doesn't get any thicker. There are other ways to do this too - making the form so that you can tie, or tape the coils tightly before you remove them.

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Re: Really thin coils. ([none / 0](#)) ([#2](#))  
by Bach On on Tue Dec 23rd, 2003 at 04:48:16 AM MST  
([User Info](#)) [change AT: bach\\_on AT hotmail.com](#)

Dan,

Thanks for the response. I've tried 1 by wood as the core for my coils. I've also tried dowels. The quarter inch thick wood seems a better thickness. I might even try to plane that down to something like 3/16 of an inch.

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A difficulty I always seem to have is that my fiberglass molded stators often vary in thickness. This often forces me to have a wider gap to accommodate the less than "plumb" and uniformly level surfaces. I just haven't found the right process to end up with a level molded surface. The plexiglass should be uniformly level, while adding minimally to the thickness.

The plexiglass I have is about an 1/8 of an inch thick.

Bach On

- I'm just as happy as if I had good sense! -  
[ [Parent](#) ]

Re: Really thin coils. ([none / 0](#)) ([#3](#))  
by wdyasq on Tue Dec 23rd, 2003 at 06:12:34 AM MST  
([User Info](#))

Bach On,

If I were trying to build the thinnest and strongest stator for the thickness, I would make the front and back plates of high-tensile epoxy resin and 'S-glass' or carbon-fiber cloth first. These thin laminates would be made on a piece of waxed plate glass and made with as little resin as it took to soak the cloth. All excess would be pulled off or I might vacuum bag it with 'peal-ply'.

I would then make my coils and sandwich them between the two skins I had just made. Spacer blocks would keep the skins at a constant thickness and squeeze out the excess resin.

The resulting product would have the structural material as separated as possible. The 'skins' would likely be less than .030 inches each.

But, there is an old saying -Go ahead, it's not my cow.-

Ron

Re: Really thin coils. ([none / 0](#)) (#4)  
by Nando on Sun Dec 28th, 2003 at 09:53:21 AM MST  
([User Info](#))

Why dont you try to explain what you are trying to do, I mean, the final product; it may be better, this way, for someone to understand what you are trying to do, this way you may get a lot of more practical help.

Nando

Re: Really thin coils. ([none / 0](#)) (#5)  
by Harry Luubovv on Tue Dec 30th, 2003 at  
09:41:32 AM MST  
([User Info](#))

Hi guys,

Don't forget, it is important to use clamping-down method while epoxying the sandwich. This will keep the stator thinner and the clamps can be adjusted to get an even thickness ALL AROUND the stator disc as you can squeeze the coils down (Unless you already have the coils wound in high density, which is not so easy to do in homemade situations). That too, you won't even have to fabricate spaces. Using 4 or even 6 clamps around the disc can get must precise height adjustments than using the "Lazy" 3 clamps. With 3 clamps, sometimes you might think you got it under control but when the resin or epoxy is dried and you opened the clamps, you would find the uneven thickness still. (Sorry for the outburst "Lazy", did not mean to contradict others. Just wanted to update ideas. Get the drift ? :-)

Smile,  
Harry Luubovv.

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[Really thin coils.](#) | 5 comments (5 topical, 0 editorial)

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[Help, DanB](#) | 13 comments (13 topical, editorial)

Re: Help, DanB ([none / 0](#)) (#6)  
by DanB on Mon Dec 22nd, 2003 at 08:50:57 PM MST  
([User Info](#))

Wow - 30 feet! (love to see/hear more about that one!)

I got mine from a local yard that sells nice tools and wood mostly for fine wood working - interior finishing and cabinet making folks. You can spend about however much money you want there. Mine was not cheap - for the prop I spent about \$160 for the wood. The eastern white pine they normally carry is about 1/4 the price and is often just as good in my opinion - it just happened they didnt have any that was knot free at the time so I went for the fur.

Good luck! - Thirty feet seems... quite daunting! I hope I have that much courage some day!

Re: Help, DanB ([none / 0](#)) (#10)  
by doubter3 on Wed Dec 24th, 2003 at 07:36:39 AM MST  
([User Info](#))

In looking for lumber for blade use (and I've been looking at construction grade lumber for the most part), I haven't found anything that is "knot free". When you guys with experience say that you're using knot free wood, is it really completely knot free, or are the smaller knots (1/4" to 1/2") alright? I've been able to find material that doesn't have the large obviously not good knots, but there is always a multitude of the small ones. Acceptable or not?

Thanks,  
Matt

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Re: Help, DanB ([none / 0](#)) (#11)  
by DanB on Wed Dec 24th, 2003 at 09:32:40 AM MST  
([User Info](#))

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I think you have to make a judgment (gamble?)... totally knot free is rare and hard to find. Knots are acceptable depending on how they run through the board - how large they are, where they are etc....

The 10' machine we recently finished is from Eastern White pine and has a few knots in the wood - one of them worries me a bit, but I think itll be fine. The fir Im using on the 14' experiment is totally knotless... but also quite expensive.

[ [Parent](#) ]

Re: Help, DanB ([none / 0](#)) ([#12](#))  
by Garry on Wed Dec 24th, 2003 at 11:06:22 AM  
MST  
([User Info](#))

DanB, Thanks for the info. At those prices my prop would be in the 1200- 1500 dollar range. I built a deck in Crested Butte in the early eighties for a friend and the lumber we used was beautiful and cheap. I guess those days are gone. I am trying to get some pictures of my new project in its current stage. I will be needing a bucket of neos to convert a one of the 15HP motors to PM alternator. The other one will feed the grid directly.  
Garry

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Re: Help, DanB ([none / 0](#)) ([#13](#))  
by DonG on Wed Dec 24th, 2003 at 04:48:57  
PM MST  
([User Info](#))

I'm building an 11ft, one piece, two blade prop for an old Wincharger 32v 1000 watt that I'm restoring. I got four 2"X6"X12' boards at Home Depot and cut them in strips to get rid of the knots then alternated the grains when I glued them together. I'm going to paint the prop and put those airplane epoxy strips on the leading edges of the blades to protect them. There is a guy that sells the copper strips like were used on the original Wincharger prop, but it's too much bother to nail them on.

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[Help, DanB](#) | 13 comments (13 topical, 0 editorial)



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[Help, DanB](#) | 13 comments (13 topical, editorial)

Re: Help, DanB ([none / 0](#)) (#6)  
by DanB on Mon Dec 22nd, 2003 at 08:50:57 PM MST  
([User Info](#))

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[Help, DanB](#) | 13 comments (13 topical, 0 editorial)

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[Using different kinds of magnets on same rotor](#) | 17 comments (17 topical, 0 editorial)

Re: Using different kinds of magnets on same rotor  
([none / 0](#)) (#16)  
by DanB on Mon Dec 22nd, 2003 at 08:27:57 AM MST  
([User Info](#))

I think thats close... the best bet is experiment I suppose. Id try the coils slightly larger. If it were me, If you're not going to break the magnets, then Id try to run them close together so the poles are as equally spaced as possible.

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[Using different kinds of magnets on same rotor](#) | 17 comments (17 topical, 0 editorial)

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[Using different kinds of magnets on same rotor](#) | 17 comments (17 topical, 0 editorial)

Re: Using different kinds of magnets on same rotor  
([none / 0](#)) (#16)  
by DanB on Mon Dec 22nd, 2003 at 08:27:57 AM MST  
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[Using different kinds of magnets on same rotor](#) | 17 comments (17 topical, 0 editorial)

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### [Using different kinds of magnets on same rotor](#)

By [Jeremy](#), Section [Homebrewed Electricity](#)

Posted on Sat Dec 20th, 2003 at 09:17:38 PM MST

[Alternators](#)

I think collecting hard drive magnets is a labor of love.

Well,

I'm building this windmill and I'm tryng to use mostly recycled parts. I've found an old strut and brake rotor from a junk yard; however, I have only one rotor. The strut was not attatched to a car and as I do not have the make and model number of the car I've had difficulty finding another matching rotor. It seems then the best thing to do is to build a single rotor machine.

I've been collecting hard drive magnets for the magnet part of things. They are of different shapes and apparently strengths. What if I were to use two different or even three different sizes or shapes of magnets on the same rotor? As long as they were still balanced would it make a meaningful difference?

I also have a hard time both understanding and locating matereial for laminates. I am really attracted to the dual rotor mills; however, I lack a second rotor. Could I use a peice of plywood or perhaps some plate of steel for a second rotor and use different magnets than I used for the first rotor or weaker magnets than the first rotor? I would be doing this more to not have to deal with the whole laminates end of things ,not really to produce more power. It also gives me another way to divide up all these different shaped magnets.

I really would appreciate any comments on these questions,

Jeremy tnhach@yahoo.com

[Using different kinds of magnets on same rotor](#) | 17 comments (17 topical, 0 editorial)

Re: Using different kinds of magnets on same rotor ([none / 0](#)) ([#1](#))

by Hank on Sat Dec 20th, 2003 at 09:53:56 PM MST

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Hi Jeremy,

Thing to be carefull with "hard drive" magnets is that a lot of them have the N and S pole on the same face. I don't think you can use these effectivly for an alternator. Look for magnets that have a N pole on one face the S pole on the other.

If you want to make a dual rotor take the disc you have to a junk yard or scrap metal yard and match it to some other one.

As this has not worked for you then a plate of steel would be the way to go, plywood is out.

I suspect you can mismatch magnets (not an ideal way to go) the outcome may be that some of your coils will produce more voltage/power then the others. In a series system I don't believe it will matter. In parallel it may, I really don't know.

As far as laminates go (for a single rotor) you would want very low carbon steel strip or special laminate steel (Silicon). A good way to check if a piece of steel is suitable for laminates is to put a magnet on a piece of this steel then remove it. Now check if there is any residual magnetism in the steel by trying to pick up a pin or small nail with it. The less residual magnetism the better. For reference try this with a hack saw blade, it will have a high residual magnetism and are not good for laminate material.

I ended buying a 4'x8'x .060 1008 steel sheet. It only cost me \$20. It cost me \$40 to have it sliced to the width I needed at the tin smith.

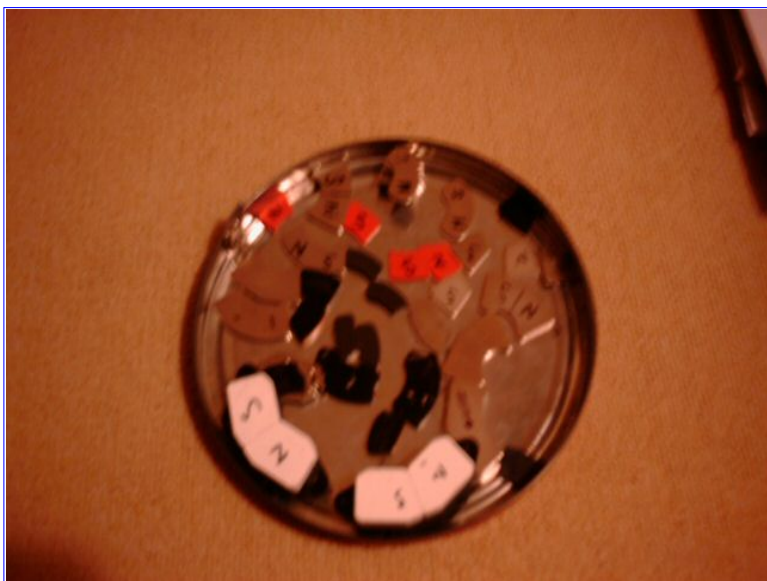
Have fun,

Hank

Re: Using different kinds of magnets on same rotor ([none / 0](#)) ([#2](#))  
by [Sponge](#) on Sun Dec 21st, 2003 at 02:27:44 AM MST  
([User Info](#))

Im working myself on a harddisk magnet rotor, this week I'm going to try my test setup for it.

As you might have noticed.. magnets come in all sorts and sizes.. liek this picture demonstrates. I took it yesterday night, bit unsharp:



(clickable)

My current amount of proper magnets:



(clickable)

I have not yet made laminates. I can't find any decent info about it. The only metal I can find overhere is 10mm wide, 1mm in height and 1m long. (or a 16mm wide version). I'm not sure if that is bad, good, or semi good. The only strips I can find are aluminium...

Oh, I forgot: Does anyone think the material from a "cookie box" (like where my magnets are on, at the top picture) would be a nice amination material? :) It's thin.. :)

Also, right here:

<http://www.fieldlines.com/story/2003/10/15/102538/69>

Someone is telling about his HD magnet windmill (somewhere in center of the page), but the guy doesn't have a nemail adres unfortunatly.

Regards,  
Almar

[ [Parent](#) ]

Re: Using different kinds of magnets on same rotor ([none / 0](#)) ([#3](#))  
by Hank on Sun Dec 21st, 2003 at 06:41:33 AM MST  
([User Info](#))

Try this site [http://www.otherpower.com/otherpower\\_experiments.html](http://www.otherpower.com/otherpower_experiments.html)

There is a lot of info there on various genny's.

The Volvo 240 and the "Ward Mill" will discuss laminates.

Have fun

[ [Parent](#) ]

Re: Using different kinds of magnets on same rotor ([none / 0](#)) ([#5](#))  
by Jeremy on Sun Dec 21st, 2003 at 09:17:13 AM MST  
([User Info](#))



I have to say that I've seen alot of your comments on the rest of the discussion board and I usually have the same questions as you do. Are you not worried by Hanks advice about the dual poles on the hard drive magnets? It seems to me that others have used them with some success. I also hear you saying, "over here" a lot. Where is that? Thanks,

Jeremy

[ [Parent](#) ]

Re: Using different kinds of magnets on same rotor ([none / 0](#)) ([#8](#))  
by [Sponge](#) on Sun Dec 21st, 2003 at 10:34:47 AM MST  
([User Info](#))

Well, ChrisW (the post I mentioned above) got it working right. Although someone else that I mailed failed on his "harddisk magnet" windmill.

"Over here" is the Nothern part of The Netherlands, always windy, 100+ windmills visible with "the naked eye" (on a small hill) :-).

[ [Parent](#) ]

Re: Using different kinds of magnets on same rotor ([none / 0](#)) ([#4](#))  
by [Jeremy](#) on Sun Dec 21st, 2003 at 09:09:34 AM MST  
([User Info](#))

Thanks for the advice,

The part I find confusing about laminates is firstly, what kind of metal to use (which I think I understand more about from your comment) and secondly, are the strips wound in a coil or are they concentric rings insulated completely from eachother? I would also love an example of a product or thing in everyday life that is made of this metal. I suppose I'm ignorrant to what low-carbon or silcon steel is. It sounds so specialized, but perhaps it is an everyday metal I come across all the time. Thanks again for the insight.

Jeremy

[ [Parent](#) ]

Re: Using different kinds of magnets on same rotor ([none / 0](#)) ([#6](#))  
by Hank on Sun Dec 21st, 2003 at 09:43:02 AM MST  
([User Info](#))

Jeremy,

Low carbon steel is probably the cheapest steel. Probably used in making cars. You may also find it in a Auto Body supply shop. It's soft and easy to work. You can also call a steel supply shop and ask about it. Key here is "low carbon" and that's what I would recommend as being the most cost effective.

The strips are concentric rings insulated from each other. I used masking tape on one side for the insulation.

The pic here shows my stator. If you look carefully behind the coils in the center you will see the laminates. The width of all the laminates should be at least the size of your magnets and they serve the purpose of focusing and completing the magnetic circuit.



This greatly enhances the power capabilities of the genny.

Have fun,  
Hank

[ [Parent](#) ]

Re: Using different kinds of magnets on same rotor ([none / 0](#)) ([#7](#))  
by Sponge on Sun Dec 21st, 2003 at 10:30:10 AM MST  
([User Info](#))

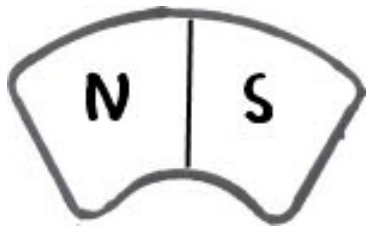
btw, staying on topic, I have tried various coils today..and right now, the power output of one coil - currently without laminates - is still a bit disappointing I think. I get about 0.3v with one coil (circular, and wide), spinning my mill as fast as I can. So I'm wondering a bit if I could improve my coil:

Note: Right now you see various magnets. This was just quickly for testing if it was a magnet problem for the low output. For my "real" setup, check out picture above!



Since this is my first windmill, I have no idea how those coils exactly work, even after reading all sites I could find :)

All my magnets look like:





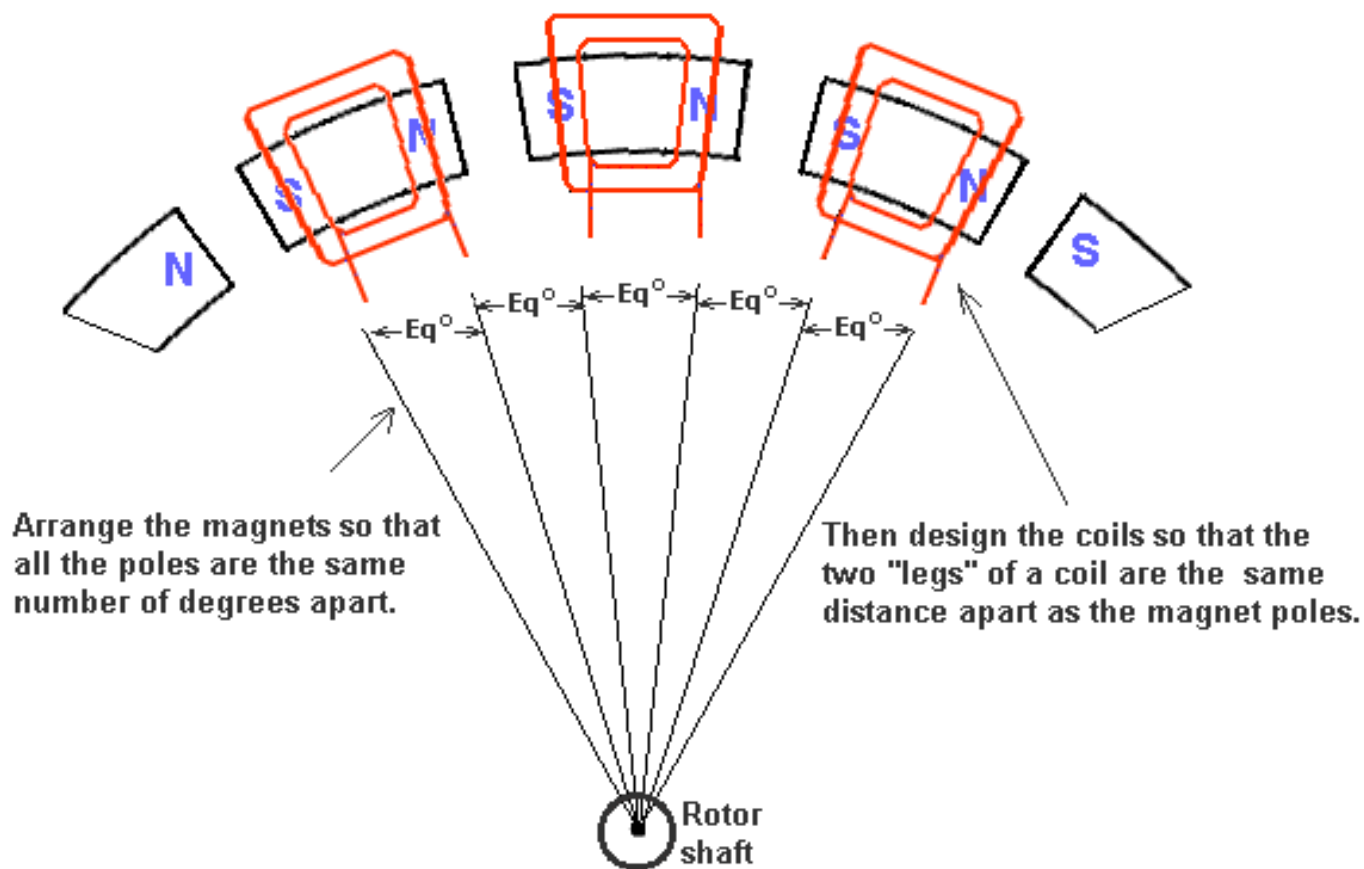
Anyone can tell me what the best size would be? :)

Regards,  
Sponge

Re: Using different kinds of magnets on same rotor ([none / 0](#)) ([#9](#))  
by Electric Ed on Sun Dec 21st, 2003 at 11:16:41 AM MST  
([User Info](#)) <http://www.electric-ed.com>

Sponge,  
Try the design approach outlined in the sketch below.

Electric Ed



[ [Parent](#) ]

Re: Using different kinds of magnets on same rotor ([none / 0](#)) ([#10](#))  
by DanB on Sun Dec 21st, 2003 at 11:59:23 AM MST  
([User Info](#))

Yes, I would try what Electric Ed suggests below. I think your coil is way too large... at most, it should be the size of a single magnet there, so that the OD of the coil is not larger than two poles (1 magnet).

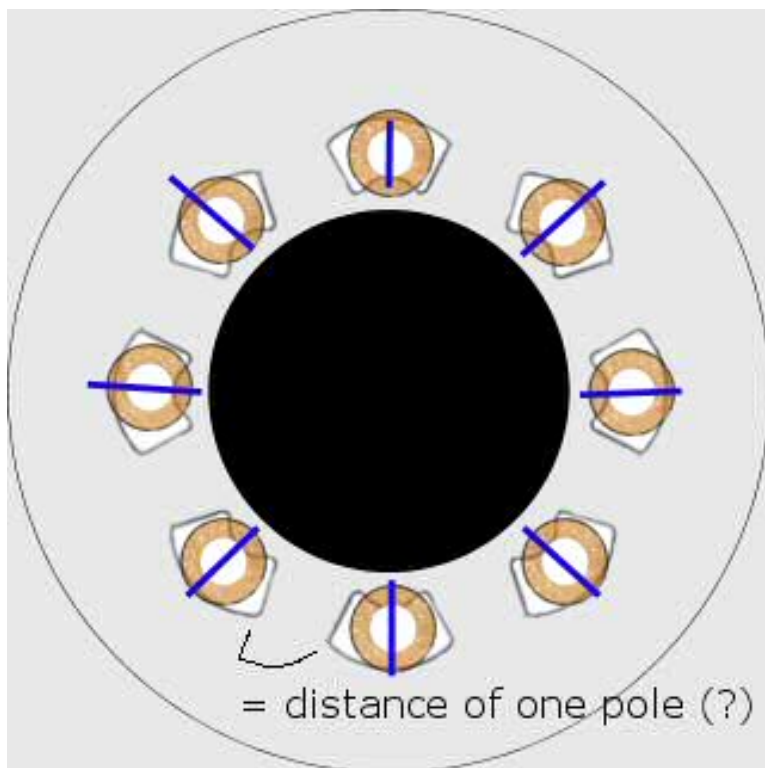
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It sounds a bit funny - but I think perhaps youd get better results if you could break those hard drive magnets in half so that there was a bit of seperation between the poles.

[ [Parent](#) ]

Re: Using different kinds of magnets on same rotor ([none / 0](#)) ([#11](#))  
by [Sponge](#) on Sun Dec 21st, 2003 at 01:20:01 PM MST  
([User Info](#))

Thanks, a bit like this?



I don't like breaking the magnets in two, actually :)

Regards,  
Sponge

[ [Parent](#) ]

Re: Using different kinds of magnets on same rotor ([none / 0](#)) ([#12](#))  
by Hank on Sun Dec 21st, 2003 at 02:14:13 PM MST  
([User Info](#))

You may want to make your coils look more like Ed showed, sort of rectangular. You want the magnets crossing the wire at a right angles (90 deg.) not parallel. So the hole in the center should be larger than your magnets are wide and the magnets should just cross the legs of the coil.

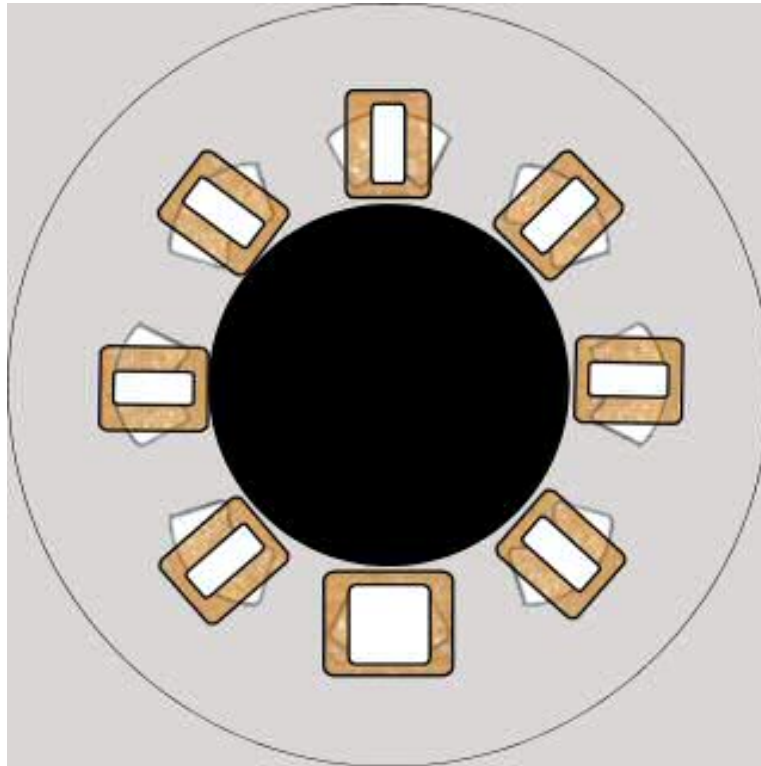
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Re: Using different kinds of magnets on same rotor ([none / 0](#)) ([#13](#))  
by [Sponge](#) on Sun Dec 21st, 2003 at 02:45:13 PM MST  
([User Info](#))

Yeah, I tried rectangular before, but somehow the circular one gave more output :). But I guess it was my first "flat" coil. So, if I understand correctly, it should be like this? (or more like the bottom coil?).

With one magnet per pole, it's easier to be sure than with these HD magnets :)  
So.. just checking :) (And I think there are more people looking for answers like these in the future too :- ) !)



Regards,  
Almar

[ [Parent](#) ]

Re: Using different kinds of magnets on same rotor ([none / 0](#)) ([#14](#))  
by Hank on Sun Dec 21st, 2003 at 06:07:22 PM MST  
([User Info](#))

Yes that's more like it. NOT like the bottom one it's too large. Also I think you might want to make the legs a bit longer so the whole magnet can be seen thru the hole in the center of the coil.

Magnets passing parallel with the coil windings don't produce power. This is a waste of potential power.

The coils don't have to be perfectly rectangular, you may want to make them a bit trapezoidal to sort of fit to the shape of your magnets. Perhaps similar to the pic I have above in an earlier thread.

[ [Parent](#) ]

Re: Using different kinds of magnets on same rotor ([none / 0](#)) ([#16](#))  
by DanB on Mon Dec 22nd, 2003 at 08:27:57 AM MST  
([User Info](#))

I think that's close... the best bet is experiment I suppose. I'd try the coils slightly larger. If it were me, if you're not going to break the magnets, then I'd try to run them close together so the poles are as equally spaced as possible.

[ [Parent](#) ]

Re: Using different kinds of magnets on same rotor ([none / 0](#)) ([#15](#))  
by kell on Sun Dec 21st, 2003 at 07:43:29 PM MST  
([User Info](#))

Consider the moment the coils pass between magnets. Flux lines extend from the north pole of one magnet to the south pole of the adjacent one just as they extend from the north pole of a single magnet to its own south pole. The coil will see that. So doesn't it make sense that the north and south poles of two adjacent magnets should measure the same distance apart as the north and south poles of a single magnet, in order to optimize the functioning of your generator?

Try dangling a needle on a thread to find the exact point a pole is located at. Measure the distance between the north and south poles of one of your magnets. That should be the distance, center to center, for you to mount the magnets. You may have to adjust the distance from the center of rotation of your ring of magnets in order to make it all come out even because, in this case, you are dealing with a fixed magnet spacing. That may be why some people succeeded with HD mags and some didn't -- it might be kind of a crapshoot whether the poles are spaced evenly even if the magnets themselves are spaced evenly. Another reason all your magnets should be the same.

Re: Using different kinds of magnets on same rotor ([none / 0](#)) ([#17](#))  
by [Sponge](#) on Mon Dec 22nd, 2003 at 02:55:01 PM MST  
([User Info](#))

Thank you guys!

I'll try it tommorow when I have a bit more time to do some testing. The "needle and a wire" trick seems to work to find the exact "pole centerpoints".

I think haddisk-magnet alternators are nice for a first windmill experiment. I think this entire thread might be usefull to other people as well :) (Although the only "bad" thing of this board is that this thread will probably be down 2 pages if I post my results and no one might see it, except for searchers :-))

Regards,  
Sponge

[Using different kinds of magnets on same rotor](#) | 17 comments (17 topical, 0 editorial)

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[Using different kinds of magnets on same rotor](#) | 17 comments (17 topical, 0 editorial)

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by DanB on Sun Dec 21st, 2003 at 11:59:23 AM MST  
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by Sponge on Sun Dec 21st, 2003 at 01:20:01 PM MST  
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Thanks, a bit like this?

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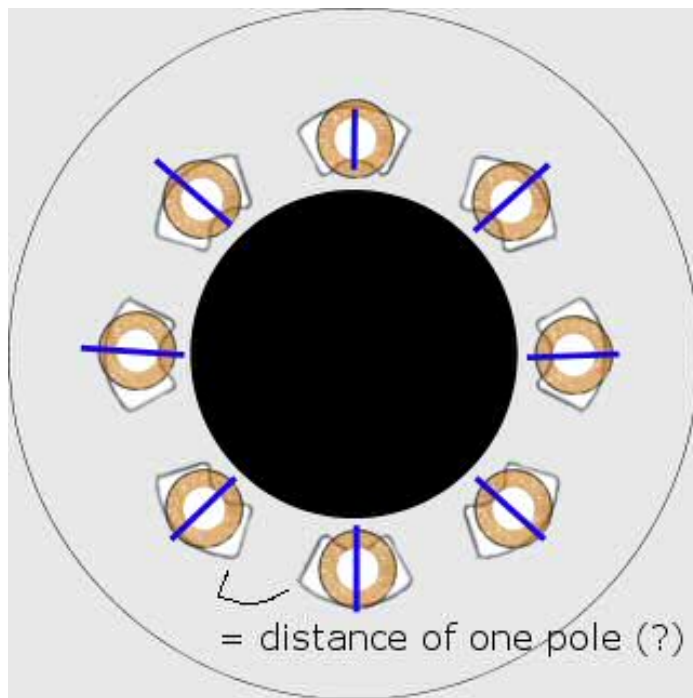
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Regards,  
Sponge

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([none / 0](#)) (#12)  
by Hank on Sun Dec 21st, 2003 at 02:14:13 PM MST  
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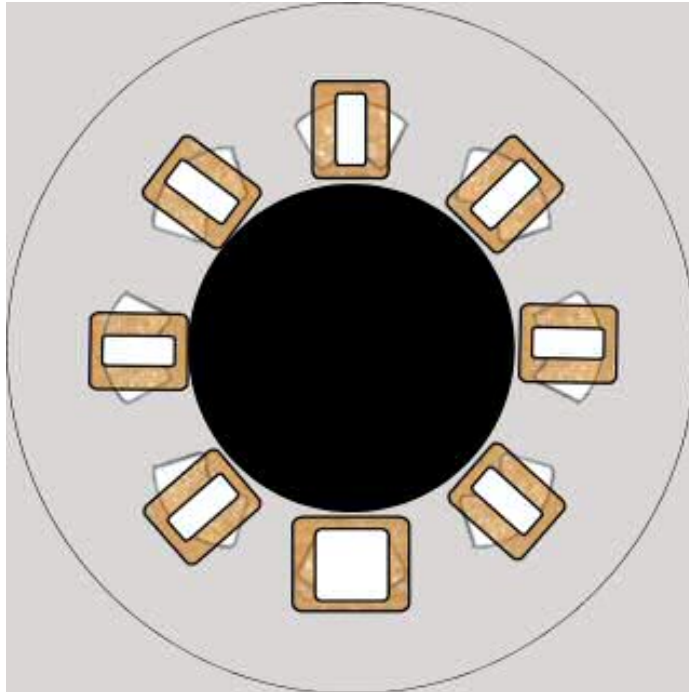
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[Using different kinds of magnets on same rotor](#) | 17 comments (17 topical, editorial)

Re: Using different kinds of magnets on same rotor  
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[Laminated Copper Coils?](#) | 8 comments (8 topical, editorial)

Re: Laminated Copper Coils? ([none / 0](#)) ([#5](#))  
by DanB on Wed Dec 17th, 2003 at 10:41:40 PM MST  
([User Info](#))

I think what he had in mind is not wider wire... but picture winding your coils with tape. You can get magnet wire in square, and rectangular shapes -and it would save a lot of space and definitely allow for significantly more wire in a smaller space. I wish I had a good selection of such wire - I think it would be great. I suspect winding nice clean tight coils might be tricky with really thick stuff, but if you had the resources and the patience the coils would come out really nice.

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Re: Laminated Copper Coils? ([none / 0](#)) ([#6](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Thu Dec 18th, 2003 at 08:24:47 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

I've used bar stock to make some extremely powerful alternators as well as copper sheet. It is, however, very difficult to work with and you have to do some advanced planning on winding them and setting them into place. One I experimented with was made from copper sheet, punched out the coils and soldered together to form a "slinky" style coil.

You can get almost double the turns of an equivalent size but it will take a couple days on each coil. The outcome, of mine, wasn't real rewarding for the amount of work I put into it and the idea was scrapped. I believe the limit was 30 to 1 which is to say the width of the sheet can't exceed 30 times the thickness of the metal. Ribbon wire would be much better and easier to work with. I used a thin plastic sheet for insulating between the copper and I'm sure I was getting a "capacitor" or "skin" effect from the unit.

Another idea was to use a circuit board to form the coils, simply etching the coils from a copper clad board and laying them in place. This worked well but didn't make any real power, but... I believe it could be done with a thicker copper using less turns and more magnets. Yet another attempt to solder straight wires between circuit boards to create coils.

The idea here was to use thicker return lines to reduce the wasted resistance on the upper and lower portion of the coil thus reducing the over all resistance of the phase. This also worked fairly well if you have the patience. If they were made on an assembly line put together by robots would have great potential... doing it by hand, and making all the wires and parts... well it took me a month to make

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one set of coils for a 3 phase unit... needless to say it was never finished. The phase that was finished kicked butt! Laying bar stock in slots and wiring them together using heavy wire also makes an extremely powerful "welder" or an alternator that will power a small town. Sky's the limit! Your only limited to your imagination!

Have Fun  
windstuff Ed

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Re: Laminated Copper Coils? ([none / 0](#))

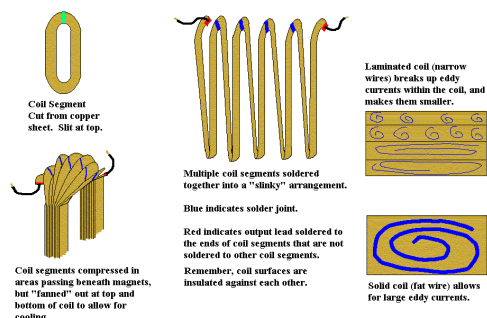
([#7](#))

by [cevonk\(atsignhere\)aol.com](#) on Thu Dec 18th, 2003 at 11:33:37 AM MST ([User Info](#))

That is the general idea that I had in mind.

Here is a (hopefully small) picture of what I had in mind. I'm guessing (literally) that the eddy currents would be as bad with laminations as they would be with solid stock. I think that the same situation would exist with regard to eddy currents as exists with laminated stators, or thinner versus thicker wires. The thinness of the laminations would hopefully reduce the problem of "skin" conduction as it exists in very thick conductors (which sounds like a different kind of "skin" conduction than the capacitance induction that you mention in using the film as an insulator between the coil layers in your experiment.

The thought is that the coil segments could be struck from copper sheet on some kind of die, or that they could be cut in a stack on a scroll saw. Having been shaped, they could be coated with a thin film of insulation (polyester resin?) Then they could be soldered together at the top. An adhesive would be placed between the insulated layers where the magnet passes over them, and they would be compressed until the adhesive cured. The end sections of the coil would not be glued to each other so that they could be bent into the fan shape at the top of the coil to provide surface area for cooling the coil.



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[Laminated Copper Coils?](#) | 8 comments (8 topical, editorial)

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## Laminated Copper Coils?

By [cevonk](#), Section [Homebrewed Electricity](#)

Posted on Tue Dec 16th, 2003 at 09:56:38 AM MST [Magnetism](#)

Instead of using wire, how about using laminated copper sheet in coils?

I was looking at pictures of the coils that were recently displayed in the discussion about thin coils, and then I was reading another post about using contact cement as the insulator between laminates in a laminated stator. I got to wondering.

How about using laminated copper instead of copper wire in the coils? The area of a cross section of #10AWG (0.1019" diameter bare wire, 0.1039" insulated) copper wire is 0.00816 square inches, or 5,26 square mm. A 1/4 inch, or 6.35 mm, wide strip of 1/32", or .79 mm, thick copper sheet has a cross section of 0.0078 square inches, or 5.04 square mm. If one has 1", or 25.4 mm, wide magnets, a copper lamination of 1/32" thickness of equivalent width would have a cross section of 0.03125 square inches, or 20.07 square mm. This would be the equivalent of 3.83 wraps of #10AWG copper wire.

One (theoretical) advantage to using a copper laminate would be that the copper could be more densely packed -- the thickness of the insulation separating the copper wires is reduced quite a bit, existing between the laminate sections (a reduction of nearly 75%) and at the two edges, the edge insulation representing a significant reduction dependent on the number of wraps used. Assuming of course that a thickness of insulation could be applied by the amatuer that is comparable to the thickness used on commercial magnet wire.

If an insulation thickness of 0.001 inches, or 0.0254 mm, were applied between the laminates, a coil equivalent to 46 wraps of #10AWG magnet wire could be constructed with a 12 laminate sections having a thickness of 0.388 inches, or 9.85 mm.

A coil having 46 wraps of #10AWG magnet wire configured in a 5 wrap width by a 9 wrap depth would have a width of 0.5195 inches, or 13.2 mm, and a depth of of 0.9351 inches, or 23.75 mm.

The wire coil would be thicker by 0.1315 inches, or 3.34 mm. As we saw from the calculator example elsewhere, 1/8" of difference in the field airgap represents a significant difference in field strength.

Maintaing the same thickness, the laminated coil could contain an additional 4 laminates, equalling roughly 16 more wraps of wire, or an increase of 34% in the amount of copper between the magnets.

Since the wire coil would also be slightly narrower than the copper laminate coil by 0.0649 inches, or 1.65 mm, and thus narrower than the width of the magnets, for a given rpm, the wire coil would spend 1/16 less time in the influence of the magnets' field. Simply by using the

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laminates, there would be a 6.5% effective increase of rpm.

Where the coil laminates extended above the magnets and across to the other side of the coil, the laminates could be "fanned" or spread open to increase the thermal losses of the coil over the laminate surface.

Does this make sense?

[Laminated Copper Coils?](#) | 8 comments (8 topical, 0 editorial)

The numbers of it all. ([none / 0](#)) ([#1](#))  
by BryanA on Tue Dec 16th, 2003 at 03:11:18 PM MST  
([User Info](#))

Okay, that's totally mindblowing for me who has little experience but lots of desire. It sounds like you're in a perfect mind set to test this with a practical model where nominal results would reveal themselves.

But as a theory, how far away from the status quo is this concept? Perhaps it's done the way it's done because that's the way it works best? A possible 6% improvement does warrant a little research I would think.

Re: The numbers of it all. ([none / 0](#)) ([#3](#))  
by cevonk ([cevonk\(at\)signhere\(aol.com\)](mailto:cevonk(at)signhere(aol.com))) on Tue Dec 16th, 2003 at 09:50:26 PM MST  
([User Info](#))

I wish I had the ability to approach showing nominal results, but for various reasons right now I'm stuck in theory. :-)

I'm not sure that it is that far away from the status quo. It's just a re-organization of the commonly used material not a departure from the standards.

One thing I can see is that it using a flat section of coil that has X times the cross sectional area of a piece of wire is that the voltage would drop and the amperage would rise (unless I have that backwards.)

If a amperage or voltage were desired, the either the width of the laminate could be adjusted or the voltage could be manipulated after the electricity leaves the stator (which would cause a loss in efficiency.)

[ [Parent](#) ]

Re: Laminated Copper Coils? ([none / 0](#)) ([#2](#))  
by wpowokal on Tue Dec 16th, 2003 at 03:37:52 PM MST  
([User Info](#))

Apologies if I have not fully followed you but,

Are you proposing the same number of turns?

I believe the flat copper you discuss would be commercially available, I still have some coils out of starter motors that are wound exactly this way.

The fanning of the "wire" would add some resistance to the total coil, but the cooling effect may more than compensate for this.

Oh and big commercial generators use copper bars, your proposal would cetrinally allow for a neat coil.

regards Allan

Re: Laminated Copper Coils? ([none / 0](#)) (#4)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Wed Dec 17th, 2003 at 09:40:26 AM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

Seems like a wider wire would produce more eddy currents within the wire, and thus, more drag on the rotor...

}-- W o o f --{

Re: Laminated Copper Coils? ([none / 0](#)) (#5)  
by DanB on Wed Dec 17th, 2003 at 10:41:40 PM MST  
([User Info](#))

I think what he had in mind is not wider wire... but picture winding your coils with tape. You can get magnet wire in square, and rectangular shapes -and it would save a lot of space and definitely allow for significantly more wire in a smaller space. I wish I had a good selection of such wire - I think it would be great. I suspect winding nice clean tight coils might be tricky with really thick stuff, but if you had the resources and the patience the coils would come out really nice.

[ [Parent](#) ]

Re: Laminated Copper Coils? ([none / 0](#)) (#6)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Thu Dec 18th, 2003 at 08:24:47 AM MST  
([User Info](#))  
<http://www.windstuffnow.com/main>



I've used bar stock to make some extremely powerful alternators as well as copper sheet. It is, however, very difficult to work with and you have to do some advanced planning on winding them and setting them into place. One I experimented with was made from copper sheet, punched out the coils and soldered together to form a "slinky" style coil. You can get almost double the turns of an equivalent size but it will take a couple days on each coil.

The outcome, of mine, wasn't real rewarding for the amount of work I put into it and the idea was scrapped. I believe the limit was 30 to 1 which is to say the width of the sheet can't exceed 30 times the thickness of the metal.

Ribbon wire would be much better and easier to work with. I used a thin plastic sheet for insulating between the copper and I'm sure I was getting a "capacitor" or "skin" effect from the unit.

Another idea was to use a circuit board to form the coils, simply etching the coils from a copper clad board and laying them in place.

This worked well but didn't make any real power, but... I believe it could be done with a thicker copper using less turns and more magnets. Yet another attempt to solder straight wires between circuit boards to create coils. The idea here was to use thicker return lines to reduce the wasted resistance on the upper and lower portion of the coil thus reducing the over all resistance of the phase.

This also worked fairly well if you have the patience. If they were made on an assembly line put together by robots would have great potential... doing it by hand, and making all the wires and parts... well it took me a month to make one set of coils for a 3 phase unit... needless to say it was never finished. The phase that was finished kicked butt! Laying bar stock in slots and wiring them together using heavy wire also makes an extremely powerful "welder" or an alternator that will power a small town. Sky's the limit! Your only limited to your imagination!

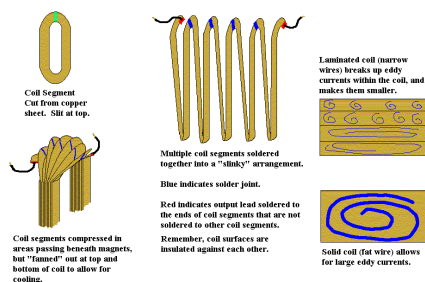
Have Fun  
windstuff Ed

[ [Parent](#) ]

Re: Laminated Copper Coils? ([none / 0](#)) (#7)  
by [cevonk\(atsignhere\)aol.com](#)  
on Thu Dec 18th, 2003 at 11:33:37 AM  
MST  
([User Info](#))

That is the general idea that I had in mind. Here is a (hopefully small) picture of what I had in mind. I'm guessing (literally) that the eddy currents would be as bad with laminations as they would be with solid stock. I think that the same situation would exist with regard to eddy currents as exists with laminated stators, or thinner versus thicker wires. The thinness of the laminations would hopefully reduce the problem of "skin" conduction as it exists in very thick conductors (which sounds like a different kind of "skin" conduction than the capacitance induction that you mention in using the film as an insulator between the coil layers in your experiment.

The thought is that the coil segments could be struck from copper sheet on some kind of die, or that they could be cut in a stack on a scroll saw. Having been shaped, they could be coated with a thin film of insulation (polyester resin?) Then they could be soldered together at the top. An adhesive would be placed between the insulated layers where the magnet passes over them, and they would be compressed until the adhesive cured. The end sections of the coil would not be glued to each other so that they could be bent into the fan shape at the top of the coil to provide surface area for cooling the coil.



[ [Parent](#) ]

Re: Laminated Copper Coils? ([none / 0](#)) ([#8](#))  
by [cevonk\(atsignhere\)aol.com](#) on Thu Dec 18th,  
2003 at 11:44:49 AM MST  
([User Info](#))

SHOULD READ: I'm guessing (literally) that the eddy currents would NOT be as bad with laminations as they would be with solid stock.

[Laminated Copper Coils?](#) | 8 comments (8 topical, 0 editorial)

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["Perpetual Motion" Experiment.....](#) | 6 comments (6 topical, editorial)

Re: "Perpetual Motion" Experiment..... ([none / 0](#))  
(#5)  
by DanB on Wed Dec 17th, 2003 at 09:30:38 PM MST  
([User Info](#))

those have batteries in them.

They are basicly just "fun" motors to watch - and they use very little power, but they use some.

[ [Parent](#) ]

["Perpetual Motion" Experiment.....](#) | 6 comments (6 topical, 0 editorial)

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["Perpetual Motion" Experiment.....](#) | 6 comments (6 topical, 0 editorial)

Re: "Perpetual Motion" Experiment..... ([none / 0](#)) (#5)  
by DanB on Wed Dec 17th, 2003 at 09:30:38 PM MST ([User Info](#))

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["Perpetual Motion" Experiment.....](#) | 6 comments (6 topical, 0 editorial)

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["Perpetual Motion" Experiment.....](#)

By [Andy1807](#), Section [Magnets & Magnetism](#)  
Posted on Tue Dec 16th, 2003 at 10:18:40 PM MST

[Magnetism](#)

I am wanting to build a little perpetual motion device for my mantel, and I'm having trouble finding plans for anything similar on the internet.

I figured there would be a ton of experiments out here, but after looking for about 3 hours, I can't find anything. I'm looking for something pretty simple, using magnets. Any ideas? I'm also trying to learn more about magnetism, so if you have any other resources for me (other experiments, or interesting projects to build) I'd love some input.

thanks.

Andy

["Perpetual Motion" Experiment.....](#) | 6 comments (6 topical, 0 editorial)

Re: "Perpetual Motion" Experiment..... ([none / 0](#)) ([#1](#))  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Tue Dec 16th, 2003 at 11:13:24 PM MST  
([User Info](#)) <http://www.internetfred.com>

If you do a search on google search engine you'll find them all. Check out JNL Labs..

<http://www.google.ca/search?q=free+energy&ie=UTF-8&oe=UTF-8&hl=en&meta>

JNL Labs  
"http://members.aol.com/jnaudin509/"><http://members.aol.com/jnaudin509/>

Keely Net  
<http://www.keelynet.com/>

Re: "Perpetual Motion" Experiment..... ([none / 0](#)) ([#2](#))  
by DanB on Wed Dec 17th, 2003 at 09:08:51 AM MST  
([User Info](#))

Hi Andy -  
Perpetual motion is a sort of "Holy grail" thing. Im quite sure it's never been achieved, although some disagree. Our "policy" when discussing it with customers/potential customers... is to try to explain that it's impossible and probably a waste of time. (unless you have a good time building something which may not work in which case you've spent your time better than lots of folks who are probably watching television or something!). There are patents for "magnetic motors" - which... Im quite confident never worked and never could work. (it does not necessarily have to work to get a patent! - it just has to be difficult to prove that it couldn't work). Here is our brief FAQ on that topic:  
<http://www.wondermagnet.com/magfaq.html#q17>

You could build come close.... building machines which use very little energy (kind of like desk toys you see which actually have batteries in them, but run for quite a long time!).

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Re: "Perpetual Motion" Experiment..... (none / 0) (#3)  
by charged on Wed Dec 17th, 2003 at 09:16:36 AM MST  
([User Info](#))

[www.keelynet.com/bedmot/bedmot.htm](http://www.keelynet.com/bedmot/bedmot.htm)

There is no such thing as "perpetual motion". But, there are many machines that gather ambient energy and concentrate it for your consumption.

Build one of these. You won't be sorry.

Enjoy!

Re: "Perpetual Motion" Experiment..... (none / 0) (#4)  
by Andy1807 on Wed Dec 17th, 2003 at 07:42:42 PM MST  
([User Info](#))

Maybe I shouldn't have called it perpetual motion. What I had in mind was something like you used to be able to find in mall shops 10 years ago. They had a black base and then had some type of chrome moving parts with magnets.

The idea was that the magnets repel each other, and then gravity bring them back together where they repel each other again. It was more of a curiosity than a "machine". Any leads as to where to find plans for something like this?

Re: "Perpetual Motion" Experiment..... (none / 0) (#5)  
by DanB on Wed Dec 17th, 2003 at 09:30:38 PM MST  
([User Info](#))

those have batteries in them.

They are basicly just "fun" motors to watch - and they use very little power, but they use some.

[ [Parent](#) ]

Re: "Perpetual Motion" Experiment..... (none / 0) (#6)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Thu Dec 18th, 2003 at 07:53:26 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Andy,

Those are driven by a small kicker circuit and are quite simple. The basic circuit was used in the "adams" and "bedini" motors. Another site that has a very simple circuit for doing just what you described is here....

<http://home.earthlink.net/~lenyr/magkick.htm>

That should get you going...

Have fun  
Windstuff Ed

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["Perpetual Motion" Experiment.....](#) | 6 comments (6 topical, 0 editorial)

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[10 kW windflower from Lithuania \(the third attempt to post\)](#) | 4  
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Re: 10 kW windflower from Lithuania (the third att  
([none / 0](#)) (#1)  
by DanB on Wed Dec 17th, 2003 at 09:18:32 AM MST  
([User Info](#))

Thankyou for sharing that! Quite impressive...

[10 kW windflower from Lithuania \(the third attempt to post\)](#) | 4  
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## [10 kW windflower from Lithuania \(the third attempt to post\)](#)

By [Virgis](#), Section [Homebrewed Electricity](#)

[Free Energy](#)

Posted on Tue Dec 16th, 2003 at 09:50:44 AM MST

A short story about homebrewed electricity enthusiast from small Lithuania town Naujoji Akmene.

---

I will try to tell a short story about my acquaintance Zigmas and his Windflower.

I thanks all who helped me to post this story. English isn't my native language, but I hope images will help me to do it.



### General technical data:

Theoretical power: 10kW at 15m/s wind speed  
Turbine diameter: 9.4 m  
Blades: (adjustable + removable) 12 big + 12 smaller  
Weight of one big blade: 24 kg  
Weight of one smaller blade: 14 kg  
Alternator: 10 kW 3 ph 380 VAC sinchrouas motor  
Total wieght on tower: 900 kg  
Furling system: Yes (remote controlled)  
Brake system: Yes (hydraulic)  
Tower height: 14 m

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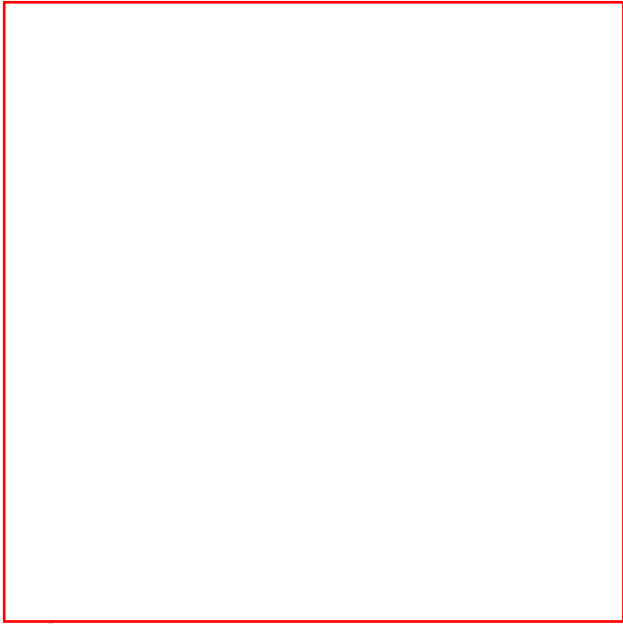
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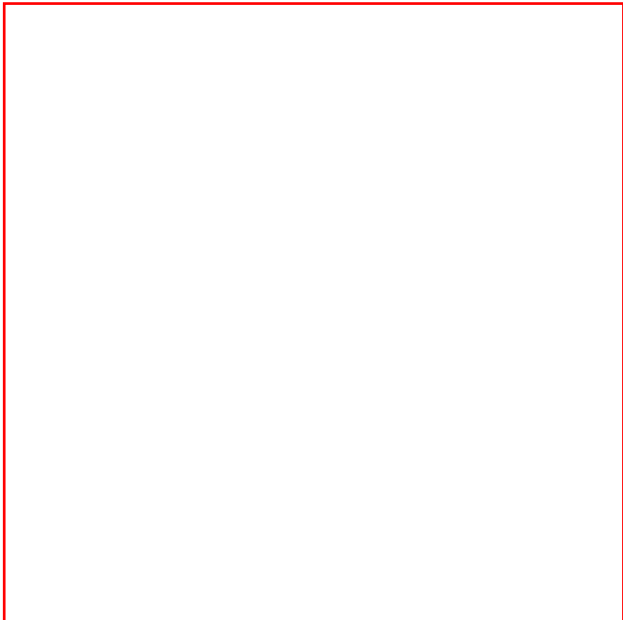
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**General view**

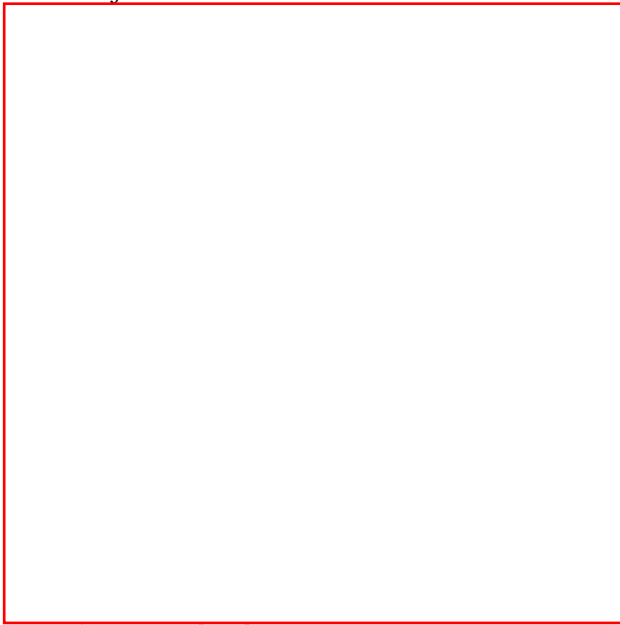


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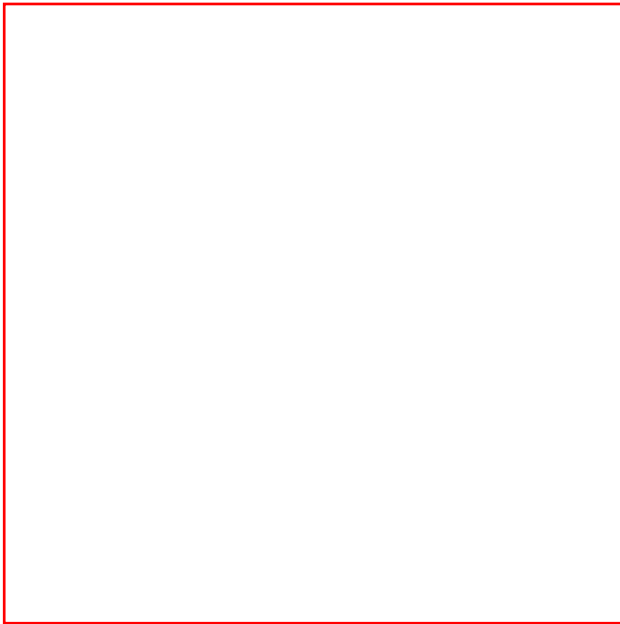




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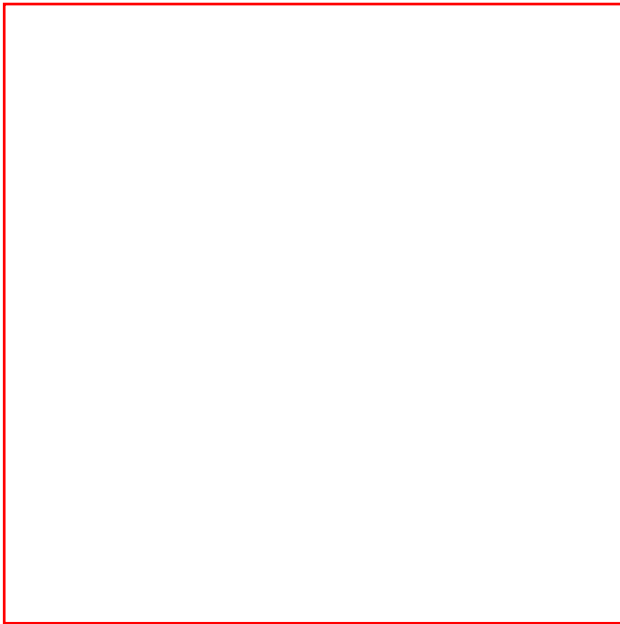
**View from wind side**



**Control cabinet**

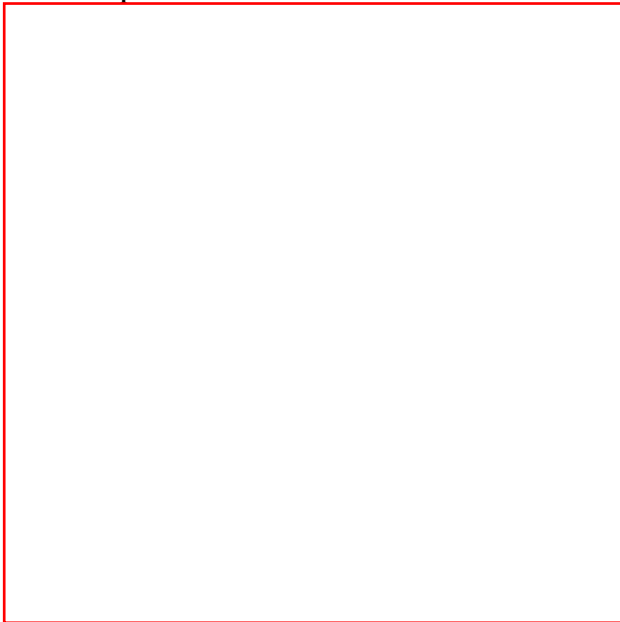


**Zigmas- an author of monstrous windflower**



Zigmas and his Baby.

The next my story will be about our pupil club WIND KIDS. I hope it will be in January 2004. The last storm two weeks ago demaged our windmill a little bit and now we are repairing it. But a nail of my postings will be a story about windmillwith heliconter blades. It is far away from me and I need to have a free time to visit enthusiast and to make photos. Let wait a little bit.



Merry X-Mas post card  
Merry X-Mas and a Happy New Year 2004 for all!  
Virgis

[10 kW windflower from Lithuania \(the third attempt to post\)](#) | 4  
comments (4 topical, 0 editorial)

Re: 10 kW windflower from Lithuania (the third att  
([none / 0](#)) ([#1](#))  
by DanB on Wed Dec 17th, 2003 at 09:18:32 AM MST  
([User Info](#))

Thankyou for sharing that! Quite impressive...

Re: 10 kW windflower from Lithuania ([none / 0](#)) ([#2](#))  
by drdongle on Wed Dec 17th, 2003 at 03:30:05 PM MST  
([User Info](#))

Pretty neat!  
Wish I had the time, money and location for something like this.

Dr.D

Re: 10 kW windflower from Lithuania ([none / 0](#)) ([#3](#))  
by Old F on Wed Dec 17th, 2003 at 04:20:25 PM MST  
([User Info](#)) <http://www.oldf.homestead.com>

Thanks for stopping in and sharing.

This shows you can get lots of power from a low rpm high torque blade set.  
Very interesting in deed.

Old F

PS

Don't worry to much about your English . A lot of American have a hard time with it my self included and its are only language : )

Have Fun

Re: 10 kW windflower from Lithuania (the third att  
([none / 0](#)) ([#4](#))  
by kurt on Mon Dec 22nd, 2003 at 06:18:14 AM MST  
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very cool



[10 kW windflower from Lithuania \(the third attempt to post\)](#) | **4**  
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["Perpetual Motion" Experiment.....](#) | 6 comments (6 topical, editorial)

Re: "Perpetual Motion" Experiment..... (none / 0) (#2)  
by DanB on Wed Dec 17th, 2003 at 09:08:51 AM MST ([User Info](#))

Hi Andy -  
Perpetual motion is a sort of "Holy grail" thing. Im quite sure it's never been achieved, although some disagree. Our "policy" when discussing it with customers/potential customers... is to try to explain that it's impossible and probably a waste of time. (unless you have a good time building something which may not work in which case you've spent your time better than lots of folks who are probably watching television or something!). There are patents for "magnetic motors" - which... Im quite confident never worked and never could work. (it does not necessarily have to work to get a patent! - it just has to be difficult to prove that it couldn't work). Here is our brief FAQ on that topic:  
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You could build come close.... building machines which use very little energy (kind of like desk toys you see which actually have batteries in them, but run for quite a long time!).

["Perpetual Motion" Experiment.....](#) | 6 comments (6 topical, 0 editorial)

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[Twin Rotor Question??](#) | 5 comments (5 topical, editorial)

Re: Twin Rotor Question?? ([none / 0](#)) ([#5](#))  
by DanB on Wed Dec 17th, 2003 at 08:42:10 AM MST  
([User Info](#))

I'd agree with Ed to a large degree.. it boils down to available resources, and personal preference I suppose.

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[Twin Rotor Question??](#) | 5 comments (5 topical, 0 editorial)



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[Twin Rotor Question??](#) | 5 comments (5 topical, 0 editorial)



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## [Twin Rotor Question??](#)

By [Hank](#), Section [Homebrewed Electricity](#)

Posted on Tue Dec 16th, 2003 at 12:27:13 PM MST

[Wind](#)

What are the real advantages of a twin rotor?

Seems like twin rotors are in vogue now. Besides not needing laminates and reducing/eliminating cogging is there a real advantage that would justify the increase # of magnets and associated cost?

[Twin Rotor Question??](#) | 5 comments (5 topical, 0 editorial)

Re: Twin Rotor Question?? ([none / 0](#)) ([#1](#))  
by [windstuffnow](#) ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Tue Dec 16th, 2003 at 01:21:36 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Hi Hank,

I believe this is another "personal preference" type answer as well as skill and tools available. There are advantages and disadvantages to both. I prefer building them with laminants. I think there is more bang for the bux, but... there is alot more work involved in slotting the laminants and its not something that's easily accomplished without the right tools. The dual rotor system compensates for the missing laminant by using the magnets to concentrate the field through the coils but is fairly expensive depending on the magnets you choose.

Cogging is only a problem when the magnets are lined up with the slots on the laminants this is easily overcome.

Cogging, due to current folowing through the coils is still a consideration in either system. Single phase systems tend to hum or vibrate, the 3phase systems still have the hum but its far less distinctive. So its basically back to the personal preference, skill and tools again... decisions... decisions....

Have Fun  
Windstuff Ed

Re: Twin Rotor Question?? ([none / 0](#)) ([#2](#))  
by [JB](#) on Tue Dec 16th, 2003 at 05:43:37 PM MST  
([User Info](#))

Hey Ya Ed. Can you get into a little more detail how the cogging issue is easily overcome on the single rotor with laminates. Is it the laminates on the backside like the one that Dan did here the magnets actually the laminates on the backside. Thanks JB

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Re: Twin Rotor Question?? ([none / 0](#)) (#3)  
by [windstuffnow \(elenz@windstuffnow.com\)](mailto:elenz@windstuffnow.com)  
on Tue Dec 16th, 2003 at 06:55:20 PM MST  
([User Info](#))  
<http://www.windstuffnow.com/main>

Hi JB,

In the past I've used an equal number of magnets to coils on the slotted stators. The drawback to this is the slots line up with the poles causing a cogging as the magnetic field changes polarity from one slot to another. If you think of the coil arrangement used in the dual rotor machines the cogging issue is solved. I've designed a progressive 3phase machine that should prove interesting... It's definately been a challenge in designing. 16 magnets over 36 slots.

Anyway if you think of a disc with say 8 magnets and wire the coils in the stator slots the same way as the dual rotor disc your done... no cogging. I have a stator that I made up a long time ago but the slots were screwed up and I did a test using 16 poles over the stator. Ran smooth as silk. The stator was set up for 12 poles and had 36 slots. This got me to thinking ( dangerous -)... a few pads of paper and some scorched brain cells I found a way to use all 36 slots and use a 16 pole disc.

The current induced cogging should be reduced to a minimum also. I'll post the beast when its done. Should make for some interesting conversation... if it works

Have Fun  
windstuff Ed

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Re: Twin Rotor Question?? ([none / 0](#)) (#4)  
by [Hank](#) on Tue Dec 16th, 2003 at 07:09:13 PM MST  
([User Info](#))

If I can chime in,

The single rotor unit I built had no static cogging. The main difference is that I did not have slotted laminates in the stator. It was very similar to the ones Dan built. I think slotted laminates will probably always have some cogging (just physics).

Cogging when producing power I think will always be there, it's the nature of the beast. Besides, it's a good sound when it's humming away. It's power into the batteries and you know it's working.

Having a blast,  
Hank



Re: Twin Rotor Question?? ([none / 0](#)) ([#5](#))  
by DanB on Wed Dec 17th, 2003 at 08:42:10 AM MST  
([User Info](#))

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[Twin Rotor Question??](#) | 5 comments (5 topical, 0 editorial)

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Re: searl disk model ([none / 0](#)) ([#1](#))  
by DanB on Tue Dec 16th, 2003 at 07:54:35 AM MST  
([User Info](#))

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If you want to make a spinning/levitating top (like the levitron) - I think you might look to using a larger solid ring magnet. And it could work, but getting everything balanced and weighted properly is tricky. And then you'd either have to spin it by hand, or make some kind of drive circuit that would spin it from the base. (look up levitron on google)

In either case, you'll require a base with magnet in it.

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## [searl disk model](#)

By [Redbone](#), Section [Magnets & Magnetism](#)

Posted on Mon Dec 15th, 2003 at 05:44:56 PM MST [Magnetism](#)

Hello, i'm fairly new to the board. I was looking to make a searl disk model. Here's my plan of action.

I have a weak background in science. My talent is in woodworking. I was going to make my disk out of wood, (red oak) with my magnets inlayed. I was thinking of utilizing the little button magnets that I can get at radio shack. Experimentation will determine the number of magnets needed on disk and on base. But i have a few questions.

1st, will properly inlayed magnets properly placed keep the disk centered and stable or will it just slide off. Spindle through the axis could solve this but I don't know if it will be necessary or not. Also the circle or elliptical inlay of magnets might be the simple and initial presumption of the pattern, but what if I layed the pattern in a spiral or coil pattern starting at center. Kinda like a crop circle pattern? Has anyone already tried this? If so what happened? I'm sure i'll have alot more questions as i go. I'll keep yall posted.

[searl disk model](#) | 1 comment (1 topical, 0 editorial)

Re: searl disk model ([none / 0](#)) ([#1](#))  
by [DanB](#) on Tue Dec 16th, 2003 at 07:54:35 AM MST  
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[Alt rotor Questions : magnets](#) | 11 comments (11 topical, editorial)

Re: Alt rotor Questions : magnets ([none / 0](#)) ([#11](#))  
by DanB on Fri Dec 12th, 2003 at 08:21:06 PM MST  
([User Info](#))

I think - if you were using Aluminum or something - then you would have a valid concern. But you should use steel - and the magnets will stick more tightly to that than anything else. Even if they were not glued down at all - you could build a dual rotor machine with good steel rotors and run the magnets so that they were almost touching - and they would stay in place.

Of course - in a dual rotor machine we need a certain thickness of stator just to fit wire and be strong enough not to warp. So I doubt you can get that close. if you bury your wires in slotted laminates, then you could run a very tight airgap - even then you should be fine without needing to bolt the magnets down.

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[Alt rotor Questions : magnets](#) | 11 comments (11 topical, 0 editorial)

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### [Alt rotor Questions : magnets](#)

By [jimpep](#), Section [Magnets & Magnetism](#)

Posted on Thu Dec 11th, 2003 at 03:09:17 PM MST

[Wind](#)

I have visted Internet Fred's site and other postings here which are very good but I have a few more magnet questions that haven't been answered lately anyway.

Would 2 neo rings poled up the same be about the same as a bar ? It seems it would be a nightmare to fix a 1" by 2" by 1/2" neo as one previously posted. We are using fences, clamps and superglue or epoxy to do this ? With rings you could predrill holes and tap for a non magnetic fastner making installation easier ? What about magnet spacing. When does an adjacent oppositely poled magnet affect the other...it seems to me that neo magnets 3/8" apart would cause more lines of flux to be induced ..hence making the voltage greater than say ...2 neos at 5/8". Or is there a trade off distance where the opposing fields cause a decrease in induced voltage. What about laminations ? Can we pre-pot metal strips between magnet positions. What types of metal are best for laminations ?

[Alt rotor Questions : magnets](#) | 11 comments (11 topical, 0 editorial)

Re: Alt rotor Questions : magnets ([none / 0](#)) (#1)  
by [5kw](#) on Thu Dec 11th, 2003 at 04:02:22 PM MST  
([User Info](#))

Hi Jim,

"Would 2 neo rings poled up the same be about the same as a bar ? "

I was going to attempt this and decided it was a bad idea. Not only would it be difficult and probably a little dangerous, but those magnets would be constantly trying to flip just waiting for a weakness in the epoxy

"What about magnet spacing. When does an adjacent oppositely poled magnet affect the other...it seems to me that neo magnets 3/8" apart would cause more lines of flux to be induced ..hence making the voltage greater than say ...2 neos at 5/8".

I believe that for a given number of magnets you will get more power if they are spaced, but for a given amount of space you will get more power with the magnets touching.

"Can we pre-pot metal strips between magnet positions."

Any iron between the magnets is a bad idea. All it would do is shunt flux away from your windings.

Make the wind fun!

Victor

Re: Alt rotor Questions : magnets ([none / 0](#)) (#2)  
by [iFred](#) ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Thu Dec 11th, 2003 at 07:32:37 PM MST  
([User Info](#)) <http://www.internetfred.com>

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Would 2 neo rings poled up the same be about the same as a bar ?

--> Yes, You can make a single bar magnet using 2 or more magnets that are lined up. Example; you have 2 magnets with poles facing same direction.

It seems it would be a nightmare to fix a 1" by 2" by 1/2" neo as one previously posted. We are using fences, clamps and superglue or epoxy to do this ?

--> No need, your problem is in the fact that when the magnets are placed side by side they tend to want to separate.. let them. The proper distance is the amount they separate by. In other words, a separation is ok. I have tested this and it shows the field to be one contiguous field across the section.

With rings you could predrill holes and tap for a non magnetic fastner making installation easier ? What about magnet spacing. When does an adjacent oppositely poled magnet affect the other...

--> Don't fight the magnetic force, it's a loosing battle. Simple glue them as straight as you can and space them as equally as you can as the magnetic force allows you to.

it seems to me that neo magnets 3/8" apart would cause more lines of flux to be induced ..hence making the voltage greater than say ...2 neos at 5/8". Or is there a trade off distance where the opposing fields cause a decrease in induced voltage.

--> If there is I have not yet detected it. Perferably a single magnet is more ideal then two, but if all you have is smaller magnets, you can make up for it in quantity and strength... almost..

What about laminations ? Can we pre-pot metal strips between magnet positions. What types of metal are best for laminations ?

--> The thinner the lamination the better .014 to start or .012 is better. I am not sure what you mean by "pre-pot between positions" ?

Re: Alt rotor Questions : magnets ([none / 0](#)) (#3)  
by DanB on Thu Dec 11th, 2003 at 10:34:20 PM MST  
([User Info](#))

I'd disagree some Fred, thought I've not carefully tested it.

I think if you have two like poles, the more you force them together the more it will "push" the flux where it should be (in the coils). Space between two like poles is not a good thing - you could actually wind up with the opposite pole inbetween.

Ring magnets with a screw holding them down seems like a good strong way to go - but the screw (and the hole in the ring) could actually be an opposite pole, and the flux would be directed in less than ideal places.

I think 1 pole of an alternator should be a solid

magnet - anything else would be costing you. (you'd windup needing more magnet). Best would be a solid pole, 1 magnet, next would be smaller magnet forced together so they are touching. Worst would be lots of small magnets with gaps between them.

This is just my impression, I could be wrong here - I've played with this sort of thing but never really tested it.

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Re: Alt rotor Questions : magnets ([none / 0](#)) (#4)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on  
Fri Dec 12th, 2003 at 08:53:09 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Dan is correct, pushing the magnets as close as possible will get you a better more concentrated field. If you press 2 opposing poles together the field is extended and actually creates a larger field. This is similar to how laminants work. Each laminant becomes opposing to the one next to it and extends the field. If you take several small sheets of steel or laminant material and place them on a magnet you can see the effect when you release the metal. All the sections will try to repel each other. If you force them together and take a gauss reading you'll find the strength greater than the magnet. This is why laminants work so well.

Another little known fact... If you put two magnets together each attracting and force two more together opposing each other and drop them off a tall building... the opposing pair will fall slower than the attracting pair. Wow magnetic wings!

Lots of fun  
Ed

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Re: Alt rotor Questions : magnets ([none / 0](#)) (#5)  
by TomW on Fri Dec 12th, 2003 at  
10:43:59 AM MST  
([User Info](#))  
<http://oneota.net/~earthsourcepowr/>

Ed, Dan, and others;

Thanks for clearing that up. Didn't want to argue it but could not get my mind around ifreds reasoning on it.

Cheers.

TomW

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Re: Alt rotor Questions : magnets ([none / 0](#)) ([#7](#))  
by windstuffnow  
([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Fri  
Dec 12th, 2003 at 12:20:52 PM  
MST  
([User Info](#))  
<http://www.windstuffnow.com/main>

By laying them out the way iFred explained works well also but the field doesn't extend out as far as pushing them together. By allowing them to spread apart will match the field of the magnet. In turn open up the area of the field. On a dual rotor system with a fairly large gap it would be better to butt them together. Where'as a laminated stator may better use the area of the magnetic field as opposed to the concentration. It all works well in the right places.

iFred tends to think outside the normal, this is usually where new things are found. I for one like unusual and creative thinking... the stranger the better! I'd like to say I think in similar terms but there are so many rules that are in the back of my head that sometimes makes it difficult. Like a cup overflowing... there is no more room to add more... sometimes we need to empty our cup in order to get more.

More fun than my cup will hold!

Ed

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Re: Alt rotor Questions : magnets ([none / 0](#)) ([#6](#))  
by DanB on Fri Dec 12th, 2003 at 11:39:14 AM MST  
([User Info](#))



It is not difficult to place large magnets around the steel disk. There are a few good ways I think.

In Hughs plans (and at his seminar) he suggests you lay out a template on thin plywood or masonite, and simply cut out the spaces where the magnets would go. This makes it quite easy - you drop the template over the steel rotor, and drop the magnets in their holes. Take the template off - then glue them down (or cast the whole thing in resin).

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by jimpep on Fri Dec 12th, 2003 at 02:26:25 PM MST  
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Thanks again Jim

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Re: Alt rotor Questions : magnets ([none / 0](#)) (#9)  
by DanB on Fri Dec 12th, 2003 at 04:31:00 PM MST  
([User Info](#))

Hi Jim -

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Yes... actually - the rotor base must be steel, and 1/4" would be minimal thickness if your using magnets 1/2" thick. The steel plays an important part of the magnetic circuit. If you used Aluminum - it would work, but the field would be almost 1/2 as strong through the coils as it would be if you used steel. It's also convenient that the magnets stick tightly to the steel! Otherwise you'd be completely relying on the glue to hold things together.

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If you put a steel bolt through a ring magnet, you've created a short path from one pole to the other - so much of the flux will go through that bolt instead of through the coils. Even just the hole... (or a hole with a non-ferrous bolt through it) creates an unnecessary path from one pole to another. I'm sure they would work out OK - but I can't really think of a good reason to use ring magnets here.

"Does the hole in the ring make it an inferior flux generator ? How much reduction in your estimation ?"

Yes, I should think it would. How much would depend on a few things - like the thickness of the magnet, and the size of the hole. I suspect a 2" diameter X 1/2" thick disk magnet with a 1/4" hole in the middle would only be slightly (undetectably) compromised. A 3/4" dia X 1/4" thick with an inner diameter of 1/2" would probably be severely compromised. I've not really messed with ring magnets, so it is hard to say - but again, I can think of no good reason to go with ring magnets unless you happen to have a bunch on hand or something.

Have fun!

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Re: Alt rotor Questions : magnets  
([none / 0](#)) ([#10](#))  
by jimpep on Fri Dec 12th, 2003 at  
04:47:39 PM MST  
([User Info](#))

Thanks for the tip on the alum. I assume iron is the best ?As far as the rings are concerned I was trying to think of a way to get the magnets as close as possible to each other without flipping things and or having installation problems. I want to maximize the amount of flux generation ( amount of magnets) on the rotor. This forces me to place magnets closer than would normally be if left to the natural magnet forces. Thanks Jim

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Re: Alt rotor Questions :  
magnets ([none / 0](#)) ([#11](#))  
by DanB on Fri Dec 12th, 2003 at  
08:21:06 PM MST  
([User Info](#))

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Of course - in a dual rotor machine we need a certain thickness of stator just to fit wire and be strong enough not to warp. So I doubt you can get that close. if you bury your wires in slotted laminates, then you could run a very tight airgap - even then you should be fine without needing to bolt the magnets down.

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Have fun!

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by DanB on Fri Dec 12th, 2003 at 08:21:06  
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If you put a steel bolt through a ring magnet, you've created a short path from one pole to the other - so much of the flux will go through that bolt instead of through the coils. Even just the hole... (or a hole with a non-ferrous bolt through it) creates an unnecessary path from one pole to another. Im sure they would work out OK - but I can really think of a good reason to use ring magnets here.

"Does the hole in the ring make it an inferior flux generator ? How much reduction in your estimation ?"

Yes, I should think it would. How much would depend on a few things - like the thickness of the magnet, and the size of the hole. I suspect a 2" diameter X 1/2" thick disk magnet with a 1/4" hole in the middle would only be slightly (undetected) compromised. A 3/4" dia X 1/4" thick with an inner diameter of 1/2" would probably be severely compromised. I've not really messed with ring magnets, so it is hard to say - but again, I can think of no good reason to go with ring magnets unless you happen to have a bunch on hand or something.

Have fun!

[ [Parent](#) ]

Re: Alt rotor Questions : magnets  
([none / 0](#)) ([#10](#))  
by jimpep on Fri Dec 12th, 2003 at  
04:47:39 PM MST  
([User Info](#))

Thanks for the tip on the alum. I assume iron is the best ?As far as the rings are concerned I was trying to think of a way to get the magnets as close as possible to each other without flipping things and or having installation problems. I want to maximize the amount of flux generation ( amount of magnets) on the rotor. This forces me to place magnets closer than would normally be if left to the natural magnet forces. Thanks Jim

[ [Parent](#) ]

Re: Alt rotor Questions :  
magnets ([none / 0](#)) ([#11](#))  
by DanB on Fri Dec 12th, 2003 at  
08:21:06 PM MST  
([User Info](#))



I think - if you were using Aluminum or something - then you would have a valid concern. But you should use steel - and the magnets will stick more tightly to that than anything else. Even if they were not glued down at all - you could build a dual rotor machine with good steel rotors and run the magnets so that they were almost touching - and they would stay in place.

Of course - in a dual rotor machine we need a certain thickness of stator just to fit wire and be strong enough not to warp. So I doubt you can get that close. if you bury your wires in slotted laminates, then you could run a very tight airgap - even then you should be fine without needing to bolt the magnets down.

[ [Parent](#) ]

[Alt rotor Questions : magnets](#) | 11 comments (11 topical, 0 editorial)



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[Alt rotor Questions : magnets](#) | 11 comments (11 topical, editorial)

Re: Alt rotor Questions : magnets ([none / 0](#)) (#6)  
by DanB on Fri Dec 12th, 2003 at 11:39:14 AM MST  
([User Info](#))

It is not difficult to place large magnets around the steel disk. There are a few good ways I think.

In Hughs plans (and at his seminar) he suggests you lay out a template on thin plywood or masonite, and simply cut out the spaces where the magnets would go. This makes it quite easy - you drop the template over the steel rotor, and drop the magnets in their holes. Take the template off - then glue them down (or cast the whole thing in resin).

In my current project, the magnets are much larger - 3" tall, about 2.5" wide and there are 12 around the 14" diameter rotor. I was concerned that placing them would be difficult, but it was quite easy really. (you always need to be very careful handling these sorts of things). I layed it out on paper, and layed the paper over the steel rotor, and simply transferred the corner locations where the magnets went with a center punch. Actually - I just did 2 of the corners on the same side. This way I could lay the magnet down, and slide it till the center punch holes pretty much stopped the magnet from sliding easily and it came out fine. (And quickly) With large magnets, especially blocks - you can tap them around easily with a non-ferrous mallet - or a piece of wooden dowel and a hammer. I think this is much easier - and in the end more economical than making up your poles from smaller magnets forced together.

There is enough work in the whole project that I think you would not want to make compromises here.

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[Will magnets work for this?](#) | 8 comments (8 topical, 0 editorial)

Re: Will magnets work for this? ([none / 0](#)) (#6)  
by DanB on Fri Dec 12th, 2003 at 07:55:08 AM MST  
([User Info](#))

Id agree Mike that some pressure on the glass would probably damp vibration some... if you do use magnets, be sure to pad them on the glass side, and you might put a bit of steel plate on the outside of the magnets to concentrate the flux where you need it and to help stop the magnetic field from going out and grabbing peoples keys... cassette tapes, wrenches, hammers - etc...

Id try something like this:  
[http://www.wondermagnets.com/cgi-bin/edatcat/WMSstore.pl?user\\_action=detail&catalogno=0076](http://www.wondermagnets.com/cgi-bin/edatcat/WMSstore.pl?user_action=detail&catalogno=0076)

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[Will magnets work for this?](#) | 8 comments (8 topical, 0 editorial)

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[Will magnets work for this?](#) | 8 comments (8 topical, 0 editorial)

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## Will magnets work for this?

By [mchimes](#), Section [Magnets & Magnetism](#)

Posted on Thu Dec 11th, 2003 at 06:54:55 AM MST

[Magnetism](#)

I guess I need to put something here to proceed

I just built a 2 room sound studio in my basement. I would like to tame sliding glass door resonance I've discovered. These doors are modified exterior sliding glass doors- so they are double paned with a sealed airspace in between the glass panes. I think several strong magnetic disks, the size of a glass coaster, could be afixed to the doors to dampen resonance. The trick would be to find magnets strong enough to bond to each other through 2 panes of glass and a 1/4" airspace (and dampen the resonance), but not strong enough to compromise the strength of the panes.

What do you think I would need?

Thanks,  
Mike

[Will magnets work for this?](#) | 8 comments (8 topical, 0 editorial)

Re: Will magnets work for this? ([none / 0](#)) (#1)

by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Thu Dec 11th, 2003 at 08:33:01 AM MST

([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

Just cut some carpet padding into strips about 2 or 3 inches wide. Then glue them onto the glass around the outside edges. If your working in sound studios, then you will recognize this trick, many drummers do this to thier Bass (kick) drum heads do prevent them from resonating too long.

I do not think that magnets on each side of the glass would work. Magnets would probably just Lower the resonate frequency by adding mass to the glass. It would not be magnetic damping.

}=- W o o f -= {

Re: Will magnets work for this? ([none / 0](#)) (#2)

by DanB on Thu Dec 11th, 2003 at 08:48:00 AM MST

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I'd tend to agree.

I think that putting magnets on both sides of the glass might damp things a bit - but it'd be kind of risky too... if they are to hold tightly, then the slightest accident (putting them on so they snap, or walking by with a wrench in your hand) might result in disaster.

[ [Parent](#) ]

Re: Will magnets work for this? ([none / 0](#)) ([#3](#))  
by mchimes on Thu Dec 11th, 2003 at 09:31:11 AM MST  
([User Info](#))

Thanks for the suggestions. While agree the carpet pad idea would work, I'm looking for a more integrated, aesthetically appealing solution. Good points in the other post about the "snapping."

What if I put a felt buffer in between the magnets and the glass?

My second best option involves installing a cross bar across the glass from frame to frame and then wedging something in between the cross bar and pane. But isn't as slick and requires some work because of the moving panel.

Thanks,  
Mike

[ [Parent](#) ]

Re: Will magnets work for this? ([none / 0](#)) ([#4](#))  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Thu Dec 11th, 2003 at 05:28:49 PM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

Just glue the felt to the glass and leave the magnets off. Why do you think putting magnets on each side of the pains will dampen the vibration? it will essentially put pressure inward on the glass. This will do nothing to dampen out the vibration.

}=- W o o f -=  
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Re: Will magnets work for this? ([none / 0](#)) ([#5](#))  
by mchimes on Fri Dec 12th, 2003 at 06:32:36 AM MST  
([User Info](#))

I think the magnets will work better because they will apply pressure to the glass. I noticed if I place my hand in the center of the pane with some pressure it significantly reduces the over-ring.

Let's say you were experimenting with damping a snare drum, you might start with a felt disk the size of a half dollar placed about 2" in from the rim. That would help eliminate resonance. Now let's say you put a heavy wallet (which drummers will sometimes do) on the drum. Would the wallet method not be more effective at killing resonance?

Similarly, would a trampoline be more "bouncy" with a 50lb. child on the edge or a 200lb. man in the center while one was jumping on it?

I think this principle would follow with the magnets too with the glass panes. Am I in left field on this one : )?

Thanks,  
Mike

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Re: Will magnets work for this? ([none / 0](#)) (#6)  
by DanB on Fri Dec 12th, 2003 at 07:55:08 AM MST  
([User Info](#))

Id agree Mike that some pressure on the glass would probably damp vibration some... if you do use magnets, be sure to pad them on the glass side, and you might put a bit of steel plate on the outside of the magnets to concentrate the flux where you need it and to help stop the magnetic field from going out and grabbing peoples keys... cassette tapes, wrenches, hammers - etc...

Id try something like this:

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Re: Will magnets work for this? ([none / 0](#)) (#7)  
by woofershound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Fri Dec 12th, 2003 at 08:53:29 AM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

The vibration was damped by your soft had touching the glass. You will find that the vibrations will damp when you put your hand on the glass, the amount of pressure you apply will have little to do with the vibration reduction. Adding hard magnets will add mass and apply pressure between the panes, but you want something that will absorb the vibrations, anything soft will do: Felt, Foam Rubber, Your Hand, Carpet, Close curtains. In fact, curtains would be better anyway. You wouldnt want a large area of glass or mirror to be around the area your mixing in. Almost 100% reflectivity to sound.

} = - W o o f -= {  
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Re: Will magnets work for this? ([none / 0](#)) (#8)  
by Harry Luubovv on Thu Jan 1st, 2004 at 02:38:36 PM MST  
([User Info](#))

I think the idea was missed sorry. What he is saying all the time is, that the glass pane is a large one, so the material in the middle of this glass become "Soft" sonic wise, one just has to apply some limited pressure onto the surface of this vibratiing material (The glass), then that be it, problem can be resolved.

Having soft materials attached to this glass is not the solution I think. Soft materials works good to kill sonic "Reflection" bounced off a suface and not doing good to control the surface vibrations of a piece of resonating material itself. And yes, a differnt case, when a drum skin is vibrating excessively, many bands use this method. But again, soft materials could not control vibrations from a hard or glazy surface, we do need some kinds of vertual real "Side forces" of touches to "Stiffen" the vibrating materials.

I could be wrong again, sorry.

Luubovv.

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[Will magnets work for this?](#) | 8 comments (8 topical, 0 editorial)

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[Alt rotor Questions : magnets](#) | 11 comments (11 topical, editorial)

Re: Alt rotor Questions : magnets ([none / 0](#)) (#3)  
by DanB on Thu Dec 11th, 2003 at 10:34:20 PM MST  
([User Info](#))

I'd disagree some Fred, thought I've not carefully tested it.

I think if you have two like poles, the more you force them together the more it will "push" the flux where it should be (in the coils). Space between two like poles is not a good thing - you could actually wind up with the opposite pole inbetween.

Ring magnets with a screw holding them down seems like a good strong way to go - but the screw (and the hole in the ring) could actually be an opposite pole, and the flux would be directed in less than ideal places.

I think 1 pole of an alternator should be a solid magnet - anything else would be costing you. (you'd windup needing more magnet). Best would be a solid pole, 1 magnet, next would be smaller magnet forced together so they are touching. Worst would be lots of small magnets with gaps between them.

This is just my impression, I could be wrong here - I've played with this sort of thing but never really tested it.

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Re: Alt rotor Questions : magnets ([none / 0](#)) (#4)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Fri Dec 12th, 2003 at 08:53:09 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Dan is correct, pushing the magnets as close as possible will get you a better more concentrated field. If you press 2 opposing poles together the field is extended and actually creates a larger field. This is similar to how laminants work. Each laminant becomes opposing to the one next to it and extends the field. If you take several small sheets of steel or laminant material and place them on a magnet you can see the effect when you release the metal. All the sections will try to repel each other. If you force them together and take a gauss reading you'll find the strength greater than the magnet. This is why laminants work so well.

Another little known fact... If you put two magnets together each attracting and force two more together opposing each other and drop them off a tall building... the opposing pair will fall slower than the attracting pair. Wow magnetic wings!

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Lots of fun  
Ed

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Re: Alt rotor Questions : magnets ([none / 0](#)) (#5)  
by TomW on Fri Dec 12th, 2003 at 10:43:59 AM MST  
([User Info](#))  
<http://oneota.net/~earthsourcepowr/>

Ed, Dan, and others;

Thanks for clearing that up. Didn't want to argue it but could not get my mind around ifreds reasoning on it.

Cheers.

TomW

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Re: Alt rotor Questions : magnets ([none / 0](#)) (#7)  
by windstuffnow  
([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Fri Dec 12th, 2003 at 12:20:52 PM MST  
([User Info](#))  
<http://www.windstuffnow.com/main>

By laying them out the way iFred explained works well also but the field doesn't extend out as far as pushing them together. By allowing them to spread apart will match the field of the magnet. In turn open up the area of the field. On a dual rotor system with a fairly large gap it would be better to butt them together. Where'as a laminated stator may better use the area of the magnetic field as opposed to the concentration. It all works well in the right places.

iFred tends to think outside the normal, this is usually where new things are found. I for one like unusual and creative thinking... the stranger the better! I'd like to say I think in similar terms but there are so many rules that are in the back of my head that sometimes makes it difficult. Like a cup overflowing... there is no more room to add more... sometimes we need to empty our cup in order to get more.

More fun than my cup will hold!  
Ed

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[Alt rotor Questions : magnets](#) | 11 comments (11 topical, editorial)

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[What PMA motor to use](#) | 8 comments (8 topical, editorial)

Re: What PMA motor to use ([none / 0](#)) ([#5](#))  
by DanB on Thu Dec 11th, 2003 at 11:34:51 AM MST  
([User Info](#))

actually - Chuck suggested in an earlier posting that the 13 amp 24 volt motor works alright. I think if I tried it, I'd use kind of a large (7' or 8'?) 3 blade prop like Chuck did, and be sure it furls out early because its 13amp rating suggests that it may not handle the power of a prop that large in very high winds.

Here is Chucks discussion about that motor:  
<http://www.fieldlines.com/story/2003/10/13/155010/22>

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[What PMA motor to use](#)

By [MoMoose](#), Section [Homebrewed Electricity](#)

Posted on Wed Dec 10th, 2003 at 08:46:52 PM MST

[Alternators](#)

This is my first try at building a wind generator.<br>

I am going to try a PMA motor. What Volt and Rpm ratings would be the best to try and get?  
I live in Missouri and think my wind rating will be marginal or a little better. Thanks

[What PMA motor to use](#) | 8 comments (8 topical, 0 editorial)

Re: What PMA motor to use ([none / 0](#)) ([#1](#))  
by [drdongle](#) on Thu Dec 11th, 2003 at 05:57:52 AM MST  
([User Info](#))

Thats not a simple question to answer  
What battery voltage do you plan to use?  
What sort of appliances do you plan to use?  
Is this for a home, hunting/vacation cabin, business?  
I'm sure that the others will think of more questions

Dr.D

Re: What PMA motor to use ([none / 0](#)) ([#2](#))  
by [wooferhound](#) ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Thu Dec 11th, 2003 at 08:39:17 AM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

a quick answer would be, the highest voltage you can find, and the lowest RPMs you can find.

}-- W o o f --{

Re: What PMA motor to use ([none / 0](#)) ([#3](#))  
by [MoMoose](#) on Thu Dec 11th, 2003 at 10:04:09 AM MST  
([User Info](#))

I was thinking about a 12volt system but do not know the advantage-disadvantages of it. So would a 24VDC 194RPM 13 Amp  
or 130VDC 3200RPM 15.3 Amp  
or 20VDC 550RPM .47 Amp  
be best. Thanks

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Re: What PMA motor to use ([none / 0](#)) (#4)  
by DanB on Thu Dec 11th, 2003 at 11:19:37 AM MST  
([User Info](#))

the advantage of a 12 volts system is that there are lots of lightbulbs/appliances which will run directly off 12 volts.

You'll find inexpensive power inverters which run on 12 volts as well. So if it's a small system, 12 volts is the way to go I think.

If it's a larger system, 24 or 48 volts has a lot of advantages in that you'll be needing to handle lots less current, and line losses will be less. (the whole system will be more efficient).

Problem is, 24 volt and 48 volt appliances are rare - so you'd probably be running everything off your power inverter. 24 and 48 volt inverters tend to be expensive.

I think if you have a 24 volt system, the 13.5 amp 194 rpm motor would be the way to go for sure. It would probably be good for up to 150 watts - and you'd see occasional peaks of much more, but like Chuck said in the "Hornet" posting - if it runs much over 13 amps it will probably fail.

For the 12 volt system, I'm not sure if any of those motors you listed would be ideal. The 24 volt motor would produce 12 volts probably at fairly low rpm (like 100 or something)... (chuck has one I think he might know exactly). Since the machine is only good for 150 watts or so, you need a fairly small blade and the small blade will probably want to run much faster than your 24 volt motor would in a 12 volt system.

The 130 volt motor would probably do 12 volts somewhere around 320 rpm - which is on the fast side.

(I assume that the motors will produce close to their rated voltage at their rated rpm when used as generators. This usually seems to be the case - but I wouldn't take it for granted) But it does have a reasonable current rating - 15 amps is not bad. I think perhaps with a very fast 2 blade prop 4 or 5' diameter, it might work. It would be fast though...

Air 403's have a 4' prop and they start charging at 400 rpm - so the 130 volt motor is a possibility I think.

The 20 volt motor would also be a bit fast, but rated at only half an amp you'd not get much power from it.

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Re: What PMA motor to use ([none / 0](#)) (#5)  
by DanB on Thu Dec 11th, 2003 at 11:34:51 AM MST  
([User Info](#))

actually - Chuck suggested in an earlier posting that the 13 amp 24 volt motor works alright. I think if I tried it, I'd use kind of a large (7' or 8'?) 3 blade prop like Chuck did, and be sure it furls out early because its 13amp rating suggests that it may not handle the power of a prop that large in very high winds.

Here is Chucks discussion about that motor:  
<http://www.fieldlines.com/story/2003/10/13/155010/22>

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Re: What PMA motor to use ([none / 0](#)) ([#6](#))  
by Homebrewed12vdc on Fri Dec 12th, 2003 at 12:38:45 PM MST  
([User Info](#))

I run a 12 volt system, and I have found that a 90v dc PM motor to be the best bet as long as it is rated for 1200rpm or less, I have 2 windmills, and a hydro built out of such motors, and they do the job nicely. 12v is a nice way to go, because if you can find a old camper, you can get plenty of 12 volt stuff cheap.

Re: What PMA motor to use ([none / 0](#)) ([#7](#))  
by Dave Lochhaas on Tue Dec 16th, 2003 at 11:00:10 PM MST  
([User Info](#))

Hi MoMoose,

I'm in Boone County, Missouri, and I think I am facing some of the same challenges. I am just beginning to experiment with a Black and Decker electric lawn mower motor(mfg. unknown) and also an Ametek tape drive motor. With our Missouri intermittent low winds and occasional high winds and a lot of gusty and seasonal winds the key seems to be in a blade design that is very efficient at low wind speeds, 5-10 mph, and doesn't freak out with the winter and March gales that sometimes occur. I picture a mini wind farm of 100 watt generators all working together but my thoughts charge ahead and run amok while my free time lags behind.

I would like to meet with other Missouri folk of similar interests.

Dave Lochhaas  
lochhaas@midamerica.net

Re: What PMA motor to use ([none / 0](#)) ([#8](#))  
by wiredup on Fri Dec 26th, 2003 at 06:12:52 PM MST  
([User Info](#))

hey guys jerry is the one to talk to about small gennys with a punch

[ [Parent](#) ]

[What PMA motor to use](#) | 8 comments (8 topical, 0 editorial)

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[What PMA motor to use](#) | 8 comments (8 topical, 0 editorial)

Re: What PMA motor to use ([none / 0](#)) (#4)  
by DanB on Thu Dec 11th, 2003 at 11:19:37 AM MST  
([User Info](#))

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Re: What PMA motor to use ([none / 0](#)) (#5)  
by DanB on Thu Dec 11th, 2003 at 11:34:51 AM MST  
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[What PMA motor to use](#) | 8 comments (8 topical, editorial)

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[Getting rid of the cog - re-post](#) | 14 comments (14 topical, editorial)

Re: Getting rid of the cog - re-post ([none / 0](#)) (#11)  
by DanB on Thu Dec 11th, 2003 at 08:52:02 AM MST  
([User Info](#))

I've taken a couple Air 403's apart, and I've seen two diff. magnet rotors in them. Sometimes you'll find the magnets layed in straight - when they did that, the tops were arched (probably to reduce cogging a bit). In others (I think newer models) they use pretty normal bar magnets, but they are slightly skewed.

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[Getting rid of the cog - re-post](#) | 14 comments (14 topical, 0 editorial)

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### [Getting rid of the cog - re-post](#)

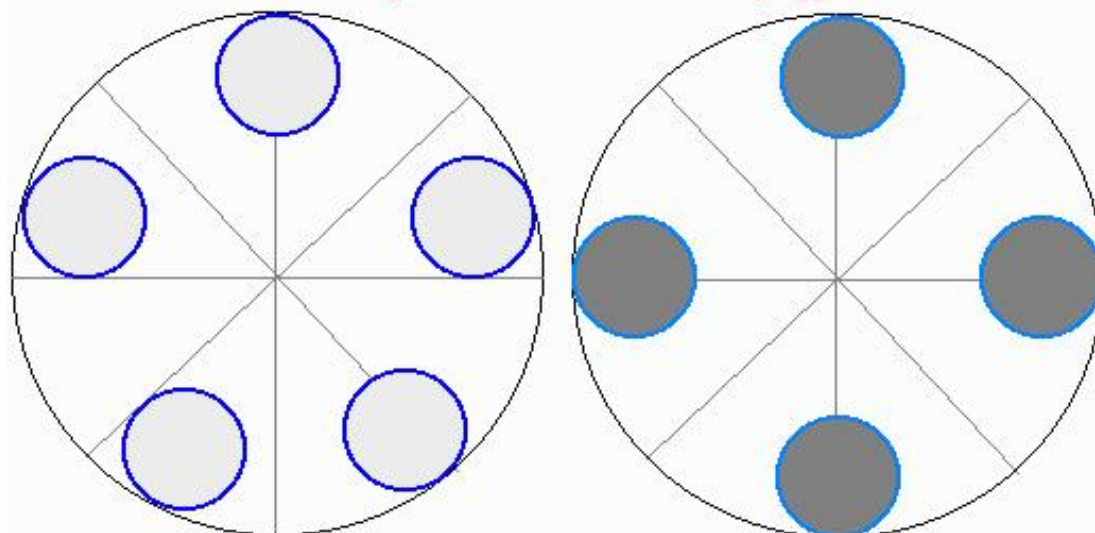
By iFred, Section [Homebrewed Electricity](#)

Posted on Wed Dec 10th, 2003 at 01:58:57 PM MST

[Alternators](#)

I posted this once before, but seems important now... Think about it!

#### Full Core- No Cog- Skewed Axial field PMG polyphase machine



Magnet Layout

Coil Layout

**By Bryan and Fred**  
 visit [www.internetfred.com](http://www.internetfred.com) for updates

[Getting rid of the cog - re-post](#) | 14 comments (14 topical, 0 editorial)

speaking of older posts... [\(none / 0\)](#) (#1)  
 by TomW on Wed Dec 10th, 2003 at 02:43:16 PM MST  
[\(User Info\)](#) <http://oneota.net/~earthsourcepowr/>

ifred;

So what ever happened with your magnetic interruptor research?

Very curious why you just stopped talking about it?

Cheers.

TomW

[Stuff I have Online](#)  
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Re: speaking of older posts... [\(none / 0\)](#) (#6)  
 by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Wed Dec 10th, 2003 at 08:26:45 PM MST  
[\(User Info\)](#) <http://www.internetfred.com>

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no reason, just have not enough time for more research.

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Re: Getting rid of the cog - re-post ([none / 0](#)) ([#2](#))  
by RobD on Wed Dec 10th, 2003 at 04:58:42 PM MST  
([User Info](#))

I took apart an Air 403 and I found that the magnets on the armature had one section with a greater gap then the other. I think this does the same thing as they get very little cogging.  
RobD

Re: Getting rid of the cog - re-post ([none / 0](#)) ([#4](#))  
by dconn on Wed Dec 10th, 2003 at 05:49:33 PM MST  
([User Info](#))

Hi RobD,

I also wondered over that gap in the AIR403 magnet rotor. I think there are maybe 12 smallish neo magnets? I cant remember if the gap is a whole magnet width (The gap just wouldn't matter then?) but the stator is three phase (although there are different wire sizes on each phase - to allow for low RPM generation?) so you'd think that the poly-phase layout that iFred suggests wouldn't work so easily? iFred's layout a phase per coil.

Of course the gap in the AIR403 is very handy for that metal band to be screwed down with.

Actually the AIR403 rotor/stator layout is very nice - but its just too small and I wonder if it is better to have the magnets on the outside like Hugh Piggots brake drum plans (seemingly scrapped now in this new age of radial designs).

All the best - Derek

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Re: Getting rid of the cog - re-post ([none / 0](#)) ([#11](#))  
by DanB on Thu Dec 11th, 2003 at 08:52:02 AM MST  
([User Info](#))

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Re: Getting rid of the cog - re-post ([none / 0](#)) ([#3](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Wed Dec 10th, 2003 at 05:28:05 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

iFred,

Thats darn'd close to what I'm comtemplating as my next low speed alternator. I've worked out the details on a progressive winding 3phase. 16 magnets over 36 slots. 3 complete 3phase units in one. It should handle low, medium and high speed operation while holding constant load on the machine. This has been one of my hold ups on the "Lenz" turbine because of the lower speed of operation.

The air 403 uses a similar concept as rob metioned. They've set their spacing back a bit and the phase difference is small so it still works. I think the unit suffers from the offset though with a little bit of canceling. It does allow it to start up sooner.

Have Fun!  
Ed

Re: Getting rid of the cog - re-post ([none / 0](#)) (#5)  
by Jerry on Wed Dec 10th, 2003 at 08:25:49 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Ed

The 403 needs all the sooner start help it can get. I wish you guys could see just how much time the 403 on my roof sets idel while the homebrew gennies are spinning.

I think the only reason SW put the space in the 403 was to have room for the screw that holds the band down to the amature. It dose make a cogging sound.

When I fist got the 403 I made the second mistake by mounting it to my metal shop. At low rpm it makes a growelling thats very anoing. Not to mention the blade noise.

How dose that poly phase thing work with N, S, N, S and the last north right next to the first N? Looks like there would be a bit of a lump or bump or a goofy wave form when this odd couple came around while the rest are normal nsns?

JK TAS Jerry

[Airheads Page](#)

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Re: Getting rid of the cog - re-post ([none / 0](#)) (#12)  
by 5kw on Thu Dec 11th, 2003 at 09:03:10 AM MST  
([User Info](#))

Hi Ed,

Youv'e got it right, each tooth is phased a little bit. If you crunch the numbers you will see it has exactly the same electrical effect as skewing.

Make the wind fun!  
Victor

[ [Parent](#) ]

Re: Getting rid of the cog - re-post ([none / 0](#)) (#7)  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Wed Dec 10th, 2003 at 08:31:00 PM MST  
([User Info](#)) <http://www.internetfred.com>

interesting what this air 403 is doing. I have never seen one before, so I can't say but it sounds like it. Are there lots of diodes by any chance in any of the circuits?

Thanks!

Re: Getting rid of the cog - re-post ([none / 0](#)) (#8)  
by Jerry on Wed Dec 10th, 2003 at 09:02:49 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Ifred

I was having trouble with my 403. I sent it back to the factory twice for the same problem. The little brain inside would put a small load on my batteries during no wind days and drain power down a little.

I called the teck the third time and he told me to just take the little brain out. I did and it actually improved its overall performance a little. I would say its performance went from crap all the way up to suck. A small change but noticeable.

Again this is just my personal observation of my own 403. Others may not share my thoughts.

JK TAS Jerry

[Airheads Page](#)

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Re: Getting rid of the cog - re-post ([none / 0](#)) (#9)  
by RobD on Wed Dec 10th, 2003 at 11:06:38 PM MST  
([User Info](#))

Sorry you don't like your 403 Jerry. It does need some wind to go. I put a scope on the output and the wave is very good with no cancellation that I can see. The gap is less than one magnet width. I haven't played with the brain but the new 'x' is supposed to be an improvement on it that makes it start sooner. So maybe some people complained. They get a very good wave out of it with a sine wave that spends a lot of time high up. The magnet placement helps this from what I can see. I'm using the same band on my magnets they use. I bought some thin stainless sheets from my supplier and I cut them into bands. I tried using CV joint bands but they weren't as good. I use the bands with epoxy. (JB weld or liquid steel) The alternator I built for my exercise bike cogs badly so I may change the magnet placement on it. I'm also thinking of using several magnets in a staggered row around an armature to cut down on the cogging. I haven't tried it yet. I also thought of using a system to shift the armature out of the field to start my machines sooner but I'm against using too many mechanical things that can fail. Hugh has the right idea about using the largest diameter you can get. you pick up power with diameter that translates directly to armature speed.

Re: Getting rid of the cog - re-post ([none / 0](#)) (#10)  
by desertratjack on Thu Dec 11th, 2003 at 08:04:37 AM MST  
([User Info](#))

How are the ends of the bands you cut held together?

[ [Parent](#) ]

Re: Getting rid of the cog - re-post ([none / 0](#)) ([#13](#))  
by RobD on Thu Dec 11th, 2003 at 01:57:41 PM MST  
([User Info](#))

I buy sheets of SS shim stock. (non magnetic .012" -6"x 24"). I cut the stock from 3/4" to 1/4" width depending on my mags. I drill and tap a hole in the gap, place the band and measure to the hole. I then clamp it together and drill a hole in the band and attach it with a SS screw. I make the band about 1/16" short so the screw doesn't bottom but holds the band very tight. I use a long dry epoxy so it sets overnight. The epoxy holds the mags from shifing and in place the band adds security in case the epoxy ever fails. I lose a few thousands in air gap but it works well and I don't have to overload the armature with epoxy which makes removing the magnets easier if I decide to change the design. (I hate gopping up my expensive mags with epoxy!)  
RobD

[ [Parent](#) ]

Re: Getting rid of the cog - re-post ([none / 0](#)) ([#14](#))  
by Old F on Sat Dec 13th, 2003 at 02:57:07 PM MST  
([User Info](#)) <http://www.oldf.homestead.com>

This may be a dumb question but with the magnets mounted as showed .  
Wouldn't rotor be way out of balance ?

Old F

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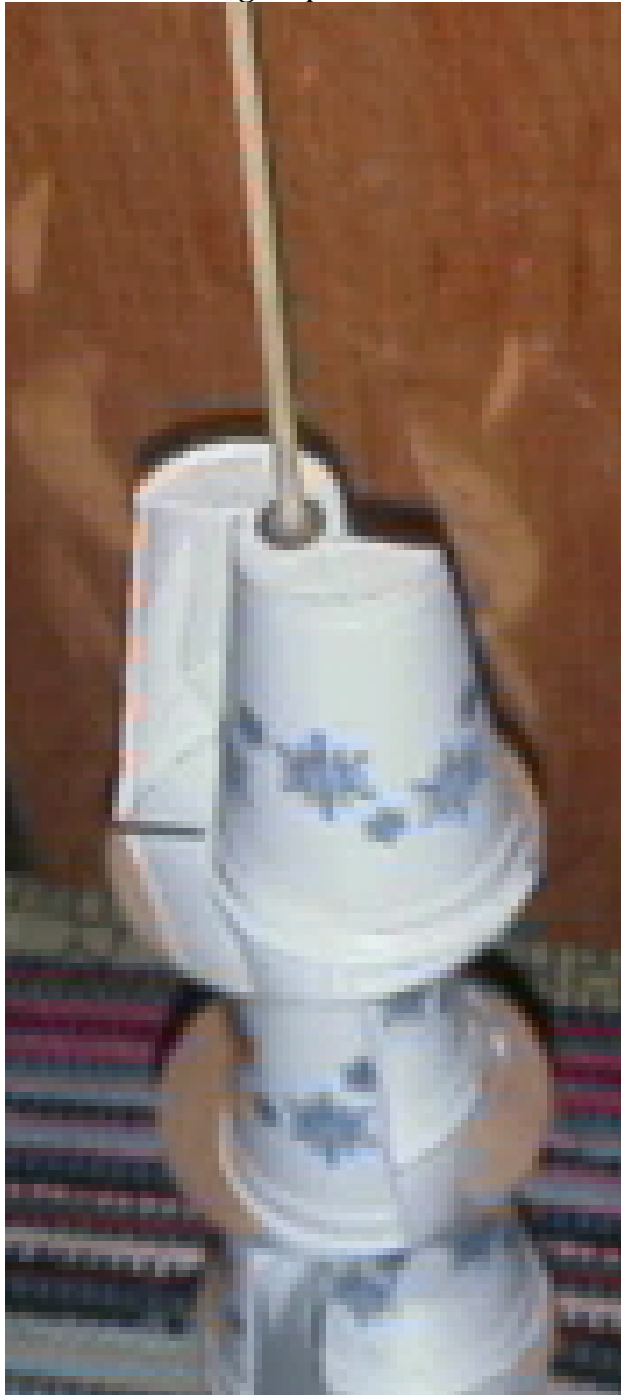
### [A very light breeze](#)

By [Norm](#), Section [Diaries](#)

Posted on Sun Jan 4th, 2004 at 06:52:23 AM MST [Norm's Diary](#)

It all started with a Free Take One (CD (get optimized) )

I recalled a person over on 'Picoturbine' making a Savonius vawt using a 'CD' to mount the blades...so as I was shopping I see this sign 'Free Take One' so everytime I started collecting 'FTO'-CD's. Some foam plastic cups, a pointed 1/4 inch wood dowel, 'super glue' and some of these CD's .....I ('got optimised' ??) like this:



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So I took it outside hardly a bit of wind just a light breeze that you can just barely feel on your face...not even enough to turn the little pinwheel(which gives me another idea for a wind speed thing).Well anyway this foam cup thing is turning about 30 rpm even in this light breeze.

So I'm wondering ...what's the lightest wind anyone out there has ever had that makes some power, even if it takes a slight gust of wind to get it over the cogging. Curious and seriously...would like to hear your stories about success in light winds....as there are a few of us, is mostly all we've got. Jerry gave me an inkling of some success in light winds...anyone else? ( :>) Norm.

[A very light breeze](#) | 2 comments (2 topical, 0 editorial)

Re: A very light breeze ([none / 0](#)) (#1)  
by Jon Miller on Sun Jan 4th, 2004 at 02:26:16 PM MST  
([User Info](#))

about 3miles an hour from a very small about 12 inch prop

Re: A very light breeze ([none / 0](#)) (#2)  
by Norm on Mon Jan 5th, 2004 at 07:47:13 AM MST  
([User Info](#))

Jon: A little more detail than that ...please your thoughts about where you think windspeed is a lost cause...is this 12 inch prop in use? is it hooked up to a generator...alternator. I was thinking this test of mine I probably had about a 3 mph breeze also, down on the ground, even 14 ft up on the peak of my shed might have been about 6mph up there, which would produce 8 times the power. Must do some further test and research. I think it would have to be a very sensitive system to even orient itself into the direction of the wind at anything under 5mph. OK Jon....Your turn..some of your thoughts. Havin Fun in NE Ohio. ( :>) Norm.

[ [Parent](#) ]

[A very light breeze](#) | 2 comments (2 topical, 0 editorial)

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Diaries

**New!** [A very light breeze](#)

By [Norm](#), Section [Diaries](#) [Norm's Diary](#)  
 Posted on Sun Jan 4th, 2004 at 06:52:23 AM MST

It all started with a Free Take One (CD (get optimized) )  
 (2 Comments, 199 words in story) [FULL STORY](#)  
 Comments by: [Jon Miller](#)(1) , [Norm](#)(1)

**New!** [Using car starter for small engine](#)

By [Norm](#), Section [Diaries](#) [Norm's Diary](#)  
 Posted on Fri Aug 29th, 2003 at 11:11:02 PM MST

Here's a brief little animation.... (14 Comments, 115 words in story) [FULL STORY](#)  
 Comments by: [Norm](#)(8) , [Old F](#)(1) , [zmoz](#)(1) , [BT Humble](#)(3) , [jubalearly](#)(1)

**New!** [my problem with larrggggee pictures](#)

By [Norm](#), Section [Diaries](#) [Norm's Diary](#)  
 Posted on Sun Aug 24th, 2003 at 06:15:33 AM MST

I'm not complaining just a quick runthru (5 Comments, 199 words in story) [FULL STORY](#)  
 Comments by: [Norm](#)(2) , [ADMIN](#)(1) , [sean](#)(1) , [Chagrin](#)(1)

**New!** [My foamboard Darrius](#)

By [Norm](#), Section [Diaries](#) [Norm's Diary](#)  
 Posted on Wed Aug 20th, 2003 at 03:59:05 PM MST

My foamboard, plywood, duct tape on a bicycle wheel....  
 (10 Comments, 333 words in story) [FULL STORY](#)  
 Comments by: [Norm](#)(4) , [windstuffnow](#)(4) , [sean](#)(1) , [RobC](#)(1)

**New!** [Gluing magnets](#)

By [Norm](#), Section [Diaries](#) [Norm's Diary](#)  
 Posted on Sun Jun 29th, 2003 at 10:12:19 PM MST  
 and what not to do..... (177 words in story) [FULL STORY](#)  
 Comments by: *None yet*

**New!** [Simple Anemometer](#)

By [Norm](#), Section [Diaries](#) [Norm's Diary](#)  
 Posted on Fri May 2nd, 2003 at 08:33:46 PM MST

Well here it is my quick and simple anemometer, (6 Comments, 98 words in story) [FULL STORY](#)  
 Comments by: [Norm](#)(1) , [ADMIN](#)(1) "Right on!", [TomW](#)(1) "Always wanted one of those", [BT Humble](#)(2) "Geocities is starting to tick me off...", [troy](#)(1) "nifty"

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by [kurt](#) - November 1  
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by [jimu](#) - October 31  
 3 comments

[Fun with fuel](#)

by [Demetri](#) - October 28  
 15 comments



## New! [Bar Stool Rings](#)

By [Norm](#), Section [Diaries](#)

Posted on Mon Apr 21st, 2003 at  
02:54:00 PM MST

[Norm's Diary](#)

That's right...bar stool rings. I ran across these 4 bar stools in the junk... (3 Comments, 110 words in story)

[FULL STORY](#)

Comments by: [Norm](#)(1) "[Confused Norm](#)", [Johnny Cool Pants](#)(1) "[Bar Stools](#)", [TomW](#)(1) "[No Clue...](#)"

---

[More Diaries...](#)

### Poll

What do you think is the best (as by efficiency, availability, cost, etc.) source of electricity?

- Hydro
- Wind
- Chemical Reaction
- Steam
- Bio-mass
- Fossil Fuels
- Nuclear
- Lightning
- Static
- Solar

Votes: 80 | Comments: 0

[Results](#)

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## [Wincharger Rebuild](#)

By [DonG](#), Section [Diaries](#)

Posted on Wed Dec 31st, 2003 at 07:59:17 PM  
MST

[DonG's Diary](#)

### Rebuilding an old Wincharger

I bought this Wincharger 32 Volt 1000 watt that had taken a bad fall. There's some broken parts and the prop is missing.



The airbrake was badly bent.



The tail casting and prop hub were broken.

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The generator was complete except for missing through bolts. They are 9 1/2" long. I'll have to make new ones from 5/16" rod and thread the ends.



I bought a junk gearbox for twenty dollars that had a good tail casting and the pulley arm that I was missing. The shaft was frozen and one of the other castings was broken.



I installed new bearings and gaskets in the gearbox and painted all the pieces Rustoleum Sunrise Yellow. The original Wincharger color is a mustard yellow brown color. I couldn't paint it that color. It reminded me of something in a baby's diaper.



I removed the rivets and started straightening the airbrake last weekend but I ran out of oxygen for my torch. I should get it finished this weekend. The rivets are unavailable. I'm going to have to make some.



Looked through a whole bunch of two by sixes at Home Depot to get some that I could cut up to remove the knots. I alternated the grain on the pieces when I glued them together to prevent warping.



Here's the assembly a little further along. I've installed the tail casting with the new pin that I made and the pulley arm has a new pin and stainless pulley.





The turntable has a broken weld on the lower three point mount. It's also missing the top mount castings. They are impossible to find so I'm going to have to make some. The sliprings and brushes are in excellent shape.



[Wincharger Rebuild](#) | 3 comments (3 topical, 0 editorial)

Re: Wincharger Rebuild ([none / 0](#)) (#1)  
by Old F on Wed Dec 31st, 2003 at 09:31:29 PM MST  
([User Info](#)) <http://www.oldf.homestead.com>

Don

You have the old gal LOOKING GOOD.  
what is she rated at?

I just love things older than my self.  
But they are getting harder and harder to find : )

Old F

Re: Wincharger Rebuild ([none / 0](#)) (#2)  
by DonG on Thu Jan 1st, 2004 at 12:03:12 PM MST  
([User Info](#))

Old F,  
Thanks. It's a Wincharger Model 3229 rated at 32 volts and 1000 watts. The rated cut in speed is supposed to be around 7-10 mph. The gearbox has about a 10 to 1 ratio. I'm going to use it to charge 24 volts instead of the rated 32 volts. These are noisy high maintenance antiques. But, it's a lot of fun searching for the parts and fixing them.  
DonG

[ [Parent](#) ]

Straightening Sheet Metal ([none / 0](#)) (#3)  
by wdyasq on Sat Jan 3rd, 2004 at 06:37:57 PM MST  
([User Info](#))

Don, Most sheet metal can be straightened without heat. Any stretching that occurs can be 'spot shrunk' by heating a small area- it will 'rise'- the area that raised - while still hot, can be hammered flat with light blows on a dolly. When it cools it will shrink pulling a little more of the stretched area in. Good luck, Ron

[Wincharger Rebuild](#) | 3 comments (3 topical, 0 editorial)

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## Diaries

### **New!** [Wincharger Rebuild](#)

By [DonG](#), Section [Diaries](#)

Posted on Wed Dec 31st, 2003 at 07:59:17 PM MST

[DonG's Diary](#)

Rebuilding an old Wincharger (3 Comments, 321 words in story) [FULL STORY](#)

Comments by: [Old F\(1\)](#) , [DonG\(1\)](#) , [wdyag\(1\)](#) "[Straigtening Sheet Metal](#)"

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### Poll

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Votes: 80 | Comments: 0  
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[Useful math to be found here.](#)

By [Old F](#), Section [Diaries](#)

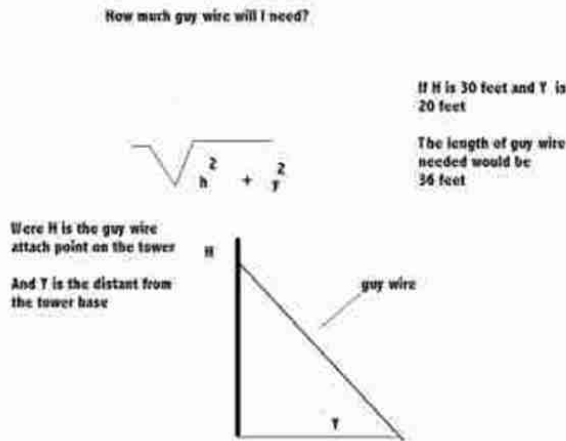
Posted on Fri Dec 26th, 2003 at 09:14:09 PM MST [Old F's Diary](#)

I am setting up this diary as a referents for RE math.

If you have any thing that you think mite be useful here is a place to put it.

Here is my contribution. Have Fun

Old F



That didn't come out so good

Were H is the guy wire attach point and Y is the distant from the tower base

If H is 30 feet and Y 20 feet the length of the guy wire needed would be 36 feet

[Useful math to be found here.](#) | 0 comments (0 topical, 0 editorial)

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## Diaries

**New!** [Useful math to be found here.](#)

By [Old F](#), Section [Diaries](#)

[Old F's Diary](#)

Posted on Fri Dec 26th, 2003 at 09:14:09 PM MST

I am setting up this diary as a referents for RE math. (97 words in story) [FULL STORY](#)

Comments by: *None yet*

**New!** [More Tower Fun](#)

By [Old F](#), Section [Diaries](#)

[Old F's Diary](#)

Posted on Thu Dec 25th, 2003 at 05:20:23 PM MST

A 30 foot octahedron tower (1 Comment, 524 words in story) [FULL STORY](#)

Comments by: [Old F](#)(1)

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15 comments

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### [More Tower Fun](#)

By [Old F](#), Section [Diaries](#)

Posted on Thu Dec 25th, 2003 at 05:20:23 PM MST [Old F's Diary](#)

A 30 foot octahedron tower

---

I am in the process of building a 30 foot guyed tower using Octahedron modules.

It is based on the 70s Wind Works plans for a free standing tower.

I decided to cut my teeth on a simpler guyed tower be for building a free standing.

Things are panning out nicely I have the first 10 foot section done. The vertical struts are 3/4 inch emt conduit and the horizontal triangles are inch and 1/2 angle iron 1/8 inch thick. With 2inch long an inch and a 1/2 wide 3/16 thick tab welded to the corners .

The thing that gets me is how strong this thing is and a ten foot section is held together with only nine 5/16 bolts. And weighs in at 41 pounds.

It's a odd looking beast and at certain angles it looks crooked as a dogs hine leg. Even tho its straight.

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A ten foot section consist two five foot modules and each module contains six vertical struts.

The conduit is flatted at each end an inch and a 1/2 back .  
I put the press together with odds an ends in the shop an a two ton bottle jack. It has a depth stop so I don't have to measure every flat just slide it in till it hit the stop an go. The flats are off set at 60o so they will line up with the tabs on the triangles.

The struts are done in three pairs. With a strut pair you will have one left hand and one right strut. You flatted one end of the conduit then turn it around.  
In the photo you will see the angle gage I use to do this the V is 120o angle so for a right hand strut you place the flat on the right hand side of the V this set the angle at 60o the other end is set in the press to the depth stop and flatted . For a left hand strut you put the flat on the left hand side of the V.  
Don't try to eye ball this been there done that and wasted conduit the gage make it easy.

The photo shows a left and right hand strut in the press I only flatten one at a time as the depth stop is only wide enough for one at time .



This photo show the guide to mark the bolt holes on the flats.  
It's a tab for the triangles its 2 inches long and a inch and 1/2 wide.

I measured back an inch an 1/2 And marked the center of inch an a1/2 square.  
Then drilled a hole I used this to mark the holes for the tabs and the flats.



Here is the angle gage



A horizontal triangle.

Here is where I am at for now next is the tower top section that will taper to a six inch triangle at the top.

Have so much fun it should be illegal

[More Tower Fun](#) | 1 comment (1 topical, 0 editorial)

Re: More Tower Fun ([none / 0](#)) ([#1](#))  
by Old F on Mon Dec 29th, 2003 at 01:38:43 PM MST  
([User Info](#)) <http://www.oldf.homestead.com>

I just got done with the top section.

The bottem triangle is foot and hafe on a side and tapers to six inchs at the top

Old F





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[hornet blades got about 800 watts 35 mph](#)

By [Geek](#), Section [Diaries](#)

Posted on Fri Nov 28th, 2003 at 03:41:27 PM MST

[Geek's Diary](#)

its working now :)

Will since a recent wind storm caused the tail to slip and then come off completely I order a new set of hornet blades with a 6 blade hub these are a much better match for my alt than the jerry blades were I maxed out at 100 watts now with the new blades I got a high of around 800 watts I did louse some lowend start it takes 10 mph to get it started where the jreeys would start around 6. at one point we were runing a shop vac stright off the alt it raan real nice it was a 7 amp motor I am not sure if it was quite flat out but it was in the 90s volatage wise. just goes to show the guys the are always saying match your alt to your blades. I should have it up on the tower next week this was all on hte road test.  
Geek

[hornet blades got about 800 watts 35 mph](#) | 10 comments (10 topical, 0 editorial)

Re: hornet blades got about 800 watts 35 mph ([none / 0](#)) (#1) by Jerry on Fri Nov 28th, 2003 at 09:37:50 PM MST ([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Geek Bravo good job. Let me ask a few questions.

You said you maxed out at 100 watts with the Jerry blades.

What are you using as your alt? How many Jerry blades? What diameter prop tip to tip. Are the jerry blades pitched at 23 degrees at the root?

Here is an entry in my wind test log book. This is from the S-10 wind test truck.

4-24-03, 8:00 pm, 50 degrees cloudy, 3/4 hp 6 pole furnace blower motor with 6 # 29 neo magnets, 6 starts windings perelell, 6 run windings perelell, 2 bridge diodes,

Prop 3 jerry blades with Mike mods, 23 degrees root, 49 inches, 35 mph, 50 amps 15.1 volts = 755 watts.

This is alittle behind the Hornets but low speed start up and total power colected at low wind was greter than the Hornets. The noise of the Hornets was also not acceptable.

The most I've seen from the Hornets is 80 amps The most I've seen from the Jerry blades so far is 80 amps.

I think there are more low wind days than high wind days. If you watch the gennys on my shop roof most days the Jerry blades are spinning and the Hornets are not.

Here is another test Nov. 24, 03

1 hp Garbogen 12 volt test. 3 Jerry/Mike mod blades 6  
Hornet blades

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5 mph	3 amps	0 amps
10 mph	8 amps	2 amps
15 mph	15 amps	5 amps

I'll agree the Hornets have higher output at the higher wind speeds but not by much. The Hornets did 80 amps at 40 mph but the Jerry blades did 80 amps at 45 mph not far behind but in either case it was storm type wind speed and not the normal every day 5 to 15 mph wind. I own and use Hornets but in average normal every day wind these do not collect as much power.

So as you can see I'm very curious about how your Jerry blades are configured?

Thanks for some specs and info on your system.

JK TAS Jerry

[Airheads Page](#)

Re: hornet blades got about 800 watts 35 mph ([none / 0](#)) (#2)  
by Geek on Sat Nov 29th, 2003 at 09:23:31 PM MST  
([User Info](#))

I had the jerry's in a four blade turbine unmodified (no mike modes)  
they were piched so the tips of the blades were near flat  
the hub had about about a 12 in dim.  
I thnk the problen was with my alt it really dosent start making  
good power till it is spinning real fast about 800 rpm (just a  
guess I don't have a tach)  
I really do like the Jerry's but the high speed of the hornets  
agreed with my alt much better.  
The allt way made by putting 8 #29 mags in a 1 HP 3 phase  
motor with the 3 phases wired in series (I still trying to sort  
the wiring because even with out a scope I can tell I'm not  
getting a very smooth output) I have tried to use the Y or delta  
that every one has talked about but I can't seem to make it  
work.  
this was my first real atempt so I'm pretty happy but I think  
there is still room to squee a few more watts out of this one.  
I really didn't hear much noise from the hornets at 35 or 40 I  
only wish I had a tach hooked up so I could be more helpful.  
Geek  
Always have a dream. Those with out dreams are just waiting to  
die.  
[ [Parent](#) ]

Re: hornet blades got about 800 watts 35 mph  
([none / 0](#)) (#3)  
by Jerry on Mon Dec 1st, 2003 at 09:47:19 AM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Geek

Like you I am RPM chalagned. Its just a mater of time though. Eventually i will have some rpm data on the plastic blades.

I do know the Mike mods make a drastic diferance in rpm. I won't fly the plastic blades without Mike mods.

The closest thing to an rpm gestamate I have is from a small dc motor I'm fling as a genny.

With this pm motor chucked up in the lathe 50 volts is reached at 500 rpm no load.

We recently had a storm and were seeing winds in the up to 35 to 40 mph range. I was seeing 125 to 150 volts from this motor no load. This motor is a 115 volt motor. It rated 1800 rpm.

I would guess the rpm to be around 1500 or so? Of course this was no load but the blades have developed 80 amps at 15 volts for 1200 watts wich is about 1.5 hp?

I was thinking of using a car type tachometer on the 80 amp GARBOGEN to get an rpm reading in the wind loaded.

Time will tell. JK TAS Jerry

[Airheads Page](#)

[ [Parent](#) ]

Re: hornet blades got about 800 watts 35 mph ([none / 0](#)) ([#4](#))  
by desertratjack on Mon Dec 8th, 2003 at 12:14:01 PM MST  
([User Info](#))

I'm using hornet 6 blade setups. How to stop the NOISE? Guess I'll have to furl them with "tip-backs" just when they are really getting going. Windseeker 503 (3 blade- rated at 500w) generally outperforms the hornets until just about the point that the hornets make noise. Very sad as the hornets cost about 1/4 of the windseeker.

Re: hornet blades got about 800 watts 35 mph ([none / 0](#)) ([#5](#))  
by Geek on Mon Dec 8th, 2003 at 03:34:25 PM MST  
([User Info](#))

I think it is a matter of how hight the rpm are. I think my alt is a lower rpm than yours. I think that is why I'm not getting much noise out of these blades. You could try and round the tips I think that might make some difference but then again it may just muck things up too.

Sorry I can't help you more.

Geek

Always have a dream. Those with out dreams are just waiting to die.

[ [Parent](#) ]



Re: hornet blades got about 800 watts 35 mph  
([none / 0](#)) ([#6](#))  
by desertratjack on Tue Dec 9th, 2003 at 10:55:00 AM  
MST  
([User Info](#))

I have the 6V and 12V hornet windmills. They both create the same noise around the same windspeed. I bought the 6V one because I thought it would drag the prop down below the noise speed. No luck. I wet sand the 6 blade hornet blades to 400 grit. Maybe the hornet blade tips deform at higher loads to make noise?

Please let me know is you notice any hints on how this noise problem.

Jack

[ [Parent](#) ]

Re: hornet blades got about 800 watts 35 mph  
([none / 0](#)) ([#7](#))  
by Jerry on Tue Dec 9th, 2003 at 10:27:02 PM  
MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Jack

I sent you an e-mail this morning to the address you said to use but AOL said it didn't go through. Do you have an e-mail address that works?

JK TAS Jerry

[Airheads Page](#)

[ [Parent](#) ]

Re: hornet blades got about 800 watts 35 mph  
([none / 0](#)) ([#8](#))  
by desertratjack on Fri Dec 12th, 2003 at 09:20:37 PM MST  
([User Info](#))

I'm not on AOL.     jacknl7s@hotmail.com

[ [Parent](#) ]

Re: hornet blades got about 800 watts 35 mph  
([none / 0](#)) ([#9](#))  
by Jerry on Sat Dec 13th, 2003 at 07:31:45 PM MST  
([User Info](#))  
<http://www.dplusv.com/Photo-03.html>

Yep That's the address I sent it to as you suggested but it didn't work.

Sorry. JK TAS Jerry

[Airheads Page](#)

[ [Parent](#) ]

Re: hornet blades got about 800 watts 35 mph ([none / 0](#)) (#10) by desertratjack on Thu Dec 18th, 2003 at 05:42:05 PM MST ([User Info](#))

send it again

jacknl7s@hotmail.com

[ [Parent](#) ]

[hornet blades got about 800 watts 35 mph](#) | 10 comments (10 topical, 0 editorial)

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## Diaries

### **New!** [hornet blades got about 800 watts 35 mph](#)

By [Geek](#), Section [Diaries](#) [Geek's Diary](#)

Posted on Fri Nov 28th, 2003 at 03:41:27 PM MST  
its working now :) (10 Comments, 162 words in story) [FULL STORY](#)

Comments by: [Geek\(2\)](#) , [desertratjack\(4\)](#) , [Jerry\(4\)](#)

### **New!** [A start in wind](#)

By [Geek](#), Section [Diaries](#) [Geek's Diary](#)

Posted on Sun Jun 8th, 2003 at 07:33:18 AM MST  
My first Turbine! (2 Comments, 131 words in story) [FULL STORY](#)

Comments by: [Geek\(1\)](#) , [Anonymous Hero\(1\)](#)

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by [swami](#) - November 15  
2 comments

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by [marv](#) - November 8  
7 comments

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by [kurt](#) - November 1  
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by [jim](#) - October 31  
3 comments

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by [Demetri](#) - October 28  
15 comments

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### Poll

What do you think is the best (as by efficiency, availability, cost, etc.) source of electricity?

- Hydro
- Wind
- Chemical Reaction
- Steam
- Bio-mass
- Fossil Fuels
- Nuclear
- Lightning
- Static
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Votes: 80 | Comments: 0  
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[aerial bunch cable](#)

By [swami](#), Section [Diaries](#)

Posted on Sat Nov 15th, 2003 at 10:57:26 PM MST

[swami's Diary](#)

what is voltage rating for aerial bunch cable . How can we minimise the RFI of power line .

[aerial bunch cable](#) | 2 comments (2 topical, 0 editorial)

Re: aerial bunch cable ([none / 0](#)) (#1)  
by TomW on Mon Nov 17th, 2003 at 06:03:40 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Swami;

Must be a language barrier here. Can you explain just what you mean by aerial bunch cable??

It is a totally unfamiliar term to me.

Cheers.

TomW

[Stuff I have Online](#)  
[Contact Me](#)

Re: aerial bunch cable ([none / 0](#)) (#2)  
by BruceDownunder on Thu Dec 4th, 2003 at 07:21:58 PM MST  
([User Info](#))

Aerial Bunched cable is mains distribution cable suspended between poles . It is less dangerous to people in so far as it's insulated and therefore can be strung where yachties raise masts , hang gliders land and also it's less obstrusive compared with "open-wire" It still has the three phases and neutral in the "bunch' and is self supporting . In Australia ,after the bush fires burnt down many open-wire poles , they quickly restored service by rolling out bunched cable -quick to erect and tap into--it can be tapped into mid-span.

Bruce.

[aerial bunch cable](#) | 2 comments (2 topical, 0 editorial)

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## Diaries

### **New!** [aerial bunch cable](#)

By [swami](#), Section [Diaries](#)

Posted on Sat Nov 15th, 2003 at 10:57:26 PM MST

[swami's Diary](#)

what is voltage rating for aerial bunch cable . How can we minimise the RFI of power line . (2 Comments)

[Comments >>](#)

Comments by: [BruceDownunder](#)(1) , [TomW](#)(1)

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### [Up and running! \(way up\)](#)

By [marv](#), Section [Diaries](#)

Posted on Sat Nov 8th, 2003 at 06:27:45 PM MST [marv's Diary](#)

my first attempt

Hi all.

I've been following this board since Jan. this year and I have to admit it's been a very addicting experience.

I built a genni in the spring and spent the summer designing, cutting, drilling and bolting a tower together to mount my first generator on. A much bigger task than the genni was.

It's 98' self standing tower with a brake drum windmill.

Had to get above the 60' trees.

I hope to start getting involved with this board while building a bigger & better unit. This place seems to bring out the creativity in us. A real brain tease.

Here's a pic of the tower and hope to swap thoughts with some of you later.

ps; (isn't this stuff fun!)



[Up and running! \(way up\)](#) | 7 comments (7 topical, 0 editorial)

Re: [Up and running! \(way up\)](#) ([none / 0](#)) ([#1](#))  
by [RobC](#) on Sun Nov 9th, 2003 at 11:35:55 AM MST  
([User Info](#))

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That's quite a tower. What did you build it from and how did you stand it up?

Re: Up and running! (way up) ([none / 0](#)) ([#2](#))  
by marv ([windtamer@hotmail.com](mailto:windtamer@hotmail.com)) on Sun Nov 9th, 2003 at 02:49:32 PM MST  
([User Info](#))

Hi Rob  
the corner pieces are 3 1/2" x 1/4" angle iron (galvanized). The rest is mostly 3" & 2 1/2" angle + 1/2" grade #5 bolts. It weigh's 11,000 lbs. so I needed a 70 ton crane. (what a adrenilane rush)

marv.

[ [Parent](#) ]

Re: Up and running! (way up) ([none / 0](#)) ([#3](#))  
by drdongle on Mon Nov 10th, 2003 at 09:13:22 PM MST  
([User Info](#))

All I can say is WOW!

Dr.D

Re: Up and running! (way up) ([none / 0](#)) ([#4](#))  
by Budgreen on Tue Nov 11th, 2003 at 07:19:55 AM MST  
([User Info](#))

just out of curiosiry, why grade #5 bolts instead of #8?

WHY grade 8? ([none / 0](#)) ([#5](#))  
by wdyasq on Sat Nov 22nd, 2003 at 06:14:44 AM MST  
([User Info](#))

Budgreen,

I'd guess (and take a sizeable bet on this one) grade 5 bolts are higher tensile strength than the metal they bolt together. Why spend the money?

It is an impressive tower.

Ron

[ [Parent](#) ]

Re: Up and running! (way up) ([none / 0](#)) ([#6](#))  
by marv ([windtamer@hotmail.com](mailto:windtamer@hotmail.com)) on Sat Nov 22nd,  
2003 at 04:09:31 PM MST  
([User Info](#))

Thanks Dr.D, Ron  
Thats right Ron. Plus thats what Ontario Hydro uses for  
bolts here.  
So if it's good enough for theirs, it's good enough for mine.

marv

Re: Up and running! (way up) ([none / 0](#)) ([#7](#))  
by troy on Wed Nov 26th, 2003 at 02:32:57 PM MST  
([User Info](#))

Holy angle iron Batman, THAT'S a TOWER!

I can only say that I am smitten with tower envy. Did you  
get a deal on the angle iron (2nd hand?) or pay full price.  
In any case, it's a beautiful tower.

Best regards,

troy

[Up and running! \(way up\)](#) | 7 comments (7 topical, 0 editorial)

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## Diaries

### **New!** [Up and running! \(way up\)](#)

By [marv](#), Section [Diaries](#)

[marv's Diary](#)

Posted on Sat Nov 8th, 2003 at 06:27:45 PM MST

my first attempt (7 Comments, 140 words in story) [FULL STORY](#)

Comments by: [drdongle\(1\)](#), [marv\(2\)](#), [RobC\(1\)](#), [wdyasg\(1\)](#) "WHY grade 8?", [Budgreen\(1\)](#), [troy\(1\)](#)

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## [renewable energy faq](#)

By [kurt](#), Section [Diaries](#)

Posted on Sat Nov 1st, 2003 at 06:39:30 PM MST

[kurt's Diary](#)

look here for answers to your RE questions

When new people find fieldlines.com they inevitably ask pretty much the same questions so this is an attempt to provide links to those questions in one easily found place

The most often asked question is probably "can I use a car alternator, induction motor, ect. For an alternator for a wind turbine. The link below should cover your questions on this matter quite well.

[http://www.otherpower.com/otherpower\\_wind\\_alternators.html](http://www.otherpower.com/otherpower_wind_alternators.html)

The second most asked question is probably about controlling voltages to the batteries in a wind system for example "how do I keep my 30v tape drive motor from frying my 12v battery bank." The batteries will pull the generator voltage down to their charging voltage until they are full then the power needs to be diverted somewhere else. That is the job of a diversion charge controller.

<http://www.bioelectrifier.com/charge.htm>

<http://www.homepower.com/files/shuntregulator18.pdf>

<http://www.xantrex.com/products/supercat.asp?did=333>

Number three most asked is probably what kind of batteries should I use or some variation of the same.

[http://www.otherpower.com/otherpower\\_battery.html](http://www.otherpower.com/otherpower_battery.html)

Probably not one of the most asked about subjects but should be is Efficient Lighting.

[http://www.otherpower.com/otherpower\\_lighting.html](http://www.otherpower.com/otherpower_lighting.html)

You can get good information on solar here.

[http://www.otherpower.com/otherpower\\_solar.html](http://www.otherpower.com/otherpower_solar.html)

Here are some good links on hydro

[http://www.otherpower.com/otherpower\\_hydro.html](http://www.otherpower.com/otherpower_hydro.html)

<http://home.carolina.rr.com/unclejoe/menu.html#Hydraulic%20Water%20Turbines>

<http://www.lcs.net/users/pinecrest/text/hydro.htm>

<http://myhydro.freesevers.com/>

Good links on internal combustion generators

[http://www.otherpower.com/otherpower\\_gas.html](http://www.otherpower.com/otherpower_gas.html)

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- <http://www.lcs.net/users/pinecrest/text/hydro.htm>
- <http://myhydro.freesevers.com/>

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<http://www.homepower.com/files/mark8.pdf>

if you have not looked through the otherpower.com main page links yet I would highly recommend that you do so.

<http://www.otherpower.com/otherpowerfront.shtml>

(links are at the bottom of the page)

overunity link

<http://phact.org/e/z/freewire.htm>

[renewable energy faq](#) | 2 comments (2 topical, 0 editorial)

Re: renewable energy faq ([none / 0](#)) (#1)  
by Norm on Sun Nov 2nd, 2003 at 08:24:35 AM MST  
([User Info](#))

Excellent job Kurt...I could never do something like this...takes to much self-discipline I'd get side-tracked on the first link. (:>) Norm.

Re: renewable energy faq ([none / 0](#)) (#2)  
by JW on Wed Nov 5th, 2003 at 02:57:26 PM MST  
([User Info](#))

This is some very useful info you have provided Kurt. Thank you, I am in the process of designing a "Dual Rotor Machine" to replace my automotive type alternator, in the app I'm working with.

-JW

[ [Parent](#) ]

[renewable energy faq](#) | 2 comments (2 topical, 0 editorial)

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## Diaries

### **New!** [renewable energy faq](#)

By [kurt](#), Section [Diaries](#)

Posted on Sat Nov 1st, 2003 at 06:39:30 PM [kurt's Diary](#)  
MST

look here for answers to your RE questions (2 Comments, 305 words in story) [FULL STORY](#)

Comments by: [JW\(1\)](#) , [Norm\(1\)](#)

### **New!** [bio](#)

By [kurt](#), Section [Diaries](#)

Posted on Sun Mar 23rd, 2003 at [kurt's Diary](#)  
04:30:59 PM MST

i live in rockford illinois. like all things macanical/electrical and am allways tinkering with something i have background in appliance repair, machine maintenance, and hvac. [Comments >>](#)

Comments by: *None yet*

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by [Old F](#) - December 26

### [More Tower Fun](#)

by [Old F](#) - December 25  
1 comment

### [hornet blades got about 800 watts 35 mph](#)

by [Geek](#) - November 28  
10 comments

### [aerial bunch cable](#)

by [swami](#) - November 15  
2 comments

### [Up and running! \(way up\)](#)

by [marv](#) - November 8  
7 comments

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by [kurt](#) - November 1  
2 comments

### [Fun with meters](#)

by [jimu](#) - October 31  
3 comments

### [Fun with fuel](#)

by [Demetri](#) - October 28  
15 comments

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### Poll

What do you think is the best (as by efficiency, availability, cost, etc.) source of electricity?

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- Chemical Reaction
- Steam
- Bio-mass
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[Fun with meters](#)

By [jimU](#), Section [Diaries](#)

Posted on Fri Oct 31st, 2003 at 05:21:39 PM MST

[jimU's Diary](#)

Beede meters

One of the things we all love are meters. Over the years, I have bought some used or surplus meters here, and some there, some are given to me, and others I find on ebay.

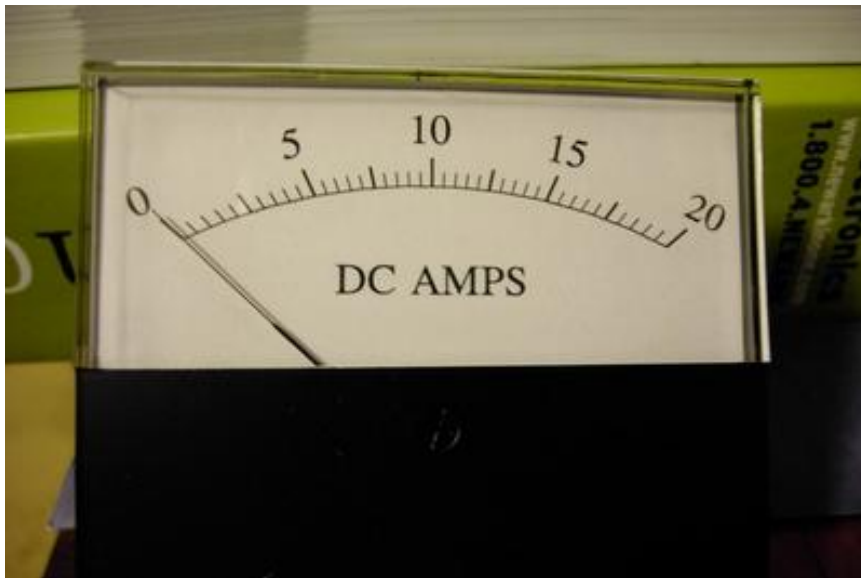
My latest find was on ebay, some Surplus new in box 1975 Beede 100 mv full scale meters, each costing about 4 bucks..

Using a freeware program, called meter.exe and a HP-GL capable laser printer, I can make a meter face for just about any size and shape meter one can think of.

The one I made today was for a PV application where I needed 20 amps full scale, and using a shunt out of 12 guage copper wire that I calibrated to drop 5 mv per amp.

These Beede meters are very easy to open and access the original blank face plate, and using the meter.exe program, designed exactly what I wanted. I then cut out the face I made, sprayed on some 3m adhesive, and reassembled.

Here is the result:



I have made several 11 to 15 volt expanded scale voltmeters, small amp meters, large amp meters etc, using proper scaling resistors and shunts.

More to come on meters.

JimU

[Fun with meters](#) | 3 comments (3 topical, 0 editorial)

Re: Fun with meters ([none / 0](#)) ([#1](#))  
 by Old F on Fri Oct 31st, 2003 at 05:44:07 PM MST  
[\(User Info\)](#) <http://www.olf.homestead.com>

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Jim

Were did you get the freeware ?

Old F

Re: Fun with meters ([none / 0](#)) ([#2](#))  
by jimU on Fri Oct 31st, 2003 at 05:47:30 PM MST  
([User Info](#))

Guess I should have added that :-)

<http://www.realhamradio.com/Meter.htm>

JimU

[ [Parent](#) ]

Re: Fun with meters ([none / 0](#)) ([#3](#))  
by zubbly on Wed Nov 26th, 2003 at 04:52:28 AM MST  
([User Info](#))

hey jimU. beautiful job on the meter. just a suggestion. i guess what makes us all happy is when you see the needle riding the higher end of the scale. how about incorporating a sad face from the bottom end just under the numbers to the happiest face possible under the 20 amp scale. he he, call it a jimU meter. just crazy zub talkin, but it would be neat!

my two cents worth-----zubbly

[Fun with meters](#) | 3 comments (3 topical, 0 editorial)

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[Propellers, what is the max number of blades?](#) | 3 comments (3 topical, editorial)

Re: Propellers, what is the max number of blades?  
([none / 0](#)) (#3)  
by DanB on Thu Dec 25th, 2003 at 07:12:28 AM MST  
([User Info](#))

Hii -  
"Everything I see uses three blades."

There is a reason for that. Typically fewer blades run faster and more efficiently. Two blades runs (as a general rule) a bit faster - and even more efficiently in many cases than three but the drawback is vibration. (they shake when they yaw). Sometimes the shaking can be overcome with weights - or sometimes it may seem un noticable, but any time you have two heavy spots a wheel and turn it (like a windmill yaws) its going to shake.

More blades generally have a bit mroe surface area and start more easily. 3 blades is a good compromise, probably the best compromise.

"I will be building an alternator that will need a twelve foot three bladed prop. Can I use, say (just for discussion) a six bladed 6 foot prop? "

No. Your 3 blade 12 footer would run at a reasonable speed and probably have lots of power. Your 6 blade 6' would probably have too many blades - a bit mroe torque - but it would be inefficient - even for a 6' prop. Power is related to the square of the diameter (the area). Your 12' blade covers a bit over 100 square feet. Your 6' prop covers about 30. The 12' prop (done well) should make 3 X the power of a good 6' prop. A 6 bladed 6' prop will have lots of xtra drag, so itd be even less powerful I suspect.

the 6 bladed 6' prop might have a bit of xtra torque to get your big alternator turning, but it will not have the power to spin it up to the sorts of speeds itll need to go to make power as it would if it had a 6' blade.

Hope that makes sense... (havent had any coffee yet this morning, its dangerous for me to do, or write anything before coffee!)

[Propellers, what is the max number of blades?](#) | 3 comments (3 topical, 0 editorial)

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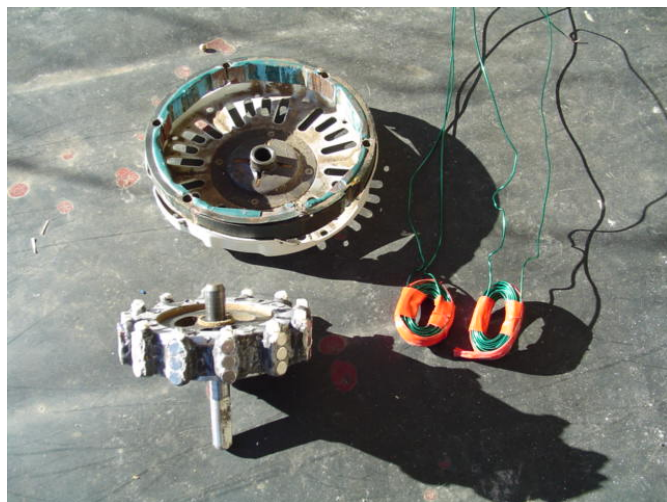
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## [My Mini Geni isn't working very good](#)

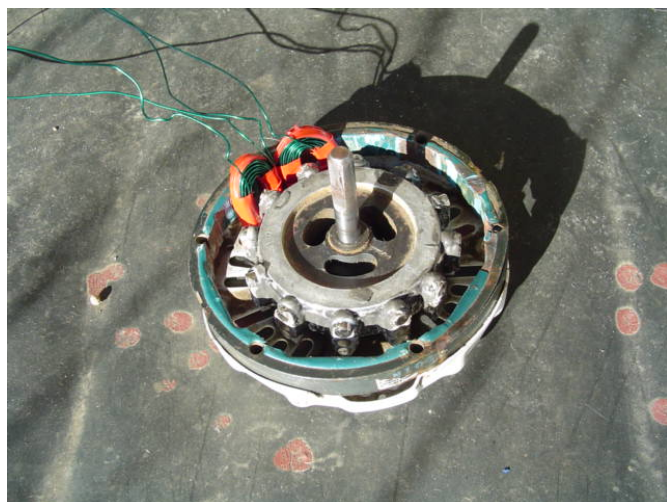
By [wooferhound](#), Section [Homebrewed Electricity](#)  
Posted on Tue Dec 30th, 2003 at 02:35:48 PM MST  
finally wound some coils for testing

[Alternators](#)

I have been working on a Miniture Generator made by converting a Window Fan motor for use with permanent magnets.



I finished the rotor yesterday. Today i wound a coupla coils to test and see what I get before I wind the 12 coils that I'll need to complete the unit. But things don't look so good. I'm getting 25 millivolts at 1200rpm with a single coil. I'm spinning the rotor with it chucked into a hand drill rated at 1200rpm. The voltage is being measured after going through a bridge rectifer with a 4700mfd cap across the output. I was puzzled and wound another coil that I thought would give me better output. However the 2nd coil was just measurably better than the first.



The magnets are quite small and are probably the problem. They are 1/4 x 1/4 Disk Neodymium and are rated N38. They are grouped in sets of three with epoxy glue & tie wraps, the

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same polarity pointing out in each set. 12 groups are glued around the rotor alternating North-South all the way around.

The 1st coil I made was 36 turns of 19ga wire. The 2nd coils was 40 turns and wound to the size of a group of magnets better.

I wanted to see the voltage loss through my rectifiers so I hooked a 9volt battery to it and measured the difference between the battery and the output. I was getting a 1.2 volt loss, so now I'm wondering if the little coils may possibly be putting out as much as 1.2 volts and then getting promptly absorbed by going through the Bridge rectifier . . .

[My Mini Geni isn't working very good](#) | 18 comments (18 topical, 0 editorial)

Re: My Mini Geni isn't working very good ([none / 0](#)) ([#1](#))  
by Electric Ed on Tue Dec 30th, 2003 at 03:14:02 PM MST  
([User Info](#)) <http://www.electric-ed.com>

From the photos, the coil "span" appears to be somewhat less than the magnet pole center-to-center distance. I suspect that there may be some voltage cancelling happening.

Also, there appears that there is no stator iron, which would create a very inefficient magnetic circuit.

Electric Ed

Re: My Mini Geni isn't working very good ([none / 0](#)) ([#6](#))  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Tue Dec 30th, 2003 at 06:33:57 PM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

When I was testing, I was only using 1 coil at a time. For the picture I just stuck those two coils in there so folks could see how I planned to place them. There will be 12 coils and 12 magnets and they will line up to each other 1 to 1.

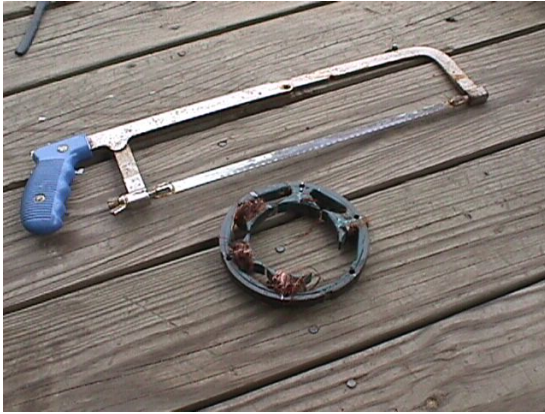
The ring around the outside is the laminate material from the original fan motor. I was sure that would work for the stator iron.

} = - W o o f - = {

[ [Parent](#) ]

Re: My Mini Geni isn't working very good ([none / 0](#)) ([#9](#))  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Tue Dec 30th, 2003 at 07:30:48 PM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

I should point out that I cut the slots out of the original fan stator, leaving me with an almost perfect circle of laminates.



}=- W o o f -= {

[ [Parent](#) ]

Re: My Mini Geni isn't working very good ([none / 0](#)) ([#13](#))  
by Norm on Wed Dec 31st, 2003 at 07:30:20 AM MST  
([User Info](#))

I've got the same thing (even the same hacksaw, but yellow handle) get another junk fan motor (you know they're not that scarce) and start all over again, but don't cut the laminates, this time grind down the armature enough to allow for some of those small magnets that Ed on Windstuffnow has (99 cents each so they won't break you) Have Fun ( :>) Norm

[ [Parent](#) ]

Re: My Mini Geni isn't working very good ([none / 0](#)) ([#2](#))  
by cevonk ([cevonk\(at\)signhere@aol.com](mailto:cevonk(at)signhere@aol.com)) on Tue Dec 30th, 2003 at 03:24:08 PM MST  
([User Info](#))

Very interesting project! Getting things to work on a small scale is sometimes harder than on a large scale. If the magnets are 1/4" in diameter and 1/4" thick, it looks as if the field airgap between the magnets and the outside stator is about 3/4". With larger magnets, say 1/2" thick, that would work out to an airgap of 1 1/2", which would probably be a serious drawback.

It's neat to see the ideas that you are working on!



Re: My Mini Geni isn't working very good ([none / 0](#)) (#7)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Tue Dec 30th, 2003 at 06:39:35 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

It's hard to tell the scale from the photos, but the airgap from the end of the magnet to the laminates is slightly over 1/2 inch. was planning on making coils at 3/8 inch thick.

} = - W o o f -= {

[ [Parent](#) ]

Its so obvious I think you are joking?? ([none / 0](#)) (#3)  
by TomW on Tue Dec 30th, 2003 at 03:41:39 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Woofers;

You said:

The magnets are quite small and are probably the problem. They are 1/4 x 1/4 Disk Neodymium and are rated N38. They are grouped in sets of three with epoxy glue & tie wraps, the **same polarity pointing out in each set.**

Way back in alternators 101 we learned that the poles need to alternate N S N S N S etc.

That and the other drawbacks noted will produce a poor alternator.

Cheers.

TomW

[Stuff I have Online](#)

[Contact Me](#)

Re: Its so obvious I think you are joking?? ([none / 0](#)) (#8)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Tue Dec 30th, 2003 at 07:21:34 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

Thanks TomW

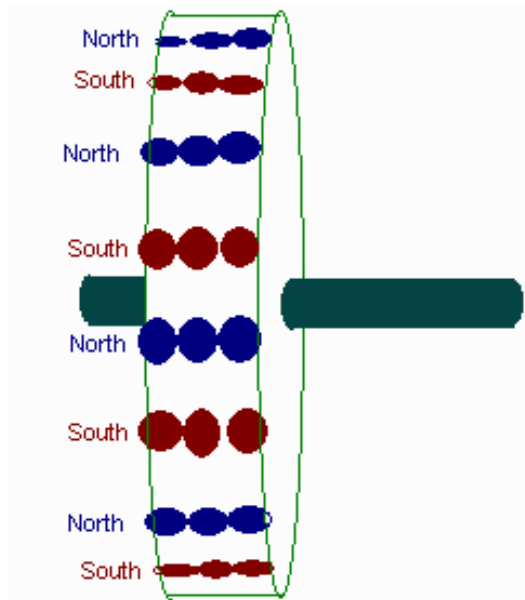
let me quote what you quoted and add the rest of the paragraph...

--Quote-----

They are grouped in sets of three with epoxy glue & tie wraps, the same polarity pointing out in each set. 12 groups are glued around the rotor alternating North-South all the way around.

-----

Perhaps I could have described this more clearly. As they say "A picture is worth a 1000 words" so here's a pic



The mags are grouped in sets of 3. Each set has all North or all South pointing out. putting the magnets together this way is very difficult as the mags are trying to run away from each other and flip around and stuff. Then these Sets are glued to the stator in alternating groups.  
set of 3 Norths  
set of 3 Souths  
set of 3 Norths  
set of 3 Souths  
etc.

} = - W o o f - = {

[ [Parent](#) ]

Re: My Mini Geni isn't working very good ([none / 0](#)) ([#4](#))  
by Norm on Tue Dec 30th, 2003 at 03:43:51 PM MST  
([User Info](#))

What happens if you just run the output of one coil thru one small 1 amp diode? or even try measuring the ac voltage? ,, , or check the voltage of the battery... then check the voltage of the battery thru the rectifier... you should be getting some kind of voltage ac or dc? even .001 volt? Hope this helps until you get a more expert advice.... Like Zuck perhaps? Maybe with a different arrangement of magnets ( :>) Norm.

Re: My Mini Geni isn't working very good ([none / 0](#))  
(#5)  
by JB on Tue Dec 30th, 2003 at 04:34:52 PM MST  
([User Info](#))

I did a little 1/6 hp motor something like that last week. it was a small 6 pole 7.8 amp 1000 rpm ac motor and had only 6 coils in series. They looked about 17 or 18 gauge. i put 6 of the 1/2 by 2 by 1/4 neos on it skewed ns ns ns. It still cogs pretty good. I wasnt terribly impressed with my results but it did show 4 amps 15.5 volts on the dc side of the bridge rectifier on my meter at 400 rpm and 5.3 amps 24 volts dc at 770rpm I think if i had doubled the magnets amd made them 1/2 thick I would have been able to bring the charging voltage down considerably. JB

[ [Parent](#) ]

Re: My Mini Geni isn't working very good ([none / 0](#))  
(#10)  
by wooferhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Tue Dec 30th, 2003 at 07:45:19 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

I did try to test the straight AC voltage, but after I disconnected everything I realized that it was'nt hooked up properly. I'll try again in the morning.

Also I did consider testing using a single diode, but the wife wanted the vacuum cleaner fixed so I went on to the higher priority project at the time.  
Thanx

}=- W o o f -= {

[ [Parent](#) ]

Re: My Mini Geni isn't working very good ([none / 0](#)) (#11)  
by kell on Tue Dec 30th, 2003 at 09:38:00 PM MST  
([User Info](#))

For each bunch of little mags fighting each other you've got a distorted multipolar field with flux lines going every which way. I think you'll do better with cheap ceramic magnets of the right size, so you know the flux lines will cut the coils where and when you want them to.

Re: My Mini Geni isn't working very good ([none / 0](#))  
(#12)  
by Norm on Wed Dec 31st, 2003 at 07:06:14 AM MST  
([User Info](#))

I think you'll do better with cheap ceramic magnets of the right size, so you know the flux lines will cut the coils where and when you want them to.

I agree ...something like Ed has would have been a lot less fuss and bother:

[http://www.windstuffnow.com/main/builders\\_corner.htm](http://www.windstuffnow.com/main/builders_corner.htm)  
and less fuss and bother = More Fun! ( :>) Norm

[ [Parent](#) ]

Re: My Mini Geni isn't working very good  
([none / 0](#)) ([#14](#))  
by Jerry on Wed Dec 31st, 2003 at 08:30:03 AM  
MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

I did 6 of the little Ed/Windstuff magnets on a smaller version of this motor. Didn't change a thing but machined the armature down to fit the magnets.

It dose cogg hard but I'm seeing 60 watts at 500 rpm. Just try getting 60 watts from a solar panel for 6 bux.

JK TAS Jerry

[Airheads Page](#)

[ [Parent](#) ]

Re: My Mini Geni isn't working very good ([none / 0](#))  
([#15](#))  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Wed  
Dec 31st, 2003 at 11:37:33 AM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

I was reading somewhere on the board that , lining up magnets like this created a magnetic field that was the same as a bar magnet with the poles on the sides. Thats why I built it this way.

Is this right or not, Many of Zubbly's designs are simular to this approach.

} = - W o o f -= {

[ [Parent](#) ]

big gap..... ([none / 0](#)) ([#16](#))  
by Norm on Wed Dec 31st, 2003 at 12:51:12 PM  
MST  
([User Info](#))



After taking a real close look at the pictures and especially the last ones ,I think I have the solution...a couple of the ones that replied and said about the gap were on the right track especially Electric Ed where he also referred to the width of the magnets to the width of the coil or something like that, so I'll be back with the solution as soon as I draw a couple of illustrations on one of your pictures. OK? Norm

[ [Parent](#) ]

Re: big gap..... ([none / 0](#)) (#17)  
by Norm on Wed Dec 31st, 2003 at  
02:48:13 PM MST  
([User Info](#))



Okay....on the next one you get like this(this would be an alternative for someone with only simple handtools)after carefully unwinding each coil....cut each pole straight down as on the red line, when you are finished it will look something like the first picture. Now center a block of wood as thick as the laminate and scribe the radius of the rotor and cut the ends of each pole off accordingly take a large half-round file and file the curve to allow clearance of the rotor. Then rewind the coils and put em back. This is far from ideal but it should work. The better way would be as Jerry suggested....Hope this helps....Have Fun! (:>) Norm.

[ [Parent](#) ]

Re: big gap..... ([none / 0](#)) (#18)  
by Harry Luubovv on Wed Dec 31st,  
2003 at 08:30:05 PM MST  
([User Info](#))

Ok Woofer,

Why not try using square magnets to line up one after another instead of round ones ? because the rounds do give trouble to the magnetic paths, that is, pulling and distorting the flux path. Square ones should behave more "Squarely" in this regard, no pun intended. :-

Love experimenters !  
Luubovv

[ [Parent](#) ]

[My Mini Geni isn't working very good](#) | 18 comments (18 topical, 0 editorial)

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### [4 foot blades](#)

By [jon 63](#), Section [Magnets & Magnetism](#)  
Posted on Tue Dec 30th, 2003 at 10:58:23 AM MST [Alternators](#)  
trying to learn how to post.

[4 foot blades](#) | 2 comments (2 topical, 0 editorial)

Re: 4 foot blades ([none / 0](#)) ([#1](#))  
by [jon 63](#) on Tue Dec 30th, 2003 at 11:12:02 AM MST  
([User Info](#))

ok maybe i got it this time.lol.i got 2 foot blades 4 foot radius and need to make generator, can you help me on deciding what size magnets i need for a start that would be exceptable for 5 to 15 mile winds on most days. i live in alabama, we have some pretty strong winds sometimes .I have material to build a 30 to 35ft tower, i'm a machinist by trade and also welder..retired.i guess you all know what i mean .lol i'm a hobbieist and always tinkering with things i dont understand . i would be tickle if i could get this to work and see it in action ..thanks John

Re: 4 foot blades ([none / 0](#)) ([#2](#))  
by [Jerry](#) on Thu Jan 1st, 2004 at 10:36:45 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi John. Could you discribe your blades. Size at the root, size at the tip, any twist, how thick, profile, cup, leading edge, degrees of attac tip and root, trailing edge and how many? I've not built a working disc genny yet. Although I've started a couple. I have mostly been doing AC motor conversions. I have seen 1200 watts from my 22 inch plastic blades (49 inches tip to tip) so at least that part is simular to yours? JK TAS Jerry

[Airheads Page](#)

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[4 foot blades](#) | 2 comments (2 topical, 0 editorial)

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### [pass magnet inside the coils ?](#)

By [amethyste](#), Section [Magnets & Magnetism](#)  
Posted on Sun Dec 28th, 2003 at 01:13:20 AM MST [Alternators](#)  
**What would happen if you pass magnet inside the coils ?**

[pass magnet inside the coils ?](#) | 4 comments (4 topical, 0 editorial)

Re: pass magnet inside the coils ? ([none / 0](#)) (#1)  
by [drdongle](#) on Sun Dec 28th, 2003 at 07:36:04 AM MST  
([User Info](#))

You would generates some voltage, dependent on speed, size of the coil, the number of turns, and the power of the magnet.

Dr.D

Re: pass magnet inside the coils ? ([none / 0](#)) (#2)  
by [kell](#) on Sun Dec 28th, 2003 at 09:06:01 AM MST  
([User Info](#))

Amethyste, do a search for "linear alternator." Some of the posts are kind of jokey, some are speculative... people that want significant power haven't been building linear alternators because they would have to reciprocate (back and forth, like pistons). Much harder to engineer than something that spins.

The flashlights that you shake to charge them have a magnet on a spring that bounces back and forth inside a coil, from what I've heard.

Re: pass magnet inside the coils ? ([none / 0](#)) (#3)  
by [wooferhound](#) ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Sun Dec 28th, 2003 at 03:06:25 PM MST  
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I've seen several teachers doing science experiment demonstrations, where they were showing the voltage from a coil while passing the magnet through the hole in the coil, or (of course) passing the coil over the magnet.

Kinda similar to dropping a magnet through a copper tube. It's generating power all the way down (which is a dead short) and the magnetic drag greatly slows the magnets drop through the metal tube.

} = - W o o f - = {

Re: pass magnet inside the coils ? ([none / 0](#)) (#4)  
by 5kw on Mon Dec 29th, 2003 at 01:08:51 PM MST  
([User Info](#))

I think the results will depend on the orientation of the magnet as it passes through the coil. If the north pole is facing one leg of the coil and the south pole is facing the other leg the voltages will cancel, via right hand rule or left which ever it is ( I never use these rules for anything but thought experiments as we rarely know or care which pole is north) . On a conventional alternator the legs are cut by opposite poles, but in this case the direction of the cutting is different , because of being on the opposite side of the magnet.

On the other hand ( may be a pun there) if the magnet passes through "pole first" it would generate a voltage as the whole coil would be cut by first one pole and then the other.

Make the wind fun!  
Victor

[pass magnet inside the coils ?](#) | 4 comments (4 topical, 0 editorial)

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## [Is this possible?](#)

By [EdParenteau](#), Section [Homebrewed Electricity](#)  
Posted on Sat Dec 27th, 2003 at 10:04:12 AM MST [Alternators](#)  
Can you make a straightline alternator?

What would happen if you had a row of coils and mounted a couple of strong magnets on a rack and sent them on a rail over the coils?

Thanks,  
Ed

[Is this possible?](#) | 8 comments (8 topical, 0 editorial)

Re: Is this possible? ([none / 0](#)) (#1)  
by TomW on Sat Dec 27th, 2003 at 10:23:32 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Ed;

First let me say that nearly anything is possible but not everything is practical.

We have discussed reciprocating style generators before and while it seems it could be done that they would be fairly inefficient. Maybe a search of this site for comments with "linear alternator" or "reciprocating" in comments would turn up the discussion I found several but the link posting feature on the board seems broken so I didn't put the link in here. I seem to recall that the lack of movement on the end of each stroke when the shaft reverses direction would be a source of lost mechanical power. Just off the top of my head before my coffee.

Oh, and welcome to the board.

Cheers.

TomW

[Stuff I have Online](#)  
[Contact Me](#)

Re: Is this possible? ([none / 0](#)) (#2)  
by DERFMOOSE on Sat Dec 27th, 2003 at 01:54:04 PM MST  
([User Info](#))

I think this might work if U use a pendelum lke on a clock ,it swings back & forth and never moves from the centre, might be worth a try.

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▪ <a href="#">Also by EdParenteau</a>

Re: Is this possible? ([none / 0](#)) (#3)

by Dave B on Sat Dec 27th, 2003 at 11:28:58 PM MST  
([User Info](#)) <http://www.madbbs.com/users/bruggelog>

Look up linear motors. I used to work on very large disk drives that used a linear motor for the read / write heads. It used a chrome etched scale with electronic reading head for indexing the distance moved in or out. The "motor" probably weighed 20 lbs itself and had incredibly fast precise movement. A very large electromagnet coil surrounding the "piston" linear rotor I'll call it and was mounted on rails with ball bearings just like you mention. Wish I had kept a couple of these for just such experiments. If you find one be very careful experimenting, these could clip your fingers off very easily ! Dave

Re: Is this possible? ([none / 0](#)) (#4)

by Harry Luubovv on Mon Dec 29th, 2003 at 08:09:39 PM MST  
([User Info](#))

Hi Yo, Pardon me if I appear to be bad when I do not agree with you :-). But I think the idea is a waste of time first off, a reciprocating coil/magnet device would induce too much vibration for the blades. Remember an internal combustion engine has good rubber mounts when it has piston(s) going up and down. Still, there are vibrations that you can feel while sitting in the car. But those engines would absolutely indeed need something (Piston) to go up and down because of the function of the fuel system --the fuel needed to be expanded and exploded in order to create powers and so we need top-dead-center position which is the best position to allow the explosions to happen. But this idea again if applied to generator of sorts, would mean wasted power as someone already mentioned, that when the magnet or whatever travels to the top dead center position, it stops for some moments before reversing direction. Hence, you get the loss of energy and wind energy can be too precious to lose this way. Besides again, we would have to have some form of a crank, or at least a cam device in order for that going-up-and-down thing to motion up and down, this arrangement is an additional source for wasted energy. I could think of many other negative areas for the reciprocating idea but I stop here and want to just briefly mention the difference between reciprocating action and linear one. Linear one is the most efficient type of motions since it has no repeated action loss, meaning, something goes forever straight-on forward, NOT REVOLVING around and around ! ! But we cannot apply this linear technology to some generators because a generator is always something affixed stationarily. But if applied to moving vehicles or vessels, then the linear idea I think is the ideal medium for future transportation propulsion folks. In fact, I can remember still in my failing head that we already have this form of motions for some thirty odd years ! I remember some monorail systems did indeed use linear electro induction theory to move forward back from that time ! And some of those vehicles indeed



do not use real rolling bearings neither, they use magnetic powers to float the vehicles above the metal track, so the friction loss is about near zero much like hovercrafts sort of. We did also have other in-plant vehicles moving this way etc etc. However, this gives me an idea, if we can somehow make a continuous "Tube" which is actually a loop of magnet wires and we allow a magnet (Which is magnetically coupled to the blades hub by a spinning disk with magnets affixed to it) to travel inside around and around and at the same time having the magnet inside to float off the wire tube, we can then cut down friction to zero and this will enhance greatly to precious wind power uses I think. But the only obstacle here is, how do we devise some magnets to travel and floats inside a tube of wires without touching the sidewall ? This is the only question in my head folks ! Perhaps we can have the a real tube made of plastic to covering the wires and have the inside of this tubing vacuum filled and have some form of fluids to float the magnet. But this fluid still would not create zero friction. But perhaps then we can use laser beams to float the magnet, this is possible. Think on folks ... but I think we are getting too high tech here, I will have to come down from the sky you would have to say ..... ! Hey last, I am not a scientist honestly, I am someone just like you, who tends to like to fiddle with things just to find out ..... so as a fellow human being, I can be wrong too in areas folks ..... hey !! Ciao ! Luubovv.

[ [Parent](#) ]

Re: Is this possible? ([none / 0](#)) (#5)  
by EdParenteau on Mon Dec 29th, 2003 at 10:18:26 PM  
MST  
([User Info](#))

Thanks for the comments. What I was actually thinking is probably a goofy idea. I was thinking of what would happen if I were to make a thirty foot or more long string of coils vertically and then use the turbine to haul up the magnet "rotors" which would be dropped down the string of coils(using gravity as the force) one after the other and loop back up again.

And thank's for the welcome Tom!

Ed P

Re: Is this possible? ([none / 0](#)) (#6)  
by RobD on Tue Dec 30th, 2003 at 07:11:39 AM MST  
([User Info](#))

Not all is lost. The application might work in a wave or tidal condition.  
RobD

Re: Is this possible? ([none / 0](#)) (#7)  
by Harry Luubovv on Wed Dec 31st, 2003 at  
08:57:29 PM MST  
([User Info](#))

Hi Ed,

Don't worry about the goofy ideas, we are all here just to goof one way or another. So lets see if I can goof along longer. I understand your idea, it would be like one round circle standing up vertically, with some benches all around, and this thing turns around and around vertically, and we are the ones who sit in those benches, like what we see in the carnivals ! This will be a true linear motor if you made the circle large enough so that the arrangement will not be seen as a circle anymore. So the magnets and the coils are actually crossing paths one vertically and the other horizontally. Or we can say that the coils stay on the inside of the revolving magnet circle. I like the part about letting gravity help move down the magnets on the return side. This actually would be a noval idea, we are not just letting the wind doing the job for us, but now we are utilizing gravity at the same time, and to think about it, the magnets are naturally heavy so there are going to be great momentum to help the down push motion, and the down motion is really the same effect as the up motion for the other side of the circle ! ! ! But sadly one hitch, because by the same token, the weigh of the magnets when first going up, will balance away the gains from the down momentum.

Happy New Year.  
Luubovv.

[ [Parent](#) ]

Re: Is this possible? ([none / 0](#)) (#8)  
by elvin1949 ([elvin1949@wmconnect.com](mailto:elvin1949@wmconnect.com)) on Fri Jan 2nd,  
2004 at 10:30:20 PM MST  
([User Info](#))

all is not lost  
look up the old round as in a circle  
free piston engine see if that can be  
adapeted to what you want to do  
later  
elvin

[Is this possible?](#) | 8 comments (8 topical, 0 editorial)

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## [Static Discharge....Lightning](#)

By [MrResistor](#), Section [Homebrewed Electricity](#)  
 Posted on Wed Dec 24th, 2003 at 04:22:02 PM MST [Alternators](#)  
 Discharge Danger in HV alternator?

Hello,

First a little location info. Farmplace in the middle of a "section"(1 mile square), wind zone 5(avg 7-15 mph). Probable location 150-200ft wire run. My goal is to go "off the grid" completely. The house will be designed with efficient appliances, etc....

I've looked at 100's of posts and a few sites. Right now I'm leaning towards iFred's designs of many thin coils and very high voltages. I'd like to try a propeller configuration like those seen at <http://www.selsam.com/> to obtain high rpm.

My question has to do with static discharge from a 1-phase design like iFred's(or any HV design). Lets say it was very windy, hot and dry. Your alternator is putting out bunches of energy. Is it possible to get nailed by "lightning" discharge from the alternator if you were standing underneath it in the right conditions? Is this a "non-problem"?

I suspect the answer will be something along the lines of "only if you present a better ground" or somesuch. I'd like to be able to put this out of my head so I can get on with coil and magnet testing.....=)

MrResistor

[Static Discharge....Lightning](#) | 3 comments (3 topical, 0 editorial)

Re: Static Discharge....Lightning ([none / 0](#)) (#1)  
 by [BrianK](#) on Wed Dec 24th, 2003 at 05:00:22 PM MST  
[\(User Info\)](#)

I looked at that website that you showed and it looks like the wind gen design that they are showing looks like if it got slightly out of balance for some reason or other it could really cause a major problem and alot of danger. JUST MY 2 CENTS

Re: Static Discharge....Lightning ([none / 0](#)) (#2)  
 by [drdongle](#) on Wed Dec 24th, 2003 at 05:28:11 PM MST  
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While the turbine blade could in theory accumulate a static charge, it will be largely dependent on the dielectric properties of the blade material. And as most blades have a metallic path to the tower, and if the tower is metallic and properly grounded, any charge should be bleed off to the tower ground automatically. Even if there is no direct metallic path to the tower from the blades any discharge would tend to be between the blade and the tower due to it closer proximity.

Up shot of all this is ground the tower.

Dr.d

Re: Static Discharge....Lightning ([none / 0](#)) (#3)  
by MrResistor on Wed Dec 24th, 2003 at 05:48:20  
PM MST  
([User Info](#))

Thanks drdongle, I kind of suspected that. I just couldn't get the tesla coil picture out of my head...: =) It occured to me later the metal tower would always be a better ground. If these props work as advertised the RPM should be significantly higher. Put that together with iFred's many thin coil design and I got a bit nervous.....

My aim was to minimize line losses to the house of course.

Now I'm off to find some carbon fiber poles and little props.....

MrResistor

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## [caps voltage rating for pulse charging](#)

By [bob golding](#), Section [Homebrewed Electricity](#) [Alternators](#)

Posted on Wed Dec 24th, 2003 at 01:53:30 PM MST

hi all, on the circuit for pulsing power down the cables that charged talked about what voltage rating should the caps be?.

was thinking worse case dead battery high wind lots of volts out of alternator. will the high voltage cap catch everything. am thinking 3 1 farad 24 volt like the ones jerry has kindly offered me. sorry for the late reply jerry did reply but it must have fallen in the bit box.

trying to find time to have more fun.

bob

[caps voltage rating for pulse charging](#) | 3 comments (3 topical, 0 editorial)

Re: caps voltage rating for pulse charging ([none / 0](#)) (#1)

by [charged](#) on Wed Dec 24th, 2003 at 03:12:10 PM MST ([User Info](#))

First, make sure you are catching the high voltage with at least 1000uf @400v capacitors where the wire comes into the building. Then run a few feet of heavy twin-lead between that capacitor and the low voltage caps.

I would go ahead and get 4 of those large caps and have two in series for .5F @50v. Then parallel the two series pairs for a full Farad of capacity. Also put a HEAVY current schottky diode across each cap. That way none of them can ever be reverse charged enough to be damaged. Better to keep them safe.

You should set up an emergency dead-load. If you are using a simple voltage triggered circuit to charge the battery bank, set up a SECOND LEVEL voltage triggered discharge circuit that's wired directly into the dead load. Set you battery bank to accept pulses at 3v above battery voltage and set up the dead-load for 5v or so above the LOAD breakover voltage. Just hook it up like it's a second battery bank with a slightly higher trigger. If your primary bank connection fails or you have to disconnect it suddenly, the cap voltage just rises a little higher then dumps across the dead-load.

Some of this info is in another thread. But, I don't remember just where. Anyway...

The dead-load:

Basically, a metal drum or a large metal garbage can filled with a mild electrolyte solution. Just fill it with tap water and saturate the water with baking soda.

I'm assuming you have a 12v bank voltage. So, go get

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EIGHT 1'x1' square steel plates (stainless preferred).

Stack them like pancakes with 3/8" plastic spacers to separate them. Make a non-conductive clamp to hold the stack together.

Fuse a long piece of heavy multi-strand steel wire to the top and bottom outside plates.

Put a non-conductive block in the bottom of the barrel and drop the stack in sideways so that the gaps are vertical.

The two steel wires come up out of the water and go to a connector block above the barrel.

This is your dead load for discharging the capacitor bank. Each plate-to-plate gap requires about 2v before it will conduct. So, eight plates amounts to about a 16v breakover voltage. It will actually be a little less. Just test it once you have it wired in. Then decide how high to set you trigger voltage to keep it about 5v above your normal battery trigger voltage.

It will simply pump out hydrogen and oxygen whenever you start putting power into it.

It will stand about 140amps of average pulse power before it produces any heat. Just cover the top and vent the gas mixture outside with a small brushless fan. If you're dumping power into a dead load, you have enough to spare for the fan, right?

Just make sure the liquid level is kept up. You can do that with a toilet float valve for automation.

Re: caps voltage rating for pulse charging  
([none / 0](#)) ([#2](#))  
by Jerry on Thu Dec 25th, 2003 at 08:40:42 PM  
MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Charged and all happy holidays.

Charged what would be a recommended value for the diode across the caps and the polarity of the diode in relation to the caps. I'm referring to the shottky across each 1 farad cap.

Speaking of caps I took a brief inventory of some of my caps. These were the caps that I could reach or find in my messy shop without renting a backhoe to dig them out.

Cap value in UF price each	voltage/surge V.	count
2,200 uf \$10	400v/475v	1
400 uf \$10	350v/v?	1
60 uf \$1	350v/v?	12
100 uf \$1	350v/v?	9

4,500 uf \$6.50	200v/250v	4
2,000 uf \$5	200v/250v	14
1,400 uf \$3	200v/v?	1
1,000 uf \$2.50	200v/v?	4
640 uf \$2	200v/v?	3
500 uf \$2	200v/v?	2
7,300 uf \$6.50	150v/175v	4
1000 uf \$3	150v/v?	14
15,000 uf \$7.50	100v/v?	240
40,000 uf \$10	90v/110v	40
26,000 uf \$10	75v/95v	40
12,000 uf \$6.50	75v/100v	10

This is a sample list I have many more in voltage down to 6.3v and uf from a few 100 to 650,000 uf plus the 1 farrad 24v special at \$59.95. Some of these are take outs and some are old new stock.

Caps can be siriesed to increase voltage, this will reduce uf or perelelled to increase uf and voltage stays the same.

If you need one cap or more just e-mail my at audiosourcesalem@aol.com.

JK TAS Jerry

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Re: caps voltage rating for pulse charging  
([none / 0](#)) ([#3](#))  
by Jerry on Thu Dec 25th, 2003 at 08:43:51  
PM MST  
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<http://www.dplusv.com/Photo-03.html>



PS the 1 farrad caps are brand new. We sell them at our car stereo store.

JK TAS Jerry

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## [Scale model PMG?](#)

By [doubter3](#), Section [Homebrewed Electricity](#)  
 Posted on Wed Dec 24th, 2003 at 07:54:07 AM MST [Alternators](#)  
 Anyone out there built a 2" diameter radial flux alternator?

Not sure exactly what to post this under, but I guess homebrewed electricity applies in a way. A friend of mine is into building working scale model steam locomotives. Lately, he's been thinking of building a diesel version. From what he's told me diesel locomotives have a genset which produces electricity to run drive motors and he's having trouble finding an alternator with high enough output small enough to fit his model. I suggested building a tiny radial flux alternator and was wondering if anyone on this board has had any experience building something so small. The diameter of the rotor disks would be limited to around two inches.

Matt

[Scale model PMG?](#) | 2 comments (2 topical, 0 editorial)

Re: Scale model PMG? ([none / 0](#)) ([#1](#))  
 by [Bach On](#) on Wed Dec 24th, 2003 at 09:15:47 AM MST  
[\(User Info\)](#) [change AT: bach\\_on AT hotmail.com](#)

What would he use as a power source? You might be able to find some hobby motors. One could power the other one, which would actually produce the electricity. He might be able to build a shell around one to make it look like a diesel engine.

Frankly, it seems like a stretch (at least to me) to make it functional. Without a miniature diesel engine, it can't actually be authentic. You'd also need motors for each of the wheels. But, hey! What do I know? Maybe he could try some of the more exclusive hobby shops - especially those that deal with model trains. Good luck!

Bach On

- I'm just as happy as if I had good sense! -

Re: Scale model PMG? ([none / 0](#)) ([#2](#))  
 by [charged](#) on Wed Dec 24th, 2003 at 09:33:27 AM MST  
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Maybe he could use a Kromrey Converter.

It's only two 500 turn windings and 4 magnets. It can be very small.

Just make sure the generator axle is non-magnetic steel.

<http://www.fortunecity.com/greenfield/bp/16/gfff1.jpg>

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## Silicon steel

By [windstuffnow](#), Section [Homebrewed Electricity](#)  
 Posted on Tue Dec 23rd, 2003 at 10:44:02 AM MST [Alternators](#)  
 Ordering a new batch...

For those that may be interested, I plan to make an order for some silicon steel once again. I still have some 1/2 inch wide stuff available if your interested and I will be ordering some 3/4" wide M4 grain oriented silicon for some new projects I'm working on. Also I plan to pick up some end rolls of various sizes and grades. Some of these will be available as well.

I'll be picking up the order on the 29th or 30th so if you have an interest let me know.

Windstuff Ed

[Silicon steel](#) | 3 comments (3 topical, 0 editorial)

Re: Silicon steel ([none / 0](#)) ([#1](#))  
 by [Firefly](#) on Tue Dec 23rd, 2003 at 11:17:27 AM MST  
[\(User Info\)](#)

Ed,  
 I am interested. How do we go about getting together on pricing etc.? will this be offered on windstuffnow?  
 Firefly

Re: Silicon steel ([none / 0](#)) ([#3](#))  
 by [windstuffnow](#) ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Tue Dec 23rd, 2003 at 03:00:01 PM MST  
[\(User Info\)](#) <http://www.windstuffnow.com/main>

If you interested in the 1/2" silicon the formula to find weight is:

$$(OD^2 - ID^2) \times .7854 \times .134 = \text{lbs}$$

This is for the 1/2" stuff, the 3/4" will have a different conversion, I'll know when I get it here.

The cost of the stuff is \$4.00 per lb. for either

You can email me with any specifics.

I'm thinking of putting it on my site but in specific size rolls instead of winding each one specific for an application. So there will most likely be 5 or 10lb rolls as a standard.

Have Fun  
 Ed

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Re: Silicon steel ([none / 0](#)) (#2)  
by bob golding ([yubba at clara dot net](#)) on Tue Dec 23rd,  
2003 at 02:52:29 PM MST  
([User Info](#))

hi ed, thjinking about silicon steel,it ocured to me that the  
cores out of toriodal transformers might work. has anyone  
tried using these?

bob

[Silicon steel](#) | 3 comments (3 topical, 0 editorial)

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## [Progressive winding alternator](#)

By [windstuffnow](#), Section [Homebrewed Electricity](#)

Posted on Mon Dec 22nd, 2003 at 11:14:21 AM MST [Alternators](#)

The beginning...

This is the first attempt at this idea. So far I've had many little problems creep up and the progress is slow.

I started with a junk stator that I started some time ago but my cutters died before it was completed and I couldn't use it for the project in mind. I decided to use it as an experiment with this new idea. First step was to decrease the cogging caused by the magnets lining up on the slots.

This stator was designed for 12 poles and has 36 slots. I set up a disc with 16 magnets over the 36 slots and tested it for cogging... Little to no noticable cogging with the offset over the slots. Unfortunately during the test the magnets sucked the laminated stator off the wood. This was corrected by using 6 3/16 bolts to hold it in place and reglued and bolted.

Ok, now here is my theory... I've been working on this problem for many years, for the most part the star/delta switch worked well but I still wasn't satisfied. Since there is a wide range of wind capturing ( from 6 to ? ). Low range needs lots of turns but typically ends up with high resistance and doesn't perform very well in mid to high winds. And the same goes for the mid to upper range. It occured to me while looking at this stator there could be 3 separate 3 phase alternators. One with lots of turns to capture low speed power, the second with less turns and larger wire to handle the mid range and the last with large wire and only a few turns to handle high winds. Now we have 3 cut in speeds where each winding starts adding power at different speeds. Also, each one would be added to the last, minus the phase difference. This would also give you the option to either parallel or series the rectifiers for different combinations of output. Quite versitile!

Below shows 1 phase in place and the completed single 3 phase leaving 24 open slots for the next windings....

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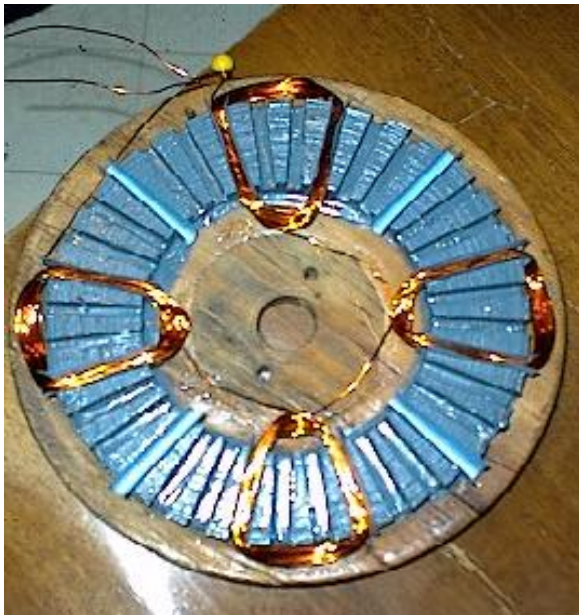
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This stator was made using 1018 steel strips, and is 8" in diameter. The first 3phase wound with #20 wire and 33 turns makes 30 volts at 300 rpm and produces about 10.5 amps going into a battery at 13V. The second set will be of #18 wire with about 22 turns and the third will be #18 wire with 16 turns. Just a calculated expected output based on the first phase as below

300. rpm

1. st phase 10.5 amps
2. nd phase 10 amps
3. rd phase 2.5 amps

total 23 amps or 300 watts approx

500. rpm

1. st phase 21 amps
2. nd phase 30 amps
3. rd phase 20 amps

total 71 amps 923 watts

700. rpm

1. st phase 31 amps

2. nd phase 50 amps

3. rd phase 43 amps

total 124 amps 1612 watts

The actual will be somewhat lower because of the phase difference between the 3 alternators but it gives you a basic idea of where I'm going with this. Still not to shabby for a small alternator. One problem that I see which could be corrected with a relay is the fact the smaller wire in higher winds will be pushed to their limit and possibly burn out. My first thought was to put a relay powered by the 3 set to turn off the first set. Could be a fun and challenging problem to ponder.

This started from the need to build an alternator to cut in at around 30 rpm but carry good power throughout the rpm range. And of course having fun making things better...

Windstuff Ed

[Progressive winding alternator](#) | 5 comments (5 topical, 0 editorial)

Re: Progressive winding alternator ([none / 0](#)) (#1)  
by hvirtane on Mon Dec 22nd, 2003 at 01:18:37 PM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

Really nice!

Another idea:

My friend Taisto had a problem that his alt didn't start charging at slow speeds. He put in between a transformer to double the voltage and run the current through a rectifier then. Also he put there parallel wires going through another rectifier directly to the battery. It seems to be working well.

Any thoughts?

- Hannu

Re: Progressive winding alternator ([none / 0](#)) (#2)  
by zubbly on Mon Dec 22nd, 2003 at 08:23:36 PM MST  
([User Info](#))

hello Ed.

just love to see all that tinkering that you are doing. it gives me many ideas and inspiration.

i am just about completed testing my last induction conversion. the results seem not too bad but have had trouble coming up with something to drive the genny for testing. i will find some drive system however.

i wonder if you have ever considered multiple Y-D. this conversion i am doing has twelve leads brought out from the winding. i can connect for 1Y, 2Y, 1D, or 2D. the open voltage at various rpm's is as follows. 1-Y @70 rpm-26.4 volt, 115 rpm-45.0 volt, 190 rpm-67.7 volt, 300 rpm-106.2 volt. the ohm resistance for the following connections are, 1Y-7.3 ohm, 2Y-1.9 ohm, 1D-2.4 ohm, and 2D-.8 ohm.

i will post all the results when the project is finished. i



just thought the idea of multiple Y-D connections may be of use to you. perhaps you have already tried it.  
good luck with your project!

zubbly

Re: Progressive winding alternator ([none / 0](#))  
([#3](#))  
by monte350c on Mon Dec 22nd, 2003 at 09:37:12 PM MST  
([User Info](#))

Hi Ed,

Looks really interesting!

I can appreciate the problem with the smallest windings at peak speeds. How about a power resistor switched into the small winding's circuit at a certain point?

Or you could always try one of those capacitive discharge circuits Charged has been posting about, might solve the current problem...

Good luck with this Ed, it's important research, and looks like a lot of fun!

Ted.

[ [Parent](#) ]

Re: Progressive winding alternator ([none / 0](#)) ([#4](#))  
by hvirtane on Tue Dec 23rd, 2003 at 02:10:31 PM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

Please see:

<http://www.windpower.org/en/tour/wtrb/stator.htm>

I'm still thinking about induction generators.

I managed to find a washing machine motor, which is running on 430 RPM.

- Hannu

Re: Progressive winding alternator ([none / 0](#))  
([#5](#))  
by Harry Luubovv on Tue Dec 30th, 2003 at 10:12:30 AM MST  
([User Info](#))

Hi Windstuff Ed,

I think your "Progressive Coil" idea is innovative thinking, and I like innovative thinking. I had such a thought also once, but only briefly though because nevertheless (Pardon my ignorance Ed), I think, the various sizes of wires will sum back up to the same output figures as if you used an averaged 3 sizes of wires. If we literally did this experiment it can prove out itself. Because I think it is the matter of total copper and the spaces available for the copper to set in, that makes the difference aside from ..... yes, the only way to optimize outputs for high-low winds situations could only be by switching between parallel and series connections. Another matter I think Ed, in both series or parallel situations, the larger sized wires would be dragged down of its output by the smaller sized wires. One thing I've learn in electronics is never to parallel nor to series two different sizes of wires coils unless you are sure that the smallest of wires alone can handle at least half of the current produced in 2 coils situation, or one third the capacity in 3 coils situations, 1/4 cap in 4 coils situation, etc etc ! But in a windgen, we can never be sure of this because we do not control the speed of the mills, the wind does.

Please correct me if I am wrong !

Cheers,  
Harry Luubovv.

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[Progressive winding alternator](#) | 5 comments (5 topical, 0 editorial)

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### [PM motor ?](#)

By [Jerry](#), Section [Homebrewed Electricity](#)  
Posted on Sun Dec 21st, 2003 at 09:34:34 PM MST [Alternators](#)  
How much power?

I'll be testing the 200 lb genny soon. How much power could I expect from this PM motor?

Motor specs; 185 lbs, 1780 rpm, 15 amps, 36 volts and max stall amps 77 at 200 volts.

JK TAS Jerry

[PM motor ?](#) | 3 comments (3 topical, 0 editorial)

Re: PM motor ? ([none / 0](#)) ([#1](#))  
by [Hank](#) on Sun Dec 21st, 2003 at 10:13:13 PM MST  
([User Info](#))

Let me try a guess,  
In 60 mph winds using a suitable sized rotor with a TSR of 8 I would guess about 500 watts. Cut in speed for charging batteries will be in the order of 600 rpm meaning about 25 mph winds for that prop.

Let us know what you test out at.

Re: PM motor ? ([none / 0](#)) ([#2](#))  
by [Jerry](#) on Mon Dec 22nd, 2003 at 09:15:10 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Hank  
Well it took me 2 days but I got the 200 lb genny in the test truck.  
That was a scary adventure?

Charging started at 10 mph at 5 amps, at 15 it hit 10 amps at 25 mph the amp meter was showing 20 amps.

The blade was a littel out of balance so i'm going to try a diferant blade.  
This blade was my plastic blades at 5 1/2 ft tip to tip.

I'm going to try a smaller blade. One of my 49 inchers. Thanks for your help I'll keep working on it.

JK TAS Jerry

[Airheads Page](#)

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- [Also by Jerry](#)

Re: PM motor ? ([none / 0](#)) (#3)  
by Hank on Tue Dec 23rd, 2003 at 08:03:22  
AM MST  
([User Info](#))

Sounds great,

Boy, my guess was off by a bit. Do you know what rpm you were getting at the various speeds?

Have fun and be carefull,

Hank

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[PM motor ?](#) | 3 comments (3 topical, 0 editorial)

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### [Finding servo motors](#)

By [windrules](#), Section [Homebrewed Electricity](#)  
Posted on Sun Dec 21st, 2003 at 06:12:01 PM MST [Alternators](#)

Does anybody out there know where you can find servo motors in Australia.

I have looked on net and yellow pages without success.;  
Thanks Mos

[Finding servo motors](#) | 2 comments (2 topical, 0 editorial)

Re: Finding servo motors ([none / 0](#)) (#1)  
by [wpowokal](#) on Tue Dec 23rd, 2003 at 05:32:08 AM MST  
([User Info](#))

Windrules,

For a fellow OZ tell me what specifically you are looking for. Here or 'e' mail me [wpowokal@bigpond.com](mailto:wpowokal@bigpond.com)

Allan

Re: Finding servo motors ([none / 0](#)) (#2)  
by [bob golding](#) ([yubba at clara dot net](#)) on Tue Dec 23rd, 2003 at 06:29:33 AM MST  
([User Info](#))

i dont know personally but if you look at the tesla coil list [pupman.com](http://pupman.com) or the tesla coil web ring you might find someone. i know there are a few tesla coilers in oz who might be able to help. lot of similarities between this list and the tesla list.

bob

[Finding servo motors](#) | 2 comments (2 topical, 0 editorial)

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## [Net metering with a generator??](#)

By [zmoz](#), Section [Homebrewed Electricity](#)

Posted on Sat Dec 20th, 2003 at 10:40:55 PM MST [Alternators](#)

How do I hookup a generator to the grid?

I know that if you're going to feed power back into the grid from an inverter, you must have a grid tie inverter. What about with a generator that already produces ~ 120 VAC? How does one hook that into the grid?

[Net metering with a generator??](#) | 3 comments (3 topical, 0 editorial)

Re: Net metering with a generator?? ([none / 0](#)) ([#1](#))  
by [wpowokal](#) on Sun Dec 21st, 2003 at 05:18:47 AM MST  
([User Info](#))

This begs the question of why would you want to!

However the least one would need for the generators well being is the facility to synchronise to the system frequency. This ensures your generator is closed to the system in phase at zero volts. A very small generator could be simply crashed onto the system and come into sync, probably without much harm.

Then there is the problem of voltage, the power factor of the grid (inductive or capacitive), frequency (should the system frequency drop your generator may try to supply the whole of uncle Sam)

Then the legality of a system outage, linesman working and your generator electrocuting them. (thus the features of grid interactive inverters)

Allan

Re: Net metering with a generator?? ([none / 0](#)) ([#2](#))  
by [JW](#) on Sun Dec 21st, 2003 at 10:15:54 AM MST  
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I agree with Allan,

It most likely is doable on a small scale, but why bother. It can be feasible to make homebrew power at 2 cents per kwh, but chances are, you most likely won't produce enough power over-time to "contribute" to the grid. Also a good point is the line-mans safety...

If somehow you have managed to assemble a substantial, micro power plant, that can produce 60kw continious 24/7, at 2 cents per kwh, including overhead(equip cost) and fuel cost and will conform to EPA emmissions standards(btw- corn burners do meet these standards). then most likely the local utility will advise you how to do this properly (your results may vary :)

with wind power this is becoming much more popular "ie" wind farms. generally the problems of "freq-sync" to the grid are lessend by stable battery banks and grid-interactive inverters.

back to the original question- use the search feature "of this site" for a -VAR- or VAR power controller. this is part of how you can sync to the grid with a mechanical gen-set. but these systems are difficult to manage(and expensive) and you must consult with the utility comp. to do it right.

-JW            www.flashsteam.com

[ [Parent](#) ]

Re: Net metering with a generator??  
([none / 0](#)) ([#3](#))  
by richhagen on Sun Dec 21st, 2003 at  
12:57:01 PM MST  
([User Info](#))

I was thinking that a synchronous inverter would be the safest off the shelf solution, in that you would take the power you generated and use it to charge a battery bank, or for greater efficiency, an ultra-capacitor bank, and set the inverter(s) to deliver power to the grid when the supply voltage reached a preset level.

This would be doable with a trace sw series or similar inverter. You would of course lose some energy in the conversion/charging necessary to provide the right charging voltage for your battery bank. The Inverter would be UL listed for grid connection, and therefore reasonably safe. As for the economics of such a connection, I suspect that with depreciation of the equipment, it would be a money loser.  
Good Luck.

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[Net metering with a generator??](#) | 3 comments (3 topical, 0 editorial)

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[SMALL AXIAL ALTERNATOR](#) | 2 comments (2 topical, editorial)

Re: SMALL AXIAL ALTERNATOR ([none / 0](#)) (#1)  
by zubbly on Sun Jan 4th, 2004 at 07:25:01 PM MST  
([User Info](#))

hello Rich.

Thanks for making the post. That is a nice job for using such common materials. I would be proud of it myself. looks like you are definately on the right track. Also like the idea of you designing and building to suit your own needs.

I noticed your last picture. looks like you are a fan of using wave windings. keep at that area, as it is a simple and very good way to make easy multiple poles from one coil. I will also be using that technique in my next genny. But with a different twist lets say.

great job!  
keep having fun-Zubbly

[SMALL AXIAL ALTERNATOR](#) | 2 comments (2 topical, 0 editorial)

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life than a single phase charging. Just imagine, the wave technique would entail longer wires again even though you can still employ the wave technique, just imagine the picture, I need to say no more because you simply would need to have running wires to bridge between coils of same phases.

This is all the negatives I can give you, now you can pleasantly see that I am that devil to ya :-

-No love loss-  
Luubovv.

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[SMALL AXIAL ALTERNATOR](#) | 2 comments (2 topical, 0 editorial)

Re: SMALL AXIAL ALTERNATOR ([none / 0](#)) (#2)  
by Harry Luubovv on Sun Jan 4th, 2004 at 11:47:08 PM MST  
([User Info](#))

Hi Rich,

I like what you did and do. It is always nice to see innovatively thinking persons.

Now my criticism if you don't mind. The wave winding is good to the point that it saves wires (And so saves weight) and also saves resistance counts. However, we have to be very careful as to phasing. Because, it is a wave winding so all the coils are wound as one giant coil spread all over the outer perimeter of the stator backing disc. And so all the magnet poles will have to pass the coils in a more precisely synchronized way. Meaning, you will have to have the same amount of coils against same amount of magnets and spacing would have to be same between magnet poles and coils--more cogging. If these rules not observed, you will lose out pretty large due to waveform cancelling one another between coils obviously. In worst of cases, you might end up having zero volt ! If one pole happens to be North cutting while another pole happens to be south cutting at the same instant, both the the peak and valley waveform will cancel out one another--Zero output !

And then, a complete closed-loop of a coil is more in efficiency than a half open coil.

It is known that multi phases are better for battery life than a single phase charging. Just imagine, the wave technique would entail longer wires again even though you can still employ the wave technique, just imagine the picture, I need to say no more because you simply would need to have running wires to bridge between coils of same phases.

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**SMALL AXIAL ALTERNATOR** | 2 comments (2 topical, 0 editorial)

Re: SMALL AXIAL ALTERNATOR ([none / 0](#)) (#1)  
by zubby on Sun Jan 4th, 2004 at 07:25:01 PM MST  
([User Info](#))

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great job!  
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by Harry Luubovv on Sun Jan 4th, 2004 at 11:47:08 PM MST  
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And then, a complete closed-loop of a coil is more in efficiency than a half open coil.

It is known that multi phases are better for battery

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posted by Jon Miller on 01/04/2004 02:42:47 PM MST  
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3. [water design](#) ([Homebrewed Electricity](#), [Hydro](#))  
posted by catfish on 01/01/2004 01:23:07 PM MST  
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4. [Servo motors ratings](#) ([Homebrewed Electricity](#), [Hydro](#))  
posted by BSparky on 12/30/2003 09:07:19 PM MST  
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5. [Reverse pump](#) ([Homebrewed Electricity](#), [Hydro](#))  
posted by wilber256 on 12/25/2003 06:54:19 PM MST  
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6. [generator choice](#) ([Homebrewed Electricity](#), [Hydro](#))  
posted by 44toy on 12/14/2003 08:47:13 PM MST  
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7. [alderwood retreat](#) ([Remote Living](#), [Hydro](#))  
posted by alderwood retreat on 11/30/2003 11:02:19 PM MST  
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8. [water wheel design ?](#) ([Remote Living](#), [Hydro](#))  
posted by alderwood retreat on 11/30/2003 04:56:26 PM MST  
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9. [Generator to Battery Storage Distance](#) ([Homebrewed Electricity](#), [Hydro](#))  
posted by cvo on 11/24/2003 07:58:12 AM MST  
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10. [SMALL HYDRO PROJECT](#) ([Homebrewed Electricity](#), [Hydro](#))  
posted by ROSCOE on 11/01/2003 09:49:54 AM MST  
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11. [Gutter water generator?](#) ([Homebrewed Electricity](#), [Hydro](#))

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posted by zmoz on 10/26/2003 06:10:33 PM MST  
4 comments

12. [another hydro ?](#) ([Homebrewed Electricity](#), [Hydro](#))

posted by 44toy on 10/19/2003 08:17:12 AM MST  
3 comments

13. [Will a more efficient Genny slow my waterwheel down?](#) ([Homebrewed Electricity](#), [Hydro](#))

posted by turner on 10/05/2003 06:42:14 AM MST  
7 comments

14. [Pelton rotors/buckets - pictures](#) ([Homebrewed Electricity](#), [Hydro](#))

posted by EcoInnovation on 09/22/2003 02:06:19 AM MST  
4 comments

15. [Plastic Injection Buckets](#) ([Homebrewed Electricity](#), [Hydro](#))

posted by EcoInnovation on 09/20/2003 01:48:23 PM MST  
0 comments

16. [What are the hydro do's and don'ts?](#) ([Homebrewed Electricity](#), [Hydro](#))

posted by ghettoride on 09/04/2003 12:49:02 PM MST  
4 comments

17. [Hydro system and how to setup](#) ([Homebrewed Electricity](#), [Hydro](#))

posted by shane on 09/02/2003 06:40:11 PM MST  
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18. [Homemade Air conditioner](#) ([Homebrewed Electricity](#), [Hydro](#))

posted by hayseed on 07/13/2003 12:04:57 PM MST  
11 comments

19. [New to power generation. Need help with best setup for hydro system.](#) ([Homebrewed Electricity](#), [Hydro](#))

posted by Anonymous Hero on 06/30/2003 08:43:41 PM MST  
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20. [Still Water Makes Deep Power for Cryonucleator](#) ([Classifieds](#), [Hydro](#))

posted by cryonucleator on 06/25/2003 04:47:30 AM MST  
18 comments

21. [water wheel](#) ([Classifieds](#), [Hydro](#))

posted by Anonymous Hero on 06/18/2003 01:23:45 PM MST  
4 comments

22. [AC/DC Hydro](#) ([Homebrewed Electricity](#), [Hydro](#))

posted by Anonymous Hero on 05/22/2003 10:15:02 PM MST  
14 comments

23. [Hydro](#) ([Homebrewed Electricity](#), [Hydro](#))

posted by Johnny Cool Pants on 05/13/2003 03:58:21 PM MST  
1 comment

24. [AC genny back into grid feed](#) ([Homebrewed Electricity](#), [Hydro](#))

posted by Anonymous Hero on 05/09/2003 09:55:47 PM MST

2 comments

25. [Waterwheel power for \\$20.00](#) ([Homebrewed Electricity](#), [Hydro](#))

posted by Juliang on 04/14/2003 05:02:26 AM MST  
8 comments

26. [finding my way--lost !!!](#) ([Remote Living](#), [Hydro](#))

posted by Bruce Downunder on 03/30/2003 02:21:28 PM MST  
0 comments

27. [Finding my way !!!](#) ([Remote Living](#), [Hydro](#))

posted by Bruce Downunder on 03/30/2003 02:05:40 PM MST  
0 comments

28. [another test](#) ([Homebrewed Electricity](#), [Hydro](#))

posted by scadmin0 on 03/19/2003 09:08:19 AM MST  
0 comments



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[Hydro Advice](#) | 1 comment (1 topical, 0 editorial)

Re: Hydro Advice ([none / 0](#)) ([#1](#))  
by kurt on Sun Jan 4th, 2004 at 05:50:34 PM MST  
([User Info](#))

[http://www.otherpower.com/otherpower\\_hydro.html](http://www.otherpower.com/otherpower_hydro.html)  
<http://home.carolina.rr.com/unclejoe/menu.html#Hydraulic%20Water%20Turbines>  
<http://www.lcs.net/users/pinecrest/text/hydro.htm>  
<http://myhydro.freesevers.com/>



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Re: Hydro Advice ([none / 0](#)) ([#1](#))  
by kurt on Sun Jan 4th, 2004 at 05:50:34 PM MST  
([User Info](#))

[http://www.otherpower.com/otherpower\\_hydro.html](http://www.otherpower.com/otherpower_hydro.html)  
<http://home.carolina.rr.com/unclejoe/menu.html#Hydraulic%20Water%20Turbines>  
<http://www.lcs.net/users/pinecrest/text/hydro.htm>  
<http://myhydro.freesevers.com/>



[Hydro Advice](#) | 1 comment (1 topical, 0 editorial)

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## Micro-Hydroelectric System



Click [here](#) to find out more about the complete, detailed, Hydroelectric Design Manual.

### Why Alternate Energy?

Alternate energy is not cheap. In fact, compared to commercially generated electric power, most forms of alternate energy are very expensive. However, you can't just compare the cost of commercial power to the cost of an alternate energy system and base your decision to install or not to install a system on a payback period of three or four years. There are other reasons to produce your own power besides costs.

Perhaps your property is located no more than a mile from the utility company power lines. If that is the case then alternate energy becomes very attractive. Often a utility company will charge you up to \$20,000 per mile to provide power to a remote site! And then you will still have a monthly bill to pay.

How reliable is your commercial power? As I am writing this I have been living "off the grid" for over twelve years and I have only been without electricity twice; about every six years I have to replace the batteries! Power for the color television, computer, radio, ceiling fans, lights, and appliances is never more that a flip of a switch away.

Living without commercially generated electric power gives you a sense of freedom like you have never felt before. You have been dependent all of your life on the utility company. You have suffered at their every whim. Whether your electricity comes from a nuclear power plant, a hydroelectric plant, or a coal fired plant, you are paying for the cost of the nuclear folly through higher utility rates. Alternate energy is "home grown"; energy harvested by you to satisfy your needs. Alternate energy puts you in control of your life and your destiny.

Many people find they have a need for electricity in places beyond the reach of utility lines. They might have a barn a half a mile or more from the house. They might wish to build a house far from utility lines. For example, I have a personal friend who recently purchased the last lot in a series of five. His lot was several thousand feet from the nearest utility line and he was the first of the buyers to decide to build. The local utility company forced him to pay \$27,000 to cover the cost of bringing power to his site! For the next five years, he must pay a minimum electric bill of \$450 each month, no matter how little power he actually uses! The other owners will not be charged any extra when they are ready for power.

Many land owners look wishfully at the creek that flows through their property. They dream of tapping the power of the water, but they are not blessed with a waterfall or with any way to develop a head of ten to twenty feet. (The head is the vertical drop of the water.) All they have is a high volume creek flowing through relatively flat land. I designed this system to illustrate the feasibility of using an ultra low head hydroelectric system to provide "usable amounts" of electric power. This system is designed to be located in the creek bed using a small dam to provide a minimum head. The prototype micro-hydroelectric system operates on a head of about 2.75 feet!

Innovative Aspects

Main

Systems Approach

Home Design

Hydropower

Electric Vehicles



Most small, hydroelectric systems require a head of at least 10 feet before they will generate an acceptable amount of power. During my research, several experts at Eco-Village told me it was impossible to generate usable amounts of power with less than four feet of head. (Eco-Village was an experiment in alternate energy system design and implementation sponsored The Mother Earth News.) The design of this system allows for operation using a minimum head of twenty inches and a flow rate greater than four cubic feet per second. The head on the prototype micro-hydroelectric system is about 33 inches. The basic turbine is a cross flow design, twelve inches in diameter and 5.5 feet long. Normal operation requires a flow rate of 5.5 cubic feet per second. The turbine rotates at approximately 120 RPM and turns a modified Delco car alternator via a belt drive system.



Test Data  
Actual Generating Capacity



The prototype micro-hydroelectric system is capable of producing about 400 watts of electricity or 9.6 Kilowatt-hours per day. I believe that with additional modifications it will be possible to improve the efficiency of the system so it will be capable of producing approximately 500 watts.

#### Dam Specifications



The main part of the dam is located in the creek bed and is less than four feet tall. The dam is about twenty feet long and eighteen inches thick. This part of the dam was poured at one time and required 10 yards of concrete that weighted about 20 tons. Rebar was used throughout the dam. About a year later some additional concrete was required to build a spillway to allow for spring flooding.

#### Creek

The flow of the creek fluctuates greatly. In the late winter through early summer the flow is about 15 cubic feet per second. During late summer and fall the flow decreases to about 4.0 cubic feet per second. This turbine was designed to operate efficiently on a flow of 5.5 cubic feet per second. As water flow decreases, electric power production is reduced to about 100 watts.

#### Investment

The investment in the design and development of this project was approximately \$7000. This includes all expenses associated with the construction of the turbine, turbine nozzle, and dam. It does not include my labor hours. However, with the knowledge and insights I have gained a similar installation would require an investment of about \$2500 (excluding personal labor).

#### Pay-back

In order to estimate the payback on this type of project, I have compared estimated construction costs to the costs of providing electricity to a remote site. If my friend had an acceptable creek flowing through his property the payback for him would have been less than six months.

For several years, we used gasoline generators to provide our power. Each generator cost about \$500 and had a useful life of about two years. It consumed an average of 1.5 gallons of gasoline each day. The annual operating cost was estimated to be \$852. (Assuming gasoline is \$1.10 per gallon @ 1.5 gallons per day, that comes to \$602 dollars per year. Depreciation is \$250 per year.) Assuming a \$2500 installation cost, the pay-back is just under three years.

A solar electric system providing equivalent power would require an array of 40, 47 watt panels that would operate an average of five hours per day in our area. This system would have cost in excess of \$12,000! The estimated life of solar electric panels is 20 years. If the \$12,000 installation cost is prorated over the twenty year life, then the cost becomes \$600 per year. At a rate of \$600 per year, it would require just over four years to pay for the micro-hydroelectric system.

The annual operating costs for the micro-hydroelectric system are very low. The standard V pulley belts must be replaced every six months, this is approximately \$70 per year. Presently, the bearings are replaced each year at a cost of around \$60. The brushes and bearings in the alternator are replaced annually for about \$20. (I have estimated the alternator operates for the equivalent of almost 400,000 miles per year.) The pulley system is replaced every two years, the estimated annual cost is \$25. The total estimated annual operating cost is \$175.

#### Basic System

The micro-hydroelectric system produces approximately 14 Volts Alternating Current, variable frequency. A modified car Delco car alternator is used. The voltage is increased to 140 volts using a step-up transformer. Conventional battery chargers are used to charge golf cart batteries located at three sites. An A-Frame house (1008 square feet) and the well are each powered directly by two, six volt batteries, wired to provide twelve volts. Power is also sent to my earth-sheltered home approximately 700 feet away from the micro-hydroelectric system installation. The electrical system of my earth-sheltered home (1920 square feet) operates from the batteries via a Trace 612 inverter. The six, six volt batteries in the

earth-sheltered home are wired in a series/parallel method to provide twelve volts to the inverter.

### Commercial Systems

The options for home scale micro-hydroelectric systems are very limited. A few companies will custom design and build a system, assuming you have a high enough head. But their systems are not really designed for the single home site. The price is very high! The Alternate Energy Sourcebook published by the Real Goods Trading Corporation offers two hydroelectric systems. Both of these systems are designed to operate on a minimum head of 20 feet and 100 gallons of water flow per minute. The "standard" output is 400 watts @ 12 Volts Direct Current or 700 watts @ 24 Volts Direct Current. In their book they site the following as a "typical" installation:

#### Site Conditions:

Head.....	100 feet
Flow.....	15 gallons per minute
Pipe Length.....	300 feet
Pipe Size.....	2" PVC
Distance To Battery.....	30 feet
Output.....	100 watts

#### Construction Costs:

Pipe.....	\$100
Turbine.....	\$875
Regulator.....	\$340
Batteries.....	\$180
Wire, etc.....	\$50
Total Costs.....	\$1545

I have created a DOS based program (remember DOS?) designed to aid you in the creation of your hydroelectric system. The program will calculate the critical dimensions for the turbine based on the available head and flow rates. You can click [here](#) to download the program now!

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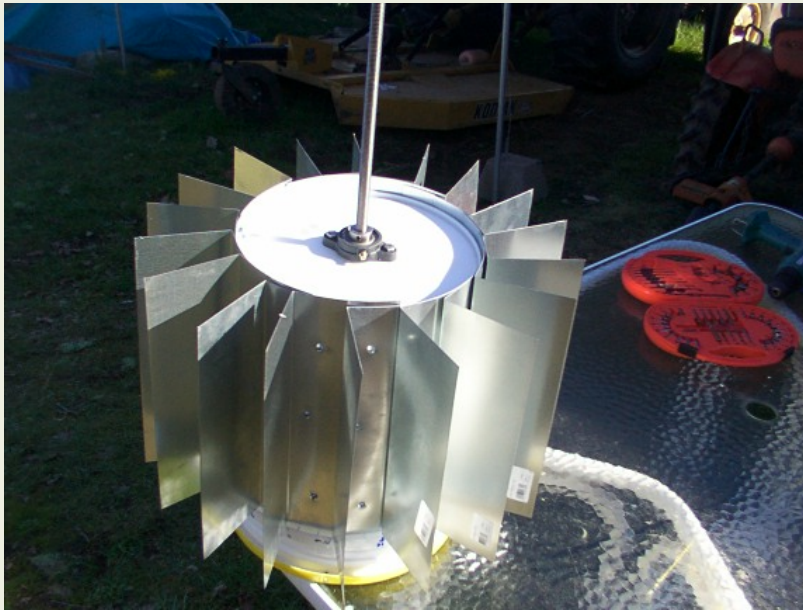


## Home-brew Hydro

[Home Page](#)

[Photo Page](#)

[Photo2 Page](#)



This shot to the left is of the home-built paddle wheel made from a 5 gallon bucket, galvanized roofing material, and a couple of mounted bearings.

The drive belt to the generators is a dryer belt that is **VERY** flexible. This helps over come the friction losses. It runs in the top groove of the converted bucket, using it as a large pulley.

Through experimentation it was found that 18 paddles provided the smoothest power from the wheel. Smaller numbers of paddles tended to cause a pulsating in the generator output and some paddles were ripped apart from the vibrations.







### **Shot of both Hydro generators in action**

The water source is from a river running for 1/2 mile on our land. The banks have a flood control levy on each side. We have a large irrigation slough that is about 6 feet lower than the water level of the river. This gives the siphon pipes about 4-6 feet of usable head to the wheels. The "tailwater" is returned back to the river about 1/4 mile downstream. The critters love the steady flow through the slough!

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posted by Salty on 01/04/2004 05:48:38 PM MST  
1 comment

2. [Automotive alternator used as motor](#) ([Magnets & Magnetism](#), [Alternators](#))  
posted by Salty on 01/03/2004 11:17:49 AM MST  
6 comments

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[Servo motors ratings](#)

By [BSparky](#), Section [Homebrewed Electricity](#)  
Posted on Tue Dec 30th, 2003 at 09:07:19 PM MST  
Calculate the output from the nametag

[Hydro](#)

Is there some kind rule of thumb to calculate the output from the nametag voltage and rpm?

Say an Ametek 30 volter around 500 rpm or a 50 volts at 1000 rpm?

I'm looking for a PMM servo type to charge some 12 volt batteries. Power is from a low flow water source so I don't expect much current, couple amps. Thanks Bob

[Servo motors ratings](#) | 6 comments (6 topical, 0 editorial)

Re: Servo motors ratings ([none / 0](#)) ([#1](#))  
by [drdongle](#) on Wed Dec 31st, 2003 at 05:33:45 AM MST  
([User Info](#))

Info for name plate conversions

Watts ( P) equals Volts ( V) times Current in amps ( A)  
 $W = AxV$  774 watts equals one horse power ( HP)

A motor rated for 500 RPM at 30 volts should produce 1000 RPM ( more or less) at 60 volts, the range is usually linear.

Dr.D

Re: Servo motors ratings ([none / 0](#)) ([#2](#))  
by [Old F](#) on Wed Dec 31st, 2003 at 07:33:42 AM MST  
([User Info](#)) <http://www.oldf.homestead.com>

Bsparky

Divide the rated voltage name tag 50 by the rated rpm 1000 = volts per rpm .05

Target voltage 30 divided by Volts per rpm .05 = 600 rpm

For what you are want to do the target voltage would be 13 volts

So 13 divided by .05= 260 rpm

This will get you pretty close . Just another way of skinning the same cat.

Have fun

Old F

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Re: Servo motors ratings ([none / 0](#)) (#3)  
by Old F on Wed Dec 31st, 2003 at 07:45:13 AM MST  
([User Info](#)) <http://www.oldf.homestead.com>

Ooops

Thats for working out you cut in speed thats the rpm needed to hit charging voltage.

Oh well you want to know that to.

Old F

[ [Parent](#) ]

Re: Servo motors ratings ([none / 0](#)) (#4)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Wed Dec 31st, 2003 at 11:25:21 AM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

This page should clear things up a bit for you . . .

[http://www.otherpower.com/otherpower\\_experiments\\_tapedrivemotors.html](http://www.otherpower.com/otherpower_experiments_tapedrivemotors.html)

}=- Woof -={

Re: Servo motors ratings ([none / 0](#)) (#5)  
by BSparky on Thu Jan 1st, 2004 at 09:22:52 AM MST  
([User Info](#))

Thanks for the responses.

So, my understanding there's no great loses with these motors. I've located a motor rated for 99 volts at 535 rpm current 0.6 amps. If I could get spinning over 75 rpm should get around 13 volts factor in for some loses, right?

Now the current question you think this generator will produce couple of amps (or more) at 75 rpm? Thinking the windings could take couple amps. Nothing more than a little heat build up, and motor is under the demagnetization concerns.

Woof, yes thanks. I was looking for that link couldn't remember where in this vastness of the net ... I've saw it.

BTW OldF maybe off topic But, I've notice the TV mast tower on your house. The picture of your current mast project.. I've have a tower similar to that one but in need of another ten foot section for my windmill slated for this spring. Looking for the name of the manufacture in helpful in searching for one. Mine has 11" centers on the legs.

Bob

[ [Parent](#) ]

Re: Servo motors ratings ([none / 0](#)) (#6)  
by Old F on Sun Jan 4th, 2004 at 07:41:38 AM MST  
([User Info](#)) <http://www.oldf.homestead.com>



Bob

The tv tower I have on the house I got from a TV repair shop. Its generic tv tower The stuff is getting harder to fine with cable an satellite taking over most people aren't putting up towers. At on time you could find it at places like Wal-Mart. This is one of the reasons I started my tower project. I am trying to work out some middle ground for towers Right now all we have to work with on one end is pipe tower and on the are commercial tower no one can afford. What size blade are you planing on using? And how is your tower set up now? Even a 4 foot diam blade set like The Jerry blades. Can put a good wind load on a tower.

Old F

[ [Parent](#) ]

[Servo motors ratings](#) | 6 comments (6 topical, 0 editorial)

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## [Reverse pump](#)

By [wilber256](#), Section [Homebrewed Electricity](#)

Posted on Thu Dec 25th, 2003 at 06:54:19 PM MST

[Hydro](#)

Searching for a water pump with or without motor for reverse generator....

.... I would like To install a water turbine/pump on the 3/4" PVC water line serving my home. I have 4 40v Amtek PMA motors and will attach one to the turbine/pump hoping that when water is used in the house the flow will turn the turbine/pump with the PMA attached and generate DC to help charge batteries. I realize the only time I will gen electricty is when water is being used but that is better than nothing at all (6 showers, dishwashing, clotheswashing ect...) Any comments or questions are welcomed.

[Reverse pump](#) | 3 comments (3 topical, 0 editorial)

Re: Reverse pump ([none / 0](#)) ([#1](#))  
by [drdongle](#) on Thu Dec 25th, 2003 at 07:17:39 PM MST  
([User Info](#))

I don't want to be negative but I suspect that it would be a wasted effort. I don't think that you will ever get a useful amount of power from it.

Dr.D

Re: Reverse pump ([none / 0](#)) ([#2](#))  
by [wilber256](#) on Fri Dec 26th, 2003 at 05:34:11 AM MST  
([User Info](#))

Also... This setup will be in addation to some solar panels charging the same batt pack, Just think of it for a second...every time a toilet is flushed, shower taken, teeth brushed, clothes washed, dishes washed, car washed, ect, ect...the turbine will be producing DC (3/4" stream @45-55 psi) I would think it would act like a "fast charger" spinning the gen at a very fast speed for a short period of time. Almost like a Boost charge on a car battery. I have the PMA already, and the water usage will be there anyway, So no waste involved.....I look at it as utlizing what is already there being used anyway. How about all 4 PMA's in line somewhere in the water stream, 4 times the energy that would otherwise not be captured and put to use. Family of 6 uses a lot of water.....

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- [Also by wilber256](#)

Re: Reverse pump ([none / 0](#)) (#3)  
by Electric Ed on Fri Dec 26th, 2003 at 06:01:49 AM MST  
([User Info](#)) <http://www.electric-ed.com>

The energy that is delivered to your home by way of the water flow was put there by your water utility company for a purpose, that is to force the water through your appliances, such as faucets, shower heads, and automatic washer.

The more of this energy you extract with a turbine, the less pressure is available for your appliances.

None of these appliances will operate properly without adequate pressure. Imagine trying to water the lawn or wash the car with little or no pressure.

Electric Ed

[Reverse pump](#) | 3 comments (3 topical, 0 editorial)

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## [generator choice](#)

By [44toy](#), Section [Homebrewed Electricity](#)

Posted on Sun Dec 14th, 2003 at 08:47:13 PM MST

[Hydro](#)

For micro hydro experiments.

I have found 2 squirrel cage fans that the motor is belt driven for hydro experimenting. Bought at auction for \$7.00 one is about 1.5 x 1.5 feet and the other about 2 x 2 feet and some other small 12volt blower with what looks dryer hose attached? Anyway looking for a few inexpensive generators to experiment with, I already have a gm alternator. The tape drive motors on ebay are getting a little expensive. I also dont know what to look for in a motor I find at the scrap pile. like hoe to tell if it is pm or not? and how dc and ac applications affect its ability to produce energy? If you have anything you dont use anymore I will pay a reasonable price for your old junk to get me started.

Was gonna start modifying the squirrel cage to direct the water onto the blades better, but have decided that mounting a generator on it and getting some readings as-is and after mods would be helpful. I will submit results as sson as it starts turning, I feel trying at least two different motors between changes to fan will give more info. thanks for any input

[generator choice](#) | 2 comments (2 topical, 0 editorial)

Re: generator choice ([none / 0](#)) ([#1](#))  
by Seth on Mon Dec 15th, 2003 at 05:09:45 PM MST  
([User Info](#))

Hang in there..... id get a TDM ... i have a 90V that i plan on using..... for wind.  
And a mppt would be nice too.....

Re: generator choice ([none / 0](#)) ([#2](#))  
by 44toy on Mon Dec 15th, 2003 at 06:30:22 PM MST  
([User Info](#))

HUH? I guess I'm still a dum arse I dont know what the tdm or mppt are. any clues to identifying a motor? thanks for help.

[ [Parent](#) ]

[generator choice](#) | 2 comments (2 topical, 0 editorial)

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## [alderwood retreat](#)

By [alderwood retreat](#), Section [Remote Living](#)  
Posted on Sun Nov 30th, 2003 at 11:02:19 PM MST [Hydro](#)

I posted some information concerning a water wheel that I would like to build and got a response from Kurt. How do I find it?

[alderwood retreat](#) | 1 comment (1 topical, 0 editorial)

Re: alderwood retreat ([none / 0](#)) ([#1](#))  
by RobC on Mon Dec 1st, 2003 at 02:41:35 AM MST  
([User Info](#))

Just click on the links it should take you to the info. It worked for me.  
RobC

[alderwood retreat](#) | 1 comment (1 topical, 0 editorial)

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### [water wheel design ?](#)

By [alderwood retreat](#), Section [Remote Living](#)

Posted on Sun Nov 30th, 2003 at 04:56:26 PM MST

[Hydro](#)

I have 1500 to 2000 gpm. of flow and 10 - 15 ft. of head and am considering a water wheel to generate power. Anyone have some sound advice?

[water wheel design ?](#) | 2 comments (2 topical, 0 editorial)

Re: water wheel design ? ([1.00 / 1](#)) (#1)

by [kurt](#) on Sun Nov 30th, 2003 at 05:13:00 PM MST

[\(User Info\)](#)

[http://www.otherpower.com/otherpower\\_hydro.html](http://www.otherpower.com/otherpower_hydro.html)

<http://home.carolina.rr.com/unclejoe/menu.html#Hydraulic%20Water%20Turbines>

<http://www.lcs.net/users/pinecrest/text/hydro.htm>

<http://myhydro.freeservers.com/>



Re: water wheel design ? ([none / 0](#)) (#2)

by [Nando](#) on Sun Dec 28th, 2003 at 03:01:41 PM MST

[\(User Info\)](#)

1500 GPM & 10 feet will give about 1.7 KW of constant power  
For this set up a Banki Turbine would be the best arrangement.

Give more info to see what variants you my need

Nando

[water wheel design ?](#) | 2 comments (2 topical, 0 editorial)

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## [Generator to Battery Storage Distance](#)

By [cvo](#), Section [Homebrewed Electricity](#)

Posted on Mon Nov 24th, 2003 at 07:58:12 AM MST

[Hydro](#)

Newbie: Component Locations

Newbie Question: If my power source (hydro generator) is at "A", how far can my storage batteries be from this source of power? And then distance from the batteries to outlets? What determines this? Volage/Wattts produced? I'd like to install a microhydro system on my farm, but I question the location of components. I can't generate alot of power (low head/water volume), but one thing at a time. I understand there's voltage drop due to distance? I'd be happy with D.C. to run a few lights. If there's enough power to convert to A.C. great! I'll not use the power 24/7, just seasonal. I'd like to be able to run a wood stove blower and a couple of 100 watt lights. I'll be using a low rpm alternator. Any thoughts or suggestions would be great Thanks for the help children.

Owen

[Generator to Battery Storage Distance](#) | 8 comments (8 topical, 0 editorial)

Re: [Generator to Battery Storage Distance](#) ([none](#) / [0](#)) ([#1](#))

by [dburt](#) on Mon Nov 24th, 2003 at 10:41:56 AM MST ([User Info](#))

Owen,

The question becomes how much power and voltage are you willing to loose versus how much do you wish to spend on wire. Bigger (and more expensive) wire will allow you to transmit electricity longer distances without so many losses. The equations that govern this are:  $E=I*R$  and  $P=I*I*R$  where E is volts, I is amps, R is ohms, and P is watts. There are wire tables on the internet where you can look up the resistance of various wire sizes. For example, 10 gage (10AWG) wire has a resistance of about .998 ohms per thousand feet. For DC current, you use 2 wires to carry the current, so if it's 200 feet from your generator to the house, the electricity will be traveling through 400 feet of wire... The resistance of that wire will be  $400 * 0.998/1000$  ohms, or about 0.4 ohms. If we assume that your generator will put out 5 amps, then the voltage drop will be  $E=5*0.4$  or 2 volts. Power lost (to heat) in the wire is  $P=5*5*.4$  or 10 watts.

So, you can cut down on your losses by moving the pond and the house closer together, buying bigger wire, or transmitting less current (by transmitting higher voltage).

If you need to transmit 500 watts of power, that would be about 40 amps at 12 volts, but only about 20 amps at 24 volts - therefore much less losses.

Dave in PA

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- [Also by cvo](#)

Re: Generator to Battery Storage Distance ([none / 0](#))  
(#2)  
by dburt on Mon Nov 24th, 2003 at 10:54:07 AM MST  
([User Info](#))

Oh, one thing more... With Hydropower, you will probably be generating a small amount of power steadily 24 hours a day. But your loads will be variable, depending on how many lights are on. So my point is that it would be more efficient to place your batteries very close to the load. You'll have less transmission losses that way.  
Dave

Re: Generator to Battery Storage Distance ([none / 0](#))  
(#3)  
by gps on Mon Nov 24th, 2003 at 01:51:03 PM MST  
([User Info](#))

"I'd like to be able to run a wood stove blower and a couple of 100 watt lights."

Sorry if I'm pointing out something you already know but that's a lot of light for compact flourescent. If you were thinking incandescent, CF will save you a lot of energy. The AC units are better and cheper but you can get them in DC.

Re: Generator to Battery Storage Distance ([none / 0](#))  
(#4)  
by cvo on Mon Nov 24th, 2003 at 03:22:10 PM MST  
([User Info](#))

Thanks for the comments. That's about what I'm coming up with. I want to get everything on paper first before going out into the field. Thanks again.

Re: Generator to Battery Storage Distance ([none / 0](#))  
(#5)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Mon Nov 24th, 2003 at 06:04:32 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

Here is a bunch of "Voltage Drop Calculators" . . .

[http://www.electrician.com/vd\\_calculator.html](http://www.electrician.com/vd_calculator.html)

<http://www.stanselectric.com/vdrop.html>

<http://www.elec-saver.com/freetool06.htm>

}=- W o o f -= {

Re: Generator to Battery Storage Distance ([none / 0](#))  
(#6)  
by zbotrobot on Tue Nov 25th, 2003 at 08:27:18 PM MST  
([User Info](#))

I just did this - I found that using heavier wire you wont notice. What do you want? 3 miles? I would say you can go as far as the wire you can afford the loss is calculatible also by any extra gains you get by getting more flow of water to pay for loss of electricity. If you use a generator that creates ac (PMG alternator) this is better for distance and convert it to dc at the other end. Dc will measure funny at a distance as its physics will show a stored value and upon load it will show an actual value. Some is lost but not much, which is why they transmit it over hundreds of miles. Some say that over 99.99% of the electrical energy is lost to its "feilds" to the mere fact that it is conducted anywhere. Tesla was trying to use this "lost energy" and apply it to another form of transmission. But practically speaking something just over the size of standard house wire will work and under 1/8 inch. You can probably buy a spool on ebay or an industrial liquidation for a 5th of the full cost otherwise if you are patient and keep trying. I was suppresed to get a 70 lb roll of new 18 gauge copper wire for 97.00 Incuding shipping! So its possible. Its pure copper - it will work.

Re: Generator to Battery Storage Distance  
([none / 0](#)) (#7)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on  
Wed Nov 26th, 2003 at 09:42:57 AM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

Using the Voltage drop Calculators above.

Using 100 feet of wire at 24 volts at 5 amp load  
18 gauge wire will lose 7.7 volts  
10 gauge wire will lose 1.2 volts

18 gauge wire is not good for power transmission  
it's only good for about 8 amps max and tons of  
resistance

} = - W o o f - = {  
[ [Parent](#) ]

Re: Generator to Battery Storage Distance ([none / 0](#))  
(#8)  
by hydrosun on Wed Nov 26th, 2003 at 04:44:15 PM MST  
([User Info](#))

Most of the hydro systems I've been putting in have been at 48 volts dc to keep down the cost and voltage losses of the wire from the generator. (the exception was where the distance was under 150 feet and the 12 volt inverter was already install.) The use of dc-dc converters from Solar Converters has given me more flexibility in design. Using the higher voltage for long distance transmission but still having the option to drop the voltage to 12 volts or 24 volts for use. If most of the power is used at 120 volts ac then a 48 volt inverter is the most efficient route. But only the bigger more expensive inverters come with a 48 volt input (Trace 4048, Outbackpower Fx2548 , I've installed both, the outback has lower output so lower cost) So dropping the voltage at the battery to 12 volts allows the use of smaller lower cost 12 volt inverters . The smaller dc-dc converters are under \$150. What you really need is some real numbers, watts produced and distance from generator to battery , cost of wire to come up with a design that keeps the total price down down.

[Generator to Battery Storage Distance](#) | 8 comments (8 topical, 0 editorial)

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### [SMALL HYDRO PROJECT](#)

By [ROSCOE](#), Section [Homebrewed Electricity](#)

Posted on Sat Nov 1st, 2003 at 09:49:54 AM MST

[Hydro](#)

I ONLY WANT TO DESING THIS ONCE

I HAVE A BYPASS POND AND WHERE THE WATER LEAVES THE POND THE CONCRETE DAM NEEDS TO BE RIPPED OUT AND REPLACED. I HAVE ABOUT A 4" PIPE WITH FULL FLOW AND ABOUT 5' OF HEAD. I WAS THINKING OF PUTTING IN A 6" PIPE ALONG SIDE OF AN OVER FLOW. I WAS THINKING IF THE PIPE WAS 12" BELOW THE OVER FLOW THAN I WOULDN'T HAVE ANY PROBLEMS WITH LEAVES OR ICE?

I THINK AT THE DISCHARGE END OF THE PIPE I'LL HAVE 5' OF HEAD. HERE I CAN REDUCE THE PIPE DOWN TO 2" IF NEEDED. I WAS THINKING THAT I COOULD RUN ONE SHAFT WITH CUPS IN THE MIDDLE AND A GENNY ON EACH END???

ANY IDEAS OUT THERE

THANKS ROSCOE

[SMALL HYDRO PROJECT](#) | 4 comments (4 topical, 0 editorial)

Re: SMALL HYDRO PROJECT ([none / 0](#)) ([#1](#))  
by [scoraigwind](#) ([magnet@scoraigwind.co.uk](mailto:magnet@scoraigwind.co.uk)) on Sat Nov 1st, 2003 at 01:18:22 PM MST  
([User Info](#)) <http://www.scoraigwind.co.uk>

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How long is the pipe?

"filling" a 4" pipe will not help until we knwo the legth of the pipe as well as the head. The we have an idea of the flow.

You might lose the head in the bigger pipe too.  
Hugh Piggott <http://www.scoraigwind.co.uk>

Re: SMALL HYDRO PROJECT ([none / 0](#)) ([#2](#))  
by [ROSCOE](#) ([roscoe.s@sympatico.ca](mailto:roscoe.s@sympatico.ca)) on Sat Nov 1st, 2003 at 04:25:07 PM MST  
([User Info](#))

the pipe will only be 20' long at the most with 1/4" per foot fall. at the discharge end of the pipe i will be able to form a 5' pit to create my head.

ROSCOE

[ [Parent](#) ]

Re: SMALL HYDRO PROJECT ([none / 0](#))  
(#4)  
by scoraigwind ([magnet@scoraigwind.co.uk](mailto:magnet@scoraigwind.co.uk))  
on Sun Nov 2nd, 2003 at 04:32:51 AM MST  
([User Info](#)) <http://www.scoraigwind.co.uk>

The maximum flow in a 4 inch pipe with a gradient of 1 in 48 is about 200 US gallons per minute. You can also measure the time it takes to fill a drum or box to confirm this flow.

With a 5' head you could get up to 100 watts from this flow.

Maybe there is a 'powerpal' product to fit this site. A propeller turbine of some sort would seem ideal. The usual approach is to build an elevated flume with shallow slope and large section which carries the water slowly to the turbine with minimum loss of height. The turbine is at the flume level and the draught tube below sucks the water through.  
Hugh Piggott <http://www.scoraigwind.co.uk>  
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Re: SMALL HYDRO PROJECT ([none / 0](#)) (#3)  
by drdongle on Sat Nov 1st, 2003 at 04:57:22 PM MST  
([User Info](#))

I would seriously consider a "mitchal" low head system these work great on as little as 3 feet of drop. They rely on large volume as opposed to peltons which need a long drop and small volume.

Dr.D

[SMALL HYDRO PROJECT](#) | 4 comments (4 topical, 0 editorial)

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Ron

Re: Gutter water generator? ([none / 0](#)) (#2)  
by Demetri ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Sun Oct  
26th, 2003 at 08:52:54 PM MST  
([User Info](#))

Hey Zmoz-

I too live in Oregon; I'm a few miles outside of Salem. I tinkered with such a setup a while back, it did.....okay. It was some output, which is always better than nothing. But I'm talking a few mili amps. I used a home built water wheel made out of a soup can and some blades made from coffee cans, pop riveted together. I mounted it in a hole I cut in the bottom of a drain pipe, and used a drive belt and pulleys from an old tape player and drove a tiny stepper with it. More experimentation would yield better results, but even as much as it rains here, I didn't think the measly output was worth the hassle. Good luck, and keep us posted. If you have better luck with a better setup, I may look into it. The neighbors didn't complain about that one.....

Demetri  
Always be the lead dog.

Re: Gutter water generator? ([none / 0](#)) (#3)  
by Jerry on Mon Oct 27th, 2003 at 09:04:59 AM  
MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Demetri  
Have you come by the store yet? The Audio Source.  
Have I met you yet?

Just curius. To the other poster above. Have you totally given up on wind?  
I think more power could be collected from wind than rain gutter even if your wind situation is very pore. My plastic blades with a steep pitch on a tape drive motor will yeild 1 to 3 amps in 3 to 5 mph wind. I'd guse this wind system would be easier to build. Posably overall collect more power. Fairly cheap to.

Wich part of NW Oregon are you located in? I'm in Salem.

JK TAS Jerry

[Airheads Page](#)

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Re: Gutter water generator? ([none / 0](#)) (#4)  
by Demetri ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Mon Oct  
27th, 2003 at 06:06:37 PM MST  
([User Info](#))

Nope Jerry, I haven't been into your shop yet. Been trying to pry enough time and \$\$ free to get myself an amp and some subs, but haven't been able to. Soon, hopefully.

Demetri  
Always be the lead dog.

[Gutter water generator?](#) | 4 comments (4 topical, 0 editorial)

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## [Gutter water generator?](#)

By [zmoz](#), Section [Homebrewed Electricity](#)

Posted on Sun Oct 26th, 2003 at 06:10:33 PM MST

[Hydro](#)

Generator powered by water from the rain gutters?

I live in the NW corner of Oregon, and as you may know of of the things we have plenty of is rain. Solar panels don't do so well...and there's hardly any wind around here. I have about 2000 sq ft of roof, and I was just thinking today, would it be worth my time to try and use the water that runs out of the gutters to spin a generator? I'm guessing it would probably have to be pretty small...do you think it would even be worth the trouble?

[Gutter water generator?](#) | 4 comments (4 topical, 0 editorial)

Small streams ([none / 0](#)) ([#1](#))

by [wdyasq](#) on Sun Oct 26th, 2003 at 06:53:07 PM MST  
([User Info](#))

zmoz,

I think if you calculate how much water falls on your roof - and the distance it falls for -generating purposes-, you will find it will only generate a miniscule amount of power.

One might also need a -holding tank- to store the water so generation and consumption of the energy would not require batteries. Then there are the permits and the visits to the mental ward when they read the permit application.

Best do the calculations first - then decide if the expense will warrant it.

<http://www.rainwatercollection.com/homepagenew.html>

Deals with using the water for domestic purposes. BUT, there is a note - One inch of rain on 1000 square feet of roof surface yields around 550 gallons of rainwater (562 to be exact, although this can easily be reduced by as much as 25% outside the laboratory in our imperfect world due to evaporation and leaking gutters. I mean, when's the last time you followed a cookie recipe precisely and came out with anywhere near the six dozen cookies it supposedly would yield?)-

And this site: <http://www.suntrekenenergy.com/hydro.htm> states - As little as 100 gallons per minute (GPM) falling 10 feet through a pipe or 5 gallons per minute falling 200 feet through a pipe can supply enough power to comfortably run a small household. In areas where there is a long rainy season, and there is a mountain stream that can be used, a small hydroelectric system can work well with solar modules, both charging the same battery. When it is rainy and the solar modules are putting out less power, the hydroelectric system will be at its peak.-

From there, you might get and idea how much energy you can expect....

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### [another hydro ?](#)

By [44toy](#), Section [Homebrewed Electricity](#)

Posted on Sun Oct 19th, 2003 at 08:17:12 AM MST

[Hydro](#)

trying to post this in correct category duplicate in quarantine.

Haveing trouble getting category right for some reason sorry for wasting space.

I have a small stream with limited flow 3-4 foot head after dam, solar is limited due to cabin located in woods with trees very close, wind is not reliable and a 100 foot? plus climb to get above tree line.

Does anyone have info or pic of a small stream other than the one on this site (mine is similar) with some real world info, not just theory.

Also would be interested in your web sites (not that otherpower isnt the best) on specific apps of very micro hydro power. It seems there is very little info on the web about homemade micro hydro units.

Any input will be welcome.

I really admire the guys building stuff from scratch and hope to see more

[another hydro ?](#) | 3 comments (3 topical, 0 editorial)

Re: another hydro ? ([none / 0](#)) ([#1](#))  
by [Electric Ed](#) on Sun Oct 19th, 2003 at 10:06:45 AM MST  
([User Info](#)) <http://www.electric-ed.com>

There is some information at these sites. For more just type the words "micro hydro power" into Google or any other search engine.

<http://www.elements.nb.ca/theme/energy/micro/micro.htm>

<http://www.microhydropower.com/>

Electric Ed

Re: another hydro ? ([none / 0](#)) ([#2](#))  
by [sean](#) on Mon Oct 20th, 2003 at 06:22:26 AM MST  
([User Info](#)) <http://homepage.ntlworld.com/s.amesbury/homepage.htm>

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<a href="#">Also by 44toy</a>

I think the reason for so little info on micro hydro is that very few of us are fortunate enough to have a stream running through our back yards. I am going to build a small hydro genny and test it a small stream just couristys sake. Are you planning on building your own alternater? The hydro genny on this site is rated as 2amps and as it says its not a lot but its 24/7. From the sound of your stream im sure it wouldnt be that difficult getting an amp or more without having to all techy about it. I would myself convert a induction motor and take it from there and make a wheel or a prop of a boat has been one my ideas but never got round to it yet. I have so many thing s going and so little time, my site is waiting to be updated but will have to take its turn like everything else. Go for it and you dont have to spend a fortune in doing it.....sean

Re: another hydro ? ([none / 0](#)) ([#3](#))  
by troy on Thu Oct 23rd, 2003 at 11:36:45 AM MST  
([User Info](#))

www.homepower.com has published several articles on micro hydro, and also lists many suppliers for alternators, pelton wheels, some of which are very reasonable. You can download the entire current issue, complete with ads (that's half the fun) at no charge. It's the best homebrew electricity periodical in the world and it's free on the web.

Good luck and have fun!

troy

[another hydro ?](#) | 3 comments (3 topical, 0 editorial)

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### [Will a more efficient Genny slow my waterwheel down?](#)

By [turner](#), Section [Homebrewed Electricity](#)

Posted on Sun Oct 5th, 2003 at 06:42:14 AM MST

[Hydro](#)

I have a homemade hydro setup I am using to charge some batteries. It consist of a couple of

squirrel cage fans (my turbine) linked by chain to my 8 pole, dual rotor genny. I only have about 3 feet of head but alot of flow so it works OK. I am getting about 110 volts out of it now and I know it is overkill for charging my batteries. I am not electrically inclined and have gleaned most of this project from this site.

Am I correct in assuming that if I rewire my coils from series to parallel I will (1) Get lower voltage. (2) Get more current. (3)Cool my coils. (4) Get more total output?

Also....as I have increased the voltage by using better magnets the waterwheel has slowed down. Does the high voltage I am producing have anything to do with this or is it simply total output related? If I rewire to parallel will the drag at the turbine be reduced?

Any help or suggestions would be appreciated!

[Will a more efficient Genny slow my waterwheel down?](#) | 7 comments (7 topical, 0 editorial)

more efficient Genny slow my waterwheel ? ([none / 0](#)) ([#1](#))  
by [drdongle](#) on Sun Oct 5th, 2003 at 07:16:21 AM MST  
([User Info](#))

Every thing you do will affect the generator and hence the water turbine. The new magnets impose a greater load on the generator and as a result it slows down.

1. Yes
2. yes
3. not necessarily coil heat is a result of the load , more load more heat
4. again not necessarily it depends on what you plan to do with it.

If the out put is AC you might consider using a transformer to reduce the voltage, that would allow you to send the out put farther and reduce it to a usable voltage where you need it.

Perhaps if you briefly described your set up we could make specific suggestions.

Dr.D

Re: Will a more efficient Gen slow my wheel ? ([none / 0](#)) ([#2](#))  
by [Electric Ed](#) on Sun Oct 5th, 2003 at 07:28:27 AM MST  
([User Info](#)) <http://www.electric-ed.com>

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- [Also by turner](#)



[quote]"I am not electrically inclined and have gleaned most of this project from this site."

I'd say you're doing fine. If you weren't electrically inclined, you are making great progress.

[quote]"Am I correct in assuming that if I rewire my coils from series to parallel I will" -

(1) Get lower voltage. - - - Yes.

(2) Get more current. - - - That depends on the load. The alternator has the capacity to deliver twice as much before it overheats.

(3) Cool my coils. - - - Yes, if the load remains the same as it was when the coils were in series.

No, if you double the load current. (See #2)

(4) Get more total output? - - - No. The maximum power output depends on the temperature rise your alternator coils can withstand before insulation damage occurs. Let's assume that in series your maximum was 5 amps at 100 volts = 500 watts.

In parallel, it will be 10 amps at 50 volts = 500 watts. Each individual coil will still be carrying 5 amps.

Electric Ed

Re: Will a more efficient Gen slow my wheel ? ([none / 0](#)) (#3)  
by turner on Sun Oct 5th, 2003 at 08:14:40 AM MST  
([User Info](#))

Thanks for the quick answers! I ask these questions of the electrical engineers at work and I just get a blank stare.

More detail on my setup. I am running the genny output through a rectifier and then into a bank of batteries parallel wired at 12 volt. They are regulated through a Trace controller which dumps the excess into some decorative lights around my yard.

I use the batteries for when the power goes out which is not often but it's just cooler to do it this way than to buy a generator. (too much discovery channel I guess)

The genny rotors are cast stainless (salvaged from work) with double stacked 1" x3/8" neos. I just realized (reading other posts) that I am losing flux because these rotors are stainless. I guess I have compensated for that by doubling the magnets. (not elegant but I guess it works) Since the genny is slowing the turbine by at least a third in this configuration am I to the point that I must look at my turbine efficiency to get more juice?

So I guess the load is my battery bank? If I add batteries does that increase the load and slow things down further??

I assumed that the heat in the coils was lost energy....interesting. So warm coils aren't necessarily bad.

[ [Parent](#) ]

Re: Will a more efficient Gen slow my wheel ? ([none / 0](#)) (#4)  
by Electric Ed on Sun Oct 5th, 2003 at 09:15:26 AM MST  
([User Info](#)) <http://www.electric-ed.com>

Ordinary mild steel plate would have less reluctance (opposition to magnetic flux) and should increase the flux available at your coils.

If the present configuration/load is slowing the turbine, any increase in load (watts) will slow it further, and will also heat the generator coils more.

That heat is, as you assumed, wasted, except for the fact that it helps keep the coils dry.

You can get more electrical OUTPUT from the generator by increasing the mechanical INPUT to it, which is the output from your turbine.

This would require a more efficient turbine, to extract more energy from the present water supply, or increase the water flow and/or head.

This might also require a higher capacity generator to handle the increased input - larger wire size, more magnets, etc. Every energy-conversion component of the system has it's maximum power limit, and the overall system efficiency is better if the components are well matched.

Excuse me for rambling on.

Electric Ed

[ [Parent](#) ]

Re: Will a more efficient Gen slow my wheel ? ([none / 0](#)) (#5)  
by signweld on Sun Oct 5th, 2003 at 12:57:05 PM MST  
([User Info](#))

Hot coils,Just a thought, wouldnt it be nice if he ever has to make a new stator, to cast in some water tubes for cooling since the water is flowing by anyway. dont know if it would affect flux lines?

signweld

[ [Parent](#) ]

Re: Will a more efficient Gen slow my wheel ? ([none / 0](#)) (#6)  
by troy on Mon Oct 6th, 2003 at 01:49:02 PM MST  
([User Info](#))

I have seriously considered casting a single copper tube in the fiberglass encased stator around the outside perimeter to at least cool the edge of each coil. Since copper conducts heat well, that will help cool the whole coil, and the whole stator. But I would install it with a thermosyphon driven small radiator on top of the wind gennie.

Now if only they would let me install a tower in town...

Best regards,

troy

[ [Parent](#) ]

Re: Will a more efficient Gen slow my wheel ?  
([none / 0](#)) (#7)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on  
Tue Oct 7th, 2003 at 04:43:55 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

Don't use metal pipes in there. Magnetic eddy currents will cause more heat in the copper pipe and slow down the rotor from magnetic resistance. Use plastic or rubber pipe.

-- W o o f  
[ [Parent](#) ]

[Will a more efficient Genny slow my waterwheel down?](#) | 7 comments (7 topical, 0 editorial)

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### [Pelton rotors/buckets - pictures](#)

By [EcoInnovation](#), Section [Homebrewed Electricity](#)

Posted on Mon Sep 22nd, 2003 at 02:06:19 AM MST

[Hydro](#)

I'm having a go at adding an image, hope it works

The pictures show the rotors/buckets and complete tubines that we now make to suit your site conditions. These are avialbe world wide, either as parts or complete units.

Regards

Michael Lawley  
EcoInnovation

[Pelton rotors/buckets - pictures](#) | 4 comments (4 topical, 0 editorial)

Re: Pelton rotors/buckets - pictures ([none / 0](#)) ([#1](#))  
by EcoInnovation on Mon Sep 22nd, 2003 at 02:09:58 AM MST  
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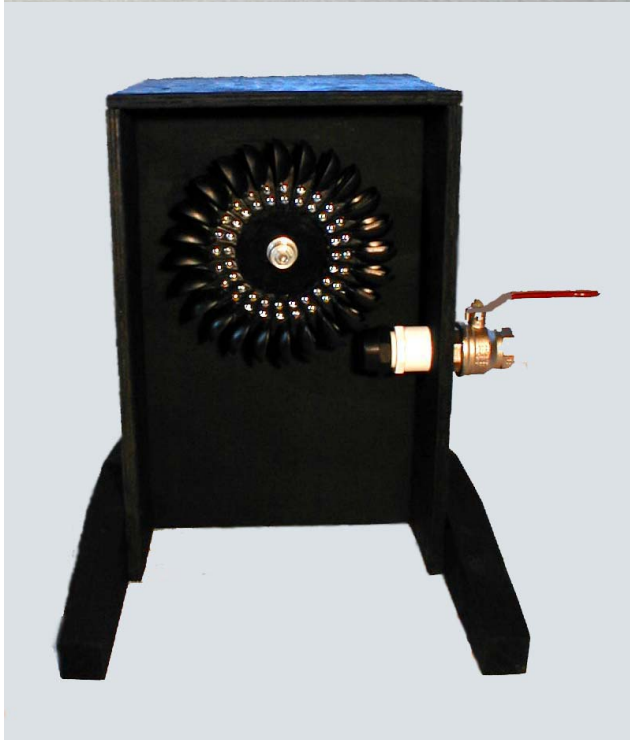
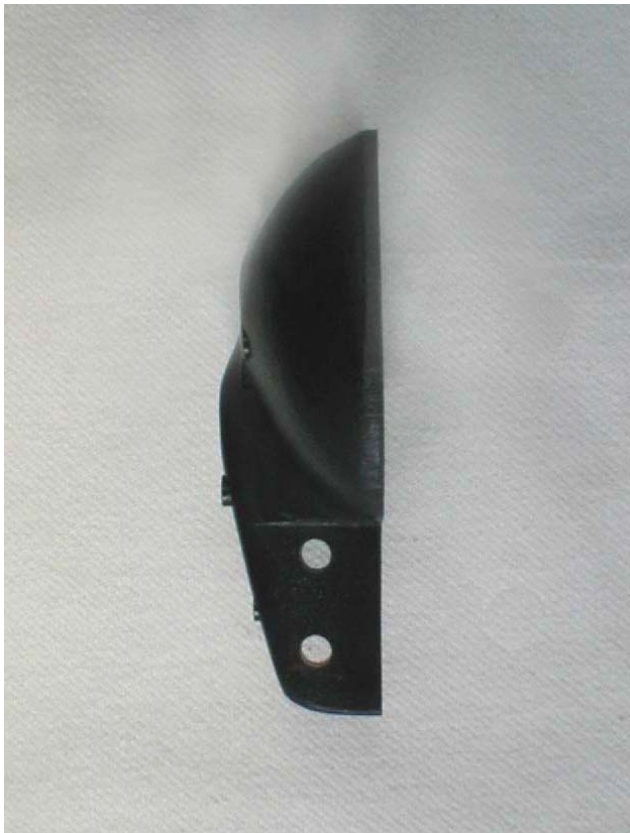
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Re: Pelton rotors/buckets - pictures ([none / 0](#)) (#2)  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Mon Sep 22nd,  
2003 at 07:37:30 AM MST  
([User Info](#)) <http://www.internetfred.com>

Thats Nice! Ok, Question: what is the fuel source and how much power can this puppy produce? Whats the total speed that it can rotate at or what is the optimal speed that it rotates at?  
Thanks!

Re: Pelton rotors/buckets - pictures ([none / 0](#)) (#3)  
by DanB on Mon Sep 22nd, 2003 at 10:36:00 AM MST  
([User Info](#))

The fuel source is presumably running water... and it's neat how they bolt on so one could use different sized wheels!

Is there a website with more details on this? Looks like a great setup... (of course I know nothing about hydro)

[ [Parent](#) ]

Re: Pelton rotors/buckets - pictures ([none / 0](#)) ([#4](#))  
by EcoInnovation on Tue Sep 23rd, 2003 at 02:44:08 AM MST  
([User Info](#))

Our web site is very out of date, hope to get it updated soon. You make the rotor the size required to optimize the efficiency of the generator. We match them to Smart Drive PM generators so the speed is normally from 300-1000 rpm.

The plastic buckets are for sale for those keen to have a go themselves. If interested email me and I can send you a spec/price sheet.

[ [Parent](#) ]

[Pelton rotors/buckets - pictures](#) | 4 comments (4 topical, 0 editorial)

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## [Plastic Injection Buckets](#)

By [EcolInnovation](#), Section [Homebrewed Electricity](#)

Posted on Sat Sep 20th, 2003 at 01:48:23 PM MST

[Hydro](#)

**Plastic injection moulded buckets now available**

Hi All,

EcoInnovation has finally got an injection mould for making plastic pelton buckets. With them you can make a rotor to any diameter starting at 180mm Pitch Diameter (18 buckets). They bolt onto an Aluminum disc, made to suit. They are priced from US\$2 each (25 rate) to US\$1.2 each (1000 rate). The buckets are a reasonable size and can accommodate a 20mm jet. If interested in being sent a data sheet email me at [ecoinn@paradise.net.nz](mailto:ecoinn@paradise.net.nz)

We are currently working on a large Turgo bucket that should be available in a few months.

We also have complete pelton turbines designed for your site from US\$750-\$1000 excluding freight, can send details if interested.

Regards

[Plastic Injection Buckets](#) | 0 comments (0 topical, 0 editorial)

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[What are the hydro do's and don'ts?](#)

By [ghettoride](#), Section [Homebrewed Electricity](#)  
 Posted on Thu Sep 4th, 2003 at 12:49:02 PM MST  
 ?

[Hydro](#)

Don't hate the noob, but of course I have a few questions. I have searched both this site and homepower.com without really getting the answers I'm looking for. Ya'll will more than likely be hearing a lot from me within the next month and a half or so. I have two main questions. I don't really know where to start with the water wheel. The site itself has a good bit of head but not too much flow. I intend to measure both the flow and head today so I can be more specific with that info later. But right now I'm guessing when I say that there is at least 3 feet of head and maybe 4 gallons a minute. I could very easily get 4 feet of head. Also, I was wondering what type of alternator/generator I should use. My best guess would be to build an alternator similar to the disc brake designs on otherpower but you can't beat the idea of a cheap, readily available car alternator. I guess it could be rewound with the voltage regulator broken out but I'm kind of fuzzy on that idea. I'm not too sure how that works. What i'm mainly looking for is the opinions of other people who have been where I am and now simply know the do's and don'ts of homebuilt hydro power, the what works and the definetly don't works. <If that makes sense. Thanks.

[What are the hydro do's and don'ts?](#) | 4 comments (4 topical, 0 editorial)

Re: What are the hydro do's and don'ts? ([none](#) / [0](#))  
 (#1)  
 by [wdyasq](#) on Thu Sep 4th, 2003 at 07:06:01 PM MST  
 ([User Info](#))

Gettoride,

I went to the "power conversion" website and to put in the parameters of your power - 32 pounds of water falling 4 feet. As you stated the 4 foot was "maybe" and "maybe" four gallons a minute and hte site has a conversion of Kw with Ft-lb/sec, I used 1/2 lb of water falling 4 feet every second the result: 2 Ft-lb/sec = 0.00368 Kw

Of course that is before loses of friction and efficiency and before multiplication of the effeciency of any conversion device or a multitude of "loses" that occur when energy goes from one form to another.

Good luck on fonding a waterwheel in the "2 watt" size range. Better luck still on rewinding one that small.

Ron

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Re: What are the hydro do's and don'ts? ([none / 0](#)) (#2)  
by ghettoride on Thu Sep 4th, 2003 at 09:12:17 PM  
MST  
([User Info](#))

I neglected to mention that this waterwheel is mainly for looks. The water source is indeed 4 gallons a minute. I was just hoping to get as much power out of it as possible. A LOT of gearing hopefully will get something to turn. Can anybody else relate?

[ [Parent](#) ]

Re: What are the hydro do's and don'ts? ([none / 0](#)) (#3)  
by troy on Fri Sep 5th, 2003 at 10:35:47 AM  
MST  
([User Info](#))

In the original comment, you state, "The site itself has a good bit of head..." Just for comparison, a good bit of head would be at least 15', and 50 to 100 feet of drop makes the site really worthwhile.

There are setups that work for high head (>50') with low flow. There are also setups for low head (<10') with high flow. But no amount of gearing will squeeze out any more power from a low head, low flow stream. On the other hand, since this sounds like a fun little demonstration thing, without the need for "real" electricity, you could probably rig up a small bike generator to light a couple small bulbs.

This comment is absolutely not meant to be negative or discouraging, just don't want you to invest a lot of time and money if the potential is very modest.

Best regards,

troy

[ [Parent](#) ]

Re: What are the hydro do's and don'ts? ([none / 0](#)) (#4)  
by Homebrewed12vdc on Fri Oct 17th, 2003 at 04:48:03 PM  
MST  
([User Info](#))

Well it mite work if you do what I did, I had more head but way less flow, I took and dug the stream out and built a dam, I then ran 10 feet of 1 inch pipe down to 10 feet of 3/4 pipe, then down to 1/2 pipe, to a garden hose preesure nozzle. I then took a 10 inch pulley and some half inch metal pipe. I cut one inch slots every 1/4 of a inch the pulley. I then took my metal pipe sawed it in half and welded 2 inch pieces into the pulley. The pulley is on the shaft of a 90v dc PM motor, I get about 3 amps constantly going into my battery bank at a voltage of about 13 volts. It can work, and does help, but dont expect anymore than you could get out of a cheap solar panel, the only good thing about it is it produces 24\7, and that makes 72 amp hours a day into my battery bank, so keep trying its possible.

[What are the hydro do's and don'ts?](#) | 4 comments (4 topical, 0 editorial)

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### [Hydro system and how to setup](#)

By [shane](#), Section [Homebrewed Electricity](#)

Posted on Tue Sep 2nd, 2003 at 06:40:11 PM MST

[Hydro](#)

What do I need?

I have an alternator, an old car generator from an old car and an ametek 40vdc motor. I was wondering what the heck do I need? It's a hydro system so I dont really need Batteries since it will be on all the time. I need to power a few lights and 2 fans. I have the wires and all. I have been checking out those diodes and bridge rectifiers but I dont know what they are for or how to 'heat sink' them.

[Hydro system and how to setup](#) | 5 comments (5 topical, 0 editorial)

Re: Hydro system and how to setup ([none / 0](#)) (#1)  
by TomW on Tue Sep 2nd, 2003 at 07:28:00 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Shane;

First off the rectifiers are mostly there to keep batteries from driving the generator as a motor when its not turning.

If the "car generator" is truly a generator you won't need any diodes at all because a true generator will put out dc to begin with so you won't need to change ac to dc with a rectifier. Same with the Ametek it puts out dc voltage.

Thats my opinion no diodes if no batteries and dc sources.

Cheers.

TomW

[Stuff I have Online](#)

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Re: Hydro system and how to setup ([none / 0](#)) (#2)  
by shane on Tue Sep 2nd, 2003 at 08:58:37 PM MST  
([User Info](#))

okay that sounds simple but I think I need to get a diode for the alternator if Im going to use it cause i heard they need there own power to make power.

Yes im pretty sure my car generator is real cause it has only a negative and positive outs, no others, the problem is I think it is run by brushes which is a problem, they wear out. Thanks for the info now I have to think if I need a inverter.

[ [Parent](#) ]

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Re: Hydro system and how to setup ([none / 0](#)) (#3)  
by TomW on Wed Sep 3rd, 2003 at 05:54:42 AM MST  
([User Info](#))  
<http://oneota.net/~earthsourcepowr/>

Shane;

Not sure how to say this but adding an inverter will likely require a battery to work properly. Your question was about direct driving dc lites and fans [I thought].

Adding an inverter negates what I told you cuz its gonna need a battery to protect its input from spikes in the supply.

You kinda changed things after i answered. I suggest you do some reading here on the board and see if you get a handle on things before you dive in. At least until you understand how the alternator, generator and ametek work as voltage sources.

Cheers.

TomW

[Stuff I have Online](#)

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[ [Parent](#) ]

Re: Hydro system and how to setup ([none / 0](#)) (#4)  
by shane on Thu Sep 4th, 2003 at 05:50:31 PM MST  
([User Info](#))

I was just wondering, if I wired everything so I can plug in a wall outlet appliance like a light would it work if The energy is coming from a 40vdc motor or would it short out? Do i have to cant the voltage to 120vac?

Re: Hydro system and how to setup ([none / 0](#)) (#5)  
by shane on Thu Sep 4th, 2003 at 05:51:59 PM MST  
([User Info](#))

oops I meant do I have to CHANGE to voltage to 120VAC?

[Hydro system and how to setup](#) | 5 comments (5 topical, 0 editorial)

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## [Homemade Air conditioner](#)

By [hayseed](#), Section [Homebrewed Electricity](#)

Posted on Sun Jul 13th, 2003 at 12:04:57 PM MST

[Hydro](#)

would this work

I live in Arkansas so evaporative air conditioners are not practical...to humid, BUT I was trying to think of a way to cool my house that would use a minimal amount of energy and not increase the moisture in the house.

Could you put a radiator in a window with a fan behind it. Hooked to the radiator would be approximately 200 feet of 3/4 inch pex pipe going 80 feet into a well and then back up creating a loop to the radiator with only a low voltage pump circulating the water. Anyone have any ideas, it seems fool proof so what am I missing...if it were really this easy it seems that everyone would be doing it.

Benton

[Homemade Air conditioner](#) | 11 comments (11 topical, 0 editorial)

Re: Homemade Air conditioner ([none / 0](#)) ([#1](#))  
by Seth on Sun Jul 13th, 2003 at 12:48:11 PM MST  
([User Info](#))

yes i think it would work.... but getting the hose primed first might prove to be a problem... buit if u have a well pump.. then no problem.... prime the hose with the pump.. then hook it up to the cooling system,.... and bleed the air off.

Lots of people also just run hose underground instead.... cools in the summer-- heats in the winter.....

Re: Homemade Air conditioner ([none / 0](#)) ([#2](#))  
by Kilroy2k1 on Sun Jul 13th, 2003 at 02:29:07 PM MST  
([User Info](#)) <http://home.cogeco.ca/~woproject>

I have been experimenting with something close to that myself. What I found is you need a lot of underground water to make any real difference in temp or a lot of pipe burried to be able to transfer the heat without saturating the ground. If you have the means to drill a few more wells at least 10ft apart and deep enough to get the majority of the pipe depth in 64°F or lower ground then you can create a closed loop system. From what a geothermal installer has told me those small pumps work just fine in a closed system, being closed loop it dosent have to fight the head pressures of trying to push water up hill because you have the same amount going downhill and they balance out. In an opened system the power needed to push the water up a pipe is considerably more.

Hope this ifno is of some use.

Tom S.

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Re: Homemade Air conditioner ([none / 0](#)) (#4)  
by E man on Mon Jul 14th, 2003 at 12:50:22 PM  
MST  
([User Info](#))

I've got an old copy of a Popular Mechanics article where a guy built a closed loop system to cool his house. He used several truck radiators stacked back to back and had two wells...one to pull cool water from and another well (opposite end of the yard) to re-inject the warm water after it had passed through the radiators. I always thought that was a cool idea.

E-man

[ [Parent](#) ]

Re: Homemade Air conditioner ([none / 0](#)) (#3)  
by troy on Mon Jul 14th, 2003 at 10:22:14 AM MST  
([User Info](#))

Dear Benton and others,

Your idea will work if you have access to enough cool water as mentioned by others. But just like a "real" AC unit, when the hot humid air hits the cold radiator, you will get a lot of condensation. So long as you're set up to deal with that condensate, it's a good thing as it will lower the humidity inside your house.

Best regards,

troy

Re: Homemade Air conditioner ([none / 0](#)) (#5)  
by Demetri ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Mon Jul 14th,  
2003 at 01:13:59 PM MST  
([User Info](#))

Hey, this just happened yesterday.

A friend of mine and I built an air conditioner for his farm's office using a monster oil cooler (I'd found it in the junk yard months before and grabbed cuz it looked new, even though I had no use for it), and a good length of garden hose. We got cool water from one of his big agricultural wells (brazing a nipple into the side of a six inch water pipe is a pain in the butt), which he had to run anyway to water his fields. We used the 'exhaust,' after having gone through the cooler, to water his private veggy garden. Put a 120v. ac fan behind it after removing the stock 12v electric cooling fans, and it worked great. Not as cold as a commercial unit, but for the \$15 we spent on garden hose and couplers, neither of us were complaining. After ten minutes running the room was noticeably cooler. The idea



certainly is workable; good luck with finding/making a source of cool water.

Demetri

Always be the lead dog.

Re: Homemade Air conditioner ([none / 0](#)) (#6)  
by wdyasq on Mon Jul 14th, 2003 at 08:07:21 PM  
MST  
([User Info](#))

The largest problem I see is the 64 degree water. Most "air-conditioners" I have seen and worked on get a 30 degree or more temperature drop "across the coil". This is achieved with a coil that is about 40 degrees less than the desired temperature.

Any reduction in temperature and/or humidity is a bonus in muggy conditions. Folks have already mentioned the need to get rid of the water "squeezed out". Try it and see - large radiators and slow air-flow will help with the temperature exchange. AND, don't forget to filter the air so the radiators won't clog up.

Ron

Diplomacy is the art of saying 'Nice doggie' until you can find a rock. - Will Rogers

[ [Parent](#) ]

Re: Homemade Air conditioner ([none / 0](#)) (#7)  
by E man on Tue Jul 15th, 2003 at 12:48:10 PM MST  
([User Info](#))

I just wanted to add one thing that we haven't touched on yet and that is using ground water in a closed loop to help cool the compressor coils of a traditional air conditioner...like using a tube-in-shell heat exchanger. This would reduce the thermal load on the compressor and probably save you some good bucks on your electric bill. I've seen commercial versions of this idea using evaporative cooling to help the compressor, but I would think the same thing would apply to a closed loop geothermal setup.

Re: Homemade Air conditioner ([none / 0](#)) (#8)  
by jubalearly on Tue Jul 15th, 2003 at 01:26:07 PM  
MST  
([User Info](#))

You can't go too far with this without making adjustments in the expansion valve. By that, I mean that the expansion part of the cycle (for cooling in the in house radiator) is meant to occur at certain rates and it won't work well outside those limits.

It's probably worthwhile with a small (window) unit if you don't spend too much money or energy pumping the water. But if you have cheap well water, you can still get considerable evaporative cooling even in wet climates by various strategies. I'll go dig up some web references - I'm been researching this for a couple of years. I'm probably going with a large ground loop, water storage in septic tanks, an auto compressor driven by alternative energy if possible, and cooling down at night & storing the "coolth".

Russ

[ [Parent](#) ]

Re: Homemade Air conditioner ([none / 0](#)) (#9)  
by jubalearly on Tue Jul 15th, 2003 at 02:00:51 PM MST  
([User Info](#))

Backwoods Home, March/April 1999, issue #56 had an excellent article on this (see refrigeration). I think it is only available now on the CD or by ordering the back issue. IIRC, it covered a number of options for cooling a refrigerator, but a number of them would work as well for AC. More to come.....Russ

Re: Homemade Air conditioner ([none / 0](#)) (#10)  
by Paul Hopkins on Wed Jul 16th, 2003 at 09:03:06 PM MST  
([User Info](#))

Hi,  
DanB and JimU were nice enough to post on our forum, so I thought I would share here too.

There are certain things we know. Hot air rises. Soil temperature is stable at depth. Evaporation cools. Simple yet profound.

First, install a ventilated ridge on your home and plenty of soffit vents to keep the attic cool.

We can't all live underground, although it is an efficient and viable alternative. But we can duct the earth.

Not knowing your situation or knowledge of construction I hope to be simple.

First, dig trenches and bury 6" ABS at a depth of 24" minimum. If you live on a hill you can pop them out to gather fresh air. Otherwise, bring them to the surface with an ell and cap with a mushroom vent.

Bring these "intakes" to your living space.

At the high points of your home create stacks that have dampers to control flow and vent them up

through the roof.

That is it!

Hot air rises and creates the draw necessary to pull the cooler air from below, (the intakes are underground. \*You can filter this air" That is all it takes! If you put the ABS underneath gardens or trees it will improve the cooling effect. No electricity necessary. It is called tower of power.

If you built your house from scratch you would want an atrium to create max draw and airflow. You generally want your underground ducting to be shaded.

I'd tell you how our greenhouse heats itself in the winter with no electricity, but... I am a nutcake. Kinda nutty, huh?

<http://www.fighting.org>

[ [Parent](#) ]

Re: Homemade Air conditioner ([none / 0](#))  
([#11](#))  
by Gorilla Boy ([No Spam/gwmorris@fgisp.com](#)) on Thu Jul 17th, 2003 at 06:36:58 AM MST  
([User Info](#)) <http://www.livetheword.info>

First, dig trenches and bury 6" ABS at a depth of 24" minimum. If you live on a hill you can pop them out to gather fresh air. Otherwise, bring them to the surface with an ell and cap with a mushroom vent. How far? Distance I mean. 50', 100', 400'? I am sure it all depends on the square footage of your home but I am not sure.

Be blessed! Gary

[ [Parent](#) ]

[Homemade Air conditioner](#) | 11 comments (11 topical, 0 editorial)

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[New to power generation. Need help with best setup for hydro system.](#)

By [Anonymous Hero](#), Section [Homebrewed Electricity](#) [Hydro](#)  
Posted on Mon Jun 30th, 2003 at 08:43:41 PM MST  
New to power generation. Need help with best setup for hydro system.

Hello, I have a 100 watt pump for a fish pond. It's stats are as follows.

Volume of water pumped = 10,300 Liters (3000 gallons) per hour.  
Can pump 4.65 meters (15 feet) high.  
the hose it pumps through is 1.5 inches in diameter.

Right now it pumps up about 5 feet to a waterfall.

So basically I am wondering what is the best setup to get the most bang for my buck. I only want to generate enough power to run about 15 garden lights.

I was thinking about using a small turbine and a car alternator and car battery. Maybe something from an autowrecker. (Always looking for the cheepest way but not something that will die in a week either.)

Any suggestions?  
Any sites on making a turbine. I was thinking from pvc pipe, etc..

Thanks..

[New to power generation. Need help with best setup for hydro system.](#) | 5 comments (5 topical, 0 editorial)

Re: New to power generation. Need help with best s  
([none / 0](#)) ([#1](#))  
by Andrew ([andrew@lookingglass.com](#)) on Tue Jul 1st, 2003 at 02:26:40 AM MST  
([User Info](#))

Your post is a little confusing.  
Did you mean you are going to make a small water wheel or something from you little fishpond waterfall? If so, why are you doing this? The fish ponds runs on 120ac why cant you run your lights off of it. It just doesn't make sense.

-Andrew

Re: New to power generation. Need help with best s  
([none / 0](#)) ([#2](#))  
by Anonymous Hero on Tue Jul 1st, 2003 at 11:08:51 AM MST

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I could run my lights off of ac, but this is a learning project for me. If I can get this to work and if it is efficient, then I will probably set up a larger system to run my house off of. But for now, I just want to make the most efficient do it yourself project from my waterfall. :)

[ [Parent](#) ]

Re: New to power generation. Need help with best s ([none / 0](#)) (#3)  
by hvirtane on Wed Jul 2nd, 2003 at 03:56:04 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

Hi,

do you have a waterfall, which runs by itself or are you making the waterfall artificially with that pump of yours?

- Hannu

[ [Parent](#) ]

Re: New to power generation. Need help with best s ([none / 0](#)) (#4)  
by Anonymous Hero on Wed Jul 2nd, 2003 at 03:18:18 PM MST

It is a pump. The stats of it are in the first post.

[ [Parent](#) ]

Re: New to power generation. Need help with best s ([none / 0](#)) (#5)  
by hvirtane on Wed Jul 2nd, 2003 at 04:38:06 PM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

Hi,

if you are making a waterfall using an electric pump and using that waterfall to make electricity for lamps, it is of course more efficient to use the electricity used for the pump for the garden lights directly?

However, I think that your waterfall is necessary for the decoration or for the fish as well?  
So nothing prevents you to use it to get

some of  
the electricity back  
and to make there  
some home-made  
water technology as decoration?

The basic equation how much there  
is power in falling water is as follows:  
 $P(\text{watts}) = (1000Q) \times 10H,$

where Q is the flow of water in cubic  
meters  
per second, and H the head of the  
falling  
water in meters.

In practice the best turbines can make  
of that  
power even about 90% into electricity.  
(Of course there cannot be more power  
available than your pump is pumping  
up,  
so you can easily estimate  
the available maximum power to be  
less than the power  
of the pump pumping water up.)

From articles of the magazine Home  
Power  
you can find some descriptions how  
to make waterwheels or home  
made crossflow turbines.

Your waterfall is quite small,  
because your pump is small. You might  
use the  
waterwheel or the turbine to power a  
couple of  
bicycle dynamos, which could make  
electricity  
for led lights?

But nothing prevents you to make  
yourself  
an permanent magnet generator,  
something  
similar as many people of this board are  
describing  
to make for their wind turbines?  
You could use an extended axle of a car  
wheel hub  
for fixing the waterwheel The same  
axle, where  
your self made generator is.

Later when you've  
made one generator, why not making  
another  
one for a wind genny...

- Hannu

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[New to power generation. Need help with best setup for hydro system.](#) |

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## [Still Water Makes Deep Power for Cryonucleator](#)

By [cryonucleator](#), Section [Classifieds](#)

Posted on Wed Jun 25th, 2003 at 04:47:30 AM MST

[Hydro](#)

Low-flow water, or "cool" geothermal can make tremendous power.

Wow! Wotta board. More active than any I've seen. Cut to the chase... I've worked for years on this and finally filed a patent app so it is patent pending. It's the blackbody cryonucleator(tm). It's simple to build, uses no fuel whatsoever, and produces from 40,000 to 500,000 ft-lbs of energy per cubic foot of water used, and the water remains unchanged and reusable.

Now, the subject of my post is that if you have access to a small water body, but the current speed is too low for a practical hydro, don't despair- you're ideally positioned to use the stream for cryonucleation. Likewise, if you have access to geothermal but it's below the recommended minimum temp of 170 C for running a steam turbine, you can use it instead for a cryonucleator. In fact, if you have a substantial land area (or large cave under you), you can use that slight heat energy to cycle the device.

After reading some of the hilarious posts on "Bad Board" about uploading images, I think I'll wait until I'm well-rested before trying it. So, to see an illustration of how to use these "useless" energy sources, just go to [Using Useless Energy](#) .

This device uses winter weather to convert water to ice, captures the expansive force hydraulically, and sends that hydraulic power to turn a turbine to make electricity. Excess power can be stored gravitationally to provide year-round power, or used to make hydrogen from water (storing the hydrogen for later use). So obviously, you have to have a way to "cycle" a cryonucleator from frozen to liquid state, or use a design with an ejection-replenishment system to dump the ice and refill with liquid water. That's where the stream and geothermal stuff comes in (or solar collectors).

Containment is a big issue with a cryonucleator. Your working pressures range from 3,000 psi to 40,000 psi, so you need a strong-walled breeder to handle it. That means thick metal. Amortizes quickly, but costly to start. So if you know anything about concrete composites, folks would love to hear about it (myself included). If I see those kinds of ideas here, I'll start referring my licensees here to join in. Or if you've got ideas about unique containment geometries...?

Anyway, long post, but I figured it best to answer as many questions as I could before they get asked. Hmm- if you want to build one, you'll need to get in touch with me about a license. Cheap and permanent.

---Dennis

[Still Water Makes Deep Power for Cryonucleator](#) | 18 comments (18 topical, 0 editorial)

Re: Still Water Makes Deep Power for Cryonucleator ([none / 0](#)) ([#1](#))  
by [cryonucleator](#) on Wed Jun 25th, 2003 at 05:08:01 AM MST  
([User Info](#)) <http://www.makehydrogen.com>

Forgot to mention. If you have a small forge or machine shop, there's a need for small-vane actuators for any turbine that uses a cryonucleator. It should be able to handle the pressures mentioned. I think about .25 cc displacement per vane would work. Actuator diameter should probably be about 1 inch or less, which means great torsional stress on the shaft. This device hasn't really taken off yet, but in time folks will be wanting these actuators and they're just not available out there. So post here if you can do this.

Also, forgot to mention that low-power breeders work well too, so there's no absolute need for a strong wall, i.e., an empty propane tank will work, or even very strong plastic. The trick is to just cycle faster using a stream or lake, in order to compensate for wasted power.

---Dennis

<http://www.makehydrogen.com>

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Re: Still Water Makes Deep Power for Cryonucleator ([none / 0](#)) (#2)  
by Wolfie1 on Wed Jun 25th, 2003 at 06:28:42 AM MST  
([User Info](#))

Hi Dennis, you mention that your device is patent pending which means it has a patent number assigned? You didn't mention the number on your site.

Also, I see lots of graphics and no pictures. Could you post a picture of a complete one (on your site or here, doesn't matter).

Martin.

Re: Still Water Makes Deep Power for Cryonucleator ([none / 0](#)) (#3)  
by cryonucleator on Wed Jun 25th, 2003 at 07:13:11 AM MST  
([User Info](#)) <http://www.makehydrogen.com>

Martin-- thanks for comment. No pictures of one yet- have been busy with theoretical, legal, patent stuff. Will post one as soon as I can build it. Live in an apt in New Mexico, with postage-stamp backyard. Need a place to build one.

On patent, anytime you file an application, it is "patent pending". The "patent number" issues when the patent issues. Meanwhile, it's not a good idea to give out even the filing number. Also, if you're planning to patent something someday, recent USPTO rules permit you to file "Provisional Application for Patent", which is also a true patent application. If using this, the nice thing is it can be very informal, and costs only \$80. But tricky, so read the fine print. Also, recent USPTO law creates retroactive liability for unauthorized use of a patent-pending device or process. For the record, I'm not a lawyer or patent attorney, just a country doctor. So don't take my word for anything, and call me in the morning. ----Dennis

<http://www.makehydrogen.com>

[ [Parent](#) ]

Re: Still Water Makes Deep Power for Cryonucleator ([none / 0](#)) (#6)  
by Anonymous Hero on Wed Jun 25th, 2003 at 11:46:57 AM MST

Mr. Dennis, So to clarify, you are not actually selling these machines, but indeed selling licences to build that which you do not actually have in fact? Are you related to Dennis Lee, by any chance? I built a BBQ tank one of these in 1998. I hope I was not infringing on your patent, but I guess my affirmative defence was, I did not know such a patent existed. My findings were conclusive and concurrent evidence with already existing science text that ice freezing expands a total of 9% in volume. And when pressurized, with the extreme cold, tremendous pressure can be exerted. Yep, that is a fact. My BBQ tank experiment proved that, but I could not get the figures of 80,000Ft /Lbs to 1,000,000 ft lbs of dead lift torque with a BBQ tank. Perhaps my crude experiment using flowing 40 F water to thaw and approx 10 F to refreeze was not refined enough. I was successful in raising several hundred pounds a few inches with not complex moving parts as a dead lift experiment, but not anywhere near your figures. What was I doing wrong? The other thing you did not tell us was the function of time as the denominator to the ft./lb figures. My BBQ experiment was capable of raising the max weight a couple feet over several hours. I was wondering what the time denominator of your equation was. After all the equation does require that

denominator to achieve a power function to equate work done. The melt / freeze cycle has fascinating possibilities, however could you provide more info as Martin, Dan and Brian ask? Thanks, Jungle Bill

[ [Parent](#) ]

Re: Still Water Makes Deep Power for Cryonucleator ([none / 0](#)) (#4)  
by DanB on Wed Jun 25th, 2003 at 10:00:01 AM MST  
([User Info](#))

It's an interesting idea and interesting web page you've got. There are some things I don't quite get here.

"and produces from 40,000 to 500,000 ft-lbs of energy per cubic foot of water"

in my understanding, ft-lbs is a measurement of torque, which I can imagine you might be able to develop a good bit with frozen water. But it is not in and of itself a measurement of "energy" like you say. Energy would be measured in something like KWH... is that right? or horsepower hours?

I think what would be interesting to know is some real numbers about temp differences, size of the machine, how often it would cycle and how much power (in either horsepower or watts) it could generate continuously, Or - a measurement of total energy that would be generated (in KWH or something) over a certain course of time, because this is what's important with all these sorts of things. It would also be fun to make some comparisons with this vs say... a sterling engine.

Not to be a critic, but I think that before you offer plans for sale here, it would be nice to see these sorts of numbers, comparisons - and possibly some real data from a real working machine! (that could make me a believer!)

Re: Still Water Makes Deep Power for Cryonucleator ([none / 0](#)) (#5)  
by Brian on Wed Jun 25th, 2003 at 11:22:03 AM MST  
([User Info](#))

I'm with you. Being a math kind of guy, I would love to see the numbers as well.

Regarding units of energy, ft-lb is the appropriate unit for torque as well as work and energy in the US system. Example: Friction, when applying work and energy to a system of particles is  $1/2(mv^2)$ . If an object being acted upon by the frictional force weighs 3500 lb and is moving at a velocity of 20 ft/sec,  $(1/2)[3500 \text{ lb}/(32.2 \text{ ft/s}^2)][(20 \text{ ft/sec})^2]$ . Cancelling the units yields ft-lbs. The US system is funky like that.....:-)

[ [Parent](#) ]

Re: Still Water Makes Deep Power for Cryonucleator ([none / 0](#)) (#7)  
by cryonucleator on Wed Jun 25th, 2003 at 03:12:41 PM MST  
([User Info](#)) <http://www.makehydrogen.com>

Looks like I'm being forced to use image upload after all. Didn't expect such busy response. First, Jungle Bill, if you didn't know of my previous patent filing on this, I don't think the law applies, though I'm not worried about it and I'm sure you're not either. Also, I "think" your barbecue barrel experiment was before the retroactive element was enacted anyway. Thanks for everybody's comments.

Okay. "Energy" is technically defined in most physics books as "the potential to perform work." A definition accessible to most of us is found in the dictionary of Microsoft Bookshelf as "the potential of a physical system to do work." It might be more technically correct to refer to "ft-lbs" as work rather than energy, but I try to write in terms that are familiar to everyone.

Now, the \*work\* figures obtain from this:  $W = FD$ . i.e., Work = Force x Distance. In fluidics (or hydraulics), the implication of this is that  $F = \text{pressure}$ , and  $D = \text{displacement}$ . The figure 9% expansion has been mentioned, and I'm not arguing, but 10% is the more commonly used figure. This kind of discrepancy is normal- for example, the temp of dry ice is given as -70 C in some references, and as -78.5 in others. You'd think physicists could agree on this stuff, but duhhh?

So, in an isostatic system having a volume of say, 1 cubic foot, and the capacity to expand 10%, with a pressure of say, 1000 psi, here's what you get...  $12 \times 12 \times 12 = 1728$  cu ins. So you have an expansion potential of  $1728 \times .10 = 172.8$  cu. ins. If you imagine this in a cylinder exactly 1 cu-in in area, it will lift a mass of 1000 lbs exactly 172.8 ins. If you divide 172.8 by 12, you get exactly 14.4 feet. This means the system can perform exactly 14,400 ft-lbs of work. I took the long way around to make this easier to visualize- we could simply have taken the square area ( $12 \times 12 = 144$ ) and multiplied it times 10% to get the 14.4 sq ins, implying 14.4 feet of displacement.

Onward. At the initial freezing point, water exerts a pressure of about 3000 psi. As it gets colder, and is not allowed to freeze, it exerts more and more pressure (going to try to put a chart in here in a minute). This varies, as the chart shows, (Tamann, c. 1900, Handbook of Chemistry & Physics, Chemical Rubber Publishing Co., 36th edition), on roughly a 45-degree slope with temperature, and reaches 31,226 psi at -7.78 F (-22.1 C). This is a naturally occurring temp, and if we do the math, it yields 449,400 ft-lbs of work per cubic foot, which is where the "500,000 ft-lbs" figure comes from.

Sure, it would be better to have a working model first, but I know the physics of this and I'm comfortable with my marketing approach for now. But the suggestion is certainly valid and appreciated. I don't know what happened with the barbecue barrel experiment, but Jungle Bill if you had allowed full pressure to develop for maximum energy capture, it would have torn the thing apart. Or worse, caused a hairline fracture and fluid jet that would have created two Jungle Bills where only one had stood before. These kinds of fluid pressures are used to cut steel, especially at the 4 degrees you mention. My best theory is that your ram size had a lot to do with it, as well as your load. Bigger load and smaller ram would have resulted in higher lift. In effect, your load/ram situation "wasted" most of the energy, luckily, I think. ;-)

Alright, let me try this image thing... and thanks again, everybody.  
---Dennis Okay. Doesn't work. I uploaded two graphs, clicked "insert image" and all it did was insert "null" in this text. So these are on my server: [Force of Ice](#), [Output](#)  
<http://www.makehydrogen.com>  
[ [Parent](#) ]

Re: Still Water Makes Deep Power for Cryonucleator ([none / 0](#)) (#8)  
by cryonucleator on Wed Jun 25th, 2003 at 03:46:16 PM MST  
([User Info](#)) <http://www.makehydrogen.com>

Dan B & Bryan-- forgot to answer your question directly, but the charts in my long response answer indirectly. Kwh equivalents are in one chart. That, as you both indicate, is the only meaningful way to express output, i.e., work divided by time = power. The conversion of ft-lbs to Kwh is...

1 hp = 550 ft-lbs/sec, 1 hp = 746 watts. And 1 Kwh is the continuous expenditure of 1 kilowatt for 1 hour. So if you have available 40,000 ft-lbs of work to use up in say 1 hour, divide by 3600 sec = ~11 ft-lbs/sec. Then 11 fps divided by 550 = .02 hp. Then .02 x 746 = 14.92 watts. So each cubic foot of water under these conditions yields .01492 Kwh. So 1000 cu-ft of water yields 14.92 Kwh (this is the rough amount at the freezing point, but the chart shows output starting a little colder, for 25.7 Kwh).

Thanks for friendly comments on my webpage. The spring-loaded storage device is actually not ideal, due to Hooke's law, which would result in 50% energy loss. Gravity storage is better. Used the spring because I thought it more understandable to folks. But thinking of changing it. Thanks again.

---Dennis

<http://www.makehydrogen.com>

[ [Parent](#) ]

Re: Still Water Makes Deep Power for Cryonucleator ([none / 0](#)) (#10)  
by Brian on Wed Jun 25th, 2003 at 06:05:07 PM MST  
([User Info](#))

Damn this HTML formatted option!! Sorry for the large block of text. The previous post is below with the appropriate "white spaces"

"Okay. "Energy" is technically defined in most physics books as "the potential to perform work." A definition accessible to most of us is found in the dictionary of Microsoft Bookshelf as "the potential of a physical system to do work." It might be more technically correct to refer to "ft-lbs" as work rather than energy, but I try to write in terms that are familiar to everyone." Potential energy, yes. Let's not forget kinetic or internal!!

The units of ft-lb is just fine by me for work and energy as they both can have the units of ft-lbs (which is required for applying the conservation of work and energy). My previous post showed just one example of how the units work out. I assume you used conservation of energy to calculate the potential energy output of the system you're designing so you should more than familiar with the concept. You're conversions look good to me. The only problem I have with the system proposed is if you're going to be able to freeze the water fast enough to generate the kind of power numbers you propose. Most people live in moderate climates and water doesn't freeze often and the temps don't get low enough to completely freeze that amount of water, which would limit the potential of the system making it difficult to get the kind of numbers you suggest in your power calculations.

In addition, the use of a ground water source at a temp of around 55-60 deg F would take way too much time to thaw the block of ice. I won't bother calculating it, but I know it would take a substantial amount of time at that temperature. The idea of using a geothermal ground source is a great remedy but most don't have access to such a supply. It would seem to me that using such a heat source would also slow the re-freezing of the water as the temperature was raised well above freezing temps due to the temps of the geothermal water supply.



Don't get me wrong, it sounds like a very promising design. One question, what fluid will you be using in your hydraulic system in addition to the water? If the temps are low enough to freeze the water in the expansion vessel, you would have to use a fluid other than water in your hydraulic system as it would freeze as well.

I look forward to hearing more. Brian

[ [Parent](#) ]

Cryonucleator: Power, Cyclic Rate, Drive fluid ([none / 0](#)) (#11)  
by cryonucleator on Wed Jun 25th, 2003 at 06:29:16 PM MST  
([User Info](#)) <http://www.makehydrogen.com>

Yeah, Brian, all good points to ponder. Will be facing these issues shortly, probably with the local university folks.

Well, once operating temp is reached, the user controls the rate of discharge, and therefore controls the power output. Or if using gravity storage, same thing. The rate at which fluid is allowed to escape is what determines power.

Drive fluid is non-freezing and can be almost anything that does not freeze. Oil, antifreeze, glycerol, etc. Sophisticated versions use a bladder to segregate the water charge from the drive fluid.

Really good point on cyclic rate you raise, i.e., specific heat. This depends on good heat exchange systems. With lots of conduits embedded in the charge. This applies to warm and cold sources. Actually, with adequate number of conduits, would cycle fairly rapidly. But would not cycle rapidly without embedded conduits, obviously. And melting does not mean getting the charge that warm. Fact is, you only want to raise its temp just above freezing, then start the freezing end again. Maintaining this narrow range operates like a switch and enables rapid cycling. Also, differential nucleation or choreographed nucleation (charges mixed with antifreeze) make the cycling possible at any temperature, even 'way below freezing.

What I really want is a reinforced concrete design that can take the pressure, so that anyone can build this as cheaply as possible. Looking forward to your comments.

Dennis  
<http://www.makehydrogen.com>  
[ [Parent](#) ]

Re: Cryonucleator: Power, Cyclic Rate, Drive fluid ([none / 0](#)) (#12)  
by Brian on Wed Jun 25th, 2003 at 07:40:11 PM MST  
([User Info](#))

The internet troll ate my first attempt at a response, so I'll try it again.

It's been quite a while since I touched any strengths of materials type problems so I can't really offer any suggestions on the design. Sorry

Regarding the conduits, I understand what you're saying. The greater the mass flow rate of water to thaw the ice the faster it will thaw, allowing for a faster cycle. Are you actually going to embed the conduit in the concrete? Concrete isn't the best thermal conductor with a thermal conductivity of around .81 Btu/(h\*ft\*deg R) so it would seem to me that the stronger the pressure vessel, the more concrete.....the more concrete, the longer it will take for the heat to be transferred from the water in the conduit to the ice. If there were a conduit available that could withstand the internal pressures associated with the device, it would be ideal to place them in direct contact with the ice to make the thawing process that much faster. It would also cut down on the losses....

Another possible problem I see with a concrete design is that it will actually make the freezing process slower as well. If it were possible to manufacture a container out of aluminum that would be able to withstand the pressures associated with such a process, that would definitely help get the cycle time down which would obviously increase the power production potential of the system. The downside to an aluminum design is the cost!!

During the freezing process, obviously the water in the conduit will not be flowing as this would substantially increase freezing time, if not preventing the water from freezing at all. If the water in the conduit is not flowing, it will freeze as well....rendering your system useless until the lines thaw out. How will you prevent this??

Also, how will you control the flow of water through the conduit? Seems that a micro controller utilizing a temperature probe which would control an electronically actuated valve would be ideal for keepng cycle times to an absolute minimum. Also adds to the cost though.

I look forward to hearing the actual numbers when you get around to building one!!

Brian

[ [Parent](#) ]

Re: Cryonucleator: Power, Cyclic Rate, Drive fluid ([none / 0](#)) (#13)  
by cryonucleator on Thu Jun 26th, 2003 at 06:27:45 PM MST  
([User Info](#)) <http://www.makehydrogen.com>

Brian, I have a hunch you're going to go far as an engineer. Yup, from the way you approach it, I agree that high heat transfer AI would be great. But the walls don't really have much to do with it... what I said was "This depends on good heat exchange systems. With lots of conduits embedded in the CHARGE." (my emphasis added). That means conduits inside the ice block. Remember I mentioned a "bladder"? That's where the water would be, and where the ice would be, and where the conduits would be.

Yes, of course a valve- for both hot and cold. And I mentioned before that the fluid in the conduits would be non-freezing, so by standing still they won't freeze. Your micro controller is a great idea too. The schematic for this is in the e-book that I issue with licenses. Lemmee see if I can find it on my server... give ya a preview... aha! got it- (my troll must be asleep ;- ) ) [complexsys.JPG](#) . Uh, this also shows the antinucleator injector/replenishment system. Thanks again, Brian. Was misspelling your name before. Sorry.

Dennis  
<http://www.makehydrogen.com>  
[ [Parent](#) ]

Re: Cryonucleator: Power, Cyclic Rate,  
Drive fluid ([none / 0](#)) (#14)  
by Brian on Thu Jun 26th, 2003 at 07:19:48  
PM MST  
([User Info](#))

Thanks for the compliment. It means a lot coming from someone with your obvious expertise. I'm just a 23 year old trying his best to make a future for himself! But if you talk to a certain other member....I'm just a would be patent thief stealing ideas!! Better watch out.... :-)

Thanks for posting the schematic. You never mentioned using heat exchangers at the hot and cold resevoirs (at least I dont think so...) which explains the problem I was having with the concept. I was under the impression that the fluid would be circulating through the system to melt the ice, then returned to the original source.....which was why the use of an anti-freeze wasn't fitting into my interpretation!! Poor fish.....

I can clearly see that you will have no trouble keeping the fluid from the hot resevoir from being frozen as it is a closed system, meaning you can utilize just about any fluid with a low freezing point and a high thermal conductivity without worrying about environmental issues.

I like the idea of using electrolysis to extract hydrogen from the additional water source. Makes the system that much more useful.

I hope it all works out for you. I look forward to seeing your device advertised and hope it takes off. A lot of money to be made out

there!! Good luck! Brian

[ [Parent](#) ]

Re: Cryonucleator: Power, Cyclic Rate, Drive fluid ([none / 0](#)) (#15)  
by cryonucleator on Fri Jun 27th, 2003 at 05:16:47 AM MST  
([User Info](#))  
<http://www.makehydrogen.com>

Thanks, Brian. Which engg discipline are you in? What do you want to specialize in? I mean, what really turns your crank, engg-wise? ---Dennis  
<http://www.makehydrogen.com>  
[ [Parent](#) ]

Re: Cryonucleator: Power, Cyclic Rate, Drive fluid ([none / 0](#)) (#16)  
by Brian on Sat Jun 28th, 2003 at 01:20:46 AM MST  
([User Info](#))

Well, I'm currently working on finishing up my BS in Mechanical Engineering. After graduation, I plan on going for my Masters in Thermodynamics.

What turns my crank?? CRANKS!! I am a car nut! I rebuilt my first engine at 12, my first tranny at 15, and have been going strong ever since. This may sound corny or something....but my dream job is working for the SVT(Special Vehicle Team) division at Ford designing high performance engines. Thermodynamics is extremely important in all engine design aspects, thus my desire to get my masters in Thermo.

Nothing beats the rumble of a high performance V-8.....

[ [Parent](#) ]



Re: Cryonucleator:  
Power, Cyclic Rate,  
Drive fluid ([none / 0](#))  
(#17)  
by Electric Ed on Sun Jun  
29th, 2003 at 06:25:41 AM  
MST  
([User Info](#))  
<http://www.electric-ed.com>

[quote]Nothing beats the  
rumble of a high  
performance  
V-8.....[/quote]

You got that right, Brian. My  
"toy" is an '82 Mustang with  
a 351 c.i.

Electric Ed

[ [Parent](#) ]

Re: Cryonucleator:  
Power, Cyclic Rate,  
Drive fluid ([none /](#)  
[0](#)) (#18)  
by Brian on Mon Jun  
30th, 2003 at  
03:00:38 PM MST  
([User Info](#))

Nice! Windsor??

I have the 351W in  
my Bronco right now  
and love it to death. It  
has close to 200,000  
miles on it now and  
still blows the doors  
off those pocket  
rocket Honda kids!!

My next project will be  
swapping out the 351  
for Fords new 6.8L  
V-10. Aluminum  
heads, SOHC, and  
tons of torque make it  
the perfect swap for  
my big hog. Best of  
all, there's no  
pushrods or  
lifters....so you can  
rev the guts out of it  
without floating the  
valves.

Not only that, you can  
get a lot more boost  
out of a supercharger  
at higher rpm!!! :-)

Good to see another  
Ford fan on the

board...Brian

[ [Parent](#) ]

Re: Still Water Makes Deep Power for Cryonucleator ([none / 0](#)) (#9)  
by Brian on Wed Jun 25th, 2003 at 06:02:24 PM MST  
([User Info](#))

"Okay. "Energy" is technically defined in most physics books as "the potential to perform work." A definition accessible to most of us is found in the dictionary of Microsoft Bookshelf as "the potential of a physical system to do work." It might be more technically correct to refer to "ft-lbs" as work rather than energy, but I try to write in terms that are familiar to everyone." Potential energy, yes. Let's not forget kinetic or internal!! The units of ft-lb is just fine by me for work and energy as they both can have the units of ft-lbs (which is required for applying the conservation of work and energy). My previous post showed just one example of how the units work out. I assume you used conservation of energy to calculate the potential energy output of the system you're designing so you should more than familiar with the concept. You're conversions look good to me. The only problem I have with the system proposed is if you're going to be able to freeze the water fast enough to generate the kind of power numbers you propose. Most people live in moderate climates and water doesn't freeze often and the temps don't get low enough to completely freeze that amount of water, which would limit the potential of the system making it difficult to get the kind of numbers you suggest in your power calculations. In addition, the use of a ground water source at a temp of around 55-60 deg F would take way too much time to thaw the block of ice. I won't bother calculating it, but I know it would take a substantial amount of time at that temperature. The idea of using a geothermal ground source is a great remedy but most don't have access to such a supply. It would seem to me that using such a heat source would also slow the re-freezing of the water as the temperature was raised well above freezing temps due to the temps of the geothermal water supply. Don't get me wrong, it sounds like a very promising design. One question, what fluid will you be using in your hydraulic system in addition to the water? If the temps are low enough to freeze the water in the expansion vessel, you would have to use a fluid other than water in your hydraulic system as it would freeze as well. I look forward to hearing more. Brian

[Still Water Makes Deep Power for Cryonucleator](#) | 18 comments (18 topical, 0 editorial)

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[water wheel](#)

By [Anonymous Hero](#), Section [Classifieds](#)

Posted on Wed Jun 18th, 2003 at 01:23:45 PM MST

[Hydro](#)

Wher do I put a water wheel on ebay?

I have a small Pelton water wheel, and would like to put it on ebay. what category would be best?  
Thanks Very much Ygraver

[water wheel](#) | 4 comments (4 topical, 0 editorial)

Re: water wheel ([none / 0](#)) (#1)  
by Anonymous Hero on Wed Jun 18th, 2003 at 02:01:44 PM MST

Go to electrical and there are a lot of catagories in that catagory as well. But if you put it under "Wind Generator" or "Windmill" alot of people use both (water wheels & wind) or like to dink around with both.

Those people come into discussion boards like this and word of mouth may find a home for it. There is alsos a "For Sale" section on this board.

Re: water wheel ([none / 0](#)) (#2)  
by WetinOR on Wed Jun 18th, 2003 at 06:27:52 PM MST  
([User Info](#))

Use: Home > All Categories > Home > Building & Repair Materials > Electrical > Alternative, Solar Energy

[ [Parent](#) ]

Re: water wheel ([none / 0](#)) (#3)  
by ygraver on Thu Jun 19th, 2003 at 02:03:27 PM MST  
([User Info](#))

Thanks VERY much!  
Its posted and if anyone here is interested, the number is: 2330137885).  
Thanks again. Ygraver.

[ [Parent](#) ]

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Re: water wheel ([none / 0](#)) (#4)  
by Homebrewed12vdc on Sat Oct 11th,  
2003 at 09:20:55 AM MST  
([User Info](#))

Do you still have that water wheel, if so I  
want it, my email is  
bearfalconer@hotmail.com. Thanks.

[ [Parent](#) ]

[water wheel](#) | 4 comments (4 topical, 0 editorial)

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## [AC/DC Hydro](#)

By [Anonymous Hero](#), Section [Homebrewed Electricity](#)

Posted on Thu May 22nd, 2003 at 10:15:02 PM MST

[Hydro](#)

Hydro set ups

Anyone out there in Hydro land ever try to run DC direct to an inverter skipping the battery process all together? If so how did you keep the voltage between 12 and 14? Or is anyone running an AC hydro and if so hows that set up?  
Thanks

[AC/DC Hydro](#) | 14 comments (14 topical, 0 editorial)

AC vs. DC... ([none / 0](#)) (#1)  
by [xeroid \(centurion27@lycos.com\)](#) on Fri May 23rd, 2003  
at 07:05:44 AM MST  
([User Info](#))

You could run a dynamo from a wind prop, but I think most folks around this board will agree that the downside of dynamos is the maintenance required on them. They require removal of the carbon dust from time to time, cleaning of the commutator etc. That's down time. It's also the hassle of tilting your tower up and down - a tricky and potentially dangerous operation that would best be done as few times as possible.

Also, if you're running DC direct to the inverter, keeping the power consistent when the wind is waxing and waning can be tricky at best. Scientists have proven that AC transmits better over distance, since the electron flow is just travelling back and forth in the conductor, rather than travelling the entire length of the circuit from your generator out on the tower to the inverter and back.

As for keeping the voltage between 12 and 14, honestly, I'm not sure how necessary that is. I do know that prolonged exposure a charging voltage that is too high for your batteries is a bad thing, but in quick bursts, your batteries can probably bear it (as in a gust of wind spiking the power for a few moments). To keep the voltage around a certain amount, you will need to set your machine up to furl before the wind can drive it to overspeed and produce to high a voltage. Also, with alternators, you can wire the machine in "star" wiring for 3 phase, to start, which gives higher voltage, but less amps. Then, once your machine gets going a little faster in higher winds, have a switching device to change the wiring to "delta", which gives double the amps but half the voltage of "star" wiring.

Check out Ed's site at <http://windstuffnow.com> for more details on 3 phase wiring and furling the wind generator.

Sorry for the book, but I hope this helps.

Regards,

Xeroid.

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Xeroid ([none / 0](#)) ([#4](#))

by Anonymous Hero on Fri May 23rd, 2003 at 04:56:54 PM MST

Thank you Xeroid,  
Now again,  
is anyone out there runnng AC HYDRO?  
thanks.

[ [Parent](#) ]

hmmmm ([none / 0](#)) ([#2](#))

by kurt on Fri May 23rd, 2003 at 12:51:17 PM MST  
([User Info](#))

the reason for using batteries in a hidro set up is that you can store power so that you can draw off more amps than your genny is making at any one time and make it up when the demand is less than the output. without batteries you have to size your genny to handle the max amp load you will ever draw but with batteries you just have to generate the same or more watts than you use. i.e.. use during the day charge at night. if you are not going to use batteries then you will need to control voltage by maintaining a constant speed. and if you are going to go to all that trouble it would make more sense to generate at 120v AC in the first place.



Kurt ([none / 0](#)) ([#3](#))

by Anonymous Hero on Fri May 23rd, 2003 at 04:54:43 PM MST

Okay that is the question, does anyone out there generate 120, with a hydro direct to the usage and how difficult is that? Or, if I use batteries, would the hydro pretty much keep them charged all the time since the hydro is running all the time? Thanks

[ [Parent](#) ]

ac dc hydro ([none / 0](#)) (#5)

by Anonymous Hero on Fri May 23rd, 2003 at 09:38:46 PM MST

You can run 12 volts into the inverter and run that so long as the supply is constant. It is not easy. Power supply fluctuations and load fluctuations can dump the voltage below 10 volts temporarily which will shut down the inverter. Thus the battery. It gives you elasticity, even if you are consuming all you produce continuously. In lieu of a battery, maybe a huge electrolytic canister? (for the surges and load voltage dumps) Why don't you want to use batteries? Is there some logistical problem in your project? jungle Bill

Hydro AC ([none / 0](#)) (#6)

by Anonymous Hero on Fri May 23rd, 2003 at 10:18:09 PM MST

Hi Anonymous,  
Thanks for the info. Yes if I can get a constant 15 or 16 volts from a steady hydro and regulate it somehow so only 12 or 13 volts are making it to the inverter, that is what I want to do.

I'm thinking batteries are just more maintenance, unless there are other benefits to batteries I'm not looking at? I'm thinking the inverter can run a half size refrigerator, TV and cable box, on an extension cord. Is this possible? Thank you.

[ [Parent](#) ]

inverter ([none / 0](#)) (#8)

by Anonymous Hero on Sat May 24th, 2003 at 01:43:06 PM MST

I have a small 1/2 size fridge . It is like a college dorm thing. It consumes 75 watts , but when it turns on there is likely closer to 700 watt punch for 3-4 seconds until the compressor is up to speed. Fridges can create huge voltage drops when coming on. Thats where I see the problem that in my eyes could be solved with a battery. For what you want to do, just an old junker would likely work. Just to act as a bumper so as not to shut down the inverter when the fridge comes on . the tv and cable box are nothing. However TVs work better on high quality inverters. My el cheapo Stat power one of 300 watts ran the vcr and tv , but the tv was ugly with poor color and resonance. It also made a disturbing noise that could only be construed as low grade power supply. Jungle Bill

[ [Parent](#) ]

inverter ([none / 0](#)) (#9)  
by Anonymous Hero on Sat May 24th, 2003 at 02:53:01 PM MST

Thanks Bill, So if I get a true sine 800 watt or higher, I can have a back up battery connected at the same time for when the refrigerator kicks in?

[ [Parent](#) ]

This may help, how others have done it. ([none / 0](#)) (#7)  
by wpowokal on Sat May 24th, 2003 at 05:16:40 AM MST ([User Info](#))

<http://www.homepower.com/files/homebrewhydro.pdf>

Response ([none / 0](#)) (#10)  
by Anonymous Hero on Sat May 24th, 2003 at 06:59:55 PM MST

That does help thanks. But I've always wondered what .PDF files are for? Are they to prevent people from saving it to their own files? Do I have to go to that site everytime I want to look? Ink cost a bit and I don't want to print the whole thing if I don't have to. Does anyone know a shortcut around that? Thank You.

[ [Parent](#) ]



PDF files ([none / 0](#)) (#11)

by Bach On on Sat May 24th, 2003 at 07:30:32 PM MST  
([User Info](#)) [change AT: bach\\_on AT hotmail.com](#)

The reason many sites put stuff in PDF format is that it is very portable and doesn't take up as much disk space (bandwidth) as putting the stuff in HTML for a webpage. Some folks don't have Word. And not all word processors can read stuff written in other formats.

The Acrobat Reader program is free. Once you have the PDF file loaded, look up in the left corner and you will see a diskette. You can use that to save the file to a drive or anyplace else. It can be opened later - no need to print it.

Adobe makes its money by selling the program used to create PDF files. I don't think you can do that with just the reader.

Bach On

- I'm just as happy as if I had good sense! -

800 watt inverter. ([none / 0](#)) (#12)

by Anonymous Hero on Sat May 24th, 2003 at 10:16:11 PM MST

Yep , that should do it. You can get a 700 watt unit ( eliminator from motomaster for about 40 USD ) but it is a cheapo. square wave. Who knows, for that amount , I'd try it. fridge motors are not that delicate. It has a 1000 watt surge and can hold 700 watts for 10 minutes/ 500 watts permanently. You may want to exercise the cheap option first. Find a trasher battery from a local garage or just about any one has one kicking around. As long as it is not broken or leaking , you can use it to balast the surge. (If it can light up a car head light for 30 seconds) . You might even find 4 or 5 for FREE and actually have a half decent battery bank. Maintenance? who cares, you did not pay nothing, keep finding old ones and put them in. Have fun . It really is when it comes next to free. Jungle Bill

thanks ([none / 0](#)) (#13)

by Anonymous Hero on Thu May 29th, 2003 at 12:47:27 AM MST

Thank you all for your information. Great site!

[ [Parent](#) ]

Answers. ([none / 0](#)) (#14)

by Johnny Cool Pants on Fri May 30th, 2003 at 06:33:16 AM MST  
([User Info](#))

When ever I don't know something, I come in under "Anonymous" to ask. You've all been a great help. Thanks again.

XOXOXOX  
Johnny Cool Pants

[ [Parent](#) ]

[AC/DC Hydro](#) | 14 comments (14 topical, 0 editorial)

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### [Hydro](#)

By [Johnny Cool Pants](#), Section [Homebrewed Electricity](#)

Posted on Tue May 13th, 2003 at 03:58:21 PM MST

[Hydro](#)

Good Link

I don't know if I already posted this but this is a good link for people interested in Hydro and water wheels  
<http://home.carolina.rr.com/unclejoe/menu.html>

Damn The Torpedos, Johnny Cool Pants

[Hydro](#) | 1 comment (1 topical, 0 editorial)

Re: Hydro ([none / 0](#)) ([#1](#))  
by Anonymous Hero on Fri Jun 20th, 2003 at 10:28:46 AM MST

jdanhk: to cool pants: water power. My research in developing water/anti-freeze power is feasible to use the same quantity of water over and over again less evaporation. With the first fill for power source a well can be driven to supplement the evaporation or catch rain water or any small stream. The system is portable to erect and be used almost anywhere in the world. If interested e-mail at [jdolci@ij.net](mailto:jdolci@ij.net) jdanhk

[Hydro](#) | 1 comment (1 topical, 0 editorial)

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### [AC genny back into grid feed](#)

By [Anonymous Hero](#), Section [Homebrewed Electricity](#)

Posted on Fri May 9th, 2003 at 09:55:47 PM MST

[Hydro](#)

AC genny back into grid feed

Hi, Do I have to call the power company and have them hook up the feed from my AC genny back into their power grid?

If so, will they do it for one simple waterfall on my property? It runs year round.

Also is there an AC motor I can use in reverse or do I have to rewire one? Thanks.

[AC genny back into grid feed](#) | 2 comments (2 topical, 0 editorial)

Feed back ([none / 0](#)) ([#1](#))

by [wpowokal](#) on Mon May 12th, 2003 at 05:20:15 AM MST ([User Info](#))

What no takers on this one, all busy arguing I guess, he he.

Wherever in the world you are, you should, consult you energy supplier before backfeeding into a grid. There are very important safety issues, but alas I will refrain.

Certainly in OZ energy suppliers are interested in buying renewable energy, a continuous stream would be very viable.

As to what type of generator, I will leave that to more experienced posters, but a similar project I reserched here in OZ was very viable so go for it.

regards Allan

feeding homemade power to the grid ([none / 0](#)) ([#2](#))

by ADMIN ([admin@otherpower.com](#)) on Tue May 13th, 2003 at 11:37:02 AM MST ([User Info](#))

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Yes, you have to call the power company. After you fill out pages and pages of forms, and pay them money (lots or only a little depending on where you are) they will install a meter (or re-configure your existing one) that tracks power going both ways instead of only one way. This depends on the net metering/net billing laws in your state, and your state PUC rulings on the subject, determine whether your production counts as retail or wholesale electricity rates.

Or, you can go "guerilla hydro" and feed your extra power back to the grid whether they like it or not. Your excess power production will not affect your bill this way, but the current crop of grid-tie inverters (whether large and expensive or tiny and cheap) will NOT let your power source electrocute a lineman working on a downed line. If the grid fails, so does your power feed to it.

If you do your own grid-tie system with a synchronous genny on your hydro plant --you could easily put a power company worker in jeopardy.

DANF

[AC genny back into grid feed](#) | 2 comments (2 topical, 0 editorial)

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### [Waterwheel power for \\$20.00](#)

By [Juliang](#), Section [Homebrewed Electricity](#)  
Posted on Mon Apr 14th, 2003 at 05:02:26 AM MST [Hydro](#)

Hello all This is my 1st posting. I've been reading this(and the old discussion board) with quite some interest for the past 3 or 4 months.

The information here in has been invaluable. Thanks to you all I've been inspired to try my own project (and of course the wife nagging me to get out of the house). With a whole lotta luck, some good contacts and a bunch of stuff lying around the property I've made a simple waterwheel that after the nagging lights up my wife's life. OK OK it generates power to charge batteries for lights in our horse barn. She got tired of carrying the batteries back to the house for charging. I've managed to spend only \$20.00(for the sprockets and chain) everything else I acquired for free. If you are interested check out at our web page <http://www.twobitranch.net> PS please excuse the mess I was pretty excited to have it running so didn't even bother to clean up when I took these photos.

[Waterwheel power for \\$20.00](#) | 8 comments (8 topical, 0 editorial)

Totally Cool! ([none / 0](#)) ([#1](#))  
by [WetinOR](#) on Sat Apr 5th, 2003 at 02:00:53 PM MST  
([User Info](#))

Man, I'm jealous! That is a very cool homebrew water wheel setup you have! George

Where are the photos? ([none / 0](#)) ([#5](#))  
by [Anonymous Hero](#) on Sun Apr 6th, 2003 at 10:29:25 AM MST

How come others can obviously see the photos, and I can't?  
Do I have to click on some link, or maybe I have to have a "user account"?

Ed

[ [Parent](#) ]

Re: Where are the photos? ([none / 0](#)) ([#6](#))  
by [Crippy](#) on Sun Apr 6th, 2003 at 09:30:45 PM MST  
([User Info](#)) <http://windpower.jkcc.com>

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- <http://www.twobitranch.net>
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The URL of his site is in his message.

"If you are interested check out at our web page [www.twobitranch.net](http://www.twobitranch.net)"

[Windpower - first attempt](#)

[ [Parent](#) ]

Re: Water wheel power ([none / 0](#)) (#2)  
by Crippy on Sat Apr 5th, 2003 at 08:26:38 PM MST  
([User Info](#)) <http://windpower.jkcc.com>

Too cool. Did you have to dam the creek any or did you just run the old eaves trough back far enough to get a bit of a head?

How much of the year do you think it'll produce power for you? I guess even if you get snow/ice, you'll never have to worry about the eaves trough rupturing/bursting on you :)

[Windpower - first attempt](#)

Waterwheel power ([none / 0](#)) (#3)  
by Juliang on Sun Apr 6th, 2003 at 08:43:59 AM MST  
([User Info](#))

I was lucky to not have to dam the stream. Where the guttering picks up the water there is a natural waterfall of about 2-3ft. The ground also slopes away to get enough head for the wheel, which is 4 ft in diameter. I'm guessing about 7-8 months of the year it'll run. I'm finding that since I don't have a regulator at this time I'm slowing the water intake to produce less power to my batteries so it remains to be seen how long it will run. So it may run well into the summer even when it gets very low. Of course the system is really intended for the winter (when there is lots of water). The Horses stay out of the barn during the summer. Here in Oregon's Southern Willamette valley we get very little snow or hard enough freezes to worry about rupturing/bursting.

[ [Parent](#) ]

I like it ([none / 0](#)) (#4)  
by TomW on Sun Apr 6th, 2003 at 08:53:33 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

I like it and I am jealous. No hydro available on our land.

Very good example of what you can do for a minimum of \$\$.

Any figures on out put like how big is the battery it charges or how many hours of lighting do you get daily from it?

Any amps is good amps and with hydro its 24/7 so it adds up nicely.

What kind of motor is it driving as a genny what gearing, rpm, whats going on at the upper end of the eavespouts, etc? More questions but I'll leave it for another time.

Anyway, BRAVO, give yourself a pat on the back and hope it gives you a warm fuzzy feeling harvesting that hydro. It would here.

Cheers.

TomW

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Specifications ([none / 0](#)) (#7)

by Juliang on Mon Apr 7th, 2003 at 08:31:35 PM MST

[\(User Info\)](#)

Thanks guys. The motor is a Baldor DC 1/2hp permanent magnet motor rated at 90V 1725rpm 4.8amps It's off a stretch wrap machine. There is a 60 tooth 40pitch sprocket on the wheel shaft and a 12 tooth 40 pitch on the motor shaft. The wheel when running flat out generates about 9.5volts. I charged the batteries, 2 x 6 volt Electric pallet jack batteries which where going to be thrown away by a local fork lift shop, before I wired them up. A couple of the cells didn't look so great but the price was right so I filled them with water and away they went. For charging I hook the batteries up in parallel(6v) and for lighting I switch them to series(12v). I still have to figure out a switch that will do this in one movement. I ran the lights for a while watching the volts drop I then hooked up the wire from the wheel. The volts from the wheel dropped to about 7.5+ volts at about 1/2 an amp. (there is no voltage drop from the wheel to the batteries about 60ft with no load) I'm going to run the batteries down and then see what the readings are and how long it will take to recharge. So far with the wheel running 24/7 I've got to much charging power to keep the batteries hooked up all the time. Julian

[ [Parent](#) ]

My bad... ([none / 0](#)) (#8)

by TomW on Mon Apr 14th, 2003 at 05:13:32 AM MST

[\(User Info\)](#) <http://oneota.net/~earthsourcepowr/>



While editing the link in this story so it was clickable I messed up and it got saved as a "new" story.

So if anyone was wondering how come it popped back up as a new story thats the reason.

Sorry for any confusion but I'm learning the ropes on this new board, too.

Cheers.

TomW

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[Waterwheel power for \\$20.00](#) | 8 comments (8 topical, 0 editorial)

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## [Miniature Axial Dual Rotor Generator tests Cont...](#)

By [bill541](#), Section [Homebrewed Electricity](#) [Magnetism](#)

Posted on Wed Dec 31st, 2003 at 07:13:51 PM MST

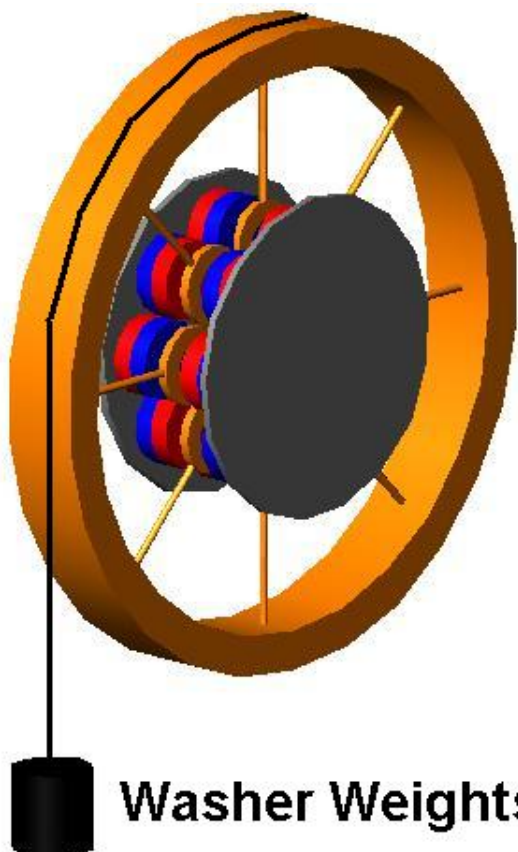
This is a continuation of tests performed on a small generator. These are the results of a cogging test when ferrous cores are used.

Hello all, this is a continuation of the same project as described in a previous posting.

<http://www.fieldlines.com/story/2003/12/27/202634/91>

Concerns of cogging were raised when I introduced ferrous cores between the two magnetic rotors.

To set up the test, I used the same dual 8-magnet rotors as before. Instead of installing all the cores, I used steel washers to simulate the ferrous "spool" cores. Gluing the washers on a plastic mayonnaise jar lid (represented by orange in the picture) provided a method to test the cogging torque caused by the ferrous material. I used a length of fishing line and wrapped it around the jar lid and then hung washer weights until the stator section began to rotate.



**Washer Weights**

By using this method, I could change the configuration and measure the differences in cogging resistance. Each washer weight is 1/50 of an oz. (0.567 grams). See the

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following tests.

1. No washers mounted on plastic lid. It took (0.567 grams) of force to turn the stator section. This is mainly due to friction. This friction applies to all other tests.
2. 8 washers mounted on plastic lid with only a single magnet rotor. It took (11.9 grams) of force to turn the stator section. Simulates 8 spool coils in stator.
3. 8 washers mounted on plastic lid with dual magnet rotor. The magnet rotors were aligned to attract each other (Same as in the picture). It took (3.4 grams) of force to turn the stator section. Simulates 8 spool coils in stator.
4. 8 washers mounted on plastic lid with dual magnet rotor. The magnet rotors were aligned to repel each other. It took (26.65 grams) of force to turn the stator section. This would not generate electricity, but I wanted to see what it would do.
5. 7 washers mounted on plastic lid with only a single magnet rotor. It took (4.54 grams) of force to turn the stator section. Simulates 7 spool coils in stator.
6. 7 washers mounted on plastic lid with dual magnet rotor. The magnet rotors were aligned to attract each other (Same as in the picture). It took (2.84 grams) of force to turn the stator section. Simulates 7 spool coils in stator.
7. 7 washers mounted on plastic lid with dual magnet rotor. The magnet rotors were aligned to repel each other. It took (7.94 grams) of force to turn the stator section.

What surprised me the most was when I added the second magnetic rotor, the cogging resistance went way down as compared to a single magnetic rotor.

When using the 8 "spools" and dual rotors, the turning resistance was quite smooth and even. When I changed to a 7 "spool" dual rotor configuration, the resistance was a bit "coggy" and also made the jar lid wobble sideways.

I did not have enough room to place more than 8 "spools" on the jar lid, but I think an even number of coils is the way to go for smooth operation. Even with 8 coils, a person could run a split phase output and have the option of series or parallel winding connections.

Question: Since I am using round magnets and round stator cores, would this show less cogging than a rectangular magnet/ coil generator?

When a generator is under load, there is current flowing in the stator windings. With current flow in a coil of wire, there is a corresponding magnetic field generated around the coil.

Question: Why would the magnetic field generated by an air core coil under load be any different than a ferrous core coil under the same load?

It seems to me that for a given current and inductance, the cogging effects would be the same for a given generator configuration.

A dual magnetic rotor and ferrous coil cores thus far does not seem to have much adverse effect when compared to power gain to be had.

Any thoughts on this guys?

Take care, Bill

[Miniature Axial Dual Rotor Generator tests Cont...](#) | 0 comments (0 topical, 0 editorial)

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## [A big magnet OR a few small magnets?](#)

By [iwico](#), Section [Magnets & Magnetism](#) [Magnetism](#)

Posted on Wed Dec 31st, 2003 at 05:51:06 AM MST

Hi, My question is: Which is more stronger? a big magnet or few small magnets stick together? (the strong grand of the magnets are same)

I need do this to save the cost of big magnet on my product--Batteryless bicycle light system.

[www.freelights.co.uk](http://www.freelights.co.uk)

[A big magnet OR a few small magnets?](#) | 2 comments (2 topical, 0 editorial)

Re: A big magnet OR a few small magnets? ([none / 0](#)) (#1)  
by [wooferhound](#) ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Wed Dec 31st, 2003 at 11:21:44 AM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

No Batteries huh . . . What happens when you stop the bike ?

A a Bigger magnet is stronger than two magnets stuck together equaling the size of the larger magnet.

}=- W o o f -= {

Re: A big magnet OR a few small magnets? ([none / 0](#)) (#2)  
by [iwico](#) on Fri Jan 2nd, 2004 at 10:22:49 AM MST  
([User Info](#))

There is a standby version of this light system. The standby light will be lite after you ride for about 1--2 minutes. and it will keep on for 1-2 minutes after you stops ride. The energy is stored in a capacitor or rechargeabel battery. Thanks for your anwser. <http://www.freelights.co.uk>

[A big magnet OR a few small magnets?](#) | 2 comments (2 topical, 0 editorial)

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## [Magnetic Brushes for Axial Flux Path](#)

By [SteveM](#), Section [Homebrewed Electricity](#)

Posted on Tue Dec 30th, 2003 at 07:10:48 PM MST

[Magnetism](#)

<br> Need help to understand how generator brushes and comutator contacts work?

---

I have been following this board for some time now and really enjoy the diversity and range of talents. Just reading all of the ideas has inspired a lot of thought toward the conception of a unique design. I am currently in the planning stage but hope to start a scale version of an axial flux design for experimentation.

This brings me to the heart of my inquiry. What if the magnetic circuit in a axial flux design was improved to increase the flux in the coil centers. In Wild Bill's recent post, he showed a 400 % improvement by adding high permeable material in the center of the coils. The flux still had to leap across two air gaps in its path.

What if we take it a step further, and add brushes that conduct magnetic flux across the air gaps. When the magnets rotate inline with the spool, a brush or button or something contacts the magnet directly, providing a more efficient physical path for the flux to travel along. The ends of the brushes would be connected to the material in the center of the coils.

I know a cogging question was raised about this proposal. I thought that the magnet patterns between the disks could be clocked a 1/2 diameter of the magnets width to reduce this effect.

Looking for ideas and design suggestions for experimenting. I haven't taken apart a commutator or brushes in a generator set to get a grip on how they have solved these problems. It occured to me to post the question and see if anyone can help with this one.

Regards,

Steve M

[Magnetic Brushes for Axial Flux Path](#) | 8 comments (8 topical, 0 editorial)

Re: Magnetic Brushes for Axial Flux Path ([none / 0](#)) ([#1](#))  
by [SteveM](#) on Tue Dec 30th, 2003 at 07:17:39 PM MST  
([User Info](#))

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In my text I was reffering to Bill541 not Wild Bill sorry for the mix up and here is the posting address:

ttp://www.fieldlines.com/story/2003/12/27/202634/91

Regards,

Steve M

Re: Magnetic Brushes for Axial Flux Path ([none / 0](#)) ([#2](#))  
by drdongle on Tue Dec 30th, 2003 at 09:05:02 PM MST  
([User Info](#))

Interesting idea, though I can foresee problems with added friction between the "magnetic" brushes and the surface they bare against, as well as the eventual wearing away of the "magnetic" brush material.

Dr.D

Re: Magnetic Brushes for Axial Flux Path ([none / 0](#)) ([#3](#))  
by kell on Tue Dec 30th, 2003 at 09:26:32 PM MST  
([User Info](#))

You'll make your brushes out of some ferromagnetic material to increase permeability in the coils? Silicon steel, soft iron, ferrite, powdered iron, whatever... I can just see a ferromagnetic brush glomming onto the first mag it touches, not just cogging but mechanically locking up your genny. In other words, your brushes would have to be made of something that is not attracted to magnets. But what?

Anybody out there know: Is there some non-ferromagnetic high-permeability material?

Re: Magnetic Brushes for Axial Flux Path ([none / 0](#)) ([#4](#))  
by drdongle on Wed Dec 31st, 2003 at 05:26:23 AM MST  
([User Info](#))

Excellent point, the brushes would have to pass or channel the field but not be affected by it, can't be done.

Dr.D

[ [Parent](#) ]

Re: Magnetic Brushes for Axial Flux Path ([none / 0](#)) ([#5](#))  
by SteveM on Wed Dec 31st, 2003 at 06:54:26 AM MST  
([User Info](#))



Thank you for your comments?

Have a few more thoughts to explore with this one and would greatly appreciate reply's.

I have been trying to compare the advantages and disadvantages of a physical path for flux. I wonder if a very small brush (lets say strands of wire) would increase the flux without the penalty of a cogging problem?

How about a radial arrangement of magnet and brushes that minimize the attraction at one angular position. Each sequential magnet and brush would have a unique position such that when one brush is in the center of a magnet their is another pulling toward the next?

I really hadn't invisioned a brush contacting the polar face of the magnet directly. I was thinking of some type of shallow sloped thin steel strips on boths sides of the gap that gentally touch as they passed each other. I was planning on a minimal interference say (.002 inch) between the strips.

The attraction issue really has me puzzled about this concept. If a means was develeped to provide a good physical path without a cogging problem, would the generator need more power to drive the machine?

Regards,

SteveM

Re: Magnetic Brushes for Axial Flux Path ([none / 0](#))  
([#6](#))  
by Harry Luubovv on Wed Dec 31st, 2003 at 12:49:15 PM  
MST  
([User Info](#))

Hi Steve M.

I like your idea of brusing along to pass the mag flux. However, we must not forget, that the coils would have to pyhsically pass and actually cut off the flux in a timing fashion. How can the coils pass the brushes when they are two real physical items one bearing against the magnet one direction, while the coils travel across in the other direction ? Aside from this physical bound, then if the brush were to continue to pass flux over, how can the flux be cut ? If the flux path is not cut, there is no electricity produced.

Ciao,  
We have to keep thinking.....  
Something good will happen one day.... I guess :-)  
Luubovv.

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Re: Magnetic Brushes for Axial Flux Path ([none / 0](#)) ([#7](#))  
by SteveM on Thu Jan 1st, 2004 at 07:02:34 PM MST  
([User Info](#))

I have been reviewing magnetic permeability which is a substances resistance to magnetic flux. Materials with higher values conduct flux more easily. Relative values are how many more times that material will conduct flux. Studying web site <http://www.ee.surrey.ac.uk/Workshop/advice/coils/terms.html#seq> it mentions that air, wood, and plastic have values around 1. Iron has a value of 5000, and silicon steel near 40,000 (wow). I need to look at this in more detail to investigate, saturation, eddy currents, temperature, and other concerns. (Silicon steel sure looks interesting as a core material) I have also seen magnetic flux references that suggest that a magnetic circuit crudely performs like a simple electric circuit  $v=i*r$ . If resistors are in series then we add the values and solve for current. If we have an axial flux magnetic circuit then  $EMF= I*(R \text{ air gap } 1 + R \text{ spool } + R \text{ air gap } 2)$  If any of the r's are large than the performance across the circuit will be poor. Bill541 in showing a good improvement by adding a magnetic conductor in the coil center. I am trying to add to it and create a physical instantaneous link to lower the complete magnetic resistance across the circuit. (Plus I would like to avoid a cogging problem) I will try to add a paint picture to represent this concept (excuse the art it's a little ruff). The red blocks represent magnets in an axial flux section. The yellow shaped sections could be either a strip of metal or a formed metal button. These would be glued to the magnets and would create a ramp for the brushes to contact. The component between the magnets is a spool made of a cylinder and two round plates. The cylinder has two brushes in the center seperated with a coil spring to keep them pushed out. When the magnets rotate the center of the ramp will contact the brush and provide an instantaneous direct flux path while the magnets are inline with the coils. The path is broken once the contact seperates from the ramps. Love the comments please tell me what you think. Regards, Steve M

Re: Magnetic Brushes for Axial Flux Path ([none / 0](#)) ([#8](#))  
by SteveM on Thu Jan 1st, 2004 at 07:23:27 PM MST  
([User Info](#))

Sorry for the continuous text block. Not sure what happened but it got compressed to look like a neverending paragraph. I had trouble with the paint attachment so I put it in the my photo uploads called magnetic brush. The small black circles are the coil windings around the spool.

Regards,

Steve M

[Magnetic Brushes for Axial Flux Path](#) | 8 comments (8 topical, 0 editorial)

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### [QUESTION ON MAGNETS](#)

By [ARMEZ](#), Section [Magnets & Magnetism](#)

Posted on Mon Dec 29th, 2003 at 06:38:18 PM MST [Magnetism](#)

I AM HAVING TROUBLE WITH POSTING QUESTIONS. I HAVE POSTED THIS QUESTION BEFORE BUT I AM HAVING TROUBLE FINDING IT POSTED.

I WANT TO KNOW IF IT IS POSSIBLE TO CREATE A MAGNET THAT HAS A MAGNETIC PULL THAT EXTENDS APPROXIMATELY FOUR FEET SO THAT IF A HAD A SOFT MATERIAL OBJECT FOUR FEET A AWAY FROM ME IT WOULD ATTRACT THAT OBJECT WITH THE SAME AMOUNT OF POWER THROUGH OUT THE FOUR FEET.

[QUESTION ON MAGNETS](#) | 3 comments (3 topical, 0 editorial)

Re: QUESTION ON MAGNETS ([none / 0](#)) ([#1](#))  
by kurt on Mon Dec 29th, 2003 at 06:50:25 PM MST  
([User Info](#))

hmmm mite try hitting that bupaten that says (capslock) on your keyboard



Re: QUESTION ON MAGNETS ([none / 0](#)) ([#2](#))  
by kell on Mon Dec 29th, 2003 at 07:07:12 PM MST  
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What do you mean "soft material?" It has to be something that a magnet will attract, which for all practical purposes means iron or steel.

No magnet exerts the same amount of force regardless of distance. All magnets exert less force at greater distance, and you get to a point where the attraction is so small you can't even measure it, let alone make use of it. Also: four feet is way too far. If you're talking about permanent magnets you could never hope to get your hands on a permanent magnet strong enough to exert useful force at four feet. Electromagnets are another matter... if you've got the dollars to build on an industrial scale.

Also, just for the sake of argument, if you could find a permanent magnet that strong you would be risking permanent injury or death just handling it around everyday objects. Get between it and a hunk of steel and it would crush you.

Or maybe I just misunderstood your post.

Re: QUESTION ON MAGNETS ([none / 0](#)) ([#3](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon  
Dec 29th, 2003 at 07:23:10 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Kell is right, you won't find a magnet, electric or permanent that will have a force that you describe. If your looking for a magnet that has a large field, your looking for a ceramic magnet. I have some ring magnets that will affect a TV from 4 ft away. They are 8 inches in diameter with a 4 inch hole and are 3/4" thick. They aren't real strong in the sense a neo is but the field size is impressive.

Have Fun!  
Ed

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### [German Patent Office website](#)

By [cevonk](#), Section [Homebrewed Electricity](#)  
Posted on Mon Dec 29th, 2003 at 02:52:27 PM MST [Magnetism](#)  
LOTS of cool stuff here!

Here is a link to the German Patent Office's web-server. There is an English page, and several search engines. Lots of cool stuff from Stirling to generators to anything you can think of. Not just German patents, either, but patents from many countries, US CA FR JP, etc.

Below is a link to a Canadian patent for an Improved Permanent Magnet Generator. Don't know if the link will work as is but the website has lots of stuff.

<http://depatisnet.dpma.de>

[German Patent Office website](#) | 3 comments (3 topical, 0 editorial)

Re: German Patent Office website ([none / 0](#)) ([#1](#))  
by [cevonk\(atsignhere\)aol.com](#) on Mon Dec 29th, 2003 at 07:10:25 PM MST  
([User Info](#))

<http://depatisnet.dpma.de>

Here is the link for the main website. If you do a Dogpile or Google search for German Patent Office, you will be able to find it.

Lots of the patents are in .pdf format. At first I thought that only the first page of the patent was available, but finally I noticed the page forward buttons on the Adobe Acrobat reader, and I was able to look at each page.

If you go to their search engine and paste in this document ID number you can find the patent that I mentioned specifically:

CA0002368426A1-24862821926

Re: German Patent Office website ([none / 0](#)) ([#2](#))  
by [cevonk\(atsignhere\)aol.com](#) on Mon Dec 29th, 2003 at 11:28:16 PM MST  
([User Info](#))

Interesting patent for a Hallback array dynamo. I think someone mentioned that as an idea in here before.

Go to main website and use the search engine to find this document ID:

EP0001263116A2

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Re: German Patent Office website ([none / 0](#)) (#3)  
by [cevonk\(atsignhere\)aol.com](#) on Mon Dec 29th,  
2003 at 11:35:13 PM MST  
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Whoa! Here's another neat one. Supposedly this design is good for small generators running at variable speeds, with lots of features that have been kicked around here:

EP0001237262A1

[German Patent Office website](#) | 3 comments (3 topical, 0 editorial)

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## [Miniature Axial Flux Generator Experiments](#)

By [bill541](#), Section [Homebrewed Electricity](#) [Magnetism](#)

Posted on Sat Dec 27th, 2003 at 08:26:34 PM MST

Experiments on a small axial flux generator using ferrous cores in the coils.

---

Hello All,

I must say it has been fun reading all the postings on Fieldlines. I have come to realize that there are a lot of talented tinkerers out there!

I've been interested in VAWTs for a while and the thought of building one is very intriguing. I have been playing with some very small models to help me learn about them as well as extensive reading on the Internet. I have a few "lawn toys" out spinning in the wind as of this writing.

One thing about home brew projects is that they must be reasonably simple to build. In visiting Hugh Piggott's web site I was introduced to the axial flux generator. What a great design and simple to build! I was especially interested in the dual rotor design. So I sat down and began building a miniature version to test on the bench.

My wife had 20 or so 1/2" diameter (very weak) refrigerator magnets that looked like they would work fine for my tests. So I built up two 2" diameter steel disks and mounted 8 magnets to each. Then used a 1/4-20 bolt and nuts to form a mandrel that holds the disks in proper alignment. An old power drill was mounted to a board and holds the dual rotor assembly. The drill motor is powered from a light dimmer to control the speed. Since the drill motor is small, a light dimmer works fine.

Now I could begin testing coil configurations. In viewing the designs presented on the Internet, I noticed that the dual rotor generators were always using air-core coils. In working with electronics for many years now, I was curious if the coils would benefit from using a ferrite or iron core.

For the tests, I used a single coil mounted on a test fixture and placed between the dual magnet rotor. I made measurements from 250 to 1500 RPMs. Each coil was 66 turns of 28AWG around a 0.25" core. The coil was loaded with a 1.5-ohm resistor and the voltage was measured across this resistor to be used to calculate the power output during each coil test.

Measurements were done with a Fluke model 187 DMM. This meter can measure the frequency of the sine wave produced as well as the RMS voltage across the resistor. Simple calculations were made to determine the frequency at various RPMs. This way all of my measurement points would be the same.

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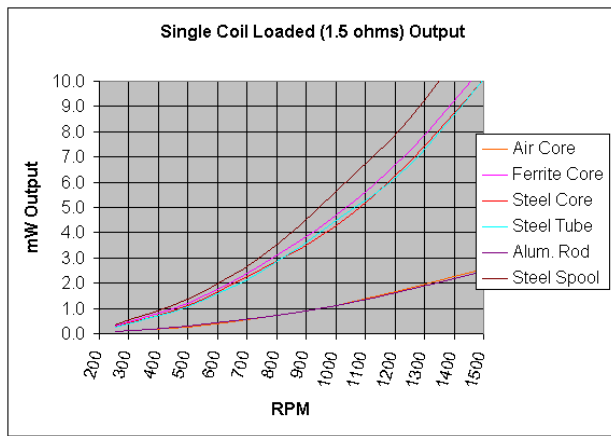
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Keep in mind the power output is not impressive, but that was not the intention of the experiments.

To keep the tests consistent, I wound a 66-turn coil around a rubber grommet with a 1/4" diameter hole in it. This way I could change the core material out without disturbing the coil itself.

First was the Air Core, it produced a whopping 41 mV across the resistor at 1000 RPM. This equates to 1.121 mW of power.

Next I inserted a Ferrite core into the coil and repeated the tests. I was a bit surprised at the magnitude of gain. The coil now produced over 4 times the power (4.7 mW) under the same load.

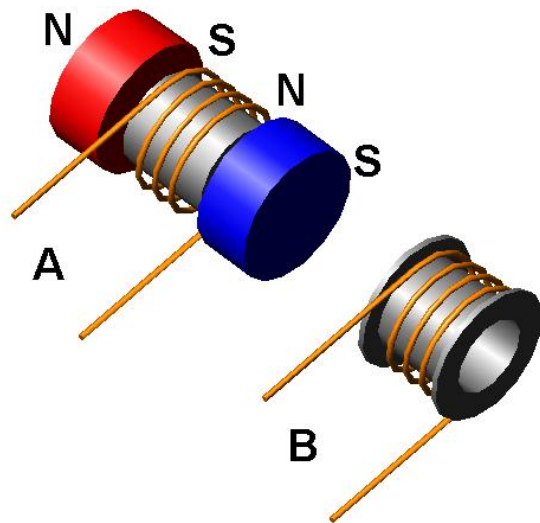
Next I tried a mild steel solid core and also a steel tube with similar results. These also provided a substantial improvement over the air core.

To satisfy my curiosity, I also tried an aluminum core. No big surprise here, the output was very similar to that of an air core.

The final test was with an all steel coil form in the shape of a spool with a hollow center. My thought here was to make the spool outside diameter the same as the magnet diameter. I tried to be very careful and duplicate the dimensions of the first coils, with the same number of turns. This configuration seemed to produce the best results with 5.64 mW at 1000 RPM.

In the following picture, figure "A" shows the coil with a core between two magnets. Figure "B" shows the spool form used in the final test.





#### Conclusions:

It was interesting to note that an improvement of about 400% was noticed across the whole RPM test range when using the ferrous core materials. I did notice that while watching the sine wave on the scope, that harmonics appeared at 570 RPM and again at 1140 RPM. I'm not sure if this would cause problems on lower speed units or not. This effect may be more pronounced on multi-coil generators.

While the addition of a core material improved the output significantly, would the same be true of higher power units? I'm not sure if the core would become saturated to the point of being useless under a high current load. That being said, could the core be beneficial under low wind speed and cut-in sooner than without the core? If under high wind speed and load, if the core becomes saturated, could this help limit power and prevent burning up the windings?

Having a hollow spool type core would make it fairly easy to build coils of even height. This may help in decreasing the distance between coils and magnets as well. The spool form would also make it very easy to wind coils, as no form would be required.

Since the inductance of each coil is increased substantially, fewer but larger windings could be used to reduce  $I^2R$  losses and still maintain the voltage levels required. As an added benefit, the core would also act as a heat sink to help pull heat out of the windings.

The use of the spool core seems to help channel flux through the coils. I think of it as a magnet extension that in essence brings the opposing magnets closer to each other, thus narrowing the gap between them. Similar to when you hold opposite poles of a magnet closer together, the attraction gets stronger.

I would be very interested to hear from any body else who has run similar tests maybe on higher power units. It would be very interesting to try a similar experiment with Silicon Steel, which has a very high permeability.

Still having fun, Bill.

[Miniature Axial Flux Generator Experiments](#) | 17 comments (17 topical, 0 editorial)

Re: Miniature Axial Flux Generator Experiments

([none / 0](#)) ([#1](#))

by charged on Sun Dec 28th, 2003 at 01:10:48 AM MST

([User Info](#))

Here's one more you'll enjoy.

Get yourself a roll of .030 MIG welding wire.

Make your coil form so that there is very little airspace at the center of the winding.

Wind the steel wire in tandem with the copper wire on the same form.

What you have there is an integrated, ultra-low eddy-current ferrous core.

You can also do this with regular mechanics wire. But, it's usually kinda dirty and oily right on the roll. MIG wire is nice and shiny.

Enjoy!

Re: Miniature Axial Flux Generator Experiments ([none / 0](#)) ([#5](#))

by Jerry on Sun Dec 28th, 2003 at 09:33:11 AM MST

([User Info](#)) <http://www.dplusv.com/Photo-03.html>

The only problem I see is sevier cogging. When the magnet is centered over the steel spool it will be very hard to move it.

This is a very efficient way though to increase magnetic flux through the coils. This is why I prefer ac motor conversion. The ac motors I most commonly convert have 36 slots so its very easy to move the magnets past these narrow slots. AND you want to talk about awesome laminations. Motors have the best steel lamination posable and your coils are allready wound.

Some people say the small diameter of the motor is a limiting factor but as deminstrated above the increased output more than compensates for this. This is why I see charging start at 5 mph on motor conversions whith 49 inch tip to tip blades.

WE gave up on the curved neo,s way to soon. JK  
TAS Jerry

[Airheads Page](#)

[ [Parent](#) ]

Re: Miniature Axial Flux Generator Experiments ([none / 0](#)) ([#6](#))  
by Jerry on Sun Dec 28th, 2003 at 09:37:50 AM MST  
([User Info](#))  
<http://www.dplusv.com/Photo-03.html>

PS and you want to talk about narrow gap. I set my gap at 1/16 inch but it could be 1/32 inch. Because of the motor lamination efficiency I've done 1/2 inch gaps with surprizing output.

JK TAS Jerry

[Airheads Page](#)

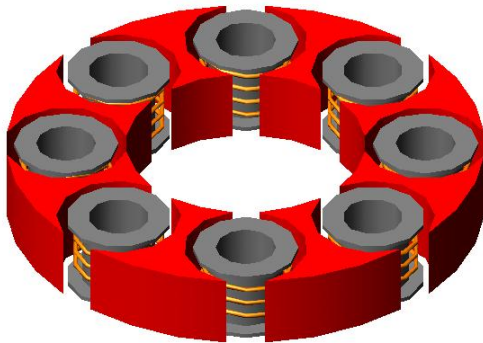
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Re: Miniature Axial Flux Generator Experiments ([none / 0](#)) ([#10](#))  
by bill541 on Sun Dec 28th, 2003 at 05:12:07 PM MST  
([User Info](#))

Thanks Jerry,

I didn't really think about cogging being much of a problem, but it sure could be in low winds. It might turn into a magnetic brake of sorts.

What do you think of the following solution?  
The red indicates more ferrous material.



By providing a few more paths for the flux when the cores are off center of the magnets, wouldn't this smooth things out? The trick would be to balance the flux out so that there was an even pull at every degree of rotation.

This may be easier to provide on a rectangular magnet set up. This way you would only need pie shaped pieces around the perimeter.

-Bill-

[ [Parent](#) ]

Re: Miniature Axial Flux Generator Experiments ([none / 0](#)) ([#12](#))  
by Jerry on Mon Dec 29th, 2003 at 06:58:22 PM MST  
([User Info](#))  
<http://www.dplusv.com/Photo-03.html>

Hi Bill

Very nice drawing. It looks as though this design would reduce cogging a bunch.

I'm not sure what effects there would be on flux path or efficiencies? your drawing is now resembling an ac motor. Coils and narrow slots. Very efficient and reduces cogging But dose away the need for curved magnets.

I do hope you build and test your idea.  
JK TAS Jerry

[Airheads Page](#)

[ [Parent](#) ]

Re: Miniature Axial Flux Generator Experiments ([none / 0](#)) ([#13](#))  
by RobD on Mon Dec 29th, 2003 at 08:01:19 PM MST  
([User Info](#))

To smooth things out use a gap in the spacing of one magnet or use an odd number of magnets.

This looks very much like a standard alternator with the exception of the ferrites.

RobD

[ [Parent](#) ]

Re: Miniature Axial Flux Generator Experiments ([none / 0](#)) ([#2](#))  
by Electric Ed on Sun Dec 28th, 2003 at 06:09:56 AM MST  
([User Info](#)) <http://www.electric-ed.com>



[quote]"Next I tried a mild steel solid core and also a steel tube with similar results"

[quote]"the addition of a core material improved the output significantly, would the same be true of higher power units?"

In a higher power unit the core would have to be made of silicon steel, and laminated, to prevent hysteresis and eddy current heating.

I believe construction methods that result in reduced air gaps will yield as good, or better, power outputs.

Electric Ed

Re: Miniature Axial Flux Generator Experiments  
([none / 0](#)) (#3)  
by SteveM on Sun Dec 28th, 2003 at 07:46:26 AM MST  
([User Info](#))

Bill,

I have been thinking along the same lines about using a material with high permeability in the core of the coil to reduce the resistance to flux through the core of a coil in an axial flux arrangement. I have enjoyed reviewing your experiment results on the subject and believe it looks promising.

I had an additional thought on the subject to see if the elimination of the magnetic air gaps would provide any additional improvement.

I was thinking of running some kind of brush between the magnet poles and the spool surface. As the magnets pass over each coil the material in the center of the coil with cooresponding brushes contact the magnet poles and complete a straight line gapless magnetic curcuit. Haven't try it but have been giving it some thought.

Enjoyed your posting, Best Regards,

Steve M

Re: Miniature Axial Flux Generator Experiments  
([none / 0](#)) (#4)  
by RobD on Sun Dec 28th, 2003 at 08:44:58 AM MST  
([User Info](#))

If you omit one of the magnets in illustration 'A' you would still produce power.

What is the ferrite core material you used?

RobD

Re: Miniature Axial Flux Generator Experiments ([none / 0](#)) (#8)  
by bill541 on Sun Dec 28th, 2003 at 12:39:23 PM MST  
([User Info](#))

Rob,

"What is the ferrite core material you used?"

For this small setup, I used a ferrite bead commonly used as a filter choke in electronics work. It is 0.25" diameter, 0.5" long.

-Bill-

[ [Parent](#) ]

Re: Miniature Axial Flux Generator Experiments ([none / 0](#)) (#11)  
by RobD on Mon Dec 29th, 2003 at 10:26:56 AM MST  
([User Info](#))

You may know this ferrites come in different classes for different freq. and apps, E43 cores or E77 cores for example.  
Nice drawings, TurboCad?  
RobD

[ [Parent](#) ]

Re: Miniature Axial Flux Generator Experiments ([none / 0](#)) (#7)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Sun Dec 28th, 2003 at 09:57:20 AM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

Did you measure the increased drag you got when you started sticking metal inside of the coil ?

}=- W o o f -={

Re: Miniature Axial Flux Generator Experiments ([none / 0](#)) (#9)  
by bill541 on Sun Dec 28th, 2003 at 12:48:04 PM MST  
([User Info](#))

"Did you measure the increased drag...?"

Thank-you, that would be a good test to perform.

Since I'm using a brush type drill motor with a reduction drive, it is difficult to tell the amount of drag at this point.

If I used a low friction motor to drive the rotors, maybe I could check the no load drive current of the motor and then compare with full load drive current. This may be a way to test the efficiency as well (power in vs power out). Maybe an induction motor with very good bearings would work here.

Thanks, Bill

[ [Parent](#) ]

Re: Miniature Axial Flux Generator Experiments  
([none / 0](#)) ([#14](#))  
by SteveM on Tue Dec 30th, 2003 at 06:13:41 PM MST  
([User Info](#))

Bill,

I like your thought process to channeling flux in the coils by adding material with high magnetic conductivity in the center of the coil. Your second option that you posted showing other iron material next to the coils to reduce cogging has questionable performance. This material would compete for the magnetic flux and diverge some of it outside the coil centers (High price to pay). How about misaligning your magnet patterns so that they are 1/2 of a diameter out of alignment. As one magnet aligns with a coil spool the opposite magnet is starting to pull toward the next spool. Your flux patterns would still be focused in the coil centers but your axial magnet pattern would be skewed. Just a thought anyway.

Regards,

Steve

Re: Miniature Axial Flux Generator  
Experiments ([none / 0](#)) ([#16](#))  
by bill541 on Wed Dec 31st, 2003 at 10:16:37 AM  
MST  
([User Info](#))

Steve,

Good points, getting the majority of flux lines to cut through the coils is certainly the goal.

I have been thinking along the lines of varying the coil numbers and spacing while still keeping the magnets at an even number and spacing. It would turn out to be a multi-phase system, but if you were to rectify the output, who cares how many phases you have. It may work out that you can still parallel or series some of the windings.

This would be worth investigating as coil arrangement would be easier to build than adding more ferrous material to the stator.

Thanks for the input! -Bill-

[ [Parent](#) ]

Re: Miniature Axial Flux Generator Experiments  
([none / 0](#)) ([#15](#))  
by josephcrawley on Tue Dec 30th, 2003 at 07:19:09 PM  
MST  
([User Info](#))

What about dusting your epoxy with iron filings as you dump it into the stator mould?

Re: Miniature Axial Flux Generator  
Experiments ([none / 0](#)) ([#17](#))  
by bill541 on Wed Dec 31st, 2003 at 10:27:36 AM  
MST  
([User Info](#))

Joseph,

You probably could do something like this, but you may still need some ferrous free boundary areas between the stator coils.

The way I view it is that flux is like electricity, it will always take the path of least resistance. If this path doesn't take it through the stator coils, power is lost.

Maybe someone more versed in magnetics could shed some light on this.

-Bill-

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### [Coil and Magnetic Physics Web Site](#)

By [SteveM](#), Section [Homebrewed Electricity](#)

Posted on Fri Dec 26th, 2003 at 07:07:37 PM MST

[Magnetism](#)

I was looking for information on the web to better understand coils. I found a great university site.

There is a lot of detail and equations to help under Faraday's law, transformers, coils, and magnetism in general. I found the site very helpful and have reread a few of the sections several times to clarify my understanding of the material.

If you look in the air coil section it shows the ideal shape of a coil for optimal efficiency.

There is also a section that breaks down the equations which define the process of induced voltage from a coil

1. Magnetomotive Force (Fm) = current (I) \* coil turns (N)
  2. Magnetic Field Strength (H) = (Fm) / effective magnet path length (Le)
  3. Flux Density (B) = Permeability (u) \* (H)
  4. Flux (PHI) = (B) \* Effective Area (Ae)
  5. Induced Voltage (e) = N \* delta PHI / delta time
- (e) = Inductance (L) \* delta current / delta time

where  $L = (u) * (Ae) * N^2 / (Le)$

Take a look I think you will find it interesting.

Regards,

Steve M

<http://www.ee.surrey.ac.uk/Workshop/advice/coils/terms.html>

[Coil and Magnetic Physics Web Site](#) | 1 comment (1 topical, 0 editorial)

Re: Coil and Magnetic Physics Web Site ([none / 0](#)) (#1)  
 by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Sat Dec 27th, 2003 at 08:32:19 AM MST  
[\(User Info\)](#)  
<http://timmythy.home.mindspring.com/timmy.htm>

It makes me wonder about some things about winding coils...

Is there a good inductance to wide the coils for ?

Does Resonate Frequency affect power generation ?

And the optimum shape for the coil thing is interesting, The cross-section of the coil leg is a Square . . .

} = - W o o f - = {

[Coil and Magnetic Physics Web Site](#) | 1 comment (1 topical, 0 editorial)

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### [Can magnets do this?](#)

By [Jeroppo](#), Section [Magnets & Magnetism](#)  
Posted on Sat Dec 20th, 2003 at 04:02:33 PM MST [Magnetism](#)  
health-caring magnets?

Do you think that magnets can be used in health-care like this?  
<http://www.alexchiu.com/affiliates/clickthru.cgi?id=tripp0>

Forget about what it says... think only to the possible effects... could it be real to use magnets in this way?

[Can magnets do this?](#) | 2 comments (2 topical, 0 editorial)

Re: Can magnets do this? ([none / 0](#)) ([#1](#))  
by [jimu](#) on Sat Dec 20th, 2003 at 04:20:36 PM MST  
([User Info](#))

Its apparent you are using this forum to further your own goals with the above mentioned website , and I think its pretty low.

JimU

Re: Can magnets do this? ([none / 0](#)) ([#2](#))  
by [Jeroppo](#) on Sun Dec 21st, 2003 at 01:48:50 AM MST  
([User Info](#))

Nono... i'm really interested in what you think about ir... could magnets help health improving like acupuncture?

Could this be the 'second evolution' of this tech?

[ [Parent](#) ]

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## [Bedini questions](#)

By [monte350c](#), Section [Homebrewed Electricity](#)

Posted on Sun Dec 14th, 2003 at 11:49:49 PM MST

[Magnetism](#)

Soldering Iron heating up as we speak...

Hi All,

Oh dear. I feel an overwhelming need to build one of these Bedini motors. I don't really care about over unity. But I am interested in high efficiency and the thought of having one of these critters spinning away on my desk for a long while on a battery is strangely appealing!

So I don't have to repeat anything others have done before that didn't work too well - here's what I've got so far -

- Read the Bedini motor patent over several times
- Downloaded the twin battery circuit available on the Web
- asked a few preliminary questions - and here are a couple more:

It seems that one of the more important things is timing, of both the primary and secondary sides of the circuit.

The primary side is pretty well explained and I kind of 'get' what's going on there. But the secondary side, with the capacitor charging the battery I must admit to some confusion on that point. I've read some very helpful stuff from "charged" here, that basically says the cap will sit at the battery potential, then gather up charge from the back EMF on the coil, then at some point (designed to be not in-line with any rotor / stator magnetic activity) be discharged into the battery. So my question is - instead of using a separate timing wheel and discharge switch - could I mount a commutator (either mechanical or electronic) on the main shaft and have it discharge once per revolution? Or would that not give sufficient time for the cap to charge?

My knowledge on caps in general is pretty shaky - other than my electronics shop teacher many years ago who had a device about the size of a toilet paper tube, covered in tin foil with two insulating spaces down the sides on his desk. As I came to know there was some kind of cap inside it because when curious visitors picked it up there was a pretty decent shock in store. (OW - voice of experience...)

One of the appealing things about this motor - I just searched through my junk drawer and found everything on the diagram for this motor except the batteries.

Having fun!

Ted.

[Bedini questions](#) | 8 comments (8 topical, 0 editorial)

Re: Bedini questions ([none / 0](#)) ([#1](#))

by [windstuffnow](#) ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon Dec 15th, 2003 at 10:14:21 AM MST

([User Info](#)) <http://www.windstuffnow.com/main>

Hi Monte,

I haven't built a "bedini" motor per say, I've built a few based on the original "Lenz" concept which was used to prove the "Lenz law" then later went on to experimenting with the "Adams motor" which is what I believe the bedini motor principal is based on. One of my early models ran for 6 months by switch charging 2 dead 9V batteries. The coils ran about 20 degrees below ambient for the whole time. Later I went on to building some more advanced models the last one shown below...

This one had dual rotors with 4 coils. Each coil had 2 windings (primary and secondary) for extracting back emf. The voltage going into the caps sometimes exceeded 1500 volts. When connected to 2 8ft flourescent bulbs, had no trouble powering them up to full light. The motor ran at 7200 rpm and ran from a 12V battery drawing about 5 amps. It never made an "over unity" output but It did come in at around 97% as long as it only ran itself and powering flourescents or recharging the secondary battery. So basically it was extremely efficient as long as it did no real work. I used a hall sensor for the timing and mosfets for powering the coils. I must have spent 2 years playing with about 40 different motors I built before I decided to move on to other things. Then built a magnetic rotary engine followed by a new hobby into the stirling engines... and on and on and still going!

Have Fun

Ed

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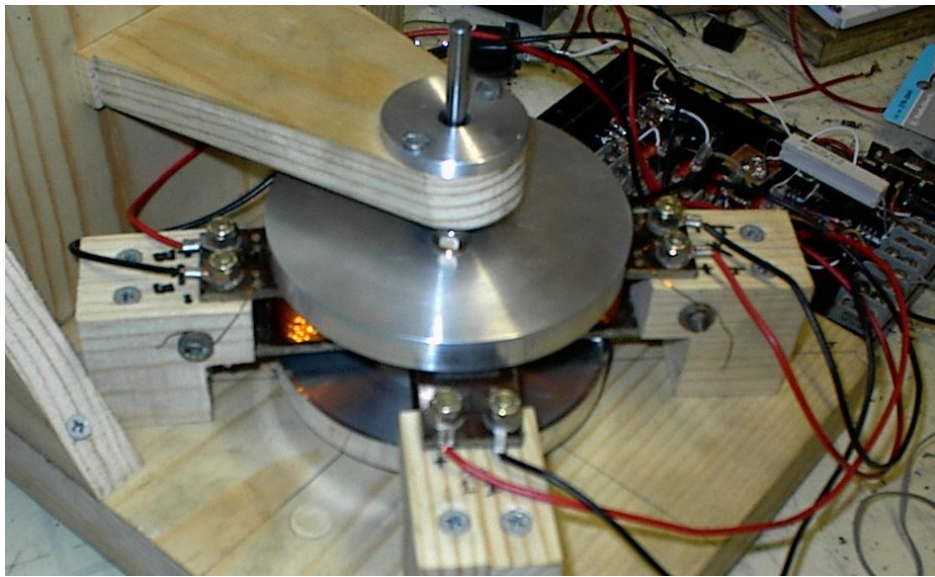
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Re: Bedini questions ([none / 0](#)) (#2)  
by ibedonc on Mon Dec 15th, 2003 at 12:59:44 PM MST  
([User Info](#))

I believe Bedini does it every 3 turns , I plan on doing mine with a divider ic or a few flip-flops ic's , look on his page <http://www.icehouse.net/john1/intro.html> you will a circuit for a pulse charger ,also look here

<http://appft1.uspto.gov/netacgi/nph-Parser?Sect1=PTO2&Sect2=HITOFF&p=1&u=%2Fmetahtml%2FPTO%2Fsearch-bool.html&r=0&f=S&l=50&TERM1=bedini&FIELD1=IN&co1=AND&TERM2=&FIELD2=&d=PG01>

From: "roamer1952000" <roamer@c...>  
Date: Thu Sep 11, 2003 4:19 pm  
Subject: Re: Bedini motor

look at the pulse charger one

this even tells what all the parts are

also this will help you with the coil and setting it up

found this in the yahoo group free\_energy

From: "roamer1952000" <roamer@c...>  
Date: Thu Sep 11, 2003 4:19 pm  
Subject: Re: Bedini motor

Ok, start with an EXACT replication (same proportions and layout) of the full motor diagram of patent #6,545,444.

To make the Stator winding assembly:

First, cut a 1" long piece of 1/2" cpvc tubing.

I then picked up a couple of the PVC "electrical outlet boxes" and cut the spool ends out of the flat sides. Just use a circle cutter on a drill. After cutting out the two circles, drill out the center hole in each to match the OD of the CPVC tube. Then just use regular pipe glue to put the ends on the spool.

Make a trifilar winding of 500turns, using #23 magnet wire. Make sure the winding is tight, then wrap it with tape to hold everything in place. Or, you can glue it all up or whatever. Just be sure the windings aren't loose.

Match up the winding ends for input, output, and feedback windings.

To make the stator core:

INCREASING INDUCTANCE is the key here.

Increasing ANY ONE of three main factors increases the inductance of

the core.

1. Cross-sectional area of the core (view from end)
2. Number of turns
3. Permeability of the core material
4. Decrease core length (pole-to-pole)

The stator core must be made from a low-loss material. Something with low hysteresis, low eddy current losses and high permeability is preferred. Pure iron wire would be great.

I've been using a bunch of 1/16" steel welding wire strands, pressed into a 1/2"x1" CPVC tube spool. I clipped them all to fit inside the length of the spool, leaving about 1/2" extra sticking out one end.

Take them back out of the spool and stand all of the core wires in a foam block. Only stick them in about 1/4". Then coat each strand with spray enamel. This insulates each wire INDIVIDUALLY and greatly reduces eddy current losses when you pack them into the core.

Once the paint has cured and is HARD, jam the wires into the core as smoothly as you can, without chipping off any paint. Leave the uncoated ends sticking out the BACK SIDE of the stator.

Squirt superglue into the pack of core wires to lock them in place. Once it's fully cured, cut off the unpainted ends flush with the back side of the core. Use some fine sandpaper and a wire brush to make sure that end of the core is free from overhanging burrs and metal dust. Put a little more superglue into that end.

Ok, so now you have your stator. Most of the real work is done.

Go take a look at patent #6,292,370.

You'll see that it shows TWO stator windings. Ignore that part for now. You'll also see that there is another permanent magnet at the BASE of the stator pole. It's set in ATTRACT mode with the rotor magnets.

This "backside" magnet puts a "field tension" on the core. When you apply current to the core windings in opposition to this pre-existing "hard" field, YOU don't have to waste energy on hysteresis in the core. The PM has ALREADY ALIGNED AND TENSIONED all the magnetic domains in the core FOR YOU. It's kinda like blowing up a balloon. You don't get ANY TENSION on the balloon surface until you take up the slack inside with YOUR AIR INPUT. Once you pass that point, YOUR AIR INPUT starts stretching the balloon surface. THAT is the only energy you'd get back when you release the air from the balloon. It works the same way with the domains in the steel. The very first part of the current YOU put into a plain steel core is spent ENTIRELY on getting the domains organized and aligned. Once aligned THEN the field starts to build and store energy. The PM takes care of this for you.

- > In the case of the Bedini motor it was never said if it attracted or
- > repelled and the coil direction winding (not specified clockwise or
- > counter clockwise) would make it work either way. We are
- > pretty sure but not certain that it had free magnet to core attraction
- > and then the positive pulse came from the trigger coil a few degrees
- > after dead center to turn on the transistor and
- > repel it past the lockup point of the free attraction.
- >
- >
- > Norman

You didn't study the patents enough. EVERYTHING about this device is in those patents. I mean EVERYTHING. Start reading with a "lawyer's eyes".

The primary winding is FULLY energized in REPULSION mode, just as the rotor reaches TDC. Bear in mind that the bipolar transistor IS already starting to turn on once base-lead threshold is reached by the incoming pulse. It is an "increasing ramp turn-on" that coincides with increasing positive current slope coming from the "sense" winding. This "RAMP" is important. Re-read.

Ok, now think about this one. In a circuit with a common ground on two batteries, one battery being a 12 volt and the other being a 9 volt, what happens if you connect the two positive terminals together on those two batteries?

What if both batteries are 12v?

What if a generator is putting out exactly 12v pure DC and you hook it to a battery at exactly 12v. Does any current flow in either direction?

The transistor must come on just enough to make a "null" field zone between the stator and the rotor. NOT A PUSH.

\*\*\*\*\*

Ok, let's now assume that your motor is assembled JUST LIKE THE PATENT, with 3 magnets spaced at 120 degrees on the wheel.

YOU MUST mount your stator in such a way that you can ADJUST THE GAP between the magnet and stator core. Without this, you'll probably fail.

This GAP is set to match whatever battery you're using to "power" the motor. It's REALLY SIMPLE TO SET.

First, get a couple of alligator clip leads and hook them up to your battery.

Find out what the stator polarity needs to be to PUSH the rotor magnet away. Once you've found that out, you can begin adjustment of the gap. I usually just put a piece of masking tape around those wires where they come out of the stator, and mark them positive and negative.

With the battery shorted into the winding, find the distance where the rotor magnet is neither pushed away NOR pulled in. There IS a sort of "bobbling point" in there somewhere. Get it as close as you can THEN set it SLIGHTLY on the repulsion side of that "null" zone. When you're using the transistor, it will drop the battery voltage a bit. This then drops the field slightly and, Voila! You're in the "null" zone, or, ahem..... The Zero Point. heh.

NOW, when the transistor is energized, you won't be wasting any energy to PUSH the magnet away. It will do IT'S OWN PUSHING as it's leaving TDC. You will ONLY provide a little "null" zone for the magnet to be "free" to do what it wants. This means that ALL THE TORQUE on the shaft is PURELY from the magnets own attractions and repulsions. It can't be anything else doing it since you ALREADY know YOU set the gap to be a NULL at FULL BATTERY VOLTAGE. You couldn't PUSH it if you wanted to. The transistor is even DROPPING some of your original voltage, so you're actually just BARELY nullifying the field at TDC. Ok, if you don't get it, re-read.

You now have ENOUGH info to accurately reproduce the device.

Here's a snapshot of what is really happening.  
First, we'll review "Lenz Law" which states:

"An induced current flows in a direction to create a magnetic field which will counteract the change in magnetic flux."

In other words ANY TIME a magnetic field APPROCHES a closed loop of conductor, a CURRENT flows in that conductor loop. That current flow causes an OPPOSING field to the approaching field and creates DRAG.

The same thing happens when you REMOVE a magnetic field from a closed conductor loop. It PULLS at the field and DRAGS it back.

This is why conventional generators ALWAYS require more torque on the shaft when you have a LOAD on them.

IF that aforementioned conductor is NOT in a closed loop, no current flows and there is NO DRAG, Just a measurable "open circuit voltage".

Keep all this in mind while you follow along here.

1. Rotor magnet approaches the stator.
2. sense winding triggers the base with an increasing current RAMP as the PM field SWEEPS INTO the stator core. NO LOAD is applied during this phase (except for base lead) SO ALL the PM attraction goes into ACCELERATION of the rotor. This is REAL TORQUE as offered up by NATURE, NOT YOU.

3. Slightly before and AT TDC, a little dance occurs.

- a. the transistor RAMPS "on" to NULLIFY PM FIELD ENTRY into the core. This is actually a very small expenditure of battery current, just to bring the two fields into the "null". This CANNOT BE A PUSH since your battery's voltage isn't high enough to do that.

- b. AT TDC, the rotor no longer "sees" anything to be attracted to, it's field is no longer EXTENDING in attraction to the stator core. The core is "stealthed". The rotor skates merrily on by, thinking nothing is wrong. Tum-te-tum-te-tum..... heh.



c. JUST AFTER TDC, the transistor is SLAMMED into "off" mode and the rotor is already moving AWAY. BUT, it's field now WANTS to extend to the nearby core and ENTER IT. Hmmmm...

d. The magnet's FIELD is trying to EXPAND and enter the core. The windings are now LOADED by the storage capacitor, a practically dead short on the windings. Hmmmm.....

What does Lenz law say? Something about when a FIELD APPROACHES a CLOSED LOOP CONDUCTOR, that conductor produces an OPPOSING FIELD that PUSHES BACK at the approaching field. RE-READ until you SEE IT in your head.

The physical magnet and it's FIELD are TWO SEPARATE ENTITIES, NOT ONE.

The magnet is moving away and it's field get's a PUSH from the EMF extraction through the capacitor.

Shake you head a little. Go slam a door a few times. Yell at the cat.

Now, re-read and recognize the implications of what you just learned.

Lenz Law can NEVER BE DEFEATED. And, it doesn't need to be. It works FOR YOU with this design.

ok , then this is from Bedini's page  
US Patent# 6,545,444,and US2003/0117111A1 now granted.

Their is one thing we should get straight right now, the dimensions of the coil are not important. The resistance of the coil is not important, the windings are not important, the magnets are not important. None of these things mean anything. All of you are wasting your good earned money on neo- magnets, dime store magnets will do just fine stacked together. There is no secret to this machine, it's the process and the switching that's important!!!! I have never counted one winding when I was making these motors with Peter, I'm not saying one turn of wire will work because it won't, again what is important is, THE PROCESS AND HOW YOU COLLECT IT AND SWITCH IT. Why are you all thinking that it makes a difference in how the coil is wound, here is a number for you 500 turns number 23 tri-filer wound wire, see no step up no step down, just 1 to 1 ,welding rod for the core, roller-skate wheel, all north poles out, 2n3055 TO-3 case Junk but better, Do not use TIP 3055 it's just real junk , 330 ohms base resistor, 1N914 diode, hooked up the way I said. that's it. This makes your mechanical inductive coupled oscillator no big deal. By the way you are right about the terminology, we are babies at this to, just trying to (DEAD MAN FUSE IT), Nature does not care what the coil looks like. OH forgot the 1kv diode bridge on the third winding, and a 10Uf 500 volt cap, be careful you will fly across the room. I said I broke the machine into three patents, third patent, use the bottom half of switcher only. Do we all get it now?, By the way this is a limited machine to just study the radiant current to the battery. Thomas Bearden has defined it!!! "Everything in nature is simple this is the most complicated to the human mind, let's keep it simple".

Most of the problems with what you are doing is, the magnets, using a bolt for the core is not right, I said cut welding rod and you are not selecting the correct resistor for the base current for this mechanical oscillator. Save your money you do not want to use NEO-MAGNETS, just use radio shack cheap magnets!!!!

WHY?

This motor energizer is a mechanical oscillator whose speed depends on the lowest amount of current you can put into the coil. If you apply too much current, you cause the transistor to cross conduct (known as cross conduction current). When you do this, the semiconductor over heats, because the current to the transistor stays on and the mechanical oscillator runs slow.You cause the same thing to happen by using NEO-MAGNETS. Once the mechanical oscillator is running , YOU MUST ADJUST THE BASE RESISTOR TO THE HIGHEST VALUE that gives you the highest speed with the lowest current draw. The more magnets you get around the wheel the better the collection process will be. The magnets can not be too close together and must be spaced evenly around the wheel. You can find the right magnets at Radio Shack or a hardware store.

For the coil, just use an old solder roll or a bobbin you get wire on, cut and fill the center hole with .030 welding rod . This works really well.

Re: Bedini questions ([none / 0](#)) ([#4](#))  
by charged on Mon Dec 15th, 2003 at 01:31:52 PM MST  
([User Info](#))

Looks like there are a bunch more people already having fun with this thing than I thought!!

Maybe we should have a convention or something!

[ [Parent](#) ]

Re: Bedini questions ([none / 0](#)) (#5)  
by bob golding ([yubba at clara dot net](#)) on Mon Dec 15th, 2003 at 04:52:01 PM MST  
([User Info](#))

yep going to make one myself when i get back home from this trip. opps getting to many projects again. still they all seem to involve caps and wire and magnets so thats ok then. trying to steer clear of anything involving programming and i should at least have something to show at the end of it.

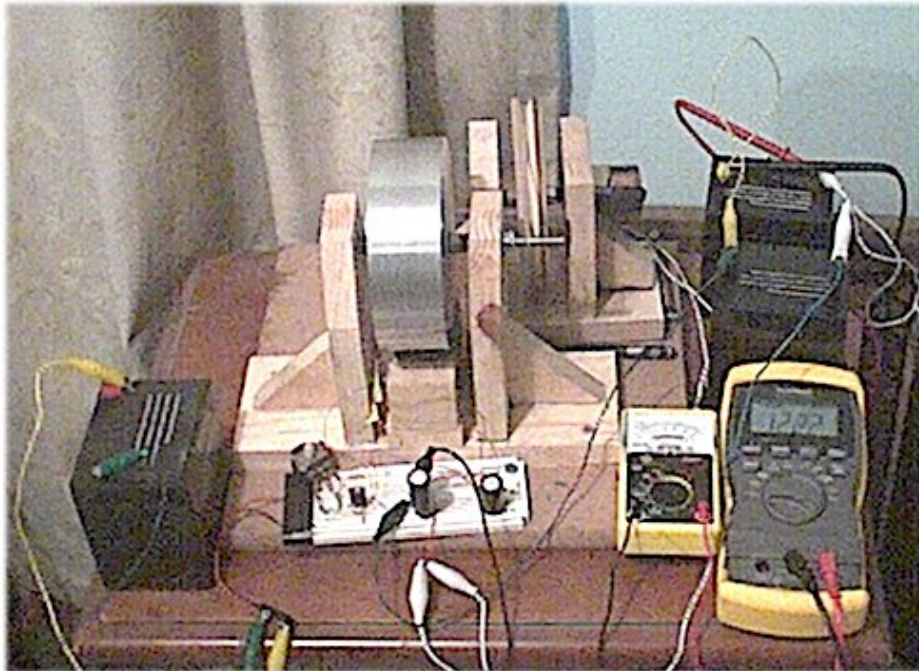
having too much fun here  
bob

[ [Parent](#) ]

Re: Bedini questions ([none / 0](#)) (#3)  
by charged on Mon Dec 15th, 2003 at 01:23:52 PM MST  
([User Info](#))

Hi Monte!

This one is running on what used to be my nightstand. Yep, there's nothing quite so soothing as clicking and rumbling bearings when you need to fall asleep. heh.



This one is using about 350uf (2 photoflash capacitors) rated at 400v each. The pulse rate is about 4hz. Why? Well, if you look at Bedini's charger patent, it says to keep the capacitors near the 20v range for max efficiency for each pulse. The less capacitance you have, the higher the voltage will rise between commutator pulses. I just built the commutator with 4 copper strips (cut from a scrap pipe) and then put caps on to see how high the voltage would climb on them between pulses. Turns out I only needed two caps on this one.

The Bedini and Adam's motors are two different creatures. I'm not going to go into the differences because others have done it elsewhere.

Take a real good look at the stator winding. What you have there is a 1:1 transformer.

Under "normal" use as a transformer, if you hit the primary with a 12v sinewave, put a full-wave bridge on the secondary, and then charged an electrolytic capacitor, you'd have 12VDC on the cap, maximum. If you put a resistive load across the cap, like small bulb, you'd see the primary side current draw increase as the bulb draws the cap charge down below 12v.

That much is conventional transformer theory.

This motor something different. An incoming magnet generates a positive sine which does no work except activating the base of the transistor.

The transistor switches the primary battery on just as the magnet reaches TDC, and creates a "null" in the field interactions, allowing the magnet to float past TDC as if the stator isn't there.

Due to the slight delay in the transformer action, it takes a tiny fraction of a second for the feedback winding's output to invert to negative, clamping the transistor OFF.

The magnet's field once again tries to reach out for the stator and THIS action does two things.

1. Voltage is a function of FLUX VELOCITY, CORE PERMEABILITY and NUMBER OF TURNS. So, the re-expanding magnetic field from the rotor magnet SLAMS into the core at nearly the speed of light. This generates an extremely high voltage that is WAY above primary battery voltage. This pulse EASILY fills a capacitor above primary voltage. Once the cap is above that primary voltage, the only current used from the primary is for field nullification. Nothing more.
2. That capacitive LOADING on the secondary causes the stator core to develop a counter EM field that resists the incoming PM field from the DEPARTING rotor magnet, giving it an elastic SHOVE away from the stator.

In a nutshell, as long as your collection capacitor is NEVER DRAWN LOWER THAN PRIMARY BATTERY VOLTAGE, the stator winding arrangement effectively isolates the primary from the secondary and you don't need to worry about timing your output pulses against primary input pulses. The fact that your motor/gen gives you nothing but CEMF to work with in the secondary means the primary side will never notice ANYTHING that you do with the cap charge, UNLESS you draw that cap lower than primary voltage.

Once you get yours going, Get a small fan-blade and put it on the main rotor. Then watch what happens to your primary input power. Oh, ok, I'll just tell you. The input power drops as you load up the output shaft.

Sounds a little counter-intuitive. But, it's not. Just don't load it down so much that you stall it out. Every motor is different. This needs to be mechanically loaded the same way you load an IC engine with a fixed throttle, like a lawnmower. You can only cut so much at a time without binding and stalling. Same thing with the Bedini system.

Make sure you posts some pics when you get it finished!

Re: Bedini questions ([none / 0](#)) ([#6](#))  
by monte350c on Mon Dec 15th, 2003 at 07:29:53 PM MST  
([User Info](#))

Hi Guys,

Thanks for all the replies! If I wasn't going to try one before this I sure am now. Might take a week or so but I'll post any results as they're available. Great minds think alike... (modify saying and place period here!)

Lots of fun!

Ted.

[ [Parent](#) ]

Re: Bedini questions ([none / 0](#)) ([#7](#))  
by charged on Wed Dec 17th, 2003 at 11:19:25 AM MST  
([User Info](#))

Everyone should hit this page AGAIN!

<http://www.icehouse.net/john1/index100.htm>

There is a NEW CIRCUIT posted near the bottom of the page!

It describes EXACTLY what the inventor intended this "motor" to be!

Enjoy!

Re: Bedini questions ([none / 0](#)) ([#8](#))  
by monte350c on Wed Dec 17th, 2003 at 01:26:04 PM MST  
([User Info](#))

Hi Charged,

Hmmmm.... that's kind of what I was thinking about when I asked about eliminating the second belt-driven wheel. Very interesting! Thanks for the link.

Ted.

[ [Parent](#) ]

[Bedini questions](#) | 8 comments (8 topical, 0 editorial)

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## [Magnet Strength vs Thickness](#)

By [dburt](#), Section [Magnets & Magnetism](#)

Posted on Fri Dec 12th, 2003 at 12:51:22 PM MST

[Magnetism](#)

How much does field strength increase if I double magnet thickness?

How much does field strength increase if I double magnet thickness? For example, if I have 3mm x 25mm x 25mm zinc coated neo N45 magnets, will the magnetic field strength at a point 10mm from the surface of the magnet double if I place 2 magnets together for a 6mm thick magnet? If not, what is the formula to calculate this?

Thanks,  
Dave in PA

[Magnet Strength vs Thickness](#) | 26 comments (26 topical, 0 editorial)

Re: Magnet Strength vs Thickness ([none / 0](#)) (#1)  
by [monte350c](#) on Fri Dec 12th, 2003 at 01:39:43 PM MST  
([User Info](#))

Hi Dave,

Here is a site I found extremely useful for this kind of thing:

<http://www.magnetsales.com/Design/Tools1.htm#disc>

You can just punch in magnet thickness, size, type (ie. Neo 35) and the distance from the magnet, or between them if they're on a dual disk and it will return the gauss at that point.

It really illustrates that small air gaps are good - a small magnet on a small air gap can give the same results as a much bigger magnet with a corresponding big air gap. So I think you can save money on magnets to some degree if you up the diameter and close the air gap down... Just my two cents worth!

Have fun,

Ted.

Re: Magnet Strength vs Thickness ([none / 0](#)) (#2)  
by [dburt](#) on Fri Dec 12th, 2003 at 01:58:59 PM MST  
([User Info](#))

Thanks Ted,

That's a super calculator! I used the one for rectangular magnets yoked in steel path. I think that answers my needs perfectly!

Dave in PA

[ [Parent](#) ]

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Re: Magnet Strength vs Thickness ([none / 0](#)) (#3)  
by jimpep on Fri Dec 12th, 2003 at 02:44:00 PM MST  
([User Info](#))

What a great site ! Thanks for the information. Jim

[ [Parent](#) ]

Re: Magnet Strength vs Thickness ([none / 0](#)) (#4)  
by cevonk ([cevonk\(atsignhere\)aol.com](mailto:cevonk(atsignhere)aol.com)) on Fri Dec 12th, 2003 at  
04:13:19 PM MST  
([User Info](#))

That's really a handy tool! Thanks for the link!

One thing it learnt me (that's proper English in my dialect) was that paying for the Neo 48s is probably not worth the price difference over the Neo 35s.

Another thing is that a 1/8" air gap is probably a worthwhile target.

(If I ever get around to building one.)

[ [Parent](#) ]

Re: Magnet Strength vs Thickness ([none / 0](#)) (#5)  
by 5kw on Fri Dec 12th, 2003 at 04:46:26 PM MST  
([User Info](#))

How are you going to get any wire into a 1/8 " gap.

[ [Parent](#) ]

Re: Magnet Strength vs Thickness ([none / 0](#)) (#6)  
by cevonk ([cevonk\(atsignhere\)aol.com](mailto:cevonk(atsignhere)aol.com)) on Fri Dec 12th,  
2003 at 07:13:48 PM MST  
([User Info](#))

Long, skinny coils?

[ [Parent](#) ]

Re: Magnet Strength vs Thickness ([none / 0](#)) (#7)  
by Jerry on Fri Dec 12th, 2003 at 08:38:54 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

My gap is 1/16 or less in motor conversion. Also with the very best possible lamination material. Also no problem with plenty of copper. Just a thought for the disc builders. We gave up on the curved neos way to soon.

JK TAS Jerry

[Airheads Page](#)

[ [Parent](#) ]

Re: Magnet Strength vs Thickness ([none / 0](#)) ([#15](#))  
by dburt on Mon Dec 15th, 2003 at 11:58:36 AM MST  
([User Info](#))

I was real excited about the site with magnetic gauss calculator, but then I hit a feature that has me concerned about accuracy of equations used by the calculator. If you use:

[http://www.magnetsales.com/Design/Calc\\_files/FluxDensityRectYoke.asp](http://www.magnetsales.com/Design/Calc_files/FluxDensityRectYoke.asp)

(supposed to calculate gauss at the center between 2 rectangular magnets in a steel yoke) and put in 3 by 3 by 1/4 neo N45's with .75 gap between magnets, it calculates about 4149 Gauss... Increase the size of the magnets to 5 by 5, with everything else remaining constant, and the Gauss calculation decreases to 3606!?! I cannot think of a reason how that could be correct. What am I missing here?? Sure wish I had access to the formulas they're using...

Dave in PA

[ [Parent](#) ]

Re: Magnet Strength vs Thickness ([none / 0](#)) ([#17](#))  
by 5kw on Mon Dec 15th, 2003 at 04:15:26 PM MST  
([User Info](#))

dbert,

It's true. The wider magnet causes a demagnetizing force on the center point.

You can verify this with a flux meter.

Flux lines repel each other and cannot cross but there all "trying" to get to the same place. The more the crowding the higher the reluctance.

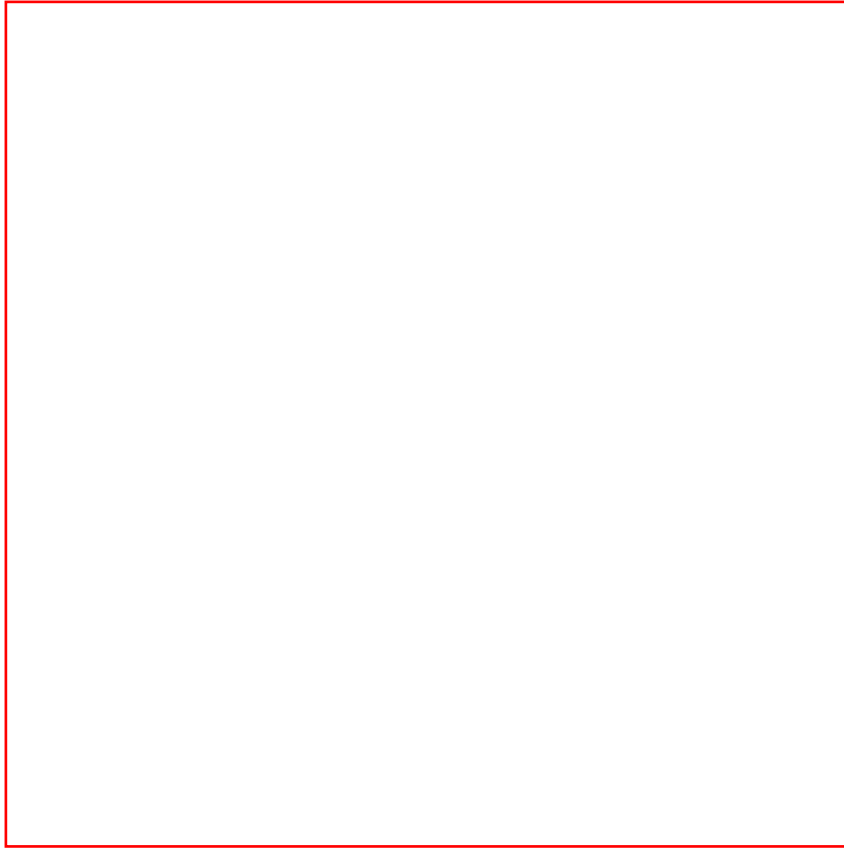
Make the wind fun!

Victor

[ [Parent](#) ]

Re: Magnet Strength vs Thickness ([none / 0](#)) ([#8](#))  
by cevonk ([cevonk\(at\)signhere\(aol.com\)](mailto:cevonk(at)signhere(aol.com))) on Sat Dec 13th, 2003 at 10:24:58 AM MST  
([User Info](#))

I think we are using two different definitions of airgap. The airgap between the magnet and the nearest face of the coil to the magnet, and the airgap between the two magnets. I bet that the proper definition is really the distance between the face of the two opposing magnets (or the magnet and the non-magnet bearing stator), which would be the "field airgap". The distance between the nearest face of the coil and the magnet would be the "mechanical airgap". (Again, this is only based on my limited understanding of what is being discussed.)



Either way, minimizing the distances involved makes a big (theoretical) difference on the magnetic force available for generating electricity. I think that probably the distance between the face of the magnet and the nearest face of the coil to that magnet is probably the distance that requires the most manufacturing skill to reduce. If the stator has an unnecessary thickness of fiberglass and resin over the faces of the coils, then the magnets will be farther from the coils even if the magnets are scouring the surface of the stator as they rotate: while that fiberglass thickness is not an "air" gap, it is an effective airgap between the coil and the magnet. If the stator's thickness is uneven, then the magnets will have to be placed so as not to contact the thickest part of the stator, which means that the magnets could be closer to some of the coils if it were not for the uneven thickness of the stator.

One thing that I have thought about is reducing the thickness of the stator to the point that the coils protrude from it...that is, that the stator should be a web between the coils instead of a thickness of fiberglass encasing the coils. This would require molding techniques slightly more complicated than the "hamburger press" molding in use, but it would eliminate from the "mechanical airgap" the fiberglass and resin that covers the faces of the coils.





Re: Magnet Strength vs Thickness ([none / 0](#)) (#9)  
by Electric Ed on Sat Dec 13th, 2003 at 01:04:42 PM MST  
([User Info](#)) <http://www.electric-ed.com>

I agree, the significant airgap, from a performance point of view, is the portion of the magnetic circuit that isn't either in iron or the magnets.

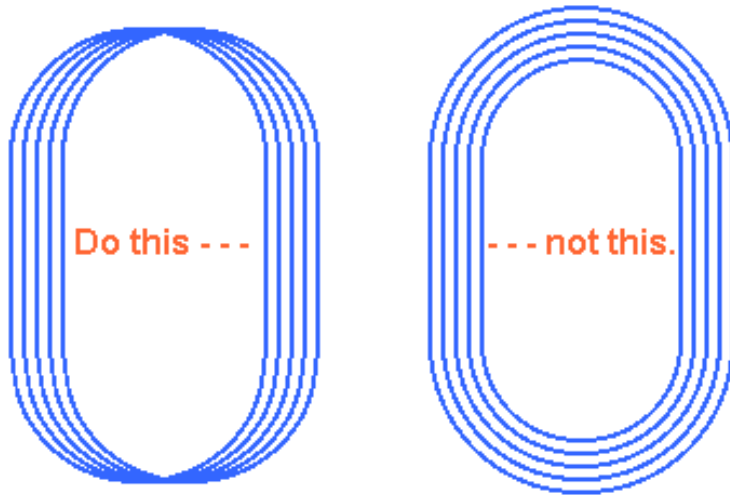
The answer is coils with a wide, flat cross-section. In motor winding lingo, they would be called "mushed" coils.

The problem, as you stated, is how to fabricate a thin, but strong, supporting structure.

Electric Ed

**When winding coils that have a wide, thin cross-section try to keep the "span" of each turn as close as possible to the center-to-center distance between the magnets.**

**This will result in less voltage cancellation and higher terminal voltage, and improved waveform.**



[ [Parent](#) ]

Re: Magnet Strength vs Thickness ([none / 0](#)) (#10)  
by wooferhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Sun Dec 14th, 2003 at 09:42:37 AM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

I can't think of a way to wind the coils like the drawing on the left ?

}=- W o o f -=  
[ [Parent](#) ]

Re: Magnet Strength vs Thickness ([none / 0](#)) (#11)  
by cevonk ([cevonk\(at\)signhere@aol.com](mailto:cevonk(at)signhere@aol.com)) on Sun Dec 14th, 2003 at 11:50:21 AM MST  
([User Info](#))

I was wondering how to do that, too. The idea i come up with is using a slanted form in the coil winding spool. That is, instead of having the piece between the sides meet the sides at a perpendicular angle, have it slanted at a 45 degree angle between the spools. Then the coils would seem to come out as described at left.

(Mind you, this is entirely theoretical. I've never wound a coil in my life.....although I have been around winches and things.)

[ [Parent](#) ]

Re: Magnet Strength vs Thickness ([none / 0](#)) (#12)  
by Electric Ed on Sun Dec 14th, 2003 at 05:02:43 PM MST  
([User Info](#)) <http://www.electric-ed.com>

[quote]"I can't think of a way to wind the coils like the drawing on the left?"

It's hard to describe, and even harder to draw a picture of.

Have you ever seen the kid's toy called a "slinky". I think that was the name. It had a wire spring joining the body parts.

Wind your coil so that, when removed from the winding form, it resembles such a spring sitting on end, one turn on top of another.

Then just push the top turns over to one side, like you'd fan out a deck of cards, sort of.

Make any sense?

Now if I could just figure out a way to mount them- - -

Electric Ed

[ [Parent](#) ]

Re: Magnet Strength vs Thickness ([none / 0](#)) (#16)  
by Firefly on Mon Dec 15th, 2003 at 12:06:27 PM MST  
([User Info](#))

Just messing around with the slinky Idea. The difficult part would be connecting all of the layers of the coil together.



>



Firefly

[ [Parent](#) ]

Re: Magnet Strength vs Thickness ([none / 0](#))  
([#18](#))  
by dconn on Mon Dec 15th, 2003 at 05:09:43 PM  
MST  
([User Info](#))

Hi Firefly,

Thats a nice thin looking coil - did you use a long sticking-out coil former and then slide the coil sideways to make it thin? You mentioned test results - did you do any testing with magnets?

Derek

[ [Parent](#) ]

Re: Magnet Strength vs Thickness  
([none / 0](#)) ([#19](#))  
by Firefly on Mon Dec 15th, 2003 at  
05:22:43 PM MST  
([User Info](#))



I did not test as yet because a new size coil form will have to be made to get he right dimensions. It was wound like a spring like Ed said

Firefly

[ [Parent](#) ]

Re: Magnet Strength vs Thickness  
([none / 0](#)) (#20)  
by dconn on Tue Dec 16th, 2003 at  
04:16:58 PM MST  
([User Info](#))

I think it looks great. I wonder though would the coils be too wide (with enough turns) - coils normally dont seem to fit well at the best of times (I've only wound a set of coils once and they were nearly too bulky).

I wonder how think the stator needs to be to ensure that it stays stiff and secure?

All the best,

Derek

[ [Parent](#) ]

Re: Magnet Strength vs  
Thickness ([none / 0](#)) (#21)  
by Firefly on Wed Dec 17th,  
2003 at 08:53:03 AM MST  
([User Info](#))

I have been working with the stiffness of thin colis and coils in general. The method shown in the photos below tell the story.



These two photos show a wooden form that I made to compress the coils tightly

together

Putting epoxy on the coil legs



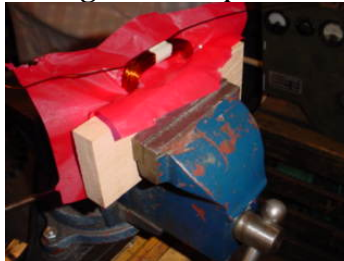
The form is covered with plastic film so the coil can release and don't get glued into the form  
Coil shown in the form



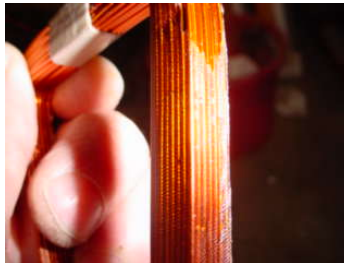
putting the top block on



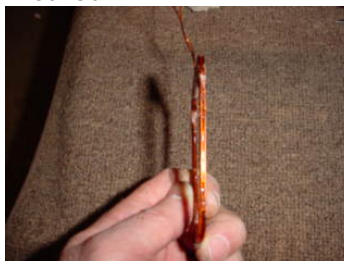
The big squeeze. This forces the coil legs into shape.



Cose up of one leg of a finished coil



A vey thin coil made with this method



These coils are very strong and ridged I think that they will have enough to support through the air gap if they are cast in resin around the outside and inside of the coils. I have made test with the air gap between the magnet faces of less than .25" with these thin coils. However the gain that I seen with less air gap don't seem to match the opinion of others. i.e. if you have half the air gap we should see 4 times the voltage. As shown in the original test this seems not to be true. A balance has to be reached between voltage output, air gap, turns per coil, and wire size to reach the highest wattage output.

[ [Parent](#) ]

Re: Magnet Strength vs Thickness ([none / 0](#)) (#13)  
by kurt on Sun Dec 14th, 2003 at 10:44:31 PM MST  
([User Info](#))

how bout trimming them images down a bit them bitmaps give my poor dileup a hurnia a giff would done the trick and would have been allot faster to load



Re: Magnet Strength vs Thickness ([none / 0](#)) (#14)  
by Firefly on Mon Dec 15th, 2003 at 08:29:22 AM MST  
([User Info](#))

Take a look at TEST RESULTS on page a little further down.  
Firefly

[ [Parent](#) ]

Re: Magnet Strength vs Thickness ([none / 0](#)) (#22)  
by Firefly on Wed Dec 17th, 2003 at 08:58:31 AM MST  
([User Info](#))

These photos are only about 15kb each. For some unknown reason they come out different sizes from one comment or posting to the next. If I am causing problems someone should let me know.

Firefly

[ [Parent](#) ]

Re: Magnet Strength vs Thickness ([none / 0](#)) (#23)  
by kurt on Wed Dec 17th, 2003 at 11:28:28 AM MST  
([User Info](#))

Firefly

i was refering mostly to the first 2 imiges which are huge bitmaps your pictures are a reasonable size. if you hit [enter] after inserting each picture they will display much better. i cannot fix this for you in a comment as scoop does not allow us to edit comments only the original story.



[ [Parent](#) ]

Re: Magnet Strength vs Thickness ([none / 0](#)) (#24)  
by Firefly on Wed Dec 17th, 2003 at 04:04:14 PM MST  
([User Info](#))

Thanks, That may explain a few things. I also noticed that if you preview the comment or posting that any image gets bigger each time that you hit preview. At least I think thats what happens. As long as I have your ear, I can't seem to be able to delete any photos from my uploads list. Any thoughts?

Firefly

[ [Parent](#) ]

Re: Magnet Strength vs Thickness ([none / 0](#)) (#25)  
by kurt on Wed Dec 17th, 2003 at 04:14:40 PM MST  
([User Info](#))



make sure you click on the confirm box (has to be a checkmark in it to delete) you have to check the confirm box each time before you click delete. but be advised that if you delete photos from your album they will no longer appear on the board.



[ [Parent](#) ]

Re: Magnet Strength vs Thickness ([none / 0](#)) ([#26](#))  
by Firefly on Wed Dec 17th, 2003 at 08:27:28 PM MST  
([User Info](#))

Thats good to know. I just have to remove one that was not intended to be there.

Firefly

[ [Parent](#) ]

[Magnet Strength vs Thickness](#) | 26 comments (26 topical, 0 editorial)

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## [Some body knows how to build magnets?](#)

By [filico](#), Section [Magnets & Magnetism](#) [Magnetism](#)

Posted on Thu Dec 11th, 2003 at 12:18:06 PM MST

I´m just curious About how to build Permanent magnets

Hi Friends: I'm curious to know how the permanent magnets are built, if somebody knows links I´d like to know them. Thank you for your help Filiberto Correa  
Saludos desde México

[Some body knows how to build magnets?](#) | 1 comment (1 topical, 0 editorial)

Re: Some body knows how to build magnets? ([none / 0](#)) (#1)  
by [stm](#) on Thu Dec 11th, 2003 at 02:15:02 PM MST  
([User Info](#))

Hello,

You can create your own magnet using a magnet and a small piece of rectangular iron (ie a small saw blade)

put the saw-blade on a table, and use the magnet to sweep from one end of the blade to the other - allways in the same direction.

When you have done this you can verify the result with a compass.

The magnet you can buield using this method is not very strong, but it make the compass react, and you can pick up very small nails.

Remember that the stronger the magnet - the stronger the resulting magnet will be.

Thou this will make a nice experiment, the magnet you can create at home will not be of the same quality and strength as the industrial made magnets.

/Steffen

[Some body knows how to build magnets?](#) | 1 comment (1 topical, 0 editorial)

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### [Ball Bearing question...](#)

By [CrookedScepter](#), Section [Magnets & Magnetism](#) [Magnetism](#)

Posted on Wed Dec 10th, 2003 at 08:38:16 AM MST

If I were to put 2 ball bearings together....

If I were to put 2 ball bearings together, and they were to be arragened vertically and they would only touch each other to one point while the bottom one spins and the other stays still...

At 300rpm, how long before that point would wear away so that the bearings would have to be rotated to keep friction and surface contact down? a day? a week? a month? not an exact answer is needed, just a guesstimation...

Thanx-

[Ball Bearing question...](#) | 4 comments (4 topical, 0 editorial)

Re: Ball Bearing question... ([none / 0](#)) ([#1](#))  
by [charged](#) on Wed Dec 10th, 2003 at 11:45:46 AM MST  
([User Info](#))

You mean the bottom bearing is spinning around the virtical axis, like a top?

Depends on the hardness of the bearing material, mainly. If you get something REALLY hard, the contact point will remain small (no flattening) and the friction would be minimal. I'm assuming you'll probably use a drop or two of oil at that contact point to, right?

What diameter are they?

Re: Ball Bearing question... ([none / 0](#)) ([#2](#))  
by [CrookedScepter](#) on Wed Dec 10th, 2003 at 12:07:57 PM MST  
([User Info](#))

the bearings are 1/2" diameter, and I got them from [www.rare-earth-magnets.com](#) they say that they bearings have high hardness and excellent wear. I'm just trying to get a general timeframe for how long that contact point will be good for low friction. Kind of a hard question, I just like to hear a ballpark figure

Thanx-

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Re: Ball Bearing question... ([none / 0](#)) (#3)  
by wpowokal on Thu Dec 11th, 2003 at 05:27:58 AM MST  
([User Info](#))

How long will depend greatly on how much load you put on the assembly, lubrication and any possible temperature rise. the proposed 300 rpm is actually quite slow.

In a sealed lubricated enviroment I would say 12 months plus. I base this on the fact that rollar bearing spend their life rolling around with a minimal contact( in theory no metal to metal contact, as lubricant should come between both bearing surfaces)

I have never replaced a roller bearing that has developed a flat, generally they fail due to pitting caused by moisture in the lubricant.

regards Allan

Re: Ball Bearing question... ([none / 0](#)) (#4)  
by CrookedScepter on Thu Dec 11th, 2003 at 08:56:44 AM MST  
([User Info](#))

12 months plus? Wow, as far as the load goes, how I have my project setup, is that there is almost no load on the contact point between the bearings. all that is keeping the points in contact is magnetic attraction that cancels out the weight of the load.

If I tell ya any more, I'll have to kill ya ;) j/k

Thanx-

[ [Parent](#) ]

[Ball Bearing question...](#) | 4 comments (4 topical, 0 editorial)

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## [Magnetic Motor](#)

By [wildbill hickup](#), Section [Magnets & Magnetism](#)  
Posted on Tue Dec 9th, 2003 at 05:16:21 AM MST [Magnetism](#)

**What happened to the guy with the magnetic motor???**

T thought I might try building the motor he refered to or a variation thereor from a bicicle wheel just to see if it works. I like to read the artical again on the link he provided.

[Magnetic Motor](#) | 5 comments (5 topical, 0 editorial)

Re: Magnetic Motor ([none / 0](#)) (#1)  
by woferhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Tue Dec 9th, 2003 at 08:14:18 AM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

<http://www.fieldlines.com/story/2003/12/5/221445/464>

}-- W o o f --{

Re: Magnetic Motor ([none / 0](#)) (#2)  
by wayne on Tue Dec 9th, 2003 at 03:01:10 PM MST  
([User Info](#))

Hi

There has been many people that have tried, some say they have but never pics or video. Then they disappear. The last one was Mikell and he is gone too. I have tried but no luck. Still believe it is possible. There is many forms. If someone did post details most goverments would stop this sad but true.

Re: Magnetic Motor ([none / 0](#)) (#3)  
by RogerAS ([rogeras@cei.net](mailto:rogeras@cei.net)) on Tue Dec 9th, 2003 at 04:00:14 PM MST  
([User Info](#))

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Wayne,

The reason you didn't succeed in making one of these motors is the same reason nobody else has or ever will, it isn't possible! I don't care how carefully the magnets are spaced or what arrangement they are positioned the laws of this universe prohibit the extraction of power from a device without a greater ammount of input.

The government is an easy target, "they" really want to keep us commoners down, not! Hell, I bet you could get a massive grant to try to build one of these over unity devices if the proposal was worded correctly. (I am not a supporter of the gov. either)

RogerAS

"Put the bunny back in the box!"

[ [Parent](#) ]

Re: Magnetic Motor ([none / 0](#)) (#4)  
by wildbill hickup on Wed Dec 10th, 2003 at  
06:53:45 AM MST  
([User Info](#))

Roger,

I'm not the government conspiracy type either, however about 35 years ago an artical came out in popular mechanics magazine about a guy that invented a device that he called a water injector for use in automobiles. I was facinated. At the time my mechanical inclinded Uncle (was in charge of maintaining deisel powered radar station, part of the early warning system) said that other than steam it would be impossible to run an engine on water absolutly impossible. Now we are playing with engines that will run on hydrogen and oxygen (the 2 components in water). I have built one of the oxy-hydorgen generators and I can't run an engine on it (yet) but I have used it with a torch tip and got a very hot flame. Rumor has it that the military uses some of Tesla's inventions, but are they readily available to the general public? No.

35 years ago that same uncle who was also an avid mariner and using LoranC locator technology would have sworn that no satellite 20,000 miles up is going to place your location as close as 3 meters, or closer if the US military would allow it. At the timr Loran C was top of the line and very expencive. Now we can buy a GPS for less than 100 bucks. I beleive almost anything is possible if you don't accept it as being impossible.

Bill

[ [Parent](#) ]

Re: Magnetic Motor ([none / 0](#)) (#5)  
by wayne on Thu Dec 18th, 2003 at 02:33:08 PM MST  
([User Info](#))

Hi

This one just came in, do not know if it works, but looks very intresting

<http://www.fdp.nu/mikelldevice/thedevic.asp>

Enjoy

[Magnetic Motor](#) | 5 comments (5 topical, 0 editorial)

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[Magnet safety](#)

By [stm](#), Section [Magnets & Magnetism](#)  
Posted on Mon Dec 8th, 2003 at 06:08:01 PM MST [Magnetism](#)

The magnetic field on an alternator is known to be very strong

and since i have just ordered 24 1x2x.5" magnets and the axial flux alternator plans, I was hoping that someone would illustrate just about how much force and at what distance i should expect when assembling this alternator. - breaking fingers is something i usually try to avoid ;-)

Well - I did buy a magnet about half the size, just to get a feeling about the strength before i start playing around with the "real stuff"

Thanks in advance.

/Steffen

[Magnet safety](#) | 6 comments (6 topical, 0 editorial)

Re: Magnet safety ([none / 0](#)) ([#1](#))  
by [Hank](#) on Mon Dec 8th, 2003 at 07:17:07 PM MST  
([User Info](#))

Steffen,

If these are neo magnets I would be very carefull. Though I am not exactly sure 24 of these magnets assembled correctly would probably have enough strenght to pick up a full size car and some. From personal experience, make sure you have a firm grip on these magnets when assembling your alternator, always slide them onto a steel disk never try to place them on directly and keep all magnetic material (iron, steel, nails etc.) far away from your work area. Magnets can be deceiving in that they may not appear to have any force in them until they get close to another magnet or steel/iron object then watch out. I beleive that the magnetic force is reduced by the cube of the distance away from a magnetic object and the converse is true.

Neo magnets are very brittle and can shatter into small pieces when slammed together or against a piece of steel so watch out for shrapnel should that happen (it has to me).

Above all be extremely cautious and vigilant when working with these. Keep them away from electronic equipment (TV's, computers, etc.) as they will damage or destroy them.

Good luck and have fun.

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- [Also by stm](#)



Re: Magnet safety ([none / 0](#)) (#3)  
by stm on Mon Dec 8th, 2003 at 08:22:01 PM MST  
([User Info](#))

Hello,

Thank you for taking the time to reply.

Sorry for leaving out such a vital piece of information, but yes, the magnet's are Neo's (Wondermagnet.com item #76)

I saw an interesting slideshow of the manufacturing of an alternator, and I noticed that they used two chains when they assembled the two rotors. - unfortunately the pictures and the story didn't tell what the chains was connected to, but the chains was very heavy duty, and I can understand from your posting, that there might be a good reason for that.

Maybe I can make a simmlar arrangement when i get to that point of the construction.

What does other people do? - i mean, if the magnets are strong enough to lift a car, then a working table would be an easy task to move?

/Steffen

[ [Parent](#) ]

Re: Magnet safety ([none / 0](#)) (#4)  
by DanB on Mon Dec 8th, 2003 at 08:37:50 PM MST  
([User Info](#))

Its very easily done with jacking screws. On my current alternator project I have 3 jacking screws, 1/2" - 13 threads, and the magnets are huge (much larger than those in Hughs plans) - it goes together very peacefully and quite easily. Chains - jacks... etc, are not necessary and probably not the safest way. In other windmills Ive made I just made a special "puller" - kind of like a wheel puller you'd use on a car. It's really very easy.

[ [Parent](#) ]

Re: Magnet safety ([none / 0](#)) (#2)  
by DanB on Mon Dec 8th, 2003 at 08:04:49 PM MST  
([User Info](#))

Those are very strong magnets you've got coming there!

I'd advise dont play with them too much before you get 'round to building the rotors for the alternator. When you get to that point - follow Hughs instructions! (he's got it pretty well layed out I think about how to handle them safely). Handle only one at a time, and keep all the xtra steel tools - etc, away from the work area. Definitely keep the two rotors are safe distance from each other.

If you follow Hughs instructions, you'll be drilling/tapping some holes for jacking screws in one of the rotors, so that you can assemble them in a slow and safe manner! It's not so bad just so your careful! If you take care in doing all this, it's perfectly safe and lots of fun!

Love to see some pictures of your project if you feel like it!  
It's a real good wind turbine.

Re: Magnet safety ([none / 0](#)) ([#6](#))  
by stm on Wed Dec 10th, 2003 at 03:40:57 PM MST  
([User Info](#))

Thank you everybody for helping me out on this matter.

I believe that i have an understanding about the power involved, and I feel better prepared for the challenge. The main reason for asking this question was that i wanted to be absolutely sure that I knew what I was doing - before I opened the box and destroyed my monitor and everything around me ;-)

The advice with the Jacking screws sound like the right approach for me. I was looking very closely at the picture with the heavy duty wires, and I believe that it was a task in itself, just to align the rotors, without doing damage to the bolts.

I'm looking forward to be reading Hugh's book, a lot of people has been refering to the book as a very good construction manual.

GPS wrote: "A bit of heightened awareness is a good thing and, with knowledge, fosters safe handling." - This was exactly what I was thinking about when i wrote my post. I have a few powertools both at home and at work, and they're all dangerous if they are used unwisely.

I did'nt get any second thoughts, but my respect for permanent magnets has been increased.

I've really enjoyed looking at pictures and reading the stories written by a lot of members of this board, and I'll take a few pictures during the development of this genny, and hopefully they will help other people getting success, and to avoid the problems I would be running into.

Have fun

/Steffen

[ [Parent](#) ]

Re: Magnet safety ([none / 0](#)) (#5)  
by [gps](#) on Tue Dec 9th, 2003 at 10:58:59 AM MST  
([User Info](#))

Just sliding one off the stack they ship them in requires significant effort - they are obscenely strong! The jacking screw approach described above is definitely the way to go, as well as being very careful about tools, etc. generally.

Most people work with numerous things in the course of their daily lives that have the potential to inflict serious harm or injury and don't give them a second thought because they are common place and the protocols for safe handling are learned to the point that they are second nature. Less familiar hazards are more intimidating because they are unfamiliar. A bit of heightened awareness is a good thing and, with knowledge, fosters safe handling.

Happy construction

[Magnet safety](#) | 6 comments (6 topical, 0 editorial)

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[magnet availability](#)

By [5kw](#), Section [Magnets & Magnetism](#)  
Posted on Mon Dec 8th, 2003 at 11:37:48 AM MST [Magnetism](#)  
DanB Magnet availability

Hi Dan.  
I'm working on a new design and want to know the long term availability of item # 0005 1.5 x 1.5 x .375 . You have plenty in stock now, but it doesn't seem to be a popular size.

Make the wind fun!  
Victor

[magnet availability](#) | 1 comment (1 topical, 0 editorial)

Re: magnet availability ([none / 0](#)) ([#1](#))  
by DanB on Mon Dec 8th, 2003 at 01:36:36 PM MST  
([User Info](#))

Hi Victor - I sent you an email... let me know if you didn't get it!

[magnet availability](#) | 1 comment (1 topical, 0 editorial)

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[Does anyone have a manget of this size?](#)

By [CrookedScepter](#), Section [Magnets & Magnetism](#)

Posted on Mon Dec 8th, 2003 at 08:05:05 AM MST

[Magnetism](#)

somebody, anyone?

I'm looking for a rare-earth magnet block shaped as 2"x1"x.25 or 2"x1"x.5"

it seems the one wondermagnet has is a bit too thick and expensive for what I want to do, I'd like to see if I can get 16 of the ones I want.

Does anyone sell such a magnet and not require a minimum order?

Thanx-

[Does anyone have a manget of this size?](#) | 3 comments (3 topical, 0 editorial)

Correction!!! ([none / 0](#)) (#1)  
by [CrookedScepter](#) on Mon Dec 8th, 2003 at 08:16:46 AM MST  
([User Info](#))

My bad, I feel like a dummy, the sizes I want are 2"x1"x.25" or 2"x1"x.125"

Thanx-

Re: Correction!!! ([none / 0](#)) (#2)  
by [ibedonc](#) on Mon Dec 8th, 2003 at 01:07:19 PM MST  
([User Info](#))

saw some on ebay

[ [Parent](#) ]

Re: Correction!!! ([none / 0](#)) (#3)  
by [ibedonc](#) on Mon Dec 8th, 2003 at 07:41:08 PM MST  
([User Info](#))

<http://cgi.ebay.com/ws/eBayISAPI.dll?ViewItem&item=2579883334>

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[Does anyone have a manget of this size?](#) | 3 comments (3 topical, 0 editorial)

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## [Magnetic Motor](#)

By [pexring](#), Section [Quarantine Zone](#)

Posted on Sat Dec 6th, 2003 at 10:19:27 PM MST

Anyone tried to build this. . .

[Magnetism](#)

Lots of links out there to magnetic motors that supposedly work. Most are proven they don't. Has anyone tried to build a magnetic motor such as this one.

[http://www.greaterthings.com/News/FreeEnergy/Directory/Howard\\_Johnson\\_Motor/Mikell/index.html](http://www.greaterthings.com/News/FreeEnergy/Directory/Howard_Johnson_Motor/Mikell/index.html)

Mark

[Magnetic Motor](#) | 1 comment (1 topical, 0 editorial)

Re: Free energy sites ([none / 0](#)) ([#1](#))

by Electric Ed on Sun Dec 7th, 2003 at 06:39:45 AM MST

([User Info](#)) <http://www.electric-ed.com>

Did you ever notice that the FREE energy sites always have something that they are SELLING?

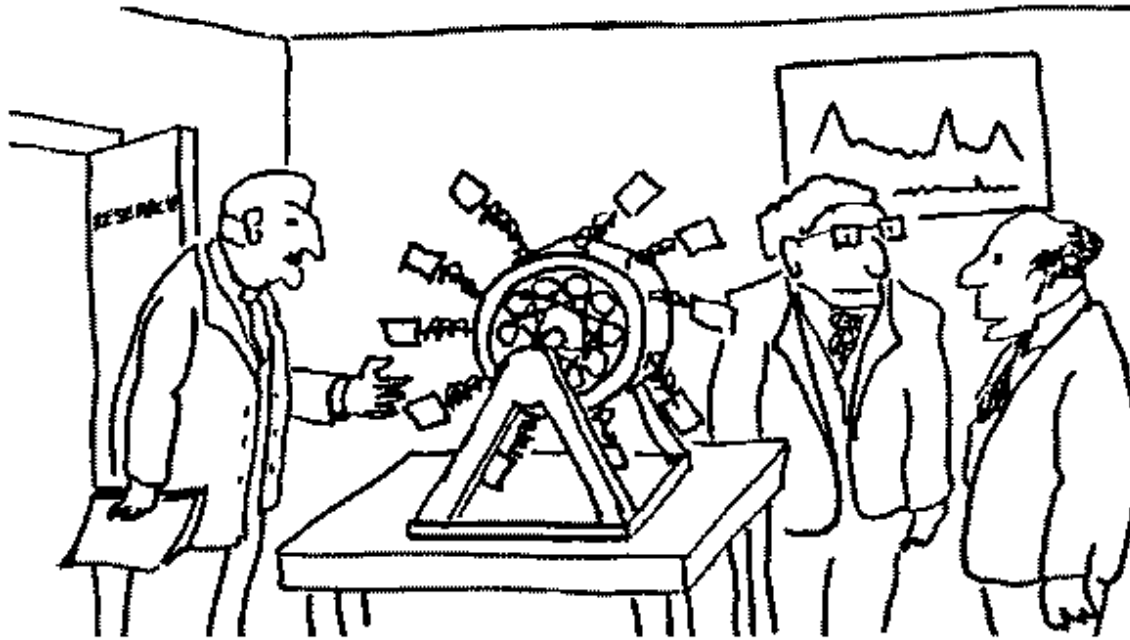
Electric Ed

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"I'm sorry sir, it may actually be perpetual motion,  
but it will take forever to test it."

Cartoon by Donald Simanek

[Magnetic Motor](#) | 1 comment (1 topical, 0 editorial)

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## [The PME Project](#)

By [buddy1065](#), Section [Quarantine Zone](#)

Posted on Sat Dec 6th, 2003 at 12:46:03 PM MST

[Magnetism](#)

The PME Project

---

### The PME Story; A History

Our company began in May of 1952 initially as a manufacturing plant for the military. The plant was located at an undisclosed area for secrecy. Although most of our projects cannot be described in detail, many of the engines and motors we designed were invaluable to our nation's department of defence. In 1963 we branched out into civilian applications. Our company continued to grow as we developed ways of producing the most efficient and light weight electrical motors and relays in their class. In 1975 our company began to be in severe financial distress. Some of our corporate managers were funnelling company funds for their own personal gain. Our company began to plummet into bankruptcy and chaos. It looked like we were about to become another ENRON. Only after these people were caught and fired did our president and founder, Dr. Dvorak Schlovowsky give the final word on hiring personnel for the company. "Dr. D" was not satisfied with mere financial gain but was always seeking new people, new ideas and innovative, history making inventions. Perhaps this is why we found among us one of the most truly innovative minds of our time. Around April of 2001 I began to notice the elderly Dr. D had become preoccupied with magnets. He carried them in his pockets and played with them constantly during board meetings. Once he even spoke to me personally of why he loved magnets. He said "They were an unexplained mystery men could only theorise about but never really understood. To see one piece of metal make another piece move away on it's own accord was a fascinating paranormal phenomenon, although most men take magnets for granted." I remember thinking he was getting senile in his old age. Nevertheless I believe his words are worth mentioning here since it marks the true beginning of our company's odd and intriguing history. On June 3, 2001 it was announced that two research teams were assigned a grant of over a half of a million dollars by our company to create a motor than could run by an internal permanent magnet system without any power supply or fuel. Although Dr D was convinced his "P.M.E." project would succeed and could not be persuaded otherwise, scientists had long considered such a motor which is powered exclusively by magnets as an impossible phenomenon. They held to the long standing rule that an electric current was always needed to convert a motor's magnetic potential energy into kinetic energy, making the motor's rotor spin. At the end of 23 months both teams were stumped. All of our top scientific personnel were left scratching their heads. Most of the staff believed it simply could not be done and called the PME project the DUD project. The grant money was used up, mostly because some of our educated ideas required us to use costly, huge equipment that super cooled different materials. The last of our theories were tried and trashed. We even tried

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ideas from the internet that others claimed to have worked, yet nothing did. Nearly everyone had thrown in the towel. On July 3, 2003 a lowly but devoted technician named Nikita Nelson, having wrestled with the problem in her mind month after month, working after hours on her own time had finally created a crude looking little prototype motor.

It's outer shell was actually made from a tomato soup can. Later Nikita admitted she had worked alone because the other researchers were always too busy and refused to listen to what they called her "ding-ee" ideas. Even our upper echelon researchers dismissed her latest idea that day, insisting it was too simple to work as she tried to explain it to them. During her presentation Nikita placed her little home made motor on the lab table and inserted one small magnetic rod into it. As the motor began spinning it's rotor without any exterior power supply everyone was speechless at first, then someone burst into a fit of laughter. "Our project is saved!" some mocked, thinking it was a gag. Laughing researchers gathered around to jeer. I suppose the staff laughed so hard because it was a relief to all of our failures during the project. Seeing the motor made from a little tin can for the first time, I found myself laughing also. Something that small could only be a prank, I thought. But glancing over at Nikita I could see a look of desperation as she tried to convince them otherwise. A few of the staff actually rolled on the laboratory floor in fits of laughter in front of her, ignoring her protests that it really worked. This infectious humour spread throughout the whole laboratory as Nikita stood, again ignored while a small mob of gathering researchers bumped against her shoulders from behind, brushing by her to see the little tin can motor. She had given up shouting for them to stop. They pointed, laughed and ribbed each other with their elbows, making witty, funny sayings about her homely little creation as she just stood there outraged. To them it was a practical joke from a mere technician who's only assignments were cleaning up the lab, dusting and book keeping. But Nikita, having observed their history of unsuccessful experiments had thought "out of the box" and made a working model of her own imagination. After the last of the chuckling died down, and people began to leave for the day, seeking their coats and belongings, a few technicians asked for Nikita's permission to dissect the engine. With an offended glare Nikita said nothing except "Sure, whatever..." Once the motor was taken apart the technicians could find no internal power supply. They used meters on all of the motor's parts but could detect no voltage or battery anywhere. Finally they excitedly called for the project engineers. You can imagine our elderly project engineers being pulled reluctantly by their arms to gather around the dismantled motor, some smiling at first, shaking their grey haired heads in doubt, expecting to find the little trick that made the motor work. Then came the puzzled looks, the murmuring and then finally the stunned expressions as their excited conversation grew fervently louder. They even accused the technicians of hiding the motor's batteries until the technicians reassembled the motor in front of them and inserted that last, little magnetic rod. When the motor delayed, then suddenly sprang to life it startled them all. Once again all of the lab workers began to gather around the little motor due to the commotion and exclamations that followed. Those who were leaving were compelled by others to rush back inside the laboratory. In the lab someone shouted for all of the loud scientific bickering to stop, and there was a profound silence, except for a single snapping sound which I noticed came from a pencil Nikita had broken between her trembling fingers. Then it was that all eyes fastened upon



her; the cute, young lady in the white lab coat who had just knocked over their Goliath problem with her simple, small stone. She had solved their impossibly huge enigma with one of the simplest yet greatest ideas of this age. Everyone could now see that Nikita was deeply offended and hurt; a tear trickled down her cheek, which she wiped quickly away. Knowing her feelings were exposed to those who had least esteemed her, Nikita's head lowered and her eyes darted defensively around at everyone as her chin trembled. For so long she wanted to be a part of the team but no one would accept her advice or ideas. Finally, we could all see what we had been doing to her; always waving her away because we were too busy. No one had realised how deeply her very heart was into this project. Through all of her labour all she wanted most was to be believed, respected and accepted. For a while no one knew what to say. A few of the female staff members drew near and encouraged her softly with the words "You did it Sis" and "You go girl" but their hugs seemed to squeeze more tears from Nikita's forlorn eyes. The head project manager cleared his voice in the silence and seemed to be about to make an apology but Nikita, trying to control her girlish, faltering voice, began asking why no one would ever give her a chance. She muttered that she was tired of being treated like dirt and ripped off her I.D. badge, letting it drop to the floor. Then she walked over, snatched up her little motor made of coiled wire, some 25 cent magnets, a capacitor, a rectifier, all housed in a shell of a tomato soup tin can, and walked hurriedly out of the building. I could never have imagined the success of the project would end up like this. Looking back on that day I realised it is not education that makes people great or special, but their hearts and their passion to follow their dreams. I learned never to underestimate people like her and to never think of anyone as lower than myself. On August 25, 2003 the military learned of Nikita's prototype motor and made an attempt to keep it under "Area 51" secrecy. Their aim was to use the PME for combat vehicle and other war applications. I was speaking with Nikita at her home, having convinced her to come back to the project when the military, having obtained a search warrant barged in, searched the whole house and found the motor in her garage. They detained Miss Nikita Nelson at the military base and confiscated all data of the PME project from our labs. Most of the lab workers were also detained, I suppose because we had seen too much. We were not allowed to communicate with our families or loved ones due to what the military described as national security reasons under penal code statute 0092B. On the night of September 11, 2003 at 3:00 AM there was a fire at the IMR plant. The PME project building was completely destroyed in the flames. The Fire Marshall could not find the cause of the fire. Two of our security personnel were burned to death in the incident. I quickly realised our project was about to go the way of the UFO; proof that the PME ever existed was disappearing fast from the public eye and there was nothing we could do about it. Back at the military base where we were all being held there was an "accidental" death of one of our project engineers during his detention. Upon hearing this news Dr. D spat at the feet of top military officials. Most of us who were detained became quite terrified, especially after we learned of the death of PME project engineer Dale Edwards while he was in the hands of the military. Soldiers claimed Edwards became so violent that they had to use force which proved to be lethal in order to prevent his escape. Those of us who knew Edwards also knew he was a well mannered church going family black man who always tried to keep the peace, never raising his voice. Two days later I overheard the chilling words "All targets

are expendable." as two lieutenants talked quietly together. After I told this to Nikita she remained strangely cool and confident. Nikita had foreseen the military's greedy interest of the project. Before being detained she had pre programmed a hidden computer to spread the PME project information by the internet. As they interrogated our personnel and as Nikita stalled them, the military eventually learned from other sources that the PME information was already leaked out into the international cyber community. Only then did they finally release every one of our employees. Consequently with Nikita Nelson's permission we have succeeded in keeping the PME lawfully available to all companies who wish to be a part of our progress. Who needs nuclear energy? Magnetic energy is not only more easy to regulate and control; it is safer. Those of you who are familiar with the power of rare earth neodymium magnets know that such magnets as small as the size of a child's hand can drag a full sized refrigerator across a concrete floor. A fluid cooled PME engine using such an array of magnets has easily propelled one of our prototype six passenger vehicles well over 200 MPH, and yet the PME that powers that vehicle is only 1/4 of the size and under 1/5 of the weight of a conventional gasoline engine. After I witnessed the power and speed of our prototype vehicle, which pulled up along side of our PME team, I looked over at Dr. D as he sat in his wheel chair. He had suffered a stroke recently. Nikita, standing at his side took hold of his hand, looking into his eyes with her girlish grin. Although Dr. D could only look up and return half of a smile due to his stroke, I could tell both of their hearts were happy now that their dreams were finally fulfilled.

We at Industrial Motor and Research Corporation would like to thank you for your interest in our history. We are also proud to announce this fantastic technological achievement called the PME and invite you to join us as we follow a new horizon toward everyone's future.

For further information please feel free to visit IMR marketing report web site at [www.imr.com](http://www.imr.com)

Sincerely,  
William Elliott  
Executive Superintendent

[The PME Project](#) | 3 comments (3 topical, 0 editorial)

Re: The PME Project ([none / 0](#)) ([#1](#))  
by drdongle on Sat Dec 6th, 2003 at 02:38:13 PM MST  
([User Info](#))

IMR.com = Internet Marketing Report

I'm sorry but this story is a bunch of tripe. Bogus Tek, bogus Company, bogus Law quoted, bogus, bogus, bogus.

Dr.D

Re: The PME Project ([none / 0](#)) ([#2](#))  
by TomW on Sun Dec 7th, 2003 at 09:46:10 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Dr. D;

Yeah, exactly why it is over here in the 'zone. Pure and utter bull droppings.

Cheers.

TomW

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\* BULLSHIT\* ([none / 0](#)) (#3)  
by Anonymous Hero on Sun Jan 4th, 2004 at 04:31:20 PM  
MST

BULLSHIT

More BULLSHIT

and even more BULLSHIT

[The PME Project](#) | 3 comments (3 topical, 0 editorial)

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## [Electromagnetic Halbach Arrays](#)

By [TheTyckoMan](#), Section [Magnets & Magnetism](#)  
Posted on Wed Dec 3rd, 2003 at 09:51:51 PM MST [Magnetism](#)

Has anyone made one of these?

would a electromagnetic halbach array work?  
I don't see why it wouldn't work, and if it does work then you could make a really strong halbach array much easier then using permanent magnets.

There would be a lot of things you could use it in, like Motors, Generators, Electromagnets, etc, I thought about this the frist time I saw a halbach array.

[Electromagnetic Halbach Arrays](#) | 2 comments (2 topical, 0 editorial)

Re: Electromagnetic Halbach Arrays ([none / 0](#)) ([#1](#))  
by [filico](#) on Thu Dec 4th, 2003 at 08:00:28 AM MST  
([User Info](#))

hi:  
tyckoman

What are a halbach? what did you means? i´d like to know, i speak spanish.  
thanks for help

filico

Re: Electromagnetic Halbach Arrays ([none / 0](#)) ([#2](#))  
by [TomW](#) on Thu Dec 4th, 2003 at 09:12:57 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

filico;

Check out this website:

<http://www.matchrockets.com/ether/halbach.html>

But, in a nutshell, a halbach array is a way of assembling multiple magnets so the assembly has only one magnetic pole. That page tells all however.

Cheers.

TomW

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### [Finding the poles on a magnet](#)

By [CyberShadow](#), Section [Magnets & Magnetism](#)  
Posted on Fri Nov 28th, 2003 at 12:28:16 AM MST [Magnetism](#)

What is the best method for finding the poles on a disk-shaped NeodymiumIronBoron Magnet.

What is the best method for finding the poles on a disk-shaped NeodymiumIronBoron Magnet.

[Finding the poles on a magnet](#) | 8 comments (8 topical, 0 editorial)

Re: Finding the poles on a magnet ([none / 0](#)) ([#1](#))  
by [drdongle](#) on Fri Nov 28th, 2003 at 06:08:45 AM MST  
([User Info](#))

A compass.

Dr.D

Re: Finding the poles on a magnet ([none / 0](#)) ([#2](#))  
by [DanB](#) on Fri Nov 28th, 2003 at 08:35:10 AM MST  
([User Info](#))

Best method depends a bit on what youve got around!

As was said below, a compass works well. The needle will point towards the South pole.

Or you can float the magnet on water (on a cork or a bit of wood or something) with the poles perpendicular to the ground, and the North pole of the magnet will point North.

Or you can tie a string to it and do the same thing...

Most fun way - simply hold the magnet flat in the palm of your hand and lightly toss it into the air (not too high). 9 times out of 10, if the South pole is facing up, the magnet will go up into the air, and land flat back in your hand without ever turning ver. If the North pole is facing up, it will flip in the air and usually land with the South pole facing up. This is how I usually tell.... although - there is rarely a reason to know or care which pole is North or South, that I can think of.

Unworkable Devices ([none / 0](#)) ([#3](#))  
by [wdyasq](#) on Fri Nov 28th, 2003 at 09:15:51 AM MST  
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Be careful Dan - has this method been tested in Australia and other places south of the Equator?

Ron

[ [Parent](#) ]

Re: Unworkable Devices ([none / 0](#)) (#4)  
by DanB on Fri Nov 28th, 2003 at 09:18:06  
AM MST  
([User Info](#))

yes, I suppose it'd the opposite further down south of the equator and probably not work at all near the equator.

Sure works well here though!

[ [Parent](#) ]

Re: Finding the poles on a magnet ([none / 0](#)) (#7)  
by Norm on Sat Nov 29th, 2003 at 11:08:57 AM  
MST  
([User Info](#))

Okayyy...this might sound silly  
'Or you can float the magnet on water (on a cork or a bit of wood or something) with the poles perpendicular to the ground, and the North pole of the magnet will point North'.  
wouldn't that be the South pole of the magnet pointing North? Opposites attract...Likes repel?  
Course I realise this is an arbitrary thing.... but like you said there is rarely a reason to know or care.And like I said this probably sounds silly. (:>) Norm.

[ [Parent](#) ]

Re: Finding the poles on a magnet ([none / 0](#)) (#8)  
by Wolfie1 on Mon Dec 1st, 2003 at 06:02:36  
AM MST  
([User Info](#))

Norm, I believe that the geographic North Pole has the south side of the Earth's magnet. It's called the North Pole because because the north poles of magnets point that way. All the names were set in stone long before we had the magnets sorted out.

Martin.

[ [Parent](#) ]

Re: Finding the poles on a magnet ([none / 0](#)) (#5)  
by santi on Fri Nov 28th, 2003 at 09:48:55 AM MST  
([User Info](#))

you can also take some iron powder and put on the magnet, you will see the magnet field.

Re: Finding the poles on a magnet ([none / 0](#)) (#6)  
by CyberShadow on Fri Nov 28th, 2003 at 01:05:32 PM MST  
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I used the "compass method"  
The magnet I was testing was Item #10

[Finding the poles on a magnet](#) | 8 comments (8 topical, 0 editorial)

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## [Rail Gun](#)

By [kevinenglish](#), Section [Quarantine Zone](#)

Posted on Thu Nov 27th, 2003 at 02:24:04 PM MST [Magnetism](#)

small question

Hey everyone,

For a personal project I am trying to develop a small rail gun, one that'll shoot a couple hundred feet with a 1/2 inch steel ball bearing. So far I have made the electronics, an extremely strong electromagnet and the switch, with a safety (so I don't shoot myself). So far what I have (not put together yet) will shoot the ball bearing ~20'-30', but that's not my goal. What I want to do is add 5 more of these electromagnets to what is going to be the barrel to accelerate the ball bearing even faster since one electromagnet isn't enough.

Now to my question, is there something that I can put in between each electromagnet that could delay the flow of electricity for about 1/500th of a second? I need this to make a ripple effect on the electromagnets so each one pulls the ball bearing in sequence until it exits the barrel at the end.

[Rail Gun](#) | 4 comments (4 topical, 0 editorial)

Re: Rail Gun ([none / 0](#)) ([#1](#))  
by Demetri ([corvettemach1@yahoo.com](#)) on Thu Nov 27th, 2003 at 07:01:50 PM MST  
([User Info](#))

I don't have an answer for your problem, and this may not be any of my business, but curiosity is getting the better of my intelligence. What are you going to use it for?

Demetri  
Always be the lead dog.

Re: Rail Gun ([none / 0](#)) ([#2](#))  
by kevinenglish on Fri Nov 28th, 2003 at 04:37:36 PM MST  
([User Info](#))

Hey,

I just thought that something like this would be an interesting project. To tell you the truth, I am really into things that can propel objects large distances. So far I have 2 potato cannons, air rifles, 2 air soft guns and more. Basically it's gonna be something to do just for a project, something neat that no-one else has.

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Re: Rail Gun ([none / 0](#)) (#3)  
by TomW on Sat Nov 29th, 2003 at 08:23:44  
PM MST  
([User Info](#))  
<http://oneota.net/~earthsourcepowr/>

kevin;

Have you considered a electromagnetically activated trebuchet? Just an odd thought i had while reading this.

After seeing those electromagnetic can crushers I am convinced you could build an awesome trebuchet with an electromagnet rather than weights.

Cheers.

TomW

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Re: Rail Gun ([none / 0](#)) (#4)  
by kell on Sat Dec 20th, 2003 at 06:47:18 PM MST  
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Try this link:

<http://www.angelfire.com/80s/sixmhz/coolstuff2.html>

[Rail Gun](#) | 4 comments (4 topical, 0 editorial)

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### [Grab bag](#)

By [pakaran](#), Section [Magnets & Magnetism](#)  
Posted on Tue Nov 25th, 2003 at 04:20:01 PM MST [Magnetism](#)  
Grab bag

Hi, I've been happy with you in the past and was about to buy 5 grab bags as a present for myself. Can you email me when they're available, or alternatively can I pay in advance? Thanks! I was very satisfied with the magnets in the first grab bag, and didn't mind the chipped corners.

[Grab bag](#) | 3 comments (3 topical, 0 editorial)

Re: Grab bag ([none / 0](#)) (#1)  
by Seth on Wed Nov 26th, 2003 at 04:53:51 PM MST  
([User Info](#))

it might take awhile for some one that is in the store to reply....  
This isnt exactly the store front.... try sending them e-mail.

Re: Grab bag ([none / 0](#)) (#2)  
by DanB on Wed Nov 26th, 2003 at 05:58:10 PM MST  
([User Info](#))

Actually - things posted here regarding the store usually get dealt with sooner! (sorry I took so long).  
Ive fixed our inventory on that, so they are available online again. Sorry for the delay and thankyou for the kind comments!

Re: Grab bag ([none / 0](#)) (#3)  
by BrianK on Thu Nov 27th, 2003 at 08:10:37 AM MST  
([User Info](#))

I just lookrd at the grab bag it says you have 200 in stock, but just below that it says out of stock. just wanted to let you know.

[ [Parent](#) ]

[Grab bag](#) | 3 comments (3 topical, 0 editorial)

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[everything you wanted to know about magnetism but were to repulsed to ask](#)

[Magnetism](#)

By [kurt](#), Section [Renewable Energy FAQ](#)  
Posted on Mon Nov 24th, 2003 at 04:08:43 PM MST  
for all those magnetics questions look here

this is a very good link page for magnetic questions  
<http://my.execpc.com/~rheadley/magindex.htm>

for all your overunity questions look here  
<http://phact.org/e/z/freewire.htm>

also see  
<http://www.wondermagnet.com/magfaq.html>

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Renewable Energy FAQ

**New!** [Wind -- How do you get the windmill power down the tower, since the mill yaws into the wind?](#) [Wind](#)

By [ADMIN](#), Section [Renewable Energy FAQ](#)  
 Posted on Mon Dec 22nd, 2003 at 06:15:18 PM MST  
 Commercial slip rings are expensive...you can build your own, or go with a simple "pendant cable." Read on.... (286 words in story) [FULL STORY](#)  
 Comments by: *None yet*

**New!** [everything you wanted to know about magnetism but were to repulsed to ask](#) [Magnetism](#)

By [kurt](#), Section [Renewable Energy FAQ](#)  
 Posted on Mon Nov 24th, 2003 at 04:08:43 PM MST  
 for all those magnetics questions look here (32 words in story) [FULL STORY](#)  
 Comments by: *None yet*

**New!** [Batteries -- What voltage should my SLA battery read when fully charged?](#) [Batteries](#)

By [kurt](#), Section [Renewable Energy FAQ](#)  
 Posted on Wed Nov 19th, 2003 at 08:32:24 AM MST  
 This question gets asked allot along with a few other SLA (Sealed Lead Acid) related questions. (49 words in story) [FULL STORY](#)  
 Comments by: *None yet*

**New!** [Systems -- Fuses and Circuit Breakers -- where do I put them in a system?](#) [Power Systems](#)

By [ADMIN](#), Section [Renewable Energy FAQ](#)  
 Posted on Mon Nov 17th, 2003 at 09:25:46 PM MST  
 For safety's sake, there are different places to put them, with different types of fuses and breakers required. (434 words in story) [FULL STORY](#)  
 Comments by: *None yet*

**New!** [Batteries -- Can I use car batteries in my solar/wind RE system?](#) [Batteries](#)

By [kurt](#), Section [Renewable Energy FAQ](#)  
 Posted on Tue Nov 4th, 2003 at 09:52:53 PM MST  
 car batteries are not a good choice for this type of an application. (55 words in story) [FULL STORY](#)  
 Comments by: *None yet*

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 3 comments

[Useful math to be found here.](#)

by [Old F](#) - December 26

[More Tower Fun](#)

by [Old F](#) - December 25  
 1 comment

[hornet blades got about 800 watts 35 mph](#)

by [Geek](#) - November 28  
 10 comments

[aerial bunch cable](#)

by [swami](#) - November 15  
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[Up and running! \(way up\)](#)

by [marv](#) - November 8  
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[renewable energy faq](#)

by [kurt](#) - November 1  
 2 comments

[Fun with meters](#)

by [jimu](#) - October 31  
 3 comments

[Fun with fuel](#)

by [Demetri](#) - October 28  
 15 comments

**New!** [Wind -- How do I regulate voltage from my windmill to my battery bank?](#)

By [ADMIN](#), Section [Renewable Energy FAQ](#)

[Wind](#)

Posted on Tue Nov 4th, 2003 at 12:43:45 PM MST

The batteries actually regulate themselves, UNTIL they get full. At that point you must start diverting power to a Dump Load. (218 words in story) [FULL STORY](#)

Comments by: *None yet*

**New!** [Wind -- Can I use a car voltage regulator to regulate my wind generator?](#)

By [ADMIN](#), Section [Renewable Energy FAQ](#)

[Wind](#)

Posted on Tue Nov 4th, 2003 at 12:24:53 PM MST

No, vehicle voltage regulators are built to perform a completely different function. (242 words in story) [FULL STORY](#)

Comments by: *None yet*

**New!** [Wind -- Can I use a car alternator to build a wind generator?](#)

By [ADMIN](#), Section [Renewable Energy FAQ](#)

[Wind](#)

Posted on Tue Nov 4th, 2003 at 12:09:21 PM MST

You could...but they are poorly-suited for the task, requiring high rpms to make power, and have other problems. (238 words in story) [FULL STORY](#)

Comments by: *None yet*

[More Diaries...](#)

**Poll**

What do you think is the best (as by efficiency, availability, cost, etc.) source of electricity?

- Hydro
- Wind
- Chemical Reaction
- Steam
- Bio-mass
- Fossil Fuels
- Nuclear
- Lightning
- Static
- Solar

Votes: 80 | Comments: 0  
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[powerful electromagnet](#)

By [kevinenglish](#), Section [Magnets & Magnetism](#)  
 Posted on Sat Nov 15th, 2003 at 09:39:30 PM MST [Magnetism](#)  
 Electromagnets-how to

Hey, this is the first time that I have posted on this site for about a year. But once again I have a question.

I have been dealing with electromagnets for a while now, I built one that off of a 9.6 R/C 1 amp battery lifts ~ 10 pounds. But now I am stepping up and I want to start using a car battery for a personal project. What I would like to know is using a 1/2 steel core, how many turns and what gauge wire I should use to make the most powerful magnet possible (over heating was the problem with my last magnet) that doesn't over heat after 1 solid minute of use.

Thanks,  
 Kevin

[powerful electromagnet](#) | 2 comments (2 topical, 0 editorial)

Re: powerful electromagnet ([none / 0](#)) (#1)  
 by [charged](#) on Sun Nov 16th, 2003 at 09:24:46 AM MST  
[\(User Info\)](#)

"Electronics Conversions Symbols and Formulas", by Rufus P. Turner and Stan Gibilisco  
 ISBN# 0-8306-2865-7

This is a great book and contains all the electromagnetics formulas that you would need to work out your magnet detail ahead of time.

Basically, the heavier gauge the wire, the more current it can handle before it begins to get hot.

Your "magnetizing force" is determined by the following formula:

$$H = (3.14159 * .4NI) / L$$

- H= mag force (oersteds)
- N= number of turns in coil
- I= coil current (amperes)
- L= length of magnetic path (core length in cm)

In order to hold more weight with the same amount of power input you should be using both poles of the magnet to grab the weight.

Get a small block of iron or steel about 2 inches on a side. Drill a 1.5" diameter hole, 1.5" deep into the center of one side. Drill a 1/2" hole down in the center of that hole so the it goes the rest of the way through the block. Thread that hole so that a fine-thread 1/2" bolt will screw into it with the head of the bolt flush with the surface of the block inside the larger hole.

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Take the bolt out and mark it 1.5" from the top of the bolt head. Between this mark and the bolt head wrap you windings. But, make sure your windings do not get wider in diameter than the 1.5" block hole.

Screw the bolt winding assembly down into the hole in the iron block. When you apply power, the bolt head will be one pole and the upper surface of the block all around the bolt head will be the other pole.

You will want to grind the top of the bolt so that it is perfectly flush with the face of the block.

Now, when you stick this to a weight, you will be shocked just how much it can lift for only a small power input.

Enjoy!

Re: powerful electromagnet ([none / 0](#)) ([#2](#))  
by RobD on Mon Nov 17th, 2003 at 06:32:00 AM MST  
([User Info](#))

Thanks Charged,  
I was looking around for this just the other day. You saved me the work!  
RobD

[powerful electromagnet](#) | 2 comments (2 topical, 0 editorial)

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### [Magnets!](#)

By [aligirl](#), Section [Magnets & Magnetism](#)  
Posted on Mon Nov 10th, 2003 at 01:25:21 PM MST [Magnetism](#)

Can Magnets pass by eachother without creating any drag?

I'm doing a Science Fair project for my Physics class over Magnets, their force, and if it is possible to have them pass by each other with out creating any drag inbetween. I realize that some believe that this is impossible because of the perpetual motion, but i wondered if anyone had any comments to agree or contrast the subject.

[Magnets!](#) | 2 comments (2 topical, 0 editorial)

Re: Magnets! ([none / 0](#)) ([#1](#))  
by [drdongle](#) on Mon Nov 10th, 2003 at 04:26:40 PM MST  
([User Info](#))

This touches on another recent thread here.  
What you would need is some way to divert or redirect the field.

Dr.D

Re: Magnets! ([none / 0](#)) ([#2](#))  
by [iFred](#) ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Mon Nov 10th, 2003 at 07:28:54 PM MST  
([User Info](#)) <http://www.internetfred.com>

Check my web site, read about MSIG  
[www.internetfred.com](http://www.internetfred.com)

[Magnets!](#) | 2 comments (2 topical, 0 editorial)

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### [Joint for pipe tower?](#)

By [Old F](#), Section [Homebrewed Electricity](#)  
Posted on Thu Dec 11th, 2003 at 07:25:24 PM [Power Systems](#)  
MST

#### Joint for pipe tower?

Has any one tryed using 1/4 inch or 3/8 steel plate to make weld on flanges to join two lengths of pipe ? Been kicking a round some tower ideas.

I know they make weld on plumbing bolt up flanges but don't know if they would be strong enough or what they would cost.  
The flange can also be used as a place to attach guy wire.

Old F

[Joint for pipe tower?](#) | 6 comments (6 topical, 0 editorial)

Re: Joint for pipe tower? ([none / 0](#)) ([#1](#))  
by [Hank](#) on Thu Dec 11th, 2003 at 09:26:21 PM MST  
([User Info](#))

Old F

I used 1/4" steel plate to re-enforce the welded joint of my tower. I used two sections about 2" wide and about 10" long. I then formed a semi-circle in the middle of these to fit around the pipe, clamp style (this took some work). The ends that were protruding were drilled and bolted together around the pipe for a tight fit. I then welded this to the pipe. These also are used as the connection points for my guy wires. I used a total of four pairs (also for 4 guy wires).

I did not trust a welded joint just where the pipes slide in together. To much time invested to have a failure such as this. Incidentally my tower is 44 feet high consisting of 3" pipe, 2 1/2" pipe and a small section of 2" pipe.

So far so good,  
Hank

Re: Joint for pipe tower? ([none / 0](#)) ([#2](#))  
by [RobC](#) on Fri Dec 12th, 2003 at 07:48:58 PM MST  
([User Info](#))

I think that I would make some slip coupling and bolt them together myself.  
RobC

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Re: Joint for pipe tower? ([none / 0](#)) (#3)  
by Old F on Fri Dec 12th, 2003 at 11:29:47 PM MST  
([User Info](#)) <http://www.oldf.homestead.com>

Here is what I am thinking . It is sort of like what Hank is doing.

You set the 2 an ½ inch pipe in to the three inch and then bolt the welded flanges together

Old F



[ [Parent](#) ]

Re: Joint for pipe tower? ([none / 0](#)) (#4)  
by RobC on Sat Dec 13th, 2003 at 01:43:15 PM MST  
([User Info](#))

Just let the small pipe extend a foot or so into the other pipe. If its a very loose fit weld 3 small spacers on the bottom of the small pipe to take up slack.

If the pipe is going to break it will break at the weld on the flange on the small pipe first 3 small gussets might be good idea. Other than that I don't see how you could improve on it.  
RobC

[ [Parent](#) ]

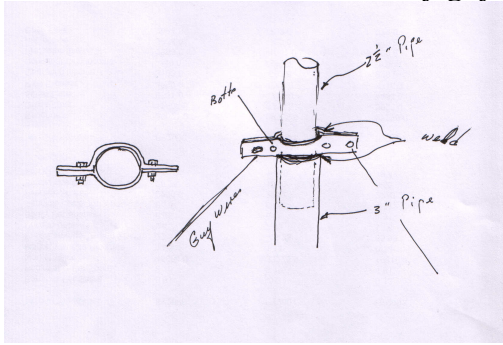
Re: Joint for pipe tower? ([none / 0](#)) (#6)  
by Hank on Sat Dec 13th, 2003 at 06:54:07 PM MST  
([User Info](#))



Old F,

Actually this is what I did. (hope photo comes through).

Two at right angles to each other at all joints, which is also where I connect my guy wires.



Perhaps an over kill but a cheap investment. Hand CAD is faster!

[ [Parent](#) ]

Re: Joint for pipe tower? ([none / 0](#)) (#5)  
by drdongle on Sat Dec 13th, 2003 at 05:01:11 PM MST  
([User Info](#))

I was working on my "small" tower today and to attach two pieces together I slipped 12" of one into the other and drilled two 1/2" holes through the two pipes 2" from each end and will insert two 3" schedule 8 bolts through with nuts to hold it together. seems a lot simpler and more secure than the welded flanges.

I might add a third bolt 180 degrees from the others if there is any wobble.

Just my \$0.02 worth

Dr.D

[Joint for pipe tower?](#) | 6 comments (6 topical, 0 editorial)

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## [MHD Generator?](#)

By [The MCP](#), Section [Homebrewed Electricity](#)

Posted on Tue Dec 2nd, 2003 at 12:21:36 AM MST

[Power Systems](#)

Using supermagnets, foil, and lighter to generate power?

I tried using an item #60 from Wondermagnet.com as the magnetic field source for a crude MHD generator. My experiment was simple. Simply tape two pieces of foil parallel to and about 4 mm from each other on glasses. Then place your magnet with either pole facing down the gauntlet between the pieces of foil.

Fire up a lighter between the foil pieces as a source of a precious few ions and you should get at least a few millivolts of output. Has anyone else tried this?

When I tried my experiment, I generated around 10 millivolts with a dying lighter and the plates about 6 or 7 millimeters apart. The most curious effect was when the foil was backed by glass, which resulted in the same gap generating 100+ mv with or without the magnet.

I'm very intrigued by this behavior, and a little lost as to an explanation for the foil/glass effect. Anyone want to replicate my experiment or tell me what the heck was going on?

[MHD Generator?](#) | 6 comments (6 topical, 0 editorial)

Acronyms are so unintuitive... [\(none / 0\)](#) [\(#1\)](#)  
by [TomW](#) on Tue Dec 2nd, 2003 at 06:26:03 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

MCP;

acronyms are so unintuitive, perhaps you can just spell out what MHD means to you?

Other than that I believe you have perhaps simply created a thermocouple or some strange version of a capacitor.

Cheers.

TomW

[Stuff I have Online](#)

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Re: MHD Generator? [\(none / 0\)](#) [\(#2\)](#)  
by [drdongle](#) on Tue Dec 2nd, 2003 at 06:29:39 AM MST  
([User Info](#))

M Magneto, H Hydro, D Dynamic

Dr.D

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Re: Oh Joy ([none / 0](#)) (#3)  
by JW on Tue Dec 2nd, 2003 at 07:37:28 AM MST  
([User Info](#))

Yep, thats MagnoHydroDynamics.

Im working with this, currently my ion stream is 5.5in in diameter, and reaches over 24inches. Im setting up a magnetic field coil for just 8inches, driven by 450amps @12.4vdc set up on a pulse width modulation schedule. the electrodes are of an un-named material for now. MHD is quite well known, and yes im using a very clean burning, Corn Burner for this. most of the previous research for this (MHD) used coal.

-JW

[ [Parent](#) ]

Re: MHD Generator? ([none / 0](#)) (#4)  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Tue Dec 2nd, 2003 at 08:28:54 PM MST  
([User Info](#)) <http://www.internetfred.com>

Anyone got a picture, I have seen this before, cannot remember where.  
Thanks!

Re: MHD Generator? ([none / 0](#)) (#5)  
by JW on Thu Dec 4th, 2003 at 12:24:01 PM MST  
([User Info](#))

Hi iFred,

Sorry no pictures at this time, But I did find an interesting link that has some basic diagrams.  
<http://mr-roboto.me.uiuc.edu/kawka/public/coal/future.html>

Normally this process uses superconductors to generate a very strong magnetic field around the fire/ion stream, and the addition of some form of seed material to the stream, to make it more electrcally conductive.

I think MCP's sugestion is a good one, just use magnets instead, and omit the seeding part. Im using coils to help optimize configuration, then most likely will use magnets. I look at it this way, some output is better than no output, its worth a try. Besides you could always cool the magnets with water cooling and use this for heating purposes. It might be a good way to get electricty from wood without a steam engine, and generator.

-JW

[ [Parent](#) ]

Re: MHD Generator? ([none / 0](#)) ([#6](#))  
by E man on Thu Dec 4th, 2003 at 04:43:13 PM MST  
([User Info](#))

I remember being fascinated by this MHD stuff even in high school...no moving parts; simply wicked. There's another configuration that involves two squattish conical shapes back to back with the burner in the middle. I found this beast on a google search for "disc MHD":

<http://www.ihed.ras.ru/mg/MHD.htm>

I searched awhile ago and found a group using a spark plug (pulsing at a regular intervals) upstream of the combustion zone to help ionize the gasses and increase the conductivity of the gases before they blast past the magnetic field. Fun topic.

-Enjoy

E-man

[MHD Generator?](#) | 6 comments (6 topical, 0 editorial)

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[Exersize bike pix.](#)

By [Jerry](#), Section [Homebrewed Electricity](#)  
Posted on Thu Nov 27th, 2003 at 09:03:53 PM [Power Systems](#)  
MST

Trying to post bike pix.

If this works its a picture of my bike pma combo.  
JK TAS Jerry



[Exersize bike pix.](#) | 3 comments (3 topical, 0 editorial)

Re: Exersize bike pix. ([none / 0](#)) ([#1](#))  
by Jerry on Thu Nov 27th, 2003 at 09:06:45 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

I realy need to use this after eating to much turkey today?

JK TAS Jerry

[Airheads Page](#)

Re: Excersize bike pix. ([none / 0](#)) ([#2](#))  
by TomW on Thu Nov 27th, 2003 at 10:53:35 PM  
MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

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Jerry;

Great pics. I fixed things up hope all the pics are there you wanted.

Your biggest problem posting for proper size is you must hit the enter key after you finish typing the text and before you click that add photo button. It ensures the pic is on its own line and works like a charm.

Cheers.

TomW

[Stuff I have Online](#)

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Re: Exersize bike pix. ([none / 0](#)) ([#3](#))  
by Norm on Fri Nov 28th, 2003 at 09:14:57 AM MST  
([User Info](#))

Now if that flywheel is steel and I where to put some magnets and make a PMA out of it...or like I posted a couple postings up....I could substitute the shaft of a big dc generator directly onto that flywheel and sprocket...just dreamin' and havin fun!  
Later....(:>) Norm.

[ [Parent](#) ]

[Exersize bike pix.](#) | 3 comments (3 topical, 0 editorial)

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[interesting site](#)

By [Dameion](#), Section [Homebrewed Electricity](#)  
Posted on Tue Nov 25th, 2003 at 07:50:38 PM [Power Systems](#)  
MST  
related to solar concentration

---

hi all

just thought that this site would interest a few on this board

<http://www.energylan.sandia.gov/sunlab/>

it's all to do with solar concentration  
[editor's note, by kurt] i moved this from quarantine zone because i believe that it was posted there by mistake

dameion

[interesting site](#) | 0 comments (0 topical, 0 editorial)

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[TO JERRY ABOUT THE GARBOGEN](#)

By [Homebrewed12vdc](#), Section [Homebrewed Electricity](#) [Power Systems](#)

Posted on Wed Nov 19th, 2003 at 01:02:33 PM MST

can I buy one

Jerry, I have heard of people claiming they bought a complete garbogen from you, and how well it was packed. I emailed you once about it, and got no response, so hears my last try, if you are building them and selling them, how much, and how do I buy them, If you arent then lets set the rumor straight for once and all. Thanks From Mike

P.S. I didnt see a link on the websites on the garbogen on where to buy one, or what the cost.

[TO JERRY ABOUT THE GARBOGEN](#) | 1 comment (1 topical, 0 editorial)

Re: TO JERRY ABOUT THE GARBOGEN ([none / 0](#)) ([#1](#)) by Jerry on Wed Nov 19th, 2003 at 09:48:18 PM MST ([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Mike

Sorry if I missed your e-mail. If I don't see something that I can identify in an e-mail I delete it.

I may have mistakenly done that?

I do build and sell the GARBOGEN. The curent price is \$350. I ship COD UPS. Casiers check or money order. UPS has a \$7 fee for COD shipments.

I'll only be able to build a few more GARBOGEN,s as the supply of curved neo magnets is about gone.

The curent modle has a large yaw/flage bearing that will mount to 1 1/2 inch EMT electrical conduit. Wires go down inside the mast. The unit is a 3 blade 49 incher.

I'm several weeks out in production right now.

JK TAS Jerry

[Airheads Page](#)

[TO JERRY ABOUT THE GARBOGEN](#) | 1 comment (1 topical, 0 editorial)

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## [Systems -- Fuses and Circuit Breakers](#)

### [-- where do I put them in a system?](#)

By [ADMIN](#), Section [Renewable Energy FAQ](#)

[Power Systems](#)

Posted on Mon Nov 17th, 2003 at 09:25:46 PM MST

For safety's sake, there are different places to put them, with different types of fuses and breakers required.

Your system should have BIG power cables from the batteries to the inverter. The '+' cable here should be fused with a BIG fuse--usually a Class T with a 250 or 500 amp rating. Your inverter probably came with suggested fusing information. If not, try the chart located at:

[http://www.otherpower.com/otherpower\\_systems\\_inverters.html](http://www.otherpower.com/otherpower_systems_inverters.html).

There are also big circuit breakers you can use for this, but they are extremely expensive. Just the fuse and holder will cost you \$60 -- a 500 amp DC breaker goes for \$300 and up. You can also run your DC loads through this fuse, though they should have their own smaller load breakers/fuses too.

You should also have fuses on both your DC and AC loads. Your inverter has fuses inside, but it's much better better to blow your breaker first. For the AC side, a standard, inexpensive breaker box will work. But it's made for the 220v feed into your house -- you'll have to bridge the hot side of your 2 vertical rows of breakers with a short piece of #8 wire to make the second row active--otherwise only one row of breakers will have power. Do this where the main feed wires attach to the rows of breakers.

You can also use breakers for the DC side, though standard automotive fuses will work if they are big enough for your loads. Check the specs on the breakers -- only certain kinds are rated for DC use. But we were able to find some at the local Home Depot.

You should also fuse your DC inputs from solar, wind, hydro, etc. This can again be done with a breaker box or fuses.

It's also wise to have a "big switch" on the + side of your system -- rated the same as your big inverter fuse, you can use it to completely shut down everything going in or out of your system. If sparks are still flying when you shut down with the big switch, something fell across your battery terminals! You can also combine your big fuse and big switch in one unit (about \$200). This starts to show how handy the use of buss bars can be (see [http://www.otherpower.com/otherpower\\_battery\\_wiring.html](http://www.otherpower.com/otherpower_battery_wiring.html)).

They give you more places to hook up inputs and outputs, and make it easier to make ALL your + wires go though the big switch.....and easier to make all your '-' wires go through your shunt, if you have an amp/hour meter installed.

[Systems -- Fuses and Circuit Breakers -- where do I put them in a system?](#) |

0 comments (0 topical, 0 editorial)

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## [Residential wiring and PV](#)

By [jubalearly](#), Section [Homebrewed Electricity](#)

Posted on Mon Nov 17th, 2003 at 10:02:40 AM MST

[Power Systems](#)

### Residential wiring

A lot of your questions regarding residential installation of PV systems may be answered at the Sandia PV website at <http://www.sandia.gov/pv/> They have a number of articles including John Wiles' Homepower articles dealing with PV and the NEC. I also find this forum helpful in regard to the NEC requirements: <http://www.homewiringandmore.com/homewiringusa/2002/index.html>

HTH, -RussH

[Residential wiring and PV](#) | 2 comments (2 topical, 0 editorial)

Re: Residential wiring and PV ([none / 0](#)) (#1)  
by [Budgreen](#) on Mon Nov 17th, 2003 at 02:41:01 PM MST  
([User Info](#))

welding cable is not appropriate : (  
guess I won't be up to code with 2/0 wiring....  
woder why that is?

Re: Residential wiring and PV ([none / 0](#)) (#2)  
by [troy](#) on Tue Nov 25th, 2003 at 04:39:15 PM MST  
([User Info](#))

Welding cable has never been tested for this application. Basically, it's a bureacracy issue. And while Mr. Wiles is a very smart guy, he is also a nitpicking, strictly by the book kind of guy. If he designs/installs your system, you can be sure it will pass code. If he's your inspector, you can be pretty sure it won't.

Best regards,

troy

[ [Parent](#) ]

[Residential wiring and PV](#) | 2 comments (2 topical, 0 editorial)

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## GM-90/8

By [windstuffnow](#), Section [Homebrewed Electricity](#)

Posted on Mon Nov 10th, 2003 at 12:50:24 PM [Power Systems](#)  
MST

Just arrived...

I just picked up the GM-90/8hp I ordered about a week ago. Was pretty excited... What a beast! I ripped open the crate like a kid at Christmas spent about 2 hours assembling, bleeding the injector pump, lines and injector.

Put a couple quarts of diesel in the tank and gave her a spin. I had a hell of a time.. couldn't get this thing through a full stroke to save my life... talk about some mean compression!!! Thinking this thing is getting a starter and feeling a bit frustrated I took a break. Looking at the distructions ( all in arabic ) I noticed a funny little gaget on one of the lifters. Hey a compression release gizmo !! Rushed back to the shop set the compression release spun it up a bit and turned the gizmo... off she went. What a sound! With a cheap pepper can muffler that came with it, it hardly makes any noise. You can hear the lifters and injector more than the exhaust... very quiet... you'd never know its a diesel. This is an 8hp unit and chugs along at 900 rpm. I plan to drive a 3kw 120/220 alternator and a GM 100 amp with it while heating about 1000 gallons of water with the exhaust and cooling system. There will also be some solar helping the heating of the water as well as my wood burner. Using the water as heat storage.

Here is a pic of the little beast ( 700 lbs little)...



[GM-90/8](#) | 12 comments (12 topical, 0 editorial)

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Re: GM-90/8 ([none / 0](#)) (#1)  
by JW on Mon Nov 10th, 2003 at 01:56:23 PM MST  
([User Info](#))

Wow Windstuffnow,

That looks like some fun...  
-JW

Re: GM-90/8 ([none / 0](#)) (#2)  
by ibedonc on Mon Nov 10th, 2003 at 02:06:07 PM MST  
([User Info](#))

so where did you get this and how much ,, How can I get one ?

Re: GM-90/8 ([none / 0](#)) (#3)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon  
Nov 10th, 2003 at 02:30:27 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

I purchased this one from Mike in North Carolina.  
His email is mdmo@rfci.net . Good guy to deal with,  
at least my experience was a good one. He charges  
800.00 for the engine plus shipping of course. I paid  
155.00 to have it trucked in so I have a bit of change  
invested in it. I didn't run it very long but tried some  
vegie oil in it and it didn't seem to care a bit... time  
to hit the restaurants!

Still looking for people that want the Lister Clone...  
basically the same thing only without the water  
pump. I want another one for the shop but need to  
order a minimum of 10 to get the price.

Yep, still having fun

Ed

[ [Parent](#) ]

Re: GM-90/8 ([none / 0](#)) (#4)  
by zmoz on Mon Nov 10th, 2003 at 03:01:38 PM MST  
([User Info](#))

Nice! Do you really think it could heat 1000 gallons of  
water?



Re: GM-90/8 ([none / 0](#)) (#8)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon  
Nov 10th, 2003 at 05:30:15 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

No, not by itself, well it probably would over time.  
I've calculated about 40,000 BTU in waste (exhaust  
and water) per hour run if its loaded to 8hp... less  
with vegie oil so it would take some time to get the  
water up to temp. I plan to add some solar as well  
as an add in for my wood stove. 1000 gallons at 140  
degrees would heat my house for 1 full day if I did  
my math correctly...not to mention cut my hot water  
costs.

Long day...  
Ed

[ [Parent](#) ]

Re: GM-90/8 ([none / 0](#)) (#5)  
by Old F on Mon Nov 10th, 2003 at 04:03:58 PM MST  
([User Info](#)) <http://www.oldf.homestead.com>

ED

Sweet! What kind of heat exchanger are you planing for  
the exhaust?

Old F

Re: GM-90/8 ([none / 0](#)) (#9)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon  
Nov 10th, 2003 at 05:37:02 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Well, at this point it's still only some thoughts but...  
I was thinking of 2 main tubes with smaller tubes  
interconnecting the two. This would be submerged in  
water. It would look like a radiator but working in  
reverse. Like I say its only an idea at this point but I  
think it would work fairly well. My first thoughts  
were to wrap the pipe in copper tube and circulate  
water through the copper but I'm not sure it would  
fully disapate the heat that way, although it would be  
much easier. Still tossing ideas around...

Too many projects... I'm pooped

Ed

[ [Parent](#) ]

Re: GM-90/8 ([none / 0](#)) (#6)  
by Norm on Mon Nov 10th, 2003 at 04:08:09 PM MST  
([User Info](#))

Nice, what's the bore and stroke? Would love to hear what it sounds like! (:>) Norm

Re: GM-90/8 ([none / 0](#)) (#7)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon  
Nov 10th, 2003 at 05:23:13 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

It has a 4.5" bore x 5.5" stroke, I believe this and the listers are identical between the 6 and 8hp models. I'm thinking the only difference is the rpm their set to run at ( 6hp at 750 and 8hp at 900 - everything else is identical

[ [Parent](#) ]

Open a valve ([none / 0](#)) (#10)  
by wdyasq on Mon Nov 10th, 2003 at 05:44:29 PM MST  
([User Info](#))

Ed - and all,

I can't remember if Lister opens an exhaust valve or the intake. It has been a while since I played with them. But, what happens is one opens a valve, gets those massive flywheels turning and then drops the valve - presto, instant compression, the energy from the compression is converted to heat, the injector does its job, a couple of strokes of white smoke, then smooth running.

If you care to use cooking oil BE SURE to purge the cooking oil from the injector and pump before shutting the engine down. It is extremely difficult to crank a cold diesel on -heavy- oil.

Compression Ignition engines are an interesting thing - keep clean fuel, oil and air to it and it will last a long time.

Ron

Re: GM-90/8 ([none / 0](#)) (#11)  
by monte350c on Mon Nov 10th, 2003 at 06:23:12 PM  
MST  
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[Lister clones...](#)

By [windstuffnow](#), Section [Homebrewed Electricity](#)  
Posted on Sat Nov 8th, 2003 at 10:30:08 AM MST [Power Systems](#)  
Another quote came in...

Slow returns but this one is for the Lister Clone 6hp diesel engine. These have roller bearings on the crank but still a thermosyphon colling system and splash oiler for the rods. The quote was 360.00 each including shipping to the Seattle port. From there there would have to be some distribution set up for delivering them to their final destination.

I wouldn't mind trying one out if there is enough interest to purchase 10 or more of them. If so is there anyone in the Seattle port area that wouldn't mind handling the distribution of them? For a free engine or someone with some trucking connections?

Just some thoughts...Let me know

Ed

[Lister clones...](#) | 5 comments (5 topical, 0 editorial)

Re: Lister clones... ([none / 0](#)) (#1)  
by [zmooz](#) on Sat Nov 8th, 2003 at 11:19:58 AM MST  
([User Info](#))

\$360 including shipping to seattle? Wow...that's much less than I thought it would be. What company is it that makes them? What country are they in? I'm starting to get very interested...

Re: Lister clones... ([none / 0](#)) (#2)  
by [meteorscatter](#) on Sun Nov 9th, 2003 at 02:01:13 PM MST  
([User Info](#))

Ed If you can get enough interest, please count me in I'll pick it up myself. Anyone else interested in Ontario, Canada?

Richard B

Re: Lister clones... ([none / 0](#)) (#3)  
by [chirp](#) on Sun Nov 9th, 2003 at 08:26:44 PM MST  
([User Info](#))

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I am interested in a Lister. What are the details?

Chirp

Re: Lister clones... ([none / 0](#)) ([#4](#))  
by John on Wed Nov 12th, 2003 at 03:06:58 AM MST  
([User Info](#))

I'm interested, depending on what the shipping will be to Southern California.

John

[Toxin absorber/Pain reliever](#)

Re: Lister clones... ([none / 0](#)) ([#5](#))  
by troy on Wed Nov 12th, 2003 at 11:00:13 AM MST  
([User Info](#))

If I could get one to my doorstep for less than 5-600 bucks, I'd be a happy camper.

Best regards,

troy

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[microengine power generator](#)

By [tviswanathan](#), Section [Homebrewed Electricity](#)  
Posted on Thu Nov 6th, 2003 at 04:49:01 PM MST [Power Systems](#)  
micro power generation

I am trying to build a 100 to 200-Watt 12 to 24-V power source from commercially available model airplane engines and miniature permanent magnet electric generators and power electronics. Can someone give me tips on the generator? Specifically, I would like to know the names of commercial sources.

[microengine power generator](#) | 3 comments (3 topical, 0 editorial)

Re: microengine power generator ([none / 0](#)) (#1)  
by [wooferhound](#) ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Thu Nov 6th, 2003 at 05:03:18 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

What are the RPMs and the Horsepower of the model airplane motors that you are talking about?

Well it's probably not measured in Horsepower, but how powerful are they ...

>=- W o o f -=

Re: microengine power generator ([none / 0](#)) (#2)  
by [Demetri](#) ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Thu Nov 6th, 2003 at 08:29:50 PM MST  
([User Info](#))

I have a .46 CID Magnum XL airplane engine puts out 1.43 hp and has "useable power" between 2000 and 12,800 rpms. I haven't found a torque curve for it. The fuel is quite expensive, and unless it could be coaxed into running on diesel, I do not think it would be worth the trouble. I'd be happy to sell the engine for 30 USD, plus shipping. I bought it used from the owner of a hobby shop for \$40, for a project which I never got around to building, and have not used it. New they go for well above \$80.

Demetri  
Always be the lead dog.

Re: microengine power generator ([none / 0](#)) (#3)  
by [zmoz](#) on Thu Nov 6th, 2003 at 10:24:50 PM MST  
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Probably would be better (cheaper, easier) to use a weed wacker engine. They use those in model planes too...small...cheap...and runs on pump gas.

[microengine power generator](#) | 3 comments (3 topical, 0 editorial)

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## [Lister Clones....](#)

By [windstuffnow](#), Section [Homebrewed Electricity](#)  
Posted on Tue Nov 4th, 2003 at 08:37:13 AM MST [Power Systems](#)  
a couple quotes are in...

I recieved a couple quotes today from about a dozen I sent in. These are for the Lister clones not the GM-90 engine and are for the 6hp units. One quote was for the bushing engine at 390.00 each plus shipping the second was for the roller bearing engine at 400.00 each plus shipping. I don't imagine shipping on those would be cheap and I still don't know what other costs would be involved with importing. Just guessing at a shipping cost of about 100 bux each plus possibly 50 bux in other unknown costs would put the engines at around 550 each.

I know little to nothing about these engines and it seems each company has a little different version. Someone that know's the engines better could chime in with some knowledge of the goods and bads. The GM-90's seem to be a breed of their own. After emailing several info/quote requests for the GM-90 I've recieved nothing in return.

I contacted Mike in NC who sells the GM-90's and decided to gamble on one of his 8hp units. I'm not sure if would be worth the gamble ordering from unknown sources as I'm a bit leary of sending funds to a place where there may be no recourse to retrieve the funds if something went bad for what ever reason. I certainly wouldn't feel right about taking someones money and not being able to produce a product. So for about 300.00 more and no headach/worry you can get one in the states from either Mike in NC or George at utterpower.com . At this point I don't plan to pursue the importing idea.

Anyone interested in the GM-90's you can email Mike at [mdmo@rfci.net](mailto:mdmo@rfci.net)

Have Fun  
Ed

[Lister Clones....](#) | 2 comments (2 topical, 0 editorial)

Re: Lister Clones.... (none / 0) (#1)  
by zmoz on Tue Nov 4th, 2003 at 03:17:19 PM MST  
([User Info](#))

Shipping on those things would probably be more like \$400-500.

Re: Lister Clones.... (none / 0) (#2)  
by hvirtane on Thu Nov 6th, 2003 at 01:43:32 PM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

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I think that somebody is importing Indian Bullet motorcycles to America. They might bring for you some Listers inside their containers?

- Hannu

[Lister Clones....](#) | 2 comments (2 topical, 0 editorial)

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### [3 phase to single phase inductive conversion](#)

By [propel7](#), Section [Weird Science](#)

[Power Systems](#)

Posted on Mon Nov 3rd, 2003 at 09:04:11 PM MST

**3 phase induction motor as generator used in single phase application by using capacitors**

I am wanting to use a 3 phase induction motor (27 HP) as a generator on a 30 ft. DI wind turbine to tie directly with the grid in a single phase application where there is not a 3 phase grid available. I have been told that capacitors can be configured to a 3 phase motor to accomplish this. Is this the truth? If so, how do I do it and what are the specifics? A response would be deeply appreciated. THANKS, Devon Drake

[3 phase to single phase inductive conversion](#) | 6 comments (6 topical, 0 editorial)

Re: 3 phase to single phase inductive conversion ([none / 0](#)) (#1)

by [drdongle](#) on Tue Nov 4th, 2003 at 06:00:24 AM MST ([User Info](#))

Capacitors are used when wanting to run a 3 phase motor off a 1 phase supply not the other way. You may be thinking of the use of a capacitor wired parallel to a motor coil to "self excite" when used as an alternator by running it at higher than rated speed. I know of no simple way to convert the 3 phase out put to single phase. Perhaps if you gave more info regarding you application we could be more helpfull.

Dr.D

Re: 3 phase to single phase inductive conversion ([none / 0](#)) (#4)

by [propel7](#) ([propel7@msn.com](mailto:propel7@msn.com)) on Tue Nov 4th, 2003 at 07:50:42 PM MST ([User Info](#))

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I want to produce power with an induction motor by driving it at a higher than rated speed in a wind turbine application in a grid intertie situation. I was told that a 3 phase motor could be used when only a single phase is available from the power grid from the utility. Capacitors are somehow connected to accomplish this.

It is probably the same situation as what you stated with the 3 phase motor being run by a single phase by using caps. How is this done and how do I determine the values of the caps? Thank you very much for your help. I hope that I may have explained this a little better. I just want to basically run a 3 phase motor with a single phase. THANKS again,  
Devon Drake

Devon Drake Propel Energy Systems, Inc. Tilt stabilized/Ballast controlled wind turbines

[ [Parent](#) ]

Re: 3 phase to single phase inductive conversion  
([none / 0](#)) ([#2](#))  
by 5kw on Tue Nov 4th, 2003 at 10:36:50 AM MST  
([User Info](#))

I have experience with an induction grid tied homebuilt wind turbine 25' diam. and also with building phase converters. I used a single phase motor on the wind turbine.

I believe a 3 phase machine will work fine, generating into a single phase line at reduced capacity by just ignoring the third leg.

To get higher power capacity a cap( be sure to use motor run, oil type, capacitors) can be connected from the 3rd leg to one of the other legs , which one determines direction of rotation. You can experiment by trying to run the motor on single phase with the cap connected, you may need to start it with a rope ( pull the rope, then throw switch). the direction it wants to run is the direction you want to turn it. The size of the cap will probably be a compromise, to small will not add enough power capacity at high load and to large will lower efficiency at low load.

Make the wind fun!

Victor

Re: 3 phase to single phase inductive conversion  
([none / 0](#)) ([#3](#))  
by propel7 ([propel7@msn.com](mailto:propel7@msn.com)) on Tue Nov 4th,  
2003 at 07:21:08 PM MST  
([User Info](#))

Thank you very much for this response.  
Devon Drake Propel Energy Systems, Inc. Tilt stabilized/Ballast controlled wind turbines  
[ [Parent](#) ]



Re: 3 phase to single phase inductive conversion

([none / 0](#)) ([#5](#))

by Joseph Turrisi on Tue Nov 4th, 2003 at 09:10:09 PM MST

([User Info](#))

There is a book called MOTORS AS GENERATORS FOR MICRO-HYDRO POWER that describes what you are wanting to do. The author is Nigel Smith and the books ISBN # is 1 85339 286 3 any book store can order this book using the ISBN number.

Re: 3 phase to single phase inductive conversion ([none / 0](#)) ([#6](#))

by propel7 ([propel7@msn.com](mailto:propel7@msn.com)) on Wed Nov 5th, 2003 at 10:33:54 AM MST

([User Info](#))

Thank you very much for this input. It is greatly appreciated.

Devon Drake

Devon Drake Propel Energy Systems, Inc. Tilt stabilized/Ballast controlled wind turbines

[ [Parent](#) ]

[3 phase to single phase inductive conversion](#) | 6 comments (6 topical, 0 editorial)

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### [Micro CHP's ?](#)

By [Junkie](#), Section [Homebrewed Electricity](#)

Posted on Mon Nov 3rd, 2003 at 04:14:11 AM MST

[Power Systems](#)

Micro CHP / boiler system

[http://news.bbc.co.uk/1/hi/programmes/working\\_lunch/3231549.stm](http://news.bbc.co.uk/1/hi/programmes/working_lunch/3231549.stm)

Could be easy-to-find stirling engine (soon)?

[Micro CHP's ?](#) | 1 comment (1 topical, 0 editorial)

Re: Micro CHP's ? ([none / 0](#)) (#1)

by DDT77 on Mon Nov 3rd, 2003 at 10:21:01 PM MST

[\(User Info\)](#)

interesting,

looks like simple payback period is about 15 years (at todays fuel prices)

Wonder what the expected lifetime is? Upkeep?

By the way, anyone have a comparison of energy costs for U.S. vs G.B.?

They say that it saves more energy when used in larger houses- sounds like a good fit for the "typical" U.S. household.

at least another company sees efficiency as paramount!

regards,

darren

[Micro CHP's ?](#) | 1 comment (1 topical, 0 editorial)

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## [Terbium and Dysprosium Metal, possible power generation](#)

By [wooferhound](#), Section [Homebrewed Electricity](#) [Power Systems](#)

Posted on Sun Nov 2nd, 2003 at 07:02:18 PM MST

**Metal that changes shape when electrical voltages are applied**

I found these two articals about making speakers from Terbium and Dysprosium, metals that change shape when Electrical power is applied.

<http://www.fortune.com/fortune/smallbusiness/technology/articles/0,15114,534705,00.html>

<http://radio.weblogs.com/0105910/2003/11/02.html>

Normally when this type of thing is possible, then the reverse is possible. Change the shape of the metal and electrical energy is created.

Personally I've never heard of these metals . . .

[Terbium and Dysprosium Metal, possible power generation](#) | 4 comments (4 topical, 0 editorial)

Piezo ([none / 0](#)) (#1)

by [wdyasq](#) on Sun Nov 2nd, 2003 at 07:22:28 PM MST ([User Info](#))

The term Piezo - from the Greek word to squeeze comes to mind...

Re: Piezo ([none / 0](#)) (#2)

by [JW](#) on Mon Nov 3rd, 2003 at 10:28:36 AM MST ([User Info](#))

Hi Woof,

Ya, I stubled across the original inventor(company) of this product some time ago. these guys are doing quite well with this material in the transducer market. I suspect you may be correct, and voltage may be produced with this. But it is unclear to me at this time. from what Ive gathered about these new materials is that they are the next generation of "muscle wires" or "memory wires" .

-JW

[ [Parent](#) ]

Re: Piezo ([none / 0](#)) (#4)

by [Wolfie1](#) on Tue Nov 4th, 2003 at 07:19:11 AM MST ([User Info](#))

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While memory wires can be controlled using electricity, it is the heat from the wire's resistance and not the electricity itself that changes the size or shape. I don't think you can reverse the process to get out electricity from them.

I haven't heard specifically about these new ones so they could be different.

Martin.

[ [Parent](#) ]

Re: Terbium and Dysprosium Metal, possible power g ([none / 0](#)) (#3)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Tue Nov 4th, 2003 at 06:41:19 AM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

Yes I thought about peizo effects too but, peizo material that I know of isn't metal and quite brittle, the motion obtained from peizo is more microscopic in nature and not much useful for moving things, getting power from peizo materials is usually very high voltage in short bursts.

>=- W o o f -=

[Terbium and Dysprosium Metal, possible power generation](#) | 4 comments (4 topical, 0 editorial)

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Very Nice Ed!

A while back I was doing some playing around with a solar trough experiment - never really finished it past a prototype (no time you know!). I was using a automotive heater core as a heat exchanger. I got a new one for a 1990 Chevy Caprice from the auto parts store for \$40. According to my Moog auto heating/cooling tech manual these are supposed to reject 6 to 10,000 BTU depending on size. Might be a good choice - 5 / 8 " and 3 / 4 " hose fittings - the one I got is mostly brass!

Now it looks like you're having "Christmas came early" Fun!

Ted.

Re: GM-90/8 ([none / 0](#)) ([#12](#))  
by troy on Wed Nov 12th, 2003 at 11:57:44 AM MST  
([User Info](#))

Lovely machine!

I thought of running the exhaust through a gas water heater. That's what they were designed to do, and come with an overheat/overpressure safety valve built in, plus all the easy hookups for the water. If the flue length is too short, you could run two in series. Unsure of what to do with the condensate...

Have fun with the new toy.

Still interested in the 6 hp if there is a way to make it work.

Good luck and have fun,

troy

[GM-90/8](#) | 12 comments (12 topical, 0 editorial)

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[GM-90 diesel update](#)

By [windstuffnow](#), Section [Homebrewed Electricity](#)

Posted on Fri Oct 31st, 2003 at 07:14:19 AM MST

[Power Systems](#)

Making contacts...

I've sent numerous emails out to different companies in India trying to find out a cost for these things. Still waiting on the prices. Most of them are the Lister clones and only one company sells the GM-90 version. The difference between them are the GM-90's have pressure oil on the connecting rod and a water pump. The lister clones have splash oiling and thermosyphon cooling. Seems like the more parts you have the more likely they could fail.

There is a guy in NC selling the GM-90's but only has the higher HP units available. 8hp and up. He sells the 8's for 800 bux plus shipping.

I should have some numbers for the others soon. Is there any "duty" costs for importing goods into the US. I know when I send stuff to Canada they get hit with brokerage fees and duty costs which I think is rediculous... anyone have any idea on what costs we may run into?

Have Fun  
Ed

[GM-90 diesel update](#) | 2 comments (2 topical, 0 editorial)

Re: GM-90 diesel update ([none / 0](#)) (#1)  
by troy on Fri Oct 31st, 2003 at 02:17:23 PM MST  
([User Info](#))

No idea on the import cost/hassle factor. But on a completely different note, here's three nice links concerning the care and maint. of Lister diesels, along with some great stories about the Australian farm experience:

- <http://www.steamengine.com.au/ic/faq/tipstrix.html>
- <http://www.steamengine.com.au/ic/history/48hours/index.html>
- <http://www.steamengine.com.au/ic/history/bushpowerlister/index.html>

Best regards,

troy

Re: GM-90 diesel update ([none / 0](#)) (#2)  
by DonG on Fri Oct 31st, 2003 at 06:19:48 PM MST  
([User Info](#))

I checked into importing the Lister diesel clones. I was going to have to import a minimum of fifteen to get a price from them. If I could have got it down to five I might have considered it.

[ [Parent](#) ]

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[kill a watt load meter vs power cost controller](#)

By [gameman](#), Section [Homebrewed Electricity](#) [Power Systems](#)

Posted on Mon Oct 27th, 2003 at 08:42:18 PM MST

which is better .. kill a watt load meter or power cost controller

you can plug an appliance into these units, and plug the unit into the wall. The controller will monitor the power usage of the appliance in watts..

but which is the best to get ?? i have heard that you can't use the kill a watt one with a gen ..any one know if you can use the power cost controller (La Crosse Technology 3362U Power Cost Controller )with a gen ??

also wheres the cheapest place to get one ?  
thanks terry

[kill a watt load meter vs power cost controller](#) | 9 comments (9 topical, 0 editorial)

kill a watt load meter vs power cost controller ([none / 0](#)) (#1)

by [DaveR](#) on Mon Oct 27th, 2003 at 09:32:55 PM MST ([User Info](#))

I use the Kill A Watt meter with my generator with no problems. Where did you hear that you can't use it with a generator?

I have also used it with an inverter without problems.

Dave

Re: kill a watt meter vs power cost controller ([none / 0](#)) (#3)  
by [gameman](#) on Wed Oct 29th, 2003 at 07:07:15 AM MST ([User Info](#))

someone on here told me ( about a year ago )that there's brunt up when they used with there gen ....

[ [Parent](#) ]

Re: kill a watt meter vs power cost controller ([none / 0](#)) (#4)  
by [TomW](#) on Wed Oct 29th, 2003 at 09:48:53 AM MST ([User Info](#)) <http://oneota.net/~earthsourcepowr/>

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gameman;

someone on here told me ( about a year ago )that there's brunt up when they used with there gen ....

Well, not to put too fine a point on it we have a few folks that post here that, quite frankly, are experts in their own minds only. Especially with a "it blew up" type comment its hard to know if it was the device the powersupply or user error just too many variables

Beware of any free advice and realize that just because its written someplace [newspaper, magazine and especially the internet] does NOT mean it is either true or sound advice. Not to point any fingers just a fact.

Cheers.

TomW

[Stuff I have Online](#)

[Contact Me](#)

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Re: kill a watt meter vs power cost controller ([none / 0](#)) (#6)  
by jubalearly on Wed Oct 29th, 2003 at 10:49:46 AM MST  
([User Info](#))

I'll be happy to show you the burnt up K-O-W meter & let you explain how YOU think the input resistor got burnt up. Unfortunately, I don't believe I have the old instruction sheet which said 'do not use with generator or inverter'

RussH

[ [Parent](#) ]

Re: kill a watt meter vs power cost controller ([none / 0](#)) (#7)  
by TomW on Wed Oct 29th, 2003 at 02:11:16 PM MST  
([User Info](#))  
<http://oneota.net/~earthsourcepowr/>

Russh;

I certainly did not intend to single anyone out with that comment or in regard to any specific piece of data or advice.

I was just trying to point out that not all information or advice is good advice.

Please accept my genuine apology if you took it as applying to you personally. I certainly had no intention to disrespect anyone in particular but was trying to make a point in general.

If you keep up with most of what goes through here like I do as an editor you see some pretty out there advice and claims. like the ability of one user to solder to aluminum and the advice to never draw over 10 amps from any battery just to cite 2 that are totally untrue. But thats another story.

Cheers.

TomW

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Re: kill a watt load meter ([none / 0](#)) (#5)  
by jubalearly on Wed Oct 29th, 2003 at 10:45:49 AM  
MST  
([User Info](#))

Dave, my first Kill-O-Watt meter came with instructions stating that it should not be used with a generator or inverter. I did try it out on a generator & it seemed to be OK. But after several hours the input resistor FRIED.

I bought a new K-O-W in order to identify that resistor. The old resistor was a 5w of unreadable value. The new KOW had a 10ohm 10watt resistor. That will probably solve the problem of using it with a generator. But I don't know since I haven't tried it. There may be thousands of the old design out there.....

RussH

[ [Parent](#) ]

Re: kill a watt load meter ([none / 0](#)) (#8)  
by gameman on Wed Oct 29th, 2003 at  
08:53:21 PM MST  
([User Info](#))



now where getting somewhere...  
is there just one power resistor in this thing ???  
when i get one i can take it apart and see if it's  
the 5 watt or 10 and if it's the 5 i will replace it  
with a 10 and maybe it will be ok  
thanks gameman

[ [Parent](#) ]

Watts UP ([none / 0](#)) ([#2](#))  
by wdyasq on Tue Oct 28th, 2003 at 04:49:35 AM MST  
([User Info](#))

You might want to check out the - Watts Up- and Watts Up PRO. Both record surge and the PRO model allows the information to be put into a spreadsheet.

Ron

Re: Watts UP ([none / 0](#)) ([#9](#))  
by troy on Fri Oct 31st, 2003 at 09:46:43 AM MST  
([User Info](#))

Anyone care to name their favorite supplier for the amp-hour meters along with a price if they remember???

Thanks in advance,

troy

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[kill a watt load meter vs power cost controller](#) | 9 comments (9 topical,  
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### [GM-90 diesel](#)

By [windstuffnow](#), Section [Homebrewed Electricity](#)  
Posted on Mon Oct 27th, 2003 at 03:36:57 PM MST

[Power Systems](#)

Any experience with them?

I've been thinking of picking up a Lister 6/1 or a GM-90/6. Anyone have anything good or bad to say about them?

Another project in the works...

have Fun  
Ed

[GM-90 diesel](#) | 22 comments (22 topical, 0 editorial)

Re: GM-90 diesel ([none / 0](#)) ([#1](#))  
by [wdyasq](#) on Mon Oct 27th, 2003 at 04:16:42 PM MST  
([User Info](#))

Ed,

The Listers and clones - I think Lister quit building the things in the late 1960's, are one of the most reliable engines ever built. I think India must have more than 20 companies building engines near identical to the original. Pakistan might have half a dozen companies making them and the Petter. There are some options that may be worthwhile. There is a compression changing device that will allow the engine to crank in colder weather. Some offer the option of roller bearings on the crank and pressure oiling. There may also be a radiator option.

If you get one with roller bearings, pressure oiling and the radiator, your great grandchildren might need to rebuild it if you run it all the time. (provided you keep clean fuel and oil in it)

If one could get a group together, the engines might be bought for a REAL good price. If I could afford to buy a container full and market them, I might try it.

Ron

Re: GM-90 diesel ([none / 0](#)) ([#2](#))  
by [windstuffnow](#) ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon Oct 27th, 2003 at 05:31:43 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

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Ron,

Sounds like its a fairly good machine then. I talked with George that runs the site utterpower.com and he seems to think their quite amazing. I saw a new GM-90/6 on ebay but didn't bid on it. It may be interesting to order a bunch of them through a group of people to get a better price... how many would be interested? Anyone?

I noticed some have the pushrods external and some internal... seems like the external ones would be high maintenance... well a glob of grease now and then isn't "high" maintenance but messy.

Any other comments on them?....

Ed

[ [Parent](#) ]

Re: GM-90 diesel ([none / 0](#)) (#4)  
by zmoz on Mon Oct 27th, 2003 at 06:22:44 PM MST  
([User Info](#))

Hmmm...now you guys got me interested. I want one...buy I don't know why...

Re: GM-90 diesel ([none / 0](#)) (#5)  
by zmoz on Mon Oct 27th, 2003 at 06:26:45 PM MST  
([User Info](#))

How cheap do you guys think I could make a KWH with fuel oil?

Re: GM-90 diesel ([none / 0](#)) (#6)  
by DaveR on Mon Oct 27th, 2003 at 09:53:56 PM MST  
([User Info](#))

I just bought a Lister 6/1 from George along with a 5 KW ST Gen. Super nice guy, a pleasure to do buisness with.

But with hunting season starting Saturday, and shoulder surgery scheduled at the end of the month I haven't had time to get it together.

Dave

Re: GM-90 diesel ([none / 0](#)) (#7)  
by RobD on Tue Oct 28th, 2003 at 04:54:30 AM MST  
([User Info](#))

I did a quick look and they seem to run 550 lbs. for the 90-6. Where do you get them?  
Anyone have a price?  
RobD

Re: GM-90 diesel ([none / 0](#)) (#8)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Tue Oct 28th, 2003 at 07:13:13 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

I've seen them for about \$750.00 ( plus shipping ). These things are quite heavy. If there were enough of us, we could possibly get them cheaper buying them direct and having them imported.

I've drawn up some ideas, since I burn diesel to heat the house anyway, why not turn it into house heat, hot water and electric. Instead of simply using it for singular use and wasting it. It would be quite easy to build an axial flux alternator running direct drive on the engine for battery charging. A radiator, and exhaust heat exchanger to do the rest. I hear they perform well with biodiesel as well.

There is a guy in NC that sells the GM-90's if I can find his address again I'll contact him and let you all know, unless you would like to pursue the possibility of getting them cheaper from India...

Have Fun  
Ed

[ [Parent](#) ]

Re: GM-90 diesel ([none / 0](#)) (#9)  
by RobD on Tue Oct 28th, 2003 at 07:33:28 AM MST  
([User Info](#))

Hi Ed,  
I burn diesel here too. I like the idea. The weight seems to be about 255 Kgms, just under 600 lbs for the 90-6. I'm wondering how much more oil the 90-8 uses? I'll bet not much.  
I'd like to run it inside the basement with an outside exhaust or just use the cooling water to supplement my heat.  
Let me know what you find maybe we can get a bunch straight from India.  
How are they on parts? Will we have to be making our own?

RobD

[ [Parent](#) ]

Re: GM-90 diesel ([none / 0](#)) (#11)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Tue Oct 28th, 2003 at 09:01:17 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Rob,

It looks like the 6 and 8 are the same engine... Both identical in bore x stroke and weights. One runs at 750 rpm the other at 900. So it appears to be the same engine running faster. The slow rpm is the part that intrigues me the most... much quieter than a briggs or other engine screaming at 3600 rpm ( although the honda's are quite quiet ).

Having fun  
Ed

[ [Parent](#) ]

Re: GM-90 diesel ([none / 0](#)) ([#10](#))  
by monte350c on Tue Oct 28th, 2003 at 07:56:13 AM MST  
([User Info](#))

Hi Guys,

Very interesting! I've been thinking about bio-diesel and generation too...

A while ago I found this on a message board:

Dear Sirs,

I know you name and address from alibaba.com. I'm writing you in hope of establishing business relations between us.If you need small diesel engine,you can touch us.

'XINHUAN' brand diesel engines are the main products of company which are quality product and very low price ,its are becoming more and more popular.

The company have 2HP-6HP air-cooled and water-cooled two series of engines,its excellent in quality and quotation is attractive.

Please inform us as to any further information you may require.

= = = = =

It's our price list and main specifications:

MODEL FOB NINGBO PORT CHINA (US DOLLAR)  
Z165F 83.00 (2.7HP ; kw/rpm/min 2.00/2600)  
165. F 84.50 (3.3HP ; kw/rpm/min 2.43/2600)  
170. F 85.00 (4HP ; kw/rpm/min 2.94/2600 ; Specific fuel consumption g/kw.h 289.7)  
175. F 94.00 (5HP ; kw/rpm/min 3.68/2600)  
ZR165 90.00 (3HP ; kw/rpa/min 2.21/2600 )  
ZR170 92.00 (3.7HP ; kw/rpa/min 2.72/2600 ; Specific fuel consumption g/kw.h 299.2)  
R175 100.00 (6HP ; kw/rpm/min 4.4/2600 )  
R175A 110.00 (6HP ; kw/rpm/min 4.4/2600)

COMPANY:CIXI XINHUAN POWER MACHINERY CO.,LTD.CHINA  
CONTACT:MR JEASON XAO  
ADD:Economic Development Area CIXI ZHEJIANG CHINA  
TEL:086-574-63284816 63289202  
FAX:086-574-63289065  
EMAIL:enginesupply@sina.com

After a bit of futzing around, I found their Web site which gives more specs on the engines:  
"http://www.new-circle.com/DIESEL.htm">http://www.new-circle.com/DIESEL.htm

You occasionally find these motors (which seem to be the same as the Yanmar brand) on E-Bay for greatly inflated prices compared with the FOB China pricing.

Also this address with more specs but no prices for 90/6:  
<http://www.satyaheet.com/de2.htm>

Seems reasonable if an order for a dozen or so of any of these was put together the



prices would be really good.

Ted.

Re: GM-90 diesel ([none / 0](#)) (#12)  
by josephcrawley on Tue Oct 28th, 2003 at 09:13:28 AM MST  
([User Info](#))

I've been interested in getting lister diesel engine for some time now. Depending on the price I would be willing to go in on some sort of group purchase.

thanks  
Joseph

Fuel Consumption ([none / 0](#)) (#13)  
by wdyasq on Tue Oct 28th, 2003 at 03:44:31 PM MST  
([User Info](#))

Diesel engines get ~ 18-21 HP/Gal/hr. That means if we burn a gallon of diesel, there have been about 15kW of power produced. One will need to back out the losses in the power conversion and one of these old crude but elegant engines will burn just about any oil that one can make flow. A modern engine MIGHT be 15-20% more efficient but, that will be about all one can do to improve fuel consumption.

The Chinese engines are/were and old German design except for the "new" air-cooled ones which are Yanmar "Clones" - or, at least all I have seen and/or read about are.

Like many I have dreamed of the small diesel powerplant supplementing a renewable energy home. Mine would have a "heat pump". I would hope I could use most of the "reject heat" for heating my home in the Winter. In the Summer I might have an airconditioner and use the heat for distillation of water if there were no other use.

Ron

BTW - the cost of the engine FOB (Free On Board) India was less than \$300 for a plain-bearing 650 RPM engine when I checked them out. I think a small container load was about 25 of them. BUT, that is old memory and about 2 year old information.

Re: GM-90 diesel ([none / 0](#)) (#14)  
by zmoz on Tue Oct 28th, 2003 at 06:57:51 PM MST  
([User Info](#))

Here's one of the foreign manufacturers:

<http://www.vibha.com/diesel.html>

How long would one of these really last running 24/7? I'm thinking if I could make diesel cheap enough I could be generating power 24/7 and feeding it back into the grid...even if it was only a few cents an hour I think it would be pretty cool just to have one of these things...:)

Re: GM-90 diesel ([none / 0](#)) ([#15](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Tue Oct 28th, 2003 at 07:33:08 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

I've heard they would run for 100,000 hours, others have said they would outlive the owner, and that your kids kids would have to rebuild it. It's all hear say though, but within some of the hearsay there may be some truth as well as some exaduration... but... I've yet to hear anything bad about them.

Have Fun  
Ed

[ [Parent](#) ]

Re: GM-90 diesel ([none / 0](#)) ([#21](#))  
by troy on Thu Oct 30th, 2003 at 06:00:36 PM MST  
([User Info](#))

I'd be interested in going in on a container of Listers, pressure oiled, roller bearings, water cooled to make for easy cogeneration.

Coincidentally, my brother-in-law spent a year in Africa, giving technical support to a bunch of missionaries. They had a couple of Listers for gennies. He assured me they can take a lot of abuse and still perform. He did comment that they were pretty noisy, not from the exhaust, but from the combustion noise. But they were the air cooled model I think, so I would expect that to be much less from the water cooled version.

Best regards,

troy

[ [Parent](#) ]

Sell it back -NOT ([none / 0](#)) ([#16](#))  
by wdyasq on Tue Oct 28th, 2003 at 07:35:37 PM MST  
([User Info](#))

Zmoz,

If one could get 15kW of sellable product with \$1.50 a gallon fuel, the fuel cost will be \$0.10 kWh. Buy back rates are about half that. And, one hasn't paid for oil-changes, disposal of the used oil(it can be filtered and used as fuel if mixed with the diesel) or the rebuild after the 100,000 hours (over 11 years, 24/7) or so life of the engine. With my math, I still haven't taken into account you won't get but about 10 kW or less out of the 15 kW produced by the engine due to energy change losses.

I also think if one sells electricity, they are bound by the rules of a new generation plant as it pertains to airpollution and such. I know in Texas, the folks with gas wells can't sell electricity generated by fuel from those wells without going through a bunch of hoops.

IMO, the only thing that makes sense is to use one as a backup to renewable sources or as a main power source if the grid is not close (or one is just plain obstinate).

Ron

Re: Sell it back -NOT ([none / 0](#)) ([#18](#))  
by zmoz on Tue Oct 28th, 2003 at 07:43:10 PM MST  
([User Info](#))

wdyasq - yes, with diesel fuel from the gas station it would be nothing more than a good backup generator. However, biodiesel is much, much cheaper...I haven't looked into it in a while, but I think it could be had for well under \$0.50 a gallon. If only producing 10kwh from that gallon of fuel, that would be 5 cents a kwh. Around here, the power company is required to buy back the power at the wholesale rate, which I would guess is at least 5 cents a KWH. They are also required install a meter for that free of charge. As for using fossil fuel to generate that power, I don't know what the laws are, but I don't think they ask how you generate that electricity. :) As I said, it wouldn't be much of a money maker, but after a few years I might be able to have one of these cool engines for free...

[ [Parent](#) ]

Re: GM-90 diesel ([none / 0](#)) ([#17](#))  
by zmoz on Tue Oct 28th, 2003 at 07:35:56 PM MST  
([User Info](#))

Another thing I've heard about is pre-heating diesel fuel to increase it's volume, therefore creating more fuel to burn. I don't know how well the concept works, but it seems like it would to me. One could probably rig up some sort of heat exchanger with the exhaust to heat up the fuel...

Re: GM-90 diesel ([none / 0](#)) ([#19](#))  
by Demetri ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Tue Oct 28th, 2003 at 11:53:45 PM MST  
([User Info](#))

I dunno about heating the diesel before burning. I'm sure it would make more fuel on a volume basis, but there'd be no more energy in the 120 gallons of heated fuel than there was in the 100 gallons of unheated fuel. Sure, the expanded fuel would last longer, but the engine would have less power. I guess if a person wasn't using the full output of the engine anyway.....

Demetri  
Always be the lead dog.

Re: GM-90 diesel ([none / 0](#)) (#20)  
by wdyasq on Wed Oct 29th, 2003 at 04:44:01 AM MST  
([User Info](#))

I guess if a person wasn't using the full output of the engine anyway.....

As matter of fact, the governer on the engine would adjust the fuel flow to match the load. Running an engine at the proper temperature might be the best option to increase the power from a given amount of fuel and to allow the engine to live as long as possible.

I'm in my mid 50's. I have been playing with diesel engines for over 40 years. At one time, I was factory certified on 8 different brands of engine and one company thought enough of me to employ me as an instructor and trouble-shooter.

All sorts of magic devices have been marketed to make engines more efficient, your wife more amorous and your children smarter. Personally, the best I have seen only lighten your wallet. BUT, your mileage may vary.

I don't know how much bio-diesel costs to produce. I think one needs to calculate the cost of the equipment and their own time, including the disposal of the wastes, in determining the TRUE costs of a product.

Ron

[ [Parent](#) ]

Re: GM-90 diesel ([none / 0](#)) (#22)  
by hvirtane on Tue Nov 4th, 2003 at 01:18:03 PM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

If using a diesel engine,  
why not using 'producer gas' or biogas to run it?

For a diesel engine  
you need a bit oil as well if using gas,  
but that is a really small amount, it can be biodiesel.

- Hannu

Re: GM-90 diesel ([none / 0](#)) (#23)  
by GeeWiz on Tue Nov 4th, 2003 at 03:22:45 PM MST  
([User Info](#))

I thought I'd add to this thread. I run a small low rpm Kubota diesel engine with a 12v 100amp alternator attached. This engine is the same one that they use for the 'road side' signs that go blink blink here in the states.

The Kubota gets about 9 hours to a gallon of diesel (yes 9+ hours), and I usuall charge my batteries at between 50 and 70 amps till they hit about 15.0v.

This unit has been a real workhorse especially in the winter when solar is non-existant and darkness settles around 3:00pm. Had it now I think 8 years.

I really like this setup (Generating at 12V). So many people I know buy these HUGE generators are unhappy with the noise, expense and smell. They all have inverters, and for the most part just run battery chargers off of them anyway.

Just thoughts to consider.

[GM-90 diesel](#) | 22 comments (22 topical, 0 editorial)

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## [Electricity Questions](#)

By [bbbaty](#), Section [Homebrewed Electricity](#)

Posted on Mon Oct 27th, 2003 at 01:51:08 PM [Power Systems](#)  
MST

How exactly does electric current work . . .

---

Hello Everyone,

I would like to once and for all get to the bottom of how electricity performs.

When one's car battery quits working and the car is running, the lights will shine as bright as when the battery was good and the car was not running. So this means that the lights are now being run solely from the alternator. Presumably the alternator is producing, or is able to produce more current than the lights actually need. So my question is why do the lights only take as much as they need to work properly and not burn up from too much current?

Along this same line of questioning is how and why does a battery being charged able to convert for example, a 100 volt 15 amp input to 12 volts @ 125 amp charge? But if you plug 12-volt bulbs into a 24-volt current, they burn out?

Say hypothetically you have a pmg alternator being turned and operated by a constant running stream and rather than having it connected to batteries you just have this alternator connected directly to an inverter. Would any appliances and lights be able to work with this system as long as the wattage needed didn't exceed the wattage being produced by the alternator? In other words, would one's appliances perform correctly like the lights on the running car with a bad or no battery?

What if one had a very large DC current coming in, say 1000 volts @ 100 amps, would you be able to connect this current directly to an inverter and all your appliances and lights just grasp what they need to operate properly? Or would the inverter burn up if enough was not being consumed?

Sorry if these questions are too elementary. I am just trying to grasp the entire overview.

All the best,

Billy Baty

[Electricity Questions](#) | 3 comments (3 topical, 0 editorial)

Re: Electricity Questions ([none / 0](#)) ([#1](#))  
by RobD on Mon Oct 27th, 2003 at 03:05:15 PM MST  
([User Info](#))

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Hi Billy,

"When one's car battery quits working and the car is running, the lights will shine as bright as when the battery was good and the car was not running. So this means that the lights are now being run solely from the alternator. Presumably the alternator is producing, or is able to produce more current than the lights actually need. So my question is why do the lights only take as much as they need to work properly and not burn up from too much current?"

The light or any load, has resistance and the current it draws is not related to the power capability but the resistance of the bulb filament. The formula is

$E(\text{voltage}) = I(\text{current}) \times R(\text{resistance})$ . A lamp inside your house is plugged into a wall socket that can supply much more power than the lamp needs but the lamp only 'draws' what it needs.

"Along this same line of questioning is how and why does a battery being charged able to convert for example, a 100 volt 15 amp input to 12 volts @ 125 amp charge? But if you plug 12-volt bulbs into a 24-volt current, they burn out?"

The battery acts as a load to the power coming in and it has very low resistance that would draw much more power than the supply can handle so the supply in this case, drops to the voltage of the battery. This is just the opposite of the condition above, now the battery controls the voltage but the same formula applies,  $E = IR$ .

The 24v source would apply twice the voltage to the bulb at the same resistance so from our formula you can see that the current through the bulb is twice what it would be at 12v and would most likely burn out.

"Say hypothetically you have a pmg alternator being turned and operated by a constant running stream and rather than having it connected to batteries you just have this alternator connected directly to an inverter. Would any appliances and lights be able to work with this system as long as the wattage needed didn't exceed the wattage being produced by the alternator? In other words, would one's appliances perform correctly like the lights on the running car with a bad or no battery?"

No, because the battery acts as a regulator for the generator and keeps its voltage at the 12v maximum. Without the battery the alternator would over drive the inverter and it would either shut down or blow out.

"What if one had a very large DC current coming in, say 1000 volts @ 100 amps, would you be able to connect this current directly to an inverter and all your appliances and lights just grasp what they need to operate properly? Or would the inverter burn up if enough was not being consumed?"

Inverters are designed to work with specific voltages, say 12 or 24 volts. You don't want to apply more voltage to them. If an inverter was capable of running at high power say 2500 watts it would be able to 'carry' any appliance that didn't consume more than that 2500 watts. The formula for watts is:

$P(\text{power}) = E(\text{voltage}) \times I(\text{current})$ . The appliances in your home will tell you on the back how much power they consume. You don't want to put more appliances on the line than the inverter will take.

RobD

Re: Electricity Questions ([none / 0](#)) (#2)  
by Jerry on Mon Oct 27th, 2003 at 07:34:39 PM  
MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Billy

Your ? about the lights only taking what the need.

Its kinda like when you go to the ice cream shop. You don't eat all the ice cream the shop has. Some people eat a liittle some eat alot but it all comes from the same ice cream shop.

JK TAS Jerry

[Airheads Page](#)

[ [Parent](#) ]

resistance heaters ([none / 0](#)) (#3)  
by JeffC on Sat Nov 22nd, 2003 at 10:05:34 AM  
MST  
([User Info](#))

I am also new to this arena and have a somewhat similar question.

I'm wondering if it would be possible to build a brake disk mill and run the 3-phase AC directly into my baseboard resistance heaters. I posed this question before and was told that it may work if I "get the loads" right. Could a mill produce the kind of power needed to produce any heat from a baseboard resistance heater, and if so, how would I figure the loads?

Thanks very much,

Jeff

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[Electricity Questions](#) | 3 comments (3 topical, 0 editorial)

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### [spin the meter backwards](#)

By [BrianK](#), Section [Homebrewed Electricity](#)  
Posted on Sun Oct 26th, 2003 at 02:06:52 PM [Power Systems](#)  
MST

Is this a hard thing to do?

I've got a 10kw gen. Short and sweet. Can anyone tell me how complicated it is to back feed the big high dollar grid in the USA. I am real new to this.

[spin the meter backwards](#) | 9 comments (9 topical, 0 editorial)

Re: spin the meter backwards ([none / 0](#)) ([#1](#))  
by Norm on Sun Oct 26th, 2003 at 04:32:53 PM MST  
([User Info](#))

All these years you've been giving them your money now you want to give them your electricity? From what I've read on this post it's complicated and expensive and 10KW isn't near enough. The electric company doesn't want your electricity they want your money! (:>) Norm.

Re: spin the meter backwards ([none / 0](#)) ([#2](#))  
by kmitchel on Sun Oct 26th, 2003 at 04:46:38 PM MST  
([User Info](#))

u need a synchronous power inverter. the utility company must buy your electricity, but depending on your area, they may be reluctant, or try to make it impossible 4 u. ur equipment will need to be inspected and be on the up and up.

A lot of regulation ([none / 0](#)) ([#3](#))  
by wdyasq on Sun Oct 26th, 2003 at 04:46:43 PM MST  
([User Info](#))

There are many hoops, loops and expenses to hook-up a generator to "the grid". Homepower magazine has many articles on those doing it "on the sly".

I don't like dealing with the "nice folks".

Ron

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Re: spin the meter backwards ([none / 0](#)) (#4)  
by zmoz on Sun Oct 26th, 2003 at 06:07:03 PM MST  
([User Info](#))

I've looked into this before, around here they have to buy it back at the wholesale power rate, and the power company has to pay for the new meter and installation. Depending on how that generator of yours is powered, however, it would probably cost more to run than the electricity they would buy back.

Re: spin the meter backwards ([none / 0](#)) (#5)  
by DanB on Sun Oct 26th, 2003 at 08:06:52 PM MST  
([User Info](#))

Not only is it complicated....

but Id argue your stance on "high dollar grid". The power grid in the US is (in my opinion) somewhat govt subsidized... and it's dirt cheap. Around here we pay about \$0.10/kwh. You can't compete with that with a diesel generator. Even if they payed you retail for it all I think the cost of fuel alone would probably be about break even, if not a slightly losing deal... not to mention maintenance and wear and tear.

Now.. last fall, when wholesale in CA was over \$1.00/KWH I think you maybe coulda made some \$\$ !

Re: spin the meter backwards ([none / 0](#)) (#6)  
by troy on Thu Oct 30th, 2003 at 02:11:31 PM MST  
([User Info](#))

Also keep in mind, the phase of your electricity MUST be totally, perfectly in step with the phase of the utility power, or bad things will happen, like fires, destroyed generators, things like that. A normal gas or diesel gennie has no provision for matching the phase properly.

Sorry...

troy

Re: spin the meter backwards ([none / 0](#)) (#7)  
by BrianK on Fri Oct 31st, 2003 at 06:10:26 AM MST  
([User Info](#))

I also have a 30kw that has parallel abilities adjustable freq.timing lights and all could that gen be able to do this task easier?



Re: spin the meter backwards ([none / 0](#)) ([#8](#))  
by troy on Sat Nov 1st, 2003 at 06:59:42 AM MST  
([User Info](#))

Nope, not unless it's specifically designed to intertie with the grid. Good frequency control is one thing, and matching the utility frequency and phase is something completely different.

Sorry again...

troy

[ [Parent](#) ]

Re: spin the meter backwards ([none / 0](#)) ([#9](#))  
by BrianK on Mon Nov 3rd, 2003 at 06:44:43 AM MST  
([User Info](#))

well it was made to parrallel other gens U.S. army special

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## [Calculating Potential Voltage from a Ferrite cored Coil](#)

By [jcertain](#), Section [Homebrewed Electricity](#)

[Power Systems](#)

Posted on Thu Oct 16th, 2003 at 01:06:16 PM MST

I am experimenting with getting AC from a ferrite cored coil.

I am experimenting with getting AC from a ferrite cored coil. I have 10 layers each with 80 windings making a total of 800 windings. I am using 32ga wire. I am using the magnets in the link with an "n40" grade. What other information do I need to figure out my voltage based on a variable turn speed?

[http://www.rare-earth-magnets.com/images/arc\\_750\\_625\\_90\\_750\\_N.jpg](http://www.rare-earth-magnets.com/images/arc_750_625_90_750_N.jpg)

[Calculating Potential Voltage from a Ferrite cored Coil](#) | 2 comments (2 topical, 0 editorial)

Re: Calculating Potential Voltage from a Ferrite c ([none / 0](#)) (#1) by [RobD](#) on Fri Oct 17th, 2003 at 04:01:11 PM MST ([User Info](#))

I think there are to many variables. You will have to do it by empirical testing. The power of the magnets , the distance from the cores, the permeability of the cores, just to much stuff.

Re: Calculating Potential Voltage from a Ferrite c ([none / 0](#)) (#2) by [TomW](#) on Fri Oct 17th, 2003 at 06:10:02 PM MST ([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Folks;

I have to whole heartedly agree with RobD on this.

I am somewhat puzzled by this recent need by people to be able to calculate these things out. While it is possible to run the math on lots of these things and get viable numbers it is just not practical.

Don't get me wrong, math is the language we must use to describe these things but it is simply a way to get in the ballpark and the only way to really know is empirical testing and measurement.

There is so much "windage" in these devices that there is simply no way you will calculate out values and arrive at those values in the completed unit. A much more sane approach is to follow the basics in the designs others have built and read everything you can on your intended subject then add in your own "windage".

Just my opinion and likely not shared by everyone, especially the mathematicians in the world.

Cheers.

TomW

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## [Converting a refrigerator to Ammonia cycle?](#)

By [drdongle](#), Section [Remote Living](#) [Power Systems](#)

Posted on Sun Sep 28th, 2003 at 06:20:21 AM MST

Make an Ammonia cycle refer?

Has any one ever looked into converting a conventional Freon refer to an Ammonia cycle machine?

Dr.D

[Converting a refrigerator to Ammonia cycle?](#) | 7 comments (7 topical, 0 editorial)

Re: Converting a refrigerator to Ammonia cycle? ([none / 0](#)) ([#1](#))

by Old F on Sun Sep 28th, 2003 at 07:30:58 AM MST ([User Info](#)) <http://www.olf.homestead.com>

Hi DR.D

If you are talking about changing a compressor based refrigerator to a heat driven ammonia cycle the short answer is no. About the only thing you would be able to salvage is the refrigerators insulated shell.

If you do a web search on the Crosley Icy ball. You will find some interesting reading. And you will see what I mean  
Hope this helps

Old F

Re: Converting a refrigerator to Ammonia cycle? ([none / 0](#)) ([#2](#))

by wdyasq on Sun Sep 28th, 2003 at 07:48:43 AM MST ([User Info](#))

I'll agree with Old F. I will also state I wouldn't want to try and cram the gear necessary for the ammonia cycle into a "Premade Box".

Ron

Re: Converting a refrigerator to Ammonia cycle? ([none / 0](#)) ([#5](#))

by drdongle on Sun Sep 28th, 2003 at 08:58:26 PM MST ([User Info](#))

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I pritty much new that one would only reuse the insulated box and perhaps the inside cooling coils and that you would end up with a "built in" system, which in many respects might be an advantage as the external heat exchanger could be mounted outside and reduce heat re introduced into the home.  
Dr.D

[ [Parent](#) ]

Ammonia ([none / 0](#)) ([#3](#))  
by TomW on Sun Sep 28th, 2003 at 09:12:04 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

DR. D.;

Besides the things already pointed out, if you start buying ammonia you will get on the "possible drug manufacturers" list. I understand it is used in underground meth labs. Ammonia is some wicked stuff to handle, too.

Cheers.

TomW

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Re: Ammonia ([none / 0](#)) ([#4](#))  
by drdongle on Sun Sep 28th, 2003 at 08:52:30 PM MST  
([User Info](#))

I think that you are thinking of Anhydrous Hydrazine which is a caustic liquid.  
The Ammonia for refrigeration is a gas, though still noxious.  
Dr.D

[ [Parent](#) ]

Re: Converting a refrigerator to Ammonia cycle?  
([none / 0](#)) ([#6](#))  
by kurt on Sun Sep 28th, 2003 at 11:02:25 PM MST  
([User Info](#))



<http://rvmobile.com/TECH/TROUBLE/COOLDOC.HTM>



Re: Converting a refrigerator to Ammonia cycle? ([none / 0](#)) (#7)  
by Norm on Mon Sep 29th, 2003 at 06:33:20 AM MST  
([User Info](#))

Evidently this is how a gas 'Servel' refrigerator works? I think for the most part it would be easier to either buy or convert one to run on 12 volts, plug it in to an inverter even! Probably would be fun to convert one to Ammonia cycle if your talent lies in that direction. Way back we used to just put the stuff down in the well...or hang out the 'ice card' for more ice! ..that was before frozen foods tho' (:>) Norm.

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[Converting a refrigerator to Ammonia cycle?](#) | 7 comments (7 topical, 0 editorial)

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## [Is a big engine going to use more gas than a small engine with a small load?](#)

[Power Systems](#)

By [zmoz](#), Section [Homebrewed Electricity](#)

Posted on Tue Sep 23rd, 2003 at 07:10:20 PM MST

**V6 powered generator inefficient with a small load?**

I'm thinking of setting up an air compressor/generator/welder with a small fuel injected V6 engine. If I was just running the generator portion of that (~10kw) off of a large engine...is that going use up more gas per hour than something like an 18hp briggs engine? I mean, the briggs engine would probably be running at full load at top RPM...while the big engine would have a very small load and could run at ~1500-2000 RPMs.

[Is a big engine going to use more gas than a small engine with a small load?](#) | 14 comments (14 topical, 0 editorial)

Re: Is a big engine going to use more ..... ([none / 0](#)) (#1)

by Norm on Tue Sep 23rd, 2003 at 09:53:52 PM MST ([User Info](#))

This is just an opinion but fuel injected computer monitored engines should win over an air-cooled engine that was never touted for fuel economy. When's the last time you've seen a claim for fuel economy on a lawnmower engine? Also I think a water-cooled engine is more efficient than an air-cooled one. Norm.

Re: Is a big engine going to use more gas ([none / 0](#)) (#2)

by zmoz on Tue Sep 23rd, 2003 at 10:51:25 PM MST ([User Info](#))

I know small engines in general aren't very efficient, especially compared to a water cooled fuel injected engine, but when only running a small load (very small for a car engine) is it going to use less gas per hour? I mean, we are talking ~4 liter engine compared to a ~1/10th of a liter engine...

Danged subject too long ([none / 0](#)) (#3)

by Demetri ([corvettemach1@yahoo.com](#)) on Tue Sep 23rd, 2003 at 11:22:55 PM MST ([User Info](#))

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I'm fairly certain that a fuel injected v-6 that can (probably) move a 3200 lb car up, over, and through mountain passes while maintaining 24 mpg would get considerably better fuel economy than an 18 hp carb'd engine screaming all out. I'm sure the calculations can be done to figure it mathmatically, but I think you'd do better than the B&S. Pully ratio would be extremely important.

If you have the v-6 already, or are getting one for free, or at considerable discount, etc., go for it. If you have yet to procure an engine.....I would suggest a four cylinder engine, as one would probably pull the load just fine, get even better economy, and are far more common and inexpensive. A diesel engine would be great for increased longevity, efficiency, and easy use of biodiesel. Good luck with whatever, and let us know what you decide on.

Demetri  
Always be the lead dog.

Re: Is a big engine going to use more gas than a s  
([none / 0](#)) (#4)  
by woferhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Tue Sep  
23rd, 2003 at 11:43:57 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

Not to mention the Heat you would be able to recover from a Water Cooled engine.

-- W o o f

this reminds me of a story ([none / 0](#)) (#5)  
by RobD on Wed Sep 24th, 2003 at 06:53:39 AM  
MST  
([User Info](#))

Once upon a time (around 1973) when gas became a problem I decided to find the smallest cheapest engine for my VW bug. I finally found and old 1100 or 1200 cc engine, blue printed it and put it in the car. It couldn't even go up hills and I always had my foot to the floor. Worse yet, the mileage was only about 30 mpg. Finally I got so fed up I put in a 1600 cc engine with twin Weber carbs. It flew! Better yet was that I got just about the same MPG. My girl friend said, "Gee, glad to see you finally tuned the car!"

RobD

[ [Parent](#) ]

Re: Is a big engine going to use more gas than a s  
([none / 0](#)) (#6)  
by RogerAS ([rogeras@cei.net](mailto:rogeras@cei.net)) on Wed Sep 24th, 2003 at  
07:15:47 AM MST  
([User Info](#))

zmoz,

I use a single cylinder Kubota oil burner. It's a EL-300-E rated at 4.5 with surge to 5 HP water cooled. I drive a big 100 amp Mopar externally regulated alternator, and a 2.8KW AC gen. Of course I can't load both power sources to their max at the same time, but I can put 20 amps into the battery bank while running any tool or appliance off the AC side. This engine gets about 1.25 PINTS of diesel (sp) per hour under full load (or as much load as I care to put on it).

This isn't a cheap engine, but with total maintaince and operating cost to date I'm still WAY under what the grid bills would be. I buy off-road fuel (without the road taxes) 50 gals at a time and have a semi tank that holds 109 gals. I useually buy fuel twice a year. I'm adding other power sources as time and money will allow. But the Kubota has been a really good investment.

Now all I need to do is figure out how to make bio-diesel.

RogerAS

"Put the bunny back in the box!"

Re: Is a big engine going to use more gas than a s  
([none / 0](#)) (#7)  
by DanB on Wed Sep 24th, 2003 at 09:49:38 AM MST  
([User Info](#))

Id think the V6 is too big...

Lots of bits reciporating - lots more friction, I'd vote for the 18hp briggs... or a nice old wisconsin or something. They are not that inefficient!

Better would be find something a bit oversized and run it slow (1800 rpm or less) for peace and quiet.

The V6 is probably a 160-200hp engine, and you'd be asking for so little from it, I think you'd be using most of your fuel just to keep the engine running.

I don't think air vs water cooled really enters into efficiency. Flat heads, and low compression do to some degree, but I think efficiency is not a big factor in 4 cycle gas engine.... they are all similar I think. One cool thing about a briggs, or other air cooled engines - once hot, they will run nicely on kerosene or light diesel! (wont start that way...) If you run on that, you'll go through almost half the fuel and they'll run a bit more smoothly. Funny how that works out - but Ive run lots of small battery chargers with little aircooled motors on diesel or kerosene and found it to be quite economical.

A few years back I took a 4 cyl volvo engine (and old B-18 90hp) and tied it to a welder (probably about a 10KW generator) and it ran 1800 rpm (direct drive). Worked great... it wasnt fuel injected, but I used an FI manifold and put a motorcycle carb on it - it was running clean, and fairly efficiently I think. But... it was a gas hog.

Your case might be even worse. A briggs, or a wisconsin or something along those lines is reasonably efficient, light weight - a good one will last a long time, they are cheap and easy to fix. If you can get one large enough to run at lower rpm that'd be better. I think you'd do OK, like

someone else said.. to find a small 4 cyl car engine perhaps, but I'd look for real small one.

Or.. a larger engine off a motorcycle might be nice!

Re: Is a big engine going to use more gas than a s ([none / 0](#)) ([#9](#))  
by RobD on Wed Sep 24th, 2003 at 01:39:10 PM MST  
([User Info](#))

HI Dan,  
I knew that B18 engine and it was a real work horse. The 544's ran them.  
I don't know how true this is but one of my friends said he gets relatively good efficiency on his lawn tractor. I told him mine was a hog and he said the overhead valve engines are much more efficient. My little Honda lawn mower with overhead valves is quite good and my 2 cycle mopeds get about 125 mpgs. Not bad for a horse and a half to two horse power. I think the most efficient is the diesel in the long run.  
RobD

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Re: Is a big engine going to use more gas than a s ([none / 0](#)) ([#10](#))  
by DanB on Wed Sep 24th, 2003 at 01:54:11 PM MST  
([User Info](#))

yes.. the B-18 is a tough little motor so long as you keep oil in it! I've had 544's... lotsa fun!

I think "efficiency" - as far as the engine itself is concerned (not the fuel system) largely boils down to compression. Overhead valve engines generally have higher compression ratios simply because there is less volume in the head. Flatheads usually have low compression because the valves have to sit beside the cylinder - and the airflow is not so smooth.

But I think it's a fairly small factor really in small engines... (my model A gets good milage with a flat head!).

I dont think air, or water cooled enters into it. My honda generator (with overhead valves) definitely does well on gas, surely a bit better than it would with an old briggs&stratton or something. I do like the simplicity of a flat head though and I think they are not bad.

[ [Parent](#) ]



Re: Is a big engine going to use more gas ([none / 0](#))  
(#8)  
by N9WOS on Wed Sep 24th, 2003 at 01:37:56 PM MST  
([User Info](#))

If it is a 3L engine, it would top out at about 150HP  
at 5100RPM or so.  
At 1800RPM, it's rated HP will be around 50HP or so.

A 3L engine would make a good match to a 25KW or 30KW  
1800RPM generator.

If your are going to run a welder/10KW  
generator/compressor  
off of it, I would say the engine would be a good match  
at 1800RPM operating speed.

Make sure the O2, map/mas, TPS, and engine temp sensor  
is working properly, so that the ECU will be in a closed loop  
operating mode, otherwise the fuel usage will suck.

Starting on diesel(yes the subject was too long)  
([none / 0](#)) (#11)  
by Demetri ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Wed Sep  
24th, 2003 at 10:55:01 PM MST  
([User Info](#))

Dan, it's possible to start a B&S when it's running diesel. I  
turn on my propane torch all the way, but I don't light it,  
and hold it near the air intake so that propane vapor can  
be "inhaled". It smokes an awful lot until the engine warms  
up, but it does work. Also good for starting an engine in  
stone-cold weather, though I have never tried starting one  
burning diesel in stone-cold weather. I'll have to try that  
when things start cooling down here in Oregon. 91F  
today....

Demetri  
Always be the lead dog.

Re: Is a big engine going to use more gas ([none / 0](#))  
(#12)  
by zmoz on Wed Sep 24th, 2003 at 11:23:29 PM MST  
([User Info](#))

Now you've done it...you've got me interested in a diesel  
powered lawnmower engine! :D I have never heard that  
before. So you're saying once it's warmed up, it burns it  
just fine?? Does it smoke alot? (I do have close neighbors!)  
How exactly would one "switch over" from gas to diesel  
while it's running?

Anyone else having problems with the subject?

([none / 0](#)) ([#13](#))

by Demetri ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Thu Sep 25th, 2003 at 10:09:30 AM MST

([User Info](#))

Once it's warmed up, it doesn't smoke (any more than usual, hehe), except upon a change in engine speed or under heavy load, and then only a little bit. When starting on diesel with propane, like above, it'll billow white smoke for a minute or two. The easiest way to make the switch over is to have just enough gasoline in the fuel tank to warm the engine up when you start it. When the engine is warm, fill up with diesel. You'll have to adjust the carb settings as it runs and diesel makes it's way into the system; the gasoline settings will be horribly rich for diesel. The biggest drawback I've found is that the oil change interval is shortened a bit. But with the cost of offroad diesel vs. gasoline and a quart of oil being 99 cents, it works out just fine. HTH.

Demetri

Always be the lead dog.

Re: Is a big engine going to use more gas ([none / 0](#))

([#14](#))

by zmoz on Thu Sep 25th, 2003 at 12:13:26 PM MST

([User Info](#))

What is offroad diesel going for these days? I don't believe I have ever bought diesel fuel before...

[Is a big engine going to use more gas than a small engine with a small load?](#) | [14](#) comments (14 topical, 0 editorial)

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## [Connecting to the Grid](#)

By [bruce](#), Section [Homebrewed Electricity](#)

Posted on Tue Sep 16th, 2003 at 08:54:15 PM [Power Systems](#)  
MST

### Grid Tie Question

I have watched this page for sometime, and I have learned quite a bit. There are definitely many people on the this page that know ALOT! I started messing with windpower this winter, and within 2-3 wks I hope to have my 42' tower up. At that point I will do alittle more testing on my motor/rotor combo, and then proceed from there. I do not have an inverter or battery bank yet. I have 2 deep cycle batteries for now just to have a battery source at the bottom (on my 12' test tower that I've been messing with).

I have read some on net metering laws and such, and from what I understand, Nebraska is not one that will credit you back retail for every KWH you put into the grid. They will pay you wholesale, not retail. I could be wrong, it happened one other time.

Lets say the local utility company says on the local level, they will keep good on their goal to work customer relations, and they will credit me back retail what goes into the grid. If my main goal is just to cut the electric bill alittle every month, could I go directly out to the grid? I know its not just a plug and play situation, but could I, or would I want to? Could it save me doing some rewiring in my house? Could I get by with a smaller battery bank? Everytime I have a full battery bank I could discharge into the grid, therefore never having to bury power through a regulated discharge?

I'm sure there are alot more components to this scenario that I am aware of, but its a question I've been wanting to go to the utilities about. I need to be more knowledgeable of what is involved before I go to them, so I dont sound like an idiot.

If I'm all wet on some of my ways of thinking, feel free to set me straight.

Thanks, Bruce

[Connecting to the Grid](#) | 9 comments (9 topical, 0 editorial)

Re: Connecting to the Grid ([none / 0](#)) ([#1](#))  
by [drdongle](#) on Tue Sep 16th, 2003 at 09:25:41 PM MST  
([User Info](#))

Connecting to the grid requires a special synchronus inverter and the utility always buys at a rate advantages to them, so I wouldn't bother, use any power for your own and reduce your dependance on the utility.

Dr.D

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Re: Connecting to the Grid ([none / 0](#)) (#2)  
by RogerAS ([rogeras@cei.net](mailto:rogeras@cei.net)) on Wed Sep 17th, 2003 at 07:21:25 AM MST  
([User Info](#))

Hi Bruce,

I agree! I say set your goal to become totally off grid.  
You'll be happier in the long run, I am.

RogerAS  
"Put the bunny back in the box!"

Re: Connecting to the Grid ([none / 0](#)) (#3)  
by troy on Wed Sep 17th, 2003 at 11:58:53 AM MST  
([User Info](#))

Intertie inverters have multiple redundant safety features and produce beautiful sine wave juice, better than the utility, and it's also designed to stay precisely in phase with utility power so things don't blow up, catch on fire, etc. If the grid goes down, you automatically go down also.

Intertie inverters cannot work independant of the grid.

They are pretty expensive and your utility may also want you to have two seperate meters. Then they will typically charge you twice the monthly base rate because now they have to "read" two meters.

Occasionally, you'll find a utility that's not such a jerk to work with, but that's rare.

Best regards,

troy

Re: Connecting to the Grid ([none / 0](#)) (#4)  
by bruce on Wed Sep 17th, 2003 at 08:15:26 PM MST  
([User Info](#))

Thanks for the inputs all. The utility guy I talked to once did mention about a second meter, so that right there would probly just add more costs to it.

It appears separating some outdoor lighting will be what I will strive for at first. I have alot to figure out being a newbie, so you will be seeing more postings from me.

Thanks, Bruce

[ [Parent](#) ]

Simply use it. ([none / 0](#)) (#5)  
by TomW on Wed Sep 17th, 2003 at 11:35:06 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Bruce;

I have to chime in here on the side of just use it yourself.

Back a couple years ago when I got bit by the RE bug I investigated grid tie. Seemed to be the way to go and no batteries to maintain . I discovered several things that led me to my current system:

- Payback on the investment was going to be beyond my lifetime
- If the grid goes down so do you [generally].
- You get less than you pay for your power while charging a premium for "green" power to other users.
- Mandatory onsite inspections by the electric company at their discretion.
- More hoops to jump through than a dog and pony show.
- Uncooperative "cooperative" electric company.

Just to name a few reasons I decided to go with a stand alone system.

In my case I have my RE setup for my garage / office / workshop area. What I did was pull 2 of the cables out of the breaker box and put heavy duty plugs on the romex that feeds those 2 circuits to the building. I have an outlet near my inverters and I can plug those circuits into one of my inverters or the grid very easily. This works very well and is pretty straight forward and foolproof. I run most of my garage area off of the solar most of the year. I generally just flip on an inverter when I am actually out there doing things which is about 5 hours a day on average running computers tv stereo lights maybe the drill press or other tools as needed. In January or other times when I am low on stored power I just plug into the outlet to use the grid. I do not run our freezer or well from the solar yet but thats because for those things the grid is lots easier and more reliable and relatively cheap here and my system is not big enough to do it reliably.

Let me make one major point in regards Alternative energy systems and use:

It is a lot easier to reduce your consumption by a few kilowatthours than to produce a few KWH.

Best of luck in your search for energy independence.

Cheers.

TomW

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Re: Connecting to the Grid ([none / 0](#)) ([#6](#))  
by DanB on Thu Sep 18th, 2003 at 12:58:55 PM MST  
([User Info](#))



Lots of differing opinions...

Batteries are one of the most expensive parts of a RE system. The cost of batteries alone, broken down over their average lifespan can easily cost more than all the power you'd have got from them had you bought it off the grid! (this depends some on where you live and where you buy your grid power). The power grid is actually a pretty neat thing, in that it allows areas with excess power to share with areas that need more power! It doesn't rely on batteries...

Batteries are a drag. They are expensive, toxic, heavy... they require lots of special care. Battery factories are horrible places - lead, acid.. etc.

Unfortunately folks who live off the grid have to deal with them. (I don't mind too much, but it is my LEAST favorite part of the system!).

If you have interest in RE, and have the grid right there, I'd seriously consider staying hooked up. You can keep a small battery bank which might get you by in the occasional blackout, and you can run your grid-tie inverter off it - and tie your system to the power grid. Most states have Net metering, which means that whatever you generate will come off the top (power that you WILL NOT have to pay for). So that power you generate comes off your utility bill directly and you don't have to pay for the huge battery bank that would've otherwise been required. If you ever generate more than you use - they may pay you retail, they may pay you wholesale... or they may pay you nothing at all. It doesn't matter a great deal though until you generate more than you need and that's probably unlikely.

It depends a lot on resources and what you really have in mind I think. Grid tie inverters are pretty expensive... but once done, it would be a neat system and I think the savings on batteries, bad backs... etc might make it all well worth it. I suspect as time goes on, more options will come along and prices for grid tie equipment will go down.

The "ideal" system (big scale) in my mind... would be if everybody could take from, and feed into the power grid and NOT use batteries. This would make us all less dependant on big coal fired power plants and probably make the power grid a bit more stable. I suspect that's a ways off yet, but the technology is definitely getting there. Solar panels and inverters are getting cheaper and better all the time.

Re: Connecting to the Grid ([none / 0](#)) ([#7](#))  
by boB on Thu Sep 18th, 2003 at 01:59:19 PM MST  
([User Info](#))

>> Batteries are one of the most expensive parts of a RE system

Yes, second to solar panels.  
boB

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Re: Connecting to the Grid ([none / 0](#)) ([#8](#))  
by DanB on Thu Sep 18th, 2003 at 02:29:36  
PM MST  
([User Info](#))

Agreed... they're not cheap either! (getting better though)  
But the panels may last a lifetime, batteries need to be replaced every 5-15 years (depending on their quality and how they're cared for). I bet if you boil it down over the "life of a system" - batteries are the most expensive thing.

[ [Parent](#) ]

Re: Connecting to the Grid ([none / 0](#)) ([#9](#))  
by boB on Fri Sep 19th, 2003 at 11:20:59 AM MST  
([User Info](#))

>>I bet if you boil it down over the "life of a system" - batteries are the most expensive thing.

Hmmm.. That's certainly an interesting angle and way to look at the whole picture !  
boB

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[Connecting to the Grid](#) | 9 comments (9 topical, 0 editorial)

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[Another Alternator Ahhh!!!!](#) | 2 comments (2 topical, editorial)

Re: Another Alternator Ahhh!!!! ([none / 0](#)) (#1)  
by Harry Luubovv on Sat Jan 3rd, 2004 at 10:51:26 PM MST  
([User Info](#))

I think the drawing is very nice. But where's the photo of a real generantor ? :-

That's nice drawing really, thanks.  
Luubovv.

[Another Alternator Ahhh!!!!](#) | 2 comments (2 topical, 0 editorial)

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[Another Alternator Ahhh!!!!](#) | 2 comments (2 topical, editorial)

Re: Another Alternator Ahhh!!!! (none / 0) (#2)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Mon Jan 5th, 2004 at 08:14:13 AM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

I think your coils need to be larger and your magnets need to be spaced farther apart because the coils won't fit.

}=- W o o f -= {

[Another Alternator Ahhh!!!!](#) | 2 comments (2 topical, 0 editorial)

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### User info for woofershound

Homepage:

<http://timmythy.home.mindspring.com/timmy.htm>

Email: [timmythy@mindspring.com](mailto:timmythy@mindspring.com)

Bio:

Huntsville Alabama, USA

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# The Homepage of Timothy Mark Mitchell

**Huntsville Alabama**

Hello there, I'm 46 years old and I've lived in [Huntsville Alabama](#) since 1964. I have some hobbies and work at companies that may be of interest to some of you. At sometime in my life I have been very involved in the following subjects . . .

- Electronics, Electronic Graphics
- Computers, Programming
- Sound, Lighting and Video
- Photography, Animation, Darkroom
- Pyrotechnics
- Model Rocketry
- Construction



As you can see I have done just a little bit of everything in the entertainment business, however I consider myself best at Sound and Lighting. In fact I have a sound and lighting company called "[Woofers Hound](#)", with sound systems as big as 5000watts, and up to 60 stage lights.

Here is a little more information about some of my interests . . .

**[Photo Gallery](#)**

**[My Wife Svetlana](#)**

**[Mutt Lee my puppy](#)**

## BBS Bulletin Board Systems

## Sound and Lighting

## Some old Doodles

## My Favorite Links

Feel free to E-Mail me at the address below, if you share similar interests . . .

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---

Tim's Home Page / [timmythy@mindspring.com](mailto:timmythy@mindspring.com) / Updated: June 2002



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1. [Another Alternator Ahhh!!!! \(Magnets & Magnetism, Alternators\)](#)  
posted by joe2012 on 01/03/2004 09:56:09 PM MST  
2 comments

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- [generating electricity using Earth's magnetic field?](#) ([Homebrewed Electricity](#), [Free Energy](#))  
posted by dude8604 on 01/03/2004 08:22:31 PM MST  
2 comments
- [Perpetual motion or science - have a look](#) ([Weird Science](#), [Free Energy](#))  
posted by Reno on 01/01/2004 09:07:01 AM MST  
8 comments
- [Bicycle lights \(batteryless, No friction\)](#) ([Classifieds](#), [Free Energy](#))  
posted by iwico on 12/31/2003 05:29:04 AM MST  
1 comment
- [Chemist Needed Please](#) ([Weird Science](#), [Free Energy](#))  
posted by wildbill hickup on 12/28/2003 06:21:04 AM MST  
14 comments
- ["WIND's KID - 5" from Lithuania](#) ([Homebrewed Electricity](#), [Free Energy](#))  
posted by Virgis on 12/23/2003 05:23:03 AM MST  
3 comments
- [Refrigerator powered by sound](#) ([Weird Science](#), [Free Energy](#))  
posted by slecain on 12/17/2003 05:11:25 PM MST  
0 comments
- [Using cold tap water to cool home](#) ([Remote Living](#), [Free Energy](#))  
posted by joe4324 on 12/17/2003 01:02:32 PM MST  
10 comments
- [Motors Running Backwards = Electricity?](#) ([Homebrewed Electricity](#), [Free Energy](#))  
posted by Static Lightning on 12/16/2003 04:28:52 PM MST  
4 comments
- [10 kW windflower from Lithuania \(the third attempt to post\)](#) ([Homebrewed Electricity](#), [Free Energy](#))  
posted by Virgis on 12/16/2003 09:50:44 AM MST  
4 comments
- [Perpetual motion questions](#) ([Homebrewed Electricity](#), [Free Energy](#))

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posted by CrookedScepter on 12/16/2003 08:49:37 AM  
MST  
12 comments

11. [For Norm](#) ([Homebrewed Electricity](#), [Free Energy](#))  
posted by Virgis on 12/16/2003 06:06:26 AM MST  
4 comments

12. [suggestions please.](#) ([Homebrewed Electricity](#), [Free Energy](#))  
posted by Redbone on 12/16/2003 12:31:09 AM MST  
7 comments

13. [What project should I take on?? I've got alot of stuff](#) ([Homebrewed Electricity](#), [Free Energy](#))  
posted by slecain on 12/14/2003 06:07:01 PM MST  
4 comments

14. [A question for Jerry](#) ([Homebrewed Electricity](#), [Free Energy](#))  
posted by filico on 12/10/2003 07:56:28 AM MST  
1 comment

15. [Motor permanent Magnet \(contol charger\)](#) ([Homebrewed Electricity](#), [Free Energy](#))  
posted by filico on 12/08/2003 08:37:57 AM MST  
1 comment

16. [Cold Electricity](#) ([Homebrewed Electricity](#), [Free Energy](#))  
posted by pexring on 12/05/2003 10:14:45 PM MST  
12 comments

17. [non electric fan](#) ([Remote Living](#), [Free Energy](#))  
posted by erne on 12/05/2003 06:52:04 AM MST  
2 comments

18. [Heat Catcher for the Generator](#) ([Homebrewed Electricity](#), [Free Energy](#))  
posted by wdyasq on 11/24/2003 06:43:14 PM MST  
4 comments

19. [Twist](#) ([Homebrewed Electricity](#), [Free Energy](#))  
posted by Seth on 11/22/2003 05:51:37 PM MST  
5 comments

20. [solar heating](#) ([Remote Living](#), [Free Energy](#))  
posted by bob golding on 11/19/2003 07:07:58 AM MST  
5 comments

21. [Free Refrigeration](#) ([Remote Living](#), [Free Energy](#))  
posted by J Steele on 11/18/2003 08:41:08 AM MST  
5 comments

22. [2besynergy](#) ([Magnets & Magnetism](#), [Free Energy](#))  
posted by Ocean on 11/14/2003 08:44:19 AM MST  
6 comments

23. [to tom](#) ([Remote Living](#), [Free Energy](#))  
posted by erne on 11/12/2003 01:41:52 PM MST  
1 comment

24. [Bedini power generation technology](#) ([Weird Science](#), [Free Energy](#))  
posted by charged on 11/12/2003 08:36:05 AM MST  
26 comments

25. [becoming synergy?](#) ([Weird Science](#), [Free Energy](#))  
posted by Ocean on 11/12/2003 08:34:07 AM MST

5 comments

26. [heat exchanger for drier](#) ([Weird Science](#), [Free Energy](#))

posted by erne on 11/12/2003 07:01:13 AM MST  
2 comments

27. [solar heat panel with fresnel lenses](#) ([Remote Living](#), [Free Energy](#))

posted by gameman on 11/10/2003 08:39:14 PM MST  
10 comments

28. [Some simple, but crucial questions about laminates, coils and armature :\)](#) ([Homebrewed Electricity](#), [Free Energy](#))

posted by Sponge on 11/10/2003 11:43:13 AM MST  
2 comments

29. [Heat exchanger for a residential clothes dryer?](#) ([Weird Science](#), [Free Energy](#))

posted by pazman on 11/08/2003 11:41:01 PM MST  
20 comments

30. [Interior Radiant heating panel](#) ([Remote Living](#), [Free Energy](#))

posted by gameman on 11/08/2003 08:53:45 PM MST  
3 comments



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[generating electricity using Earth's magnetic field?](#) | 2 comments (2 topical, 0 editorial)

using Earth's magnetic field? ([none / 0](#)) ([#1](#))  
by drdongle on Sat Jan 3rd, 2004 at 09:41:23 PM MST  
([User Info](#))

It works but the trick is the motion, that is finding a way to move the coil continuously through the natural magnet field and as that field is very weak producing enough power to be usefull.

Dr.D

[generating electricity using Earth's magnetic field?](#) | 2 comments (2 topical, 0 editorial)

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Re: using Earth's magnetic field? ([none / 0](#)) (#2)  
by Harry Luubovv on Sat Jan 3rd, 2004 at 10:02:26 PM MST  
([User Info](#))

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Love, not hate  
Luubovv.

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[Perpetual motion or science - have a look](#)

By [Reno](#), Section [Weird Science](#) [Free Energy](#)  
Posted on Thu Jan 1st, 2004 at 09:07:01 AM MST  
none

Anyone here who is interested in perpetual motion or free energy might want to take a look at these guys. This apparatus is a hydrogen machine. I think the company is canadian. From what I gather there is already quite a story here. <http://www.xogen.ca/>  
<http://www.xogen.ca/tests.php> If you do a search on the company name you will find all kinds of links (makes for some good entertainment.) They even have a video!!!!!!!!!!!!!!(in this case a picture isn't worth a 1000 words) I originally came across this about a year ago while looking for info on wind turbines. On one of the Alt energy pages there was news releases published and this company had news that wind and sloar energy would be used to drive this machine.

[Perpetual motion or science - have a look](#) | 8 comments (8 topical, 0 editorial)

Hydrogen Experiments ([none / 0](#)) (#1)  
by [pexring](#) on Thu Jan 1st, 2004 at 11:34:44 AM MST  
([User Info](#))

Over Christmas vacation I started reading a lot more about hydrogen. Someday hydrogen will replace the oil fields. Is anyone out there experimenting with hydrogen?

Mark

Re: Hydrogen Experiments ([none / 0](#)) (#3)  
by [drdongle](#) on Thu Jan 1st, 2004 at 04:48:39 PM MST  
([User Info](#))

It won't unless some one comes up with a more efficient way to extract it from water. Currently it requires more energy to extract hydrogen that is liberated by burning it or using it in a fuel cell. If the article is accurate then just maybe some one has, only time will tell.

Dr.D

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Re: Perpetual motion or science - have a look ([none / 0](#)) (#2)  
by kell on Thu Jan 1st, 2004 at 03:53:47 PM MST  
([User Info](#))

They don't make claims of perpetual motion. They do claim to get more gas with less current than predicted by theory that no one has questioned for more than a hundred years or examined narrowly in this particular experimental context insofar as I am aware... and the empirical trumps the theoretical. If you're a scientist.

Also, even if they were to claim that the hydrolyzer would run on its own heat output (which they don't), that's still not "perpetual motion". It isn't a closed system.

Re: Perpetual motion or science - have a look ([none / 0](#)) (#4)  
by Reno on Thu Jan 1st, 2004 at 05:09:28 PM MST  
([User Info](#))

The way I read it is this system is for stationary uses. Along with the use of solar and or wind as the power source. Being a stationary device then the solar or wind energy being used directly wuld be more effecient. Even though there is no claim of free energy the fact that these systems are stationary would imply a benefit to converting the energy source. If the hydrogen was stored and used off site then it might make sense. This is the way I see it.

Re: Perpetual motion or science - have a look ([none / 0](#)) (#5)  
by Tom in NH on Thu Jan 1st, 2004 at 10:30:16 PM MST  
([User Info](#))

Hydrogen production with straight DC is pretty straightforward, but when you get into AC and pulsed DC strange things appear to happen and there is debate as to what it is. With AC electrolysis, you have hydrogen and oxygen bubbles forming at the same electrode, a very explosive mix. Some people report that heating takes place which is unaccounted for with the electrical energy going into the water. Some suggest that the hydrogen and oxygen reform into water and give off heat in the process. Others think it may be a form of cold fusion. Whatever is happening, it needs more investigation. Here's a link to an interesting site. Look for the article about the "boiler cells." That's something I want to try to replicate.  
[http://www.geocities.com/mj\\_17870/myideas.html](http://www.geocities.com/mj_17870/myideas.html) In reference to home energy production, Hydrogen should be thought of as being a storage medium, like batteries. When the sun shines or the wind blows, you make H2 and burn it later. --Tom

Re: Perpetual motion or science - have a look

([none / 0](#)) (#6)

by pexring on Thu Jan 1st, 2004 at 10:40:12 PM  
MST

([User Info](#))

That's what I've been reading, that hydrogen makes great storage for alternative energy products.

Countries around the world are spending millions on hydrogen research, so something has to break.

Have also been reading about adding different catalysts to accelerate the the hydrogen reaction.

Then there's the plans on the internet for building a simple hydrogen gadget that will increase your car mileage. It makes hydrogen and pumps it directly into the motor. So if that's the case, why can't that be upscaled to make enough hydrogen to totally run the car without the need for other fuels? So long gas stations!

Have any of you read the book, "They Hydrogen Economy?" Now available in any bookstore.

Interesting info in that book.

Mark

[ [Parent](#) ]

Re: Perpetual motion or science - have a look

([none / 0](#)) (#8)

by Reno on Fri Jan 2nd, 2004 at 08:10:42 AM  
MST

([User Info](#))

I myself like the SOFC fuel cells can run on many hydrogen containing fuels. They produce electricity and heat at around 800C. As for hydrogen as a fuel in automobiles I believe the winning idea in all this is the internal combustion engine. BMW has had a fleet of vehicles on tour for some time. (do not know if they are still out there)got to BMW.com and search Hydrogen. BMW has stated the only thing missing is the supply chain. If hydrogen is to be used in a stationary device it makes no sense to me to make electricity convert it to hydrogen then to power. That is where the SOFC cells have an advantage, they can take natural gas in a house or gasoline in a car to run. BMW used SOFC cells as the electrical source in their hydrogen vehicle.

[ [Parent](#) ]

Re: Perpetual motion or science - have a look ([none / 0](#)) (#7)

by charged on Fri Jan 2nd, 2004 at 07:40:38 AM  
MST  
([User Info](#))

A more efficient hydrogen production method uses sodium hydroxide. The NaOH is heated to liberate the oxygen, leaving NaH. Solar concentrators can do a great job of this. The NaH is then sealed in ping-pong-ball-like spheres of plastic and carried in the car's "fuel" tank. The balls are split open into a sealed container of water where H<sub>2</sub> is liberated and sent to power the engine.

<http://www.powerball.net/> What you're left with is essentially a container full of "draino" solution that only needs to be heated and re-packaged to repeat the process.

[Perpetual motion or science - have a look](#) | 8 comments (8 topical, 0 editorial)

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## [Bicycle lights \(batteryless, No friction\)](#)

By [iwico](#), Section [Classifieds](#) [Free Energy](#)

Posted on Wed Dec 31st, 2003 at 05:29:04 AM MST

NO battery needed, No friction on any parts of the bicycle. Very bright, Get the energy almost free. Standby light.

<http://www.freelights.co.uk>

[Bicycle lights \(batteryless, No friction\)](#) | 1 comment (1 topical, 0 editorial)

Re: Bicycle lights (batteryless, No friction) ([none / 0](#)) (#1)  
by [drdongle](#) on Wed Dec 31st, 2003 at 05:40:31 AM MST ([User Info](#))

kinda cute

Dr.D

[Bicycle lights \(batteryless, No friction\)](#) | 1 comment (1 topical, 0 editorial)

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## [Chemist Needed Please](#)

By [wildbill hickup](#), Section [Weird Science](#)

Posted on Sun Dec 28th, 2003 at 06:21:04 AM  
MST

[Free Energy](#)

Can anyone tell me how aluminum, Zinc, and motor oil can produce heat???

Ad claims chemical reaction between Aluminum container, zinc rod in center, filled with motor oil will produce heat. Is this remotely possible? Me thinks "To Good To Be True!

Wild Idea from Wildbill

[Chemist Needed Please](#) | 14 comments (14 topical, 0 editorial)

Re: Chemist Needed Please ([none / 0](#)) (#1)  
by Old F on Sun Dec 28th, 2003 at 06:34:46 AM MST  
([User Info](#)) <http://www.oldf.homestead.com>

Bill

I am no chemist but off the top of my head the only way you would get heat with this set up is to set the oil on fire.

Where did find the add?

Old F

Re: Chemist Needed Please ([none / 0](#)) (#2)  
by wildbill hickup on Sun Dec 28th, 2003 at 06:52:37 AM MST  
([User Info](#))

I don't even remember the website. It sounded absurd to me too. BUT they claim it will produce heat and won't consume the oil. I had prettymuch forgotten about it but I figured that the folks here seem to try almost anything, and a few years ago I never would have imaged getting to very volital substances out of a non volitle substance (water) but you can. Or spinning magnets near a peice of aluminum will produce heat. I know the old saying "If that were possible then everybody would be doing it." Well from what I have learned here and elsewhere, If all these things were possible none of us would be paying outragous prices to get electricity and fuel to heat our homes. But most of the world is still coughing up \$\$\$\$\$ to do just that. :)

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Re: Chemist Needed Please ([none / 0](#)) (#6)  
by RobC on Sun Dec 28th, 2003 at 02:00:29 PM MST  
([User Info](#))

Probably here.<http://www.fuellesspower.com/Heater.htm>  
RobC

[ [Parent](#) ]

Re: Chemist Needed Please ([none / 0](#)) (#7)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on  
Sun Dec 28th, 2003 at 02:52:50 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

You need to put your wading boots on when you visit that site, best not to get any of that BS on you. On thier plans to build a wind generator, it says that you can run your whole house at 50amps & 12vdc . . .

}=- W o o f --{  
[ [Parent](#) ]

Re: Chemist Needed Please ([none / 0](#)) (#8)  
by bob golding ([yubba at clara dot net](mailto:yubba at clara dot net)) on  
Sun Dec 28th, 2003 at 06:01:19 PM MST  
([User Info](#))

got to watch those atomic atoms dont mix with the anti atomic atoms might get spattered in BS

[ [Parent](#) ]

Re: Chemist Needed Please ([none / 0](#)) (#14)  
by wildbill hickup on Sat Jan 3rd, 2004 at 06:18:10 AM MST  
([User Info](#))

600 watts, must be a very very small house with a few lightbulbs:)

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Re: Chemist Needed Please ([none / 0](#)) (#11)  
by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Wed Dec 31st, 2003 at 12:16:58 PM MST  
([User Info](#))

Testing NEW STUFF.  
Testing testing testing

[ [Parent](#) ]

Re: Chemist Needed Please ([none / 0](#)) (#3)  
by drdongle on Sun Dec 28th, 2003 at 07:39:31 AM MST  
([User Info](#))

Sounds like some sort of "nasty" cell intended for an electrolytic reaction. I don't want to try it.

Dr.D

Re: Chemist Needed Please ([none / 0](#)) (#4)  
by kww on Sun Dec 28th, 2003 at 07:39:46 AM MST  
([User Info](#))

Seems like this may be possible(I've forgotten a lot). However, it's not going to make a lot of heat or work for very long or it'd be a lot more popular, unless it's just been developed. You can experiment using a beer can(aluminum container) and a galvanized nail(zinc plated) to see for yourself. Btw, you can make heat by simply turning something in a container of oil, but not much unless you're really putting a lot of energy into it.

A transmission is a good example of this.

Kevin

Re: Chemist Needed Please ([none / 0](#)) (#5)  
by kell on Sun Dec 28th, 2003 at 09:13:46 AM MST  
([User Info](#))

Maybe it consumes the metals... somebody came up with an engine that runs by oxidizing aluminum. The aluminum sits in a container of water, and there's some way they use the energy released by oxidizing the aluminum to hydrolyze the water, then burn the hydrogen to run the engine. After a while you have a bucket of aluminum oxide sludge. As you may know, refining (reducing) aluminum takes huge amounts of energy, so there's a lot of energy in an aluminum ingot -- I think twenty pounds drives a car 500 miles, or something like that.

Re: Chemist Needed Please ([none / 0](#)) (#13)  
by elvin1949 ([elvin1949@wmconnect.com](mailto:elvin1949@wmconnect.com)) on Fri Jan 2nd, 2004 at 11:06:01 PM MST  
([User Info](#))

mix salt with the water  
it works power out is not much  
compared to power in but can be made from scrap  
later  
elvin

[ [Parent](#) ]

Re: Chemist Needed Please ([none / 0](#)) ([#9](#))  
by wildbill hickup on Mon Dec 29th, 2003 at 07:20:20 AM MST  
([User Info](#))

Well folks thanks for your input. All of you confirmed my suspicions. RobC I think your right. Woof, Bob Golding love your comments. Bob Golding I like the part about the atomic, anti atomic it sounds so technical. It's like you guys have been to that site or something. :) Well I guess I just better stick with wind and maybe see if I can blow up another container of hydrogen. As I remember the plans were 50 bucks, I think I'll spend that on winding wire or the surplus motor chuck reviewed.

Re: Chemist Needed Please ([none / 0](#)) ([#10](#))  
by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Wed Dec 31st, 2003  
at 12:15:30 PM MST  
([User Info](#))

testing NEW STUFF. THanks for bearing with us.

Re: Chemist Needed Please ([none / 0](#)) ([#12](#))  
by Geek on Wed Dec 31st, 2003 at 09:00:31 PM MST  
([User Info](#))

I am a chemist, it will not work under current ,well supported, theories but we also used to think the workd was flat too. Always have a dream. Those with out dreams are just waiting to die.

[Chemist Needed Please](#) | 14 comments (14 topical, 0 editorial)

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### [Refrigerator powered by sound](#)

By [slecaïn](#), Section [Weird Science](#)

Posted on Wed Dec 17th, 2003 at 05:11:25 PM MST [Free Energy](#)

I remember this.

Have not seen it on the board yet.  
Only a week in though.  
Whats up..

[Refrigerator powered by sound](#) | 0 comments (0 topical, 0 editorial)

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## [Using cold tap water to cool home](#)

By [joe4324](#), Section [Remote Living](#)  
Posted on Wed Dec 17th, 2003 at 01:02:32 PM MST

[Free Energy](#)

Using cold tap water in a radiant system to cool your home in the summer.

On my own site, I just posted a new thread I would like your opinons on. You dont have to register or anything to post there, you can post here if you like as I will frequently check both places.

<http://www.ecoforums.com/forum/viewtopic.php?t=12>

[Using cold tap water to cool home](#) | 10 comments (10 topical, 0 editorial)

Re: Using cold tap water to cool home ([none / 0](#)) (#1)  
by [halfcrazy](#) on Wed Dec 17th, 2003 at 02:23:50 PM MST  
([User Info](#))

go to [www.radiantec.com](http://www.radiantec.com) they have plans for such a system i just installed one in my own home in the summer all the domestic water runs thru the slab to help cool it and it also preheats it for the water heater.

Re: Using cold tap water to cool home ([none / 0](#)) (#3)  
by [DDT77](#) on Thu Dec 18th, 2003 at 06:47:22 AM MST  
([User Info](#))

Hi,

Just wondering if anyone has had condensation problems in relation to the loop in the slab?

Has anyone tried to replace / avoid using a central air system with a loop of pipe in the ground tied to a coil in the duct (as in a typical central air system) in which water or other fluid is circulated? Similar to ground source heat pump, without the heat pump part.

Would seem that the benefits would be low electricity (pumping) costs, as power hungry compressor would not be needed, but limit to cooling would be the ability for the ground to sink the heat from the house.

thanks,

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- [Also by joe4324](#)

darren

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Re: Using cold tap water to cool home ([none / 0](#))  
(#2)

by joe4324 on Wed Dec 17th, 2003 at 08:00:21 PM  
MST

([User Info](#)) [www.ecoforums.com](http://www.ecoforums.com)

I knew it must have existed already, I will probably build my system from scratch unless the radiantec units make it alot easier and arent very cost prohibitive. I'd love to hear a more indepth opinoin on how you feel about the system, and the kind of performance gains you seen on your water heating.

Re: Using cold tap water to cool home ([none / 0](#))  
(#4)

by veewee77 on Thu Dec 18th, 2003 at 12:32:00 PM  
MST

([User Info](#))

I read an article the other day (can't remember where off hand, though) where a guy had done it this way.

On the supply line from the city water supply, he put a valve which would run the water directly to his water lines in the house or through a heat exchanger made from a heater core from a big van. When he is watering his lawn (the water is running then) he turns the valve to divert the water through the heat exchanger before going to the supply lines in the house. The cold water (if your pipes are deep enough it will be about 60 degrees) runs through the exchanger, where he has a solar-powered fan blowing air through the exchanger.

This is "free" cooling. You are already running water to water the grass anyway, and the water is warmed when it hits the lawn, so why not use the cooling "before" it hits the lawn. . . And the fan is powered by solar (you probably wouldn't be watering the lawn on a cloudy day) panels so the electricity don't cost you anything and you don't even have to pump the water!

Doug

ground temperature ([none / 0](#)) (#5)

by wdyasq on Thu Dec 18th, 2003 at 04:48:05 PM  
MST

([User Info](#))

These procedures depend on the ground temperature and the water temperature coming into the house. The two areas I know are Central Ohio - 57 degree water in the Summer and North Central Texas, where 85 to 90 degree water is normal.

Obviously, Ohio might be a "possible" with a 15 degree delta to reach 72 degrees. Of course the Texas water has a 15 to 20 degree delta too - it is just in the wrong direction.

The only reason I mention this is because a little research will save one a lot of trouble. I would consider a 15 degree delta marginal for trying this.

Different climates will take completely different approaches to cooling and heating. Most solutions that are addressed can work if liberal amounts of energy are applied. Minimal power consumption requires different thoughts and processes.

Ron

Re: Using cold tap water to cool home ([none / 0](#))  
([#6](#))  
by Demetri ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Thu Dec 18th, 2003 at 05:08:57 PM MST  
([User Info](#))

How does it work that the ground is ~ 60 degrees.....but the water that comes out of my tap(from a well out back) is far colder than 60 degrees, even when it's 100 outside. What am I missing?

Demetri  
Always be the lead dog.

Re: Using cold tap water to cool home  
([none / 0](#)) ([#7](#))  
by joe4324 on Thu Dec 18th, 2003 at 10:30:23 PM MST  
([User Info](#)) [www.ecoforums.com](http://www.ecoforums.com)

well I believe that could be two things, usually well water (at the tap) isnt much colder then 60degrees anywere. (not usually) maybe the high 50's but it realy depends on were your at (have you measured the temp?) I live in northern indiana and my tap water is seldom below 60f but it feels ICE cold in the summer time because well. its hot :) So it might just be a perception thing. Also the water is comming from deep underground were it could be even colder. that is a possibility too.

[ [Parent](#) ]

Re: Using cold tap water to cool home ([none / 0](#)) ([#8](#))  
by RogerAS ([rogeras@cei.net](mailto:rogeras@cei.net)) on Fri Dec 19th, 2003 at 11:15:44 AM MST  
([User Info](#))

Hi,

I live in Stone County Arkansas and there is a place called Blanchard Springs nearby. The water coming out of a cave there is so cold one cannot stand the water for more than a few minutes, far too cold. Most of the wells in our area also produce water so cold it hurts ones head if it is drank too fast, like ice cream headace!

I plan on dilling our well this spring, and if I get the same cool water I'm going to try this.

RogerAS  
"Put the bunny back in the box!"  
[ [Parent](#) ]

Re: Using cold tap water to cool home ([none / 0](#)) ([#10](#))  
by Norm on Sat Dec 20th, 2003 at 10:45:52 PM MST  
([User Info](#))

Roger...just to satisfy our curiosity after you drill your well take a thermometer and let us know how cold the water actually is! Back in Illinois I remember the water from our well used to be cold enough that a tin pitcher would 'sweat' on the outside, used to lower milk and stuff down in the well to keep it cool....power outages back then only meant you had to get out the kerosene lamp when it got dark. (:>) Norm.

[ [Parent](#) ]

Re: Using cold tap water to cool home ([none / 0](#)) ([#9](#))  
by charged on Sat Dec 20th, 2003 at 03:29:17 PM MST  
([User Info](#))

Get a basic window mounted AC unit.

Build a sealed enclosure around both hot and cold side exchangers with a water inlet on one face at the top, and the outlet on the opposite face on the bottom.

Mount the evaporator thermostat to the outer surface of the evaporator box.

Put a small flow-control valve on the hot-side outlet. Feed the hot-side with your cold-water source and route the heated water to your hot-water tank heat exchanger. You won't need to open the flow valve very much since the water absorbs heat MUCH FASTER than blown air, even when the water is seemingly already "hot" to your touch.

Run a separate liquid flow loop through cold-side (evaporator) box and use a simple manifold valve system to send the cold water anywhere you want in the house.

By sealing this inside an insulated enclosure, and building a flow switching manifold, you can adjust the hot and cold side flows to either COOL or HEAT the house, depending on the season.

Seal both hot and cold-side loops and circulate 50:50 antifreeze solution in both. Then, disconnect the evaporator thermostat and rewire the compressor control to the house thermostat. The evaporator won't ever ice up since R22 boils at about -40 and the antifreeze is good down to about -60.

Your outdoor heatexchanger should be a LONG flow path inside a metal pipe. You can run it anywhere you want. Got a fence? As long as the fluid returning to the house from the loop has reached ambient outdoor temps the system efficiency will be through the roof.

The greater the total exchanger space access (longer flow path) the higher the efficiency will be.

[Using cold tap water to cool home](#) | 10 comments (10 topical, 0 editorial)

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## [Motors Running Backwards = Electricity?](#)

By [Static Lightning](#), Section [Homebrewed Electricity](#) [Free Energy](#)

Posted on Tue Dec 16th, 2003 at 04:28:52 PM MST

Somewhere, I don't know where, I heard that if you make a motor run backwards, it will produce electricity.

---

Somewhere, I don't know where, I heard that if you make a motor run backwards (by using a pull cord wrapped around the axle, etc.), it will produce electricity.

Has anyone tried this? I am interested in doing this but I can't find much info on it.

[Motors Running Backwards = Electricity?](#) | 4 comments (4 topical, 0 editorial)

Re: Motors Running Backwards = Electricity? ([none / 0](#)) (#1)  
by [drdongle](#) on Tue Dec 16th, 2003 at 04:46:04 PM MST ([User Info](#))

It depends on the motor type, but yes many DC motors can be used as a generator, just check the archives here for more info.

Dr.D

The motor ([none / 0](#)) (#2)  
by [Static Lightning](#) on Tue Dec 16th, 2003 at 05:34:27 PM MST ([User Info](#))

The motor came from some nail dryer I took apart. It was used as a fan and ran on 2 C-cells or D-cells. It is cylindrical, 1 in. diameter and 1 1/8 in long. There are no markings on it.

Re: The motor ([none / 0](#)) (#3)  
by [Static Lightning](#) on Tue Dec 16th, 2003 at 05:36:42 PM MST ([User Info](#))

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### Poll

What do you think is the best (as by efficiency, availability, cost, etc.) source of electricity?

- Hydro
- Wind
- Chemical Reaction
- Steam
- Bio-mass
- Fossil Fuels
- Nuclear
- Lightning
- Static
- Solar

Votes: 80

[Results](#) | [Other Polls](#)

### Related Links

- [More on Free Energy](#)
- [Also by Static Lightning](#)

and there is + and - to show the polarity of where the wires are attached. Does anyone know a way or have a link to a way I could make this work?

[ [Parent](#) ]

Re: The motor ([none / 0](#)) (#4)  
by Hank on Tue Dec 16th, 2003 at 06:53:52  
PM MST  
([User Info](#))

Static,

Sounds as what you have is a mass produced PM DC motor. These are used in many toys and other battery driven gadgets.

Just spin it and it will generate electricity. Not a whole lot but it will generate DC voltage with some current. If you spin it the other way the polarity reverses.

The + and - leads are probably there to ensure whoever assembled these as a nail dryer would have the fan going the right direction.

These motors will probably generate enough power to light a flash light bulb but generally need to be spun pretty fast.

Have fun,  
Hank

[ [Parent](#) ]

[Motors Running Backwards = Electricity?](#) | 4 comments (4 topical, 0 editorial)

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### [Perpetual motion questions](#)

By [CrookedScepter](#), Section [Homebrewed Electricity](#)

Posted on Tue Dec 16th, 2003 at 08:49:37 AM MST

[Free Energy](#)

Just a couple things...

I heard from someone at work how a guy showed his "perpetual motion" machine on the Johnny Carson show. Obviously if it was legit, I'd be seeing variations of that machine on this website and others, I'm wondering what was it exactly and who was he?

Lets say someone actually pulls it off and creates a PM machine that works and they tried to get a patent for it, what would happen? Would the gov't still laugh at the person, or would they apply for the patent only for that person to mysteriously "dissappear" into the desert along with the patent app?

Please indulge me, Thanx :)

[Perpetual motion questions](#) | 12 comments (12 topical, 0 editorial)

Re: Perpetual motion questions ([none / 0](#)) ([#1](#))  
by [charged](#) on Tue Dec 16th, 2003 at 09:36:43 AM MST  
([User Info](#))

First, there are no "closed energy systems" in the known universe. So, anything that appears to be "perpetual motion" must be drawing it's power from somewhere.

Every machine that we use relies on nature's constantly cycling energy flows. We simply "tap" those flows in the most convenient ways we can.

A windmill isn't perpetual motion since the energy to turn the blades AND the extra energy to generate power all comes from the wind. But, once the system is installed and running, the power is "free energy" with respect to US.

Trees are essentially free "fire energy" since it costs less in btu's to cut one apart than what you get out of it when you burn it.

There are already quite a few machine patents that claim a smaller USER ENERGY INPUT than the total energy the system COLLECTS from the ambient sources. Heat-pumps are good example. They are rated in "coefficient of performance". That's a nice term that they came up with so that they don't have to exceed 100% efficiency numbers. A C.O.P. of 6 would really be 600% efficient, by old standards. There is no

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- [Also by CrookedScepter](#)

theoretical upper limit of C.O.P. in any heatpump systems since ANY air temperature that is higher than the boiling point of the refrigerant WILL boil that refrigerant given enough time.

A "free lunch" for US is ALWAYS paid for by NATURE at some point in the chain.

Perpetual motion does not exist. Nor does it need to.

It's just a question of how big you draw your boxes.

Re: Perpetual motion questions ([none / 0](#)) (#2)  
by wayne on Tue Dec 16th, 2003 at 10:15:41 AM MST  
([User Info](#))

Hi

Maybe have a look here.

<http://www.newebmasters.com/freeenergy/index.shtml#links>

Wayne

Re: Perpetual motion questions ([none / 0](#)) (#3)  
by John on Tue Dec 16th, 2003 at 02:34:02 PM MST  
([User Info](#))

I believe that was Joseph Newman. The machine was called the Joseph Newman Motor.

John

[Toxin absorber/Pain reliever](#)

Re: Perpetual motion questions ([none / 0](#)) (#4)  
by slecain on Tue Dec 16th, 2003 at 03:17:25 PM MST  
([User Info](#))

I have a page you should look at

<http://www.lhup.edu/~dsimanek/museum/unwork.htm>

I'm still working on the gravity machines in conjunction with the adams type motor. I believe that Newton was correct. I also believe that a permanent magnet perpetual motion device (the magnets) will fail after 5000 years. thus satisfying that bastards theory.

[ [Parent](#) ]

Re: Perpetual motion questions ([none / 0](#)) (#5)  
by slecain on Tue Dec 16th, 2003 at 03:30:52 PM MST  
([User Info](#))

P.S.

As you get into this Remember This.

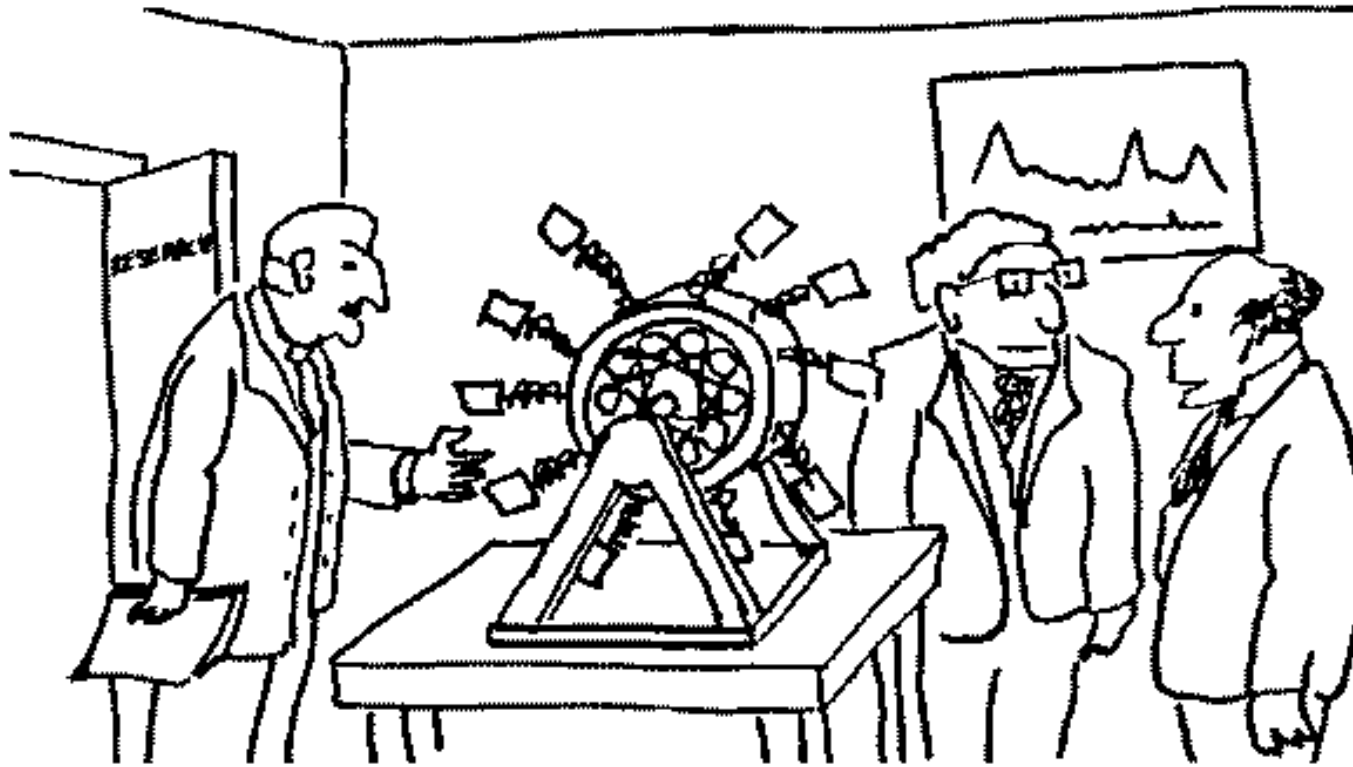
You can patent anything and you don't need to prove it works.

[ [Parent](#) ]

Re: Perpetual motion questions ([none / 0](#)) (#6)  
by Electric Ed on Tue Dec 16th, 2003 at 03:54:35 PM MST  
([User Info](#)) <http://www.electric-ed.com>

[quote]"I also believe that a permanent magnet perpetual motion device (the magnets) will fail after 5000 years. thus satisfying that bastards theory."





**"I'm sorry sir, it may actually be perpetual motion,  
but it will take forever to test it."**

**Cartoon by Donald Simanek**

Electric Ed

[ [Parent](#) ]

Re: Perpetual motion questions ([none / 0](#)) (#7)  
by slecain on Tue Dec 16th, 2003 at 07:05:56 PM MST  
([User Info](#))

Nice Ed!

I would like to share a quote with you folks that I have found that has done nothing more than to excite me and increase my will to achieve PM.

"He has survived an attempt on his life by an individual affiliated with the New Zealand Secret Intelligence Service and the Central Intelligence Agency, direct suppression of his invention by former (and recently deceased) Prime Minister of New Zealand, Robert Muldoon, the giant British electronics company, Lucus Industries, as well as numerous other insurmountable difficulties that have been placed in his path. ALL BECAUSE HIS INVENTION WORKED. And not only that, it is so simple, any electronics manufacturer or skilled backyard-home-scientist could build one."

From

<http://www.geocities.com/CapeCanaveral/Lab/1287/adams/adamsall.htm>

Keep the faith.  
Steve

[ [Parent](#) ]

Re: Perpetual motion questions ([none / 0](#)) ([#8](#))  
by woferhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Wed Dec 17th, 2003 at 12:04:15 PM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

The page you linked to has diagrams with large banks of batteries.  
Is this part of the perpetual motion ?

} = - W o o f -= {  
[ [Parent](#) ]

Re: Perpetual motion questions ([none / 0](#)) ([#9](#))  
by slecain on Wed Dec 17th, 2003 at 04:58:29 PM MST  
([User Info](#))

As long as they re-charge themselves!  
;-)

Nice point though.

As well as the Magnets failing with the pyramids the batteries will certainly fail within a birds life. Newton never said anything about maintenance. This seems alot like my wind generator problem, Ie.. I have to apply energy to an auto alternator to allow it to produce energy. Thats almost as silly as an adams motor needing a battery bank.

[ [Parent](#) ]

Re: Perpetual motion questions ([none / 0](#)) ([#10](#))  
by charged on Fri Dec 19th, 2003 at 08:21:13 AM MST  
([User Info](#))

Actually, unless the inventor can make someone really understand EXACTLY HOW any device works, the device is usually ignored.

IF any device APPEARS to go against what "scholarly" people consider the "known laws" of thermodynamics, they immediately begin vitriolic assaults on the inventor, his "bogus" device, his family, his friends, even his pets.

The logic of thinking you'd see "variations" of these devices on boards "like this" is a bit flawed.

It could be that you are ALREADY seeing variations without realizing what they are. Every machine that manipulates part of nature's energy flows has an analog that manipulates a DIFFERENT KIND of energy flow, using comparable force application.

A heat-pump IS a "free energy" device. With a SMALL application of USER INPUT, the device collects and concentrates a MUCH LARGER AMOUNT of ENVIRONMENTAL ENERGY. The larger the surface area of the "cold side" of the heat-pump, the greater the system efficiency.

A large concentrating mirror array does the same thing.

The same goes for wind machines. You build it once (hopefully) and it extracts mostly useless mechanical energy from the wind, concentrating it onto an axle and transforming it into USEFUL ENERGY for YOU. Free energy, after initial expenditures.

Here's a toy you can build.

Applying this to permanent-magnet fields. Build a "ramp" of fields in a loop (spiral). Put a single permanent magnet on a rotor, inside the spiral so that IT's field opposes the ramp field.

Move it into the tight end of the spiral and let go. You'll have torque on the axle until the rotor magnet reaches the end where the two spiral ends meet. Then it just stops there. Sounds useless, right? Wrong.

Place a single stator winding at the tight end of the ramp so that the rotor magnet is attracted to it and locks in position over it after it rotates through the spiral.

Apply a battery to the winding and determine the polarity that causes a "push" on the rotor, forcing it away.

Wire a set of points on the axle so that when the rotor comes into line with the stator, the winding receives a current pulse and jams the rotor back into the tight end of the spiral. Now you have a simple spiral pulse motor.

Connet the cathode of a rectifier diode to the positive coil terminal. Connect the anode to the negative of a large electrolytic capacitor. Connect the positive cap terminal to the other coil lead.

Now, every time the stator gets a pulse, the emf from the field collapse is collected.

Set up a charge dumping circuit and pulse a second battery with that capacitor.

Your capacitor discharge rate, capacitor voltage (minus battery voltage) and total capacitance will tell you just how much power is being recovered from the emf with each pulse.

Re: Perpetual motion questions ([none / 0](#)) (#11)  
by wayne on Fri Dec 19th, 2003 at 08:47:58 AM MST  
([User Info](#))

Hi

When you talked about the magnetic spiral that hit home with me. you might call me crazy but been trying to build a PM for awhile. You seem like a free energy person like me and give you this new link, maybe you have see it and know more about it. <http://www.fdp.nu/mikelldevice/thedevic.asp>

Later  
Wayne

[ [Parent](#) ]

Re: Perpetual motion questions ([none / 0](#)) (#12)  
by charged on Fri Dec 19th, 2003 at 03:13:14 PM MST  
([User Info](#))

Sounds like a waste of time and money. 1001 neodymium magnets???????

Anyway, just start reading here:

<http://cheniere.org/mission.html>

This is real physics applied to real energies to get real results.

Free energy flows are all around you. But, there is no such thing as "perpetual motion".

That particular term is commonly used as a derogatory remark and also used as an "intellect clamping device" to quickly shut the doors on useful innovations before they've been given a fair review.

Yes, I believe that "free energy" exists, with respect to MY energy needs. The environment provides it. All I have to do is engineer the devices the collect it, concentrated it, and store it. Then I can use it for my benefit.

[ [Parent](#) ]

[Perpetual motion questions](#) | 12 comments (12 topical, 0 editorial)

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[For Norm](#)

By [Virgis](#), Section [Homebrewed Electricity](#)  
Posted on Tue Dec 16th, 2003 at 06:06:26 AM MST [Free Energy](#)  
How to use <IMG> tag?

Thanks Norm,  
I would like to post photos (JPEG files)from my PC.Could you explain how to use tags in intro and extended copy boxes.Could you type an example how it must be done?  
Virgis

[For Norm](#) | 4 comments (4 topical, 0 editorial)

Re: For Norm ([none / 0](#)) ([#1](#))  
by kurt on Tue Dec 16th, 2003 at 06:28:49 AM MST  
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# If you are a registered user of the board, you can upload your images to our server. Simply use the 'Your Photo Uploads' link in the menu.  
# To add the image links when you are submitting a posting, just select the image you want from the drop-down menu in the User Files box to your right,

look for "your photo uploads" link to your right in box with your name at the top



Re: For Norm ([none / 0](#)) ([#2](#))  
by Firefly on Tue Dec 16th, 2003 at 06:40:45 AM MST  
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While on the subject, I am having trouble deleting uploaded photos from my photo uploads.  
Any comments?

Firefly

[ [Parent](#) ]

Re: For Norm ([none / 0](#)) (#3)  
by kurt on Tue Dec 16th, 2003 at 06:47:10 AM MST  
([User Info](#))

working fine for me are you checking the confirm box before you click deletee?



[ [Parent](#) ]

deleting photos ([none / 0](#)) (#4)  
by Norm on Tue Dec 16th, 2003 at 08:10:16 AM MST  
([User Info](#))

Works fine for me too...Now! It didn't use to until I started checking confirm FIRST then delete.... Try it ...I know it makes you feel stupid...but we all get tapped with the stupid wand sometimes....if you find this works...slam yourself in the forehead one time with the heel of your right hand and yell Eureka! LOL Norm

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[For Norm](#) | 4 comments (4 topical, 0 editorial)

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[suggestions please.](#)

By [Redbone](#), Section [Homebrewed Electricity](#)  
Posted on Tue Dec 16th, 2003 at 12:31:09 AM MST  
which should I use?

[Free Energy](#)

I live in North East Texas. I liked the idea of a wind gennie but after 30secs of research on the net, i realize i'm not in an optimal area. ...Poor wind fields here and the pines are rather tall. I live close to a river but alas I have no moving water on my property,...unless i can tap into the city water pipes with a hydro gennie, but i don't think they would think to kindly of that. I've looked at solar but it appears to be outside of any kind of financial budget I could think of. So I'm left at drawing a blank. Hmmm what resources do i have here. I live on 7ac. of mostly cleared land but surrounded by tall pines on all sides. I raise redbone coonhounds, rabbits, and goats. I do have alot of rabbit poop. is that a resource or just a pile of crap? The rabbit poop does do wonders for my vegetable garden. I have 3 children ages 3,2, and 3months. They seem to possess an internal battery that never need recharging and might be look upon as a bonifide perpetual motion mechanism. I thought about that, but you try to harness that resource. lol  
my goal is to find an energy source to provide power to my barn. barn has 8 60watt light bulbs, and my wood shop tools. I don't expect to beable to run a table saw or planer, but being able to provide lights and maybe power a power drill or dremal tool would be great. any suggestions guys.

Thanks Ron.

[suggestions please.](#) | 7 comments (7 topical, 0 editorial)

Re: suggestions please. ([none / 0](#)) ([#1](#))  
by kurt on Tue Dec 16th, 2003 at 01:49:28 AM MST  
([User Info](#))

theres btu's in that pile of crap  
<http://www.homepower.com/files/methane.pdf>  
<http://www.homepower.com/magazine/downloads.cfm>

allso 60w incondesent bulbs are not the best choice for a re system  
[http://www.otherpower.com/otherpower\\_lighting.html](http://www.otherpower.com/otherpower_lighting.html)



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Re: suggestions please. ([none / 0](#)) (#2)  
by elvin1949 ([elvin1949@wmconnect.com](mailto:elvin1949@wmconnect.com)) on Tue Dec 16th, 2003 at  
05:54:17 AM MST  
([User Info](#))

redbone  
i ain't that far away  
go vertical  
not a lot of power but some  
get all you can  
later  
elvin

Re: suggestions please. ([none / 0](#)) (#3)  
by Redbone on Tue Dec 16th, 2003 at 09:32:13 AM MST  
([User Info](#))

thanks for the response guys. BTU's outta the rabbits butts. How do I tap that resource to convert the energy to something i can use? I might just take your advice elvin1949 and experiment verticle. Has anyone ever developed a way to pull static electricity from the air. From what I've seen around here about Tesla, he could of probably done it, but he did transmissions. I figure they're quiet a bit of static charge around these power lines.



thanks again guys

[ [Parent](#) ]

Re: suggestions please. ([none / 0](#)) (#4)  
by charged on Tue Dec 16th, 2003 at 09:43:09 AM MST  
([User Info](#))



Build a heliostat. Direct sunlight will give you about 1kw per square meter.

A single 4'x8' panel with 1'x1' square mirrors all focused on the same point would give you a 32x concentrator yeilding a usable 2.4kw of energy in a 1'x1' square spot. That spot has a peak potential temp around 700 degrees F.

That's a pretty cheap construction project considering the energy yield.

Build it like you love it.

[ [Parent](#) ]

Re: suggestions please. ([none / 0](#)) (#6)  
by monte350c on Tue Dec 16th, 2003 at 02:48:52 PM MST  
([User Info](#))

Hi All,

Charged is right on the money with this one but perhaps a little pessimistic about the amount of KWH available.

Check out this site:

[http://www.focus-solar.com/insolation\\_levels\\_us.htm](http://www.focus-solar.com/insolation_levels_us.htm) It gives the amount of power, in KWH, available in a square meter in various locations, in different seasons throughout the year.

I made a small parabolic trough about a year ago which was able to heat water quite quickly to an impressive temperature. Like boiling.

If it's mainly heating you're after, there really is a lot to recommend this approach.

Here's another page that illustrates the main kinds of "solar concentrate"

[http://www.eere.energy.gov/csp/csp\\_tech.html](http://www.eere.energy.gov/csp/csp_tech.html)

Have fun!

Ted.

[ [Parent](#) ]

Re: suggestions please. ([none / 0](#)) (#7)  
by desertratjack on Wed Dec 17th, 2003 at 11:03:10 AM MST  
([User Info](#))

<http://www.energylan.sandia.gov/sunlab/overview.htm#dish>  
for ideas.

[ [Parent](#) ]

Re: suggestions please. ([none / 0](#)) (#5)  
by celticpower on Tue Dec 16th, 2003 at 09:55:01 AM MST  
([User Info](#))

How about a diesel generator run off your own produced fuel? I am thinking along those lines. like u wind/water out of the question. BUT am looking for a PMG design for approx 1.kw 230Volts 50Hertz, running at 600 r.p.m. any offers? thanks

[suggestions please.](#) | 7 comments (7 topical, 0 editorial)

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## [What project should I take on??](#)

### [I've got alot of stuff](#)

By [slecaïn](#), Section [Homebrewed Electricity](#) [Free Energy](#)

Posted on Sun Dec 14th, 2003 at 06:07:01 PM MST

**What project should I take on?? I've got alot of stuff**

Hello All,

I've put up a couple of post tonight and its my first time on your board.

I can see from reading over the past several wweks that this board is filled with many smart people with the same passion in free energy that I have.

Thus I post my 3rd (and final tonight I Promise) question. Please be advised I'm not trying to sell anything here. I just advise on what to do with it all.

----What project should I take on?? Off The Grid-----

I'm looking for ideas and suggestions as to what to do with all my stuff. I desire to get as far off the grid as possible.

A Brief Background, I have a degree in electronics engineering from 15years ago and have forgotten almost everything but the value is of a silicon diode. I am currently a Network engineer for Novell and the other Devil

Heres what I have

An APC UPS 1000 XLS and 9 - 24volt battery packs connected. About 36hrs of 500 watts off the grid (a good guess) - Psyched - got them for nothing and they work.

-I have an ONAN generator in a 1975 RV that needs almost a complete overhaul (350lbs and I can't get it out).

-Several of the 3.2watt 12v VW solar chargers you see on ebay every day and a couple of the amorphous ones.

-Two homemade Gennies that don't do a thing but hold up in tough weather. I've put up another post and am still confident I'm gomma solve this one.

-Every hand tool known to man.

-No Patience - Duct tape and a glue gun are in my daily tool kit. (just being honest)

-I live on a lake and have alot of wind all the time I think 7mph average.

-I believe I have a good southerly exposure but I live in New England (Go Pats)

-Lots of free time to put in to this.

-an Air-303 24v on the way.

-2 - 8ft wind towers, you know the \$30 jobs on ebay, I think they hold up fantastically.

-Coleman 1200watt / 2400 peak 12vdc/110vac inverter.

-No name 400 watt / 600 watt peak 12vdc/110vac inverter.

-Oscilloscope.

-Multi meters.

-20 - 3mm Neo cube Magnets.

-8 working RC cars

-Tons of computer scrap.

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- [Also by slecaïn](#)

- A running Kawasaki 450 Motorcycle engine
- A solargizer
- Lots of enthusiasm on any chosen project.
- An efficient house.

Getting fed up with wasting time (and cash) on too many projects and would like your ideas and recommendations.

Please don't anyone say Lakota, H-80 or Air-X. Whisper or Rutland either wiseguys. (but if its the truth please let me know, I think that Gluegun thing is gonna kill me)

Still bleeding from this weekends experiments.

Lovin it.

Thanks a bunch,  
Thanks for having me.  
Steve

[What project should I take on?? I've got alot of stuff](#) | 4 comments  
(4 topical, 0 editorial)

Re: What project should I take on?? ([none](#) / [0](#)) ([#1](#))  
by Old F on Sun Dec 14th, 2003 at 09:45:19 PM MST  
([User Info](#)) <http://www.oldf.homestead.com>

Steve

Seeing how your hooked and there is no 12 step program  
: )

The only thing I can pass on is you are not alone in having more project than you can shake a stick at. Ask any one here : )

You will have to focus on one and take it one step at a time.

If you go with let say a wind generator. There is a lot of different ways to go.  
Pick the one that is the best fit for the tools an toys you have to work with.

Have fun

Old F

Having so much fun it should be illegal

PS

When it come to duct tape all I can say is

If the women don't find you hansom at lest let them find you handy : )

Re: What project should I take on?? ([none](#) / [0](#)) ([#2](#))  
by drdongle on Mon Dec 15th, 2003 at 06:14:57 AM MST  
([User Info](#))

Well as I said earlier don't through out you treasure yet,  
BTW that 1000LXS UPS sounds like a keeper.  
I would suggest taking one of your existing turbines and  
installing a TDM generator If that is feasible. As for the  
tools, looks like your in high cotton.  
The computer power supplies are great for caps, rectifiers,  
inductors and hook up wire.

Dr.D

Re: What project should I take on?? ([none / 0](#))  
(#3)  
by slecain on Mon Dec 15th, 2003 at 05:14:28 PM  
MST  
([User Info](#))

Duct Tape ( always want to call it Duck Tape)  
Handy it is, I'm lovin the glue gun, no need for a  
welder if your ready to watch yout creations fall apart  
as they start working.

Yes I picked peices of the Gennie proto from 30 feet  
away after last nights 40mph gusts. Still see two  
blades attached and still spinning .

As for the UPS' Yes I'm very happy about them. I'm  
going to hire an electrician to wire them into my  
panel. Yes I could do it but.....  
They are very cool, They are what got me back into  
this.

I used to fry eggs on cars in the middle of the  
summer and all that other silly stuff like the drinking  
bird and parabolic (death star )solar concentrators.  
Sun concentration is where its at, but the expense of  
a tracker make it untouchable.

Any way.  
What about the bicycle dynamo's, worth pursueing?  
Trickle charge maybe?  
Dr. Whats a TDM? I'm sure I could figure it out but  
the family is upsatairs wondering where I am.

Whats up with these Woodstove fans for \$150? just A  
stirling engine from what I see.

And back to my true love, Wind. How about the  
Ametek motors.

My last prototype was on the top of a minkota trolling  
motor and it worked but couldn't get it to put  
anything out below 15mph.

Blah, Blah, Blah,  
Gotta go.  
See you tomorrow.  
Thanks  
Steve

[ [Parent](#) ]



Re: What project should I take on?? ([none / 0](#)) ([#4](#))  
by [drdongle](#) on Mon Dec 15th, 2003 at 10:21:10 PM MST  
([User Info](#))

TDM= Tape Drive Motor

Dr.D

[ [Parent](#) ]

[What project should I take on?? I've got alot of stuff](#) | 4 comments  
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### [A question for Jerry](#)

By [filico](#), Section [Homebrewed Electricity](#)  
Posted on Wed Dec 10th, 2003 at 07:56:28 AM MST [Free Energy](#)  
What kind of regulator.

Hello Jerry

I did read that you have a permanent magnet motor producing current, I have a motor dc permannet magnet 0.96 hp 6 amp, at 120 rpm it prduce 4 volt cc 1 amp. I have 4 blades 30" diameter, the question is What kind of regulator do you have, to control the charge. I will appreciate all your help.

Thanks from México

Filiberto Correa L

[A question for Jerry](#) | 1 comment (1 topical, 0 editorial)

Re: A question for Jerry ([none / 0](#)) (#1)  
by Jerry on Wed Dec 10th, 2003 at 10:06:12 AM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Filiberto  
I don't use regulators or charge controllers on any of my RE systems.

I let the load of the batteries do that. If I see to much charging or voltage in a system I add batteries. If there is more power available I like to collect it.

I may do some diversion process latter but I'm not to that point yet. If I lived in an area of strong constant wind I'm sure I'd have to deal with excessive power some how but thats not the case where I'm located.

JK TAS Jerry

[Airheads Page](#)

[A question for Jerry](#) | 1 comment (1 topical, 0 editorial)

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[Motor permanent Magnet \(contol charger\)](#)

By [filico](#), Section [Homebrewed Electricity](#)  
Posted on Mon Dec 8th, 2003 at 08:37:57 AM MST  
none

[Free Energy](#)

Hi! My friends.

I recieved a very good motor from texas, it is permanent ceramic magnet 120 vcc 6 amp 0.96 hp, i rotate whith full drill i dont know revolutions per minutes readings: 60 volts cc 7.5 amp, at 120 rpm readings, 4 volts cc 1 amp, i did buy a 4 blades around 36" but the question is how to control the charging battery at low and high winds?

how to accumulate low voltages? how to transform high voltages to 13.5 volts? exists some like that?.

Thank for help

[Motor permanent Magnet \(contol charger\)](#) | 1 comment (1 topical, 0 editorial)

Re: Motor permanent Magnet (contol charger) ([none / 0](#)) (#1)  
by Seth on Mon Dec 8th, 2003 at 04:44:00 PM MST ([User Info](#))

120V CC ???

Well id say something like a MPPT like this mabey... if its actually 120V OC (open circuit) then this might work... [http://www.thesolar.biz/OutBack\\_MX60\\_Charge\\_Controller.htm](http://www.thesolar.biz/OutBack_MX60_Charge_Controller.htm) I bought one... and i use a 60A@35Vdc military genset on it... when i need a boost after a couple of weeks of no sun.

So far it performs exactly as rated... witch means my pannels are below rateing( bumper huh tom & mech) ... i get 97% effecincy at 40A, just like it was rated.. so am i happy.. well i guess not... but its not the MPPT fault.

OH.. yea... forgot... this is what i would use if that PM motor dosent exceed the MAX rateing of the mppt at say 1200rpm, if it does-- well then i dont know .... u really need to get that tested ... i have a 90V TDM(Tape Drive Motor) im planning testing soon.

Seth

[Motor permanent Magnet \(contol charger\)](#) | 1 comment (1 topical, 0 editorial)

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## [Cold Electricity](#)

By [pexring](#), Section [Homebrewed Electricity](#)  
 Posted on Fri Dec 5th, 2003 at 10:14:45 PM MST [Free Energy](#)  
 Is this for real, or a hoax?

I stumbled upon some article in Google referring to Cold Electricity. Can't seem to find out how it works, but you can certainly order a video for \$30. Is this a hoax? They talk of a fuelless motor, which is a red flag in my book.

Here's one such article:  
<http://www.free-energy.cc/radiant.html>

Mark

[Cold Electricity](#) | 12 comments (12 topical, 0 editorial)

Re: Cold Electricity ([none / 0](#)) ([#1](#))  
 by Electric Ed on Sat Dec 6th, 2003 at 06:07:36 AM MST  
[\(User Info\)](#) <http://www.electric-ed.com>

The words "free energy" always serve as a warning of a scam.

Ed

Re: Cold Electricity ([none / 0](#)) ([#2](#))  
 by wildbill hickup on Sat Dec 6th, 2003 at 06:16:44 AM MST  
[\(User Info\)](#)

Cold Electricity is something that Nicola Tesla experimented with. While it's claimed by Tesla fans to work it is very technical and has to do with very very high voltage. This guy got off on wireless transmission of power through the atmosphere and other amazing things. Look up Tesla on your search engine, if nothing else it makes for fascinating reading. Tesla helped Westinghouse discover AC power and was instrumental in the development of Niagra Falls Hydro and the AC motor. It seems as though he kind of dropped out of the picture when he started talking about free power for everyone. How can the government and big business make any money on that? Some very shady stuff. I read somewhere that some of the things we consider science fiction was science fact in 1901, thanks largely to Nicola Tesla. Example of wireless power: Supposedly at his lab in Colorado he lit-up a 10KW bank of lightbulbs from 26 miles (if my memory serves correctly) away with his power transmitter!! It really is some interesting reading.

As far as the fuelless motor, supposedly there are working models, however I've never actually seen one. It's based roughly on a wheel with magnets placed around 1/2 of

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the wheel at very precise angles a counter balance weight then placed on the other side to compensate for the weight of the magnets. A single magnet is then placed on a mount very close to the rim of the wheel. If you start the wheel by giving it a spin and you have done all your math correctly it should keep spinning forever. If you search around long enough you can find free plans for the same thing.

Tesla ([none / 0](#)) (#5)  
by wdyasq on Sun Dec 7th, 2003 at 09:20:28 AM  
MST  
([User Info](#))

Better reread your Tesla stuff Bill,

Tesla - without Westinghouse developed "poly-phase" electricity. Westinghouse bought Tesla's patent rights for \$1 a horsepower for every motor or generator produced under the patent. Westinghouse then went belly-up, the patent rights were acquired by a new investment group that Westinghouse was involved in. Tesla lost his patent.

Tesla also described the radio Marconi built. The US government used one of Tesla's presentations to avoid paying royalties to Marconi in WWI. While Marconi was playing with spark gap transmissions, Tesla was operating a radio-controlled boat in Long Island Sound and transmitting the power to it.

Some of Tesla's work is still classified by the military.

Ron

[ [Parent](#) ]

Re: Tesla ([none / 0](#)) (#6)  
by wildbill hickup on Mon Dec 8th, 2003 at  
05:48:15 AM MST  
([User Info](#))

Wellll I was trying to be diplomatic, guess I didn't word things correctly. I do think Tesla was amazing. I know he got the short end of the stick. He was a visionary and a scientist not a businessman. I used the term AC because it is easily recognized if not for poly-phase we might not have AC. Sorry I gave Westinghouse so much credit in my statement. I am sometimes a bit angry when I think of where we might be today if more of Tesla's inventions were available to the general masses instead of being kept such a secret "classified" as you worded it. In lew of the comments rules I'll stop there. :):)

[ [Parent](#) ]

Re: Cold Electricity ([none / 0](#)) (#7)  
by kww on Mon Dec 8th, 2003 at 06:25:01 AM  
MST  
([User Info](#))

When I was in high school I built a large Van de Graf generator which made the fluorescent lights in my basement room come on when I ran it. :-)

[ [Parent](#) ]

Re: Cold Electricity ([none / 0](#)) (#8)  
by wildbill hickup on Fri Dec 12th, 2003 at  
05:16:00 AM MST  
([User Info](#))

When I was a kid we lived fairly close to a high voltage line and if we could catch just the right weather conditions we could get a florescent light to light by staning under the lines.

[ [Parent](#) ]

Re: Cold Electricity ([none / 0](#)) (#9)  
by kww on Fri Dec 12th, 2003 at  
06:41:48 PM MST  
([User Info](#))

Sounds like there's a lot of leakage with those things. I wonder around how close you could get before you got a really hot arc. I've heard tell of farmers on tractors getting hit while passing under them, scary.  
Kevin

[ [Parent](#) ]

Re: Cold Electricity ([none / 0](#))  
(#10)  
by wildbill hickup on Sat Dec  
13th, 2003 at 06:15:07 AM MST  
([User Info](#))

Well you know when your 12 you don't think of all that technical stuff, even when you can hear the high voltage hum, your ten feet tall and bullet proof. What's a little shock anyway!!!! With all the stupid stuff I've done young and old somebody's got to be watching over me. :)

[ [Parent](#) ]

Re: Cold Electricity ([none / 0](#)) ([#11](#))  
by kww on Sat Dec 13th, 2003 at 07:34:43 AM MST  
([User Info](#))

I've been lucky way too many times myself to think I'm alone in all this anymore. I grew up playing with fire, electricity, and about everything else that's dangerous, so far so good. :-) I'm really very careful I think, but we all have those brainstorm from time to time that make us human and prone to error. Just keep on having fun (really creating, which is fun and the key to satisfaction :-).  
Kevin

[ [Parent](#) ]

Re: Cold Electricity ([none / 0](#)) ([#3](#))  
by charged on Sat Dec 6th, 2003 at 10:06:44 AM MST  
([User Info](#))

The "fuelless motor" is actually Ed Gray's capacitive-discharge engine. It runs on a passive-timing high-voltage discharge from a bank of capacitors. There are other deeper details involved. But, that's the basic principle.

The "cold electricity" is also referred to as "radiant energy". There is no "scam" involved. The website that the original post shows pretty much puts all the basic patent details right on the site for you to read. The video and book bring it all together.

"Free energy" systems are all around you, especially here in the otherpower forums.

If you have built a machine that collects some form of ambient energy and re-orders it for your use, you have built a "free energy" system. This is how everything works.

Energy is all around you already. It doesn't need to be "produced", just transformed. There is no "perpetual

motion", only energy transformation. Remember THAT whenever you run across someone saying they've found a new "source" of energy, it really just means they've discovered another way to tap into nature's pre-existing processes and flows.

Radiant energy is, apparently, the primary, pre-existing flow that is the foundation of all the others. At least that's what everyone involved in that research currently believes.

Look up "Ed Gray" and "Tube" in the same google search. You'll get buried in links.

Re: Cold Electricity ([none / 0](#)) ([#4](#))  
by pexring on Sat Dec 6th, 2003 at 11:57:40 AM MST  
([User Info](#))

I've learned not to have much faith in reading patents. Lots of patents out there for things that don't work -- like Frenette's friction heater.

Mark

Re: Cold Electricity ([none / 0](#)) ([#12](#))  
by Nando on Sun Dec 28th, 2003 at 02:40:07 PM MST  
([User Info](#))

Cold Electricity :::: FORGET IT

Nando

[Cold Electricity](#) | 12 comments (12 topical, 0 editorial)

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[non electric fan](#)

By [erne](#), Section [Remote Living](#)  
Posted on Fri Dec 5th, 2003 at 06:52:04 AM MST [Free Energy](#)  
non electric fan

Hi I dont know how to post a comment, help apriciated.  
FREE BREEZE out of canada is a sterling engine 12" fan that works great. the dissmilar metal fans are junk for moving air. free breeze has a web site. I have one of there fans and it works for me. --erne

[non electric fan](#) | 2 comments (2 topical, 0 editorial)

Re: non electric fan ([none / 0](#)) (#1)  
by TomW on Fri Dec 5th, 2003 at 08:10:17 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

erne;

Hi I dont know how to post a comment, help apriciated.  
Well, erne, its as easy as [easier really] posting a story.

At the bottom of every story there is a "Post Comment" link. If you are logged in and click on that it pulls up a page where you can post a comment. Once you have that page your comment gets typed into the text window much like when posting a story. Same thing when you wish to respond to a comment except then it is a link titled "Reply to This".

Cheers.  
TomW

[Stuff I have Online](#)  
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Re: non electric fan ([none / 0](#)) (#2)  
by erne on Fri Dec 5th, 2003 at 02:04:11 PM MST  
([User Info](#))

found it thanks tom, I knew it would be simple but !!!! I cant stand simple I guess.

[non electric fan](#) | 2 comments (2 topical, 0 editorial)

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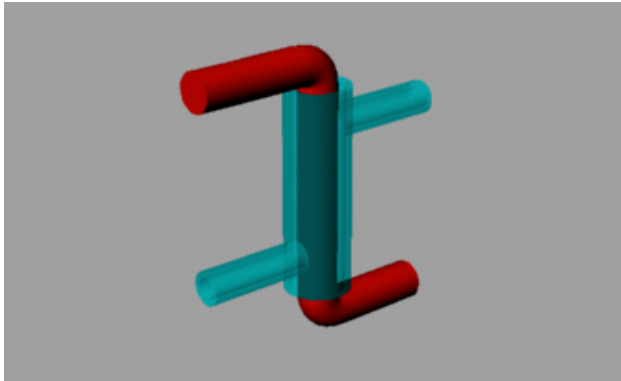
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### [Heat Catcher for the Generator](#)

By [wdyasq](#), Section [Homebrewed Electricity](#)  
Posted on Mon Nov 24th, 2003 at 06:43:14 PM MST [Free Energy](#)  
A tube in shell exchanger for the exhaust

Copper pipe fittings can be used to make a heat exchanger as shown.



[Heat Catcher for the Generator](#) | 4 comments (4 topical, 0 editorial)

Re: Heat Catcher for the Generator ([none / 0](#)) ([#1](#))  
by [windstuffnow](#) ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon Nov 24th, 2003 at 07:18:14 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

My GM90 will get one of these... also there is a great article in the new issue of homepower magazine (<http://www.homepower.com>) if your interested in firing up the hot water heater with your wood burner or solar. Very simple to make!

Have Fun  
Ed

Re: Heat Catcher for the Generator ([none / 0](#)) ([#2](#))  
by [RogerAS](#) ([rogeras@cei.net](mailto:rogeras@cei.net)) on Tue Nov 25th, 2003 at 07:23:20 AM MST  
([User Info](#))

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Hi,

I've been thinking of something similar.

My headache point about all this is the circulation pump. I've considered using a water pump from a big block V-8. Bolt plates on the inlet & outlet with pipes welded into those (before attachment!). Then put a much smaller pulley on the pump than normally would be used. Drive this with a small motor that has a big pulley, like a 3 to 1 ratio (all that assembled on a steel plate mounting system). Any time the system needed flow the motor could cycle for a few minutes. With a DC motor and a speed controller one could "tune" the circulation, avoid the need for a sophisticated expensive water pump, and adjust the flow to match either the need or supply of hot water. On the inside of the house a small 4 cylinder car radiator in a cute little box could be the heater, even use the electric fan with another speed controller. I think this could be done for very few bucks. (if one has a source for salvage parts).

RogerAS

"Put the bunny back in the box!"

Re: Heat Catcher for the Generator ([none / 0](#))  
(#3)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Tue  
Nov 25th, 2003 at 08:01:00 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

If you have the water pump and the time that would probably make a reasonable set up. If you don't have the components on hand it could be more expensive than a simple "Taco" pump. You can purchase these for around 55.00 from Grainger and probably less somewhere else.

If you do have the pump and the time you could actually let the engine drive the pump and install a ball valve to regulate the flow. Once you have the flow dialed in you wouldn't have to mess with the valve anymore. Sounds like a fun and challenging project...

Ed

[ [Parent](#) ]

Re: Heat Catcher for the Generator ([none / 0](#)) (#4)  
by troy on Wed Nov 26th, 2003 at 02:04:41 PM MST  
([User Info](#))

I have in mind to try the same thing at some point, using a gas water heater as the heat exchanger. They're already fine tuned to work in the temperature ranges that I want, glass lined and equipped with an anode to reduce rust/corrosion issues, and even include over temp and over pressure safety valves.

Flow rates for the coolant are an interesting subject. You want high enough flow rates that your power plant doesn't over heat of course, but it's also easy to overcool an IC engine and ruin your combustion efficiency. Flow rates that are too high will also lead to parasitic energy losses from the pump as well.

The japanese are doing research (probably the big three too) on internal combustion engines using ceramics and other very heat resistant materials that need no external cooling at all. With higher combustion temperatures come higher efficiencies.

Good luck and have fun!

troy

[Heat Catcher for the Generator](#) | 4 comments (4 topical, 0 editorial)

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## [Twist](#)

By [Seth](#), Section [Homebrewed Electricity](#)

Posted on Sat Nov 22nd, 2003 at 05:51:37 PM MST

[Free Energy](#)

Twist it up Baby !!!

If i could take a flat material... and twist it. How would i calculate (or just use a table) the angle of twist per foot or some measure??

Say if i wanted a root of 24Deg and a tip of 2.3Deg any program that can be used.... or mabey pick a tsr and give a length of the blade... out put the Deg id need at each 1/10 of the tottal length??

[Twist](#) | 5 comments (5 topical, 0 editorial)

Re: Twist ([none / 0](#)) (#1)

by srbarlow ([s\\*rbarlow\\*3@nauticom\\*.net](#)) on Sat Nov 22nd, 2003 at 07:52:52 PM MST

[\(User Info\)](#)

There is an inexpensive ( \$5.00 ) program available that does pretty much what you desire... plus a lot more. It is designed mostly to help hand carving blades using the Hugh Piggott methods as described in his excellent Axial Flow Wind Generator Plans. It does specify a blade angle at user selected spacing along the radius of the blade. If you want to investigate see:

<http://windstuffnow.com/main/formulas.htm>

Sam

Re: Twist ([none / 0](#)) (#2)

by Jerry on Sat Nov 22nd, 2003 at 08:56:21 PM MST

[\(User Info\)](#) <http://www.dplusv.com/Photo-03.html>

Hi Seth

I can't help you with your calculations but I couldn't help notice the degree #s you've used. Are they just an example or the #s you want to use.

The #s on my plastic blades are 23 degrees at the root and about 3 degrees at the tip. This bade is 23 inches long. The hub I use makes tip to tip measure 49 inches.

I've been able to get charging at 5 mph and max out at 80 amps at 40 mph from 4 of these blades.

I've just finished my first 3 blade at 23 degrees. Up untill now my 3 blade have been at 27 degrees or longer than 49 inches. I have the proper hub now and will test the new 3 blade on a 1 hp GARBOGEN soon.

I hope to see 90 or 100 amps for a short peak or burst. This would be a new record for this alt.

I'm sure the blades your talking about are longer than mine?

If I take my plstic blade and lay it on a blade from a very excelent blade from a

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commercial genny it fits like a glove. This comercial genny sells for \$1700 and is said to make 100 amps at 25 mph. The only diferance is my blade is shorter and is made of plastic. The factory made blade is made of a very special type carbon fiber.

And my blades are only \$10 each without Mike mods and \$15 each with Mike modes.

JK TAS Jerry

[Airheads Page](#)

Re: Twist ([none / 0](#)) (#3)  
by Jerry on Sat Nov 22nd, 2003 at 08:58:31 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

PS.

Just weighed the new 3 blade. Complete with steel hub and all it comes in at 4 lbs.

JK TAS Jerry

[Airheads Page](#)

[ [Parent](#) ]

Re: Twist ([none / 0](#)) (#4)  
by scoraigwind ([magnet@scoraigwind.co.uk](mailto:magnet@scoraigwind.co.uk)) on Sun Nov 23rd, 2003 at 01:15:36 AM MST  
([User Info](#)) <http://www.scoraigwind.co.uk>

The way I calculate twist is actually very simple. I reckon the tangent of the airflow incidence angle varies inversely with radius. You could even say that the angle itself varies inversely with radius and be close enough. This means the air comes in a twice as big angle when you halve the radius.

To work out the blade angle I take the angle of incidence of the air and then subtract 4 degrees to give a suitable angle of attack for the blade.

Say you blade angle is 2.3 degrees at the tip. This is a bit too precise to make any sense to me. I'd say the airflow would be 6-7 degrees in this case. 86 is easier to work with here.

Therefore the angles at a series of 5 equally spaced stations along the blade would be

- 5.  $x 6 - 4 = 26$  degrees
- 5.  $/2 x 6 - 4 = 11$  degrees
- 5.  $/3 x 6 - 4 = 8$  deg
- 5.  $/4 x 6 - 4 = 3.5$  deg
- 5.  $/5 x 6 - 4 = 2$  deg

and there's the twist.

Strictly speaking if I used a computer I'd use the tangent of the angle but it makes no difference in the end - it'll fly.  
Hugh Piggott <http://www.scoraigwind.co.uk>

Re: Twist ([none / 0](#)) ([#5](#))  
by Michael on Tue Nov 25th, 2003 at 10:24:32 PM MST  
([User Info](#))

check out

<http://www.windmission.dk/workshop/BasicBladeDesign/bladedesign.html>  
for lots of formulas calculation twist and shape.

or you could download a **\*\*FREE\*\*** program that uses this formulas at  
warlock.com.au

Because paying money eg \$5.00 for this sort of software really sucks!

[ [Parent](#) ]

[Twist](#) | 5 comments (5 topical, 0 editorial)

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## [solar heating](#)

By [bob golding](#), Section [Remote Living](#)  
Posted on Wed Nov 19th, 2003 at 07:07:58 AM MST [Free Energy](#)  
**double glazing units for solar heating**

noticed some big double glazed patio doors at the dump. 6 foot by 4 foot. wondered if they would work as a air type solar heating panel? cant get my head round weather the double glazing would help or hinder?

[solar heating](#) | 5 comments (5 topical, 0 editorial)

Re: solar heating ([none / 0](#)) (#1)  
by TomW on Wed Nov 19th, 2003 at 07:29:33 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Bob;

While the extra pane of glass might block a small % of the incoming solar radiation I can't help but believe that with the double glazing the net result would be more heat to the heated area. Simply because the inner pane of glass will not be so cold like it would with a single. Go for it.

Cheers.

TomW

[Stuff I have Online](#)  
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Re: solar heating ([none / 0](#)) (#2)  
by Homebrewed12vdc on Wed Nov 19th, 2003 at 10:39:32 AM MST  
([User Info](#))

Well my solar heater has triple panes of glass out of sliding glass doors, they work excellent. I think they retain there heat better at nite than the one single pane solar heater I have. I would say go for it, I did and found it was worthwhile. From Mike

ALWAYS REMEMBER THE SUN, WATER, WIND, AND OTHER POWER IS YOUR BEST FRIENDS.

Re: solar heating ([none / 0](#)) (#3)  
by pexring on Wed Nov 19th, 2003 at 05:20:42 PM MST  
([User Info](#))

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I just finished building a solar heating panel out of the same type of double glass doors (3'x8'). Double glazing is a must! It gives a layer of protection against the outside elements. Without double glazing, your panel would have to work harder for less heat. The one I just built has been averaging temps of 140 degrees at the peak of the day.

Mark

Re: solar heating ([none / 0](#)) ([#4](#))  
by bob golding ([yubba at clara dot net](#)) on Fri Nov 21st, 2003 at 03:59:26 PM MST  
([User Info](#))

got my double glazed doors today . glad i decided to wait and ask what people thought rather than just jump in. got them for half the price they were on monday :- ) a whole 5 pounds. thats about 8 bucks i think hehehe. someone gave me some fibreglass insulation so was going to make a frame out of 2x4 timber on top of some exterior 3/4 ply. and put 2 inches of fibreglass then a layer of ally foil. should i put foil on the back instead or as well? cheap enough. then i was going to fix a layer of ally sheet over that and paint it black. will make some channels about out of 2 x 1 x 1 1/4 wide up to the height of the glass and put draught proof seal on the top of that. does that sound like a good plan. will put baffles in the channels as well. i have a 4 inch computer fan if thats not big enough got plenty of fans that one happens to be 12 volt which makes life a bit easier.

bob

[ [Parent](#) ]

Re: solar heating ([none / 0](#)) ([#5](#))  
by troy on Tue Nov 25th, 2003 at 05:04:36 PM MST  
([User Info](#))

Just be certain that your fan is pushing the air through the panel, not sucking the hot air out of the panel, which will shorten the life of the fan.

Good luck and have fun!

troy

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[solar heating](#) | 5 comments (5 topical, 0 editorial)

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## [Free Refrigeration](#)

By [J Steele](#), Section [Remote Living](#)

Posted on Tue Nov 18th, 2003 at 08:41:08 AM MST [Free Energy](#)

Simple trick for saving energy

Now that winter has returned to Colorado and it gets below freezing each night, I save a little on my electric bill with this simple trick. I have two plastic gallon jugs filled with water. One is always in my refrigerator and the other is always on my porch. Each morning when I let my dog out I swap the partially thawed jug from the refrigerator with the fully frozen jug on the porch. I could measure the amount of liquid water in the refrigerator jug each morning and calculate how many watts I'm saving but I'm too lazy for that and I'm afraid that it is costing me more in heat for the extra time that I have the front door open. Have a good day,

John

[Free Refrigeration](#) | 5 comments (5 topical, 0 editorial)

Re: Free Refrigeration ([none / 0](#)) ([#1](#))  
by [Homebrewed12vdc](#) on Tue Nov 18th, 2003 at 09:04:36 AM MST  
([User Info](#))

This does work, I shut my gas fridge off in the winter, and use 8 milk jugs at a time. It saves me money all winter, but I found it takes 4 jugs at a time to make a big difference, I also keep my frozen foods in a insulated box out on the porch in the winter. Every bit of energy saved helps.

Re: Free Refrigeration ([none / 0](#)) ([#2](#))  
by [5kw](#) on Tue Nov 18th, 2003 at 02:04:44 PM MST  
([User Info](#))

I have been gleening ice for years. Low teck and even appartment dwellers can do it. I found that straight water melts at to high a temp to absorb heat fast enough to take advantage of all the free cold.

I have three 2 liter pop bottles, I put 2 tbsp of salt in one, 4 tbsp in the 2nd, and 6 tbsp in the third. I put out any that are mostly liquid at night and take in the frozen ones in the morning. The high salt bottles need a cold night to freeze, but have high quality heat abbsorbing capabilities ie they melt quickly in the frig

Make the wind fun!  
Victor

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- [Also by J Steele](#)

Summertime tricks ([none / 0](#)) (#3)

by wdyasq on Tue Nov 18th, 2003 at 03:43:58 PM MST  
([User Info](#))

When I lived on a boat for a couple of years we would put gallon jugs in the bait freezer and move them to the boat to keep the food cold. When using regular block ice, one would have the water from the melting ice drain into a bucket and cool the adult beverages. I have been told the same trick can be used for non-alcoholic beverages, but I don't know if it has been tried.

BTW- sail boat folks use a lot of energy saving tricks. Many of the appliances and devices they use have applications in renewable energy.

Ron

Re: Free Refrigeration ([none / 0](#)) (#4)

by stm on Thu Dec 11th, 2003 at 04:09:29 PM MST  
([User Info](#))

Hello,

Great tip. - especially at this time.

I have been thinking about your idea, and liked to think that we could use the winter wick makes us use more energy to save even a small amount in the refridgerator.

One thing i thought about when i read your post was the old rule about hot vs cold air: cold air is heavier than hot air. This mean (if my guess is correct), that if you place your frozen ice-bottles at the top of the fridge, then you would allways be heating the higher temp air.

Anyway this arrangement works out for me, since my wife has problems reaching the high level shelves ;-) - and I have'nt heard any complains from her, since she's never using the top shelve.

/Steffen

Re: Free Refrigeration ([none / 0](#)) (#5)

by stm on Thu Dec 11th, 2003 at 04:16:20 PM MST  
([User Info](#))

btw. the ice-cold water created as a bi-product turned out to be a VERY popular source of drinking water :-)

/Steffen

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[2besynergy](#)

By [Ocean](#), Section [Magnets & Magnetism](#)

Posted on Fri Nov 14th, 2003 at 08:44:19 AM MST

[Free Energy](#)

trying to show it

duh, that is all greek to me right now, duh but I want to show my 2besynergy.mpg to this base.

<http://www.otherpower.com/images/scimages/677/2besynergy.mpg>

[2besynergy](#) | 6 comments (6 topical, 0 editorial)

Re: 2besynergy ([none / 0](#)) ([#1](#))  
by [drdongle](#) on Fri Nov 14th, 2003 at 05:58:35 PM MST  
([User Info](#))

It's interisting but what are you trying to achive?

Dr.D

Re: 2besynergy ([none / 0](#)) ([#2](#))  
by [Ocean](#) on Sat Nov 15th, 2003 at 06:27:36 AM MST  
([User Info](#))

I am trying to achive movement with little input that will create greater output.  
No telling what next year will bring.

[ [Parent](#) ]

Re: 2besynergy ([none / 0](#)) ([#3](#))  
by [drdongle](#) on Sat Nov 15th, 2003 at 09:08:35 AM MST  
([User Info](#))

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- [Also by Ocean](#)

ah, over unity, well all I can say is that there is "no free lunch".

Dr.D

Re: 2besynergy ([none / 0](#)) (#4)  
by charged on Sat Nov 15th, 2003 at 05:44:02 PM MST  
([User Info](#))

The laws of thermodynamics do not prevent anyone from building a system that can absorb ambient energy and reorder it for producing useful work.

Example #1: windmill - you build and maintain it and in exchange it absorbs enough wind energy to keep itself moving as well as enough to provide useful mechanical input to a generator.

In this case you are directly intercepting a diffuse PHYSICAL FORCE and concentrating it in a rotating shaft.

Example #2: Heatpump - allowing a liquid to "boil" at atmospheric pressure where it absorbs heat, then applying a small amount of energy to compress that vapor and release the once diffuse btu's into a smaller space at higher temperature.

This is an application of a small physical force to move a much larger amount of ambient heat from one point to another.

Example #3: Light concentrators - collection of low level light from a large area and focusing it all on a single small point.

My point is that we readily accept these concepts and the mostly "free lunch" that they provide. At the same time, many in the engineering community disparage anyone that believes there may be an electromagnetic analog to the above processes.

The term "over-unity" also applies to all of the conventional systems mentioned above. Once built and installed (small input) a wind turbine can provide many years of "free lunch". That "free lunch" is many times more energy than the construction and installation required in the first place.

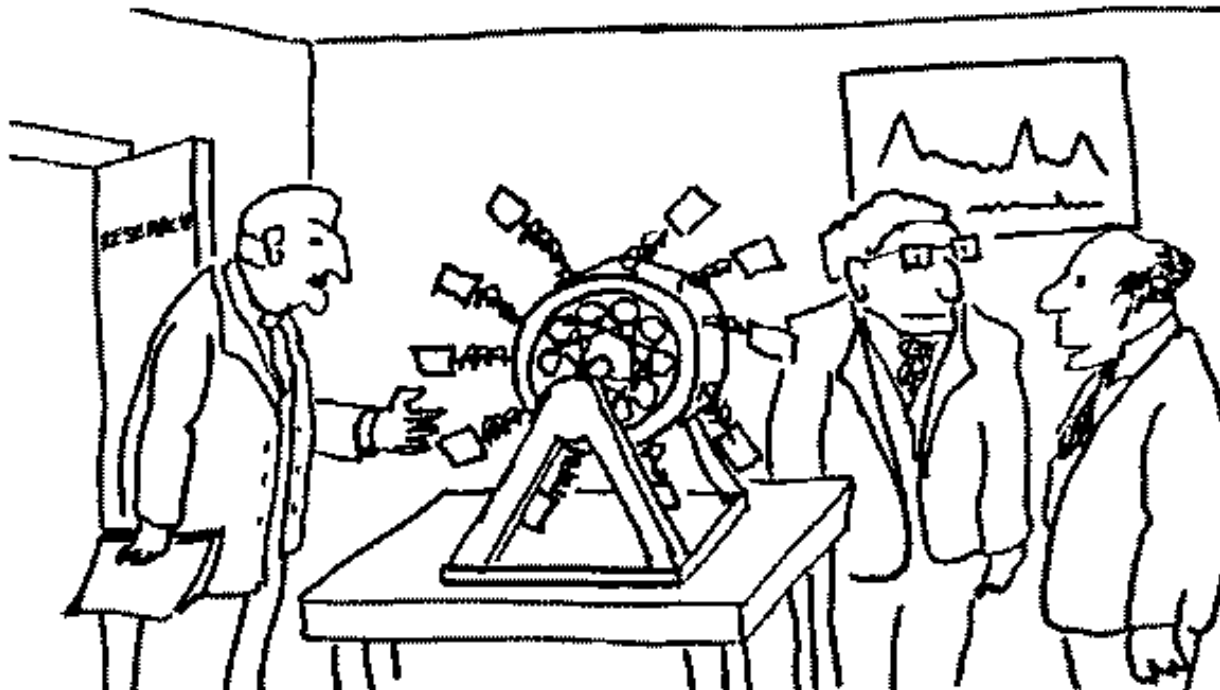
Personally, I applaud anyone that's attempting to think outside the box.

[ [Parent](#) ]

Re: 2besynergy ([none / 0](#)) (#5)  
by Electric Ed on Sat Nov 15th, 2003 at 06:50:30 PM MST  
([User Info](#)) <http://www.electric-ed.com>



Let's just say that your definition of overunity differs from mine, and leave it at that.  
As for Ocean's experiments, they won't do him any harm, and he will learn from them.



"I'm sorry sir, it may actually be perpetual motion,  
but it will take forever to test it."

Cartoon by Donald Simanek

Electric Ed

[ [Parent](#) ]

Re: 2besynergy ([none / 0](#)) (#6)  
by charged on Sun Nov 16th, 2003 at 03:48:08 AM MST  
([User Info](#))

Would I be out of line if I inquired just how many union electricians are spending any time studying the applications of modern quantum physics to their trade?

[http://www.quantum-chemistry-history.com/Kron\\_Dat/Kron-1945/Kron-PR-1945/Kron-PR-1945.htm](http://www.quantum-chemistry-history.com/Kron_Dat/Kron-1945/Kron-PR-1945/Kron-PR-1945.htm)

<http://www.cheniere.org/misc/kron.htm>

My point is, our electrical theory texts are about 130 years behind all the advances that we've made in physics. Why is that, I wonder.

I'll never argue that the basic formulas and processes still do what they do quite well. The problem is, they are not inclusive of many known anomolous processes. But then, this is why there are people out there trying to tie everything together with superstring theory.

Perpetual motion does not exist. What does exist is an infinite number a varying potentials in 3-space. All the work that done is a result of tapping the equalization time period between different potentials.

The terms "perpetual motion" and "over-unity" are misnomers.

The term "coefficient of performance" is the only one that can apply. It is already an industry standard measurement of system "efficiencies".

<http://www.aie.org.au/melb/material/resource/cop.htm>

A simple efficiency equation only allows for user-input to work-output ratios that fall under 100%. To apply that same measurement to a heat-pump produces numbers well above 100%. Therefore "efficiency" is an obsolete term. C.O.P. calculations account for environmental energy input plus user input which then more accurately reflects the validity of thermodynamic rules.

The simplest example of a "free lunch" using pure EM theory is a crystal radio. No batteries needed. The intercepted RF supplies the power for the circuit which drives an earphone (linear motor) at varying frequencies to communicate and intelligent signal. From the user's perspective, the power was free. But, we know where it came from and therefore know where to draw the outside of the box.

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[2besynergy](#) | 6 comments (6 topical, 0 editorial)

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[to tom](#)

By [erne](#), Section [Remote Living](#)

Posted on Wed Nov 12th, 2003 at 01:41:52 PM MST

[Free Energy](#)

yes I think!! how is that for a answer.

Hi tom there is a picture in the picture files of my 24 foot mill. I couldnt answer you in the reply colom or wheatever. I must be doing something wrong. You need to have a picture file that a guy could brouse thru easily. I live so far off grid I never seem to get time to figure this stuff out. Guess you could say that I am computer deficient.---erne

[to tom](#) | 1 comment (1 topical, 0 editorial)

Re: to tom ([none / 0](#)) (#1)  
by TomW on Wed Nov 12th, 2003 at 02:07:14 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

erne;

Thanks. Thats the unit.

Can you tell us about it? Home made, factory made, output, etc? It looks like there is a belt drive to a motor or genny head of some kind?



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In fact all the images on the server are over here:

<http://www.otherpower.com/images/scimages>

Cheers.

TomW

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## [Bedini power generation technology](#)

By [charged](#), Section [Weird Science](#)

Posted on Wed Nov 12th, 2003 at 08:36:05 AM MST

[Free Energy](#)

**Strange power generation system**

A basic replication of this device, as well as several video clips, can be seen at:

[http://nuscam.com/testing\\_now.htm](http://nuscam.com/testing_now.htm)

A young grade-school girl built one too.

<http://www.keelynet.com/bedmot/bedmot.htm>

Think of this device as an "energy gatherer". This is not perpetual motion, any more than a windmill being pushed by the wind is perpetual motion. It's just using certain ambient energy sources by concentrating and releasing them.

For the full theory of operation, read the following page and the links at the bottom of that same page.

<http://www.icehouse.net/john1/intro.html>

Enjoy!

[Bedini power generation technology](#) | 26 comments (26 topical, 0 editorial)

Re: Bedini power generation technology ([none / 0](#)) ([#1](#))  
by [charged](#) on Fri Nov 14th, 2003 at 05:07:38 PM MST  
([User Info](#))

Here's a picture of a working model. Instead of using a belt for the timing, this one uses two magnetic gears made up of many small magnets around the outside edge. The two "gears" don't actually touch. The fields lock together like teeth.

The larger wheel turns at about 2 rps and discharges the output capacitor with each rotation.

The main rotor is running at about 2000rpm.

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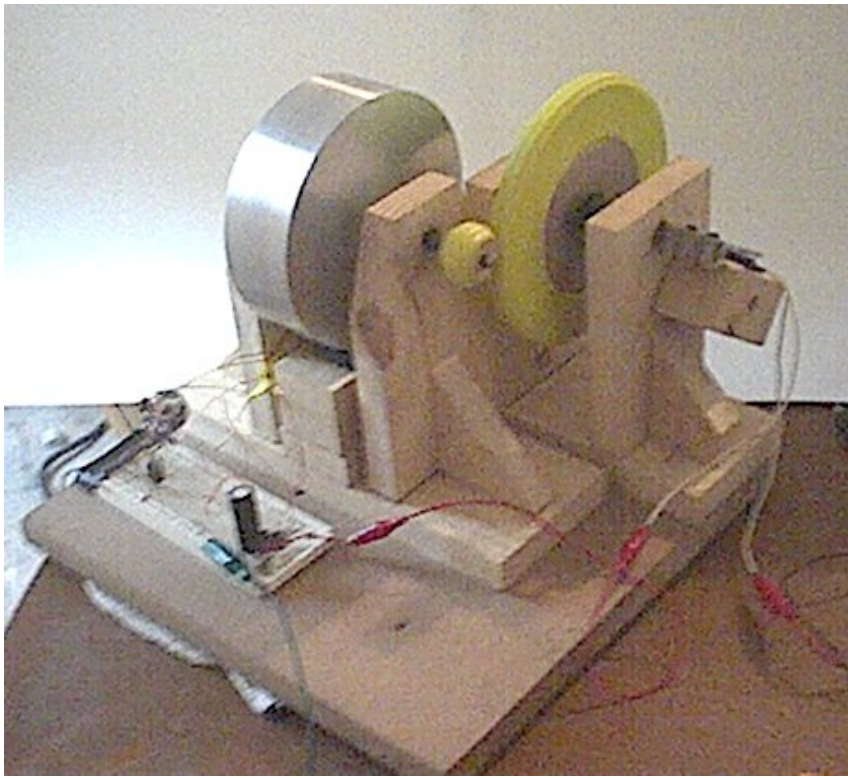
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- <http://www.keelynet.com/bedmot/bedmot.htm>
- <http://www.icehouse.net/john1/intro.html>
- [More on Free Energy](#)
- [Also by charged](#)





This motor is running on about 150ma input at 12v. Every input pulse is bounced back out to the collector capacitor and sent to a second battery to recharge it. The more you load up the axle, the lower the average input current drops.

It is based on the model design found at:  
[www.keelynet.com/bedmot/bedmot.htm](http://www.keelynet.com/bedmot/bedmot.htm)

Re: Bedini power generation technology ([none / 0](#)) ([#2](#))  
by Kevin L on Sat Nov 29th, 2003 at 01:28:52 PM MST  
([User Info](#))

From the video it appears that alot of energy is first applied to the fly wheel, then the power used by the bulb slowly slows down the flywheel till all the kenetic energy is consumed by the bulb. Fun to learn about basic physics though.

[ [Parent](#) ]

Re: Bedini power generation technology ([none / 0](#)) ([#3](#))  
by charged on Sun Nov 30th, 2003 at 10:57:24 AM MST  
([User Info](#))

Things are not always what they seem.

[ [Parent](#) ]

Re: Bedini power generation technology ([none / 0](#)) ([#4](#))  
by charged on Sun Nov 30th, 2003 at 12:01:11 PM MST  
([User Info](#))

Oops. I hit the post button before I finished my reply.

The stator core is made from individually enameled strands of soft steel wire packed tightly and epoxied in place. It's an extremely efficient three-winding 1:1:1 transformer with very low hysteresis and eddie-current losses.

As a PM approaches the core, it generates a positive voltage and current on the base of the transistor, turning it on.

The transistor switches fully on and applies the battery to the primary winding to oppose the PM field. This happens at TDC where the PM field is compressed just enough for the rotor to "glide" past TDC as if there were no stator present.

The transistor just as suddenly switched off, collapsing the current-generated field in the stator. At the same time, the PM field expands at nearly the speed of light and tries to "reach out" to grab the stator core once again.

THIS is where a CAPACITIVE LOAD is applied to the third winding to collect cemf. According to LENZ LAW, the now INCOMING PM FIELD produces a massive power spike and as current is drawn from the winding, an OPPOSING FIELD PUSHES back at the PM field, accelerating the PM AWAY from the stator. The heavier the load of the CEMF the greater the torque on the rotor. Yep, sounds insane on the face of it. But, it works.

This explains the basics of Lenz law.

<http://hyperphysics.phy-astr.gsu.edu/hbase/electric/farlaw.html>

Notice that the law only applies to "fields" not to the "physical structure" that contains the fields. In other words, the physical magnet is a separate entity from it's field. Otherwise, you'd never be able to distort the shape of a PM field in relation to the PM's shape.

In a nutshell, the SHAFT TORQUE is an entity INDEPENDANT of the user's power input and CEMF output collection activities.

This is called ELECTROMAGNETIC REGAUGING.

[ [Parent](#) ]

Re: Bedini power generation technology ([none / 0](#)) ([#5](#))  
by [ibedonc](#) on Sun Nov 30th, 2003 at 10:08:20 PM MST  
([User Info](#))

do you have a source for the enameled "soft steel wire" , oh wait , just came to me  
are you using coat hangers cut to size ,also when you wind the coil do you do one layer  
then go back to the top and start the next , and how big is the core.

Can you use a MOSFET instead of the transistor , I have 100 500v IRF power mosfets

I have a 6" dia x 3" W Al flywheel that I have been want to play with this with

Re: Bedini power generation technology ([none / 0](#)) (#6)  
by charged on Mon Dec 1st, 2003 at 06:42:52 AM MST  
([User Info](#))

Actually, it's just solid MIG welding wire (hardware store). The core is a piece of 1/2" ID CPVC pipe with a couple of PVC discs glued on either end to make a plastic spool.

The strands of wire are cut slightly longer than the core and then stuck in a foam block so they can be spray painted with epoxy enamel. Once completely dry, they're packed into the spool and the ends are cut flush. Then I use some glue in either end of the core to fix them permanently in place.

This particular stator is a 500 turn tri-filar winding of #24 magnet wire. The wire size is not super critical. But, that's a good starting gauge for a basic motor.

The TIP3055 transistor has specific characteristics that make it useful for this application. Various bipolar transistors will work. But, this one is cheap and plentiful. Mosfets will not work in that circuit because they are voltage-controlled, not current-controlled. Darlington transistors won't work either because they can't switch fast enough.

In a nutshell, for this circuit, you need a relatively high gain, fast switching bipolar transistor.

Re: Bedini power generation technology ([none / 0](#)) (#7)  
by ibedonc on Mon Dec 1st, 2003 at 03:12:41 PM MST  
([User Info](#))

Thanks ,,

about the winding pattern , do you wind one layer tape it off go back to the top then wind the next ,, etc

or wind top to bottom , then next layer bottom to top , then start over

Re: Bedini power generation technology ([none / 0](#)) (#8)  
by charged on Tue Dec 2nd, 2003 at 11:12:19 AM MST  
([User Info](#))

While that method DOES allow you to build a transformer with the proper turns-ratio, it gives you three windings with varying impedance. You don't want that.

Make it a "tri-filar" winding. Use three spools of magnet wire. Feed your coil form with all three simultaneously. This will leave you with three windings with matching impedance.

[ [Parent](#) ]

Re: Bedini power generation technology ([none / 0](#)) (#9)  
by ibedonc on Tue Dec 2nd, 2003 at 11:54:45 AM MST  
([User Info](#))

ok , sorry I am not getting idea across , yes my question would have been winding all three at once , so using three spools start with all three wires at the top , wind to bottom , tape off , return to top start next layer winding to bottom

or start with all three wires at the top , wind to bottom tape off start next layer from bottom ,

Re: Bedini power generation technology ([none / 0](#)) ([#10](#))  
by ibedonc on Tue Dec 2nd, 2003 at 11:58:30 AM MST  
([User Info](#))

which one described are you winding ?

Re: Bedini power generation technology ([none / 0](#)) ([#11](#))  
by charged on Wed Dec 3rd, 2003 at 06:33:02 AM MST  
([User Info](#))

It doesn't matter which end you start on or whether it's CW or CCW winding. Just attach all three wire ends to the same spot on the spool at one end and then start winding back and forth until I get 500 turns.

You should just try to keep the windings as neat and snug as you can manage.

[ [Parent](#) ]

Re: Bedini power generation technology ([none / 0](#)) ([#12](#))  
by ibedonc on Wed Dec 3rd, 2003 at 08:30:27 AM MST  
([User Info](#))

ok , thanks that was the answer I was looking for :)

[ [Parent](#) ]

Re: Bedini power generation technology ([none / 0](#)) ([#13](#))  
by ibedonc on Thu Dec 4th, 2003 at 01:08:06 PM MST  
([User Info](#))

I have a 8.5" x 2.5" al flywheel in the works , would it still work if I put the magnets on the side face instead of the outside face ( I am thinking it would)  
it would be a lot safer if I could , would not fly off as easy.

my magnets are 1" x 1/2" round N45 neo's

also would it miss up the effect if the frame was AL.

thanks

[ [Parent](#) ]

Re: Bedini power generation technology ([none / 0](#)) (#14)  
by charged on Fri Dec 5th, 2003 at 08:10:26 AM MST  
([User Info](#))

Almost any embodiment will work. If you're putting the magnets around the outside of the rotor, use superglue to hold them in place and then put a couple of wraps of fiberglass packing tape around the outside. Using neodymium magnets, you'll have a pretty decent gap between the stator core and the PM's so the tape won't get in the way. I just used the glue and left it at that. No problems after many weeks of 2000+rpms.

Uh oh, I feel a "too much info" moment coming on.....

I'm going to quietly suggest that you build with wood or plastic for the frame of the first motor. There are some simple adjustments that you must make to get it running properly.

Aluminum is ok as long as the PM fields don't end up getting dragged through the stationary aluminum parts. That's going to be an eddie-current area that will cause drag on the flywheel. It won't specifically change the inductive effects in the stator. But, it will detract from the available shaft torque and make it run slower.

All the positive shaft torque is provided by only two things.

1. The initial attraction of the incoming PM to the stator core.
2. The CEMF loading (capacitor charging) as the PM is moving away after TDC.

Your battery input is only enough to cause a "null" field at TDC, not a "push" after TDC. You will need to short your battery into the primary winding and adjust the gap between the stator core and the rotor magnet to see where the "null" zone is. Use an almost dead battery (10.5v) to do this adjustment.

More interesting stuff....

1. The incoming attraction for EACH SINGLE PM-STATOR INTERACTION is exactly the same amount of torque, each time, regardless of the RPM. This means that the available working force from the attraction increases in a linear fashion with RPM's.
2. The input pulse from the battery and the CEMF output pulse have a fixed efficiency relationship that is determined by your stator design. The maximum efficiency for battery recharging is by allowing the capacitor to only rise a few volts above the receiving battery's voltage before pulsing. This is why the motor has that simple timing wheel arrangement. ALL MECHANICAL means that you can study things very closely. Using a larger capacitance keeps the pulsing voltage lower and allows greater standard charging efficiency. Always make sure the input and output batteries are the SAME VOLTAGE. The 1:1 transformer effect guarantees that the charging is provided ONLY from collected CEMF and NOT from primary pulse current. This will make more sense if you place a lower voltage battery on the output and watch what happens to the input current and shaft torque.
3. JUST BECAUSE you are extracting the CEMF with the capacitor, the PM gets an extra "push" as it's leaving the stator. This is because the PHYSICAL MAGNET is moving away from the stator at the same time it's FIELD is trying to APPROACH the stator. Lenz law applies and the load during this phase causes a reflected field from the stator that "bounces" the PM away even faster. This is much like dropping your glasses and trying to catch them in



mid-fall, smacking them across the room like a tennis ball. oops.

[ [Parent](#) ]

Re: Bedini power generation technology ([none / 0](#)) ([#15](#))  
by ibedonc on Fri Dec 5th, 2003 at 04:53:44 PM MST  
([User Info](#))

I was planning on having the supports 2 or 3 " away from the rotor and it will be on a 3/4" steel shaft , that is why I asked about the AL for supports  
also I am going to put the neo's on the flat side (inside face) , thanks for all your help , it you would like to hear updates on my motor , you can email your email address to don@star-c.com

[ [Parent](#) ]

Re: Bedini power generation technology ([none / 0](#)) ([#16](#))  
by charged on Sat Dec 6th, 2003 at 11:21:50 AM MST  
([User Info](#))

You may want to take another look at <http://www.icehouse.net/john1/intro.html>

It's been updated.

Re: Bedini power generation technology ([none / 0](#)) ([#17](#))  
by ibedonc on Mon Dec 8th, 2003 at 01:22:12 PM MST  
([User Info](#))

thanks , I see a plexiglass rotor and chassis , and probably only one magnet , but that is just a guess , also from looking at the patents I believe they are using a electronic timer to dump the cap i.e. count 3 pulses , dump ,etc

I guess I have to build one , while I am waiting for my AL rotor to be finished

:)

[ [Parent](#) ]

Re: Bedini power generation technology ([none / 0](#)) ([#18](#))  
by charged on Tue Dec 9th, 2003 at 07:40:25 AM MST  
([User Info](#))

Very astute observations. Except that the flywheel probably has 3 magnets spaced 120degrees apart near the edge, to maintain balance.

Notice that the "motor" aspect of the device is not used for anything except timing and "firing" the inductors. The rotor magnets must be spaced properly so that they pass the stator fast enough to generate the trigger voltage for the transistor base. But, at the same time, there must be enough time between interactions that the next magnet doesn't overlap any of the electrical action of the previous magnet. Make sense?

The "motor" is an electro-mechanical PWM that set's it's own frequency. Very little interaction between the rotor and stator is required when a very high-gain transistor is used. This CAN be done with fancy solid-state controls. But, a mechanical system is easier to maintain since it keeps your solid-state parts count very low and very simple to work on.

As the webpage describes, the transformer effect uses only the CEMF or "radiant" aspect (ala Tesla) which is pure potential, with no electron current. Until that radiant spike "lands" in a capacitor, it is not "real" power in the truest sense. Funny thing is that you can put the capacitor at the other end of a few thousand feet of wire, and it will fill at the same rate. Freaky stuff to see when you've already been trained to think in standard textbook theory. I've been beating my head against this stuff for several years now and one day, not too long ago, it all finally began to click.

I hope I can help accelerate the learning curve on this for some others.

[ [Parent](#) ]

Re: Bedini power generation technology ([none / 0](#)) ([#19](#))  
by [ibedonc](#) on Fri Dec 12th, 2003 at 06:02:48 PM MST  
([User Info](#))

do see another coil on the other side ?

looks like a seperate gen coil

,, I went to look at the picture again and it is gone , did you happen to save a copy of it

[ [Parent](#) ]

Re: Bedini power generation technology ([none / 0](#))  
([#20](#))  
by [charged](#) on Fri Dec 12th, 2003 at 08:54:47 PM MST  
([User Info](#))

I'm sorry, what picture are you talking about and on what web page?

[ [Parent](#) ]

Re: Bedini power generation technology ([none / 0](#)) (#21)  
by ibedonc on Fri Dec 12th, 2003 at 10:01:26 PM MST  
([User Info](#))

bedini's , the one of his charger in a CD case  
that is ok ,I have been reading the Patents :)

[ [Parent](#) ]

Re: Bedini power generation technology ([none / 0](#)) (#22)  
by charged on Sat Dec 13th, 2003 at 09:23:26 AM MST  
([User Info](#))

<http://www.icehouse.net/john1/index100.htm>

Make sure you save that page. You'll love it.  
Especially the pics.

[ [Parent](#) ]

Re: Bedini power generation technology ([none / 0](#)) (#23)  
by ibedonc on Wed Dec 17th, 2003 at 03:47:40 PM MST  
([User Info](#))

well , I first try at this motor has not worked, this one I made the rotor out the plastic that they use for cutting boards , 1 inch thick , plexiglass frame / 3/16 steel shaft and bearing

used 1/2 x 1/8 round neo mags ( maybe I should use ferrite like bedini said ?)

coil 1/2 cpvc pipe and 1-1/2 spool ends , #24 motor and gen wire #26 tigger , wound until could not put any more on coil form all wires at once .

used .030 solid mig wire to fill core , spray painted each wire.

2n3055 trans , in914 diode , 330 resistor , 1000v bridge and 330 uf 500v cap

no dump yet , just wanted to get the motor to run

lined up coil to mags , I am able to adjust the gap by moving the rotor up or down

coil does repeat , adjust to null zone as per directions , spin rotor and it stops

using 12v battery scope shows waveform on all windings

sometimes the circuit will start to oscillate without the rotor turning and when one of the mags is tdc, when this happens I get up to 150 volts on cap and trans gets hot

any ideas , what kind of mags are you using ?

I have the tigger wire like the patenth

Re: Bedini power generation technology ([none / 0](#)) (#24)  
by charged on Thu Dec 18th, 2003 at 08:54:24 AM MST  
([User Info](#))

1. Make sure you're using a TIP3055, NOT a 2N3055. The gain on the latter will usually prevent it from working properly.
2. Go to radio shack and pick up a 10k, 15 turn potentiometer. The part number is 271-343. Get rid of that 330 ohm resistor and put a 100ohm resistor in it's place. Then put the potentiometer in series with it. Now you can adjust the input pulse-width. Start with the lowest resistance setting and give the motor a spin. Make sure the transistor isn't heating up. Watch the waveform on the scope. You'll see the positive sine, then the transistor "on" pulse, and then an hv spike. Increase the resistance slowly and watch the transistor "on" pulse duration. It should be decreasing. Keep turning up the resistance until you see a second "ghost" oscillation. Stop there and go back down just a hair to make it go away. If you go further out, you'll get wild oscillating and the motor will stall.
3. Yes, you SHOULD be using HIGH POWER CERAMICS, not neos. But, you've already got the stator gap adjusted, so it should work.
4. Disconnect the bridge and capacitor for now. It will interfere with the motor if you are not DUMPING the cap steadily. Without it hooked up, the radiant spikes will not interfere with the motor action.
5. Lastly, You MIGHT have TOO MUCH INDUCTANCE in the windings. This will lower the resonant frequency of the stator and can prevent the motor from running. Since this is the most annoying thing to fix, check all the other possibilities first. If this is the only option left, rewind the stator and stop at about 400 turns. Then try running it again.

[ [Parent](#) ]

Re: Bedini power generation technology ([none / 0](#)) (#25)  
by ibedonc on Thu Dec 18th, 2003 at 10:37:40 AM MST  
([User Info](#))

when you test the ohm's of your coil when do you usually see ,mime is 2.8 ohms

ok off to get the parts

thanks

[ [Parent](#) ]

Re: Bedini power generation technology ([none / 0](#)) (#26)  
by charged on Fri Dec 19th, 2003 at 06:46:12 AM MST  
([User Info](#))

Ohms don't matter much when it comes to the way this thing works. This might sound weird. But, it's true. You've already adjusted the stator gap, so you KNOW that the magnets are attracted and then "zeroed" with full battery voltage in the winding. Getting "motor" action is now just a matter of proper components and tuning.

I've made all sorts of rotors out of MDF board, plywood (yep, wobbled too much), bicycle wheels, pvc tubing "stalks", etc....

What matters is the switching speed of the circuit, in relation to the magnet interactions.

Once you've dabbled with these a bit, you'll begin to get a feel for what's required.

Look at the specs for the TIP3055. As long as you use a good bipolar transistor that meets or exceeds the voltage/frequency/gain specs, it will work. Don't bother trying any darlington transistors. They REALLY stink for this. Too slow. You will get a nice THUMP noise each time you try to start the motor, though. heh.

[ [Parent](#) ]

[Bedini power generation technology](#) | 26 comments (26 topical, 0 editorial)

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## [becoming synergy?](#)

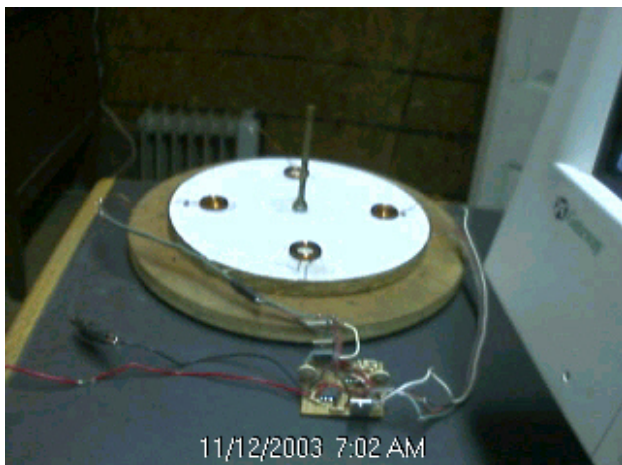
By [Ocean](#), Section [Weird Science](#)

Posted on Wed Nov 12th, 2003 at 08:34:07 AM MST [Free Energy](#)  
trying to get more than given

This prototype has been an experiment for many years, ever changing with understanding and design. It is understood that even still the knowledge is in its infancy.

The windings used to make it move have been "on the front burner" for so long but now it is time to start thinking about delivering power back. I am happy with the circuit design even though changes can be made in order to change its performance.

Now if I could just figure out how to display my images.



[becoming synergy?](#) | 5 comments (5 topical, 0 editorial)

Re: becoming synergy? ([none / 0](#)) ([#1](#))  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Wed Nov 12th, 2003 at 11:13:37 AM MST  
([User Info](#)) <http://www.internetfred.com>

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Need more info! Whats it do and how does it work, or a nice discription! Thanks!  
Good Work by the way!

Re: becoming synergy? ([none / 0](#)) (#3)  
by Ocean on Wed Nov 12th, 2003 at 01:10:54 PM  
MST  
([User Info](#))

All it does at the present is spin around and around. Two inner windings power it to spin and two outer windings tell it when. (The other two windings in the photo aren't connected) The circuit is simple and it involves two 741s and an NPN, PNP for deciphering the duty cycle and firing appropriately. This particular example is with twenty neodimium magnets and is powered by four rechargeable batteries. I have yet to go higher in voltage because I believe heat may come into play.

There is an extreme amount of learning shown in these photos.

This is still confusing.....Ok, one winding has two parts: it is air core. The inner winding is half the diameter of the magnet on its inside up to the size of the magnet, which is used for powering movement. The outer section is from the inner up to a half bigger and is used for trigger.

Winding (inside = .25-.5 outside = .5-.75)  
magnet=.5

By the way, now I have seen there are four pictures here and there is only supposed to be two.

[ [Parent](#) ]

Re: becoming synergy? ([none / 0](#)) (#5)  
by TomW on Wed Nov 12th, 2003 at 01:36:57  
PM MST  
([User Info](#))  
<http://oneota.net/~earthsourcepowr/>

ocean;

Just tell me which ones you want eliminated [1,2,3 or 4] and ill kill the extras.

Cheers.

TomW

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Re: becoming synergy? ([none / 0](#)) ([#2](#))  
by [veewee77](#) on Wed Nov 12th, 2003 at 01:05:14 PM MST  
([User Info](#))

This looks very similar (but horizontal) to the Muller motor/generator.  
Is that what it is based on?

DS

Re: becoming synergy? ([none / 0](#)) ([#4](#))  
by [Ocean](#) on Wed Nov 12th, 2003 at 01:14:11 PM MST  
([User Info](#))

I have never been here before. This is my image.

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[becoming synergy?](#) | 5 comments (5 topical, 0 editorial)

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[heat exchanger for drier](#)

By [erne](#), Section [Weird Science](#)  
 Posted on Wed Nov 12th, 2003 at 07:01:13 AM MST [Free Energy](#)  
**pazman** my drier may help you with ideas for your unit

pazman  
 You need to go and get a old hot water register out of the 50's or earlier. Mine has a 3 inch inlet and outlet and weigh about 120 pounds. I built a box out of a truck air cleaner and put screening in place of the filter. I ran the exhaust out of the top pipe after some experimentation. It heats the iron better. I have the register behind my pellet stove (it hardly shows). Out of the smaller outlet on the bottom, I put a glass bowl out of a truck fuel line to drain the water. I also bring in my air from a hot air exchanger, and have the element disconnected. I also had to change the blower motor to d/c so I could regulate the air flow. It uses to much electric (factory drier) as I am off grid. In the summer I use a bypass valve. When the drier panel is not in use I switch the air to help with the house heat. It produces air in the temp range of about 100 to 120 degrees for about 30 min before it starts to cool. Hope this helps.----erne

[heat exchanger for drier](#) | 2 comments (2 topical, 0 editorial)

Question for erne.... ([none / 0](#)) ([#1](#))  
 by TomW on Wed Nov 12th, 2003 at 07:29:02 AM MST  
[\(User Info\)](#) <http://oneota.net/~earthsourcepowr/>

Erne;  
 I am curious if you are the same erne that sent me a picture of your windmill awhile back?  
 If thats you I would appreciate it if I could get another copy I lost the one I had.  
 It was an awesome machine.  
 Cheers.  
 TomW

[Stuff I have Online](#)  
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Re: heat exchanger for drier ([none / 0](#)) ([#2](#))  
 by pexring on Wed Nov 12th, 2003 at 09:46:20 PM MST  
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I was in Menard's earlier today and they sold this contraption which you could hook up to the end of a dryer hose. It's designed for dryers in which you can't duct to the outside. Supposively, moisture is trapped in the bottom, lint towards the top and air blows into the room. Was only like \$8. Anyone tried it?

Mark

[heat exchanger for drier](#) | 2 comments (2 topical, 0 editorial)

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[solar heat panel with fresnel lenses](#)

By [gameman](#), Section [Remote Living](#)

Posted on Mon Nov 10th, 2003 at 08:39:14 PM MST

[Free Energy](#)

[solar heat panel with fresnel lenses](#)

has anyone ever tryed makeing a solar heater with fresnel lenses on top of the glass to focus the sun??? one will need to make the box out of metal ( fire proof ) where is a good place to get fresnel lenses???  
gameman

[solar heat panel with fresnel lenses](#) | 10 comments (10 topical, 0 editorial)

Re: solar heat panel with fresnel lenses ([none / 0](#)) ([#1](#))  
by [DanB](#) on Mon Nov 10th, 2003 at 08:43:57 PM MST  
([User Info](#))

I can't imagine much advantage, since you'd still be taking in the same square footage of sunlight. I think would only be advantagous if you could have a huge lense (or lenses together) that focused a big area into a smaller area.

Re: solar heat panel with fresnel lenses ([none / 0](#)) ([#2](#))  
by [pexring](#) on Mon Nov 10th, 2003 at 11:48:02 PM MST  
([User Info](#))

I always wondered if a fresnel lens could be used to create a furnace? Somehow concentrate those beams inside the hot box of a furnace and then kick on the blower. Of course, would have to have real precise tracking. How about using a fresnel lens to build a hot water heater?

As far as heating a home, I'm sold on using/building regular solar heating panels. In fact, I'm about 3/4 done with my next project -- a heated floor system. I live in a mobile home, and the floors are ALWAYS cold no matter how warm it is inside.

So I'm running some 3" perforated ductwork inside the belly. Heat from the solar panel will be blown into the ductwork. As in many mobile homes, the insulation in the belly is below the floor joists and not between the floor joists, so heat will be free to travel and warm my floors! I also bet that the floors stay heated long after the sun goes down. Only place the heat has to go is up through the floor, and that will take awhile. I'll probably have just revolutionized heating in the mobile home industry! Once its up and running, I'll be sure to post results.

I'm hoping its true with my home, but houses I've seen with heated floors always feel warm, and the owners' say the furnace doesn't run much either. Let's hope so!

Gosh this stuff is fun,  
Mark

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Re: solar heat panel with fresnel lenses ([none / 0](#))  
(#4)  
by gameman on Tue Nov 11th, 2003 at 07:08:51 AM  
MST  
([User Info](#))

why not make the regular solar heating panels bigger or use 3 or 4 of them with a bigger fan .can't you get more heat that way ??  
gameman

[ [Parent](#) ]

Re: solar heat panel with fresnel lenses ([none / 0](#))  
(#5)  
by RobD on Tue Nov 11th, 2003 at 07:50:57 AM MST  
([User Info](#))

Hi Mark,  
I have radiant floors in my home. When I built it about ten years ago I put Radiantec tubes under the floor. Here's what I have. Tubes are attached to the underside of my floor with thin aluminum plates each about 6" x 10". The plates are stapled to the bottom of the underlayment (3/4" plywood). Above this is 3/4" hardwood flooring. Under the tubes is a special aluminum foil backed paper that sits about 1-1/2" below the tubes. About 10" below this I have Aluminum foiled foam board (R5 I think).  
My furnace is run at between 108 and 110 degrees by a sensing circuit that I built. I asked my boiler company about running boilers this low and they said it is no problem.  
According to Radiantec 110 degrees mean temperature is ideal.  
The floors are warm and I can keep the house temperature lower because the heat is always rising. The system is quiet and my small house has more room because there are no radiators to take up space.  
The only thing I don't like is the delay in getting up to temperature when the sun goes down and the temperature can drop 20 or 30 degrees in an hour.  
I advise having a small heater to keep this from happening.  
Most of the time I walk around in bare feet or socks.  
RobD

[ [Parent](#) ]

Re: solar heat panel with fresnel lenses ([none / 0](#)) (#8)  
by pexring on Tue Nov 11th, 2003 at 12:06:58 PM  
MST  
([User Info](#))

RobD,

I would have loved to have installed the system you mentioned in my home. Unfortunately, I don't have access to underneath my floors (other than ripping open the belly - NOT).

With my heated floor system, I'll open up one small section of the belly, feed in ductwork along the sag of the belly, and connect the solar heating panel to the ductwork. I realize my floors won't be as evenly heated as yours, but it'll still be a huge improvement!

Nice and sunny today. My solar heating panel on the side of the house is blowing air into the house at a temp of 120-125 degrees (dropping to 115 when some high clouds roll by).

Mark

[ [Parent](#) ]

Sunspots ([none / 0](#)) (#3)

by wdyasq on Tue Nov 11th, 2003 at 04:55:03 AM MST  
([User Info](#))

If one is considering using solar heat, they would be well advised to get a copy of Steve Baer's book -- Sunspots -- I think that is the book. My copy was destroyed in a flood several years back but Mr. Baer had many thoughts, and the test results to back them up, on solar heating of air and water.

Remember, you'll never live long enough to make all the stupid mistakes yourself. Sometimes it is best to let others find the way and then just follow.....

Ron

Re: Sunspots ([none / 0](#)) (#6)

by JW on Tue Nov 11th, 2003 at 07:51:20 AM MST  
([User Info](#))

Gameman,

A cheap source for large fresnel(sp?) lenses is 1980's vintage internal projection large screen TV's. I have seen them as large as 3 foot by 4 foot. In the 90's you could find these just about anywhere, now they are more difficult to find, since they stopped making TV's that way. I suspect that TV repairmen have packed some of these away, perhaps there's such an establishment in your area, I would ask questions there.

Be careful not to "melt" (it's going to be plastic) your lens from heat rising from the metal box you plan to construct. Also you may experience some transparency loss, due to necessary support bars or struts, that will keep the lens from sagging. Most likely you will have to force plenty of air thru the box to keep things manageable.

Also be exceedingly careful if you decide to work with glass instead.

-JW

[ [Parent](#) ]

Re: Sunspots ([none / 0](#)) (#7)  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Tue Nov  
11th, 2003 at 08:37:54 AM MST  
([User Info](#))

Actually, another place is those old retro tv magnifiers you would see at your old aunt's house or someplace like that. I salvaged a couple and have made some fun stuff from it like a small solar powered copper foundry, where I can pour small amounts of copper just by the sun... But back to the point, one can find these old retro magnifiers pretty much everywhere. Another good place is to find a scrapyard for old office supplies. Overhead projectors have a fresnel lens right under the glass plate, and although they are small, there is a lot of them out there.

-Andrew

[ [Parent](#) ]

Re: Sunspots ([none / 0](#)) (#9)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on  
Tue Nov 11th, 2003 at 01:15:10 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

I've seen lenses like you are describing on the back windows of vans and motor homes.

}=- W o o f -=  
[ [Parent](#) ]

Re: Sunspots ([none / 0](#)) (#10)  
by troy on Wed Nov 12th, 2003 at 01:39:16  
PM MST  
([User Info](#))

Don't forget, you only get so many BTU's per square foot of collector area, whether that's a Fresnel lens, or plain window glass. You can achieve much higher temperatures with the Fresnel lens, but in a much smaller area. So it doesn't multiply the heat, it multiplies the temperature while proportionally reducing the heated area.

Good luck and have fun!

troy

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[Some simple, but crucial questions about laminates, coils and armature :\)](#)

By [Sponge](#), Section [Homebrewed Electricity](#) [Free Energy](#)  
Posted on Mon Nov 10th, 2003 at 11:43:13 AM MST

Some simple, but crucial questions about laminates, coils and armature :)

Hi,

I have some small questions, which easily could be answered by the pro's here. For most of those questions I have searched this board, and the old one. But things just stay vague sometimes :-(.

1) Laminates.

Those are used under the coils to get rid of "eddy currents". as far as I have read, the material should allow magnetic "fields", but should not remain magnetic, or something like that?. I have no clue what exact material I should use. Would iron-wire work? or does it need to be like iron strips. (no idea where I can find those over here though :P)

2) Armature.

Does it really have to be a steel backing (I'm using HD magnets). Can't I just glue the magnets to wood (so to speak). Since it's quite hard to find such a steel thing over here :(

3) Coils.

I read the "flatter the better". The smaller the wire "width" (AWG), the lower the A, the higher the V. And vice versa. But what's a nice middle line? How do you determine a bit what type to use, or what is an average? And how should I determine the amount of windings. Just do a guess like, 60 is nice, or 100? Or just when "it gets too big"? :)

4)

Some question rather related to this board. I have found no way to get in contact with someone who didn't public specify his email address. I really hope someone knows the email address of ChrisW, since this: <http://www.fieldlines.com/comments/2003/10/15/102538/69/6#6> post was quite interesting to me. (about using HD magnets, and he managed to do it pretty nice) Unfortunately I cannot find anything on Google referencing to him :-(.

I hope these questions aren't too obvious :) I tried to find all these answers, but I just didn't get the answers very straight. Getting the right materials is my main problem over here.

Regards,  
Sponge

[Some simple, but crucial questions about laminates, coils and armature :\) | 2](#)  
comments (2 topical, 0 editorial)

Re: Some simple, but crucial questions ([none / 0](#)) ([#1](#))  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Mon Nov 10th, 2003 at 04:54:22 PM MST  
([User Info](#)) <http://www.internetfred.com>

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1) Laminates

use thin strips, .014 silicon steel or so. insulated or paint em with varnish.

2) Armature

Want lots of output or a mouse? Put on a metal backing! steel plate 1/4 min. if you can't feel the magnet behind the material then it's thick enough. You can, though not suggested.. laminate a plate ontop of a plate for thickness.

3) Coils - Do the reasearch on this board.. there are sooooooo many referances to "coils" and making coils, we keep having to anwser the same question a hundred times.. Use search PLEASE!!

Your problem is not materials, it's reading the vast amount of information that is presently available on this board and deciphering a bit of it. (information overload)

Here is a good starting point.. Visit my web site below and click on turbine building and -->>"alt energy links"<<-- that will get you started in the right direction. Look at all the web sites out their! They will amaze you! and give you invaluable information on building.

<http://www.internetfred.com>

I wish you good luck on your journey! it's just begun.

Re: Some simple, but crucial questions ([none / 0](#)) (#2)  
by [Sponge](#) on Tue Nov 11th, 2003 at 01:42:22 AM MST  
([User Info](#))

Thanks! :)

I have been reading through every page I could find though, for a while already. But sometimes the pictures are quite unclear, and they do not explain why they choose a certain wire size or x windings :)

For laminates, normal iron/metal or something won't work out? I doubt I can find that Silicon stuff overhere :). It certainly can't be bought in a large "do it yourself" shop.

I'll try finding a steel platething. It would probably be too heavy for my current design, so I'd need to make a new "head" for the windmill. New challenges! Especially with the amount of tools I have :)

Regards,  
Sponge

[ [Parent](#) ]

[Some simple, but crucial questions about laminates, coils and armature :\)](#) | 2  
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[Heat exchanger for a residential clothes dryer?](#)

By [pazman](#), Section [Weird Science](#) [Free Energy](#)  
 Posted on Sat Nov 8th, 2003 at 11:41:01 PM MST  
 Residential dryer heat exchanger?

If my math is correct, an average residential electric clothes dryer in north america is around 5000 to 6000 watts of power. A chunk of this power gets converted directly into heat (not sure how much), dries the clothes and gets exhausted outside for the birds. An average laundry load runs on the dryer for 45 min to an hour. A household with two to three kids can run two to three loads a day. So we could have a total hydro consumption of as much as 18 kilowatt hours a day. It would be great to recover some of this energy...some google searches later I couldn't find anything on the subject (aside from industrial heat exchangers) so I'm not sure if anyone has done much with trying to recover heat from the dryer.

Done the brute force way and vented directly in the basement and with a cheap lint trap, in a new energy efficient house, moisture will quickly become a problem. A source from somewhere told me that an average dryer load removes about 5 litres or so of water. Introducing this into an airtight new house would be bad news with excess moisture/mold etc. Lint is another problem. The best thing I can think of would be a heat exchanger of some sort, but a dryer needs a minimum spec unrestricted airflow in order not to overheat the dryer itself...so the airflow can't be restricted beyond the standard dryer hose spec and beyond the max length of the dryer hose run. Any kind of a heat exchanger that I can think of would need to worry about the water condensing out as well as being able to deal with (remove) the lint at some intervals.

It would be great to recover heat (winter only) from a clothes dryer...but the only way I can think of it being possible (to avoid moisture problems) is with a heat exchanger of some sort (can't think of a cheap way to put one together...car radiator would have piping too small)...and with a heat exchanger one would need to make sure that the airflow would be within spec for adequate cubic volume flow of air so as to not break the dryer itself.

My house already has a heat exchanger, put I can't splice into it and vent the dryer exhaust through it...this would probably plug it up in no time at all.

Has anyone thought of doing something with the waste heat from their dryer and gone through these thoughts as well?

[Heat exchanger for a residential clothes dryer?](#) | 20 comments (20 topical, 0 editorial)

Re: Heat exchanger ([none / 0](#)) (#1)  
 by Garry on Sun Nov 9th, 2003 at 05:50:14 AM MST  
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Ideas for a residential dryer heat exchanger?

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With any normal type of heat exchanger your main problem will be the lint. It comes out of the dryer damp and sticks to anything. The close spaced plates in the heat exchanger will soon clog all the air gaps. You might try a coaxial type where the lint stays inside a convoluted four inch aluminum vent pipe with a six inch fresh air pipe surrounding it. It will require cleaning every month to avoid being a fire hazard. The pipes will have to be long and straight or the air friction will overheat the dryer.  
Garry

Re: Heat exchanger ([none / 0](#)) (#8)  
by pazman on Sun Nov 9th, 2003 at 03:01:06 PM  
MST  
([User Info](#))

Hi Gary,

Good points about the potential fire hazard. Dealing with lint creates an on going maintenance issue...just the kind of tinkering that always seems to perk my interest towards household tasks instead of mundane things with no challenges :-)

[ [Parent](#) ]

Re: Heat exchanger for a residential clothes dryer ([none / 0](#)) (#2)  
by Junkie ([madscientist@blownup.com](mailto:madscientist@blownup.com)) on Sun Nov 9th, 2003 at 05:52:58 AM MST  
([User Info](#)) <http://www.akuma.dsl.pipex.com/chris>

My dryer is a condenser drier. It's got a condenser built in somewhere that collects the water. So any heat from it get "lost" into the house. Its only 2KW though, about average for a UK dryer, I think.

So maybe you could some sort of large condenser and have the water run into a bucket or something ? Maybe something as simple blowing the outlet over a cold aluminium sheet and collecting the water that drips off ?

Have fun,

-Chris

Re: Heat exchanger for a residential clothes dryer ([none / 0](#)) (#4)  
by pazman on Sun Nov 9th, 2003 at 09:07:33 AM  
MST  
([User Info](#))



That's a good idea. Figuring out a condenser would probably be the thing. I live in a townhouse/"rowhouse" that has the main floor and a basement with a neighbour on both sides of us so we have only two exterior walls to heat. I have a garage that is part of our integrated unit which I just finished insulating. It has no source of heat aside from whatever leaches off from our living space. My initial thought was to vent the dryer exhaust into the garage, but then I saw a posting on the net with the problems that some other people had ran into with extreme moisture and lint. Perhaps I could still go back to my original plan of exhausting into the garage if I figured out the condenser and a drain system for the resulting water. Having a condenser inside the house would present the problem that the heat differential (condenser being room temperature) would not really be there for the condensing to be effective. Venting into the garage I would have the temperature difference for condensing and I could probably deal with the lint problem with a commercial lint trap. All of these are purely "thought experiments" at this stage...gaining approval from the wife for actually buying stuff and cutting into things is another matter :- ) :- ) not to mention that she already thinks that I'm a bit nuts :- )

I live in Northwestern Ontario and our hydro rates are set to go up potentially dramatically. If I ever build a house I would seriously think about scaling it down a bit and going off grid...and give the big raspberry to OPEC as well as the years of mismanagement of Ontario hydro and the debt that all people are paying down above the kvh usage...that's me getting political :- )

[ [Parent](#) ]

spin-dry cut out a lot of dryer time ([none / 0](#)) (#3)  
by Norm on Sun Nov 9th, 2003 at 07:08:23 AM MST  
([User Info](#))

Take an old washer, fix it so it's locked on spin cycle, no water, just hooked to the drain. Spin them almost dry, then put them in the dryer...you'll cut off about 80% of the drying time. You could spin-dry them in your regular washer, but it injects water every once in awhile on it's spin cycle so you would have to shut the water off, also you'd have to keep putting it back on spin-cycle 3 or 4 times. (the wife would probably be hollering about not being able to wash any more clothes until you got thru monkey ing around with the washer.....) Hey! At any rate...keep on having fun! (:>) Norm.

Re: spin-dry cut out a lot of dryer time ([none / 0](#)) (#7)  
by pazman on Sun Nov 9th, 2003 at 02:56:58 PM MST  
([User Info](#))

Hi Norm,

Thanks for the suggestion. I checked with the real expert on this with our current Frigidaire washer (front loader) and she (the wife of course) said that the machine spins the clothes quite dry and according to her does not inject further water in the spin cycle. Another posting on this same topic by Ron made me think that likely a single combo unit (the equator) might be in the cards for me as the washer/dryer combination is more energy efficient than what we have now and is a condensing dryer.

[ [Parent](#) ]

Filter, then cool ([none / 0](#)) (#5)  
by wdyasq on Sun Nov 9th, 2003 at 09:10:56 AM MST  
([User Info](#))

I see this as several problems. But to solve the problem how pazman wants to - to recover the heat, one will need to first filter the exhaust air and get the lint out. I'll propose a large foam-type air filter as is used in automotive applications. I would run the resulting clean, wet air through an air to air heat exchanger as used on large industrial engines and air-compressors. One would need to keep the air flow in a basic down direction so the condensing water would collect at the bottom and could then be drained. There would also need to be a fan to flow air through the heat exchanger into the room. This should cost no more than a few thousand dollars for the parts.

A new Equator clothes processor with condensing dryer is about \$1200. It uses less water meaning less water to heat and buy and needs a 12.8 amps at 115V to run. It also does not require the clothes to be moved from one appliance to the other. But few in the US know of the Equator brand appliances.

While I find it stupid to buy and waste electricity, it is convenient to do so. And, conserving energy is not that as socially correct as having a new and 'proper' washer, dryer, a refrigerator that self defrosts and a high electrical bill to complain about while one sits in front of the TV on election days. This same person will have thermostat set to 78F, gets his cold beer out of the refrigerator when it is freezing outside and tell you Solar energy is not practical - and for him, it ain't.

Ron

Re: Filter, then cool ([none / 0](#)) (#6)  
by pazman on Sun Nov 9th, 2003 at 02:51:31 PM MST  
([User Info](#))

Hey Ron,

Filtering and then cooling and condensing the moisture out would definitely be the right combination. Not sure if there is a homebrew way of doing it economically...I'm a cheap bugger :-)

Thanks for the tip on the equator unit. I'm checking it out on the web. Not sure if they have distribution in Canada or not. We currently have a two unit Frigidaire front loading team that is now pushing six years old. At the time these were one of the best rated and energy efficient in the market when we got them. The dryer has always been a bit troublesome, running way too hot even when it is set low...many repair visits and bills are starting me to wonder the diminishing returns of spending money on the old unit...the equator condensing model might be just the ticket...definitely the better choice than spending thousands on a heat recovery system for an old dryer...still just a "thought experiment" at this stage.

I totally agree with your view on energy waste. This is a mindset that is starting to change, little by little...although us folks in North America are far behind the rest of the world and far out in front in the generation of green house gases. Connection to politics, convenience, the consumerism mentality and the default to do the same as always are all big mountains to move...the thing that does sometimes work the best are rolling blackouts, outages and a higher energy bill.

[ [Parent](#) ]

Forget greenhouse gas ([none / 0](#)) (#9)  
by wdyasq on Sun Nov 9th, 2003 at 03:33:56  
PM MST  
([User Info](#))

Pazman,

I'm not too worried about the -greenhouse gasses- or other -the sky is falling- stories. I figure we haev been able to guess what is going on with measuring devices built in the last 50 years. With these short -rulers- we are predicting things beyond our knowledge base.

I relate it to measuring from LA to NYC with a micrometer and stating the results in inches - change the temperature 5 degrees and even if everything was perfect in the first measurement the result isn't going to look the same.

I insist on paper bags at the grocery store. When one of the - Save the Tree\_ crowd says something I tell them - I'll go plant a tree. You go hatch a dinosaur. Let's see who gets a product to market first.-

I am the founding member of the -Save the Oil Well- foundation. We believe there are a lot better things to do with oil than burn it in IC engines or make plastic bags. Of course, all of this is controlled by governments. If our

electricity wasn't so subsidized by them, North Americans would embrace low-energy consumption appliances. We would have heat-pumps that recovered waste heat going down the drain and take the reject heat from the frig and freezer and use it to heat water.

But, with the false cost of energy, it just isn't financially feasible to do these things.

Well, off the rant now...

Ron

[ [Parent](#) ]

Re: Forget greenhouse gas ([none / 0](#)) (#10)  
by pazman on Sun Nov 9th, 2003 at 03:59:46 PM MST  
([User Info](#))

Hey Ron,

Lots of conjecture, very little hard science and a good dose of politics. I agree with your rant. To get the popular opinion and public on side with conservation, the issue is totally financial and political, and not necessarily even in that order. We haven't been the best custodians of the earth thus far, hopefully human kind is getting smarter collectively as we go.

Things get political very quickly, at least from north american view, with foreign oil and things like the OPEC. If the political will isn't there for conservation, then we are going to need to get more of the black stinky stuff by hook or by crook. Affordable energy drives the economy...even with that a point comes sooner or later the time to consider a different strategy as opposed to more of the same.

[ [Parent](#) ]

Re: Filter, then cool ([none / 0](#)) (#11)  
by Norm on Sun Nov 9th, 2003 at 06:06:03 PM MST  
([User Info](#))

We have a few Amish families around ...as I watch their clothes drying with solar heat on the clothes line ...I think...what a bundle of money they must be saving on electricity...right?  
and Dad used to have a window box to keep his beer cold in the winter....(:>) Norm.

[ [Parent](#) ]

Re: Filter, then cool ([none / 0](#)) (#15)  
by Wolfie1 on Mon Nov 10th, 2003 at  
07:43:27 AM MST  
([User Info](#))

I dry my clothes on a line too. What do the Amish do in the colder months when it stays below freezing? Do they just put the clothes near the fire or do they have some other technique?

Martin.

[ [Parent](#) ]

Winter line drying ([none / 0](#)) (#16)  
by TomW on Mon Nov 10th, 2003 at  
07:53:47 AM MST  
([User Info](#))  
<http://oneota.net/~earthsourcepowr/>

Martin;

We use both line drying and an electric [ouch] dryer. In winter we have a line that deploys near the woodburner but you can just put them out on the line. Our dry climate and freezing tend to dry them well just not as fast. Sheets and large items get pretty rigid until the ice starts to evaporate.

Interesting phenomenon that water can go from a solid to a vapor without becoming a liquid again.

Just what I have done.

Cheers.

TomW

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Re: Filter, then cool ([none / 0](#)) (#19)  
by BrianK on Tue Nov 11th, 2003 at  
05:12:17 PM MST  
([User Info](#))

If I remember correctly my mom used to hang cloths outside in the winter they would freeze but still dry

[ [Parent](#) ]



Heat exchanger and spinner ([none / 0](#)) (#12)  
by Kemper73 on Sun Nov 9th, 2003 at 08:14:39 PM  
MST  
([User Info](#))

Well, everyone,, I live in Kingston Ontario, and have already made installed and currently using a simple air to air heat exchanger that I built for about \$150 bucks canadian..

All I did was make a simple plate heat exchanger that has a larger x-sectional area than the standard dryer vent tubing,,

Check out [aexusa.com](http://aexusa.com). It has some good info on how to design them. I was originally going to build and sell them but was worried about the liability if someone doesn't clean them out. Mind you,, after running all winter (and checking regularly) there was very little lint inside the unit, and all the water just trickled out into the laundry tub. Good little unit

Also take a look at <http://www.spin-x.com/> I've seen them at public pools, they work great.

Jeff

[ [Parent](#) ]

Re: Heat exchanger and spinner ([none / 0](#))  
(#13)  
by pexring on Sun Nov 9th, 2003 at 08:46:58  
PM MST  
([User Info](#))

Jeff,

Would sure be nice to get a better idea of how to build one. Know of any plans available, or do you have plans you could e-mail, and a supplier for the parts?

I've seen dryer duct with square plastic boxes built inline. What do those boxes do, maybe just divert a little of the heat/moisture into the room?

Mark

[ [Parent](#) ]

Re: Heat exchanger and spinner  
([none / 0](#)) (#14)  
by laskey on Sun Nov 9th, 2003 at  
09:03:54 PM MST  
([User Info](#))

Now I know this is getting low-tech, but I went to my local Canadian Tire store and found two different products for about 15 bucks (Canadian, each). One is a box you put in your dryer exhaust vent line that acts like a switch closing off the outside line and blowing through a lint trap (which you have to clean with each use) marked with the cryptic settings of summer and winter. The other is a thing for houses that have no dryer vent (and can't have one for some reason) it goes on the end of the dryer vent hose and is like a vented bowl filled with water (I guess to catch the lint) and you have to clean it with each use as well.

I was thinking of getting one (the box switch thingy), but there is only two of us, and we only do laundry once a week. It wouldn't solve my basement heating problems. I need a little bit of heat all the time... Not alot for a couple of hours a week.

I'm still thinking about what I could do with that dryer heat.

Cya,  
Chris

[ [Parent](#) ]

Heat exchanger for a residential clothes dryer?  
([none / 0](#)) ([#17](#))  
by jt72 on Mon Nov 10th, 2003 at 12:44:54 PM MST  
([User Info](#))

There exists a contraption for recovering heat from woodstove stovepipes. It is a box that mounts inline with the stovepipe through which pass several tubes with a fan on the back side. As the hot smoke passes by these tubes, they are heated and the fan blows the hot air through the tubes and into the room. I'm sure it is nowhere near as efficient as many high tech heat exchangers used in furnaces and air conditioners but it really does work. I'm thinking that a similar setup mounted inline with the dryer exhaust with a small 12 volt fan may allow you to capture and return at least some of this otherwise wasted hot air.

I'm going to start putting a little thought into making something like this just to see if it works and will post results.

Jim

Heat exchanger for a residential clothes dryer?  
([none / 0](#)) ([#18](#))  
by Kemper73 on Tue Nov 11th, 2003 at 08:01:43 AM MST  
([User Info](#))

This is almost exactly what I built. Mind you I used a plate heat exchanger not a tube type. You just have to make sure that you have a large enough area for the airflow or you will have a higher potential for fire.

I wouldn't buy any of the canadian tire units for a dryer, all they do is put dusty, moist air into your basement. Eventually (usually very quickly) you will start having mold growth in the basement which is bad for your health.

I had mine custom made by a local sheet metal fabricator, I will post a drawing of the unit if I ever get a chance

Jeff

[ [Parent](#) ]

Re: Heat exchanger on stove flu ([none / 0](#)) ([#20](#))  
by bob02 on Fri Nov 21st, 2003 at 03:45:45 PM MST  
([User Info](#))

Jim, Jeff...

Be very careful robbing heat from any combustion device. Doing so lowers flu gas temp, increasing chimney deposits (gases condense sooner at lower temperature). After an initial market introduction, the devices you describe were declared illegal in many provinces and states after UL and CSA tests... and many fires. You may reclaim some heat, but you could get more heat than you bargained for from the fire department, your insurance company, or a chimney fire. Clean that chimney very frequently and make sure your liner is in good shape!  
Bob

[Heat exchanger for a residential clothes dryer?](#) | 20 comments (20 topical, 0 editorial)

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## [Interior Radiant heating panel](#)

By [gameman](#), Section [Remote Living](#)

Posted on Sat Nov 8th, 2003 at 08:53:45 PM MST

[Free Energy](#)

Interior Radiant heating panel

ran a cross this site ..

<http://home.att.net/~cleardomesolar/thermalbarrierpage.html>

it's some kind of fabric ...It measures 2' x 4' for \$49 you hang it in a widow ...

there saying that the Room-side temperatures can reach 135+ degrees F

any one know how good this stuff is ?

gameman

[Interior Radiant heating panel](#) | 3 comments (3 topical, 0 editorial)

Re: Interior Radiant heating panel ([none / 0](#)) ([#1](#))  
by [pexring](#) on Sun Nov 9th, 2003 at 08:15:36 AM MST  
([User Info](#))

I've heard of those curtains, but have never tried them.  
Someone on this board should give them a test.

Mark

Re: Interior Radiant heating panel ([none / 0](#)) ([#2](#))  
by [windstuffnow](#) ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Sun Nov 9th, 2003 at 12:01:31 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

A full 4ft x 8ft sheet of aluminum only cost 53.00...  
enough to do a few windows with the same or similar  
results....

just a thought...

Ed

[ [Parent](#) ]

Re: Interior Radiant heating panel ([none / 0](#)) ([#3](#))  
by [gameman](#) on Tue Nov 11th, 2003 at 08:51:55 PM  
MST  
([User Info](#))

i ordered one ..when i get it i will let everyone know how  
it does  
gameman

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[High voltage at very low rpm](#) | 7 comments (7 topical, 0 editorial)

Re: High voltage at very low rpm ([none / 0](#)) ([#1](#))  
by [Budgreen](#) on Sat Jan 3rd, 2004 at 08:29:54 PM MST  
([User Info](#))

for just 5-10W it seems like a lot of trouble to go through. I have a small stepper motor that puts out about 6-8W into a battery in low winds I think that you might have better luck with something like this, but it is your call

[High voltage at very low rpm](#) | 7 comments (7 topical, 0 editorial)

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[High voltage at very low rpm](#) | 7 comments (7 topical, editorial)

Re: High voltage at very low rpm ([none / 0](#)) ([#1](#))  
by Budgreen on Sat Jan 3rd, 2004 at 08:29:54 PM MST  
([User Info](#))

for just 5-10W it seems like a lot of trouble to go through. I have a small stepper motor that puts out about 6-8W into a battery in low winds I think that you might have better luck with something like this, but it is your call

[High voltage at very low rpm](#) | 7 comments (7 topical, 0 editorial)

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[High voltage at very low rpm](#) | 7 comments (7 topical, editorial)

Re: High voltage at very low rpm ([none / 0](#)) (#2)  
by Norm on Sat Jan 3rd, 2004 at 09:36:05 PM MST  
([User Info](#))

It will have to be a very small 12 volt battery...5amp/hr.  
Well anyway try <http://www.picoturbine.com/>  
their more advanced alternator 3phase should work you  
wouldn't necessarily have to hook it up to a vawt. Have  
Fun! Norm.

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[High voltage at very low rpm](#) | 7 comments (7 topical, 0 editorial)

Re: High voltage at very low rpm ([none / 0](#)) (#3)  
by dave123 on Sun Jan 4th, 2004 at 12:45:16 AM MST  
([User Info](#))

I signed up on this board with the same basic question. Looking for a "portable" wind generator to be set up and used when camping, which will mostly be in the Oct-Dec timeframe, and out in the woods. Not good for wind generation, but not good for solar in the northern part of the U.S. either. My homemade furnished camper will be heated via a tent stove, it will have LED for basic lighting(at least to prevent stubbing a toe!), and possibly a radio. So my electrical loads should stay small. However, I would like to experiment for the learning experience as much as anything, not to mention having multiple sources of power for flexibility. So, being in the woods(major wind blockage) and having to stay portable, I am severely limiting the available wind to be harvested. Therefore, I would like to build something that is maybe the size of a box fan or slightly larger, that will at least contribute to battery maintenance. This raises another question; if the batteries are somewhat low, will the increased load of a low battery stall a small wind generator in low winds? I have recently built a lawnmower engine-powered GM alternator to do bulk recharging of batteries, but would rather not even use it at all. As it is, I had to build a variable pulse width generator to reduce the motor load on the tired ole garbage-picked lawnmower engine when the battery is low, or it would stall. Perhaps this pulse width modulation could be used for a small wind generator when used on low batteries? I have read many posts on this board as well as some other sites, and it is very confusing. Number of poles, phases, number of windings, number of prop blades and design, stator diameter, etc. Very hard to figure out for a small capacity battery maintainer that I would like to build. Any suggestions would be appreciated.

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Re: High voltage at very low rpm ([none / 0](#)) (#7)  
by stm on Sun Jan 4th, 2004 at 10:33:39 AM MST  
([User Info](#))

Since your needs are very low, and you dont have access to either a good vind, or a source of good sunlight, you might want use the possibility of using a bicycle connected to an alternator?

[http://www.otherpower.com/otherpower\\_experiments\\_bicycle.html](http://www.otherpower.com/otherpower_experiments_bicycle.html)

The owner of this site claims that he can get 60 watt without struggling, and 120 watt, when he is pedaling as fast as he can.

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can power while you are siting in your chair.

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[High voltage at very low rpm](#) | 7 comments (7 topical, 0 editorial)

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by stm on Sun Jan 4th, 2004 at 10:33:39 AM MST  
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# A quick, ugly "pedal generator" made from an old 3 speed bicycle.

---

**This is a brief page about a simple pedal bike we made from a 3 speed bicycle. Although none of us really cares to "pedal" for power, we thought it would be interesting to see just how much power could be generated this way. It also served to test a low rpm alternator we built from a single phase 1/2hp induction motor. Although most folks who live off the power grid probably get plenty of exercise doing other things, this could provide significant power if used daily. We built this in about 1 hour, if a person actually had a need, it would be well worth taking a little more time, and making certain improvements to the design. The two things are necessary to build one, a bike, and a low rpm generator/alternator. We used an old 3 speed, although the gears on a 10 speed might be more appropriate. We removed the back wheel, and took the sprocket off it.**





The sprocket was welded to a hub which fit the shaft of the generator. A design improvement would probably be to have a flywheel on the same shaft as the generator. The generator fit into a bracket which we welded near the back of the bike (approx where the rear wheel was). We welded "feet" together out of some re-bar left over from a concrete project. Another design improvement would be more rigid feet. The feet

were welded to the back of the bike so that it was level, and high enough off the ground to operate. I'll have to admit...it's kind of wobbly and a little bit scary when pedaled at full speed. Better feet, and a flywheel at the generator would help a bunch. Another improvement would be a higher gear ratio. The gears from a 10 speed would be excellent, at least with the alternator we used. The generator, is actually an alternator we built from a 1/2hp furnace blower motor. The lower the rpm for this type of motor, the more poles, so that it generates at lower rpm.

This was a 1200 rpm 6 pole motor. We removed the armature and cut a slot into which we inserted 6 surplus computer hard drive magnets, with alternating poles facing outwards. Although the magnets were not a perfect fit for arc, and diameter, they were more than close enough. The gaps between the magnets were evened up



by sliding the magnets, fitting feeler gauges between them, and then using "super glue" to hold them in place. The magnets are a light press fit into the slot cut. We then put the armature back into the motor, and it becomes an effective low rpm alternator. Alternating Current(AC) is rectified into Direct Current(DC) using a bridge rectifier (4 diodes). Although I have not tested this alternator for exact speed vs output information, it seems to start charging 12 volts at approx 80 rpm. When coupled to the bike, I was able to generate 5 amps(60 watts) in a leisurely way, and if I pedaled as fast as I could, I'd get about 10 amps(120 watts). This seems to be in line with claims we've seen for other peoples plans, although it seems clear that with a higher gear ratio, one could generate significantly more with this alternator.



In summary, again...none of us really feels the need, or want to pedal for electricity, which is why we didn't invest a great deal of time here. Seems like, with a few improvements to the bike, and a 1 hour workout daily, one could produce easily 100 watt hours per day, which is significant, and might actually be practical for some folks who have small power systems. Especially when one considers the efficiency of new light bulbs and LED's, a daily 1 hour workout could easily provide lights, and radio for a small, simple power system. With the use of a welder and a hack saw, it took about 1 hour to make our bike. The generator took another hour, of course, it required use of a metal lathe.

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[High voltage at very low rpm](#) | 7 comments (7 topical, editorial)

Re: High voltage at very low rpm ([none / 0](#)) (#4)  
by RobD on Sun Jan 4th, 2004 at 06:04:11 AM MST  
([User Info](#))

Since your voltage is high and current needs low you might want to run single phase. RobD

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[High voltage at very low rpm](#) | 7 comments (7 topical, 0 editorial)

Re: High voltage at very low rpm ([none / 0](#)) (#5)  
by Moogly on Sun Jan 4th, 2004 at 07:06:41 AM MST  
([User Info](#))

Thank you for your advices I know that building a wind generator is a complicated way to get 10W and will turn out to be more expensive than simply buying a solar cell, but I'm interested in building my own alternator and maybe it will be a prelude for a bigger one eventually. There's still one question unanswered: Is it better to have 1 coil with a lot of turns or 10 coils with 10 times less turns each in series. Thanks

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[High voltage at very low rpm](#) | 7 comments (7 topical, 0 editorial)

Re: High voltage at very low rpm ([none / 0](#)) (#5)  
 by Moogly on Sun Jan 4th, 2004 at 07:06:41 AM MST  
[\(User Info\)](#)

Thank you for your advices I know that building a wind generator is a complicated way to get 10W and will turn out to be more expensive than simply buying a solar cell, but I'm interested in building my own alternator and maybe it will be a prelude for a bigger one eventually. There's still one question unanswered: Is it better to have 1 coil with a lot of turns or 10 coils with 10 times less turns each in series. Thanks

Re: High voltage at very low rpm ([none / 0](#)) (#6)  
 by Electric Ed on Sun Jan 4th, 2004 at 07:36:43 AM MST  
[\(User Info\)](#) <http://www.electric-ed.com>

[quote]"Is it better to have 1 coil with a lot of turns or 10 coils with 10 times less turns each in series."

Yes. With your windings evenly distributed around the circumference of the machine, all of the available magnetic flux is acting on coils at all times.

I believe that the most efficient layout for an axial-flux machine is the twin-rotor three phase.

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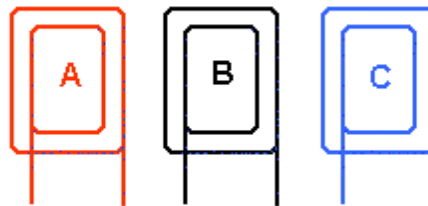
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- [Hank](#)
- [DanB](#)
- Anonymous Users: 14

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**Three Phase Winding - all coils identical**

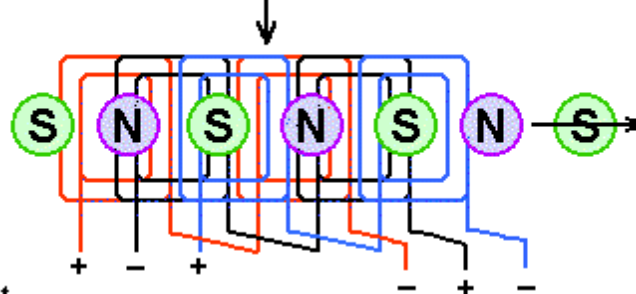
Connect the coils of each phase in series for higher voltage, and parallel for higher current



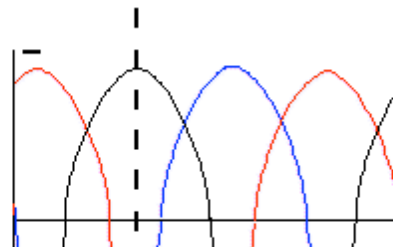
"Edge-on" View from here shown below

**Magnet Spacing - Equal to the coil span**

After interchanging the center phase leads, connect the phases in wye for higher voltage, and delta for more current

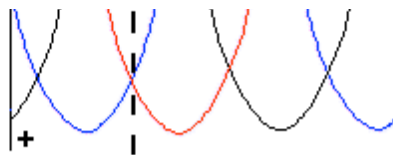


**Voltage waveforms at the instant when magnets are at position illustrated above**

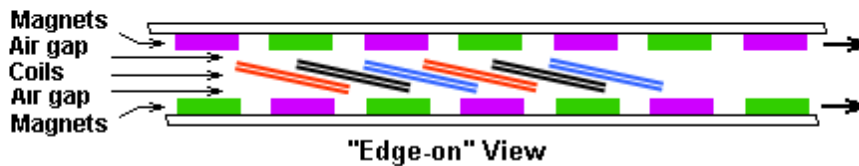


**Note - At any instant, one phase is always opposite**

phase is always opposite  
in polarity to the other two



### Twin Rotor Magnet Arrangement



Electric Ed

[ [Parent](#) ]

[High voltage at very low rpm](#) | 7 comments (7 topical, 0 editorial)



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[High voltage at very low rpm](#) | 7 comments (7 topical, 0 editorial)

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 by Electric Ed on Sun Jan 4th, 2004 at 07:36:43 AM MST  
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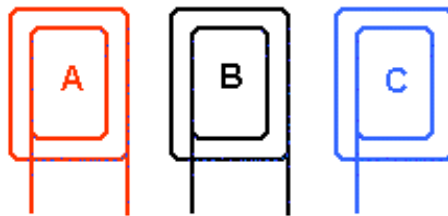
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- [Harry Luubov](#)
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**Three Phase Winding - all coils identical**

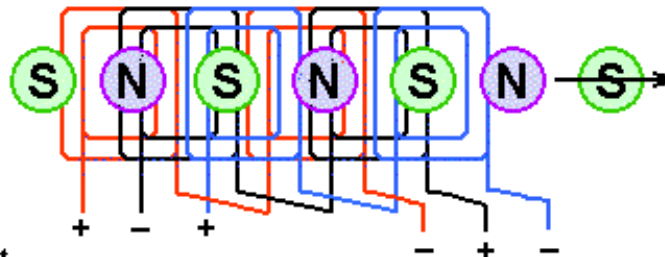
Connect the coils of each phase in series for higher voltage, and parallel for higher current



"Edge-on" View from here shown below

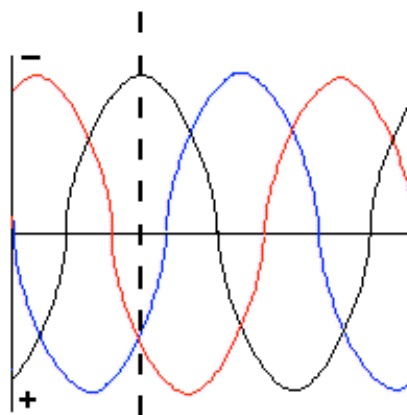
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After interchanging the center phase leads, connect the phases in wye for higher voltage, and delta for more current



**Voltage waveforms at the instant when magnets are at position illustrated above**

**Note - At any instant, one phase is always opposite in polarity to the other two**



**Twin Rotor Magnet Arrangement**





Electric Ed

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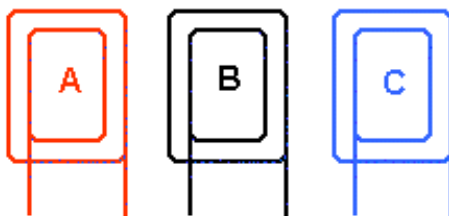
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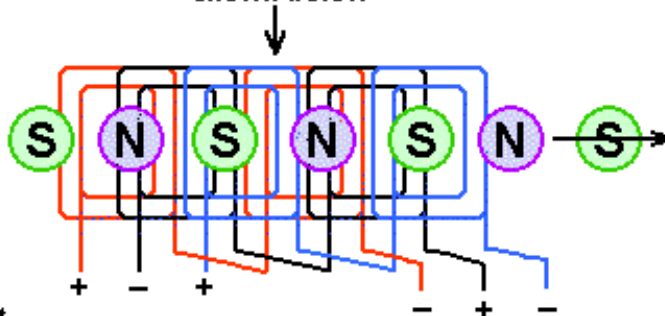
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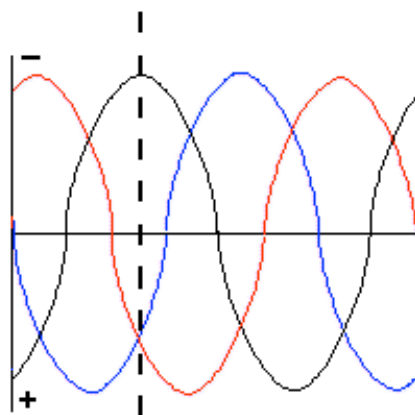
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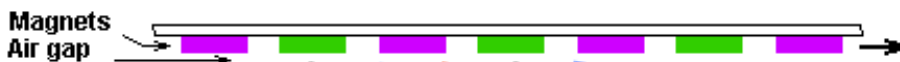


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**Twin Rotor Magnet Arrangement**







Electric Ed

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This web site is for those who make their living in the world of electrical construction and maintenance - the **apprentice** or **journeyman electrician**, the electrical **contractor**, and the electrical **inspector**.

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[Drawing Program for postings](#) | 1 comment (1 topical, 0 editorial)

Re: Drawing Program for postings ([none / 0](#)) ([#1](#))  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Sat Jan 3rd, 2004 at 05:17:02 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

I post a lot of drawings. I use the Wondoze Paint program and convert the file to a GIF Image so the file size will be real small.

Small file size is important, I suggest you use GIF images for drawings and JPG images for Photos. And try to keep the pic size under 650 pixels.

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2. [Wind Turbines - wood \(Homebrewed Electricity, Wind\)](#)  
posted by VermontMaple on 11/21/2003 03:56:41 PM MST  
5 comments

3. [Where is the flux path in the Dual Rotor design? \(Magnets & Magnetism, Alternators\)](#)  
posted by VermontMaple on 11/19/2003 06:31:58 PM MST  
18 comments

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1. [Is 15.3 volts too high to leave my batteries charging?](#) ([Homebrewed Electricity](#), [Batteries](#))  
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2. [conecting 12 Volt Batteries.](#) ([Homebrewed Electricity](#), [Batteries](#))  
posted by mmulzer on 01/01/2004 11:08:22 AM MST  
5 comments
3. [Exploding Lithium-Ion Batteries](#) ([Homebrewed Electricity](#), [Batteries](#))  
posted by woofhound on 12/31/2003 01:03:51 PM MST  
1 comment
4. [Can I see sulfation on battery plates?](#) ([Homebrewed Electricity](#), [Batteries](#))  
posted by zmoz on 12/28/2003 08:19:53 PM MST  
7 comments
5. [Maintaining two batteries with one charger?](#) ([Homebrewed Electricity](#), [Batteries](#))  
posted by zmoz on 12/27/2003 07:26:33 PM MST  
10 comments
6. [Gel Cells](#) ([Homebrewed Electricity](#), [Batteries](#))  
posted by JohnS on 12/27/2003 04:57:42 PM MST  
3 comments
7. [NiMH Batteries](#) ([Homebrewed Electricity](#), [Batteries](#))  
posted by Tom in NH on 12/26/2003 09:07:53 AM MST  
6 comments
8. [AGM battery-last rights?](#) ([Homebrewed Electricity](#), [Batteries](#))  
posted by Mike Wolak on 12/23/2003 04:30:04 PM MST  
17 comments
9. [System set up ?](#) ([Homebrewed Electricity](#), [Batteries](#))  
posted by iceman on 12/18/2003 08:34:23 PM MST  
5 comments
10. [How should I store my battery?](#) ([Homebrewed Electricity](#), [Batteries](#))  
posted by zmoz on 12/18/2003 03:47:43 PM MST  
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11. [Battery shunt set up ?](#) ([Homebrewed Electricity](#), [Batteries](#))

posted by iceman on 12/18/2003 12:11:22 AM MST  
5 comments

12. [Weird problem with SLA battery](#) ([Weird Science](#), [Batteries](#))

posted by drdongle on 12/11/2003 07:03:27 PM MST  
4 comments

13. [22 batteries 48 volt bank.](#) ([Homebrewed Electricity](#), [Batteries](#))

posted by Jerry on 12/09/2003 11:24:47 PM MST  
12 comments

14. [Electric Car?](#) ([Homebrewed Electricity](#), [Batteries](#))

posted by Mike Wolak on 12/08/2003 12:13:59 PM MST  
7 comments

15. [Voltage monitor designed for batteries](#) ([Homebrewed Electricity](#), [Batteries](#))

posted by Reno on 12/07/2003 08:44:17 AM MST  
0 comments

16. [Chemical Rejuvenation Of Batteries](#) ([Homebrewed Electricity](#), [Batteries](#))

posted by bruce1 on 12/05/2003 07:37:42 AM MST  
9 comments

17. [Sharing info](#) ([Homebrewed Electricity](#), [Batteries](#))

posted by Mike Wolak on 12/04/2003 10:06:13 AM MST  
3 comments

18. [SLA batts](#) ([Homebrewed Electricity](#), [Batteries](#))

posted by RobD on 12/01/2003 07:49:22 AM MST  
5 comments

19. [Making a drill battery pack - can I up the voltage a little?](#) ([Homebrewed Electricity](#), [Batteries](#))

posted by zmoz on 11/27/2003 01:36:36 PM MST  
10 comments

20. [Do array of batteries want an equal distance to positives](#) ([Homebrewed Electricity](#), [Batteries](#))

posted by zbotrobot on 11/25/2003 07:54:02 PM MST  
6 comments

21. [how many volts dose it take to charge?](#) ([Quarantine Zone](#), [Batteries](#))

posted by scagger2002 on 11/25/2003 05:01:43 PM MST  
2 comments

22. [diy batteries](#) ([Homebrewed Electricity](#), [Batteries](#))

posted by bigdan on 11/23/2003 11:53:35 PM MST  
6 comments

23. [Dry Battery](#) ([Homebrewed Electricity](#), [Batteries](#))

posted by Tim C on 11/22/2003 10:26:08 PM MST  
4 comments

24. [Fork lift batteries](#) ([Homebrewed Electricity](#), [Batteries](#))

posted by Guerreiro on 11/21/2003 10:31:40 AM MST  
1 comment

25. [Forklift Battery](#) ([Homebrewed Electricity](#), [Batteries](#))

posted by bruce1 on 11/20/2003 12:23:26 PM MST  
3 comments

26. [Equalization charge](#) ([Homebrewed Electricity, Batteries](#))

posted by bruce1 on 11/19/2003 09:24:57 AM MST  
1 comment

27. [Batteries -- What voltage should my SLA battery read when fully charged?](#) ([Renewable Energy FAQ, Batteries](#))

posted by kurt on 11/19/2003 08:32:24 AM MST  
0 comments

28. [Full voltage of gel cell?](#) ([Homebrewed Electricity, Batteries](#))

posted by zmoz on 11/18/2003 03:39:15 PM MST  
4 comments

29. [proper battery venting](#) ([Homebrewed Electricity, Batteries](#))

posted by Budgreen on 11/17/2003 01:02:51 PM MST  
4 comments

30. [Will this battery ever recover?](#) ([Homebrewed Electricity, Batteries](#))

posted by Norm on 11/17/2003 04:25:18 AM MST  
5 comments



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[Is 15.3 volts too high to leave my batteries charging?](#) | 2 comments  
(2 topical, 0 editorial)

battery charging - ([none / 0](#)) (#1)  
by VermontMaple on Sat Jan 3rd, 2004 at 02:05:49 PM MST  
([User Info](#))

Zmoz

Charging batteies is a tricky business. And floating them for an extended period is even a harder. I have had a lot of experience over the past decade floating lead acid batteries. Most trickle style battery chargers have some minimum current always being fed to the battery . This is fine for a short time (1 week or so) however if you are not cycling your batteries...like most off the off-grid poeple do, you will boil out the acid in your battery. Many years ago I had a very useful conversation with a battery engineer at C&D corporation about proper charging and maintenance of lead acid batteries. His advice is as follows. Never allow the float voltage of the charging device exceed the natural float voltage of the battery. The natural float voltage of the battery can be found by initaly charging the battery very hard for enough time that you are satisfied it is fully charged..The battery will usually be warm/hot...for a standard car style battery charge it at about 10amps (about 1/10 to 1/3 of the amp hr rating of the unit 60-100 amp/hrs for car batteries = 6 to 10 amps) And charge it for about 24 hours. The voltage of the unit should be well above 14 volts at the end of the charge cycle. Now let the battery rest for 15 minutes after removing the charger, then measure the voltage of the battery (to 2 decimal places if possible). This is the natural charged voltage of this particuluar battery. Set the voltage out on your charging unit not to exceed this voltage. If the battery is kept at this voltage it will not evaporate its electrolyte, and be always ready for use.

As for paralleling batteries, one will usually discharge the other until the lowest voltage unit is at its natural voltage. If the battery have the same natural voltage (or very close +\_ .1 volts) than they can be paralleled without a problem.

Stacking, paralleling batteries is a complex subject. Whenever possible stack/parallel batteries from the same lot if possible or at least the same capacity and age. There are tricks using fuses as swamping resistors (and saftey devices) to help better stacking/paralleling...but I will save that for a future post if anybody is interested.

[Is 15.3 volts too high to leave my batteries charging?](#) | 2 comments  
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[Is 15.3 volts too high to leave my batteries charging?](#) | 2 comments  
(2 topical, 0 editorial)

battery charging - ([none / 0](#)) (#1)  
by VermontMaple on Sat Jan 3rd, 2004 at 02:05:49 PM MST  
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Zmoz

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Re: battery charging - ([none / 0](#)) (#2)  
by bob golding ([yubba at clara dot net](#)) on Sat Jan 3rd, 2004 at 04:38:59 PM MST  
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[Is 15.3 volts too high to leave my batteries charging?](#) | 2 comments

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posted by zmoz on 11/25/2003 08:05:45 PM MST  
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10. [Full voltage of gel cell?](#) ([Homebrewed Electricity](#), [Batteries](#))

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posted by zmoz on 08/28/2003 08:24:13 PM MST  
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26. [How deep is too deep for auto batteries?](#) ([Homebrewed Electricity](#), [Batteries](#))

posted by zmoz on 08/25/2003 02:48:07 PM MST  
5 comments

27. [Can I charge a sealed lead acid with this?](#) ([Homebrewed Electricity](#), [Batteries](#))

posted by zmoz on 08/21/2003 04:27:57 PM MST  
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posted by zmoz on 08/20/2003 02:52:53 PM MST  
6 comments

29. [Is there anything I can do for a dead SLA?](#) ([Homebrewed Electricity](#), [Batteries](#))

posted by zmoz on 08/14/2003 02:47:43 PM MST  
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30. [Whoops...how do I put the alternator back together?](#) ([Homebrewed Electricity](#), [Alternators](#))

posted by zmoz on 08/14/2003 02:24:01 PM MST  
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[Is 15.3 volts too high to leave my batteries charging?](#) | 2 comments  
(2 topical, 0 editorial)

Re: battery charging - ([none / 0](#)) (#2)  
by bob golding ([yubba at clara dot net](#)) on Sat Jan 3rd, 2004 at 04:38:59 PM MST  
([User Info](#))

you could try draining the acid after you have fully charged them. never tried it but batteries will keep for years like this. just pour the acid back in in spring. no charging, no freezing, and you can just forget about them till you need them. do a google on battery maintainance, its all there somewhere.:-) bob

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[connecting 12 Volt Batteries.](#)

By [mmulzer](#), Section [Homebrewed Electricity](#)  
Posted on Thu Jan 1st, 2004 at 11:08:22 AM MST [Batteries](#)

Somebody help??If I conect several Batteries inline,will I still have a 12 Volt Battery or ??????

[conecting 12 Volt Batteries.](#) | 5 comments (5 topical, 0 editorial)

Re: conecting 12 Volt Batteries, ([none / 0](#)) ([#1](#))  
by [stm](#) on Thu Jan 1st, 2004 at 11:30:00 AM MST  
([User Info](#))

You can connect 2 or more 12v bateries in parallel if you need more amphours (connect the poles + to +, and - to -).

By connecting the bateries in parallel you will still measure 12v between + and -. - and your bateries will be charged/used simultaneously. - a lot of people use this method of doubling the capacity of the batery to power their home/cabin in the periods without sun and wind.

If you make a series connection on 2 bateries (+-+-) your result will be 24 volt using the same batery.

/Steffen

Re: conecting 12 Volt Batteries, ([none / 0](#)) ([#3](#))  
by [mmulzer](#) on Thu Jan 1st, 2004 at 11:53:20 AM MST  
([User Info](#))

Hi Steffen,you saved my life,I think.As you can see from my Question,electricity is not my strong point.Am building(Or trying to)windturbin for my Sons Farm and my Farm in Ecuador.Sons Farm 3500 meters high,mine on the Beach.Lots of Wind.Thanks for help Heinz

[ [Parent](#) ]

Re: conecting 12 Volt Batteries, ([none / 0](#)) ([#2](#))  
by [catfish](#) on Thu Jan 1st, 2004 at 11:31:30 AM MST  
([User Info](#))

yes. your 12 volts here is a constant ( tho your meter may read 10 to 14). the added batteries simply add time/load you may draw from your pack between charges. good luck.

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Re: connecting 12 Volt Batteries, ([none / 0](#)) (#4)  
by mmulzer on Thu Jan 1st, 2004 at 11:58:34 AM  
MST  
([User Info](#))

Hey Catfish, Thanks for the info, greatfull, Happy New Year. Heinz

[ [Parent](#) ]

Re: connecting 12 Volt Batteries, ([none / 0](#)) (#5)  
by bob golding ([yubba at clara dot net](#)) on Thu Jan 1st,  
2004 at 03:47:12 PM MST  
([User Info](#))

its worth remembering that the batteries should all be the same type or around the same age at least. the reason for this is that if one battery has a dead cell all the charge will leak away though this cell and flatten them quickly. if you cant measure the voltage on each cell, should be between 1.9 to 2.4 or thereabouts depending on the type, at least test all the cells with an hydrometer. bob

[connecting 12 Volt Batteries.](#) | 5 comments (5 topical, 0 editorial)

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### [Exploding Lithium-Ion Batteries](#)

By [wooferhound](#), Section [Homebrewed Electricity](#)  
Posted on Wed Dec 31st, 2003 at 01:03:51 PM MST [Batteries](#)  
an artical I found about batteries that have Thermal Runaway

I was looking at an artical I found at <http://slashdot.org> talking about Lithium-Ion batteries that explode from Thermal Runaway caused when the batteries are heated like being in the trunk of a car. [http://www.infoworld.com/article/03/12/19/500Preality\\_1.html](http://www.infoworld.com/article/03/12/19/500Preality_1.html) They are also mentioning Lithium-Ion Batteries that weigh 60 pounds.

} - Woof -{

[Exploding Lithium-Ion Batteries](#) | 1 comment (1 topical, 0 editorial)

Re: Exploding Lithium-Ion Batteries ([none / 0](#)) (#1)  
by bob golding ([yubba at clara dot net](#)) on Wed Dec 31st, 2003 at 04:04:24 PM MST  
([User Info](#))

hi tim i rember the fire safety equipment for lithuim batteries when i worked in an electronics factory. it had a sort of cone to put over the fire and a bucket of sand as wel all on a trolley. thought ermm that looks serious. think lithuim is a bit like magnesium when it burns. bob

[Exploding Lithium-Ion Batteries](#) | 1 comment (1 topical, 0 editorial)

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### [Can I see sulfation on battery plates?](#)

By [zmoz](#), Section [Homebrewed Electricity](#)  
Posted on Sun Dec 28th, 2003 at 08:19:53 PM MST [Batteries](#)

I wrestled the battery out of my boat today to store it in the garage for the winter and charge it up.

(it's a starting battery) I would guess it's at least 3-4 years old, but I don't really know as it was in the boat when I bought it. I opened up the cell caps to check the water level - it looks like there is something white flaking off of the plates. Is that bad? Also the acid in one of the cells looks a bit more cloudy than the others...I'm guessing it's not supposed to be?

[Can I see sulfation on battery plates?](#) | 7 comments (7 topical, 0 editorial)

Re: Can I see sulfation on battery plates? ([none](#) / [0](#)) (#1)  
by [bill541](#) on Sun Dec 28th, 2003 at 08:40:14 PM MST ([User Info](#))

You sure can, lead sulfate is a white scale that builds up on the plates and can sluff off.

In a starting battery this age, a certain amount is normal, but it does degrade the performance. You could try a full charge cycle and then check the electrolyte using a hydrometer. All cells should read the same. The exact reading on the hydrometer is based on the electrolyte mix used by the manufacturer, it does vary.

If any of the plates are exposed, just add enough distilled water to cover the plates, then charge the battery.

Hope this helps, Bill

Re: Can I see sulfation on battery plates? ([none](#) / [0](#)) (#3)  
by [wooferhound](#) ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Mon Dec 29th, 2003 at 02:32:24 PM MST ([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

What happens if you add ordinary Tap Water to the batteries, instead of distilled water, like the last time that I topped off my battery ?

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Re: Can I see sulfation on battery plates?

([none / 0](#)) ([#5](#))

by Electric Ed on Mon Dec 29th, 2003 at 07:41:56 PM MST

([User Info](#)) <http://www.electric-ed.com>

I've heard that minerals, especially iron, will increase the rate of self-discharge.

Electric Ed

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Re: Can I see sulfation on battery plates? ([none / 0](#))

([#2](#))

by zmoz on Mon Dec 29th, 2003 at 12:44:45 PM MST

([User Info](#))

Alright, I let the battery charge overnight @ 1 amp. When I checked it this morning with the charger still attached it read 15.5 volts. I'm guessing that's bad too? :) Do any of those products you put into the battery acid actually work to help the sulfation?

Re: Can I see sulfation on battery plates? ([none / 0](#))

([#4](#))

by kell on Mon Dec 29th, 2003 at 06:39:54 PM MST

([User Info](#))

There was a charging circuit posted here a while ago that is supposed to help freshen up a sulfated battery. I don't know how to post diagrams but I'll describe the circuit. You need a full bridge rectifier rated for at least a couple hundred volts peak inverse voltage. Basically you are running rectified line power (120 v) into the battery, but you limit current by simply feeding the ac into the bridge through a capacitor. The capacitor should have a voltage rating of at least a couple hundred volts. The capacitance determines the current. For a fairly big battery you could go for a few dozen uF (microfarads).... it's not an exact thing; just monitor current and voltage. Attach the dc output of the bridge to the battery. Keep an eye on the battery voltage so you don't overcharge it. You can do a couple of discharge/recharge cycles. The cap needs to be non-polarized. There's also a way to use polarized capacitors and diodes to pass ac, but I won't go into that here.

In effect this is a constant-current high voltage pulse charger, so the monitoring is important because it will overcharge your battery if you don't watch it.

Re: Can I see sulfation on battery plates? ([none / 0](#))

([#6](#))

by Scott on Tue Dec 30th, 2003 at 07:14:14 PM MST

([User Info](#))

Remove the charger before checking the battery voltage.  
You're probably reading the voltage that the battery  
charger is putting out rather than the actual battery voltage.

Re: Can I see sulfation on battery plates? ([none](#)

[/ 0](#)) ([#7](#))

by paulpic on Fri Jan 2nd, 2004 at 04:28:18 AM MST

([User Info](#))

Have a look here, there is lots of info on desulfators  
and battery stuff.

<http://pub36.ezboard.com/bleadacidbatterydesulfation>

<http://www.shaka.com/~kalepa/lowpower.htm> Paul

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## [Maintaining two batteries with one charger?](#)

By [zmoz](#), Section [Homebrewed Electricity](#) [Batteries](#)

Posted on Sat Dec 27th, 2003 at 07:26:33 PM MST

Would it be ok to leave two batteries on the same trickle charger?

Right now I have two car batteries sitting in my garage - one is brand new from my totaled Jeep, the other is from my boat. Both will be sitting in my garage until summer. I don't really want to buy one of those fancy battery maintainers for them. I have a 1 amp trickle charger...would it be ok to wire the batteries in parallel and hook the charger to them both? And then just leave it plugged in until summer? The batteries are different sizes...if that makes any difference.

[Maintaining two batteries with one charger?](#) | 10 comments (10 topical, 0 editorial)

Re: Maintaining two batteries with one charger?  
([none / 0](#)) ([#1](#))  
by [bill541](#) on Sat Dec 27th, 2003 at 08:42:53 PM MST  
([User Info](#))

Usually when connecting two batteries in paralell, they must be of the same type and age. You can get away with it as long as you know your charger will never fail and that both batteries have the same voltage when bridging them together. I would not recommend doing this in your situation.

Since they are of different types (one starting battery the other a deep cycle?)you would probably be better off with an isolator between them and then connect that to the trickle charger.

Since you are only using a 1A charger, a couple of schottkey diodes could serve as the battery isolator. Connect both diode anodes together and then connect them to the battery charger positive lead. Connect the cathode (has the stripe) ends of the diodes to the battery + leads. One diode to one battery. Then you can connect both battery neg leads to the charger neg lead.

The diodes should be rated at =>25 PIV, and say 3 Amps to be safe. The diodes prevent any charge current going from one battery to the other and will allow for imbalances during charging.

There will be a small voltage drop across the diodes, but at least they wont go dead during storage.

Take care, Bill

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- [Also by zmoz](#)

Re: Maintaining two batteries with one charger?

([none / 0](#)) (#2)

by zmoz on Sat Dec 27th, 2003 at 09:29:44 PM MST

([User Info](#))

They are both starting batteries. The boat battery isn't a marine battery either, and is at least a few years old. Would it be better maybe to leave the charger on one battery, and change it to the other battery every week or so?

Re: Maintaining two batteries with one charger?

([none / 0](#)) (#3)

by witapple on Sat Dec 27th, 2003 at 10:02:16 PM MST

([User Info](#))

I have float charged several different types of batteries (same voltage) in parallel after making sure they were all fully charged and all of acceptable integrity. To the best of my knowledge there were no problems. They were all in great condition in the spring so i assumed it worked fine.  
Dan W

Re: Maintaining two batteries with one charger?

([none / 0](#)) (#4)

by desertratjack on Sat Dec 27th, 2003 at 10:03:14 PM MST

([User Info](#))

No harm in trying to do what you want. If you find they are "imbalanced", then charge them alternately or do the shotky diode thing. It is good that you intend to charge them at all. If they are older batteries there is a possibility they won't make it 6 months even with the best care.

Re: Maintaining two batteries with one charger?

([none / 0](#)) (#5)

by zmoz on Sat Dec 27th, 2003 at 10:23:58 PM MST

([User Info](#))

So a continuous .5 amp charge for several months won't be a problem for these batteries?

Re: Maintaining two batteries with one charger? ([none / 0](#)) (#7)

by bill541 on Sat Dec 27th, 2003 at 11:13:11 PM MST

([User Info](#))

zmoz,

It is a good thing that you are keeping the batteries on a maintenance charge while storing them. Most people do not, and they should. You can keep the batteries on a continuous float charge around 13.8 VDC for a 12-volt flooded battery. You can remain at this charge rate for a long time with no damage.

All you will be trying to do is make up for the self-discharge of the battery. If your charger levels off at around 13.8 VDC, then very little current will be flowing into the batteries and you will be below the gassing voltage.

It would be a good idea to check the electrolyte level now and again to make sure the plates stay wet. Your idea of swapping the charger manually between the two would work equally well as the battery isolator, just requires a bit of labor now and then.

Take care, Bill

[ [Parent](#) ]

Re: Maintaining two batteries with one charger?  
([none / 0](#)) (#6)  
by kell on Sat Dec 27th, 2003 at 11:07:28 PM MST  
([User Info](#))

Long term you want to float; that's even less than a trickle charge. I'd check with an ammeter.

Re: Maintaining two batteries with one charger?  
([none / 0](#)) (#8)  
by zmoz on Sat Dec 27th, 2003 at 11:16:49 PM MST  
([User Info](#))

Alright...thanks guys. I'll charge them both up separately first, and then hook them up together. I will check the voltage/amperage after a couple days...

Re: Maintaining two batteries with one charger? ([none / 0](#)) (#9)  
by Seth on Mon Dec 29th, 2003 at 11:29:34 AM MST  
([User Info](#))

buy 2 2n4001 diodes from radio shack..... use them as a battery isolator....

I can't make you a pic.. but I'm sure Tom or Mech could.  
Since you have only 1A of charge.. those diodes will handle the current fine.

[ [Parent](#) ]

Re: Maintaining two batteries with one charger? ([none / 0](#)) ([#10](#))  
by Harry Luubovv on Tue Dec 30th, 2003 at 07:03:18 PM MST  
([User Info](#))

Hi Zmoz,

I do not recommend trickle charging two very different capacity ratings of battery with one set of charge leads even when one is not a deep cycle bat. As the high capacity bat will certainly discharge into the smaller cap bat, aside from what's going into the small cap bat from the charger itself. This will make the large bat unfull at times while the small bat receives more than its share of trickle charge. Aside from that, nothing's wrong with hooking them all together from one charger. But be sure that the polarities are hooked up the same between 2 bats !! Otherwise you will get some pretty high sparks !! Explosion is a possibility since the wet fluid inside the bat can be flammable especially during charge, even at slow charge and hotter weather or hotter room temperature.

But you don't really have to keep the charger on everyday during winter. Since this wears out the transformer inside the charger and other components. And if you are on alternative energy scheme, you are wasting off more electricity than you need to. I would recommend trickle charging perhaps 3 days in a week. But have them on charge every day of the week if the weather gets to be very very cold, or if the bats are old old bats.

At last if anyone wants small capacity diodes at about one amp, I have tons of them new. I will send them to you free in an airmail envelope, they are small enough anyway. I am not going to bother charging for them since they are about a dollar or two each. In other words, I am not going to charge anything that you are going to use to charge something else with, this will become double charge :-). Just say so on this board, give your email or street address, or your proxy email address or your proxy street address.

Hey Yo, be nice,  
be the best dice.  
Be my friends,  
again,  
be your neighbour's friends.  
Again,  
be friends to yourself.  
Luubovv.

[ [Parent](#) ]

[Maintaining two batteries with one charger?](#) | **10** comments (10 topical, 0 editorial)

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## [Gel Cells](#)

By [JohnS](#), Section [Homebrewed Electricity](#)

Posted on Sat Dec 27th, 2003 at 04:57:42 PM MST

[Batteries](#)

An offer too good to miss.

Hi all, I have been offered 24 Tungstone Challenger plus 2volt 400Ahr Gel Cell batteries free for the taking. They were used as a 24 volt dc supply for a gas turbine control system which is now redundant. They are about 5 years old, have never been used in anger, were kept fully charged by a large industrial microprocessor controlled charger and had 6 monthly checks carried out by the battery vendor. Before I say yes to the offer, would they be suitable for my wind genny and if they are, are their any special requirements for charging / maintaining gel cells. i.e. maximum voltage, equalising charge. Any info or guidance would be appreciated.

John S.

[Gel Cells](#) | 3 comments (3 topical, 0 editorial)

Re: Gel Cells ([none / 0](#)) ([#1](#))

by kurt on Sat Dec 27th, 2003 at 05:53:15 PM MST

[\(User Info\)](#)

look here

<http://www.fieldlines.com/story/2003/8/11/182542/847>

<http://www.fieldlines.com/story/2003/8/11/105255/518>

<http://www.fieldlines.com/story/2003/7/16/122142/109>



Re: Gel Cells ([none / 0](#)) ([#2](#))

by zmoz on Sat Dec 27th, 2003 at 07:23:35 PM MST

[\(User Info\)](#)

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- [Also by JohnS](#)

No, you don't want any of that crap. Have them box 'em up and send them to me for proper disposal. :-D

Re: Gel Cells ([none / 0](#)) ([#3](#))  
by RobD on Sun Dec 28th, 2003 at 08:46:59 AM MST  
([User Info](#))

They will work. I suggest looking up the manufacturer for their charging guidelines.  
RobD

[Gel Cells](#) | 3 comments (3 topical, 0 editorial)

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## NiMH Batteries

By [Tom in NH](#), Section [Homebrewed Electricity](#)

Posted on Fri Dec 26th, 2003 at 09:07:53 AM MST

[Batteries](#)

How would they be for solar PV apps?

Is anyone out there able to tell me about the potential of Nickle Metal Hydride batteries in solar PV applications? They seem to have a lot of kick in my power tools that use them. Do they offer advantages that make the extra cost worthwhile? How do they stack up against Lead Acid batteries in terms of power consuming, cycling and charging? Anyone know of any WWW links to NiMH design info? --Tom

[NiMH Batteries](#) | 6 comments (6 topical, 0 editorial)

Re: NiMH Batteries ([none / 0](#)) ([#1](#))

by [drdongle](#) on Sat Dec 27th, 2003 at 05:48:01 AM MST  
([User Info](#))

I don't think I have ever seen them in sizes large enough to be useful for RE installations. That is I have never seen one larger than a "D" battery. They are superior to conventional Lead Acid, Alkaline, and NiCad batteries for current delivery and storage.

Dr.D

Re: NiMH Batteries ([none / 0](#)) ([#2](#))

by [Norm](#) on Sat Dec 27th, 2003 at 07:04:48 AM MST  
([User Info](#))

Ever have any experience with the Rayovac 3 in 1 charger for AA and AAA NiMH batteries? When I first got the charger I plugged it in at like 8:00 AM...24 hrs later the lights were still on so I E-Mailed a representative and he said that they had to go thru a kind of a 'break in cycle', something like you charge them for about 12 hrs. use them for awhile...charge, use...charge, use 2 or 3 times, then charge until the lights go out(red indicator lights on the charger go out that is...) so I usually charge them after ('breaking them in)till all the indicator lights go out..most of the time some of the indicator lights go out a couple of hours before the others...and they do get really warm (good hand warmers) aside from this they seem to be really rugged little critters. I use them mostly in my digital camera. I've been reading that they do have some rapid chargers. Norm.

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- [Also by Tom in NH](#)

Re: NiMH Batteries ([none / 0](#)) ([#3](#))  
by Tom in NH on Sat Dec 27th, 2003 at 07:39:34 PM MST  
([User Info](#))

I was thinking of maybe wiring up a bank of NiMH cells to make a 12 volt battery pack on the order 75 amp/hours. I found some good info on how to charge NiMH cells at <http://www.powerstream.com/NiMH.htm> Powerstream also has info on NiCd's which may prove to be a better choice given the costs involved.

The info at Powerstream suggested that warming of NiMH batteries can be caused by the production and reabsorbtion of oxygen at the end of the charge cycle and it can be taken as a sign that charging is complete. --Tom

Re: NiMH Batteries ([none / 0](#)) ([#4](#))  
by zmoz on Sat Dec 27th, 2003 at 10:26:07 PM MST  
([User Info](#))

I think the biggest problem with NiMh here would be the self discharge rate - about 1% per day. Much much more than with lead acid batteries.

Re: NiMH Batteries ([none / 0](#)) ([#5](#))  
by elvin1949 ([elvin1949@wmconnect.com](mailto:elvin1949@wmconnect.com)) on Fri Jan 2nd, 2004 at 04:01:21 PM MST  
([User Info](#))

god morning  
look up electric race cars  
the fastesed drag car does 300mph plus  
on NiMH batteries in aa size [lots of them]  
don't remember where on the web i  
saw this  
later elvin

Re: NiMH Batteries ([none / 0](#)) ([#6](#))  
by elvin1949 ([elvin1949@wmconnect.com](mailto:elvin1949@wmconnect.com)) on Fri Jan 2nd, 2004 at 04:02:38 PM MST  
([User Info](#))

good morning  
look up electric race cars  
the fastesed drag car does 300mph plus  
on NiMH batteries in aa size [lots of them]  
don't remember where on the web i  
saw this  
later elvin

[NiMH Batteries](#) | 6 comments (6 topical, 0 editorial)

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### [AGM battery-last rights?](#)

By [Mike Wolak](#), Section [Homebrewed Electricity](#)  
Posted on Tue Dec 23rd, 2003 at 04:30:04 PM MST [Batteries](#)  
Dynasty AGM 12-140 absorbed glass mat battery.

Dynasty AGM 12-140 absorbed glass mat battery. These battery's appeared new but used. Looking inside the battery was dried, no water level at all. Charging these battery's they never charge over 10 volts. I decided to fill the battery's with water. The battery charged to 12 volts, but when applying a load from the batter tester they showed dead. Is this battery dead? Did I kill them applying water? Is the car battery tester to much of a load for this type of battery? So gang what you say?

Have a happy holiday, stay warm, may the sun shine down on your solar panels!

Mike  
N8JGU

[AGM battery-last rights?](#) | 17 comments (17 topical, 0 editorial)

Re: AGM battery-last rights? ([none / 0](#)) ([#1](#))  
by [kell](#) on Tue Dec 23rd, 2003 at 08:21:37 PM MST  
([User Info](#))

Is this a lead-acid battery? Maybe you should have put battery acid in it.

Re: AGM battery-last rights? ([none / 0](#)) ([#8](#))  
by [Mike Wolak](#) on Fri Dec 26th, 2003 at 09:02:57 PM MST  
([User Info](#))

This is a AGM battery ups12-140 dynasty.

[ [Parent](#) ]

Re: AGM battery-last rights? ([none / 0](#)) ([#2](#))  
by [N9WOS](#) on Tue Dec 23rd, 2003 at 08:36:06 PM MST  
([User Info](#))

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Be careful how much you put in.  
I have revived a few AGM batteries back to full health  
by adding water, But you can put too much water in.

When you look in the batteries, you should see  
the top of the plates, and the fiberglass separators.  
You add JUST enough CLEAN water to saturate the  
fiberglass separators.  
You don't want ANY free liquid water in the batteries.

Then close the top vents and give a good healthy EQ  
charge.  
Some times, it takes a while before the battery will start  
taking charge again.

The water content of AGM batteries is lost over time.  
You only want to bring the water content back up to what  
it was when it came from the factory.

Do NOT add acid.  
It already has all the acid it needs, locked in the plates.  
With that type of battery, you can't dump out the acid and  
add fresh water, if the acid content is too high.

And there is no chance it lost any acid by leaking, so  
There is no reason to add any more.

If the battery plates had sulfated (from drying out) to the  
point  
That it won't accept a charge after you add water, then the  
Battery is too far gone to worry about.

Re: AGM battery-last rights? ([none / 0](#)) (#5)  
by Mike Wolak on Fri Dec 26th, 2003 at 08:45:58  
PM MST  
([User Info](#))

They were dry. I filled them over the plates just a  
quarter inch from top of fill hole. Should I only  
dampened the plates or do they swim in water?  
These were used in UPS telecom application. They  
were never used, appear new, dry. I am using a  
Sears car charger, plain, 2-6 amp charger. Had the  
charger on for 48 hours. The battery is a Dynasty  
ups12-140 battery. I hear about glass matt  
recirculates hydrogen back to water. Is my flooding  
of these so called dried battery's wrong?

[ [Parent](#) ]

Re: AGM battery-last rights? ([none / 0](#))  
(#9)  
by N9WOS on Fri Dec 26th, 2003 at 11:12:30  
PM MST  
([User Info](#))

Yes, it is not the proper way to fill them.

I will give you a detailed description of an AGM battery, and why they are designed like they are.

The main problem with a flooded battery is they will pour out acid when damaged, and they can't be used in any position beside right side up. Other wise, they will pour our electrolyte. (acid)

The GEL cell batteries were the first ones to get past that problem. They are basically the same as a normal flooded cell, but they use a silica gelling agent in the electrolyte to immobilize it. That way, you can crack the case and you don't have to worry about total electrolyte loss, and damage to other equipment from the lost electrolyte. And you can use the gel cell in pretty much any position.

Problems with the gel cell. You can only charge it so fast, and so much. If you charge it too fast, or overcharge it, bubbles will form in the electrolyte, and the electrolyte will dry out. That will almost permanently damage the battery. You can only discharge it so fast, If you discharge it to fast, you will also cause bubbles and heating of the electrolyte, which will permanently damage the battery

The AGM battery is a relatively new design as batteries go. It is also know as a starved electrolyte battery. They use a dense fiberglass mat in-between the plates and around the plates, between the edges of the plates and the case. The matting provides support for the plates ,acts as a plate separator, and provides a way to immobilize the electrolyte. It acts more like a flooded cell. It can handle the same quick discharges that the flooded cell can. It can tolerate quick charges, and moderate overcharging, without much damage. And yet, you can turn it upside down, or what ever, and you have no worry about spilling electrolyte.

The electrolyte level is critical. There is just enough electrolyte in the battery to saturate the fiberglass. There is two ways to fill a new AGM battery. The first is by carefully measuring out the electrolyte, to the exact amount that the design requires, then dumping that in each cell.

The second is completely overfilling the battery

and letting the bubbles work out of the matting, then dump ALL the extra electrolyte back out, then seal the battery.

Both ways, you get about the same result. When a new battery is put into service, it will have a break in period. With the glass mat fully saturated, there will be no gas cavities in the matting for gas recombination to occur . So, during the first charge cycles, the battery will vent a moderate amount of gas. As the battery loses electrolyte from gassing, air pockets form in the fiberglass. After enough pockets form, gas recombination (in the pockets) becomes more apparent, and gassing becomes almost non existent. When you refill the battery, you want to restore the original factory condition. That is put only enough water in the battery to totally saturate the fiberglass, and nothing more.

DO NOT put acid in the battery. The acid content of the original electrolyte is still in the battery, that is something that can't be lost, unless the case is cracked. It is just locked in the plates, in the form of sulfate. When you add water and charge the battery, you pull the sulfate out of the plate and turn it back into sulfuric acid.

If you add too much water, there isn't enough sulfur in the plates to bring the acid content up to working level.

If the battery has sit too long, uncharged, it will suffer from the same thing any other lead acid battery will suffer from. The sulfate in the plates will crystallize and the battery can be rendered useless.

That is why I say, if you fill them to the proper amount, and try charging them, but they won't take any charge at all, then forget about it, they are dead.

If they take a little charge, then try cycling them to see if you can bring them out of their hiatus.

I have found that it is best to refill the level on AGM batteries before they totally die from drying out. If you wait until they totally stop working, then the plates have probably crystallized beyond use. So replacing the missing water will be of no use.

[ [Parent](#) ]

Re: AGM battery-last rights? ([none / 0](#)) ([#10](#))  
by Mike Wolak on Sat Dec 27th, 2003 at 06:01:47 PM MST  
([User Info](#))

Thank you. I now have a total visual. I will empty the battery's apply charge and see how it goes. I will update on the results. I have 10 of these batteries they all took a charge but didnt last when applying a load. I will empty the over fill of water, the AGM have been soaking for a week. Lets see how this goes. I now understand AGM.

Thank you

[ [Parent](#) ]

Re: AGM battery-last rights? ([none / 0](#)) ([#13](#))  
by Mike Wolak on Sun Dec 28th, 2003 at 02:48:44 PM MST  
([User Info](#))

Hey it works! I emptied the battery, put a EQ charge (14.7VDC) on for 24 hours, more liquid appeared after charging occured. I will empty the extra bubbling water (electrolite). It charged well, put the load tester on it and yes it held a good charge. (Chicago Electric Battery Tester). I have 9 more of these batterys to go. I will take some PIC's for all to see. It was a good freebe!

Thank You

[ [Parent](#) ]

Re: AGM battery-last rights? ([none / 0](#)) ([#14](#))  
by N9WOS on Sun Dec 28th, 2003 at 04:06:20 PM MST  
([User Info](#))



Do not empty the extra liquid while charged.

It contains a moderate portion of the sulfuric acid.

If it is just a small amount, leave it.

The extra water will vent in the form of gassing,

during the charging, and the liquid level should be able to work it's self back to normal.

(ie) Vent enough water to form a few air pockets in the

Fiberglass to allow for recombination.

If there is a large amount of free water in the cells.

FULLY discharge the battery.

And make sure it's dead flat.

That will put the sulfur back into the plates,

and turn the electrolyte back to almost pure water.

Then you can dump the water without losing any of the acid content.

[ [Parent](#) ]

Re: AGM battery-last rights? ([none / 0](#)) (#15)  
by Mike Wolak on Sun Dec 28th, 2003 at 04:15:58 PM MST  
([User Info](#))

Thank you. Here are some pics of the battery plant that was given to me. The 60 volt chargers, four of them were used in parallel and series for a 120VDC plant. I'm only using 12 VDC plant.





[ [Parent](#) ]

Re: AGM battery-last rights? ([none / 0](#))  
([#16](#))  
by N9WOS on Sun Dec 28th, 2003 at 05:11:22 PM MST  
([User Info](#))

The battery should be fine.  
The rise in fluid level is a result of all the gas bubbles trapped in the fiberglass from the heavy charging.  
After a few hours, the gas bubbles should dissipate and the fluid level should go back to normal.

**SAFETY NOTE.**  
Please keep the valves in place during charging and use.  
One function they provide is explosion prevention.  
If the vapor above the battery ignites, it will prevent the flame from propagating into the cell cavity.  
That will stop the battery from exploding if a spark ignites the vapor above the battery.

The dynasty battery uses plug type valves.

The AGM battery that the charger is setting on (gray case battery) Uses a rubber cap for the venting valve.

Both types of valves provide the same function.  
They isolate the cell

cavity from the outside  
to stop flame  
propagation into the  
cell.

And they raise the  
pressure of the cell to  
promote  
gas recombination by  
the fiberglass mat.

[ [Parent](#) ]

Re: AGM  
battery-last  
rights? ([none /](#)  
[0](#)) ([#17](#))  
by Mike Wolak  
on Sun Dec  
28th, 2003 at  
06:57:20 PM  
MST  
([User Info](#))

The gray battery  
is a gell cell,  
another freebe  
from one of my  
Ham friends that  
work for the  
power company.

They have to  
change out these  
battery's even if  
good. I removed  
the battery from  
under the  
charger. If you  
looked at my  
postings you  
would see that  
I'm getting ready  
to set up a  
battery bank  
charged by a  
solar panel  
running a  
inverter. Looked  
you up on ARRL.

Thanks Bennett!

[ [Parent](#) ]

Re: AGM battery-last rights? ([none / 0](#)) ([#3](#))  
by Seth on Wed Dec 24th, 2003 at 01:49:20 AM MST  
([User Info](#))

Did u get this off of ebay ???

Re: AGM battery-last rights? ([none / 0](#)) (#6)  
by Mike Wolak on Fri Dec 26th, 2003 at 08:52:15  
PM MST  
([User Info](#))

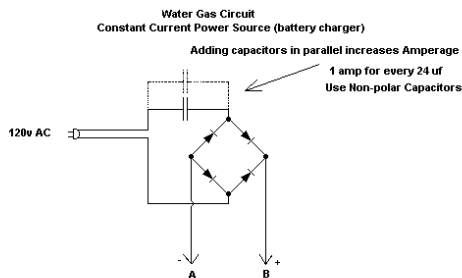
No, they were given to me from work. I'm in telecom.

[ [Parent](#) ]

Re: AGM battery-last rights? ([none / 0](#)) (#4)  
by charged on Wed Dec 24th, 2003 at 06:55:15 AM MST  
([User Info](#))

You probably diluted the acid when you filled the cells.

Put this across the battery and let it run for a while. This particular circuit can be used to very neatly desulfate supposedly "dead" batteries that won't take normal charging anymore.



This circuit should have connections A and B shorted together for storage.  
Circuit produces "constant current" pulsed D.C.  
The output voltage only rises to a potential sufficient to allow current to flow through the load.  
This means that if you leave A and B in an "open circuit" configuration, the voltage will reach maximum (120 v).  
This circuit works GREAT for charging car batteries and can even de-sulfate "dead" batteries.  
It works well for producing "watergas" because it only raises the voltage to the potential necessary to force current through the acid solution.

I've revived small 12v SLA batteries by flooding with deionized water and running a SMALL version (< 100ma) on them until most of the water was gassed off. Then, I SHOOK them to get the remaining liquid (concentrated electrolyte) back into the matting.

They now take a full charge as if it had never happened.

This circuit uses the capacitor's reactive component to get nearly 100% charging efficiency from the incoming AC waveform. This translates to a bit better than 80% efficiency when charging lead-acid. Go ahead, check it with a watt-hr meter.

The voltage might climb quite high on a severely sulfated battery. I've had some go up to 70v or more for short periods of time before falling back into normal charging range.

Leave your cell caps OFF so that all the gas can be fully ventilated ASAP. Shorted plates can cause sparks and you don't want any hydrox gas mix sealed into the cells if this happens. It gets messy.

All the usual "use this at your own risk" disclaimer whot-not applies.

Re: AGM battery-last rights? ([none / 0](#)) (#7)  
by Mike Wolak on Fri Dec 26th, 2003 at 09:02:00  
PM MST  
([User Info](#))

This is scary. Were rectifying 120vac to out put 120vdc pulsating. Won't this cook the 12 volt AGM battery? Or is this used to fry off sulfating and the battery will only take 12.7 volts and rest of energy is turned to heat or gas? Still a little confused, we have battery chargers that out put around 14 volts. A rise of 2 volts, this application of applying 110 volts over normal charge is bogging. Could you give a little more info for me to understand.

[ [Parent](#) ]

Re: AGM battery-last rights? ([none / 0](#))  
(#11)  
by charged on Sun Dec 28th, 2003 at  
12:59:56 AM MST  
([User Info](#))

Think of it in terms of total current flow.

Forget the voltage for just a moment.

What you have is a capacitor that is limiting the total current flow by restricting the amount of charge that can pass through the circuit during each part of the AC cycle.

I've charged every kind of battery I can think of using that same circuit with different capacitor values.

Using small 200v poly caps, 3uf will give you approximately 100ma from 110VAC line.

If any of the battery cells have a major physical flaw that's preventing normal charging, this charger is not what you want to use.

But, if the cell is simply sulfated, it will clean it up.

You can charge one battery at a time. Or you can put them in series and place on them. The current flow will remain the same while the voltage will be reactively adjusted to match the total battery voltage and maintain that current flow.

Watch a watt-hr meter and you'll see that the wattage used increases as you add more batteries in series.

[ [Parent](#) ]



Re: AGM battery-last rights? ([none / 0](#)) (#12)  
by Mike Wolak on Sun Dec 28th, 2003 at 02:42:44 PM MST  
([User Info](#))

now that makes sense, this capacitor is a current limiting device before the rectifier. Not a filter after the recitifier. I'll try this.

Thank You

[ [Parent](#) ]

[AGM battery-last rights?](#) | 17 comments (17 topical, 0 editorial)

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### [System set up ?](#)

By [iceman](#), Section [Homebrewed Electricity](#)  
Posted on Thu Dec 18th, 2003 at 08:34:23 PM MST [Batteries](#)  
Need some help..

I have 8 batteries at 75 AH 12 volt  
I have a Specialty Concepts mark 111/15  
I have a Inverter 3000 watt input 10 to 15 vdc.  
I have a Trace Engineering C30  
I have a pelton turbine with a Delco GM alternator  
2500 feet of 4 inch PVC pipe dropping 700 feet  
And a gen set.  
I have a basic picture of how to wire up the system  
from this web page  
Basic Home Power System Diagram.  
<http://www.absak.com/diagram/general/index.html>

I have some questions ?? as I have never done this  
before  
and am really new to this.

Do I wire battery up in series ?  
Can I use the S.C mark 111/15 ?  
What is and how do i wire in a shunt  
Do I need one ?  
Trace Engineering C30 charge controller ??

I am doing this for a friend and this is the parts  
He has so far..  
I know we still need some more but I understand the  
rest I think at this point.  
Just need a bit of help to get started.

Want to try to just run the batteries for a bit then  
recharge  
with gen then hook up turbine and try it all  
Then put gen inline also when I find a AC transfer  
switch.

Maybe a little bit of a wiring drawing or something

Thanks guys...

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[System set up ?](#) | 5 comments (5 topical, 0 editorial)

Re: System set up ? ( <a href="#">none / 0</a> ) ( <a href="#">#1</a> ) by drdongle on Thu Dec 18th, 2003 at 10:11:34 PM MST ( <a href="#">User Info</a> )
--

If it's to be a 12v system all your batteries need to be in parallel.

What is a mark 111/15?

A shunt is usefull for mesuring the current to and from the batterys.

Dr.D

Most of what you need to know about shunts:

([none / 0](#)) ([#2](#))

by TomW on Thu Dec 18th, 2003 at 10:28:14 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Here is a page I did on shunts. You do not need to get one from Rat Shack.

<http://oneota.com/~earthsourcepowr/shunts.html>

Cheers.

TomW

[Stuff I have Online](#)

[Contact Me](#)

Re: System set up ? ([none / 0](#)) ([#3](#))

by iceman on Fri Dec 19th, 2003 at 07:28:50 PM MST  
([User Info](#))

So do i realy need a shunt to try things out ??  
or do you run the turbine throught the shunt to  
the battery ??????grrrr

Re: System set up ? ([none / 0](#)) ([#4](#))

by wdyasq on Fri Dec 19th, 2003 at 07:36:48  
PM MST  
([User Info](#))

What you really need is someone who understands what all the parts are for and where they go. It would help if he were close enough to observe and advise.

Magic smoke is expensive,  
Ron

[ [Parent](#) ]

Re: System set up ? ([none / 0](#)) ([#5](#))

by iceman on Sun Dec 28th, 2003 at  
10:55:26 AM MST  
([User Info](#))

Nice comment.....

I am trying to understand all the parts and where they all go. I thought this site was all about learning and understanding this stuff...

[ [Parent](#) ]

[System set up ?](#) | 5 comments (5 topical, 0 editorial)

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### [How should I store my battery?](#)

By [zmoz](#), Section [Homebrewed Electricity](#)  
Posted on Thu Dec 18th, 2003 at 03:47:43 PM MST [Batteries](#)

Tuesday night I totaled my truck. :( The battery, however, is still good and is only a month old.

Tuesday night I totaled my truck. :( The battery, however, is still good and is only a month old. I don't have a use for it right now, but I'm not going to leave it in there for the insurance agent to tow away. :) If I'm going to let it sit, possibly a year or more...what should I do? I don't really want to spend any money to keep it, but I do have a 1 amp trickle charger. Should I leave that on it? Should I put it on a timer so it charges for an hour or two every day? Should I just let it charge up once a month?

Thanks

[How should I store my battery?](#) | 6 comments (6 topical, 0 editorial)

Re: How should I store my battery? ([none / 0](#)) (#1)  
by Demetri ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Thu Dec 18th, 2003 at 04:49:16 PM MST  
([User Info](#))

Zmoz- Sorry to hear about your truck. Did you get hurt?

First, make sure it's well charged. Then cover the vent holes and clean it with a light baking soda/water solution, this will eliminate acid on the outside of the battery that can conduct electricity, which will discharge the battery. Then figure out where you're gonna stash it; don't worry about cement floors. Cool and dry is best. If you can spare the \$\$, get an actual battery maintainer or solar panel type charger. Harbor Freight has the solar panel types for ten bucks or so, if you catch the sale. If not, your trickle charger will work, on a couple hours a week. Hook up the maintainer, then let it be. Make sure you check the water just as often as you would if the battery were in actual service.

Demetri  
Always be the lead dog.

Re: How should I store my battery? ([none / 0](#)) (#2)  
by zmoz on Thu Dec 18th, 2003 at 06:10:13 PM MST  
([User Info](#))

I'm a little sore...but I'll be ok. (hit the ground hard enough to break the front axle in half) What if I dumped all the acid out of it, and stored it dry? Although I guess I've never heard of anyone doing that before, so it must be a bad idea. :)

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Re: How should I store my battery? ([none / 0](#))

([#5](#))

by troy on Fri Dec 19th, 2003 at 10:01:59 AM MST

([User Info](#))

The only time you can store a flooded lead acid battery in the dry state is when it is newly manufactured (ie before they ever add electrolyte.)

Once it's filled, if you drain it and let it dry out, it's shot.

Don't forget that used electrolyte is loaded with heavy metal contamination and lead poisoning will cause brain damage. So disposal is an issue.

Boy I'm just full of good news today!

Anyway, good luck and have fun!

troy

[ [Parent](#) ]

Re: How should I store my battery? ([none / 0](#)) ([#3](#))

by Demetri ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Thu Dec

18th, 2003 at 10:58:19 PM MST

([User Info](#))

Glad you're okay.

I've only heard of storing a battery dry, never actually done it or seen it done. If I was going to, I'd dump the acid, fill with distilled water, charge for a bit, dump the water, refill with water, charge, then dump and let it dry. I wouldn't do this. Too much hassle, still have to buy more acid, and possible damage to the battery. Just put a solar charger on it and let it be. Make sure and keep the battery clean while it's in storage, and make sure the terminals can't be shorted by a dropped wrench or the like. I prefer to keep it in a battery box, \$8-\$10 for a group 24.

Now, what could be done, and I'm not suggesting I would(wink wink), is take the battery back to the place of purchase and claim it is bad. If it's only a month old, I'm sure they'll give you your money back. When the time comes, buy another battery. Battery storage problem solved. HTH

Demetri

Always be the lead dog.

Re: How should I store my battery? ([none / 0](#)) ([#4](#))

by zmoz on Fri Dec 19th, 2003 at 12:12:05 AM MST

([User Info](#))

Funny you should say that. :) Now that I think about it, the battery is about 2 months old, and I accidently ran it completely dead overnight once. I think I'll take it back and at least get a new replacement...the sticker on the side says it's already a year old.

Re: How should I store my battery? ([none / 0](#))  
(#6)  
by Harry Luubovv on Wed Dec 31st, 2003 at  
04:41:16 PM MST  
([User Info](#))

I am sorry Zmoz, but if it were me, I'll hang onto things such as integrity and such. Honesty best, it is just material thing, it is not worth it to lie to get something from others that you know you do not deserve.

I am sorry, I can support you wholeheartedly on your projects or anything else but ..... So please excuse me for talking when not asked.

Please do not pour out the acid liquid from a battery once it is there, this is not a good practice. Putting new acid in is not the same as using the original first set of acid when the bat was new.

Ciao,  
Luubovv  
PS : Happy New Year Zmoz !

[ [Parent](#) ]

[How should I store my battery?](#) | 6 comments (6 topical, 0 editorial)

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### [Battery shunt set up ?](#)

By [iceman](#), Section [Homebrewed Electricity](#)  
Posted on Thu Dec 18th, 2003 at 12:11:22 AM MST

[Batteries](#)

Hello  
Hey all I am new to this and need some help.

I am trying to set up a power system and can not figure out the shunt part.

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[Battery shunt set up ?](#) | 5 comments (5 topical, 0 editorial)

Re: Battery shunt set up ? ([none / 0](#)) ([#1](#))  
by [iceman](#) on Thu Dec 18th, 2003 at 12:18:47 AM MST  
([User Info](#))

Having trouble will not let me post it all ?

I have A Specialty Concepts mark 111/15  
it has battery then a number bar under it 9 up to 15 D.C. volts  
under that it has solar panel then a number bar under that 0 to 15 D.C. amperes.  
It also has a fuse and a charging light  
It has 3 wires a red yellow and a black  
how and where to i hook this up  
Is it like a shunt

RE:Having trouble will not let me post ([none / 0](#)) ([#4](#))  
by [Norm](#) on Thu Dec 18th, 2003 at 04:54:27 AM MST  
([User Info](#))

When you submit a posting right at the start you have bulleted instructions one of them starts out:

Text in the INTRO box (which shows on the front page) is limited to 30 words or less  
...so just type in a short sentence in the INTRO box even tho' it is as big as the EXTENDED copy box  
that is just below it, type the main part of your text in the EXTENDED copy box. This should solve the  
problem. (:>) Norm.

[ [Parent](#) ]

Re: Battery shunt set up ? ([none / 0](#)) (#2)  
by iceman on Thu Dec 18th, 2003 at 12:21:29 AM MST  
([User Info](#))

Having trouble will not let me post it all ?

I have A Specialty Concepts mark 111/15  
it has battery then a number bar under it 9 up to 15 D.C. volts  
under that it has solar panel then a number bar under that 0 to 15 D.C. amperes.  
It also has a fuse and a charging light  
It has 3 wires a red yellow and a black  
how and where to i hook this up  
Is it like a shunt

Re: Battery shunt set up ? ([none / 0](#)) (#3)  
by jimU on Thu Dec 18th, 2003 at 04:39:33 AM MST  
([User Info](#))

Hello Iceman...

I am surprised that when you went to the Specialty Concepts site, that you didnt see  
the pdf file on your controller.

[http://www.specialtyconcepts.com/SPECIALTY\\_CONCEPTS\\_PDF\\_FILES/SC3\\_15\\_INSTRUC\\_MANUAL.PDF](http://www.specialtyconcepts.com/SPECIALTY_CONCEPTS_PDF_FILES/SC3_15_INSTRUC_MANUAL.PDF)

JimU

[ [Parent](#) ]

Re: Battery shunt set up ? ([none / 0](#)) ([#5](#))  
by iceman on Sun Dec 28th, 2003 at 10:56:52 AM MST  
([User Info](#))

Thanks guy  
missed it....

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[Battery shunt set up ?](#) | 5 comments (5 topical, 0 editorial)

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## [Weird problem with SLA battery](#)

By [drdongle](#), Section [Weird Science](#)

Posted on Thu Dec 11th, 2003 at 07:03:27 PM MST

[Batteries](#)

Reverse polarity??

I encountered a weird problem today with a relatively new SLA battery one of my clients has been using. It seems that the battery which has been working properly has swapped polarity. To clarify the Positive terminal is now negative and the negative terminal is now positive. At first I thought that I had a shored battery when I hooked it to the charger and it popped the circuit breaker, then I tested it with my meter and then I thought that my meter was wacky. I verified that the meter was working properly.

Has any one ever heard of this?

Dr.D

[Weird problem with SLA battery](#) | 4 comments (4 topical, 0 editorial)

Re: Weird problem with SLA battery ([none / 0](#)) (#1)  
by [RobD](#) on Fri Dec 12th, 2003 at 05:00:30 AM MST  
([User Info](#))

Dr. D,

I've seen it with Ni-Cads. Gel sells are lead acids with a gel replacing the acid. Two things to watch for are over charging and over draining. Over charging causes the gasses to escape through a one way valve and this eventually dries out the battery. My hunch is your customer ran the batts into the 'mud' or there is something off in the charging system. Check with the battery maker and look at their charging data. Not all gel cells use the same charging data. The problem is most gel cells charge to a specific voltage, usually 14.7 then go to about 14.1 volts float. This is why they are difficult in wind systems.  
RobD

Re: Weird problem with SLA battery ([none / 0](#)) (#2)  
by [jubalearly](#) on Fri Dec 12th, 2003 at 12:42:26 PM MST  
([User Info](#))

I accidently reverse charged a gell cell once. It won't maintain normal voltage or very much capacity for long that way. I never did get it straightened out, even after a slow & complete discharge using a resistor and several slow complete charges with the correct polarity.

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Re: Weird problem with SLA battery ([none / 0](#)) (#3)  
by acenergydfw on Fri Dec 12th, 2003 at 06:16:06 PM  
MST  
([User Info](#))

I work on UPS and Emergency Lighting Units and have seen this occur usually from a high impedance battery. The battery string tries to provide current to the load which is low impedance and the total string voltage ends up across the high impedance battery. If it stays like that long enough the batt will be permanently reversed. We had one on an ELU that went to 80vdc when we tried to run the inverter. If you only had 24 or 48 vdc total in the string and it tried to support the load with a weak batt, I could see this happening. Did the reversed batt have any current capacity? Put a load on just that one and see if doesn't drop it's voltage really quick. You might want to check the low dc cut-off on the load(s). Low DC cut-off is critical to protect batteries from being discharged below a recoverable level, usually about 1.67 volts per cell or 10v on a 6 cell (12v) SLA. I also have used reverse charging to recover weak batteries, works pretty well on small NiCds. You just give a quick discharge from a capacitor in the reverse direction a few times and it may take a charge again. You have to be careful with SLAs and use a current limited supply.  
HTH,  
Mel

Re: Weird problem with SLA battery ([none / 0](#)) (#4)  
by drdongle on Fri Dec 12th, 2003 at 09:31:38 PM  
MST  
([User Info](#))

I can't really answer these questions as the battery has been returned for warranty replacement. This is the only battery in the system to ever have this happen though, and we have been running it several years (not a RE system). Actually they are being used to power a TV camera and UHF transmitter on a thrill ride.

Dr.D

[ [Parent](#) ]

[Weird problem with SLA battery](#) | 4 comments (4 topical, 0 editorial)

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[22 batteries 48 volt bank.](#)

By [Jerry](#), Section [Homebrewed Electricity](#)

Posted on Tue Dec 9th, 2003 at 11:24:47 PM MST

[Batteries](#)

This is my 48 volt battery bank.

I just did an upgrade to copper bars instead of wire jumpers. These are 24 volt aircraft batteries. There are 20 in the picture there is an equivalent to 6 more out of view the total amp/hrs is 546.

I charge these with 2 separate 24 volt sources. Out of view on a shelf above is a 3500 watt sine wave inverter. I would like to see other folks systems also.



JK TAS Jerry

[22 batteries 48 volt bank.](#) | 12 comments (12 topical, 0 editorial)

Re: 22 batteries 48 volt bank. ([none / 0](#)) ([#1](#))  
by [zubbly](#) on Wed Dec 10th, 2003 at 04:05:39 AM MST  
([User Info](#))

hi Jerry. lovely battery bank. i hope Santa will bring one of those for Christmas.

what was your source and what made you decide on aircraft batteries?

zubbly

Re: 22 batteries 48 volt bank. ([none / 0](#)) ([#3](#))  
by [Jerry](#) on Wed Dec 10th, 2003 at 10:22:14 AM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

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There is a local aircraft service center here. I guess the FAA will only allow so many HRs on aircraft batteries. I've done some house trading with a guy who knows a guy. One of those things. They are rated 42 amp hrs at 24 volts. They are 85 lbs each.

JK TAS Jerry

[Airheads Page](#)

[ [Parent](#) ]

Re: 22 batteries 48 volt bank. ([none / 0](#)) ([#2](#))  
by RobD on Wed Dec 10th, 2003 at 07:57:41 AM MST  
([User Info](#))

How do you water those batteries? They look very tightly packed to me. Are they sealed?  
RobD

Re: 22 batteries 48 volt bank. ([none / 0](#)) ([#4](#))  
by Jerry on Wed Dec 10th, 2003 at 10:28:09 AM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

They are a sealed gell cell. They were used in helicopters. Because of this they are very rigid and reliable. The guy I got these from said the first time he saw one a guy was welding with it. I believe that cause when I accidentally shorted the terminals there was quite a fire ball.

I think some folks here have said this type of battery is not good for RE use but I got them cheap and they've been working great for me.

JK TAS Jerry

[Airheads Page](#)

[ [Parent](#) ]

Re: 22 batteries 48 volt bank. ([none / 0](#)) ([#5](#))  
by Chuck on Wed Dec 10th, 2003 at 03:14:49 PM MST  
([User Info](#)) <http://www.greeley.net/~cmorrison>

Since you asked...



These are 1/2 of the 2880 AH of telco type batteries I have in the shed. There are two 24v strings in the shed. The other 1/2 is identical and located to the left of the photographer. They're about 2 feet deep and stack about 3 ft high and 4 feet wide per string. 3000 lbs per.

These are also ones that are "not recommended" for RE use. I think the main reason people shy away from them is they don't like to be deep cycled. IMHO if you have enough amp hours available, you don't have to deep cycle them.

Chuck

Re: 22 batteries 48 volt bank. ([none / 0](#)) ([#6](#))  
by [Budgreen](#) on Wed Dec 10th, 2003 at 07:31:32 PM MST  
([User Info](#))

well, here we go (beware dialup)

to many batteries





to few racks



these racks will hold 24 of the 60 cells I have, each is rated at 2v200AH so the total in my basement when i finish getting it hooked up will be 24v@400Ah

Re: 22 batteries 48 volt bank. ([none / 0](#)) ([#7](#))  
by Jerry on Wed Dec 10th, 2003 at 08:37:39 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hey thanks a bunch guys. See this is what I'm talkin about. I love see, in what the other folks are a doin. I think its a inspiration to all of. So gime more.

JK TAS Jerry

[Airheads Page](#)

[ [Parent](#) ]

Re: 22 batteries 48 volt bank. ([none / 0](#)) ([#9](#))  
by Budgreen on Thu Dec 11th, 2003 at 06:43:46 AM MST  
([User Info](#))

oops, what I meant to say was my total system will eventually be 24v@1000Ah when i find the space to mount it all. gotta love the work in progress stuff

[ [Parent](#) ]

Re: 22 batteries 48 volt bank. ([none / 0](#)) ([#8](#))  
by BT Humble ([za2bb@optusnet.com.au](mailto:za2bb@optusnet.com.au)) on Wed Dec 10th, 2003 at 10:54:18 PM MST  
([User Info](#)) <http://www.geocities.com/za2bb/>

1100Ah @ 24VDC (at the 10 hour rate).



You can see the rest of the system at <http://www.geocities.com/za2bb/solar/>

BTH

Re: 22 batteries 48 volt bank. ([none / 0](#)) ([#10](#))  
by wpowokal on Thu Dec 11th, 2003 at 07:12:16 AM MST  
([User Info](#))

24v system, 8 banks of 660 ah Excide flouded lead acid.  
[http://66.140.203.100/gallery/allan/power\\_in\\_out\\_small](http://66.140.203.100/gallery/allan/power_in_out_small)

regards Allan

Re: 22 batteries 48 volt bank. ([none / 0](#)) ([#11](#))  
by wpowokal on Thu Dec 11th, 2003 at 07:15:42 AM MST  
([User Info](#))

Ops wrong pic, try this.

<http://66.140.203.100/gallery/allan/batteries2>

[ [Parent](#) ]

Re: 22 batteries 48 volt bank. ([none / 0](#)) ([#12](#))  
by BT Humble ([za2bb@optusnet.com.au](mailto:za2bb@optusnet.com.au)) on Thu Dec 11th, 2003 at  
07:14:04 PM MST  
([User Info](#)) <http://www.geocities.com/za2bb/>

Nice Exide Faure-X collection! (I thought I was the only guy using them!)

That's a nice shelving system too. I've been thinking about how to arrange mine once I move, and you've given me a few ideas. ;-)

BTH

[ [Parent](#) ]

[22 batteries 48 volt bank.](#) | 12 comments (12 topical, 0 editorial)

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### [Electric Car?](#)

By [Mike Wolak](#), Section [Homebrewed Electricity](#)

Posted on Mon Dec 8th, 2003 at 12:13:59 PM MST

[Batteries](#)

Electric Car?

Ok, make fun. I can take it. I have this 1995 GM Pontiac Tran Van (dust buster) all fiberglass body with a blown engine. Yes I have this issue of throwing out things (pack rat). I am dreaming of removing the engine and replacing with electric. Is there sites about this? Any tips, knowledge, jokes, ideas. Hate to give car away to charity. Its still a nice ride. So dieing to hear your thoughts.

[Electric Car?](#) | 7 comments (7 topical, 0 editorial)

Re: Electric Car? ([none / 0](#)) ([#1](#))  
by [RobD](#) on Mon Dec 8th, 2003 at 12:36:32 PM MST  
([User Info](#))

Hi Mike,  
What's the weight? Stick or automatic?  
RobD  
Everyone on this board is a pack rat!!

Re: Electric Car? ([none / 0](#)) ([#2](#))  
by [Mike Wolak](#) on Mon Dec 8th, 2003 at 02:04:22 PM MST  
([User Info](#))

automatic i think it was a 2600 engine

[ [Parent](#) ]

Re: Electric Car? ([none / 0](#)) ([#3](#))  
by [RayW](#) on Mon Dec 8th, 2003 at 02:35:27 PM MST  
([User Info](#))

Try this site. [www.electroauto.com](http://www.electroauto.com)  
RayW

Re: Electric Car? ([none / 0](#)) ([#4](#))  
by [BT Humble](#) ([za2bb@optusnet.com.au](mailto:za2bb@optusnet.com.au)) on Mon Dec 8th, 2003 at 05:41:14 PM MST  
([User Info](#)) <http://www.geocities.com/za2bb/>

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- [Also by Mike Wolak](#)

<http://www.homepower.com> has a few pages in every issue devoted to electric vehicles, could be worth a look.

BTH

Re: Electric Car? ([none / 0](#)) (#5)  
by veewee77 on Mon Dec 8th, 2003 at 06:42:32 PM MST  
([User Info](#))

[www.electroauto.com](http://www.electroauto.com) is where I'd start. . .

DS

Re: Electric Car? ([none / 0](#)) (#6)  
by Tommy L on Mon Dec 8th, 2003 at 11:46:04 PM MST  
([User Info](#))

Hi !

Some inspiration? , take a look at  
<http://www.austinev.org/evalbum/>

/ Tommy L

Re: Electric Car? ([none / 0](#)) (#7)  
by hardwired on Tue Dec 9th, 2003 at 09:17:03 PM  
MST  
([User Info](#)) <http://www.sulltek.com>

Check out the book, Bob Brant: Build Your Own  
Electric Vehicle, it's an invaluable source if you want  
to build an EV.

[ [Parent](#) ]

[Electric Car?](#) | 7 comments (7 topical, 0 editorial)

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## [Voltage monitor designed for batteries](#)

By [Reno](#), Section [Homebrewed Electricity](#) [Batteries](#)

Posted on Sun Dec 7th, 2003 at 08:44:17 AM MST

none

Has anyone seen these or are familiar with them would like some information.

<http://www.pc-s.com/chargers/LVD12-LVD24.PDF>

[Voltage monitor designed for batteries](#) | 0 comments (0 topical, 0 editorial)

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## [Chemical Rejuvenation Of Batteries](#)

By [bruce1](#), Section [Homebrewed Electricity](#)

Posted on Fri Dec 5th, 2003 at 07:37:42 AM MST

[Batteries](#)

Has anyone used something like this?

Isn't there some sort of chemical that is marketed for use in batteries, to desulfate them, or rejuvenate them somehow? I've seen stuff before in the past, is it any good or a waste of money? Any names come to mind.

I have some forklift batteries that I've been cycling to see if they are good. I think they are OK, but I know they could be better.

Thanks, Bruce

[Chemical Rejuvenation Of Batteries](#) | 9 comments (9 topical, 0 editorial)

Re: Chemical Rejuvenation Of Batteries ([none / 0](#)) ([#1](#))  
by Norm on Fri Dec 5th, 2003 at 08:46:33 AM MST  
([User Info](#))

Charged comment on <http://www.fieldlines.com/story/2003/11/17/42518/034> a way to desulphate batteries. Norm.

Re: Chemical Rejuvenation Of Batteries ([none / 0](#)) ([#2](#))  
by Nando on Fri Dec 5th, 2003 at 12:41:37 PM MST  
([User Info](#))

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- [Also by bruce1](#)

There is a Food additive that has been used by me many times to rejuvenate batteries is called EDTA (ethylenediaminetetraacetic acid).

Unhappily, this food additive has been used for about 30 years to do CHELATION in humans, so it makes it difficult to get it cheaply, a true cost is about 50 to 75 cents of a dollar per pound ( in a sac of 100 pounds ), but you have to be well known by the company to sell it to you.  
Or you can buy a lb for about 10 dollars or so.

The last time I used it, I bought it from TRAILHEAD SUPPLY 1-800-226-6630 , I do not know if they are still in business.

Best way get boiling water and start dissolving the EDTA until you saturate the amount of water you have ( a car battery may take 1/3 lb total, equally dividing the liquid into 6 parts -- I used a large Plastic Syringe to place around 100-150 CC in each cell.

I let the battery stand for about 48 hours, then I start to charge at around 10 % of amp capacity for a long time -- several days, until all the cells show equal voltage ( few millivolts down from a new cell). I used a small drill to perforate the inter-cell links covering to be able to read each cell voltage. The last one I did could not take charge, not even start a car after a charge, after the treatment it has been working beautifully for the last 5 years and still strong.

THERE IS ANOTHER SYSTEM TO DO THE SAME JOB and it is an ELECTRONIC DESULFATOR a small pulse generator that is attached to the battery that after many hours of work; the sulfates are practically removed and the battery is rejuvenated.

I do both EDTA then ELECTRONIC DESULFATION-

Regards  
Nando

Re: Chemical Rejuvenation Of Batteries ([none / 0](#)) ([#3](#))  
by bruce1 on Fri Dec 5th, 2003 at 12:54:25 PM MST  
([User Info](#))

Norm, have you built the component on the site  
<http://bbs.vtdl.net/I-/KEELYNET/DIAGRAMS/WATGAS1.GIF?>

I need to know a partnumber of that part or parts, or where to get the parts. I'm not a whiz at reading that diagram and totally understanding if thats an easy to find component, or what it is, though I understand what a rectifier does. I'll need help with this one.

Thanks, Bruce

Re: Chemical Rejuvenation Of Batteries ([none / 0](#)) ([#4](#))  
by charged on Fri Dec 5th, 2003 at 02:08:44 PM MST  
([User Info](#))

Radio Shack Bridge rectifier, part #276-1181a, 250v 6amp rating, or something similar.

The capacitor is just a "motor run" capacitor for an AC induction motor. These are available from a bunch of different places.

www.digikey.com should have some. Every 24uf of capacitance will give you about 1amp average current from a 110vac line.

[ [Parent](#) ]

Re: Chemical Rejuvenation Of Batteries ([none / 0](#)) ([#5](#))  
by kell on Fri Dec 5th, 2003 at 08:17:37 PM MST  
([User Info](#))

How do you tell the difference between start and run caps? I live in a major metropolitan area where I can find trashed air conditioners and other equipment just by walking down the street, so getting the caps free is no problem, but I need to know what I'm looking for.

Re: Chemical Rejuvenation Of Batteries ([none / 0](#)) ([#6](#))  
by kell on Fri Dec 5th, 2003 at 08:20:39 PM MST  
([User Info](#))

Here's a link to a commercial product sold through JC Whitney:

<http://www.jcwhitney.com/webapp/wcs/stores/servlet/ProductDisplay?productId=31&catalogId=10101&amp;langId=-1&storeId=10101>

Re: Chemical Rejuvenation Of Batteries ([none / 0](#)) ([#7](#))  
by bruce1 on Sat Dec 6th, 2003 at 08:13:26 AM MST  
([User Info](#))

Thanks for the info everyone. Has anyone used the Chemical additive from JC Whitney?

Also, I'm having trouble finding that capacitor for the electric desulfator. Digikey did not have one, I called their 800# and talking to a knowledgeable person. He thought maybe Grangier, and they have capacitors, but its all pretty Greek to me. Anyone know where I can find the capacitor? Thanks to the earlier note, I know the rectifier to use.

Thanks again, Bruce

Re: Chemical Rejuvenation Of Batteries ([none / 0](#)) ([#9](#))  
by elvin1949 ([elvin1949@wmconnect.com](mailto:elvin1949@wmconnect.com)) on Tue Dec 9th, 2003 at 03:28:30 AM MST  
([User Info](#))

i could not get into jcwhitney.com tonight  
i think what they sell is called vx-6  
will work sometimes i have used it  
later  
elvin

[ [Parent](#) ]

Re: Chemical Rejuvenation Of Batteries ([none / 0](#)) ([#8](#))  
by kell on Sat Dec 6th, 2003 at 11:11:40 AM MST  
([User Info](#))

Newark.com is one big electronics supplier, I don't think they have a minimum order. Make sure to specify ground shipping because their default shipping is the more expensive second-day. I know Allied Electronics has that kind of cap, bunches of them -- but they have a \$50 minimum order. Best for cheap stuff (surplus) is All Electronics ([allelectronics.com](http://allelectronics.com), I think). No minimum, \$6 shipping. I think I got some 22uF 450v caps from them a while back. Caps with wire leads, not the heavy duty cans like you see on motors, but they would still work. And way cheaper. Get their catalog. You might end up ordering more stuff from them. Mouser is another supplier, but their prices are like retail.



[Chemical Rejuvenation Of Batteries](#) | 9 comments (9 topical, 0 editorial)

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### Sharing info

By [Mike Wolak](#), Section [Homebrewed Electricity](#)  
Posted on Thu Dec 4th, 2003 at 10:06:13 AM MST

[Batteries](#)

#### Sharing Info

A neat source of surplus stuff. I am a ham radio operator and this site has many devices that could be used in RE. They have shunts, amp, volt meters. Old vibrators mechanical. What ever. This place is located in Ohio. Some item are over priced some not. Get on thier mailing list and get there catalog of sale items. Just a tip, lets all share the little shopping spots of our obsessions.

[www.fairradio.com](http://www.fairradio.com)

Thank You  
Michael  
N8JGU

[Sharing info](#) | 3 comments (3 topical, 0 editorial)

Re: Sharing info ([none / 0](#)) ([#1](#))  
by JW on Thu Dec 4th, 2003 at 10:29:02 AM MST  
([User Info](#))

Here's a good one.  
[www.cotronics.com](http://www.cotronics.com)  
-JW

Re: Sharing info ([none / 0](#)) ([#2](#))  
by drdongle on Thu Dec 4th, 2003 at 07:42:53 PM MST  
([User Info](#))

I have bought stuff from them perodicaly over the years, and even got to visit the store once, I love "clasic" surplus companys. There is NOTHING like a REAL surpluss yard.  
Dr.D

Re: Sharing info ([none / 0](#)) ([#3](#))  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Thu Dec 4th, 2003 at 08:55:37 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

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- [Also by Mike Wolak](#)

I really like the "Electronic Goldmine" ...

<http://www.goldmine-elec.com/>

} = - W o o f - = {

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### [SLA batts](#)

By [RobD](#), Section [Homebrewed Electricity](#)  
Posted on Mon Dec 1st, 2003 at 07:49:22 AM MST [Batteries](#)  
Anyone using SLA batteries?

I can get some used, in good condition, SLA batts. I was wondering if anyone is using them or has and gave them up for open lead acids?  
RobD

[SLA batts](#) | 5 comments (5 topical, 0 editorial)

Re: SLA batts ([none / 0](#)) ([#1](#))  
by kurt on Mon Dec 1st, 2003 at 08:28:49 AM MST  
([User Info](#))

[http://www.fieldlines.com/faq/re\\_faq](http://www.fieldlines.com/faq/re_faq)



Re: SLA batts ([none / 0](#)) ([#2](#))  
by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Mon Dec 1st, 2003 at 08:49:18 AM MST  
([User Info](#))

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- [Also by RobD](#)

Forcefield magnet magnate MattB has about 3000 a/h of surplus SLAs from ChuckM installed at his place -- they went online a couple weeks ago. So far so good! We'll see how they perform, but my opinion is that if the SLAs are in good shape when you get them, and you use the proper regulator (in his case a c-40 set for SLAs) to prevent overcharging, they are probably just great. We've seen lots of dead SLAs, but I think they were murdered by the owners...you can't just add distilled water, so it's critical to not overcharge and boil them.

His SLAs were mounted in steel racks, horizontally. There are 4 racks, and each weighs about 800 lbs. We used an engine hoist to unload them from Chuck's truck into Matts. Matt stated that he used a variety of Mankind's most basic tools to unload them and get them up the hill to their spot underneath his house -- the lever, the fulcrum, the wheel, and the chainsaw :-)

DANF

PS -- the chainsaw was used to widen the doorway so they would fit thru!

PPS -- we'll try and get some pics posted.

Re: SLA batts ([none / 0](#)) (#4)  
by RobD on Tue Dec 2nd, 2003 at 08:35:33 AM MST  
([User Info](#))

Good Dan,  
You crack us up here with your sense of humor!

Where did Matt get his batts?  
I looked for the Surplus Center batts. Are they Surplus Center o Nebraska? I couldn't find them there.

[ [Parent](#) ]

Re: SLA batts ([none / 0](#)) (#5)  
by Chuck on Tue Dec 2nd, 2003 at 12:07:40 PM MST  
([User Info](#))  
<http://www.greeleynet.com/~cmorrison>

Hi Rob,

I picked up the batteries in Denver from a guy who was disposing of them for US West. Last I spoke with him it looked like he had made arrangements to have the rest (about 10 48v strings !) sold in mid november. If you are interested, contact me off list and I can make sure they're gone (or not). (See my web site for my email address)

Yes, it was Surplus Center of Lincoln, Neb. They might have sold them by now too.

Chuck



[ [Parent](#) ]

Re: SLA batts ([none / 0](#)) (#3)  
by Chuck on Mon Dec 1st, 2003 at 01:00:03 PM MST  
([User Info](#)) <http://www.greeleynet.com/~cmorrison>

I'm curious if the ones I (and Matt) have are the same type as you ask about. The ones we have are SLAs, but are specifically VRLA, or Valve Regulated Lead Acid. These are the type that Surplus Center was showing on their mail out flyer. They are huge in size, weight and capacity (1440 amp hours) and were made originally for telcos. They use a calcium paste on the plates rather than antimony that is used in most liquid lead acid type batts and should not be drawn down below 50% if you want them to last. They were designed to last 20 years and I'm hoping with care, they will.

I've been using my original set (12 2v cells strung for 24v) for the past couple years with 600 watts (rated) of solar panels and occasional wind from my homemade gennies. I use a c-40 for the wind and a Solar Boost 3048 for the PV. There is temperature compensation on both units as I don't have a constant temp where the battery is.

There are other SLAs that are completely sealed, including some car batteries. It would depend on the make and specific type as to how good they might be in RE applications.

The main thing about using SLAs, as DanF said, is to not abuse them. Never overcharge them as you would when equalizing a liquid lead acid battery, and try not to draw them down too low. Having said that, I've read a study done by East Penn (makers of the VRLA telco batts <http://www.eastpenn-deka.com/> ) which shows no discernable degradation of performance after several hundred complete discharge cycles, but I don't know if I really trust tests done in idealized conditions.

Chuck(M)

[SLA batts](#) | 5 comments (5 topical, 0 editorial)

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## [Making a drill battery pack - can I up the voltage a little?](#)

By [zmoz](#), Section [Homebrewed Electricity](#)

[Batteries](#)

Posted on Thu Nov 27th, 2003 at 01:36:36 PM MST

Can I run a 7.2v drill at 9.6v?

I have an old craftsman cordless drill, but the 7.2v battery pack has been long dead. I'm going to make a new one for it, although it will be external with a wire going to it. Am I going to kill the drill if I power it with 9.6v rather than the original 7.2v?

[Making a drill battery pack - can I up the voltage a little?](#) | 10 comments (10 topical, 0 editorial)

Re: can I up the voltage a little? ([none / 0](#)) ([#1](#))  
by Norm on Thu Nov 27th, 2003 at 03:50:23 PM MST  
([User Info](#))

I'm beginning to think that a low-voltage drill will burn up quicker than a higher voltage one...my neighbor got a 9 volt drill about the same time I got my 14 volt drill, both Craftsman, his lasted about 3-4 months just driving standard 1 inch wood screws. Mine is still goin' strong after 2 yrs of driving couple...3 hundred 3 and 4 inch deck screws. My next cordless is going to be an 18 volt or more...These baby's really pack a hunk of torque! I used to nail stuff together now I screw em together with deck screws...if I make a mistake I can always unscrew it and reposition.Fun! Norm.

Re: Making a drill battery pack - can I up the... ([none / 0](#)) ([#2](#))  
by zmoz on Thu Nov 27th, 2003 at 03:54:30 PM MST  
([User Info](#))

This drill won't be used that often...or put to work too hard, I've already got 4 others. :)

Re: Making a drill battery pack - can I up the... ([none / 0](#)) ([#4](#))  
by Norm on Fri Nov 28th, 2003 at 09:29:58 AM MST  
([User Info](#))

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Oh Well if you've already got 4 others....I'd sure try it, if the smoke gets out...it gets out! BTW where are you getting the cells to make this battery pack and are you just using the old shell and substituting ni-cads or whatever...? or making the whole thing from scratch? Norm.

[ [Parent](#) ]

Re: Making a drill battery pack - can I up the... ([none / 0](#)) ([#5](#))  
by zmoz on Fri Nov 28th, 2003 at 12:25:17 PM MST  
([User Info](#))

I'm going to put a coaxial connector jack in the casing of the drill to plug in an external battery pack made from NiMh AA batteries. Not the best option for a "cordless" drill, but better than throwing it away because replacement batteries cost more than a new drill. :-)

[ [Parent](#) ]

Re: Making a drill battery pack - can I up the... ([none / 0](#)) ([#7](#))  
by ThomasK on Fri Nov 28th, 2003 at 02:25:57 PM MST  
([User Info](#))

Hello to All,  
Myself have 5 units and i´ll repair the battpacks as needed.  
my opinion is that higher voltage will destroy the Drill and so i´d just repair it.  
But if you want to do so it is for a try - you´ll find it out.  
About the cable, What size? it seems that it will draw lot of amps under full load.  
When there is need for replacement of cells i have a few always on hand from so called surplus because after a while a specific type of Drill is sorted out of sale shops sell sometime Battpacks for cheap away where i live. This seems a good source for my tinkering with that problem.Also i´m trying to get Drills from scrap and / or Battpacks. Thats why i´m having 5 units. Exept 2 of them fit together, the others don`t.  
Have fun...  
Thomas

[ [Parent](#) ]

Re: Making a drill battery pack - can I up the... ([none / 0](#)) ([#8](#))  
by Norm on Sat Nov 29th, 2003 at 10:13:01 AM MST  
([User Info](#))

I think ThomasK has the best idea  
....making a batterypack with new cells  
from another incompatible batterypack,  
Some of the cells from a 9.6vdc battery  
pack might be the same size as the ones  
in the 7.2. Another good one that would  
probably work is a 6v sla 4Ah for  
PowerWheels like I got at a Walmart  
clearance sale for \$3 apiece (pretty good  
deal). I really don't think those AA NiMh  
will work out too good ...but you have  
got me to thinking about trying out a  
couple of things...I think I'll try 4 of those  
AA NiMh in a little cheap drill that is  
supposed to take 4 alkaline batteries and  
check the difference in power also a few  
other experiments with some of the other  
expendable cordless devices that I have  
laying around. Have Fun at any rate.  
Later...(:>) Norm.

[ [Parent](#) ]

Re: Making a drill battery pack  
- can I up the... ([none / 0](#)) ([#9](#))  
by zmoz on Sat Nov 29th, 2003 at  
02:43:54 PM MST  
([User Info](#))

The battery pack I am replacing is  
only 1.2AH NiCd, so 2AH NiMh AA  
batteries will still be quite an  
improvement. The main reason I  
wanted to use them is because,  
first I have about 30 of them that  
I'm not using, and I have a good  
charger already for them. I would  
have liked to rebuild the original  
batteries, but they are "versa-pack"  
batteries and they are inside of a  
metal tube, and I doubt I could  
ever get it back together if I took it  
apart.

[ [Parent](#) ]

Re: Making a drill battery  
pack - can I up the...  
([none / 0](#)) ([#10](#))  
by Norm on Sat Nov 29th,  
2003 at 09:29:44 PM MST  
([User Info](#))

Still be interesting how it  
turns out let us know how it  
turns out. Have fun! Norm.

[ [Parent](#) ]

Re: Making a drill battery pack - can I up the vol  
([none / 0](#)) (#3)  
by RobD on Thu Nov 27th, 2003 at 05:41:39 PM MST  
([User Info](#))

I'd say you probably could run it at 9 volts without  
problems.  
RobD

rebuilder ([none / 0](#)) (#6)  
by wdyasq on Fri Nov 28th, 2003 at 02:19:41 PM MST  
([User Info](#))

<http://www.primecell.com/>

[Making a drill battery pack - can I up the voltage a little?](#) | 10  
comments (10 topical, 0 editorial)

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[Do array of batteries want an equal distance to positives](#)

By [zbotrobot](#), Section [Homebrewed Electricity](#)  
 Posted on Tue Nov 25th, 2003 at 07:54:02 PM MST  
 What to know about wiring parallel batteries

[Batteries](#)

Thanks for you help, I have assumed that the wires to the positive posts all be of an equal distance, I end up with a bundle of 4 foot wires all fused together each wire goes to a positive post - the negative posts are all connected as they are. Two rows of batteries are arranged so that the negatives are close to each other while the positives are on the outside. This arrangement is also less likely to short if something stupid should happen - which has happened to me before. So the negatives have heavy wire wound around them with peices of foil pressed on the posts to insure against a poor contact. The equal distance of positives is the theory that when I charge/discharge a battery that each battery has no advantage over another.

I have noticed or imagined that corrosion occurs on the "first battery" if they are not wired in equal distances. This would seem be as if I was charging the first battery, then that battery would charge the next and so forth down the row.

A friend also theorized that the row of parallel batteries could also have the negative at the far end and the positive at the opposite end thus forcing an equalization as the electrons at the far ends would have to make the same effort as the ones in the center.

My question is what is the method, and also what should the diodes and fuses be on, the + or -. I have not noticed any differance. Lastly what direction if electricity considered a physical matirial? I had heard that it flowed from negative to positive. High speed phots of lightning show that one creates a path and then the other flows through that path. Please answer I appreciate it. Thanks alot otherpower and folks.

[Do array of batteries want an equal distance to positives](#) | 6 comments (6 topical, 0 editorial)

Batteries ([none / 0](#)) (#1)  
 by Demetri ([corvettemach1@yahoo.com](#)) on Tue Nov 25th, 2003 at 09:01:01 PM MST  
[\(User Info\)](#)

If you're using big enough cables, the distance between the batteries that are next to each other will make very little difference. I don't know what kind of terminals you have on your batts, but actual battery clamps and grease are a must for a good connection. Fuses are generally put on the positive post, but if you do good quality work and keep everything neat, they're not needed on each individual battery. There is a voltage drop through both diodes and fuses, I would be far more worried about that than equal length wires. Hope this helps, and good luck.

Demetri  
 Always be the lead dog.

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Do WHAT? ([none / 0](#)) (#2)

by wdyasq on Wed Nov 26th, 2003 at 04:52:18 AM MST  
([User Info](#))

your statement: So the negatives have heavy wire wound around them with peices of foil pressed on the posts to insure against a poor contact.

I'm not familiar with this techniqe. I am familiar with electrolysis, which occures when dissimilar metals can create a battery like reaction. I'll use a quote from this site :  
<http://www.metserve.co.za/Corrosion/Galvanic%20Corrosion.htm>  
as an example.

~~~~~  
In its most general meaning, galvanic corrosion is caused when two metal pieces, in electrical contact with each other, or two adjacent metal areas are at different electrochemical potentials. In this case the two metal parts will constitute a "galvanic cell", in which the metal part with the lowest electrochemical potential (i.e., the more active metal or metal area) will corrode. At the same time, the more noble metal part, with the more positive electrochemical potential, will be "cathodically protected" from corrosion.

~~~~~  
I don't know what - foil - you are using but I suspect Aluminum foil may be a poor choice.

Ron

equal distance to positives? ([none / 0](#)) (#3)

by drdongle on Wed Nov 26th, 2003 at 06:08:49 AM MST  
([User Info](#))

All good comments above, Distance isn't really a problem as long as the wires are heavy enough, use proper battery connections and battery terminal grease. The diodes usually are installed in the + line, though as it is a series circuit it will work either way. The convention for many years has been that current flows from + to - but physics determined that it in fact flows from - to +, but it doesn't really matter as long as proper consideration for polarity is observed when interconnecting devices.

Dr.D

hole theory ([none / 0](#)) (#4)

by JW on Wed Nov 26th, 2003 at 10:06:06 AM MST  
([User Info](#))

zbotrobot,

I found your last ques interesting, "which way to the electrons move? towards positive or negative" The answer is both, according to "electron theory" electrons move towards the negative terminal, and according to "hole theory" its the other way around, as the "holes" mirgate towards the positive ground. At one point hole theory was mainstream and as a result several positive ground systems were constructed for various tractors and very early automobiles. it seems 'hole' theory has been abandoned but its always interesting, at least for me, when I read about it.

If you want to stop corrision at the terminals, use those green and red round felts that they sell at the local autoparts store. they are to be mounted on clean battery terminals then the cable lugs mount on top of them just like usual, in cars these will keep the termials corrosion free for about three months depending on the enviroment, personally I just pour mountain dew on mine periodically, without the felts, but I have seen very good results with the felts as well.

-JW

[ [Parent](#) ]

Re: hole theory ([none / 0](#)) (#5)  
by Thomask on Fri Nov 28th, 2003 at 02:53:45 PM  
MST  
([User Info](#))

Hello JW,  
I`m interested in the thing you said in your post: " i pour mountain dew on mine periodically...- the soft drink? or is it a specific liquid which i not knew??  
Pls give more info!  
Thanks  
Thomas

[ [Parent](#) ]

Re: hole theory ([none / 0](#)) (#6)  
by JW on Mon Dec 1st, 2003 at 08:24:07 AM  
MST  
([User Info](#))

Hi Thomask,

Yes mountain dew, as in the soda pop, coca cola also works well, basically any carbonated soda pop. mechanics often use soda pop on really corroded battery terminals, sometimes its the only way to get the bolts loosened on the terminal lugs.

-JW

[ [Parent](#) ]

[Do array of batteries want an equal distance to positives](#) | 6 comments (6 topical, 0 editorial)

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[how many volts dose it take to charge?](#)

By [scagger2002](#), Section [Quarantine Zone](#) [Batteries](#)  
Posted on Tue Nov 25th, 2003 at 05:01:43 PM MST  
Will 8 volts charge 7.2V Battery?

If my generator produces 8 volts can I charge a 7.2V battery or should I make a 6V instead?  
I'm building a remote controled mini zero turn mower out of RC parts. It's going to have 3 deck motors with 5" blades and two wheel motors. I would like to make a nitro generator out of a twin in line motor set from a old RC boat. Thinking of 3 very effcent RC motors or 6V motors for the deck since I think I will only be able to produce 8V. If 8V would hold up 12V batterys for awhile, I would do that but I don'k know if the generators would do anything untill battery Voltage gose down to 8V. Another idea is to run the deck directly of the generator but I could only use one because I still need batterys for the rear drive wheels, the reciver and servos that will need charged to.

any advice?

Thanks,  
lawn boy

[how many volts dose it take to charge?](#) | 2 comments (2 topical, 0 editorial)

Re: how many volts dose it take to charge? ([none / 0](#)) (#1)  
by [scagger2002](#) on Tue Nov 25th, 2003 at 05:14:39 PM MST  
([User Info](#))

Also I was wondering if anyone knows of a better generator that is small but powerful enough to run 5 RC motors constantly from a nitro engine.I have to gear it down from 30,000RPM max. I would like to keep the engine down around 20,000 if it has enough power. What happens if I over spin the generator?

Re: how many volts dose it take to charge? ([none / 0](#)) (#2)  
by [jimuj](#) on Sun Jan 4th, 2004 at 02:05:54 PM MST  
([User Info](#))

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What type of renewable energy source are you looking to charge your batteries from??

Solar?  
Wind?  
Hydro??

let us know please :-)

JimU

[how many volts dose it take to charge?](#) | 2 comments (2 topical, 0 editorial)

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[diy batteries](#)

By [bigdan](#), Section [Homebrewed Electricity](#)  
 Posted on Sun Nov 23rd, 2003 at 11:53:35 PM MST [Batteries](#)  
 homebrewed batteries

Has anyone ever considered building their own batteries? It seemed to be simple technology, could a person melt and pour lead for plates, acid is cheap, etc. Are the positive and negative plates both made of the lead? Could I melt down old car batteries?

[diy batteries](#) | 6 comments (6 topical, 0 editorial)

Re: diy batteries ([none / 0](#)) ([#1](#))  
 by TomW on Mon Nov 24th, 2003 at 10:25:07 AM MST  
[\(User Info\)](#) <http://oneota.net/~earthsourcepowr/>

bigdan;  
 We have discussed this before and the general consensus is that it probably can be done but:

You would have an inferior product compared to professionally manufactured units

You risk your health and the health of anyone around the operation as well as the health of generations to come from lead that escapes your operation.

Not to be the wet blanket but those seem to be big deterrents to building your own lead acid batteries. A lot of risk for a few hundred or even thousand dollars.

On another note. I have in the long ago past made my own sinkers and even a few bullets from dead batteries. It is a very nasty process and in a lot of the dead batteries the plates are not solid lead like you might think but a spongy oxide or something that does not yield good quality lead.

Just my opinion and may not be shared by others

Cheers.

TomW

[Stuff I have Online](#)  
[Contact Me](#)

Re: diy batteries ([none / 0](#)) ([#4](#))  
 by Chagrin on Mon Nov 24th, 2003 at 05:32:42 PM MST  
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Half of the plates should be spongy lead (Lead oxide?). If he were to cast his own battery plates he'd need that type of lead for them.

[ [Parent](#) ]

Re: diy batteries ([none / 0](#)) (#2)  
by bob golding ([yubba at clara dot net](#)) on Mon Nov 24th, 2003 at 12:13:38 PM MST  
([User Info](#))

think it would be better to try and get dicarded batteries working. according to one report on a site dedicated to building pulsers 85% of batteries are discarded before there time. thats a lot of batteries. i seem to get about 30% back to working condition just by charging them. and they only cost 1 dollar each from the junk yard.

bob

Re: diy batteries ([none / 0](#)) (#3)  
by doubter3 on Mon Nov 24th, 2003 at 05:31:25 PM MST  
([User Info](#))

Here's a website a friend just sent me. Some interesting information about battery building, but the site is still under construction.

<http://members.optusnet.com.au/~weza/>

Enjoy,  
Matt

Re: diy batteries ([none / 0](#)) (#5)  
by Norm on Tue Nov 25th, 2003 at 04:41:36 PM MST  
([User Info](#))

After reading thru that website most people will consider that it might be easier to just try and rejuvenate old 'dead' batteries, but it is an interesting site. (:>) Norm.

[ [Parent](#) ]

Re: diy batteries ([none / 0](#)) (#6)  
by zbotrobot on Tue Nov 25th, 2003 at 08:55:22 PM MST  
([User Info](#))

I considered this, (best to find a friend somewhere that discards batteries). Anyway one would have to do a lot of smelting if it was hot it would burn cleanly. Dangerous. You would need to get a jar of lead dioxide and bake it on. It can't be painted on, and it seems that it doesn't really meld to the plate chemically so they make a close physical bond that is baked on probably just under the melting point. The other plate is just lead. I imagined casting a thin plate (liquid lead and water are explosive!!) perforating the plate with some sort of mallet and then rolling the two plates between felt or something into a big roll and seating it in a 5 gallon bucket. This would be worth while if you had the facilities to do, knew how to do it and set it up so it was easy to simply melt down the old one and make a new one. The cost of doing all that would be about the same as simply getting decent used batteries. The best thing is contact a semi-truck fleet maintenance center, or somewhere where they throw them a pile and are happy to have someone take care of them so they don't have to deal with recycling the damn things. If they test 12.5 under a load, (light bulb on a volt meter) they're good. If they are 8-9-10 they suck. Lead plates are useful maybe for a bomb shelter.

[diy batteries](#) | 6 comments (6 topical, 0 editorial)

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## [Dry Battery](#)

By [Tim C](#), Section [Homebrewed Electricity](#)

Posted on Sat Nov 22nd, 2003 at 10:26:08 PM MST

[Batteries](#)

### Dry Battery

I have a marine deep cycle battery which was never abused, however it was never kept on a charger. I popped open the cells and found they are almost dry. Is there a rehab recommendation to save this battery or is it doomed?

[Dry Battery](#) | 4 comments (4 topical, 0 editorial)

Re: Dry Battery ([none / 0](#)) ([#1](#))

by Norm on Sun Nov 23rd, 2003 at 07:38:24 AM MST  
([User Info](#))

It's too soon to know and not enough data add distilled water to bring the level up to normal...will it take a charge? What is the voltage of the battery. a marine deep cycle battery which was **never abused**, however it was **never kept on a charger**. I popped open the cells and found **they are almost dry**. However...there may be hope...after bringing the level up...check the voltage and post back. It really needs to be charged a little bit and get the specific gravity with a hydrometer of each cell before the condition of your battery can be determined. My 2 cents worth (every little bit helps to make a dollar) Norm.

Re: Dry Battery ([none / 0](#)) ([#2](#))

by 5kw on Sun Nov 23rd, 2003 at 01:44:43 PM MST  
([User Info](#))

Because the electrolyte will expand when charging you should just cover the plates, then charge untill full , then add water to desired level.

I would do all of my conditioning with the plates just covered to avoid losing electrolyte

too much water ([none / 0](#)) ([#3](#))

by Norm on Sun Nov 23rd, 2003 at 07:32:47 PM MST  
([User Info](#))

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You're right about that. Been there. Done that. It's been so long ago I almost forgot about the battery that I added too much water and came back a little later to find the stuff running all over. thanks for the reminder. Norm.

[ [Parent](#) ]

Re: too much water ([none / 0](#)) (#4)  
by troy on Wed Nov 26th, 2003 at 11:25:11  
AM MST  
([User Info](#))

It may recover somewhat, but in my experience, once the plates dry out, it's never the same. Hope your experience is different. I check my battery bank twice a month because I'm a belt and suspenders kind of guy.

Good luck and have fun!

troy

[ [Parent](#) ]

[Dry Battery](#) | 4 comments (4 topical, 0 editorial)

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### [Fork lift batteries](#)

By [Guerreiro](#), Section [Homebrewed Electricity](#)  
Posted on Fri Nov 21st, 2003 at 10:31:40 AM MST  
[www.fieldlines.com](#)

[Batteries](#)

I'd like to know if anyone can tell me if fork lift batteries are good to use on a windpower system. If so, you reccommend low voltage high amperage or the other way around??  
Thanks  
Guerreiro

[Fork lift batteries](#) | 1 comment (1 topical, 0 editorial)

Re: Fork lift batteries ([none / 0](#)) ([#1](#))  
by [scoraigwind](#) ([magnet@scoraigwind.co.uk](mailto:magnet@scoraigwind.co.uk)) on Sat Nov 22nd, 2003 at 01:36:06 AM MST  
([User Info](#)) <http://www.scoraigwind.co.uk>

You can use any type of battery for a windpower system but on the whole I do not recommend forklift truck batteries. They are designed for many, deep cycles but they are not so good at holding their charge during calm periods, especially as they get older. This is because the plates contain a lot of antimony.

Forklift batteries are expensive and if you need to do a lot of deep cycling they are worth it, but if you want to have a big battery that will last several days then this is not the best choice to buy new. If you buy them second hand, watch out for a tendency to go flat just sitting there.  
Hugh Piggott <http://www.scoraigwind.co.uk>

[Fork lift batteries](#) | 1 comment (1 topical, 0 editorial)

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## [Forklift Battery](#)

By [bruce1](#), Section [Homebrewed Electricity](#)  
 Posted on Thu Nov 20th, 2003 at 12:23:26 PM MST [Batteries](#)

Another question about a forklift battery I found

I dug a forklift battery out of a salvage yard that showed 22v. I bought it, busted it out of the steel tray, broke them all into 12 2volt cells. I drained the acid, flushed them out, refilled them with new acid and am now charging 6 of them reconnected into a 12v fashion. I cannot charge them in 24 series, so I will charge them for now, as 2 12v batteries while I see if they will be something I can use. My question is how do I know if they will be 'good' batteries? How heavy of a draw should I put on them to cycle them, and at what voltage of each cell should I stop discharging? I'm not sure how to go about knowing what I actually have. The only numbers I could find on the case is.....TYPE (I think) is a 85G-13, and I can see it says.....6hr capacity 510AH. Thats all the info I have about these beasts.

If you know of a link that will explain alot of this, that would be great.

Thank you all, Bruce

[Forklift Battery](#) | 3 comments (3 topical, 0 editorial)

Re: Forklift Battery ([none / 0](#)) (#1)  
 by [Budgreen](#) on Fri Nov 21st, 2003 at 06:48:04 AM MST  
[\(User Info\)](#)

most 2v cells (like the ones I have) are rated for a full discharge around 1.75v and a full charge voltage of 2.1-2.3v 510Ah@6hrs could mean 3060Ah total but not sure..

Re: Forklift Battery ([none / 0](#)) (#2)  
 by [Chuck](#) on Fri Nov 21st, 2003 at 09:32:37 AM MST  
[\(User Info\)](#) <http://www.greeleynet.com/~cmorrison>

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3060Ah would only be if you're drawing at 2 volts with all the cells in parallel. Otherwise, it remains 510Ah, but at the voltage of the string of cells.

Bruce is asking about testing the cells to see if they're any good. I'd suggest finding out who manufactured them and get the specs and charging/testing instructions from them if possible. Otherwise, find someone who makes a similar battery (like trojan) and go by their recommendations.

Chuck

[ [Parent](#) ]

Re: Forklift Battery ([none / 0](#)) ([#3](#))  
by Budgreen on Fri Nov 21st, 2003 at  
01:31:59 PM MST  
([User Info](#))

figure out the Ah rating for each cell.. let that determine for a load test  
for example a 2v 200Ah cell has a 4 hour discharge to 1.75v rating of 48A  
so putting a 48A load on that cell should drop it's voltage to 1.75 after about 4 hours

also you can charge them and check specific gravity to get an indication

[ [Parent](#) ]

[Forklift Battery](#) | 3 comments (3 topical, 0 editorial)

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## [Equalization charge](#)

By [bruce1](#), Section [Homebrewed Electricity](#)

Posted on Wed Nov 19th, 2003 at 09:24:57 AM MST

[Batteries](#)

Manual or automatic?

I just received my c35 charge controller. What do most of you people do about the equalization charge, do you do it manually when the individual cells get alittle out of balance, or do you set it automatically for once a month, and let it do it?

Also, what do you recommend for forklift batteries, as far as the bulk and float voltage settings? I'm not sure what category those style of batteries fall into in the manuals recommendations. Default was 14v and 13.5v.

Thanks all, Bruce

[Equalization charge](#) | 1 comment (1 topical, 0 editorial)

Re: Equalization charge ([none / 0](#)) ([#1](#))  
by 5kw on Wed Nov 19th, 2003 at 10:28:03 AM MST  
([User Info](#))

Automatic can only work if you have an excess of energy at the time of equilization. I prefer to eq. manually and oppertunistically, ie when the batteries are full and I have an excess of power, ie during a wind event. I am not fully accuainted with this feature of the C35.

I think the defaults are set intentionally low in case the controller is connected to sealed batteries by a person not versed in proper voltage settings. Are your batteries at constant temperature or are you using temp compensation. If not your bulk setting will be changing with the seasons. I set my bulk settings high enough to produce noticable but not excessive gassing and have enough loads that I,m not getting to bulk voltage daily.

Make the wind fun!

Victor

[Equalization charge](#) | 1 comment (1 topical, 0 editorial)

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## [Batteries -- What voltage should my SLA battery read when fully charged?](#)

By [kurt](#), Section [Renewable Energy FAQ](#)

[Batteries](#)

Posted on Wed Nov 19th, 2003 at 08:32:24 AM MST

This question gets asked allot along with a few other SLA (Sealed Lead Acid) related questions.

They all are covered very well by the Panasonic website at.

<http://www.panasonic.com/industrial/battery/oem/chem/seal/index.html>

also JimU wrote a SLA battery mini tutorial a wile back as well

<http://www.fieldlines.com/story/2003/8/24/20535/6203>

[Batteries -- What voltage should my SLA battery read when fully charged?](#) | **0** comments (0 topical, 0 editorial)

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### [Full voltage of gel cell?](#)

By [zmoz](#), Section [Homebrewed Electricity](#)

Posted on Tue Nov 18th, 2003 at 03:39:15 PM MST

[Batteries](#)

What is the fully charged voltage of a gel cell battery?

Can anybody tell me what the voltage of a 17.2AH sealed gel cell battery should be when it is fully charged?

[Full voltage of gel cell?](#) | 4 comments (4 topical, 0 editorial)

Re: Full voltage of gel cell? ([none / 0](#)) ([#1](#))  
by [Chuck](#) on Tue Nov 18th, 2003 at 03:48:03 PM MST  
([User Info](#)) <http://www.greeleynet.com/~cmorrison>

What kind of Gel Cell ? There are many.

Re: Full voltage of gel cell? ([none / 0](#)) ([#2](#))  
by [zmoz](#) on Tue Nov 18th, 2003 at 05:14:13 PM MST  
([User Info](#))

I don't know, all it says is "Sealed rechargeable lead acid battery" on the front. Only reason I know it's gel cell is because it's out of a portable jump starter.

Re: Full voltage of gel cell? ([none / 0](#)) ([#3](#))  
by [Norm](#) on Tue Nov 18th, 2003 at 08:57:02 PM MST  
([User Info](#))

Is this a new battery or an old one and you're having trouble with it or just curious? I would think it would be just a little over 13volts just like any other lead-acid battery I looked around on Google and there are a few people that do stuff like unsealing sealed batteries to see if they can bring 'em back to life. [http://www.4unique.com/battery/battery\\_tutorial.htm#Battery](http://www.4unique.com/battery/battery_tutorial.htm#Battery) Maintenance. Later. Norm.

[ [Parent](#) ]

Re: Full voltage of gel cell? ([none / 0](#)) ([#4](#))  
by [kurt](#) on Wed Nov 19th, 2003 at 05:04:07 AM MST  
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have a look at these links

<http://www.batterymaster.com.au/resources/la-charge%20Methods.pdf>

<http://www.batterymaster.com.au/resources/la-overview.pdf>



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[proper battery venting](#)

By [Budgreen](#), Section [Homebrewed Electricity](#)  
 Posted on Mon Nov 17th, 2003 at 01:02:51 PM MST [Batteries](#)  
 what are the options?

hello,

as I stand now, I am in the process of setting up my battery bank in my basement, it consists of 3 racks holding 24v@200Ah each, I currently have 2 racks in my basement room (kindof walled off with door to keep kids etc. away) my dilemma is that 2 racks fit along the wall right beneath a window for venting, the third will be around the corner thus not directly under a window. what would be the best option to keep this vented properly? the basement is large enough and open enough that i'm not very worried about gases building up, but I do want my installation to be as safe as possible. any input on this would be greatly appreciated as I have found no other good resource online as of yet.

Josh.

[proper battery venting](#) | 4 comments (4 topical, 0 editorial)

Re: proper battery venting ([none / 0](#)) ([#1](#))  
 by jubalearly on Mon Nov 17th, 2003 at 01:36:44 PM MST  
[\(User Info\)](#)

Well, let me start this out with a couple of points.  
 Hydrogen is lighter than air so it rises. That means it could accumulate near the ceiling if the window is much below the ceiling.  
 Hydrogen gas is not generated during most battery operations - it occurs during charging when the battery is usually bubbling or during high discharge rates when a lot of heat is being generated in the battery. A high discharge rate would normally be at least 10% of capacity and you would probably be a bit higher than that before you got a significant amount of hydrogen gas. Another consideration is acid splashing/vaporization & corrosion with high charge/discharge rates.

I haven't found any good guides on just how much ventilation is required, but it isn't much. You can tell that from looking at how ventilation requirements are handled on commercial battery boxes or battery rooms. One common design for small battery banks seems to be a 3 in. PVC pipe without a fan but run up from the battery and arranged (like a sewer line vent) for air flow over the roof to pull air thru it. I suspect there are some general guide lines in the MSDS for batteries or the fire code (local or NFPA) for battery rooms. I'd sure like to see if anyone comes up with some regulations or other authoritative recommendations/requirements.....

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Re: proper battery venting ([none / 0](#)) (#2)  
by JohnS ([john.slaven@btinternet.com](mailto:john.slaven@btinternet.com)) on Mon Nov 17th,  
2003 at 03:54:43 PM MST  
([User Info](#))

Hi Josh, I started off with some ex fork lift batteries in a small room which had no ventillation. During charging there were some horrendous fumes from the vents in these batteries. What I did was to build a wooden plywood box with a lid to fit the batteries in. I fitted a 12dc fan from an old computer power supply to the inside of the box and screwed a 40mm plastic pipe fitting to the other side of the box. All the fumes are now taken away via a 40mm plastic pipe to an outside vent. I haven't had any problems with fumes in the room since. The fan is connected to a timer which switches on the fan for 5 minutes every 30 minutes. Make sure you fit the fan with the correct direction of air flow. The power drawn by the fan and timer is in the order of 50mA when running which will not be a problem with your battery size. Hope this is of some help Josh. Hang loose. John S.

Re: proper battery venting ([none / 0](#)) (#3)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on  
Mon Nov 17th, 2003 at 05:30:06 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

I would'nt put the fan Inside the box. Could be a possable ignition source.

} = - W o o f --{  
[ [Parent](#) ]

Re: proper battery venting ([none / 0](#)) (#4)  
by Budgreen on Mon Nov 17th, 2003 at  
09:11:30 PM MST  
([User Info](#))

depends on the type of fan I suppose >:)

my basement windows butt up to the ceiling,  
and I was thinking of putting a small fan in  
there, that will take the gas out from the 2  
main racks, the third would be iffy. I may have  
to box it in and do it that way, thanks for the  
ideas

Josh

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[proper battery venting](#) | 4 comments (4 topical, 0 editorial)



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### [Will this battery ever recover?](#)

By [Norm](#), Section [Homebrewed Electricity](#)  
Posted on Mon Nov 17th, 2003 at 04:25:18 AM MST [Batteries](#)

I was wondering if there is something more that I can do

to this regular car battery? I got this car battery from a friend he was having trouble with it. After close inspection...no wonder..they hadn't secured it in the battery holder and it had bounced around a number of times wearing out a bottom corner enough so all the acid had leaked out. I flushed it out with water sealed the hole with JB Weld, filled it up with acid from an old battery and stuck it on charge for about an hour at a time 13.3v. put a light load on it then charge again seems to be working to a point. the total voltage 13.3 voltage of the weak cell 1.92v. and it doesn't have a light trail of bubbles like the good cells. So is there anything more to help this battery out? Norm.

[Will this battery ever recover?](#) | 5 comments (5 topical, 0 editorial)

Re: Will this battery ever recover? ([none / 0](#)) ([#1](#))  
by [dburt](#) on Mon Nov 17th, 2003 at 06:26:56 AM MST  
([User Info](#))

**\*\*acid from an old battery \*\*** This may be where the trouble is... If the old battery was not fully charged, the acid would be weak. Suggest you put in new acid, I can buy it cheap from the local auto parts place.

Dave in PA

Re: Will this battery ever recover? ([none / 0](#)) ([#2](#))  
by [charged](#) on Mon Nov 17th, 2003 at 07:00:24 AM MST  
([User Info](#))

You can use a very low amp constant current charger to "clean up" that particular cell.

Any cells that reach full charge will begin to produce hydrogen and oxygen bubbles. Just use a low enough amperage to keep the battery from getting hot. Bubbling won't hurt the plates. But, heating them unduly will cause damage.

A 500ma constant current charger should work for a car battery without causing it to get hot.

This one can be dangerous if you don't know what you're doing. Use at your own risk. This is dirt simple and very effective. Never plug it in until it's already connected to the battery. Always unplug it BEFORE disconnecting it from the battery. Shorting the contacts together is the safest way to store it when not in use. The open-circuit voltage can rise to around 180v DC. This means, DON'T PLUG IT IN UNLESS

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IT'S HOOKED TO A BATTERY. Get it?

<http://bbs.vtdl.net/I-/KEELYNET/DIAGRAMS/WATGAS1.GIF>

Believe it or not, this circuit will usually desulfate lead-acid batteries and also works as an efficient general purpose charger. I have a switch on mine that engages a max voltage safety across the DC output. I use that setting for normal charging. I only disengage it for desulfating. The voltage clamp is set to 20v peak.

I've used these countless times, at various amperage designs, to bring back sulfated battery cores that I picked up for \$5 a piece at the autoparts store. They won't all come back. But, many do. After charge-discharge cycling several times, the battery will reach it's maximum destined capacity.

12uf-15uf capacitance would give you an average of about 500ma depending on exact line voltage and frequency (it varies). The capacitor limits the current on the AC side of the rectifier. The rectified DC, when connected to the battery, will only raise the battery voltage enough to pass that amperage.

Here's the procedure I've used that's produced the best results.

On the first day, I charge it for about an hour. then I put a light load on it for an hour. Back and forth like that for 6 hours. Then I just put the charger on and leave it.

Check the specific gravity of the individual cells to get a real idea of the charge state. The sulfated cell might do some bubbling and then stop. Don't be fooled into thinking it's done unless you check the electrolyte.

Bizarre notes: if you are charging at an amperage that is below the heating threshold of the battery, the battery sometimes drops to a LOWER than ambient air temperature. Apparently the capacitive pulse waveform can sometimes induce an endothermic chemical reaction in the cells. Whodathunkit?

Once batteries are fully restored, they'll charge within the normal voltage limits for a new battery. At this point you may recharge several batteries in series on that charger with the overvoltage clamp disengaged. I usually use a maximum of 5 batteries at a time in series. This works great for recharging your bank quickly and efficiently from a backup generator too.

Re: Will this battery ever recover? ([none / 0](#))

([#3](#))

by bob golding ([yubba at clara dot net](#)) on Mon Nov 17th, 2003 at 11:03:13 AM MST

([User Info](#))

that charger sounds interesting. we have 240 volts this side on the pond. so would i assume a cap voltage of say 400volts and a piv of 1000 volts on the diodes? how did you clamp it? seems a lot simpler than the desulphater i have got the parts for but have yet to build.

still having lots and lots of fun

bob

[ [Parent](#) ]

Re: Will this battery ever recover? ([none / 0](#)) (#4)  
by charged on Mon Nov 17th, 2003 at 01:02:34 PM MST  
([User Info](#))

that charger sounds interesting. we have 240 volts this side on the pond. so would i assume a cap voltage of say 400volts and a piv of 1000 volts on the diodes? how did you clamp it? seems a lot simpler than the desulphater i have got the parts for but have yet to build.

still having lots and lots of fun

bob

With 240v service you'll need to cut the capacitor value in half to get the same amperage. So, about 6uf-7uf would give you 500ma.

Yes, a 400v capacitor (motor "run" type, not "start" type) would work. As long as the diodes can handle the current level and the peak voltages they'll work.

The clamping is just a 20v zener that feeds the base of a 2N3055 power transistor. The transistor is across the DC side, collector to positive and emitter to negative. The zener goes from the positive to the base of the transistor. Pretty simple really.

On a 1 amp charger, a 22v turn-on produces only 22w power dissipation in the transistor. I probably didn't even need to put it on the heat-sink. But, better safe than sorry.

I don't ever plug the thing in unless it's connected to a battery anyway. so the clamp never really gets to do much of anything.

Here's a safer but more complex charger you might try. You won't need to do any clamping since it isolates the line power from the output. And the output only has a voltage when the output transistor is turned on. Quite safe.

Use an SG3524 PWM chip. They are cheaper than dirt, old IC technology. It is internally regulated for frequency stability and requires only a few external components to make it work. All the specs for it are out there on the web in various places.

It has two discrete output transistors that never overlap their "on" states. I think the max duty-cycle is 45% per transistor. This is good for our purposes here.

You can use a photoflash capacitor for this charger, 330v rating at about 150uf would work. At 60hz pulsing (dumping 60 times per second) this cap will give you an average of about 900ma if you're using a 110v source and charging a 12v battery. Larger capacitors will obviously give you greater total current flow for any given frequency.

Be careful with rapidly charging and discharge electrolytic caps. Some of them get cranky when you push the frequency up and they'll get hot and explode. If you want to make a heavy-current charger it's better to use larger capacitance by building a big parallel bank of electrolytics and then slow cycling them at speeds under 60hz. The batteries only care about the average current over a period of time. Frequencies under 60hz seem to work just fine. You just run the pulse-width at maximum.

Use the SG3524 PWM to control two heavy power transistors through a pair of opto-couplers.

One power transistor charges the capacitor from the transformer. The other power transistor dumps the capacitor across the battery(s). Very simple.

Use a multi-tap step-down transformer and put in a switch for selecting different voltages (25v, 50v, 110v). This part isn't that critical since you can use capacitive voltage dividers, or multipliers, etc... with any suitable transformer to achieve the required voltages.

You can adjust the frequency up and down to vary the average current to the battery.

Select the highest setting (110v) and run the charger for about 15 minutes. Then put a light load on the battery for a while. The HV pulses pierce the sulphate layer. Discharging dissolves some of it and shrinks the crystals.

Then drop it to the 50v setting and let it run for a few hours. Keep an eye on it to see where the charge state is. If the battery voltage is floating higher than 25v, leave it on the 50v setting until it drops down to normal looking battery voltages. Then switch the charger down to the 25v setting for normal charging.

Or, just use the 110v all the time. As long as your average current never exceeds the threshold for plate heating, the battery should accept it without complaint. It's just not quite as efficient as the low voltage for normal charging.

I hope this helps.

[ [Parent](#) ]



Re: Will this battery ever recover? ([none / 0](#)) ([#5](#))  
by GeeWiz on Thu Nov 20th, 2003 at 11:07:36 PM MST  
([User Info](#))

Speaking of lead acid desulfators, check out this site. They sell kits too.

<http://www.shaka.com/~kalepa/desulfparts2.htm>

[Will this battery ever recover?](#) | 5 comments (5 topical, 0 editorial)

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[Automotive alternator used as motor](#) | 6 comments (6 topical, editorial)

Re: Automotive alternator used as motor ([none / 0](#)) (#1)  
by RobD on Sat Jan 3rd, 2004 at 04:39:07 PM MST ([User Info](#))

Hi, Not easily or efficiently. Car alternators are designed with a narrow specific purpose and while they can be used in other applications they usually don't excel. RobD

[Automotive alternator used as motor](#) | 6 comments (6 topical, 0 editorial)

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[Automotive alternator used as motor](#) | 6 comments (6 topical, editorial)

Re: Automotive alternator used as motor ([none / 0](#)) (#2)  
by rhud on Sat Jan 3rd, 2004 at 07:10:28 PM MST ([User Info](#))

Hi, I seem to remember a pamphlet i received from linsay publishing telling how to easily turn an alternator into a motor, but there's a catch (there always is). you had to remove the diode pack and bring the three field winding wires outside the case. so now what you have is a three phase motor with slip ring feed to the rotor. (most of us dread a three phase motor) but in this case the idea was to also remove the diode pack from an alternator that was being used to produce power, there by turning it into a three phase generator that could feed the motor. i'll try to find the information, i'm too tired to think. but its a good tired, i just got back from North Carolina with my new GM-90 engine from Mike. I'm going to post the experience when i can think (better).

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by kell on Sat Jan 3rd, 2004 at 07:48:29 PM MST ([User Info](#))

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Re: Automotive alternator used as motor ([none / 0](#)) (#4)  
by Harry Luubovv on Sat Jan 3rd, 2004 at 10:20:11 PM MST  
([User Info](#))

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Luubovv.

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Re: Automotive alternator used as motor ([none / 0](#)) (#5)  
by Harry Luubovv on Sat Jan 3rd, 2004 at 10:32:55 PM MST  
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[Automotive alternator used as motor](#) | 6 comments (6 topical, 0 editorial)

Re: Automotive alternator used as motor ([none / 0](#)) (#6)  
 by kell on Sun Jan 4th, 2004 at 07:32:45 PM MST  
 ([User Info](#))

The \$64,000 question: would it run as an induction motor or a synchronous motor? The rotor on an alternator is very different from the rotor of an induction motor. It could work, but probably very, very inefficient. Theoretically you could make it run like a synchronous motor, but you would have to put in an alternating current to the rotor that's synchronized with the current going into the stator, and chances are the phasing you would need for that current would not be precisely in phase with any of the three phases going into the stator. Maybe if you use a capacitor to shift your rotor current 90 degrees from one of the phases of the stator, the magnetic fields of the stator and rotor would be close but just off enough to give you some torque. Otherwise you might have to do something like installing hall effect sensors to register angular position of the rotor and signal a controller to apply power of the necessary polarity to the rotor. In that case it would be running like a brushless dc motor and you might use dc in the stator... now I'm confusing myself. Ha ha. But you see the problem. An alternator is just not designed like a backwards motor.

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posted by cvo on 01/01/2004 04:26:50 AM MST  
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3. [picture diagram area](#) ([Magnets & Magnetism](#), [Wiring](#))  
posted by JB on 12/16/2003 07:06:40 AM MST  
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posted by RobD on 11/22/2003 03:58:02 AM MST  
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posted by storrence on 11/16/2003 04:59:29 AM MST  
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posted by BrianK on 11/12/2003 04:35:11 PM MST  
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posted by AMA on 11/12/2003 07:26:45 AM MST  
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posted by thegingerone on 10/30/2003 05:06:50 PM MST  
5 comments

12. [2 Gennies on 1 line](#) ([Homebrewed Electricity](#), [Wiring](#))

posted by Scott on 10/28/2003 07:26:41 PM MST  
6 comments

13. [SALE: 50 lbs #10 GUAGE 0.1051" DIA. ESSEX ALLEX 240 DEGREES C MAGNET WIRE : \\$6/lb](#)  
([Classifieds](#), [Wiring](#))

posted by Christina on 10/28/2003 12:15:39 AM MST  
0 comments

14. [hey internet fred, quick question...](#) ([Homebrewed Electricity](#), [Wiring](#))

posted by headhunter on 10/23/2003 05:07:38 PM MST  
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15. [Hooking up GFI outlets to a STAR wired alternator](#) ([Magnets & Magnetism](#), [Wiring](#))

posted by kww on 10/19/2003 09:55:10 PM MST  
16 comments

16. [coil winding data](#) ([Homebrewed Electricity](#), [Wiring](#))

posted by Inspector Gadget on 10/07/2003 11:54:50 AM MST  
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17. [better drawing of flat coil](#) ([Homebrewed Electricity](#), [Wiring](#))

posted by zubbly on 09/21/2003 08:12:42 PM MST  
7 comments

18. [flat wire coils](#) ([Homebrewed Electricity](#), [Wiring](#))

posted by zubbly on 09/21/2003 07:05:40 PM MST  
5 comments

19. [Copper Tubing instead of Hi\\$ Wire](#) ([Homebrewed Electricity](#), [Wiring](#))

posted by LowTechWreck on 09/17/2003 02:05:51 PM MST  
6 comments

20. [Rewiring 120vac1.52KW transformer](#)  
([Homebrewed Electricity](#), [Wiring](#))

posted by LowTechWreck on 09/14/2003 02:48:55 PM MST  
10 comments

21. [hard to rotate PMA by hand.](#) ([Homebrewed Electricity](#), [Wiring](#))

posted by paulpic on 09/11/2003 06:48:27 AM MST  
2 comments

22. [How do I wire a 220 motor to run on 110?](#)  
([Homebrewed Electricity](#), [Wiring](#))

posted by dwhit on 09/10/2003 10:37:17 AM MST  
1 comment

23. [Black hole satellite photo](#) ([Homebrewed Electricity](#), [Wiring](#))

posted by Dave B on 08/25/2003 10:40:41 PM MST  
19 comments

24. [Coil Wiring](#) ([Homebrewed Electricity](#), [Wiring](#))

posted by pearl on 07/23/2003 06:35:06 PM MST  
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25. [quick question on 22 gage magnet wire](#)

[\(Homebrewed Electricity, Wiring\)](#)

posted by headhunter on 07/23/2003 10:03:29 AM MST  
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26. [New Service wiring](#) ([Homebrewed Electricity](#), [Wiring](#))

posted by storrence on 07/20/2003 03:59:47 PM MST  
7 comments

27. [Wiring,Gauge/Thousands](#) ([Homebrewed Electricity](#), [Wiring](#))

posted by pearl on 07/18/2003 08:45:15 PM MST  
3 comments

28. [skip pole](#) ([Homebrewed Electricity](#), [Wiring](#))

posted by Anonymous Hero on 06/30/2003 03:33:30 AM MST  
2 comments

29. [Can I split an inverter](#) ([Homebrewed Electricity](#), [Wiring](#))

posted by Anonymous Hero on 06/23/2003 12:05:17 PM MST  
9 comments

30. [Wire Guage???](#) ([Homebrewed Electricity](#), [Wiring](#))

posted by Anonymous Hero on 06/22/2003 08:48:55 AM MST  
3 comments



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[Help with Induction Motor](#) | 6 comments (6 topical, editorial)

Re: Help with Induction Motor ([none / 0](#)) (#1)  
by 5kw on Sat Jan 3rd, 2004 at 08:14:54 AM MST  
([User Info](#))

Wild bill, It is presently a four pole motor, to use more poles than this it would have to be rewound, twelve poles would be an obvious choice. Is it worth it? At low speeds this would yield a very low power unit. Most induction motor conversions start with a much larger motor. I think Jerry uses 3/4 or one horse motors for his garbogens which have only about 4' diameter blades. Make the wind fun!  
Victor

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Re: Help with Induction Motor ([none / 0](#)) ([#2](#))  
 by Jerry on Sat Jan 3rd, 2004 at 08:54:00 AM MST  
[\(User Info\)](#) <http://www.dplusv.com/Photo-03.html>

Hi WildBill I have some wind test results from a very simular 6.7 amp, 1725 rpm, 1 ph., 120 volt garbage disposal motor. 10 mph 5 amps, 15 mph 8 amps, 20 mph 12 amps, 25 mph 23 amps, 30 mph 25 amps, 40 mph 40 amps, 45 mph 45 amps. This is using 3 of my plastic blades at 49 inches tip to tip. These same blades have done 1200 watts top end on the 1 hp. If you were using a 1 hp motor the out put above 15 mph would just about double. Your motor has 4 start and 4 run windings. The starts may be aluminum wire. Also it appears the starts have the typical coil sizes. That is 2 of the start coils are small and 2 are large. Reassigning the coil arrangements will yeald proper results for 12 volt charging. Tom W has a scimatic on his web page. My alt have been made with the old Wondermagnet #29 curved neos. They fit the lamination bore perfect. However the amature in this motor is to short for these magnets. I take the armature from a furnace blower motor. All these motors are free at your Heating and air conditioning shop or at your plumber or at motor rewind shop or at your garage door shop. And Harbor Freight has nice new unit 3/4 hp \$60. I'll post more latter I must go to work now but there is much more I'll share with you on this subject. JK TAS Jerry

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Re: Help with Induction Motor ([none / 0](#)) ([#3](#))  
 by wildbill hickup on Sat Jan 3rd, 2004 at 11:02:48 AM MST  
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by monte350c on Sun Jan 4th, 2004 at 09:13:04 PM MST  
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Re: Help with Induction Motor ([none / 0](#)) (#2)  
 by Jerry on Sat Jan 3rd, 2004 at 08:54:00 AM MST  
 ([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi WildBill I have some wind test results from a very simular 6.7 amp, 1725 rpm, 1 ph., 120 volt garbage disposal motor. 10 mph 5 amps, 15 mph 8 amps, 20 mph 12 amps, 25 mph 23 amps, 30 mph 25 amps, 40 mph 40 amps, 45 mph 45 amps. This is using 3 of my plastic blades at 49 inches tip to tip. These same blades have done 1200 watts top end on the 1 hp. If you were using a 1 hp motor the out put above 15 mph would just about double. Your motor has 4 start and 4 run windings. The starts may be aluminum wire. Also it appears the starts have the typical coil sizes. That is 2 of the start coils are small and 2 are large. Reassigning the coil arrangements will yeald proper results for 12 volt charging. Tom W has a scimatic on his web page. My alt have been made with the old Wondermagnet #29 curved neos. They fit the lamination bore perfect. However the amature in this motor is to short for these magnets. I take the armature from a furnace blower motor. All these motors are free at your Heating and air conditioning shop or at your plumber or at motor rewind shop or at your garage door shop. And Harbor Freight has nice new unit 3/4 hp \$60. I'll post more latter I must go to work now but there is much more I'll share with you on this subject. JK TAS Jerry

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Re: Help with Induction Motor ([none / 0](#)) (#3)  
by wildbill hickup on Sat Jan 3rd, 2004 at 11:02:48 AM MST  
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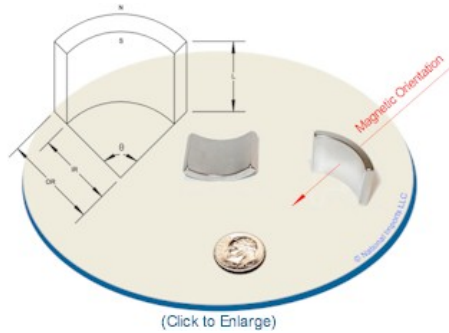
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Product ID: NSN0027

ProductName: [Rare-Earth Neodymium-Iron-Boron Arc-Segment Magnet - 0.750 x 0.625 x 90 x 0.750 - N](#)

Description: Rare-Earth Neodymium-Iron-Boron (NdFeB) Arc-Segment Magnet Size - OR0.750" x IR0.625" x 90Deg x L0.750" Polarity - North on Outside Face

[More Info](#)

Price: \$2.80

[Grade ?](#)

[In Stock!](#)

[Add To Cart](#)

[Volume Price](#)

Product ID: NSN0028

ProductName: [Rare-Earth Neodymium-Iron-Boron Arc-Segment Magnet - 0.750 x 0.625 x 90 x 0.750 - S](#)

Description: Rare-Earth Neodymium-Iron-Boron (NdFeB) Arc-Segment Magnet Size - OR0.750" x IR0.625" x 90Deg x L0.750" Polarity - North on Inside Face

[More Info](#)

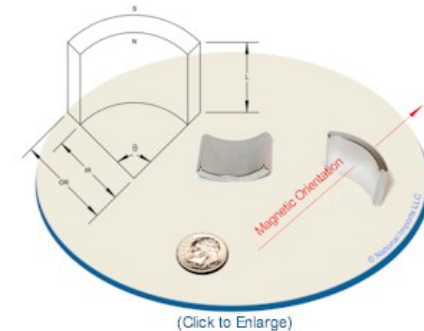
Price: \$2.80

[Grade ?](#)

[In Stock!](#)

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[Volume Price](#)



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Product ID: NSN0025

ProductName: [Rare-Earth Neodymium-Iron-Boron Arc-Segment Magnet - 1.000 x 0.875 x 45 x 1.000 - N](#)

Description: Arc-Segment Magnet Size - OR1.000" x IR0.875" x 45Deg x L1.000" Polarity - North on Outside Face

[More Info](#)

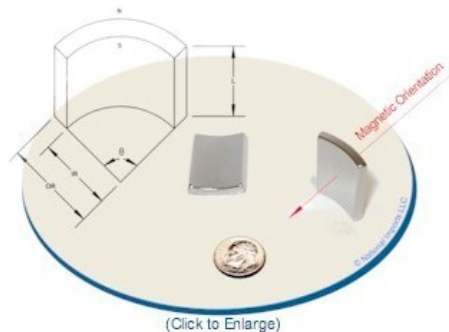
Price: \$2.49

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Product ID: NSN0026

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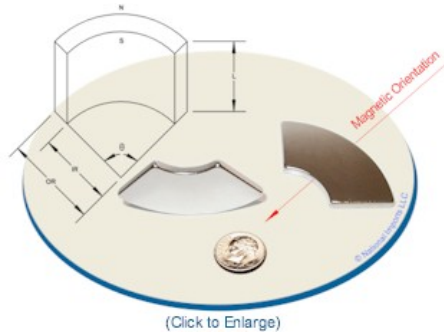
Price: \$2.49

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[In Stock!](#)

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[Volume Price](#)



Product ID: NSN0029

ProductName: [Rare-Earth Neodymium-Iron-Boron Arc-Segment Magnet - 1.250 x 0.500 x 90 x 0.125 - N](#)

Description: Rare-Earth Neodymium-Iron-Boron (NdFeB) Arc-Segment Magnet Size - OR1.250" x IR0.500" x 90Deg x L0.125" Polarity - North on Outside Face

[More Info](#)

Price: \$2.73

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Description: Rare-Earth Neodymium-Iron-Boron (NdFeB) Arc-Segment Magnet Size - OR1.250" x IR0.500" x 90Deg x L0.125" Polarity - North on Inside Face

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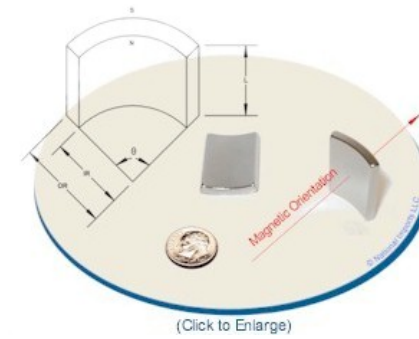
Price: \$2.73

[Grade ?](#)

[In Stock!](#)

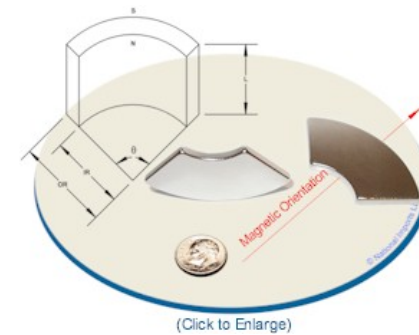
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[Help with Induction Motor](#) | 6 comments (6 topical, 0 editorial)

Re: Help with Induction Motor ([none / 0](#)) (#5)  
by kell on Sun Jan 4th, 2004 at 08:18:12 PM MST  
([User Info](#))

That thing with All Electronics bums me out. To get the mags in pairs you would have to know somebody that lives in L.A. and willing to go to their store to pick the mags. I know it's doable that way because I talked to somebody in L.A. that went to the store and picked out mags by polarity. But really All Elec should just get a clue and put the mags in two big piles. I tried talking to them but they just won't listen.

[Help with Induction Motor](#) | 6 comments (6 topical, 0 editorial)

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[Help with Induction Motor](#) | 6 comments (6 topical, editorial)

Re: Help with Induction Motor ([none / 0](#)) (#5)  
by kell on Sun Jan 4th, 2004 at 08:18:12 PM MST  
([User Info](#))

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[Help with Induction Motor](#) | 6 comments (6 topical, 0 editorial)

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## [Magnetic Wire Question](#)

By [cvo](#), Section [Homebrewed Electricity](#)

Posted on Thu Jan 1st, 2004 at 04:26:50 AM MST

[Wiring](#)

Mag Wire

Is there any difference between magnetic wire and wire used in houses, besides size? I've got a lot of it left over from remodeling jobs and thought I could waste it away building coils. Stripping it down is not a problem, one of my employees could do it. Thanks for the replies.

[Magnetic Wire Question](#) | 5 comments (5 topical, 0 editorial)

Re: Magnetic Wire Question ([none / 0](#)) ([#1](#))  
by [wpowokal](#) on Thu Jan 1st, 2004 at 04:37:13 AM MST  
([User Info](#))

Basically yes, magnetic wire has an insulating coat which allows you to wind a coil layer on layer wire alongside wire.

Normal household insulated wire having no "varnish" would short out to touching turns. To my limited understanding that is the only and of course essential difference.

Allan

Re: Magnetic Wire Question ([none / 0](#)) ([#2](#))  
by [cvo](#) on Thu Jan 1st, 2004 at 05:37:13 AM MST  
([User Info](#))

Thanks for the reply. Cheaper to go buy mag wire, but then again that's too easy! Thanks again.

Re: Magnetic Wire Question ([none / 0](#)) ([#3](#))  
by [kell](#) on Thu Jan 1st, 2004 at 10:15:33 AM MST  
([User Info](#))

Some vinyl insulation has lead in it. Tell that to your employee and give him or her some gloves.

Re: Magnetic Wire Question ([none / 0](#)) ([#4](#))  
by [Chagrin](#) on Thu Jan 1st, 2004 at 11:09:10 PM MST  
([User Info](#))

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- [Also by cvo](#)

I think the main difference is being missed: magnetic wire has a much THINNER insulation which allows more coils in a tighter space, and the insulation is designed to tolerate the heat generated inside the motor/generator.

Re: Magnetic Wire Question ([none / 0](#)) ([#5](#))  
by Electric Ed on Fri Jan 2nd, 2004 at 07:29:57 AM  
MST  
([User Info](#)) <http://www.electric-ed.com>

Right, also, the voltage difference between adjacent turns of a correctly wound coil is quite low, thus permitting the thin insulation.

Electric Ed

[ [Parent](#) ]

[Magnetic Wire Question](#) | 5 comments (5 topical, 0 editorial)

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## [picture diagram area](#)

By [JB](#), Section [Magnets & Magnetism](#)

Posted on Tue Dec 16th, 2003 at 07:06:40 AM MST [Wiring](#)

I was wonderin if we could add a picture and diagram area to the board.

I was wonderin if we could add a picture and diagram area to the board. I had some diagrams of the fluxpath etc in my hotlist I go back to to study but they are no longer there. I guess the intro box is back again. Thanks JB

[picture diagram area](#) | 10 comments (10 topical, 0 editorial)

Re: picture diagram area ([none / 0](#)) (#1)  
by [kurt](#) on Tue Dec 16th, 2003 at 10:14:51 AM MST  
([User Info](#))

if people would upload pics at a reasonable size instead of megapixel jpegs and huge bitmaps each user would be able to keep 2 dozen or more reasonable sized pictures in there album no problem and then the pictures would be available for people to go back and reference do we really need to upload pictures at 8"x10" or larger format one would think that 3"x5" or smaller would get your point across and save alot of server space.



overly large pics ([none / 0](#)) (#2)  
by [Norm](#) on Tue Dec 16th, 2003 at 11:48:14 AM MST  
([User Info](#))

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Kurt: Seems as if some mean well but they don't realize what they are doing like the Lithianian(sp?) one just recently posted it took this poor computer about 15 min. to scroll down to the bottom. I was glad to see that he had succeeded those on the board have always been patient with newcomers it sure would be nice if there was some way to avoid this...I guess that's all in the game computers are always doing what you tell 'em to do instead of what you want them to do, eh?  
(: >) Norm.

[ [Parent](#) ]

Re: picture diagram area ([none / 0](#)) (#6)  
by John on Tue Dec 16th, 2003 at 02:58:48 PM MST  
([User Info](#))

I strongly concur. Giant pictures are a huge pain. I wish that Admin. could/will do something to automaticly limit pictures to a reasonable size.

John

[Toxin absorber/Pain reliever](#)

[ [Parent](#) ]

Re: picture diagram area ([none / 0](#)) (#3)  
by JB on Tue Dec 16th, 2003 at 11:54:39 AM MST  
([User Info](#))

Im not complaining about no picture size but Dan had a diagram on wiring coils and Cevonk posted some interesting diagrams on where the flux path is that I have been studying these but they are no longer there, I didnt think they were big, Electric Ed has some nice diagrams. Im definitely not a electrical whiz but this is the kind of information that I like to look at to understand things without having to post redundant questions that is why I keep them in my HOTLIST. Trash the big pictures but The diagrams shouldnt be thrown out but put in the wiring area. Just my opinion. JB

Issues with pictures and graphics; ([none / 0](#)) (#4)  
by TomW on Tue Dec 16th, 2003 at 12:17:40 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

JB;

There have been lots of ongoing issues with pictures and diagrams on the board.

Several people have uploaded such huge pictures [file size] that they exceed their storage quota. Some have deleted some of them to get more space for their next set of uploads. To the best of my knowledge none of the admins have removed any uploaded files. Once the files are removed by the user they are no longer available for display on the board. Frankly it is almost exclusively a user problem not a board problem. It is very inconsiderate to post a picture that is much bigger than 200 or 300 kilobytes to a forum like this but some of our users regularly post several 900 kilobyte plus sized pictures and diagrams in comments & stories. One recent comment had over 3 megabytes of diagrams from one user and that takes a very long time to download for a dialup user.

Others link to external pictures they have hosted other places. In that case there could be any number of reasons they do not display that I can't begin to explain here.

Here is my suggestion for you:

When you see something you like you should simply download it to your own computer and then it will be available to you any time.

How you do that depends on your operating system and your browser.

Cheers.

TomW

[Stuff I have Online](#)

[Contact Me](#)

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Re: Issues with pictures and graphics;  
([none / 0](#)) ([#7](#))  
by Wolfie1 on Wed Dec 17th, 2003 at  
06:21:13 AM MST  
([User Info](#))

Have you considered a ban on BMP files as they are probably the real problem. If everyone stored their diagrams as GIFs and their photos as JPEGs wouldn't the problem go away.

Unless you have a very old computer, there are programs installed with the operating system that can do the conversion.

Martin.

[ [Parent](#) ]



Re: Issues with pictures and graphics; ([none / 0](#)) (#8)  
by TomW on Wed Dec 17th, 2003 at 08:32:30 AM MST  
([User Info](#))  
<http://oneota.net/~earthsourcepowr/>

Wolfie1;

I totally agree that .bmp files are the main culprit.

Cheers

TomW

[Stuff I have Online](#)

[Contact Me](#)

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Re: picture diagram area ([none / 0](#)) (#10)  
by Reno on Wed Dec 17th, 2003 at 07:38:00 PM MST  
([User Info](#))

If there is ever a post you want to keep for reference you can always save it as an HTML file just go to file click save as and put it where you want.

This way you don't have to print it and you do not have to come here to review it.

[ [Parent](#) ]

Re: picture diagram area ([none / 0](#)) (#5)  
by JB on Tue Dec 16th, 2003 at 01:39:01 PM MST  
([User Info](#))

Unfortunately Tom that one diagram didnt get put in my favroite places and it was a diagram Id go back to to think about. It was like reading a newspaper and somebody Trys to grab it from you. You know what happens then. You get ticked. I was under the impression that with the new board all information was the property of otherpower thats why we got to register. I know it all goes to google because i used to put my hometown on my replys and i found myself on google one day. Why it all goes there I dont know., But I thinking Im not the only one that a diagram part would be nice and helpful. It would clean up the board and keep the redundant ??s down in my opinion. I do the hotlists stuff so I can go back to it easily and I thought It would still be there.I dont need cheese with my wine but I found it frustrating that the diagrams that had me thinking and exercising my brain were gone. JB

Re: picture diagram area ([none / 0](#)) (#9)  
by woferhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Wed Dec  
17th, 2003 at 09:58:02 AM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

This may not be a lotta help But, all the pictures are here  
<http://www.otherpower.com/images/scimages/>

This page will have the user numbers.  
click the user number to see all the pictures that they have  
uploaded  
I am user # 231

There is also the IRC photo gallery  
<http://66.140.203.100/gallery/albums.php>

} = - W o o f - = {

[picture diagram area](#) | 10 comments (10 topical, 0 editorial)

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### [Switch over power](#)

By [RobD](#), Section [Homebrewed Electricity](#)

Posted on Sat Nov 22nd, 2003 at 03:58:02 AM MST

[Wiring](#)

Has anyone built a power switch for their main box?

I'm looking to build a power switch to flip over to my batteries when the power fails. I've never seen one. How are they set up? Does the main fuse come out and a plug go into it to xfer the line to a switch box?

What's the code and where do you get the parts?

Thanks,  
RobD

[Switch over power](#) | 7 comments (7 topical, 0 editorial)

Re: Switch over power ([none / 0](#)) ([#1](#))  
by Electric Ed on Sat Nov 22nd, 2003 at 05:45:48 AM MST  
([User Info](#)) <http://www.electric-ed.com>

Codes require a double throw transfer switch to prevent the stand-by power source from ever getting into the utility lines. The utility transformer would step it up to a voltage that could be dangerous to utility linemen.

There are liability/insurance issues if the installation is not done to code.

Example of a generator/transfer switch below.

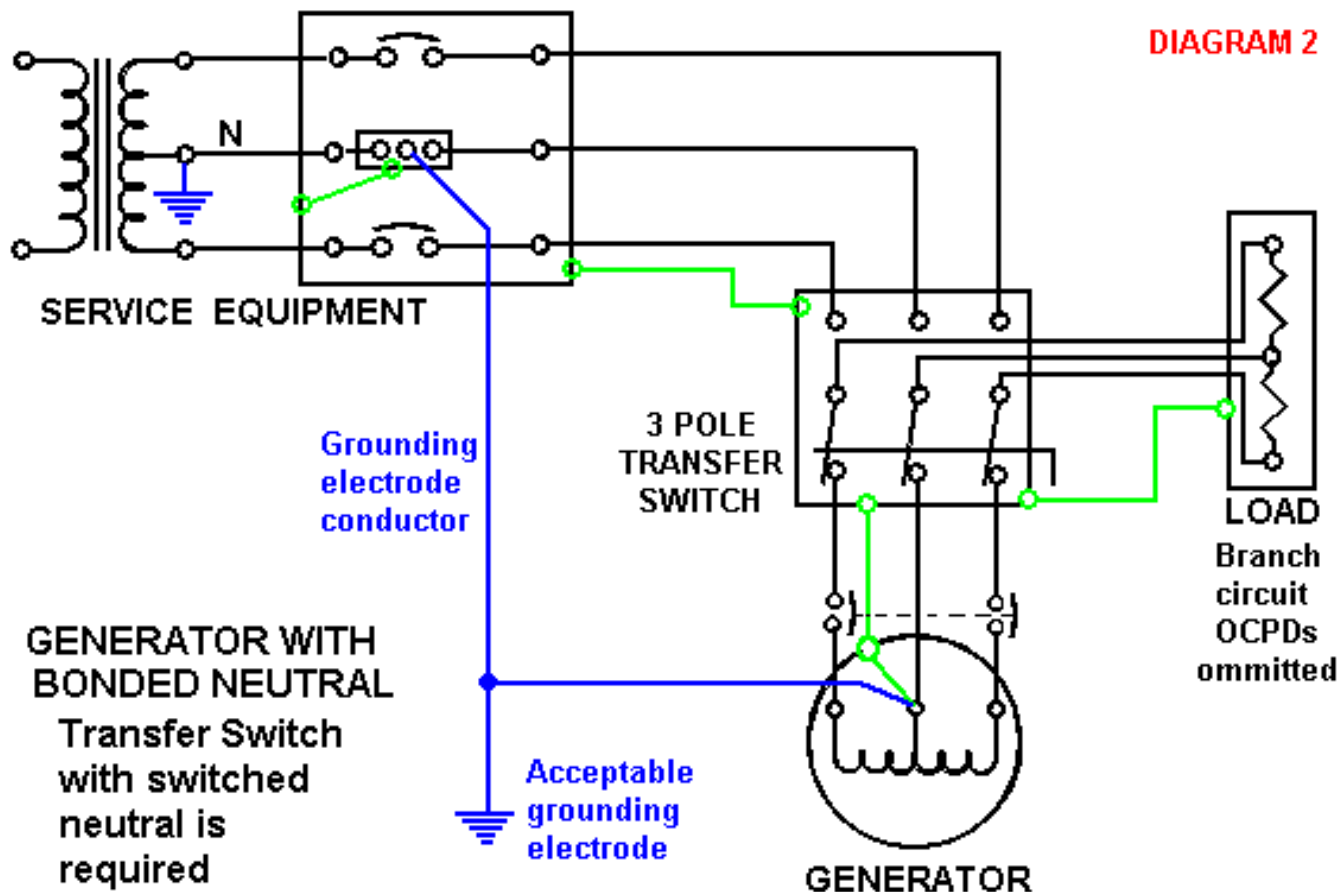
Electric Ed

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▪ <a href="#">More on Wiring</a>
▪ <a href="#">Also by RobD</a>



Re: Switch over power ([none / 0](#)) (#2)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Sat Nov 22nd, 2003 at 07:05:46 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Just out of curiosity... If you break or pull the mains from the house's main panel box and tie a generator to the same box through separate mains, is there any way to feed the utility line? If not what about the neutral line? Any possibility of feeding back on the neutral?

Windstuff Ed

[ [Parent](#) ]

Re: Switch over power ([none / 0](#)) ([#3](#))  
by Electric Ed on Sat Nov 22nd, 2003 at 11:08:08 AM MST  
([User Info](#)) <http://www.electric-ed.com>

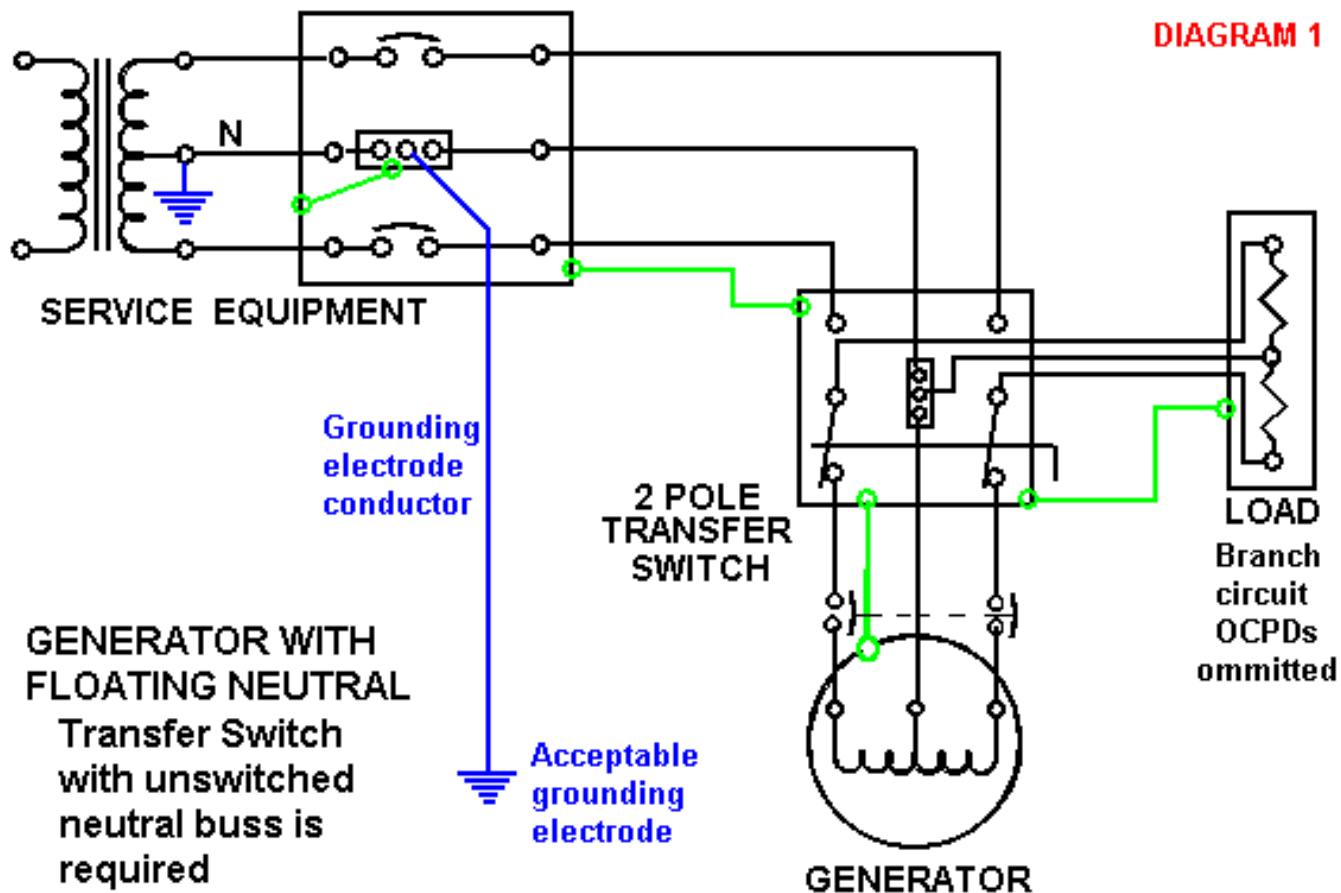
What you describe is safe enough, it's just that the inspection authorities do not accept transfer schemes that rely on an individual REMEMBERING to open the main. Because they deal with the public they require it to be "idiot" proof, and usually with good reason.

You wouldn't believe what some folks will do. :-)

There normally wouldn't be any "feed back" on the neutral. The reason my example sketch shows a three-pole transfer switch is to deal with a grounding issue. If the generator neutral is NOT bonded to the frame, a two-pole transfer switch would be required, as shown below.

Electric Ed





[ [Parent](#) ]

Re: Switch over power ([none / 0](#)) (#4)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Sat Nov 22nd, 2003 at 01:39:13 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Couldn't you take two single throw boxes, mount them handle to handle and end up with a very inexpensive power transfere system? Going handle to handle puts one box upside down and the other right side up. bolt the handles together, one breaks the connection to consumer line and the other connects the gen to it. Much cheaper than those Gen boxes and allows you to use a common main panel.

Mine is set up on the "remember" theory right now but I'm looking for ways of meeting code cheaper...

Have Fun  
Windstuff Ed

[ [Parent](#) ]

Re: Switch over power ([none / 0](#)) (#5)  
by Jerry on Sat Nov 22nd, 2003 at 09:49:49 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Guys.

This is what I've done. I went to the big box home improvement store and picked up a metal switch box that has room for 9 lite switches, picked up 9 double pole sigle through light swiches. The are the type wall switch that lets you turn of one lite in a room at two locations. By this door or by that door. One lite 2 switches.

I sellected 9 circuts in the house. These circuts are wired to the sellecter part of the switch. Now I have 2 terminals left over. One term. is wired to the circuit breaker where the Utility power is coming from and the other is wire to my inverter. However on each one of these I've wired a seperate circuit breaker for safty.

I works realy slick I can select any circuit I want or all. Home power or grid power just flip a switch. I'm going to do the rest of the panle this way. However this is only for 120 volt use. Thats the CAUTION here.

For my aplication thats all I need. And there is no danger of sending power back to the grid.

I think I did this hole project for less than \$20. The big box store whanted \$200 for there switcher box that dose the same thing.  
It works good for me. Use at your own discesion?

JK TAS Jerry

[Airheads Page](#)

[ [Parent](#) ]

Re: Switch over power ([none / 0](#)) ([#6](#))  
by RobD on Sun Nov 23rd, 2003 at 02:37:03 PM MST  
([User Info](#))

Thanks for the help everyone.

Nice idea Jerry!

WS Ed. I'm going to use the main fuse as a 'breakout' to feed the three terminal relay. I like the three terminal relay idea and I may build a sensor to switch it over when the power fails (which happens a lot up here) like an UPS configuration. I'll check with my rural co-op to see what they say first.

Thanks again everyone,

RobD

Re: Switch over power ([none / 0](#)) ([#7](#))  
by Joseph Turrisi on Sun Nov 23rd, 2003 at 06:05:17 PM MST  
([User Info](#))

It shouldn't be too hard to build your own switch but I wouldn't recommend it. If it is not UL approved and installed according to the national electric code, your homeowners insurance will have an excuse not to pay out if something bad happens like a fire or electrical shock.

[Switch over power](#) | 7 comments (7 topical, 0 editorial)

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## [Should neutral be grounded near house if meter is a long distance away?](#)

By [storrence](#), Section [Remote Living](#)

[Wiring](#)

Posted on Sun Nov 16th, 2003 at 04:59:29 AM MST

My meter is 350 meters from my house hookup and am wondering if I should put a copper stake near the house to ground neutral?

I have been told the power companies prefer that the neutral pass through the meter but I'm not sure on this.

I have a meter that is 350 meters from my home. At the meter there is a 2 meter copper stake in the ground. The installer said this was because the last place the neutral was ground was far from my meter and better to be grounded. Now I'm wondering if it's better to also ground the neutral near my house. My questions are:

1. Should I still use the neutral going to the meter and just tap into it and connect it to a copper stake in the ground next to my house?
2. Does it matter if it's close to the copper stake I already have in the ground for my ground wire coming from my breaker box?

I've also been thinking if it makes a difference on the strength of my electricity here. The way I understand it is the 60hz phase coming from one of the phase lines is just 170v oscillating from + to - 60 times per second. I assume that this oscillation only takes place when it can connect with ground/neutral. If the neutral or ground is not well grounded then does that make the phase line weaker just like if you were using to thin of a wire and going over a long distance. Sort of like to much resistance so the phase doesn't oscillate very strong. I also visualize it like water pipes that pumps and pulls 60 times per second. The potential is there as if you had a pump at the other end and it was reversing direction 60 times per second. But you wouldn't benefit from that at the other end of the hose unless you opened it up and in the case of electrons connected it to ground. So in the case of water if you connect it to the returning pipe but the returning pipe is much smaller than it should be (much thinner wire creating a higher resistance) then wouldn't the power of the system be reduced?

I'm using 25mm2 wire to run the 350 meter distance. 3 lines for the 3 phases and 1 for neutral. What would happen if I either connected the neutral directly to ground at my house and/or disconnected the neutral going to the meter at the street. Would I improve my power at the house?

[Should neutral be grounded near house if meter is a long distance away?](#) | 12 comments (12 topical, 0 editorial)

Re: Should neutral be grounded near house ([none / 0](#)) (#1)  
by [drdongle](#) on Sun Nov 16th, 2003 at 07:55:42 AM MST  
([User Info](#))

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Your "neutral" should be most definitely grounded at the house and tied to the ground bar in the circuit breaker panel, use at least # 10 ( US gage) or larger copper wire. Not having a proper ground doesn't change the voltage level it just creates a safety hazard. I suggest that you not mess with the incoming drop cable from the street/ meter unless there is a disconnect at the meter that allows you to cut off the house.

Dr.D

Re: Should neutral be grounded near house  
([none / 0](#)) ([#2](#))  
by storrence on Sun Nov 16th, 2003 at 03:43:47 PM  
MST  
([User Info](#))

I'm not sure in AWG but here I'm using 4mm<sup>2</sup> ground wire from the box to the grounding stake at the house.

The way it's all set up is:

The meter is at the street. From there I ran 4 25mm<sup>2</sup> wires (seems like the size of a writing pin). 3 for the 3 phases and 1 for neutral.

These go directly into the box inside the house. 3 go to a tripole 40a breaker. 1 goes to the neutral bar.

I have a separate neutral and ground bar that are currently not tied together.

So the neutral goes to the neutral bar in the box with a 25mm<sup>2</sup> cable.

The ground bar which is not connected to the neutral bar goes out of the house on a 4mm<sup>2</sup> cable to a 2 meter copper grounding rod. This ground wire is 4mm<sup>2</sup> and seems about 1/5 the size of the wires coming from the meter.

Since I already have a grounding wire and a good size cable coming from the neutral bar but just not getting to earth until the street which is 350 meters away. Should I just T tap into that neutral and connect it to the ground stake and then connect the ground and neutral bars together in the box?

[ [Parent](#) ]

Re: Should neutral be grounded near house  
([none / 0](#)) ([#3](#))  
by signweld on Sun Nov 16th, 2003 at  
07:21:10 PM MST  
([User Info](#))



Your neutral is neutral, and ground is ground!. Inside your service entrance box the neutral is insulated from the box( unless someone turned in the bonding screw.)and box is grounded to ground connection bar and ground rod, as per the electric code here in the U.S. Anyway else will give you tingles!  
signweld

[ [Parent](#) ]

Re: Should neutral be grounded near house ([none / 0](#)) (#6)  
by drdongle on Sun Nov 16th, 2003 at 09:14:17 PM MST  
([User Info](#))

This seems to be part of the problem I would think that in the box the neutral and ground should be tied together. Perhaps I'm mistaken I'll have to check into this ferther.

Dr.D

[ [Parent](#) ]

Re: Should neutral be grounded near house ([none / 0](#)) (#8)  
by jubalearly on Mon Nov 17th, 2003 at 09:07:37 AM MST  
([User Info](#))

Frequently one of the bolts in the box is used to connect the neutral to the ground bar. This connection may not be visible, or, anyone not familiar with that style of panel may not recognize it. In the USA it is often done with a green bonding screw or bolt. That bolt would simply be removed when the panel is used as a sub panel and the neutral - ground connection is not wanted.

[ [Parent](#) ]

Re: Should neutral be grounded near house ([none / 0](#)) (#4)  
by signweld on Sun Nov 16th, 2003 at 07:28:41 PM MST  
([User Info](#))

Dr D., I only mean well, but you may want to check the NEC, or your local electrical code. The neutral should NOT be wired to ground at your service entrance in your house. The only place it is bonded to ground is in the meter box only. after this, the neutral carries the load and the ground only provides a current path to trip the breakers or blow the fuses.

[ [Parent](#) ]

Re: Should neutral be grounded near house ([none / 0](#)) ([#5](#))  
by drdongle on Sun Nov 16th, 2003 at 09:11:14 PM MST  
([User Info](#))

Well my box passed inspection with a link ( provided with the load center) from the neutral to the box ground ( screwed to the metal of the box). At the meter or load center both neutral and ground are at the same potential. Perhaps there have been changes since I did mine.

Dr.D

[ [Parent](#) ]

Re: Should neutral be grounded near house ([none / 0](#)) ([#9](#))  
by jubalearly on Mon Nov 17th, 2003 at 09:36:29 AM MST  
([User Info](#))

Dr. D, the NEC still requires a ground to neutral connection in the (residential) main panel box which is required to be located at the service entrance in the USA. See NEC (NFPA 70, 2002) sections 250.20 and 250.64 as well as a number of parts of article 250 where applicable.

Note that industrial and utility requirements (or apartment complex) may be different in the US, and other countries have all sorts of diffent systems which may have unique requirements. Note that the meter may be either before or after the service entrance and is not necessarily service equipment. There are too many variations to say whether the meter box is grounded, although there normally is a ground at the service entrance. Its all up to the local authority.

[ [Parent](#) ]

Re: Should neutral be grounded near house ([none / 0](#)) (#7)  
by jubalearly on Mon Nov 17th, 2003 at 09:02:23 AM MST  
([User Info](#))

You should ground the neutral in accordance with the National Electrical Code or your countrys equivalent (Brazil?). Be careful of any advice you get here because it may not apply in your country.

In general for the USA, the neutral is also connected to a ground bar in the main circuit breaker box. You MUST only ground the neutral in one place (per US NEC). The NEC also requires connections (to the ground bar in the main panel box or to the ground rod) to things like gas & water pipes. The possibilities are too numerous to go into here but you should do a web search.

As far as grounding the meter goes, this is usually up to the power company. Every utility has different grounding requirements and a meter ground is about 50-50 in the US. Unless you have a receptacle or circuit breaker (not a disconnect) at the meter, I wouldn't worry about whether it is grounded or not. The ground is primarily a safety feature & you need one near the breakers to insure that they can trip properly. That's why there is one in the panel. The neutral is only grounded once to prevent circulating currents & to make sure that devices like a GFCI work properly.

I don't know about your countrys power, but 3 phases should be balanced - that is, they should all have the same voltage between the Hot & ground. Ideally there should be no voltage between ground and neutral. You might read a low voltage between ground and neutral because of the long run or because your load on each phase is not exactly equal. Are you using all 3 phases? and what voltage are your appliances?

You might be able to improve the ground at your house but that is another involved subject that you should do a web search on (residential grounding). Do you have a local electrical inspector? I would get his advice or talk to an engineer at the power company before you do anything. You want to be sure you do not create an electrocution or fire hazard, or nullify any safety equipment.

Re: Should neutral be grounded near house ([none / 0](#)) (#10)  
by storrence on Mon Nov 17th, 2003 at 11:16:22 AM MST  
([User Info](#))

Oh reading this reminds me of when I lived in the states :-) You would be surprised at how these things are done here, especially in a rural area. People literally drop a small cable over the street lines to hookup their house. Saves on the month bills quite a bit :)

Well we decided to do it a little more official and have the power company come out and install the meter and I went from the meter 350M to our house up the mountain. It's as close as they would go :)

In the US is grounding the neutral done at every pole or is it carried directly from the distribution point? I had understood at least here that it is connected to a grounding rod on every pole. This is why the power company put the neutral to a new grounding rod at our pole which was put in at the same time. Since I'm going underground another 350M from that point to my house I'm curious if I should reground the neutral at my house. Possibly using the same rod I'm using for the ground now. Asking someone here about this is impossible. 10 different electricians will give you 10 different advices and they all work for the same company! For me the US standards will do fine if I can adopt them to my situation. I wonder what they do or if you ever have a situation where the street meter would be some distance from the house connection. What would they do in that situation? Carry the neutral from the street or reground it at the house?

The meter itself doesn't have a separate ground from what I remember but it does have the neutral grounded. Same thing? The meter does have a triphase 40A breaker.

Our 3 phase here is balanced. 126v when I test each phase against neutral.

When an installation is done in the US do they put in a ground rod for the house and then connect that to the grounding bar in the circuit box? And do they also connect the neutral leads to this bar also?

[ [Parent](#) ]

The answer is ([none / 0](#)) ([#11](#))  
by [wooferhound](#) ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Wed Nov 19th, 2003 at 08:20:37 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

The answer is . . .

There should be an earth ground rod connected to every Breaker Box with some rather high gauge wire, regardless of whether the neutral is screwed to the ground of the box or not.

} = - W o o f - = {

Re: Should neutral be grounded ([none / 0](#)) ([#12](#))  
by BrianK on Thu Nov 27th, 2003 at 11:43:27 AM MST  
([User Info](#))

here in the U.S. our meter where I live has a ground that goes back through the meter box to the transformer on the pole. also a earth ground in the breaker box.

[Should neutral be grounded near house if meter is a long distance away?](#) | **12** comments (12 topical, 0 editorial)

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[microwave transformer questions](#)

By [BrianK](#), Section [Homebrewed Electricity](#)  
 Posted on Wed Nov 12th, 2003 at 04:35:11 PM MST [Wiring](#)  
 any info would help

I built a small wind gen out of one of those little honda 1000 watt gens that had the little weedeater engine shot. As a wind gen it is producing 6 to12 volts dc not much I wired the 110 ac side of it up and connected to the diodes for the actual dc side thus that is what is producing the voltage. Ok now the question microwave trans are ac. so I unhooked one of the 3 ac lines comeing in and hooked it to the trans it seems to be bumping that lines voltage up to 100 to 300+ volts I need to know if it is ac or dc my multi meter seems to give me readings on ac or dc its got me lost which is it?

[microwave transformer questions](#) | 5 comments (5 topical, 0 editorial)

Re: microwave transformer questions ([none / 0](#)) ([#1](#))  
 by [drdongle](#) on Wed Nov 12th, 2003 at 05:41:18 PM MST  
[\(User Info\)](#)

The transformer out put will be AC  
 Dr.D

Re: microwave transformer questions ([none / 0](#)) ([#2](#))  
 by [bob golding](#) ([yubba at clara dot net](#)) on Wed Nov 12th, 2003 at 05:47:35 PM MST  
[\(User Info\)](#)

all transformers are ac. be very careful of microwave oven transformers, will kill you very quickly if you get across the high voltage side. they are usually 110 or 240 in and 2100 volts out, so even if you only put in say 25 volts you have 500 volts on the output. not a good idea to play with high voltage transformers even on low voltage systems till you know more about the risks.

play safe  
 bob

Re: microwave transformer questions ([none / 0](#)) ([#3](#))  
 by [BrianK](#) on Fri Nov 14th, 2003 at 10:34:36 AM MST  
[\(User Info\)](#)

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Yep I found out kinda found the voltage thing out the hard way the about 6 volts gives a pretty good jolt when you dont pay attention make ya jump real quick I found that all out when I was trying to figure out the wiring to get it to work I,m still learnin i,m getting a better understanding of it all.

[ [Parent](#) ]

Re: microwave transformer questions  
([none / 0](#)) ([#4](#))  
by Norm on Fri Nov 14th, 2003 at 12:47:56  
PM MST  
([User Info](#))

Yeah, a used-to-be friend would have fun tossing small charged capacitors to unsuspecting victims....(here catch!) Norm.

[ [Parent](#) ]

Re: microwave transformer questions ([none / 0](#)) ([#5](#))  
by wpowokal on Sat Nov 15th, 2003 at 05:47:20 AM MST  
([User Info](#))

Bran K, it is easy to rewind the high voltage of a microwave transformet to whatever voltage you choose, this may be a possibility for you.

regards Allan

[microwave transformer questions](#) | 5 comments (5 topical, 0 editorial)

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## [Power Transmission](#)

By [AMA](#), Section [Homebrewed Electricity](#)

Posted on Wed Nov 12th, 2003 at 07:26:45 AM MST

[Wiring](#)

I need help with info on how to transmit power efficiently from a hombrew wind turbine to batteries

Hi

I have been using Hugh Piggot's plans to build a 500W wind turbine, and have nearly a completed turbine, i.e. blades carved, batteries purchased, casting jigs made and resin casting probably this weekend. However I intend to put the 500W wind turbine about 200 Yards from the house (battery location) and therefore I need help on how others transmitted power similar distances. My main problem is that in the plans it says to use diodes to change from AC-DC but this would only make the losses worse so I was thinking of transmitting the 5 phase AC to the battery and then perform the rectification, however 5 core insulated wire for this kind of power is expensive!! is their any way that is not to expensive that I can do this? What is everyone else doing regarding transmission between turbine and house???

Regards

Aodhan MacAleer  
Ireland

[Power Transmission](#) | 4 comments (4 topical, 0 editorial)

Re: Power Transmission ([none / 0](#)) ([#1](#))  
by [charged](#) on Wed Nov 12th, 2003 at 07:54:53 AM MST  
([User Info](#))

You need four things to efficiently transfer your DC down the long wire.

1. Large capacitance for both ends of the wire.
2. A heavy inductor (microwave oven transformer primary)
3. A high current transistor with a pulsing circuit (556 timer IC with voltage regulation added)
4. A high voltage/medium current rectifier

The first capacitor goes across the DC output at the turbine. Figure out what your maximum voltage is and use and over-rated capacitor. This will be your primary charge reservoir.

The negative lead is then fed directly to the house.

The positive goes to the transistor collector. The transistor emitter goes to one side of the large inductor. The other lead from the inductor goes directly to the house as the positive lead.

The positive and negative leads in the house connect to the second large capacitor. This is your secondary charge reservoir.

The heavy rectifier is connected in reverse bias mode, between the turbine negative lead and the transistor

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emitter.

The transistor base is driven with the 556 IC set up as a PWM (Pulse Width Modulator).

First, set the pulse frequency very low. Then adjust the "ON" time for the transistor (pulse width) so that the current is turned on JUST LONG ENOUGH to build an 80% field in the inductor. This is called the "field moment" of the inductor. The waveform looks like a sawtooth. If you see ANY steady current flowing after the sawtooth then you need to shorten the pulse width.

Next, turn the pulse frequency up until you are at 50% duty-cycle.

Each time the transistor shuts off, the inductor field collapses and the CEMF is sent down the wire to the house as a "spike" that also gets collected in the receiving capacitor.

Set up a second pulse circuit to dump that capacitor into your battery bank with a second transistor and pulse circuit.

You can efficiently transfer DC power from point to point over VAST distances with few losses using this method.

There are some slightly more complicated methods to utilize a pure CEMF from a 1:1 flyback inverter that allows VERY fine wire for power transfer. But, that's a bit more complicated. Dig through Tesla's old patents from AFTER 1891 and you'll see some interesting stuff that works quite well in our "solid-state" age of tech.

Re: Power Transmission ([none / 0](#)) (#2)  
by AMA on Wed Nov 12th, 2003 at 08:04:05 AM  
MST  
([User Info](#))

Thanks a million for the detailed answer, much appreciated

[ [Parent](#) ]

Re: Power Transmission ([none / 0](#)) (#3)  
by dburt on Wed Nov 12th, 2003 at 10:19:49 AM  
MST  
([User Info](#))

charged,

Do you have any measurement data from a real-life example of a setup like this that gives an indication of voltages, power transmitted and efficiency?

Thanks,  
Dave in PA

[ [Parent](#) ]

Re: Power Transmission ([none / 0](#)) ([#4](#))  
by charged on Thu Nov 13th, 2003 at  
11:11:38 AM MST  
([User Info](#))

Hi Dave!

Nope. But, it's the same thing as a "buck boost" capacitive charge transfer IC circuit. You know, power isolation chips?

Only, this setup is a larger version. CEMF doesn't care how long the wire is. It doesn't develop any "real" current component until it impacts on a capacitance. Just make sure your capacitors are rated for 200v or so and you won't pop the internals when the spikes come down the line.

Do a slow charge transfer test with two caps and a long wire and you'll see what's happening.

For even more fun, don't use a long ground lead. Just drive a long copper rod into the ground at both ends to replace the ground lead, just like the old telegraph systems.

Sounds bizarre. But, with some tweaking, the stuff works.

Enjoy!

[ [Parent](#) ]

[Power Transmission](#) | 4 comments (4 topical, 0 editorial)

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## [Question for Zubbly](#)

By [Garry](#), Section [Homebrewed Electricity](#)

Posted on Mon Nov 10th, 2003 at 07:40:41 PM MST

[Wiring](#)

Could you give me a short explanation of connection methods inside a 15 hp motor.

When I was in trade school thirty some years ago they had us scraping and soldering coil and lead connections inside motors. I am reconnecting a 480 volt only motor to 240 volt by placing groups of coils in parallel. The coil connections appear to be melted in a blob. Are the wires stripped first? Is a flux used? Is a copper brazing rod like is used in refrigeration containing silver applied, or just heat used to melt the wire ends into a blob.

Thanks  
Garry

[Question for Zubbly](#) | 2 comments (2 topical, 0 editorial)

Re: Question for Zubbly ([none / 0](#)) (#1)  
by [zubbly](#) on Mon Nov 10th, 2003 at 08:12:36 PM MST  
([User Info](#))

hi Garry.

the most common method in motor rewind shops today to connect the magnet wires is as follows.

twist the magnet wires tightly together 5 or six times, and cut off the free ends.

for the lead wire connections, wrapp the magnet wire around the stripped end of lead wire and cut off free end.

depending on the size of your connections, quickly burn the wrapped part of the magnet wire to a dull cherry colour. do this to all the connections including the lead wire connections.

I suggest that you use silfoss 5% silver for the best connections. flux is not needed. they also use this in refrigeration repair of the units cooling coils. quickley re-heat connection to a brighter cherry colour and touch sifoss to wire while applying heat. you will quickly see the sifoss take to the wire. now apply more heat to the tip of connection and actually melt the tip to completely amalgamate copper wire-lead wire, and the silfoss. take care when doing these procedures as not to use too much heat and totally melt off the whole end. an oxy-acetalene gas with a small brazing tip works well.

wrapp your connections with a mylar tape if possible and slide over a piece of insulating tube ( called sleeving ) to cover the connection up to and a little over the unburned portion of connections.

a word of caution. since you are re-connecting and the length of magnet wire may be quite short as compared to when motor was originally wound, I would suggest that you just scrape the wires clean, twist together as i mentioned, use solder paste, and use 40/60 or 50/50 solder with a

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soldering iron. this old soldering method is still used today ( and very reliable ) on many large motors with large rectangular wire.

the use of silfoss was really developed to speed up the process of connecting.

hope this helps.

have fun----zubbly

Re: Question for Zubbly ([none / 0](#)) (#2)  
by Garry on Mon Nov 10th, 2003 at 08:29:09 PM  
MST  
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Thanks for all the info. This motor was wound three-in-hand so there would be a lot of scraping. I use silfos on copper pipe so I will try that. The jumpers in this motor go almost half way around the stator.

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[Question for Zubbly](#) | 2 comments (2 topical, 0 editorial)

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### [How to get from here to there](#)

By [robotmaker](#), Section [Homebrewed Electricity](#)

Posted on Tue Nov 4th, 2003 at 01:37:26 PM MST

[Wiring](#)

I just stumbled across this board, and I must say I am so happy I did.

I have been an advocate of alternate energy for, well, lets just say I was around to see the first issue of Mother Earth News, was a subscriber for quite some time, and have built several of their projects. I currently have a waste oil heater in my 1200 sq ft. shop, and it heats it quite nicely.

I have moved on to wind power, and have a burning question that I hope someone like Zubbly or someone can answer. I found several posts for extremely good links on building windmills. And I thank you. I have available to me several sizes of brushless AC servo motors, which at first glance, work EXTREMELY well for generating power. I take the three phase out of the delta wound stator, and put it thru a 3 phase bridge feeding a nice size capacitor bank, and just by turning the motor by hand, produces what looks like a healthy amount of energy. I already cut my first PVC prop this last weekend too, and will attempt to scale it up to a 4" diameter version this weekend.

Question: How to get the wire from the motor, down the mast, to the electronics. I have seen a couple references to running it inside the mast? What about twisting?

God I love this stuff!!

rj

[How to get from here to there](#) | 7 comments (7 topical, 0 editorial)

Re: How to get from here to there ([none / 0](#)) (#1)  
by [drdongle](#) on Tue Nov 4th, 2003 at 04:25:06 PM MST  
([User Info](#))

A lot of people don't bother with slip rings and periodically untwist the wire or have a plug at the bottom that they periodically disconnect and unwind.

Dr.D

Re: How to get from here to there ([none / 0](#)) (#2)  
by [Reno](#) on Tue Nov 4th, 2003 at 04:43:43 PM MST  
([User Info](#))

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I have two rubber coated wires running down the center of the mast and when they twist on themselves they act like a spring eventually the resistance created between the wires will cause the next movement to spin the other way. I manually wound the genny before putting it up and after just a little over 2 turns and releasing it it spun completely around.

Re: How to get from here to there ([none / 0](#)) ([#3](#))  
by zubbly on Tue Nov 4th, 2003 at 06:45:47 PM MST  
([User Info](#))

hello Robotmaker. thankyou for the mention of use of some of my ideas as well as from others. being still relatively new to the genny field, i often refer to the advise of others who have already done and experimented in paticular fields with great success. sometimes the simplest ideas and solutions work out to be the best in the long run. the subject of slip rings does ring a bell to me as i have repaired many of these units for years. for some reason i seem to keep adding more projects to the ones i have not yet completed. i do have some ideas on simple slip ring assembles that can be made from discarded circular pump parts. need alittle time though. i will post when i complete the design and model. for now, accept the good advise from the people that have been there and done it.

keep having fun, its what it's all about--zubbly

Re: How to get from here to there ([none / 0](#)) ([#4](#))  
by kww on Tue Nov 4th, 2003 at 06:47:24 PM MST  
([User Info](#))

A method I saw here somewhere which I used on mine was to bolt a short cable with some slack between the top(turning part) and stationary pole. The cable keeps it from winding one way too much. They say it will unwind itself eventually if it winds all the way up.  
Kevin

Re: How to get from here to there ([none / 0](#))  
([#5](#))  
by robotmaker on Wed Nov 5th, 2003 at 09:00:06 AM MST  
([User Info](#))

Thanx for all the feedback, I really appreciate it. I still have to work out how the cable will get INTO the mast at this point, but being a model engineering student, wanted to explore all the obvious pitfalls first. Thanx again.

rj

[ [Parent](#) ]

Re: How to get from here to there ([none / 0](#)) (#6)  
by kww on Wed Nov 5th, 2003 at 10:52:13 AM MST  
([User Info](#))

I just drilled a hole and smoothed the edges where my romex goes into and comes out of the mast.

Kevin

[ [Parent](#) ]

Re: How to get from here to there ([none / 0](#)) (#7)  
by desertratjack on Thu Nov 6th, 2003 at 08:37:13 AM MST  
([User Info](#))

I have run the cable inside the mast with some slack for the two wires to wind up and down (#6 THWN/THNN). No problems after a month and others say that there is never a problem with this arrangement (although they recommend the more flexible welding wire).

[How to get from here to there](#) | 7 comments (7 topical, 0 editorial)

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[wire size?](#)

By [BrianK](#), Section [Homebrewed Electricity](#)  
Posted on Fri Oct 31st, 2003 at 02:24:14 PM MST  
wire help please!!!

[Wiring](#)

Ok i'm real new at this can anybody tell me what is a good wire size to use that seems to be the best producer on a brake rotor wind turbine? Oh yeah and i guess magnets would be another good question.

[wire size?](#) | 0 comments (0 topical, 0 editorial)

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### [How far can you carry your electricity?](#)

By [thegingerone](#), Section [Homebrewed Electricity](#)  
Posted on Thu Oct 30th, 2003 at 05:06:50 PM MST [Wiring](#)

**What is the rate of loss of energy over distance travelled?**

Hi,  
I am totally new to this .  
I have been reading all the websites I get my hands on over the past couple of days on the topic of wind power. The use of homebrewed electricity to keep the lights on in the outhouses on the farm seems very appealing. In evaluating whether this source of alternative energy would be suitable for me, one question has come up which I cannot answer: How far can u carry the energy, either as a DC, or an AC current from the point of generation to the point of use? Or what is the rate of loss of energy over distance travelled?

[How far can you carry your electricity?](#) | 5 comments (5 topical, 0 editorial)

Re: How far can you carry your electricity? ([none](#) / 0) (#1)  
by [drdongle](#) on Thu Oct 30th, 2003 at 06:05:28 PM MST ([User Info](#))

General rule of thumb the larger the wire size(gage) the farther you can send the juice ( the lower the loss). I'm sure some one out there has a resistance table close to hand.

Dr.D

Re: How far can you carry your electricity? ([none](#) / 0) (#2)  
by [windracer](#) on Thu Oct 30th, 2003 at 06:16:48 PM MST ([User Info](#))

go to  
<http://www.dankoffsolar.com/reference/wiresizechart.html>  
this is a nice chart for all voltages.

Re: How far can you carry your electricity? ([none](#) / 0) (#3)  
by [wooferhound](#) ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Thu Oct 30th, 2003 at 07:38:40 PM MST ([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

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- [Also by thegingerone](#)

Here is a bunch of "Voltage Drop Calculators" . . .

[http://www.electrician.com/vd\\_calculator.html](http://www.electrician.com/vd_calculator.html)

<http://www.stanselectric.com/vdrop.html>

<http://www.elec-saver.com/freetool06.htm>

>=- W o o f -=<

Re: How far can you carry your electricity? ([none / 0](#))  
(#4)  
by thegingerone on Fri Oct 31st, 2003 at 03:35:23 PM  
MST  
([User Info](#))

Guys thanks for the information, it has helped to answer my question.

Re: How far can you carry your electricity? ([none / 0](#))  
(#5)  
by charged on Wed Nov 12th, 2003 at 08:10:37 AM MST  
([User Info](#))

You can carry it as far as you want, with as small a diameter wire as you want, with no losses. That is, IF you don't FORCE the power through the system.

Here's how you can prove it to yourself.

Get two large capacitors of equal capacitance. The bigger, the better you'll see what's going on. Two of those big car-stereo caps will work very nicely.

Charge one of them to 12v and discharge the other to 0v.

Charge the empty one with the charged one through some short jumper cables. You'll get 6v in each. Nothing special.

Now, get yourself a long roll of wire like telephone cable or just about anything. The smaller the better.

Start with 12v and 0v again in the two caps. This time, charge one cap with the other THROUGH the long wire.

It takes a little longer. But, in the end, you still have 6v and 6v in the two caps. The resistance doesn't EAT CHARGE. It only slows down the transfer time.

In a nutshell, engineer your power transfer system to carry your maximum generated power in a PASSIVE manner and you won't have ANY significant losses, regardless of distance.

Tesla was using these "interruptor" circuits in the 1890's. Just go look at his patents. The concepts work much better with our modern solid-state devices than they ever could with his mechanical interruptors.

[How far can you carry your electricity?](#) | 5 comments (5 topical, 0 editorial)

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## [2 Gennies on 1 line](#)

By [Scott](#), Section [Homebrewed Electricity](#)

Posted on Tue Oct 28th, 2003 at 07:26:41 PM MST

[Wiring](#)

2 different voltage tape drive gennies running on one line to batteries

I have one 40v tape drive mill and just ordered a 99v Ametek motor. Can I run them both into one transmission line to the batteries. I will put a blocking diode on each one before they connect together so one doesn't feed the other then connect them together for the 75' run to the batteries. Will the voltage just average out?

Thanks  
Scott

[2 Gennies on 1 line](#) | 6 comments (6 topical, 0 editorial)

Re: 2 Gennies on 1 line ([none / 0](#)) ([#1](#))  
by TomW on Tue Oct 28th, 2003 at 07:37:18 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Scott;

Since these produce DC and you are using blocking diodes I see no reason not to share the line if its capable of handling the combined current from the mills without too much voltage drop. The current will be the sum of both current sources [gennies] so size your wire accordingly the voltage will simply be the voltage of the highest source. Its what I would do. If they were producing AC I think it will be a bit different and tough to isolate them.

Cheers.

TomW

[Stuff I have Online](#)  
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Re: 2 Gennies on 1 line ([none / 0](#)) ([#2](#))  
by laskey on Tue Oct 28th, 2003 at 07:43:22 PM MST  
([User Info](#))

Mmmmm... I don't think your tape drives are actually producing DC (I could be wrong here), so you'd probably want bridge rectifiers before transmission (as it were).

Cya,  
Chris

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- [Also by Scott](#)



Re: 2 Gennies on 1 line ([none / 0](#)) (#3)  
by TomW on Tue Oct 28th, 2003 at 08:10:21 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Laskey;

The Ametecs I have experience with [30V, 40V and 50V] all produce DC voltage via a commutator and brushes.

Cheers.

TomW

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[ [Parent](#) ]

Re: 2 Gennies on 1 line ([none / 0](#)) (#4)  
by Scott on Tue Oct 28th, 2003 at 08:19:51 PM MST  
([User Info](#))

Thanks for the replies. For wire I have 2 runs of 12-3 romex, it's what I had around at the time. There's 8 #12 conductors total, 4 per + and -. It should be fine for now.

Scott

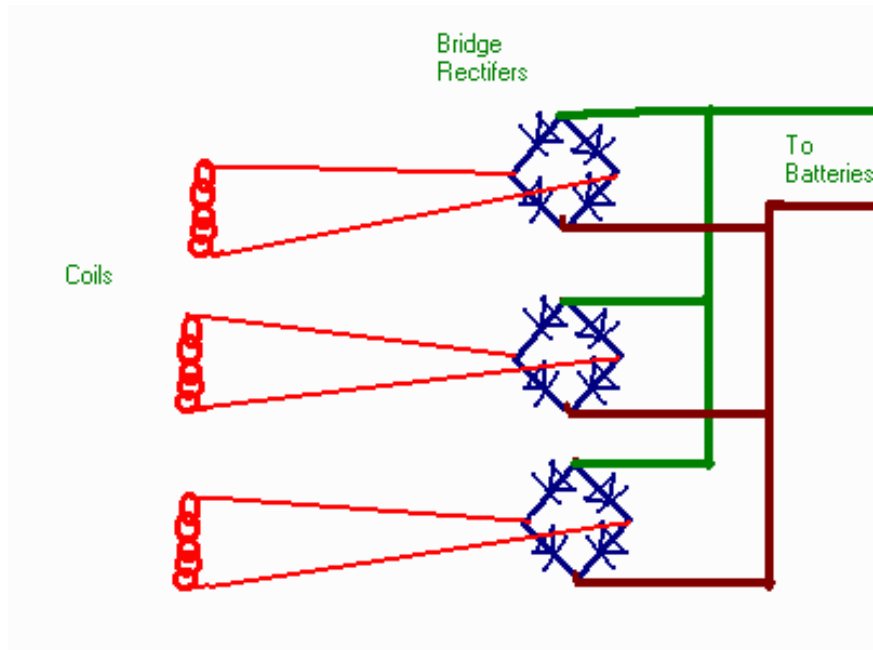
Re: 2 Gennies on 1 line ([none / 0](#)) (#5)  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Wed Oct 29th, 2003 at 01:02:49 AM MST  
([User Info](#)) <http://www.internetfred.com>

Filter the outputs at the pole!! You will have higher output and less ripple and more consistant power. Causes less problems. That voltage seems great! Match the temprature as well. Caps run at different tempratures, find one that is sutible for the lowest temprature in winter conditions. The higher the farad randge on your cap the better. Also this will lessen the load on the generator durring high load conditions. Acts like a small battery that will feed a bigger one, but charges smaller one first before feeding big one, hence produces lesser load and higher consistant voltages.

Good Luck  
ifred

Re: 2 Gennies on 1 line ([none / 0](#)) (#6)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Wed Oct 29th, 2003 at 01:57:55 PM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

You can hook a lotta sources up to the same wire as long as there isn't too much current for the wire. I'd hook 'em together like this . . .



. >=- W o o f -=<

[2 Gennies on 1 line](#) | 6 comments (6 topical, 0 editorial)

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[SALE: 50 lbs #10 GUAGE 0.1051" DIA. ESSEX ALLEX 240 DEGREES C MAGNET WIRE : \\$6/lb](#)

[Wiring](#)

By [Christina](#), Section [Classifieds](#)  
Posted on Tue Oct 28th, 2003 at 12:15:39 AM MST  
For Sale: 50 lbs of #10 Guage 0.1051

Hi Everyone,

I have for sale 50 lbs of #10 Guage (0.1051" Inches Diameter) Essex Allex High Temperature 240 Degrees C Magnet Wire. Price: \$6 per pound (lb).

This type of magnet wire is used in applications where temperature specific requirements are paramount and is ultra high quality stuff with proprietary insulation methodology being used from Essex. It is their highest temperature rated magnet wire that they sell. Here is a URL to Essex's Website for more information on this magnet wire: [<http://www.essexwire.com/oem/products/magnet/allex.htm>].

Will accept Paypal, or any other payment method including Escrow, USPS Money Order, Cash, etc. You can come and pick this up also for free if you are in the area (Zip 33147, Miami, FL).

Please note shipping would be whatever method you choose including your own FEDEX or UPS Account Number (insurance option must be used with these methods) and will be based on the exact amount of what is quoted to me from the Carriers. Please note I only use World Class Trackable Carriers/Shippers so that when product ships you will be emailed a Tracking #.

Will also be willing to sell this batch on a per pound basis.

I am a verified user of Paypal with paypal email being [[cyrix333\\_1999@yahoo.com](mailto:cyrix333_1999@yahoo.com)]. Also note that for Paypal payments sent online I will not ship to unconfirmed addresses for reasons relating to fraud. I am aware that someone might just want to have their stuff drop shipped to another location but as Paypal have it and to protect you and me it cannot be done.

Thanx a lot for your patience reading this.

Respectfully Yours,

Christina

[SALE: 50 lbs #10 GUAGE 0.1051" DIA. ESSEX ALLEX 240 DEGREES C MAGNET WIRE : \\$6/lb](#) | 0 comments (0 topical, 0 editorial)

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[hey internet fred, quick question...](#)

By [headhunter](#), Section [Homebrewed Electricity](#)  
Posted on Thu Oct 23rd, 2003 at 05:07:38 PM MST

[Wiring](#)

[hey internet fred, quick question...](#)

Hey, i replied back to your 32 coil setup but i guess ya haven't reread that post since. Was curious how ya got the coils to stay so nice when ya pulled em outta your winding unit... assuming u used glue of some type.

Any info would be appreciated.

Ivan.

[hey internet fred, quick question...](#) | 3 comments (3 topical, 0 editorial)

Re: hey internet fred, quick question... ([none / 0](#)) ([#1](#))  
by RobC on Thu Oct 23rd, 2003 at 07:42:37 PM MST  
([User Info](#))

Don't know how fred did it but I used super glue [cyanoacrylate glue] the quick set type and it worked great. RobC

Re: hey internet fred, quick question... ([none / 0](#)) ([#2](#))  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Thu Oct 23rd, 2003 at 10:13:20 PM MST  
([User Info](#)) <http://www.internetfred.com>

Hi Ya!

That was a trick. What I did was make a temporary inside diameter ring out of some sheet metal, which stands about an inch and a half high; if you look close you'll see it. I used finishing nails to hold it in place and soldered it tight. I made guidelines everywhere (inside radius, coil radius and coil center). When the coils where installed I lined it up to the inside ring first, then to the guides. Each coil on the underside was glued with some white silicon (all I had at the time, but ok) and positioned each coil all the way around, then corrected it as it was drying (mostly by eye and by the guidelines. Since the inside ring held the exact position around the inside circumference, did not have to worry about that alignment just the center alignment of each coil and it's position to the guidelines. I kept re-adjusting during the dry to get it as accurate as possible. A good eye helps, if I do it again, I would use a ruler attached to the center going outwards and use it as well to eye up the coils even better.

Once the coils where dry, I went to a friend of mine (car shop) who has a hand operated downward vise. I put the completed form in between two pieces of wood and slowly and carefully squeezed them flat more or less with equal pressure between the boards, this produced a nice flat coil form. It flattens the tops down a bit. I then checked all the coils again with an ohmmeter and no coils where damaged due to the squeeze. That's about it. If you have further questions, please feel free to ask. Good Luck!

Fred  
[www.internetfred.com](http://www.internetfred.com)

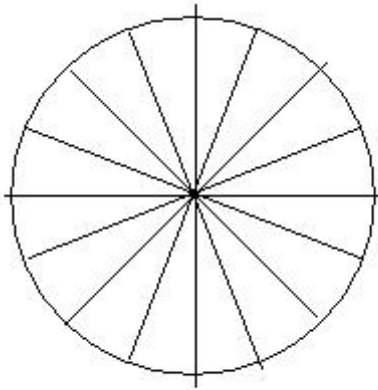
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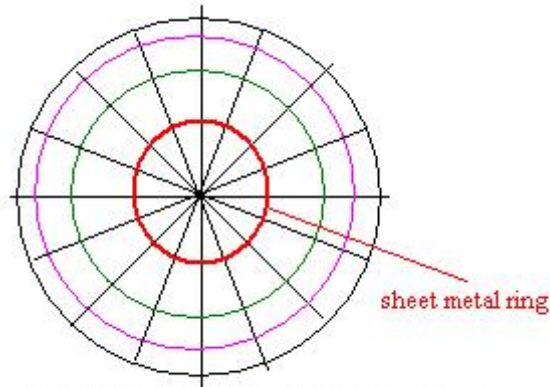
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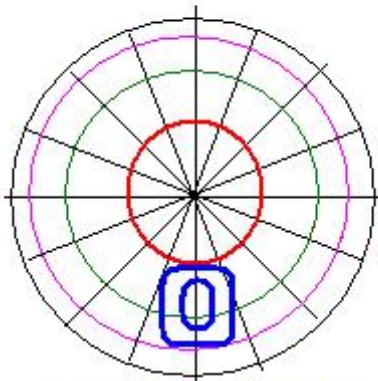




Step 1 - Make lots of guide lines  
90, 45, 22.5 deg



Step 2- Make some round center guide lines.  
make a sheet metal ring 1 inch in diameter,  
marked in red. the other two are center guide and  
outside coil diameter guide



line up coils to sheet metal  
ring and to guide lines



Re: hey internet fred, quick question... ([none / 0](#)) (#3)  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Thu Oct 23rd, 2003 at 10:22:12 PM MST  
([User Info](#)) <http://www.internetfred.com>

P.S. After the coils are all done and dried, remove the sheet metal ring, the nails and since you should have it in a form, make a centerpiece of wood to replace the metal ring and the center hole. Coat the entire form with varnish and when dry, wax or grease. Next cut out the fiber for your form for fiberglass and fiberglass it. Good Luck!

[hey internet fred, quick question...](#) | 3 comments (3 topical, 0 editorial)

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## [Hooking up GFI outlets to a STAR wired alternator](#)

By [kww](#), Section [Magnets & Magnetism](#)

[Wiring](#)

Posted on Sun Oct 19th, 2003 at 09:55:10 PM MST

How is it done?

I think I know how, but I'd like to know from someone who knows for sure. What I was wanting to do is to take my 3 outputs(ABC), use A and C as the hots and B as the neutral for both A and C in hooking up two GFI outlets. I'd have to split B into two wires to hook to both outlets to have an equal load between one of the hots and B at the point of the GFI outlet, which I read is what the GFI looks for. If the current going through the hot and neutral wire isn't equal it indicates a "leak" to the GFI which trips out. Please let me know if I got this all right, thanks.

Kevin

[Hooking up GFI outlets to a STAR wired alternator](#) | 16 comments (16 topical, 0 editorial)

Re: Hooking GFCI outlets to STAR alternator ([none / 0](#)) ([#1](#))  
by [jubalearly](#) on Mon Oct 20th, 2003 at 08:54:59 AM MST  
([User Info](#))

You can't use two phases (A & B) on a 120v GFCI outlet. One of them must be a neutral. You need to bring out the center of your star (WYE) and use it with any of the 3 phases. Read the instructions that come with the GFI outlet. They cover the requirements in detail. And note that you will probably only be able to use this in a restricted speed range, unless you have some way to set the frequency & voltage seperately. Give us some more details on your alternator and you can get some more informative answers.

Re: Hooking GFCI outlets to STAR alternator ([none / 0](#)) ([#2](#))  
by [kww](#) on Mon Oct 20th, 2003 at 10:39:46 AM MST  
([User Info](#))

Should the center of my star(WYE) be grounded with what I'm doing? Should it ever be grounded? My alternator is a 12 pole 9 coil 3-phase, makes 36 vac at my drill's max. rpm while turning it between any combo of ABC, 20 vac is found between AB or C when compared with the WYE connection. I don't have the equipment to measure frequency, amps, etc. so I can't really give a lot of detail. Anyway, thanks for the info.  
Kevin

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Re: Hooking up GFI outlets ([none / 0](#)) (#3)  
by drdongle on Mon Oct 20th, 2003 at 03:31:07 PM MST  
([User Info](#))

If you have a grounded system (recommended) then the common point of the star should be at ground. and if you intend to use phases independently (as required with a GFI or any standard outlet) it will also be the neutral return connection.

Dr.D

Re: Hooking up GFI outlets ([none / 0](#)) (#4)  
by kww on Mon Oct 20th, 2003 at 08:27:14 PM MST  
([User Info](#))

Dr.D

Thanks for the info., but you've caused me more questions :-)  
that I hope you will answer. Would it be okay to ground the WYE connection at the windmill and run the 3-phases of ac through an underground romex cable to a box which has 3 romex cables coming out, each carrying one phase and a ground/neutral made at the house? I guess 2 wire romex would be fine coming out of the box since they'd go to GFI outlets?

Kevin

[ [Parent](#) ]

Re: Hooking up GFI outlets ([none / 0](#)) (#5)  
by drdongle on Tue Oct 21st, 2003 at 06:28:14 PM MST  
([User Info](#))

You can use any wire you want so long as 1) you have at least 4 conductors, phase A, phase B, phase C, and the Ground/ Neutral (though ideally the 4th ground/neutral should be two wires in most situations you probably won't have any problem). 2) it is large enough (gage wise) to deliver the juice to the load. 3)and lastly that the insulation is rated for the application (300 and 600 volts is pretty common, so this probably won't be an issue.

If I understand your other question you want to run the drop from the genny to a junction box then split up the phases, yes you can but you need to use a fuse or circuit breaker on each phase. I would recommend a small stand alone 3 phase circuit breaker box which will hold 3 fuses or circuit breakers, and can also act as a junction box. If you have a lot of loads they you will really need some sort of "load center" with several circuit breakers for each "spur" circuit.

Dr.D

Re: Hooking up GFI outlets ([none / 0](#)) (#6)  
by kww on Tue Oct 21st, 2003 at 07:48:41 PM MST  
([User Info](#))

So I need a four wire underground cable I guess. Btw, I read today in "Windpower Workshop" that I need to ground only at the source(windmill). Also, I read(same book, which is coming in very handy as I understand more of this stuff) that an overcurrent device isn't suitable for a windmill or inverter, instead use an RCD(residual current device), which I'm guessing is the same as a GFCI. Thanks for the info.  
Kevin

[ [Parent](#) ]

Re: Hooking up GFI outlets ([none / 0](#)) (#7)  
by drdongle on Wed Oct 22nd, 2003 at 05:03:40 PM MST  
([User Info](#))

I would question the statement that an "over current device" is not needed. Smaller wind generators with limited out put don't pose much of a problem in this regard but it's till a good idea. As far as inverters go I would definatly have some sort of circuit breaker or fuse, and I'll bet the manufacturer has two built into the unit already, one on the input and one on the output. Personally I think it unwise to do with out, if nothing else it may protect you equipment from being seriously damaged or destroyed.

Dr.D

[ [Parent](#) ]

Re: Hooking up GFI outlets ([none / 0](#)) (#8)  
by kww on Wed Oct 22nd, 2003 at 08:33:41 PM MST  
([User Info](#))

Think about it this way, the windmill can't make more current than I'll be trying to use and the 400watt inverter sure can't give me more than I want. So to put a breaker rated above what the windmill or inverter can put out seems pointless and putting one on below the current I want(within the windmill or inverter's capacity) is not using the full capacity of the machine, seems pointless again. Maybe there's a good reason, I'm very open-minded, but I haven't found it yet and you haven't given me one, except that you think it's a good idea. :-). Btw, I'm not trying to be disrespectful or anything else, just telling you how I'm seeing it. Also, I think you're right about the inverter possibly having an internal fuse, but that's something needing little power hooking up to something that could fry it 100 times over, my windmill would probably blow away before it cooked the 4 heat lamps it'll be powering. It will take a little study to see how much potential load to have waiting in reserve. Anyway, thanks for your info.  
Kevin

[ [Parent](#) ]

Re: Hooking up GFI outlets ([none / 0](#)) ([#9](#))  
by DanB on Wed Oct 22nd, 2003 at 08:42:04  
PM MST  
([User Info](#))

I tend to agree Kevin, but Im no electrician!  
but... if you put a fuse, or a breaker... between  
your heater and your wind turbine - then, if it  
ever blows it'll surely be on a windy day. If it  
blows on a windy day - yoru windmill will  
become disconnected from the load and....  
overspeed, and possibly blow up.

Hard to say... but Im personally afraid to put a  
fuse or breaker between the windmill and the  
load. I've got no experience with professoinal  
installations though.

[ [Parent](#) ]

Re: Hooking up GFI outlets ([none / 0](#))  
([#10](#))  
by drdongle on Thu Oct 23rd, 2003 at  
07:11:13 PM MST  
([User Info](#))

I think what we have is a difference in  
definitions. When I think of an "over current  
device", I'm referring to circuit breaker or fuse  
rated near the maximum safe current level of  
the device ( or circuit) being protected. An  
example would be a 20 amp fuse on the DC  
side of an inverter, when the inverters  
maximum DC current draw is 20 amps. If the  
maximum is exceeded the fuse blows  
protecting the inverter from damage that will  
happen when that inverter tries to draw more  
than 20 amps.

I agree it would be pointless to use a fuse  
rated at 40 amps as it would offer no  
protection, and a 10 amp fuse would severely  
limit it usefulness.

I simply suggest that if you generator puts out  
5 amps per leg then use an appropriately sized  
fuse or circuit breaker. If you using less than  
full capacity then a smaller fuse is OK, just  
don't exceed the maximum the device can  
deliver or draw.

Dr.D

[ [Parent](#) ]

Re: Hooking up GFI outlets ([none / 0](#)) ([#11](#))  
by kww on Thu Oct 23rd, 2003 at  
09:44:29 PM MST  
([User Info](#))



I think what the problem is that you don't fully realize what I'm up to, which is running heating loads only with a windmill and the heating loads will be able to handle all and then some of the windmill's output. This setup makes overcurrent devices useless because the system is designed to handle more power than it could ever see, unless lightning hits it, but from what I've seen fuses and breakers are useless for lightning protection as well and seemingly have no use in my current application.  
Kevin

[ [Parent](#) ]

Re: Hooking up GFI outlets  
([none / 0](#)) ([#12](#))  
by drdongle on Fri Oct 24th, 2003  
at 06:35:11 AM MST  
([User Info](#))

I understand what you want to do and that's great, however.. let's say that you expect the genny to be able to deliver 10 amps to each leg with no overloading, no overheating ( fat and happy), your heaters are rated at 10 AMPS. Perfect match no problem, now some well meaning soul plugs in a second heater on one leg, you have a stiff wind so it powers right up, no problem? yes problem, the winding on that leg starts to overheat, it starts to deform, and soon it burns out, because it was delivering more than it was designed for. If you think that will never happen, or you can prevent it, great. I just know that if it were me and I went to a lot of trouble to build a genny and erect it I wouldn't want to chance damaging or destroying it and having to start over. Even if you can guarantee that you will never overload the circuits with appliances what happens if some one accidentally drives a nail through a some wires or some other unforeseen accident happens? Circuit breakers are cheap, fuses are even cheaper, you're time and energy aren't.

Dr.D

[ [Parent](#) ]

Re: Hooking up GFI outlets ([none / 0](#)) ([#13](#))  
by kww on Fri Oct 24th, 2003 at 08:44:51 PM MST  
([User Info](#))

Around here I really can guarantee that no one will mess with things and a short would stop the windmill in the same way my brake switch does. Not to mention I've got it designed so that it can't be overloaded by it's own ability to make power, lightning's another story, but breakers and fuses don't protect other things around here from lightning so... You put up a good effort, but I'm still not convinced. :- ) Would you believe I've been called stubborn? :- )

[ [Parent](#) ]

Re: Hooking up GFI outlets ([none / 0](#)) ([#14](#))  
by outpost invent on Fri Oct 31st, 2003 at 04:06:14 AM MST  
([User Info](#))

Sorry to butt in, but I was doing a search on GFI and fusing and came across your conversation. I am kind of new to this, commenting and the GFI business, but I think I can help. From what I understand the turbine has three hot lines possible and a single return in the core. The way a GFI works is sensing that current in equals current out, if not the circuitry opens. I am planning on using this idea in a new instrument to act as a fault protector. I am tired of having to fuse all the different lines that are in my circuit. I have a master relay that turns on the power to the downstream circuit where I want my protection. As long as

all the power going to and from the circuit passes through a single GFI then all is fine. If there is a short or leak the GFI will trip, irregardless of the current. So, in your situation if you take one of your hot legs and connect it to whatever circuit through the GFI and ensure the return for this circuit only goes through the same GFI it should protect from shorts and failures no matter what the current, unless of course the high current melts the wire and causes the short or leak in the first place. All the returns can be tied to the center on the generator side of the GFI, but just make sure each branch has a separate return. Consumer GFIs must trip at 6 milliamp, UL Standard. In your case, and mine, we will need to alter that circuit to allow for small leaks, otherwise I think it will be trip every time there is a glitch. We are using the GFI for fault safety, not current limiting or lighting protection. The lowest rating fuse in my system is 375 milliamp, so I think I will set mine to trip at that level. Not sure how to do it yet, but if you are interested I could pass it on once I do. Whatever your generator can put out make sure the circuit can handle it that you have it hooked up. The too many heater example is a good one.

[ [Parent](#) ]

Re: Hooking up  
GFI outlets  
([none / 0](#)) ([#15](#))  
by kww on Fri  
Oct 31st, 2003  
at 06:24:38 AM  
MST  
([User Info](#))

Thanks for the info. Btw, I found GFI outlets at Home Depot, 3 for \$15, so I've decided to just use 3 of those, one for each output. It's the GFI breakers that cost around \$39 each, which is too much in my opinion, considering I'd need 3.  
Kevin

[ [Parent](#) ]

Re:  
Hooking  
up GFI  
outlets  
([none / 0](#))  
([#16](#))  
by outpost  
invent on  
Thu Nov  
6th, 2003  
at  
03:28:40  
AM MST  
([User Info](#))

Hi Kevin -  
good deal  
3/4/\$15 - I  
have taken  
them apart  
and I am  
not sure  
that they  
will work  
directly on  
the turbine  
output as  
designed.  
Easy to  
check. Have  
the system  
running and  
take a light  
bulb, at  
least

enough wattage to get 6 millamps of current and hook one side up to the hot circuit downstream of the GFI and the other side up to the return on the upstream side of the GFI. This way there will be an imbalance on the input and output lines running through the GFI. IT should trip. If not then it won't work. The inside circuitry has a rectifier and a couple of diodes and a GFI chip, probably made by Fairchild. The rectifier is for the solenoid to cut off the power and the diodes are to change the typical AC into DC for the chip. The chip contains internal components that act like a comparitor to sense the imbalance and send the power signal to the cut off solenoid. You will also find



some resistors and caps that are used to set the sensitivity, trip current, and trip speed, resistance to spikes.  
Todd

[ [Parent](#) ]

[Hooking up GFI outlets to a STAR wired alternator](#) | 16 comments (16 topical, 0 editorial)

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### [coil winding data](#)

By [Inspector Gadget](#), Section [Homebrewed Electricity](#)

Posted on Tue Oct 7th, 2003 at 11:54:50 AM MST

[Wiring](#)

Coil winding

Hello all, I have a set of plans from Hugh Piggot for the 2.4 mtr wind turbine and the coil spec calls for 80 turns of #15 wire or 90 turns of 1.4mm wire to produce 12volt coils, unfortunately I have purchased 1.7mm wire (as shown in his free plans) the question is ... can I use the 1.7mm or should I buy the correct size wire?

Iggy

[coil winding data](#) | 5 comments (5 topical, 0 editorial)

Re: coil winding data ([none / 0](#)) ([#1](#))  
by [Seth](#) on Tue Oct 7th, 2003 at 12:58:37 PM MST  
([User Info](#))

then try 85 turns!!!!

Re: coil winding data ([none / 0](#)) ([#2](#))  
by [Inspector Gadget](#) on Tue Oct 7th, 2003 at 01:34:38 PM MST  
([User Info](#))

Struggling to find data here but I thought that #15 AWG was 1.450mm ! My 1.7mm is closer to #14AWG so I was expecting something like 70-75 turns!!! Once they are wound and installed there is no turning back, but thanks anyway Seth.

IG

Re: coil winding data ([none / 0](#)) ([#4](#))  
by [DanB](#) on Wed Oct 8th, 2003 at 07:23:37 AM MST  
([User Info](#))

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If you have enough of this thicker wire to do it...

I wouldnt compromise # of windings too much as it will mean youll need higher rpm. Hughs wind turbine is slow anyhow - so perhaps a small compromise would be OK. Id consider slightly shrinking the hole in the center of the coil so that perhaps its only 3/4" or 7/8" wide instead of 1", this might make give you a little more room for windings. In the end - it is also a compromise which would cost you rpm some, but I think less so than simply eliminating the windings.

[ [Parent](#) ]

Re: coil winding data ([none / 0](#)) ([#3](#))  
by wpowokal on Tue Oct 7th, 2003 at 11:31:49 PM MST  
([User Info](#))

Iggy, Number of turns is relevent to voltage generated, all other points being equal. Gauge of wire is relevent to total resistance of coil, this of course is relevent to  $I^2 R$  losses at a given current which means heat in stator.

I suggest you do not stray too far from Hughs given turns, welcome to a field where every parameter has an effect on the other ie gauge of wire v coil thickness v air gap v flux strength etc. Try one test coil first.

The attached URL is to copper wire conversions which may be usefull.

<http://www.thelenchannel.com/1wire.html>

regards Allan

Re: coil winding data ([none / 0](#)) ([#5](#))  
by Inspector Gadget on Wed Oct 8th, 2003 at 12:05:22 PM MST  
([User Info](#))

DanB, Allan, thank you for that , am a bit wiser now hopefully ontrack again.

Iggy

[ [Parent](#) ]

[coil winding data](#) | 5 comments (5 topical, 0 editorial)

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### [better drawing of flat coil](#)

By [zubbly](#), Section [Homebrewed Electricity](#)

Posted on Sun Sep 21st, 2003 at 08:12:42 PM MST

[Wiring](#)

[better drawing of flat coil](#)



here is a better drawing of the flat coil.

zubbly

[better drawing of flat coil](#) | 7 comments (7 topical, 0 editorial)

Re: better drawing of flat coil ([none / 0](#)) ([#1](#))  
by [kww](#) on Sun Sep 21st, 2003 at 08:34:06 PM MST  
([User Info](#))

You just gave me an interesting idea, in my opinion at least. :-)  
Flatten each coil individually before putting it in a stator. I guess you'd need a mold shaped just like the coil you want to end up with and some sort of press. If you over do it and cause a short or break no huge deal, it's just one individual coil.

Re: better drawing of flat coil ([none / 0](#)) ([#2](#))  
by [zubbly](#) on Sun Sep 21st, 2003 at 08:46:46 PM MST  
([User Info](#))

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- [Also by zubbly](#)

hey kww, you would not have to flatten coil. when you make the coil former, make the width between coil plates the same width as the flat wire. #14 flat wire measures .030 thick by .119 wide. with the two coils on top of each other the total thickness would be less than 1/4 inch.thick. the turns would be completely symetrical with no cross overs. turn 1 touches 2, turn 2 touches turn 3 and so on.

zubbly

[ [Parent](#) ]

Re: better drawing of flat coil ([none / 0](#)) (#3)  
by kww on Sun Sep 21st, 2003 at 09:05:02 PM MST  
([User Info](#))

Hi zubbly,  
You're right, but the wire I ordered is round and doesn't pack that well, could use a good squeeze. I've never heard of flat wire before, didn't know it existed. Does it cost a lot more? I'm new to this stuff and this place btw.  
kww

Re: better drawing of flat coil ([none / 0](#)) (#4)  
by zubbly on Sun Sep 21st, 2003 at 09:14:16 PM MST  
([User Info](#))

for flat wire look at  
[www.alphacore.com/Flatwire.htm](http://www.alphacore.com/Flatwire.htm)

zubbly

[ [Parent](#) ]

Re: better drawing of flat coil ([none / 0](#)) (#5)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Sun Sep 21st, 2003 at 10:26:56 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

I use large speakers almost everyday. The speakers are usually wound with flat aluminum wire. I am almost sure that this is because you can get more output from the tight spacing of the flat wires...

-- W o o f

Re: better drawing of flat coil ([none / 0](#)) (#6)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Sun Sep 21st, 2003 at 10:45:04 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>



I have some spare speakers laying around. Well a speaker is a coil in a magnetic field. I have'nt yet done this, but I wanna hook a bridge rectifer to a 15" or larger speaker and see what the output is. Yes I understand it will be quite low power.

This size speaker can be excited by more energetic means than sound. Anything giving a 1/2 inch motion on these speakers would produce considerable voltage, I believe in the 36v range (mechanical, not audio excitation), and they ere very durable operating in the 10 - 500hz range for years.

-- W o o f  
[ [Parent](#) ]

Re: better drawing of flat coil ([none / 0](#)) (#7)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon Sep 22nd, 2003 at 08:22:26 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

I made some similar to this using copper sheet stock. I made the strips.375 tall and the width was .014. I made the start by folding it into a 90 degree angle and the end of course was fine. I insulated the copper with paper. You can get alot of turns of thin sheet stock, more than with the equivilant size of round stock. The problems I found using this method is the coils tend to heat up quicker.

Enamaled ribbon wire is much better for the same process. Using sheet stock, ribbon wire or square wire is about the best way to utilize a given space.. but it will increase eddy currents in the copper. Square wire is a bit more difficult to work with but the amps you get from the system is quite rewarding. Round wire in a hole is about 75%efficient, Round wire in a square hole is about 80% and about 85% in a rectangular hole, but sheet, ribbon, or square stock is close to a 100% efficient space fill factor. Using Hughs dual rotor coil arrangement for 3 phase would work the best when winding coils with this type of an arrangement, overlapping arrangements become very difficult but not impossible.

Have Fun winding!  
Ed

[better drawing of flat coil](#) | 7 comments (7 topical, 0 editorial)

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[flat wire coils](#)

By [zubby](#), Section [Homebrewed Electricity](#)  
Posted on Sun Sep 21st, 2003 at 07:05:40 PM MST  
[how to make flat wire coils](#)

[Wiring](#)



still trying to post a picture. hope it works.

a few months ago i sent an e-mail to Hugh Piggott suggesting he try using flat wire to make a tighter and very flat coil. Hugh replied with ( how do you get the inside out of the coil and still keep it flat), well i figured it out.

lets say you use #14 flat-.030" thick and .119" wide. make half your turns as in #1 and the other half as in #2. now flip #2 onto #1, as if you were turning the page in a book. now in diagram#3 here are the two coil halves ontop of each other. solder the two ends together in the centre and the two outsides are your start and finish. coil will be less than 1/4 inch thick. COMMENTS PLEASE!

P.S. if the picture does not come out, sorry forwasting your time.

zubby

[flat wire coils](#) | 5 comments (5 topical, 0 editorial)

Re: flat wire coils ([none / 0](#)) ([#1](#))  
by [zubby](#) on Sun Sep 21st, 2003 at 07:09:47 PM MST  
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sorry for the lousy picture. i guess it worked. i should also have mentioned that the coil former plates should be spaced so that the wire just fits in between them. if you want 60 turns total in your coil, put 30 turns in each half.

zubbly

Re: flat wire coils ([none / 0](#)) (#2)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on  
Sun Sep 21st, 2003 at 08:20:19 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

to view the images on this board

Right click the image, in Mozilla I select "View Image" from the menu that pops up  
not sure what it may say in other browsers

The picture will display without the resizing that the board does. Resizing will cancel out the fine lines that you used in your image. next time try wider lines...

-- W o o f  
[ [Parent](#) ]

Re: flat wire coils ([none / 0](#)) (#3)  
by RobC on Sun Sep 21st, 2003 at 10:19:37 PM MST  
([User Info](#))

On my coils I made a form twice as wide as the wire. I found the center of the wire needed to make the coils and starting in the middle wound one wire one direction and the other wire in the opposite direction. This made a very flat 2 layer coil with both ends on the out side. For what its worth. RobC

Re: flat wire coils ([none / 0](#)) (#4)  
by DanB on Mon Sep 22nd, 2003 at 05:04:07 AM MST  
([User Info](#))

You probably noticed my other comment down below about pictures...

This one works, because its a .bmp, your photos didnt though because they are microsoft word perfect files (.wps)... no chance there!

But even .bmps are a bit tedious compared with the .jpg format. .jpg will upload (and download) faster, as the will be smaller files. Try to make all your pictures .jpg and I think theyll start working better for you!

Regarding Flat wire... interesting to think about! I got some big stuff Im dying to play with. I got about 20 pounds of 1/2" wide X .1" thick flat enameled wire... It'll be fun when the time comes!

Re: flat wire coils ([none / 0](#)) ([#5](#))  
by jubalearly on Mon Sep 22nd, 2003 at 08:27:03 AM  
MST  
([User Info](#))

Big motors (2300-4160v and higher) are made with form wound coils. It's rectangular wire, custom made to fit the slot. One would calculate the number of turns required and select a wire size to fit (after allowing for insulation). I've got a piece of an old winding with about .125x .250 wire, 8 turns (2 groups of 4) with around .2 inches of insulation around it. The whole 3" chunk is about 3/4 inch x 2.5 inches and makes a good paperweight.

[flat wire coils](#) | 5 comments (5 topical, 0 editorial)

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## Copper Tubing instead of Hi\$ Wire

By [LowTechWreck](#), Section [Homebrewed Electricity](#)

Posted on Wed Sep 17th, 2003 at 02:05:51 PM MST

[Wiring](#)

Stranded Vs/ 3/8

It looks like I'm going to have several Battery Banks some at every tower.  
What size copper tubing would be the equivelant(sp) '0' Wire.

[Copper Tubing instead of Hi\\$ Wire](#) | 6 comments (6 topical, 0 editorial)

Re: Copper Tubing instead of Hi\$ Wire ([none / 0](#)) (#1)

by J Steele ([Jvsinthai@yahoo.com](mailto:Jvsinthai@yahoo.com)) on Wed Sep 17th, 2003 at 03:28:19 PM MST ([User Info](#))

1/0 cable has a cross section area of .083 in<sup>2</sup>. 1/2 od copper tube has a wall thickness of .048" so it has a cross section of .068 in<sup>2</sup>. 3/4 type L copper tube has an OD of .880" and a wall thickness of .044 giving it a cross section of .115 in<sup>2</sup>. I don't have any 5/8" tube in my shop. Wire is nearly pure copper while tube is some alloy so you may want to overkill a bit.

Have a good day.  
John

Re: Copper Tubing instead of Hi\$ Wire ([none / 0](#)) (#3)

by jubalearly on Wed Sep 17th, 2003 at 04:12:46 PM MST ([User Info](#))

After reading John's reply I went back & checked my references. I thought maybe I used circular mils instead of square inches, but no. I did find this in the '93 NEC, chapter 9, table 8. 1/0 is .373 in. diameter & .109 in. sq. area. (105600 circular mils, if anyone cares). I'm also assuming 75C rise copper (not aluminum 1/0) rated at 150 amps max. Are you sure 1/0 is big enough in your application?

My previously quoted wall thicknesses came from a McMaster Carr catalog which did not state the actual diameter. I'm a little surprised that it is that far from nominal. At any rate, there is no set standard for wall thickness (just meet pressure specs.) AFAIK. Using these as lugs, there is usually enough contact area to avoid overheating the lug/wiring connection.

Russ H.

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'o' wire ([none / 0](#)) (#4)  
by LowTechWreck on Thu Sep 18th, 2003 at  
02:27:50 AM MST  
([User Info](#))

Yes you are right.  
'O' wire probably not big enough .  
I remember in one of Chucks posts  
He mentioned '000' wire.  
I might even need bigger.  
What I want to do is connect several battery  
banks together that are 30 to 50 feet apart.  
I haven't priced it but I might have to  
take out a second mortgage for that size wire.

[ [Parent](#) ]

Re: Copper Tubing instead of Hi\$ Wire ([none / 0](#))  
(#2)  
by jubalearly on Wed Sep 17th, 2003 at 03:47:47 PM MST  
([User Info](#))

I actually found a chart on this once. It isn't a simple question. I think it was in a Homepower magazine article where Richard Perez did this. It was about using tubing for homemade lugs for copper wire. Which is what I often do, myself. You might search their site or email him.

My NEC book doesn't list 'O' size. Another reference gives .372" diameter and I calculate an area of .108 sq. in. ( $\pi r^2$ ). You might use 1" tubing, if you don't mind it getting HOT. The wire is sized for a temperature rise of 75 deg. C, usually - higher than boiling after adding the ambient temp. ( $75 + 25 = 100C$ ).

However, I wouldn't use this without checking or revising the numbers myself. There are various alloys of copper used in tubing and they do not all have the same conductivity as copper wire. That means you have to allow for more heating in the tubing. I think if I got over 3/4" tubing I'd just use bar stock tho.

Also, there are several different tubing thicknesses depending on type of use. 3/4" type L tubing (for water) comes in 2 common thicknesses: .045 & .032. That particular reference does say what the actual OD is...Using .75, & .032 I get  $3.14 \times .75 \times .032 = .075$  sq. in. OK, we're close.  $1" \times .035 \times 3.14 = .1099$  sq. in. Note that 2 pieces of 1/2" is not the same as one of 1".....My approach here would be to use 2 3/4" for each connection (or bar stock about 1" x .25"). HTH,  
Russ

Re: Copper Tubing instead of Hi\$ Wire ([none / 0](#))

([#5](#))

by wpowokal on Thu Sep 18th, 2003 at 05:15:27 AM MST

([User Info](#))

Centralise the batteries, feed into them from your souces, inevitably much less potential current flow.

regards allan

Re: Copper Tubing instead of Hi\$ Wire ([none /](#)

[0](#)) ([#6](#))

by JW on Thu Sep 18th, 2003 at 07:42:29 AM MST

([User Info](#))

Ive seen so much good heavy gauge copper wire thrown away. It bothers me everytime I see this. when I say thrown away I mean scraped for recylcing at 5 cents a pound or whatever. you should check with the local metal recycler in your area, this is where most of it will end up. Most electrical contractors pull this stuff out of a service and let the journeyman sell it at the recycler. Most will not take the time to strip the wire so the insulation is usually intack.

I happen to have three peices about 50 foot long, real nice and flexable stranded type. It was used after hurricane andrew in miami fl to hook up service from a diesel gen-set. this stuff is about 1.0 inch in diameter and the lot of it weighs about 200 lbs.

(guessing here) last week while helping my dad clean some stuff in the back yard we ran across it. He seid why dont you take that down to the recycler and get rid of that stuff. Anyway I managed to talk him out of it, and its still sitten there.

If you go searching you will find something simular. actually there is this place I found in the local phone book under used electrical supply. whenever I have to find transformers for hooking up big lathes I check there first. I buy the transformers for like \$500.00 or \$800.00 that cost \$5000.00 new at that place. Never had to check for wire but I bet its there. Good hunting.

-JW

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[Copper Tubing instead of Hi\\$ Wire](#) | 6 comments (6 topical, 0 editorial)

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### [Rewiring 120vac1.52KW transformer](#)

By [LowTechWreck](#), Section [Homebrewed Electricity](#)  
Posted on Sun Sep 14th, 2003 at 02:48:55 PM MST  
Secondary Removed

[Wiring](#)

Ok it's Gonna Blow up or work>>>one of the two.  
This is the one:  
[http://zephyrgennys.tripod.com/tony\\_van\\_roon\\_inverter.doc](http://zephyrgennys.tripod.com/tony_van_roon_inverter.doc)

I got lucky and found a monster Microwave Transformer 1.52KW.  
Here it is:  
<http://zephyrgennys.tripod.com/120v1.52w1>  
<http://zephyrgennys.tripod.com/120v1.52w2>  
<http://zephyrgennys.tripod.com/120v1.52w3>

I need some help on this.

Should the Secondary wire be the same diameter as the Primary  
For 1KW output?

I used 22 gage wire just to see if I can get anything flowing.  
It looks like the Primary might be 16 Gauge.

12 turns>twist loop>12 more turns:

[http://zephyrgennys.tripod.com/120vac\\_12vdc1](http://zephyrgennys.tripod.com/120vac_12vdc1)

See at the bottom> the two terminals are connected to the  
Primary  
Big 16 ga. or so.  
The two red wires above it Go nowhere!  
Continuity check says infinity.  
They must have been part of the Secondary  
But they are not conected to anything except each other.  
Should I cut them out?

In this picture is the new secondary winding>  
12 turns>twist loop>12 more turns:

[http://zephyrgennys.tripod.com/120vac\\_12vdc2](http://zephyrgennys.tripod.com/120vac_12vdc2)

There are no shorts.  
How do I check to see if I have this right?  
Plug in the primary and take a reading from the  
Center tap as ground and then check the voltage  
on the two ends of the new Secondary windings.

[http://zephyrgennys.tripod.com/120vac\\_12vdc3](http://zephyrgennys.tripod.com/120vac_12vdc3)

Those two red wires are starting to bug me.

wmbays@grandecom.net

[Rewiring 120vac1.52KW transformer](#) | 10 comments (10 topical, 0 editorial)

Re: Rewiring 120vac1.52KW transformer ([none / 0](#)) ([#1](#))  
by hardwired on Sun Sep 14th, 2003 at 03:16:29 PM MST  
([User Info](#)) <http://www.sulltek.com>

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<ul style="list-style-type: none"> <li>▪ <a href="http://zephyrgennys.tripod.com/tony_van_roon_inverter.doc">http://zephyrgennys.tripod.com/tony_van_roon_inverter.doc</a></li> <li>▪ <a href="http://zephyrgennys.tripod.com/120v1.52w1">http://zephyrgennys.tripod.com/120v1.52w1</a></li> <li>▪ <a href="http://zephyrgennys.tripod.com/120v1.52w2">http://zephyrgennys.tripod.com/120v1.52w2</a></li> <li>▪ <a href="http://zephyrgennys.tripod.com/120v1.52w3">http://zephyrgennys.tripod.com/120v1.52w3</a></li> <li>▪ <a href="http://zephyrgennys.tripod.com/120vac_12vdc1">http://zephyrgennys.tripod.com/120vac_12vdc1</a></li> <li>▪ <a href="http://zephyrgennys.tripod.com/120vac_12vdc2">http://zephyrgennys.tripod.com/120vac_12vdc2</a></li> <li>▪ <a href="http://zephyrgennys.tripod.com/120vac_12vdc3">http://zephyrgennys.tripod.com/120vac_12vdc3</a></li> <li>▪ <a href="#">More on Wiring</a></li> <li>▪ <a href="#">Also by LowTechWreck</a></li> </ul>

On your secondary I would go with 16 ga if you have 22 it may not handle the amps. I would leave the two red wires the manf. could have them in there as a spacer. As for the reading you have it right.

Re: Rewiring 120vac1.52KW transformer ([none / 0](#)) (#2)  
by LowTechWreck on Sun Sep 14th, 2003 at 06:19:12 PM MST  
([User Info](#))

Well as you can see in:

<http://zephyrgennys.tripod.com/120v1.52w2>

They must have been the secondary connections with one of them going to a giant Capacitor and then connected to the other side must have been a center tap or something.

I guess I need to carefully remove the Paper and see if infact a secondary wire was connected to them. I think the center tap was a ground.

Red Wire ([none / 0](#)) (#3)  
by LowTechWreck on Sun Sep 14th, 2003 at 07:21:22 PM MST  
([User Info](#))

In fact it was not connected to anything. I guess this would be a good time to look up electromagnetic flux or what ever it is. Up until this point it has been an:

e·nig·ma (Ã nigÆmÃ), n., pl. -mas, -ma·ta (-mÃ tÃ).  
1) a puzzling or inexplicable occurrence or situation

TO :)ME

[ [Parent](#) ]

Re: Rewiring 120vac1.52KW transformer ([none / 0](#)) (#4)  
by drdongle on Sun Sep 14th, 2003 at 07:25:17 PM MST  
([User Info](#))

This is a "ferroresonant" transformer there will be four windings, the primary (120vac,)the large 16 gage winging is for the magnatron filament and the 22 gage wire was for the HV ckt, (one side will be to ground) and the resonating winding for the capacitor.

Dr.D

DR. D ([none / 0](#)) (#5)  
by LowTechWreck on Sun Sep 14th, 2003 at 08:03:26 PM MST  
([User Info](#))



Thank You Sir  
Very Informative...Yes Indeed.  
I have removed the Red wire.  
No connections to the secondary on it,  
unless it was metaphysical.

If I wire it as the schematic demands,  
as I have wound it.(for test purposes)  
rewind with equal dia.wire (secondary)  
will I get the desired results..  
see schematic:

[http://zephyrgennys.tripod.com/tony\\_van\\_roon\\_inverter.doc](http://zephyrgennys.tripod.com/tony_van_roon_inverter.doc)

[ [Parent](#) ]

Refference # 2 ([none / 0](#)) ([#6](#))  
by LowTechWreck on Sun Sep 14th, 2003 at 08:12:40 PM MST  
([User Info](#))

<http://www.aaroncake.net/circuits/inverter.htm>

Re: Refference # 2 ([none / 0](#)) ([#7](#))  
by drdongle on Mon Sep 15th, 2003 at 03:18:02 PM MST  
([User Info](#))

It's probably to late now but in future versions leave the  
capacitor and it's winding intact as it will assist in making  
the transformer "resonate" at 60 hz and may in fact result in  
an output that will be more of a sine wave.

Dr.D

[ [Parent](#) ]

Re: Rewiring 120vac1.52KW transformer ([none / 0](#)) ([#8](#))  
by wpowokal on Tue Sep 16th, 2003 at 05:58:41 AM MST  
([User Info](#))

Just one point, I have rewound a number of microwave  
transformers, and have not achieved more than 0.92v/turn.

regards Allan

0.92v/turn ([none / 0](#)) ([#9](#))  
by LowTechWreck on Tue Sep 16th, 2003 at 04:40:08 PM  
MST  
([User Info](#))

Hi Allan

Should the secondary gauge wire be the same as the primary.

[ [Parent](#) ]

Re: 0.92v/turn ([none / 0](#)) ([#10](#))  
by wpowokal on Wed Sep 17th, 2003 at 06:23:02 AM  
MST  
([User Info](#))

Low tech, The size winding wire depends on a number of things.

1. The wattage you plan to achieve from this inverter, which comes back to what transistors you plan to use.
2. Your primary is I assume 120v, so lets say at 1kw thats  $1000/120=8.33A$ . A secondary wound with the same diameter wire would give a theoretical(without losses)  $8.33A*12V+100watts$ . From my charts 16 gauge has a capacity of 10 amps.
3. I used 14 AWG 1.68 MMsq on some of my tranies and run them at around 25 amps charging my 24v system with forced cooling. 14 SWG rating is 15A. Others I used 2 strands (bi-filia wound) of 18 SWG 1.02mm sq.
4. From the pics you first posted you have heaps of room for more wire so use 2 or even 4 strands. They don't have to be wound together, ie they can be wound on top of each other, just be super careful about start and finish markings, the purests would argue about this but it works. Microwaves have a cooling fan venting the transformer area.
5. The other circuit worth considering, (apologies if someone else has suggested this one)but if I go back to check all this will scoot off into cyber space.

<http://www.uoguelph.ca/~antoon/circ/555dcac.html>

If this message flips to the second page and I miss any more questions 'e' mail me at wpowokal@bigpond.com

regards Allan

[ [Parent](#) ]

[Rewiring 120vac1.52KW transformer](#) | 10 comments (10 topical, 0 editorial)

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[hard to rotate PMA by hand.](#)

By [paulpic](#), Section [Homebrewed Electricity](#)  
Posted on Thu Sep 11th, 2003 at 06:48:27 AM MST [Wiring](#)  
hard to rotate PMA

Hi all.  
I have just completed assembling pma for my windmill and have wired it to 3 phase.  
When i rotate it by hand its quite hard, then soft, then hard etc when it goes through the fields.  
I then disconnect 1 wire that joins fields together, it rotates ok and sparks when i reconnect  
It hasnt been wired through rectifier or connected to dc as yet.  
Is this normal? or will it rotate ok when i connect through rectifier and connect to battery.

details of machine are follows.  
Dual 15" dia rotor (12 off 2"x1/2" dia neos) for each rotor  
Stator is, 9 off coils 14awg x 60 turns each 1/2" thick  
Gap in stator 1mm each side.

Thanks Paul.

[hard to rotate PMA by hand.](#) | 2 comments (2 topical, 0 editorial)

Re: hard to rotate PMA by hand. ([none / 0](#)) ([#1](#))  
by [DanB](#) on Thu Sep 11th, 2003 at 07:07:37 AM MST  
([User Info](#))

Hi Paul - presumably this is a Delta connection?  
Presumably you checked each phase individually to see that output is good, and the same on each phase?  
id unhook each phase from other others and try again - I think you probably have it miswired.  
It gets stiff - then hard, then stiff - because one phase is under a load, thats how it would feel if you had a load on 1 phase. Once all 3 phases are under load it would be completely smooth. My guess is you have the Delta connection wrong... should be very easy to fix.

Re: hard to rotate PMA by hand. ([none / 0](#)) ([#2](#))  
by [electronbaby](#) ([electronbaby@hotmail.com](mailto:electronbaby@hotmail.com)) on Thu Sep 11th, 2003 at 07:07:56 AM MST  
([User Info](#))

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It seems to me that you might have the coils wired wrong (out of phase). When you wire the coils wrong (out of phase), the current generated in each coil is fed back into an adjacent coil and it actually cancels out the current from the first coil (not good, and this is why its hard to turn). If your wiring in three phase, your going to have three 'sets' of coils and three series legs. To make up the legs, you have to wire every third coil around the circumference of the stator together and you should go... start finish, start finish of each coil. If you were to wire start to start and finish to finish (this is how you would wire a single phase stator) it would not work correctly in a 3 phase stator. You need to be careful, though. This could fool you if your magnet spacing and coil spacing was not correct. The best way to be sure you get this right is to spin the alternator up to speed and just go around the stator connecting every third coil and make sure the voltage increases for every coil you connect. I hope this isnt too hard to understand. I probably didnt word it the best. Have fun!! RoyR

[hard to rotate PMA by hand.](#) | 2 comments (2 topical, 0 editorial)

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## [How do I wire a 220 motor to run on 110?](#)

By [dwhit](#), Section [Homebrewed Electricity](#)

[Wiring](#)

Posted on Wed Sep 10th, 2003 at 10:37:17 AM MST

How to wire a 220 motor to 110

I have some blower motors off of indoor air handlers that run on 220v AC. they have a starting capcitor on them.

Can anyone point me in the right direction as far as how to make them run on 110v AC?

thanks

[How do I wire a 220 motor to run on 110?](#) | 1 comment (1 topical, 0 editorial)

Re: How do I wire a 220 motor to run on 110? ([none / 0](#)) ([#1](#))

by [Kilroy2k1](#) on Wed Sep 10th, 2003 at 11:26:34 AM MST ([User Info](#)) <http://home.cogeco.ca/~woproject>

Hi Dwhit,

Some motors are not able to be changed over to 110V operation, If you pull the cover off where the wiring connections are made and there isnt an alternate wiring scheme on the inside sticker or on its name plate then i recommend calling up a local rewiring or repair facility. If its possible they will know just by the make and model #'s Hope this Helps

Tom S.

[How do I wire a 220 motor to run on 110?](#) | 1 comment (1 topical, 0 editorial)

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[Black hole satellite photo](#)

By [Dave B](#), Section [Homebrewed Electricity](#)  
Posted on Mon Aug 25th, 2003 at 10:40:41 PM MST

[Wiring](#)

**Black hole - Satellite view photo**

I'm sure some of you have seen this but I thought it would be a very interesting post

to those who have not. It really makes you think. Dave B 

[Black hole satellite photo](#) | 19 comments (19 topical, 0 editorial)

Re: Black hole satellite photo ([none / 0](#)) ([#1](#))  
by [zmooz](#) on Mon Aug 25th, 2003 at 11:46:21 PM MST  
([User Info](#))

That reminds me...I need to move to one of those dark spots. :-D

Re: Black hole satellite photo ([none / 0](#)) ([#2](#))  
by [Bach On](#) on Tue Aug 26th, 2003 at 04:43:54 AM MST  
([User Info](#)) [change AT: bach\\_on AT hotmail.com](#)

Dave,

Is it possible you forgot to post the URL for that photo? I saw nothing. Or is that what you're supposed to see in a black hole? ;-)

Bach On

- I'm just as happy as if I had good sense! -

Re: Black hole satellite photo ([none / 0](#)) ([#3](#))  
by [Norm](#) on Tue Aug 26th, 2003 at 05:32:04 AM MST  
([User Info](#))

Bach: Either that or we're both starting to go blind? (:>) Norm.

[ [Parent](#) ]

Re: Black hole satellite photo ([none / 0](#)) ([#5](#))  
by [Sponge](#) on Tue Aug 26th, 2003 at 06:14:26 AM MST  
([User Info](#))

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The problem is that the Width= part of the image tag is not correct (maybe this new resizing thing?).

Anyway, this is the URL to the image :)

[http://www.otherpower.com/images/scimages/57/NY\\_blackout\\_satellite\\_view.jpg](http://www.otherpower.com/images/scimages/57/NY_blackout_satellite_view.jpg)

[ [Parent](#) ]

Re: Black hole satellite photo ([none / 0](#)) ([#4](#))  
by hvirtane on Tue Aug 26th, 2003 at 05:56:44 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

I can see the picture.

I don't know if I can see it because I was not in the area of the recent blackout in Helsinki, Finland.: =).

That blackout made me to think.  
As much as America's blackout.  
I already tens of years ago realized how easily grid systems fail. If somebody wants them to fail or if somebody wants them not to fail.

In Indian big cities blackouts are really common.

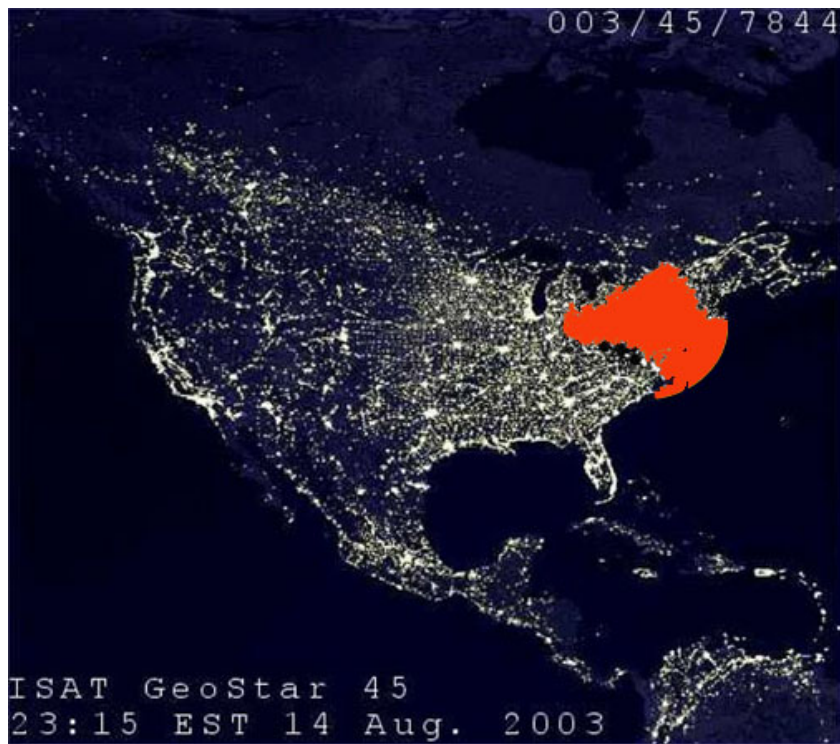
- Hannu

Re: Black hole satellite photo ([none / 0](#)) ([#6](#))  
by laskey on Tue Aug 26th, 2003 at 06:58:01 AM MST  
([User Info](#))

Here, Maybe this will make more sense

The red section is where the the lights should have been on August 14 at almost mid-night. Look at this pic and then look back at the other one. You'll see the black hole across the eastern seaboard. Look at that and then realize that buy then a bunch of people already had their power back.

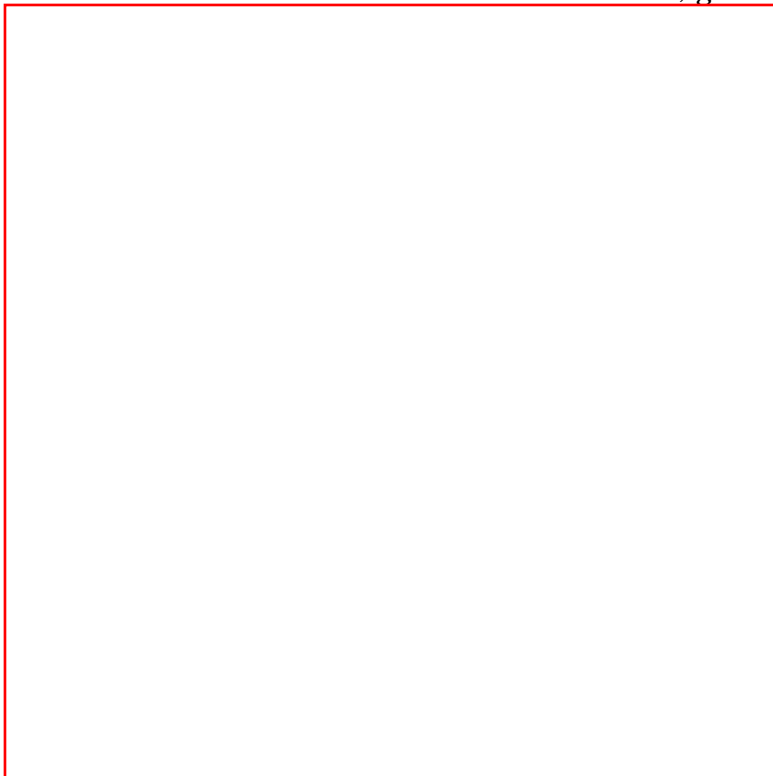
Cya,  
Chris



[ [Parent](#) ]

Re: Black hole satellite photo (Attn: Admin) ([none / 0](#)) ([#7](#))  
by Dave B on Tue Aug 26th, 2003 at 08:27:19 AM MST  
([User Info](#)) <http://www.madbbs.com/users/bruggelog>

When I posted the original photo and previewed it and then posted it everything was perfect. I went back and refreshed and checked it as a new posting also and everything was fine. I was surprised to see the photo missing this morning ! I'm trying this again but now it will be an attachment to a comment (maybe different in some way) Anyway I figured most would realize the black hole to be the black out, great photo. Dave B



[ [Parent](#) ]

Re: Black hole satellite photo (Attn: Admin) ([none / 0](#)) ([#15](#))  
by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Tue Aug 26th, 2003 at  
09:28:47 PM MST  
([User Info](#))

Usually when photos disappear it means that the server was slow in dishing up the photo, so your browser said "\$#&\$ it!" and gave you the page minus photo. Did it show you a "broken picture" icon? If so slow serving, either because of prevailing internet problems, constipation, etc. is the problem.

We have awesome bandwidth and storage space on our servers, but if Scoop starts acting real slow for everyone we'll turn on message archiving and some other tricks that will speed things up.

ADMIN

[ [Parent](#) ]

The disappearing photo... ([none / 0](#)) ([#8](#))  
by TomW on Tue Aug 26th, 2003 at 09:48:43 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Folks;

Late last nite I was browsing through and noticed that the image, which had displayed fine earlier, was just a tiny square at the end of the text of the story and a comment or two wondering why they couldn't see it.

I removed the width=80% in the image tag and it displayed nicely so I updated it that way. No idea what was up with that since it was OK previously altho that was a different computer and browser.

I am beginning to see that the image display issue may not be as simple a fix as it first seemed. Perhaps the users will have to learn how to size images themselves rather than an internal Scoop automated system?

Cheers.

TomW

[Stuff I have Online](#)

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Re: The disappearing photo... ([none / 0](#)) ([#9](#))  
by Sponge on Tue Aug 26th, 2003 at 10:15:53 AM MST  
([User Info](#))

Well, resizing is fine.. but what size? :) My pics were 600xsomething (fits on most internet forums without misaligning threads) but somehow they were still too big, and were resized to 592? :)

[ [Parent](#) ]

Re: The disappearing photo... ([none / 0](#)) ([#10](#))  
by TomW on Tue Aug 26th, 2003 at 10:56:05 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Sponge;

Sorry, I don't have the answer but this thread is an example of what obviously doesn't work:

<http://www.fieldlines.com/story/2003/8/22/171154/307>

The huge drawing in there is not big byte wise but displays in a huge size which, for me anyway, makes the thread very difficult and annoying to read.

Bottom line is that the person posting should "preview" and adjust so it fits but that seems unlikely to be something people will do. There is no way to edit comments so as an editor I cannot fix the images in comments like I can in stories.

Tweaking Scoop is DanFs thing so not much I can do from here beyond make suggestions.

Cheers.

TomW

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[ [Parent](#) ]

Re: Black hole satellite photo ([none / 0](#)) ([#11](#))  
by StanB ([solar4@juno.com.nospam](mailto:solar4@juno.com.nospam)) on Tue Aug 26th, 2003 at 12:01:11 PM MST  
([User Info](#))

Photo looks fake to me...the blackout area is TOO dark...Look at Canada and it is slightly blueish from starlight or moonlight...so why is the blackout area SO black? Makes me wonder..

Stan

Fake?? ([none / 0](#)) ([#12](#))  
by TomW on Tue Aug 26th, 2003 at 12:31:15 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Stan;

I think its simply a matter of contrast. Look at the change as you travel into open water.

Can't see any plausible reason to fake the photo although faking it would be trivial.

Cheers.

TomW

[Stuff I have Online](#)

[Contact Me](#)

[ [Parent](#) ]



Re: Fake?? ([none / 0](#)) (#13)  
by Old F on Tue Aug 26th, 2003 at 05:43:10 PM MST  
([User Info](#)) <http://www.oldf.homestead.com>

If it were a true black hole it would be centered over Washington D C.  
And the green tint on the event horizon is are tax dollars being suck in : )

Old F

[ [Parent](#) ]

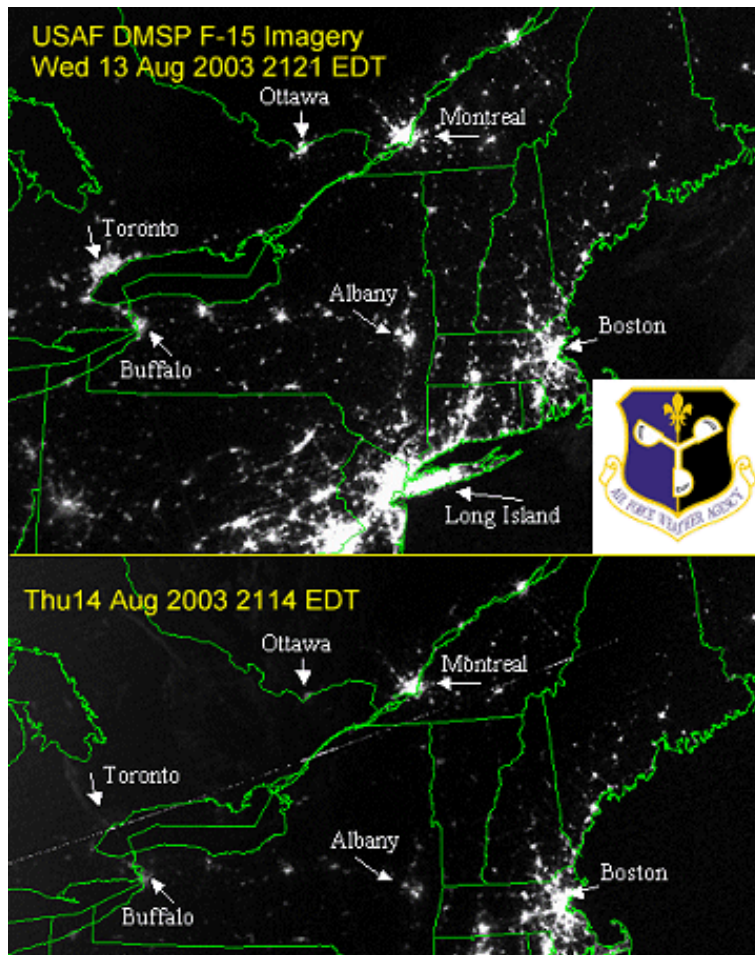
Re: Fake?? ([none / 0](#)) (#14)  
by elvin1949 ([elvin1949@wmconnect.com](mailto:elvin1949@wmconnect.com)) on Tue Aug 26th, 2003  
at 06:30:45 PM MST  
([User Info](#))

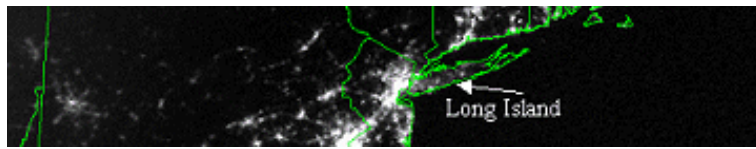
AMEN

[ [Parent](#) ]

Re: Black hole satellite photo ([none / 0](#)) (#16)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Thu Aug 28th, 2003 at  
07:37:26 AM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

Yes it is fake, here is the real picture...





the top picture is before, and the bottom picture is after  
and here are some comments about why the first picture is fake.

<http://revjim.net/comments/9662/>

. T i m  
[ [Parent](#) ]

Re: Black hole satellite photo ([none / 0](#)) ([#17](#))  
by Demetri ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Thu Aug 28th, 2003 at 04:42:07 PM MST  
([User Info](#))

After reading a few of the comments on that Revjim site, it makes me appreciate all the more what we have here. Polite, knowledgeable people who would rather help others than make problems. Thank you, everyone.

Demetri  
Always be the lead dog.

Polite, knowledgeable people ([none / 0](#)) ([#18](#))  
by TomW on Thu Aug 28th, 2003 at 08:18:09 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Demetri;

I wholeheartedly agree. We had a few bumps but essentially we have an extremely nice board here.

I have this theory I got from Barney Fife the deputy in Mayberry RFD. "Bud Nipping", gotta nip it in the bud!

Happily its seldom necessary lately. And as my dear, departed mom would say "If you don't have something nice to say then don't say anything".

Cheers.

TomW

[Stuff I have Online](#)

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[ [Parent](#) ]

Re: Polite, knowledgeable people ([none / 0](#)) ([#19](#))  
by elvin1949 ([elvin1949@wmconnect.com](mailto:elvin1949@wmconnect.com)) on Fri Aug 29th, 2003 at 07:01:58 AM MST  
([User Info](#))

and one man said  
"good he's dead"  
lot's of garbage out there  
have fun  
later  
elvin

[ [Parent](#) ]

[Black hole satellite photo](#) | 19 comments (19 topical, 0 editorial)

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## Coil Wiring

By [pearl](#), Section [Homebrewed Electricity](#)

Posted on Wed Jul 23rd, 2003 at 06:35:06 PM MST

[Wiring](#)

Pearl

Hey all, I got the coils wound, the [in] lead and the [out] lead...all the same for each coil. Now, does all the [in's] tie together and all the [out's]...Or is it, a [in] to the [out]. Oh, And please don't tell me, series or parallelllll. [grin]..I just need to know where the wires go. I did build a 6 ft. blade,,it turns nothing yet, but the wind turns it just fine and fast. Pearl

[Coil Wiring](#) | 4 comments (4 topical, 0 editorial)

Re: Coil Wiring ([none / 0](#)) (#1)

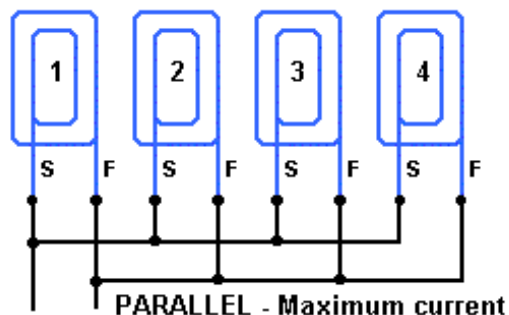
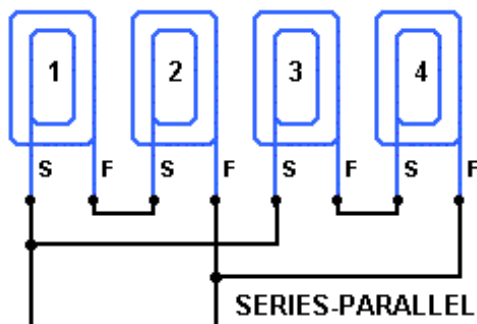
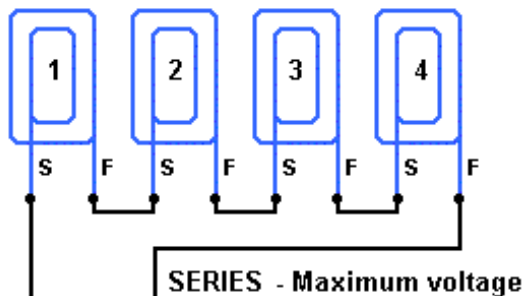
by Electric Ed on Wed Jul 23rd, 2003 at 08:42:06 PM MST

[\(User Info\)](#) <http://www.electric-ed.com>

The type of connection depends on whether you want to maximize the voltage or the current. The example shown is a 4-pole winding, but the principles can be applied to a winding with any number of poles.

**Example of a 4-pole winding. All coils are wound the same direction.**

**In a three-phase, 4-pole machine, this represents one phase.**



Electric Ed

Re: Coil Wiring ([none / 0](#)) (#2)

by pearl on Wed Jul 23rd, 2003 at 09:16:39 PM MST

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Thank You Ed, Are there only two main wires that connect these coils and comes down from the tower? and what is the better to have? voltage? or current? And Is current Amps? Or maybe both, and thats why its wired both ways? I'm tryin to learn. Thanks for your help Ed

[ [Parent](#) ]

Re: Coil Wiring ([none / 0](#)) (#3)  
by Electric Ed on Thu Jul 24th, 2003 at 06:19:46 AM MST  
([User Info](#)) <http://www.electric-ed.com>

"Are there only two main wires that connect these coils and comes down from the tower?"

Yes, if it is a single phase machine. Could be three, or even four, wires if it was a three phase machine.

"And Is current Amps?"

Yes, current is measured in amps.

"and what is the better to have? voltage? or current?"

It is the current flowing through a load device, such as a lightbulb, heater, or motor that makes it operate, but voltage is required to force current through the resistance of the device. So both are required for the device to do "work". The rate at which work is done is measured in watts, and watts(W) are calculated by multiplying volts(E) times amps(I).  $W = E \times I$

"Or maybe both, and thats why its wired both ways?"

The option to connect the coils in series, parallel, or series-parallel, helps adjust the machines output to match the requirements of the load.

For battery charging, which is the most common application for wind generators, the charging current must be forced through the battery "backwards", so you need sufficient voltage to overcome the battery voltage, plus the internal resistance of the battery.

Electric Ed

[ [Parent](#) ]

Re: Coil Wiring ([none / 0](#)) (#4)  
by hvirtane on Thu Jul 24th, 2003 at 04:28:13 PM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

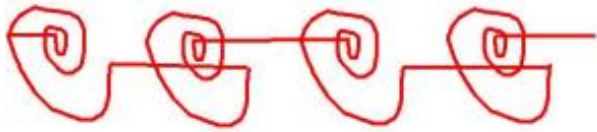
Hi,

in order we can know  
that you are doing it the right way,  
you need to tell us,  
how your alternator is made.

-----  
If you made it like 'The Volvo Alternator'  
of the otherpower.com  
with laminates,  
then your magnets  
are not all the same way but  
... ,N,S,N,S, ... ?  
-----

In that case to put your coils in series  
to get maximum voltage  
you have to hook your coils:  
- in - in - out- out -





The easiest way to get it right is to connect the coils one by one and by turning the alternator by hand and measuring with a volt meter to make it sure that every time you add a coil the voltage rises.

In principle if you put all the coils in 'series' you get the maximum voltage at the lowest RPM.

In some cases if you made your coils with really many turns you don't need to put them all in 'series', but can use the same wiring as the original 'Volvo' alternator so that two halves are in series and those halves are then wired 'parallel'.

- Hannu

[Coil Wiring](#) | 4 comments (4 topical, 0 editorial)

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### [quick question on 22 gage magnet wire](#)

By [headhunter](#), Section [Homebrewed Electricity](#)

Posted on Wed Jul 23rd, 2003 at 10:03:29 AM MST

[Wiring](#)

#### [quick question on 22 gage magnet wire](#)

I have some 22 gage magnet wire and am interested in knowing the voltage and amps that the wire can handle.

Also one other thing, when you clearing off the coating to make a connection do u guys just scrape it off or burn it off?

[quick question on 22 gage magnet wire](#) | 4 comments (4 topical, 0 editorial)

Re: [quick question on 22 gage magnet wire](#) ([none / 0](#)) ([#1](#))

by [DanB](#) on Wed Jul 23rd, 2003 at 10:20:42 AM MST ([User Info](#))

It really depends on it's length... if its in an alternator it depends on how the coils are wired together etc... What are you using it for?

Here is a pretty good chart that should answer your questions for the most part.

<http://www.thelenchannel.com/1wire.html>

To clear the ends.... I usually scrape the insulation off with a razor, although burning it off and then sanding it moves along pretty fast too. Although a soldering iron can do it, I like to use a propane torch (it goes REAL fast)

Re: [quick question on 22 gage magnet wire](#) ([none / 0](#)) ([#2](#))

by [headhunter](#) on Wed Jul 23rd, 2003 at 10:55:29 AM MST

([User Info](#))

am using it for a small homemade transformer. Just curious what kind of returns on a homemade transformer can i expect? Ie. 50% loss, etc.

Re: [quick question on 22 gage magnet wire](#) ([none / 0](#)) ([#3](#))

by [DanB](#) on Wed Jul 23rd, 2003 at 12:11:28 PM MST

([User Info](#))

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I suppose it depends on just how well built the homemade transformer is! Be fun to hear about it though and see pictures! I've always been somewhat inspired to try building transformers for some things.

[ [Parent](#) ]

Re: quick question on 22 gage magnet wire ([none / 0](#)) ([#4](#))  
by zubbly on Wed Jul 23rd, 2003 at 03:02:07 PM MST  
([User Info](#))

hello headhunter,

after winding hundreds of transformers and being in the electric apparatus repair service for years, i would recommend the following. for small air cooled transformers in the 25va to 1000va, i would say anywhere from 400 to 600 circularmills per amp of expected load. for transformers of expected higher inrush as in motor starting transformers, from 800 to 1200 circularmills per amp. most magnet wire today can safely be used for 600vac applications.

hope this helps,  
good luck-----zubbly

[quick question on 22 gage magnet wire](#) | 4 comments (4 topical, 0 editorial)

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## [New Service wiring](#)

By [storrence](#), Section [Homebrewed Electricity](#)

Posted on Sun Jul 20th, 2003 at 03:59:47 PM MST

[Wiring](#)

Adding new electrical service in Brazil

I have a few questions about wiring we just had done for a new construction in rural part of Rio de Janeiro. I don't know if they do it here the same as in the rest of the world. I lived most of my life in the US and am used to 110/220v service. To describe what we have here: The main lines come to the edge of our property and have 4 wires. I'm assuming 3 wires for 3 phase and 1 for neutral. Each 110v I assume but haven't yet tested. But I think they use 126v here. We have the electrical box there on one of the line poles and then 4 separate wires are run underground for about 500-600 meters inside a hard plastic non rigid tubing that they also use here for water when it's run a long distance. Something that probably wouldn't pass code in other countries.

The meter box on the pole has a 40amp breaker that looks like it has 6 wires connected. I suppose the 3 hot leads.

I know this is 3 phase service but will I have any problem with running this distance?

Will I experience a voltage drop going this distance?

I haven't checked the guage of the wires but what would be the required guage for this type of service. Probably it depends on how much load I will be putting on it but our house is pretty typical. Probably less than what is typical in the US. We have a refrigerator a few water pumps, gas stove, electric washer and dryer. Single room airconditioner, A range of other devices like home stereo and about 6 computers. Oh and possibly an small electric water heater.

I am pretty sure with this type of service I would have 3 separate 110-120v legs and 3 separate 220-240v legs and 1 330-360v service. Am I correct or is there a way to test it? I have a multimeter.

Is there some sort of chart that shows the wire guage in relation to distance and load to know the correct guage to use?

Thank you!

[New Service wiring](#) | 7 comments (7 topical, 0 editorial)

Re: New Service wiring ([none / 0](#)) ([#1](#))  
by [zubbly](#) on Sun Jul 20th, 2003 at 08:33:39 PM MST  
([User Info](#))

hello Storrence, it is good to read your posting. if things in your part of the world are the same as here in Canada, i think i know what you have. when you have a 3 phase service run to a residential dwelling, you have 3 208 volt lines with neutral. to get your 120 volt 1 phase service in your panel, you end up using 1 of the 208 volt lines plus the neutral. if you look at a star or sometimes called a wye connection, your 120 volt comes from one of the 208 volt lines and the star point ( the common connection where all three phases come together ). the voltage measured from line to star is always 58% of the incoming line voltage-- 120 volt. if you look inside your new panel in the house, you will see the three incoming lines plus neutral. the breakers or fuses will be connected ( zig zagged back and forth ) from all three lines to give you equal distribution on all three lines. put your volt meter from one of the three lines to the neutral, you will get 120 volt. also, if you are using an electric dryer, it should be 208 volt compatible. when you measure voltage across any 2 of the three lines, you will get 208 volt.

i hope this helps you!--zubbly

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Re: New Service wiring ([none / 0](#)) (#3)  
by storrence on Mon Jul 21st, 2003 at 03:08:41 AM MST  
([User Info](#))

Hello Zubbly!

Thanks very much for your help. I initially tried to test the voltage using my volt meter. It has a common connector and 2 + (1 that says 10A). I used that but accidentally put one of the hots on the neutral of the meter and another hot on the + of the meter and fried the fuse :-/ Well at least it wasn't the meter! I then did a test touching each wire with one hand and the other to the earth (they teach you this stuff in Brazil) :-) And found the common. Now today I will go test to see what the voltage is and report back.

Do you know how I can find a chart on the internet that would tell me what guage wire I should use for this distance to avoid any voltage drop? What are these charts usually called?

I know yesterday I did a test with a 110v light bulb and when I plugged it on 2 hots it was very bright and likely would have burned out in a minute. When I connected it to one neutral and one hot it worked fine.

Thanks again,  
Steve

[ [Parent](#) ]

Re: New Service wiring ([none / 0](#)) (#4)  
by zubbly on Mon Jul 21st, 2003 at 06:46:59 AM MST  
([User Info](#))

hello Steve, i am not sure what these charts are called, but any electrical distributor that supplies cable and connection supplies to your local electricians should be able to help you out here. i suggest following the code of your local electricity supplier to remain within code and insurance guidelines.

good luck-----zubbly

[ [Parent](#) ]

Re: New Service wiring ([none / 0](#)) (#2)  
by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Sun Jul 20th, 2003 at 08:37:44 PM MST  
([User Info](#))

Being not very fond of math myself, I look stuff up on a 10% loss chart, 5% loss chart, 3% loss chart, etc. The handiest ones I use here are in my Sunelco catalog. There are a few on the internet if you search Google.

I also have a nifty wire size/voltage/amperage/distance --> voltage drop calculator that was made by Onan in 1970 -- one of those cardboard slide rule things! It's great and I use it all the time. I don't think they still make them.

CHeers  
DANF

Re: New Service wiring ([none / 0](#)) (#5)  
by Matt on Mon Jul 21st, 2003 at 07:26:49 AM MST  
([User Info](#))



hi try this url it might be what you are looking for

<http://www.elec-toolbox.com/calculators/voltdrop.htm>

[ [Parent](#) ]

Re: New Service wiring ([none / 0](#)) (#6)  
by storrence on Mon Jul 21st, 2003 at 05:48:23 PM MST  
([User Info](#))

Thanks Matt. It's not coming up now but I found quite a few on Google  
<http://www.google.com/search?q=voltage+drop+calculator&ie=UTF-8&oe=UTF-8>

Using these calculators I'm wondering if we have sufficient gauge wire. I need to see the gauge tomorrow. Hopefully they are using AWG or something else that these calculators work with. From what I'm seeing with these calculators I believe I have something like a 10 or 12 gauge solid copper wire just from visually looking at it. If I plug that in to the calculator and also the distance which is about 1200 feet and just consider 110v service using one neutral and one hot it seems the voltage drop would be huge. Something like only 25 volts at the load if I was pulling 40 amps. I put in 40 amps because that is the rating on the breaker at the meter and probably would be what the average house would draw.

It seems the gauge I would need according to these charts is 2/0 AWG to stay within a 5% voltage drop on a single phase 110v line. We have 3 phase with 4 wires (they tell me it's 3 110v lines and 1 neutral). I don't know if this makes a difference in these calculators so I just inputted it like it was 110v single phase since I will have that situation if I use 1 hot and 1 neutral.

[ [Parent](#) ]

Re: New Service wiring ([none / 0](#)) (#7)  
by jubalearly on Mon Jul 28th, 2003 at 04:27:29 PM MST  
([User Info](#))

My rule of thumb is to go up to 100 ft. at the 60 deg C amp rating (20a for 12ga.) of the wire for 3% or less voltage drop, 1 phase. That's for normal residential wiring where you're allowed 5% total drop from the service entrance. It could put you a hair over 3% in some cases. Also, it's for 120v. For 12v, use 10% of that (10ft., 1 way).

Most of these formulas on the internet are for house wiring or DC applications. Note that DC wiring usually has higher amperages for ea. wire size (often 105 deg C rating) & therefore higher voltage drops. Residential wiring should never use more than the 75 deg C amperage rating (you can't get 90 deg C connectors) AC or DC. The NEC tells you how to allow for ambient or conduit (as opposed to "in air").

For long distances outdoors (underground or overhead) I prefer to use the more complicated formulas that work from the area of the wire (or the resistance per ft. - Ohm's law) and account for worst case environmental conditions (temperature, effect of conduit, etc.). The basic formula is

$$CSA = (kIL)/Ed$$

where L=distance in feet one way, I=amperes, Ed=voltage drop, and CSA is the required circular mil area. k is a constant, usually 22-24 for a complete circuit (copper, alum is 36-39)

The constant can be varied with load & temperature (like for those 105 deg C DC circuits use k=26-29). Being able to go down a size or 2 using underground ambients of 25 deg C is nice when your looking at several hundred feet of large wire. I've had fun talking to power company engineers - ask them what they use for underground or overhead & what they recommend.

HTH,

Russ

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[New Service wiring](#) | 7 comments (7 topical, 0 editorial)

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## [Wiring,Gauge/Thousands](#)

By [pearl](#), Section [Homebrewed Electricity](#)

Posted on Fri Jul 18th, 2003 at 08:45:15 PM MST

[Wiring](#)

[rhall11thacr@jayco.net](mailto:rhall11thacr@jayco.net)

Does anyone know what #14, #16, #18 Ga. wire is in thousands..I know that #12 [12/2 household wire] is .080.. I have 2 sizes of Mag. wire, and not marked, but smaller than #12..I can relate in thousands not gauges..Help.

The other question I have, is transformer, coated wire the same as magnet wire?

Yep, you guessed it, I'm a green horn, but very interested. Pearl

[Wiring,Gauge/Thousands](#) | 3 comments (3 topical, 0 editorial)

Re: [Wiring,Gauge/Thousands](#) ([none / 0](#)) ([#1](#))  
by [iFred](#) ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Fri Jul 18th, 2003 at 08:52:26 PM MST  
([User Info](#)) <http://www.internetfred.com>

If the wire comes from a transformer, yes, it more then likely to be coated magnet wire and you will find no difference. All magnet wire has a thin coat of varnish or other coating that prevents shorts. If you take wire off a transformer, be carefull not to knick the wire or bend it to much. Good Luck!

Re: [Wiring,Gauge/Thousands](#) ([none / 0](#)) ([#3](#))  
by [wpowokal](#) on Sat Jul 19th, 2003 at 05:23:31 AM MST  
([User Info](#))

Try, <http://www.thelenchannel.com/1wire.html>

[ [Parent](#) ]

Re: [Wiring,Gauge/Thousands](#) ([none / 0](#)) ([#2](#))  
by [wdyasq](#) on Fri Jul 18th, 2003 at 09:13:48 PM MST  
([User Info](#))

Pearl,

A "GOOGLE" search for wire guages will find you a table of wire gauge/diameter in whatever format you desire.

Ron

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[skip pole](#)

By [Anonymous Hero](#), Section [Homebrewed Electricity](#)

Posted on Mon Jun 30th, 2003 at 03:33:30 AM MST

[Wiring](#)

1-7 coil spacing instead of 1-4

1-7 jumper spacing. hi guys. has anyone experimented with 1-7 coil spacing? this connection was commonly used in very low rpm 3phase motors to cut electrical noise produced because the poles were jammed so close together. instead of jumpers within the phase connected 1-4, they were connected 1-7 ( skip pole ) would this create any usable effect for gennys?

[skip pole](#) | 2 comments (2 topical, 0 editorial)

Re: skip pole ([none / 0](#)) (#1)

by Electric Ed on Mon Jun 30th, 2003 at 06:13:40 AM MST

([User Info](#)) <http://www.electric-ed.com>

I don't believe the 1-7 connection has any effect in alternator windings.

Each coil will have an "alternation" or, half-cycle, generated into it in the order that the magnets pass it, in other words, either clockwise or counter-clockwise, so the phase sequence will be either a-b-c or a-c-b.

There are some magnet/coil arrangements that result in the three phase voltages being generated 60 deg out-of-phase.

In order to connect the phase windings in wye or delta the voltages must be 120 deg out-of-phase, and this somtimes requires the interchanging of the "center" phase leads.

**In a three phase winding, the three windings are spaced so that the voltages are generated 120 degrees out of phase on purpose.**

**Magnet Spacing is still equal to the coil span**

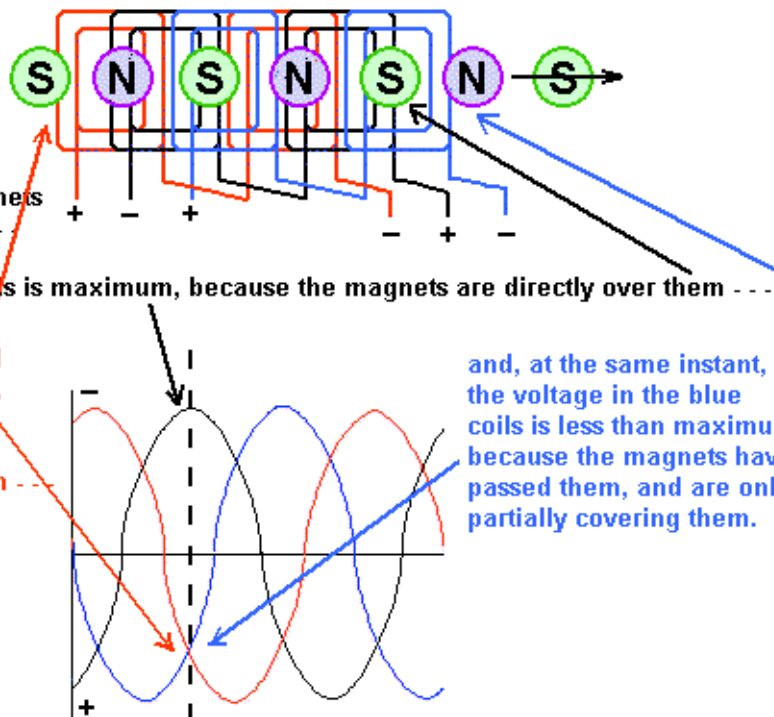
Visualize the magnets moving past the coils - - -

At the instant that the magnets are in the position shown - - -

the voltage in the black coils is maximum, because the magnets are directly over them - - -

while the voltage in the red coils is less than maximum, because the magnets are approaching them, and only partially covering them - - -

and, at the same instant, the voltage in the blue coils is less than maximum, because the magnets have passed them, and are only partially covering them.



**Note - At any instant, one phase is always opposite in polarity to the other two**

Electric Ed

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Re: skip pole ([none / 0](#)) (#2)  
by hvirtane on Mon Jun 30th, 2003 at 08:51:31 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

Hi,

your post looks interesting.

I think that if we would make a really low RPM generator,  
there would be problems to make it running smoothly.

Maybe the idea of yours would help.

Could you, please provide more info, what you mean?

A rough picture of the arrangement?

- Hannu

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[Can I split an inverter](#)

By [Anonymous Hero](#), Section [Homebrewed Electricity](#)

Posted on Mon Jun 23rd, 2003 at 12:05:17 PM MST

[Wiring](#)

230 volts AC from 12 voltsDC

I was wondering instead of buying a real expensive 12 volt to 230 volt inverter if they are made for the US type 230 not the European type 230 or buying and running 2 separate 115 volt 1500 watt inverters could I take lets say a 3000 watt inverter and run 115 ac off 2 of its receptacles in the front into each leg of a 230 volt ac quick disconnect type box so I can run my lathe and mill of 230 volts instead of 115 and keep my systym better balanced with the lights and ac plugs in my little shop. only one would be goin at a time. Has anybody tried this without any damage to the inverter or would the 230 feedback into the inverter and ruin it. Any ideas.??????? Im getting closer. Thanks JB Dayton Nevada

[Can I split an inverter](#) | 9 comments (9 topical, 0 editorial)

Re: Can I split an inverter ([none / 0](#)) (#1)  
by [electronbaby](#) ([electronbaby@hotmail.com](mailto:electronbaby@hotmail.com)) on Mon Jun 23rd, 2003 at 12:30:41 PM MST  
([User Info](#))

I dont think that would be possible because there would be no way to sync the frequency of both inverters. Those things are pretty inaccurate to begin with as far as voltage and frequency are concerned. You would have to have 2 115vac sources in phase in order to add them in series. And even if you could do that, the wattage would remain constant, 1500w (not 3000w). RoyR

Re: Can I split an inverter ([none / 0](#)) (#2)  
by [Anonymous Hero](#) on Mon Jun 23rd, 2003 at 01:21:30 PM MST

Howdy Roy. Maybe you didnt quite understand my ? but maybe you did. If I cant do it with one 3000 watt inverter and I had to use 2 of the same kind of 1500 watt inverters what I was thinking was then running one 115 voltinverter into one leg of the 230 box and the other 115 inverter into the other 230 leg and both neutrals into the neutral lug. Wouldnt that give me 3000 watts at the 230 outlet. Thanks JB

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Re: Can I split an inverter ([none / 0](#)) (#4)  
by jubalearly on Mon Jun 23rd, 2003 at  
03:10:48 PM MST  
([User Info](#))

You can only do this with inverters that are designed to work in sync this way (180 degrees out of phase, to get 230v from two 115v sources). There must be electronics to accomplish that, the voltages don't add linearly. Think about that sine wave voltage, it varies between 115v and -115v.

The easiest solution is that there are 230v inverters (and paired 115v inverters for dual voltage setups) available for the more expensive sine wave inverters. Another approach (usually cheaper) is to use a 115/230v transformer. There is no easy/cheap way to do it with any inverters that aren't designed for it.

Russ

[ [Parent](#) ]

Re: Can I split an inverter ([none / 0](#)) (#3)  
by electronbaby ([electronbaby@hotmail.com](mailto:electronbaby@hotmail.com)) on Mon Jun  
23rd, 2003 at 01:55:16 PM MST  
([User Info](#))

Well, it would give you 3000W if the inverters actually put out 1500W each. Unless your using a Trace or Xantrex unit or something of higher quality, I wouldnt expect the full output. They are just built cheaply. As far as wiring them together, theoretically, that should not be a problem as long as the phasing is the same. AC likes to be in phase. Especially with all these fancy new mosfet switching supplies all the newer inverters use. I suppose if you knew how to tinker with that sort of thing, you could probably open them up and find on the circuit board what circuit controls the phase regulation of the output and you could tie both units to that signal which would put them both in phase with each other. You would just have to worry about signal loss into the sensing circuitry due to loading it down. It sounds like you would be running some heavy machinery with it. What kinda start up current would you see being drawn though the inverter? Ive heard of people wanting to parallel up 110VAC inverters to get more wattage but never to series them like you want to do. In both cases, you have to worry about phasing. You can phase shift with a transformer, but you lose some efficiency. Maybe you would be better off buying the 3000W model. :/ RoyR

Re: Can I split an inverter ([none / 0](#)) (#5)  
by jubalearly on Mon Jun 23rd, 2003 at 03:16:09 PM MST  
([User Info](#))

Regardless of how many plug outlets you have on the 3000w inverter, they are all the same 115v. Think of it as a bunch of parallel sockets. So you can't get 230v that way.

Re: Can I split an inverter ([none / 0](#)) (#6)  
by Anonymous Hero on Mon Jun 23rd, 2003 at 04:39:53 PM MST

Hello RoyR Russ and others. Basically the mill is a 2hp using 16 running amps at 115 volts and 8 at 230 or 1840 watts. The lathe is 3/4 hp 13.4 amps at 115 and 6.7 amps at 230 volts or 1541 watts. The lathe likes the 230 volts better as it slow down at the start of a cut but that could be the extension cords im using from the other part of the garage for right now. Id like to run this room off my wind generator only. Its my play room and when the grid power goes down I can still play and have my independence. the mill seems to handle 115 volts allright for what I do with it. I put quite a few 25 amp 230 outlets in the shop for them. Oh well. My next ? is the phasing and transformer?. If the were both sine wave inverters, which I cant afford them but here is the ? would true sine wave inverters 2 of them take care of the phasing part of the 230?. ?#2 How much of the power would a 115 volt to 230 transformer eat up.  
Thanks JB

[ [Parent](#) ]

Re: Can I split an inverter ([none / 0](#)) (#7)  
by Anonymous Hero on Mon Jun 23rd, 2003 at 07:14:47 PM MST

No matter how you do it they must be in phase. Trace has a little cord to put two together like you want, but it gets pricey. The transformer is the cheapest way to go Ken

Re: Can I split an inverter ([none / 0](#)) (#8)  
by RobD on Tue Jun 24th, 2003 at 04:40:51 AM MST  
([User Info](#))

I've seen this done with Trace DR inverters. I went to a location where the person ran the two inverters into his house box just like standard 220. Each inverter carried 1500 watts. It's important to have inverters that can phase together so ask the seller if their's do before you purchase them.  
RobD

Re: Can I split an inverter ([none / 0](#)) (#9)  
by troy on Thu Jun 26th, 2003 at 09:22:42 AM MST  
([User Info](#))

Yes, if the two inverters aren't designed to lock in phase, you WILL cook something. Otherwise, the idea is a sound one.

Best regards,

troy

[ [Parent](#) ]

[Can I split an inverter](#) | 9 comments (9 topical, 0 editorial)

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### [Wire Guage???](#)

By [Anonymous Hero](#), Section [Homebrewed Electricity](#)

Posted on Sun Jun 22nd, 2003 at 08:48:55 AM MST

[Wiring](#)

Stator windings wire guage sizes.

I'm building my first PMG and have all the data I need except the stator wire guage. The PMG will have 8 poles and I want to minimize power loss as much as I can. Suggestions welcome. Inquiring Mind

[Wire Guage???](#) | 3 comments (3 topical, 0 editorial)

Re: Wire Guage???

(none / 0) (#1)  
by wpowokal on Sun Jun 22nd, 2003 at 09:18:06 AM MST  
([User Info](#))

Simply the biggest wire you can fit in and still have the required number of turns, works for me.

Over to the experts.

regards Allan

Re: Wire Guage???

(none / 0) (#2)  
by Electric Ed on Sun Jun 22nd, 2003 at 10:41:54 AM MST  
([User Info](#)) <http://www.electric-ed.com>

There is a maximum limit to the amount of power that can be generated by any given magnet/core strength and arrangement.

In lieu of a fully engineered unit, I recommend the following "trial-and-error" steps.

1. Determine the voltage that you must have for your specific application.
2. Build the rotor and the stator coil supporting structure first.
3. Make and mount one coil, using, let's say #16 wire, with as many turns as you can fit within the physical space that will be available for a single coil.
4. Connect a variable load to the coil, and spin the rotor at the desired "cut-in" speed, and measure the voltage and current.
5. Evaluate the voltage at various loadings to determine if you need more turns of smaller wire to increase the voltage, or less turns of larger wire to increase the current, bearing in mind that you will be connecting the other coils in series, parallel, or even series-parallel, with the test coil.
6. If you want to evaluate coil heating at this time, run the test setup for at least an hour under load, and

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- [Also by Anonymous Hero](#)

check the coil heating.

7. When you find a wire size/turns combination that works, wind the remaining coils.

Electric Ed

Re: Wire Guage??? ([none / 0](#)) (#3)  
by Anonymous Hero on Sun Jun 22nd, 2003 at  
05:24:24 PM MST

This is by far the best advice given, purely logical thinking. I could kick myself for complicating a simple task. Thanks for the swift kick in the ego! Inquiring Mind

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[Wire Guage???](#) | 3 comments (3 topical, 0 editorial)

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2. [A non expensive generator :\) \(Homebrewed Electricity, Alternators\)](#)

posted by Putte on 08/26/2003 02:21:34 PM MST  
3 comments

3. [Experiment \(Homebrewed Electricity, Wind\)](#)

posted by Putte on 08/17/2003 08:04:18 AM MST  
9 comments

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[Pictures on my small experiment :](#) | 3 comments (3 topical, editorial)

Re: Pictures on my small experiment :) ([none](#) / [0](#)) (#1)  
by [drdongle](#) on Sat Jan 3rd, 2004 at 07:18:46 AM MST ([User Info](#))

Both machines in the picture look to be very professionally constructed, how about some more information on both.

Dr.D

[Pictures on my small experiment :](#) | 3 comments (3 topical, 0 editorial)

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by Putte on Sat Jan 3rd, 2004 at 10:09:37 AM MST  
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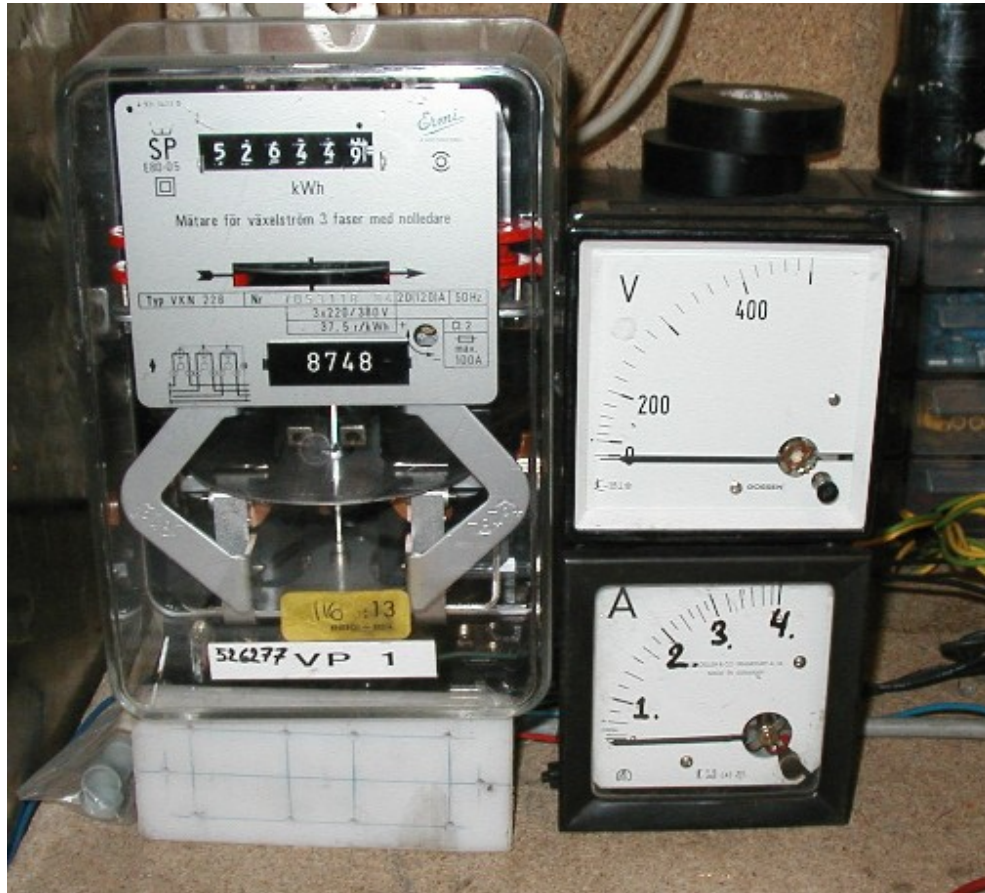
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put it upp yesterday for testing...

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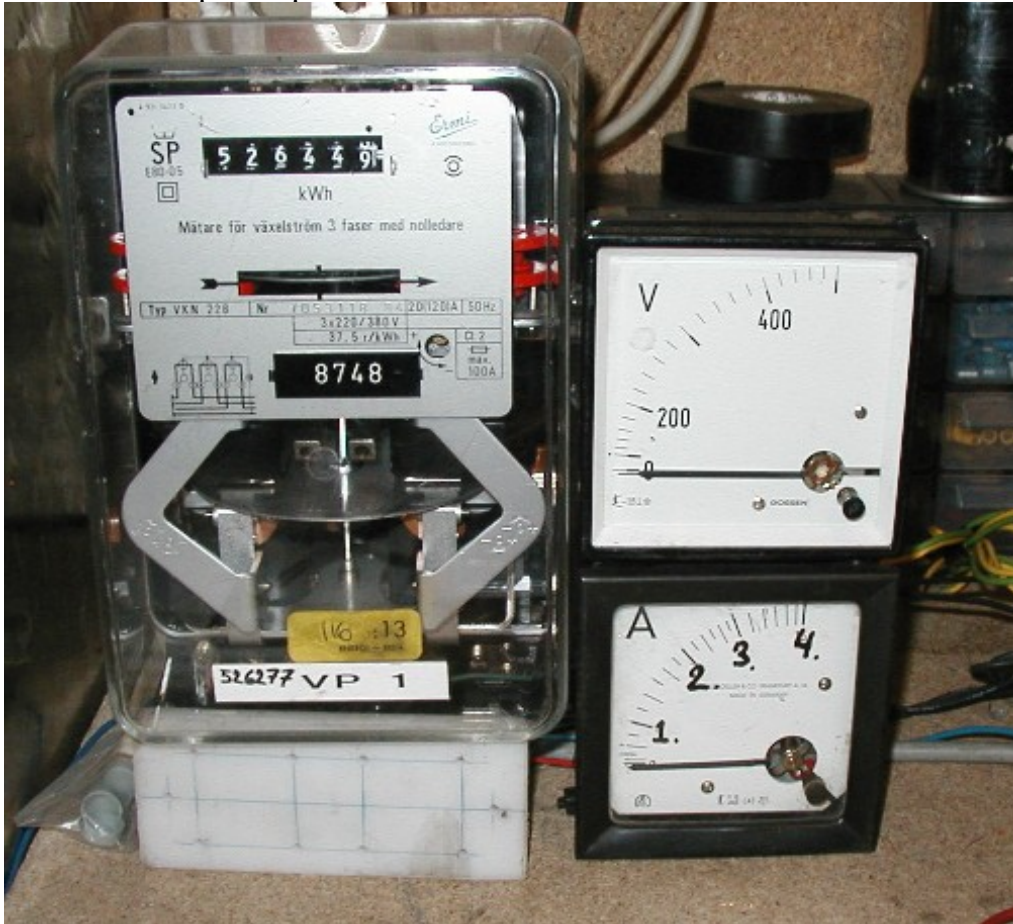
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[Coils "Shorting out laminates"](#) | 3 comments (3 topical, editorial)

Re: Coils "Shorting out laminates" ([none / 0](#)) ([#1](#))  
by Electric Ed on Sat Jan 3rd, 2004 at 05:55:11 AM MST  
([User Info](#)) <http://www.electric-ed.com>

The sharp edges of the steel laminations could wear through the thin enamel insulation on the copper magnet wire, and short out the coils, so there must be insulation between the two. Motor rewinders use a material they call "fish-paper".

Here is a photo (thanks to zubbly), showing the slots insulated, and ready for the coils, for one of his induction motor conversions.

[http://www.otherpower.com/images/scimages/253/us\\_stator\\_insulated.jpg](http://www.otherpower.com/images/scimages/253/us_stator_insulated.jpg)

Electric Ed

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Electric Ed

Re: Coils "Shorting out laminates" ([none / 0](#)) ([#2](#))  
by Sponge on Sat Jan 3rd, 2004 at 06:20:12 AM MST  
([User Info](#))

Aha! That makes sense, thanks!

(And yeah, I've figured the sharpness of my material is near razor blade :) (some cuts in my hands.. :P))

Regards,  
Sponge

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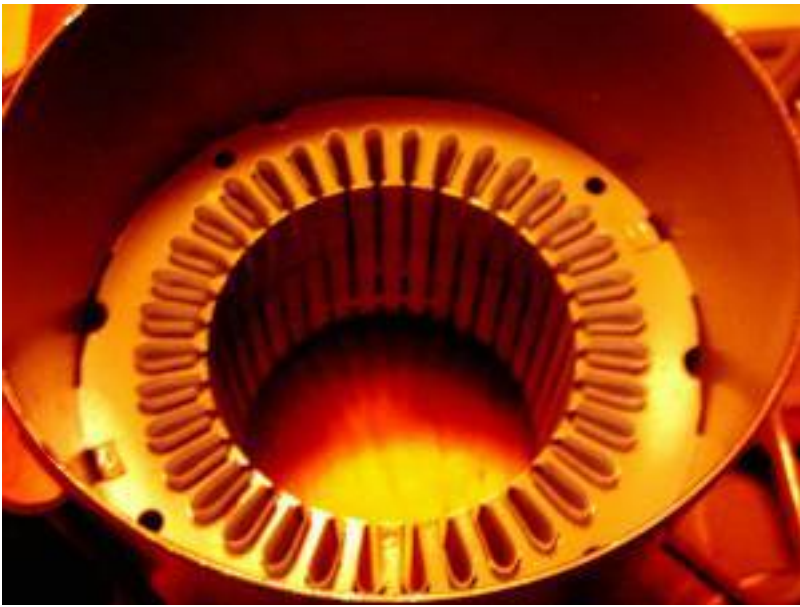
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posted by Sponge on 12/28/2003 02:26:13 PM MST  
5 comments
3. [Some simple, but crucial questions about laminates, coils and armature :\) \(Homebrewed Electricity, Free Energy\)](#)  
posted by Sponge on 11/10/2003 11:43:13 AM MST  
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7. ['Beginner' blade question \(Homebrewed Electricity, Wind\)](#)  
posted by Sponge on 08/23/2003 08:56:59 AM MST  
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[Coils "Shorting out laminates"](#) | 3 comments (3 topical, 0 editorial)

Re: Coils "Shorting out laminates" ([none / 0](#)) ([#3](#))  
by zubbly on Sat Jan 3rd, 2004 at 08:48:44 AM MST  
([User Info](#))

hello Sponge.

Magnet wire on its own does have an insulative coating. this coating is intended to only serve as electrical insulation between turns of the coil only. It should never be relied upon to insulate the coils from the laminates.

the material i use is DMD 180 degree celcius(dacron-mylar-dacron) which is intended for this purpose. thickness available ranges from .003-.025 inches. you should be able to obtain some from any electric motor rewind shop or another suitable material. if insulating stator slots, you just cut it to size. if insulating a flat laminate surface, i suggest using a thin coating of 5 minute epoxy on the laminates and applying the insulation in one thickness layer.

hope this helps

Zubbly

[Coils "Shorting out laminates"](#) | 3 comments (3 topical, 0 editorial)

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[coil shape and size for pm axial field alternator using donut magnets](#) | 7 comments (7 topical, 0 editorial)

Re: coil shape and size ([none / 0](#)) (#1)  
by Electric Ed on Fri Jan 2nd, 2004 at 04:44:35 PM MST  
([User Info](#)) <http://www.electric-ed.com>

Some of the basic principles are illustrated below.  
I believe "straight sided" coils, preferably a trapezoidal shape, so that the coil sides are aligned with the radius of the machine, will give good results.

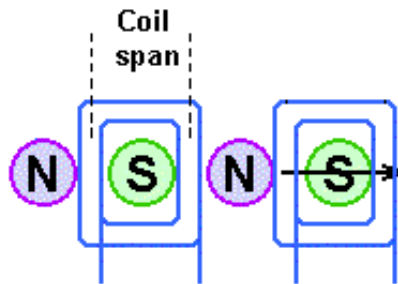
To maximize the field flux density, I recommend that you use two mild steel rotor discs, even if the second one does not have magnets on it.

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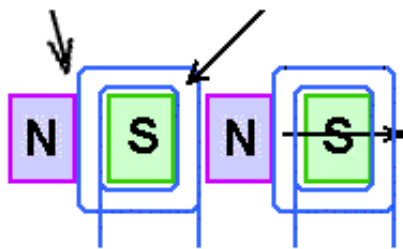
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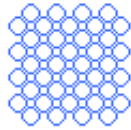
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## THINNER IS BETTER - - - -

Three cross-sectional views of  
one "leg" of forty turn coil construction

OK



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Electric Ed

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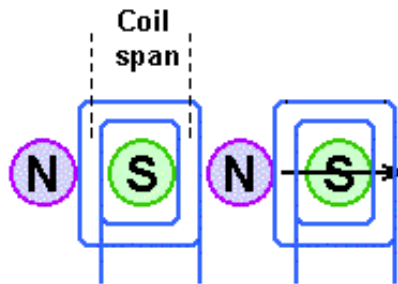
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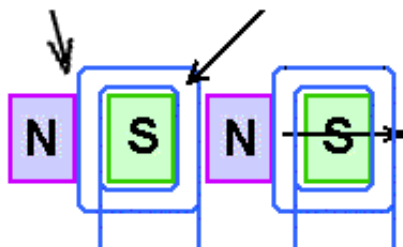
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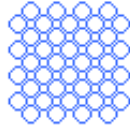
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**THINNER IS BETTER - - - -**

**Three cross-sectional views of  
one "leg" of forty turn coil construction**

OK



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[coil shape and size for pm axial field alternator using donut magnets](#) | 7 comments (7 topical, editorial)

Re: coil shape and size for pm axial field altern ([none / 0](#)) ([#2](#))  
by Oliver on Sat Jan 3rd, 2004 at 03:11:47 AM MST  
([User Info](#))

Hi Electric Ed, Thanks for your reply, very nice diagrams! So should the inner diameter of the coil be the same as the outer diameter of the magnet? I was originally thinking of having the coils the same size of the magnets to get the most flux passing through them. Thanks for your help Oliver

[coil shape and size for pm axial field alternator using donut magnets](#) | 7 comments (7 topical, 0 editorial)

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Re: coil shape and size for pm axial field altern ([none / 0](#)) ([#3](#))  
by Electric Ed on Sat Jan 3rd, 2004 at 06:05:59 AM MST  
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That depends on the magnet and coil sizes.

Refer again to my diagram. The important part reads - "Magnet center-to-center spacing should equal the coil span"

Does that make sense?

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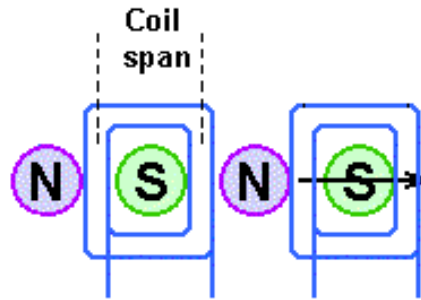
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## Magnet / Coil Spacing

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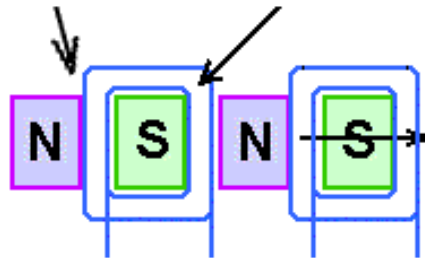
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Electric Ed

[ [Parent](#) ]

Re: coil shape and size for pm axial field altern ( [none / 0](#) ) (#4)  
by Oliver on Sat Jan 3rd, 2004 at 06:34:27 AM MST  
([User Info](#))

Yes, that makes sense that the coils and magnets must be spaced accurate to limit any phase difference in the output of the coils. Thanks for your help Oliver

[ [Parent](#) ]

Re: coil shape and size for pm axial field altern ( [none / 0](#) ) (#5)  
by Oliver on Sun Jan 4th, 2004 at 04:48:18 AM MST  
([User Info](#))

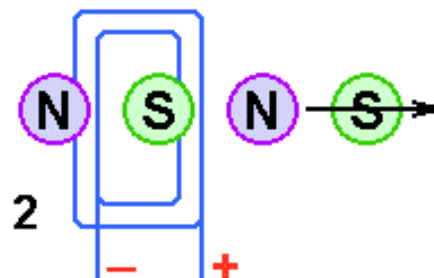
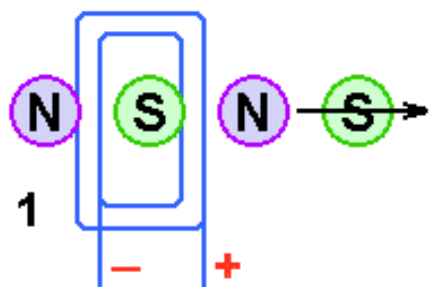
Electric Ed, when is the emf induced in the coils? - when the whole coil is over one pole e.g. N OR when one leg of the coil is over N and when one leg of the coil is over S? Thank you.

[ [Parent](#) ]

Re: coil shape and size for pm axial field altern ( [none / 0](#) ) (#6)  
by Electric Ed on Sun Jan 4th, 2004 at 06:50:02 AM MST  
([User Info](#)) <http://www.electric-ed.com>

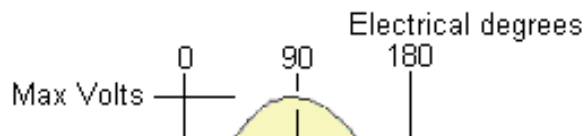
Voltage is induced when one leg of the coil is over a North, and the other leg of the same coil is over a South.

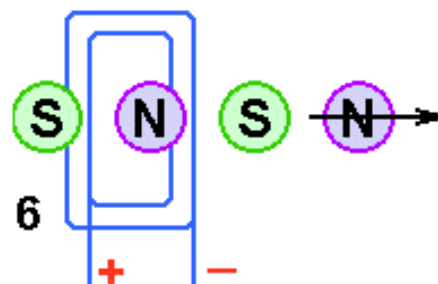
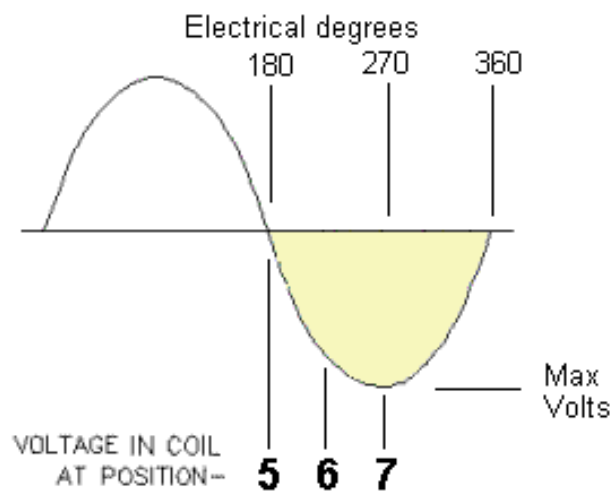
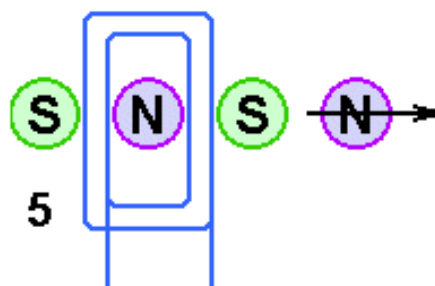
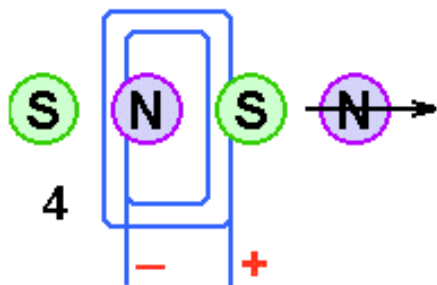
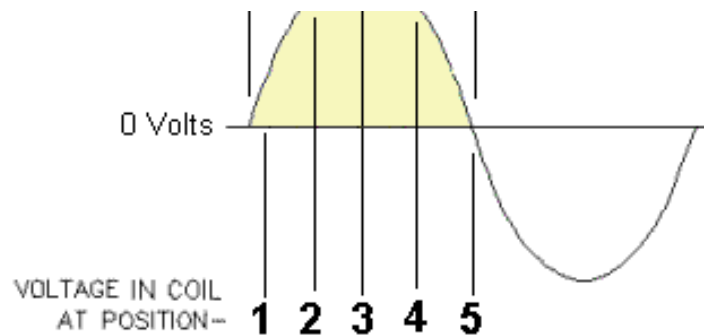
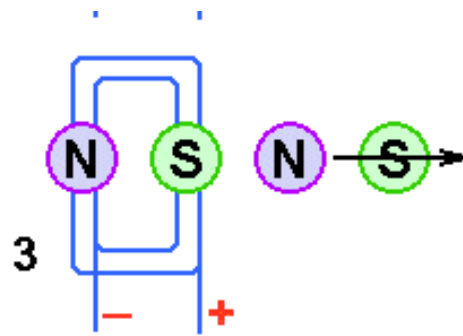
Electric Ed



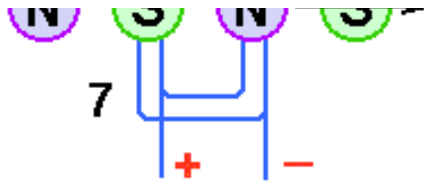
### Generation of an Alternating Voltage

Views 1 thru 7 represent the positions of the magnet poles as they move in relation to the stationary coils.









[ [Parent](#) ]

Re: coil shape and size for pm axial field altern ([none / 0](#)) (#7)  
by Oliver on Sun Jan 4th, 2004 at 11:34:46 AM MST  
([User Info](#))

Thanks for the clear reply Ed, I may have to re-think my coil design as at the moment it will do the following both legs of the coil will be over the same magnet (n-pole), then one leg over north pole - other leg over air (gap between magnets) one leg over north pole - other leg over south pole one leg over air (gap between magnets) - other leg over south pole both legs of coil over south pole on same magnet I assume this would cause a problem with the sine wave i.e a positive half cycle - a space until coils line up - then a negative half cycle and so on. My coils are already quite big due to the size of the magnets - might have to make the even bigger? Cheers Oliver

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[coil shape and size for pm axial field alternator using donut magnets](#) | 7 comments (7 topical, 0 editorial)



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[coil shape and size for pm axial field alternator using donut magnets](#) | 7 comments (7 topical, 0 editorial)

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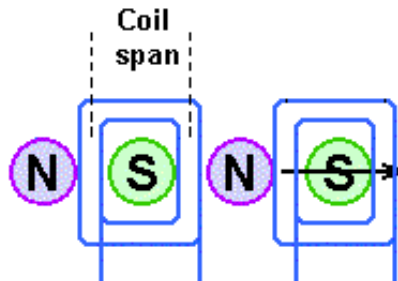
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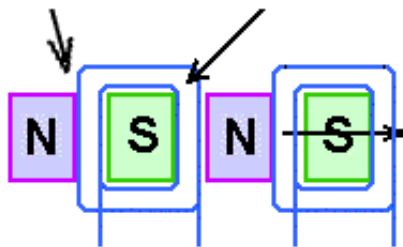
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Electric Ed

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[coil shape and size for pm axial field alternator using donut magnets](#) | 7 comments (7 topical, 0 editorial)

Re: coil shape and size for pm axial field altern ([none / 0](#)) ([#3](#))  
by Electric Ed on Sat Jan 3rd, 2004 at 06:05:59 AM MST  
([User Info](#)) <http://www.electric-ed.com>

That depends on the magnet and coil sizes.

Refer again to my diagram. The important part reads - "Magnet center-to-center spacing should equal the coil span"

Does that make sense?

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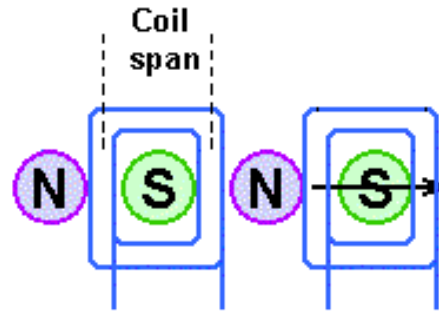
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## Magnet / Coil Spacing

In order to connect coils in series or parallel, so that the voltages, (or currents in parallel) will add instead of cancelling, the voltages induced in the coils must be "in phase" with each other.

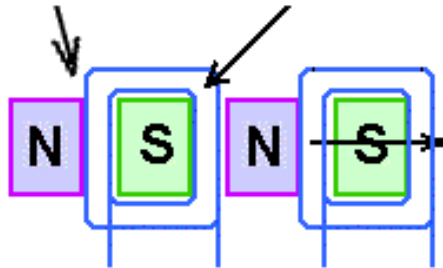
The only way to ensure that the coil voltages are in phase is by accurate magnet / coil spacing.

Magnet center-to-center spacing should equal the coil "span".



The objective is to have the leading edge of a NORTH pole reach one side of the coil - -

- - just as the leading edge of a SOUTH pole reaches the other side of the same coil.



Electric Ed

[ [Parent](#) ]

Re: coil shape and size for pm axial field altern ( [none / 0](#) ) (#4)  
by Oliver on Sat Jan 3rd, 2004 at 06:34:27 AM MST  
( [User Info](#) )



Yes, that makes sense that the coils and magnets must be spaced accurate to limit any phase difference in the output of the coils. Thanks for your help Oliver

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by Oliver on Sun Jan 4th, 2004 at 04:48:18 AM MST  
( [User Info](#) )

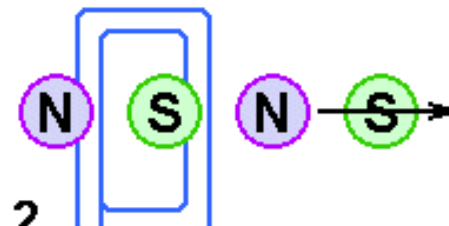
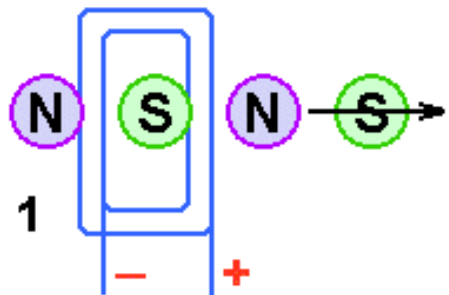
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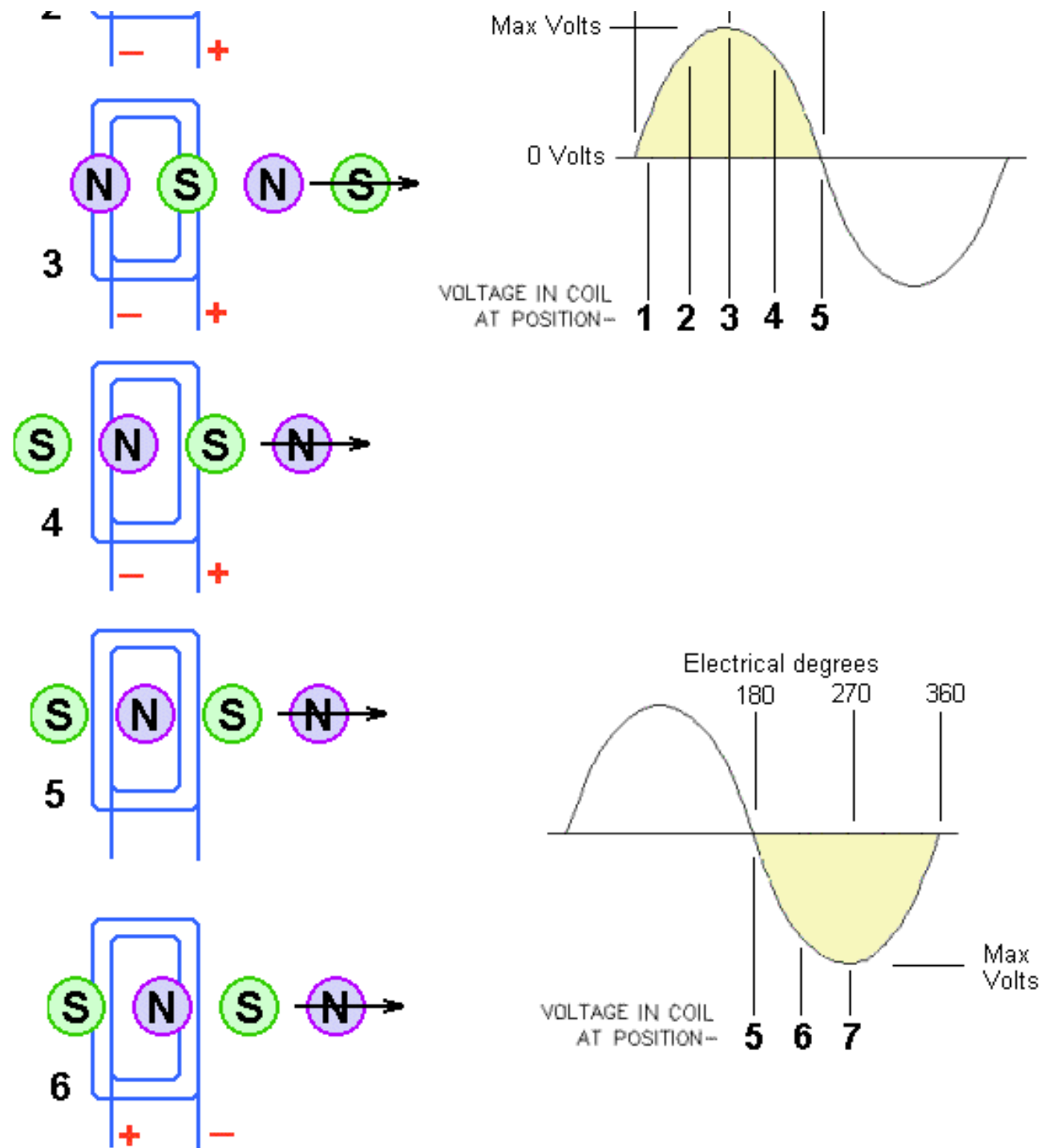


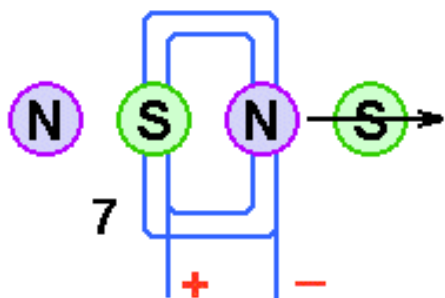
### Generation of an Alternating Voltage

Views 1 thru 7 represent the positions of the magnet poles as they move in relation to the stationary coils.

Electrical degrees

0      90      180





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by Oliver on Sun Jan 4th, 2004 at 11:34:46 AM MST  
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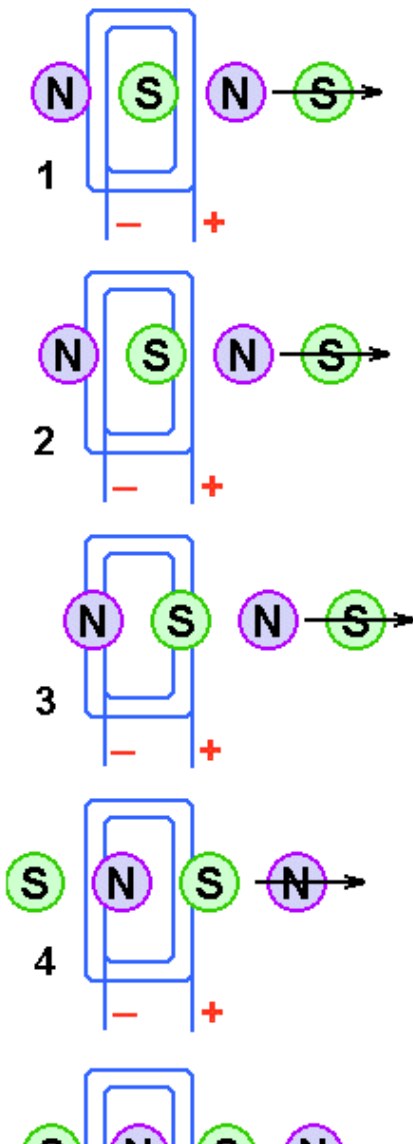
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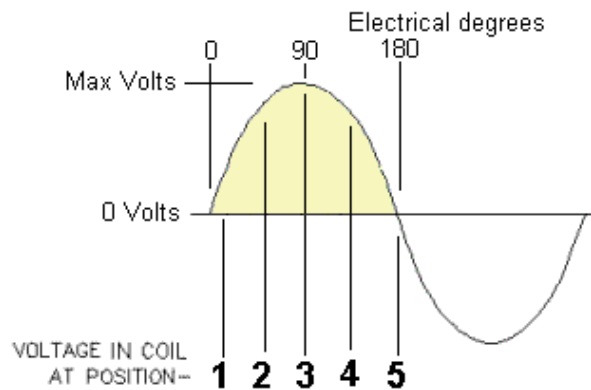
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Electric Ed



**Generation of an Alternating Voltage**

Views 1 thru 7 represent the positions of the magnet poles as they move in relation to the stationary coils.



Electrical degrees  
 180 270 360

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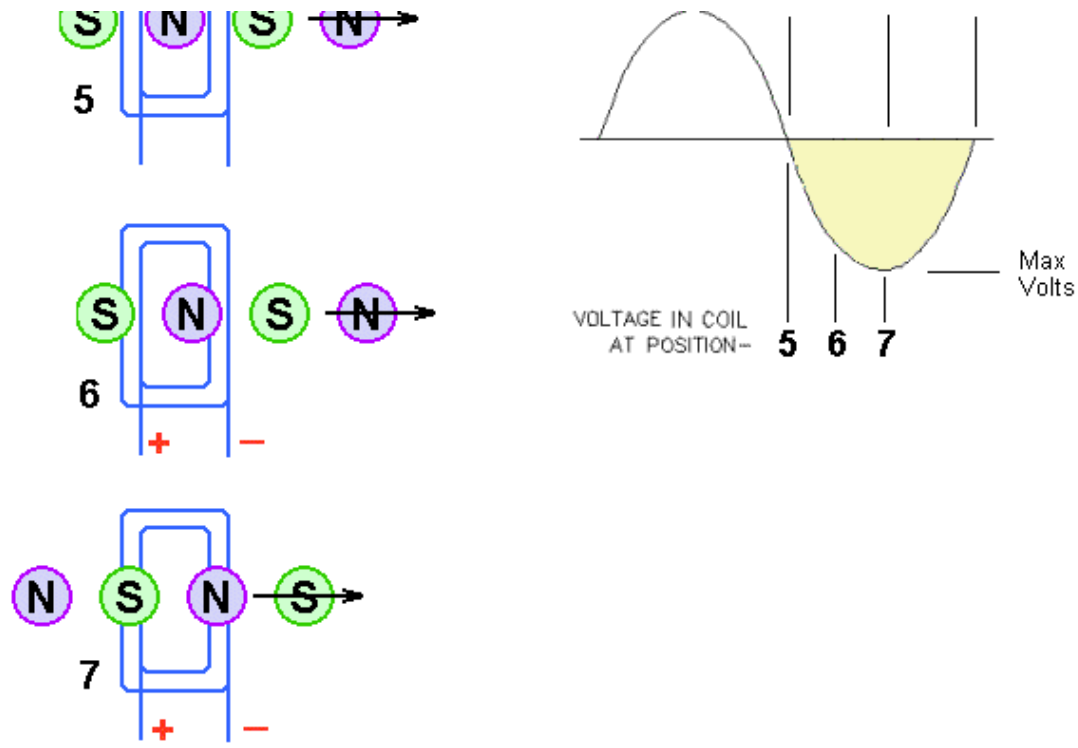
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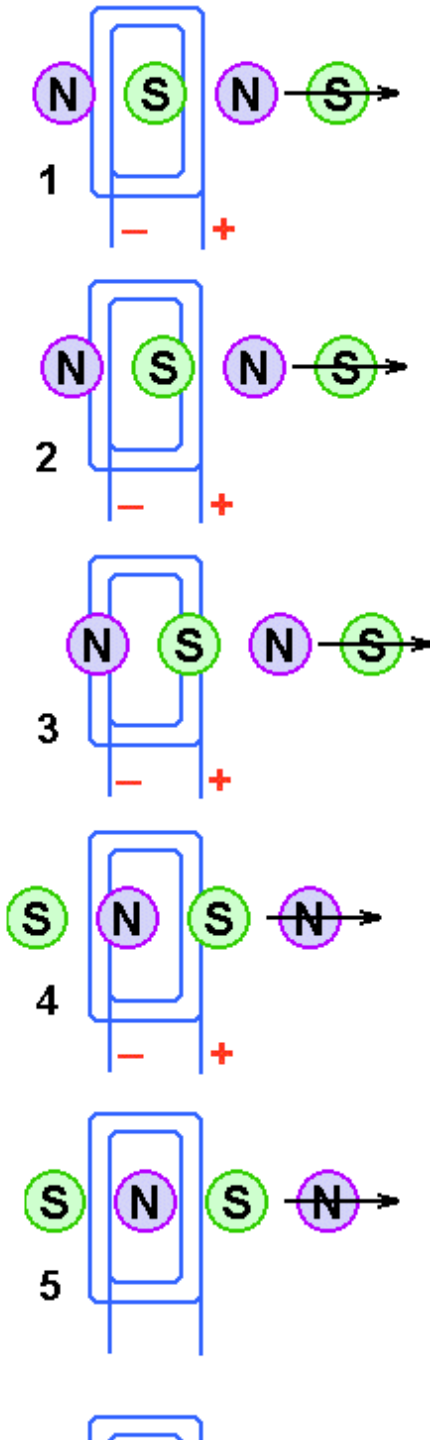
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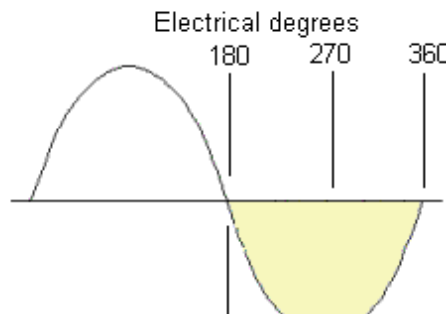
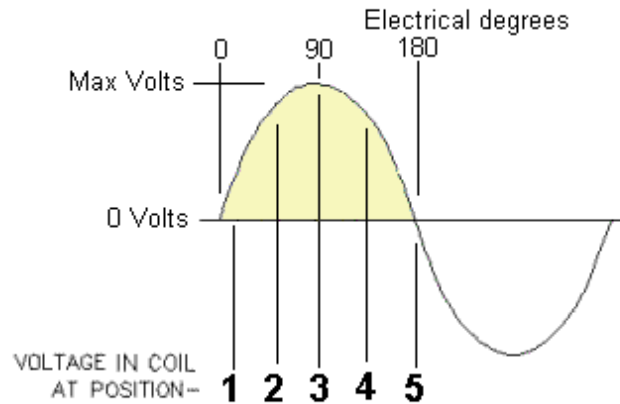
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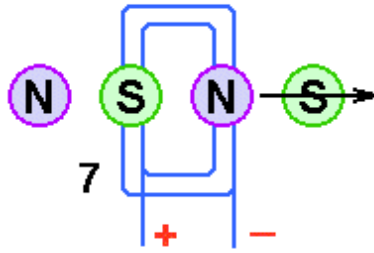
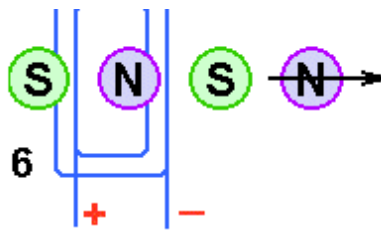
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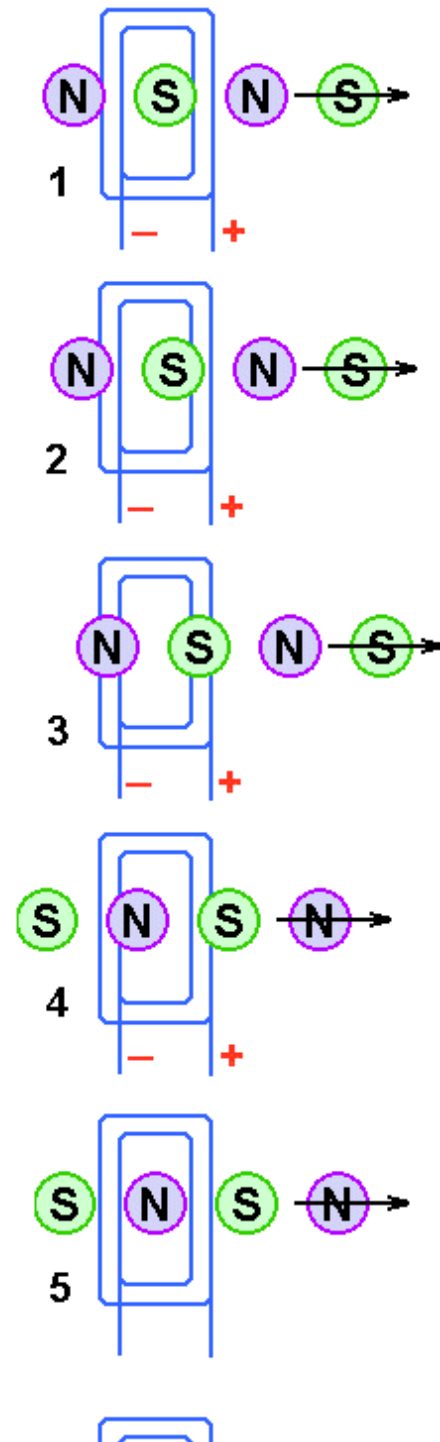
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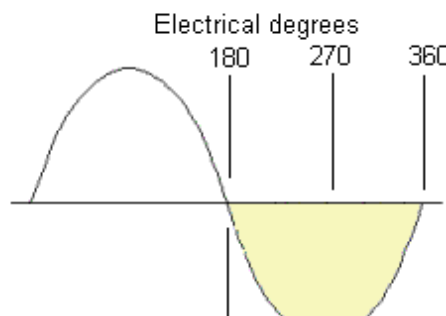
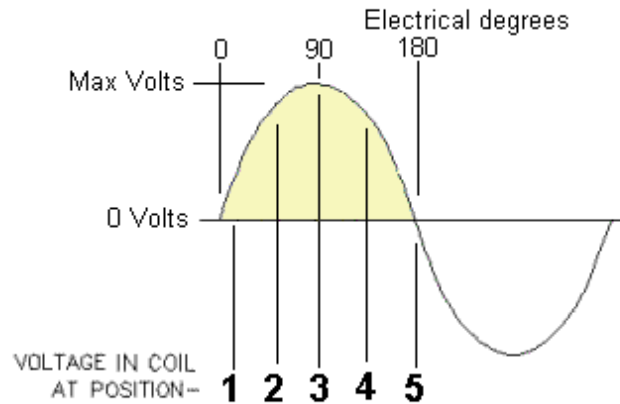
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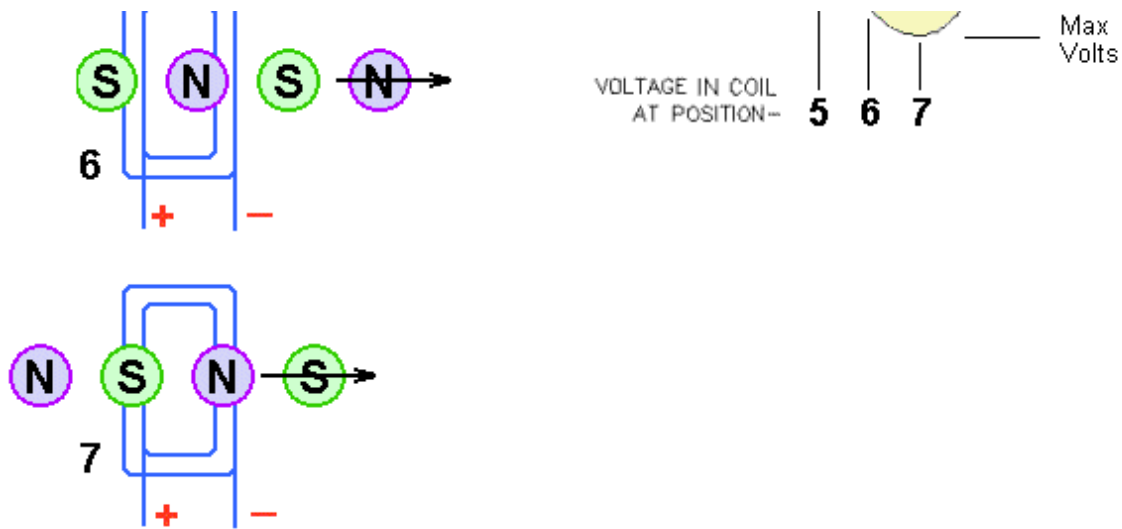
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posted by gameman on 09/05/2003 08:47:37 PM MST  
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9. [My latest LED Flashlight](#) ([Homebrewed Electricity](#), [Lighting](#))

posted by RobD on 07/24/2003 05:54:00 PM MST  
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10. [12 volt led's for houseboat?](#) ([Remote Living](#), [Lighting](#))

posted by Anonymous Hero on 06/26/2003 02:37:30 PM MST  
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([Homebrewed Electricity](#), [Lighting](#))

posted by Maharaja on 06/24/2003 04:46:32 PM MST  
3 comments

12. [Fluorescent voltages](#) ([Homebrewed Electricity](#),  
[Lighting](#))

posted by Andrew on 06/12/2003 03:25:48 PM MST  
9 comments

13. [Light from a bubble](#) ([Weird Science](#), [Lighting](#))

posted by Anonymous Hero on 06/06/2003 05:58:34 PM  
MST  
0 comments

14. [White led's](#) ([Classifieds](#), [Lighting](#))

posted by Demetri on 05/23/2003 11:00:39 AM MST  
1 comment

15. [converting ac flourescents to 12v dc](#) ([Remote  
Living](#), [Lighting](#))

posted by sean on 05/22/2003 08:43:49 AM MST  
4 comments

16. [800 watt inverter doesn't light a 500 watt light?!](#)  
([Homebrewed Electricity](#), [Lighting](#))

posted by zmoz on 04/04/2003 11:44:33 PM MST  
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## Batteryless Bicycle Flashing Safety Light System



- \* No Batteries!
- \* No Friction!
- \* No Drag!
- \* No Resistance!
- \* Always On, standby light when stops at traffic!
- \* One White Flashing Light in Front!
- \* Two Red Flashing Lights at Back!
- \* One standby light at back!
- \* Bright Enough to Be Seen in Daylight!
- \* Get Energy Almost Free! (At Least on Bicycle)

This product is based on a newly invented high efficiency electrical generating device; to see how it works [CLICK HERE](#)

### Product Advantages

- ★ No batteries needed (save your money and protect the environment).
- ★ No friction on any parts of the bicycle.
- ★ No drag can be detected in this device; it is not a traditional dynamo. With this innovative, electrical generating system you will not feel any extra weight when you are cycling.
- ★ Small size (approximately 1 by 2 inches).
- ★ One white light and two red safety lights flash as the wheel rotates (even at very slow speed). No need to switch them on/off.
- ★ On standby version, a standby red LED at back will keep on for 1-2 minutes after your bicycle is stopped by traffic lights.
- ★ The lights are bright enough to be seen in daylight - 24 hour safety lights free!
- ★ Very reliable and simple design, no maintenance needed.
- ★ Friction free design works well in all weather conditions.
- ★ 2 year warranty on the generating unit.
- ★ You will be in better legal position by using this safety lights if a traffic accident occurred. Because you can prove, the safety lights were always flashing on your bicycle in any weather conditions (e.g. in a dark day) or road conditions (e.g. under a bridge or inside a tunnel).
- ★ Alternatively, this safety lights can be used as a backup, in case your battery powered safety lights are not working when you are cycling in dark.

★ Another extra benefit of having this light system on your bicycle is: It may prevent the bicycle being stolen, as bicycle-thieves may think the light system is a security alarm system. Because many people told me, they first thought the "strange device" was a electrical security alarm.

Improved design using the latest LED products, the flashing lights become very bright. In fact, the lights are now too bright for the naked eye in a short distance.

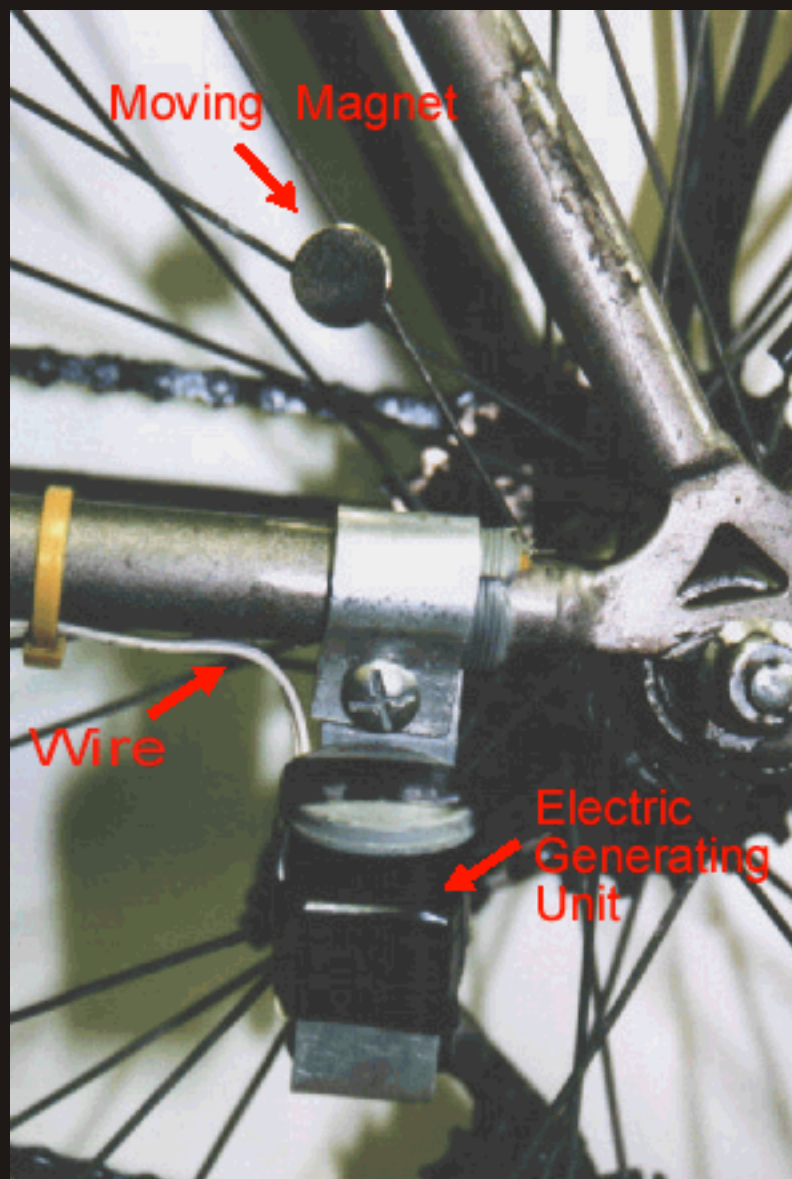
### WHY I DESIGNED THIS PRODUCT?

I used battery powered safety lights for many years. To keep battery powered lights in good working order, you must spend time, money and pay lot of attention to them. When I started cycling I was worried about: Are my safety lights on? Are batteries in my safety lights fully charged? Many times I rode my bike in the dark without safety lights because I simply forgot to switch them on, or the batteries were flat. When I arrived home I often forgot to switch the lights off. This why I designed this product!

**Real Products**

This product is now available in hand-made version.

To install this product on your bicycle, see instructions below:



(Picture 1) To install: (1) First stick the moving magnet onto spokes of the wheel by magnetic force, cover it by plastic film to prevent rust. (2) Fix the generating unit on tube of the bicycle as picture shown, make sure the moving magnet passes close to bottom part of the unit, but not touch each other (see picture 2 below for details).





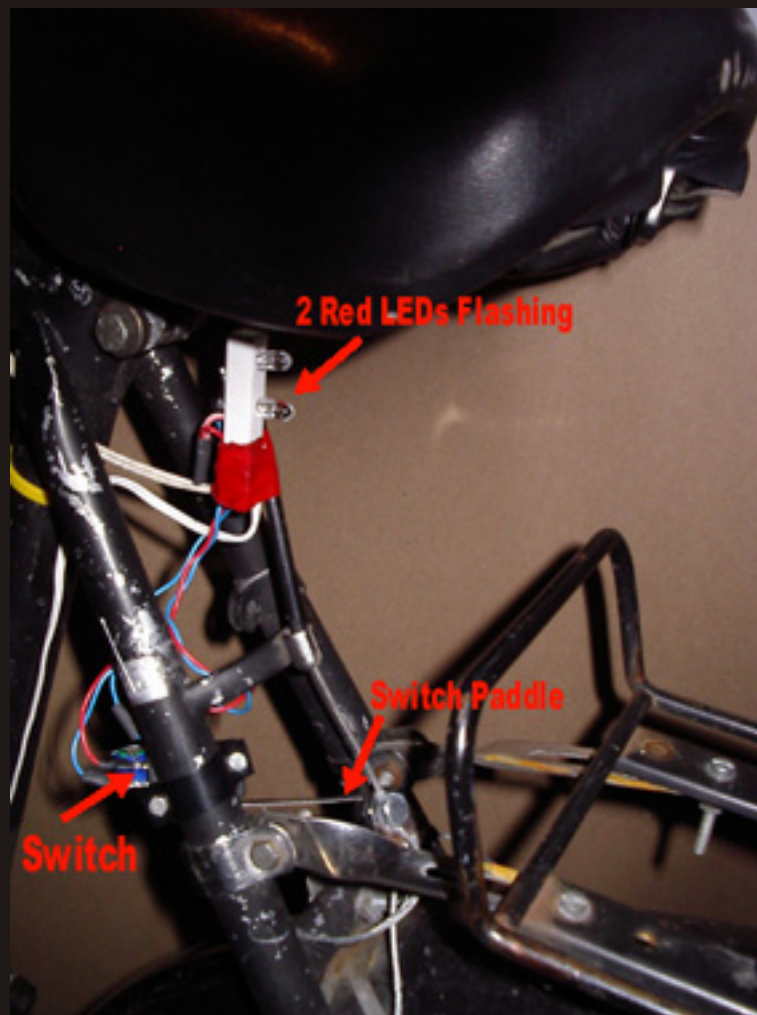
(Picture 2) shown the moving magnet (covered by plastic film) passes close to bottom part of the generating unit with a 0.5-1 cm gap. There is no friction between them, and you will feel no extra weight when cycling.



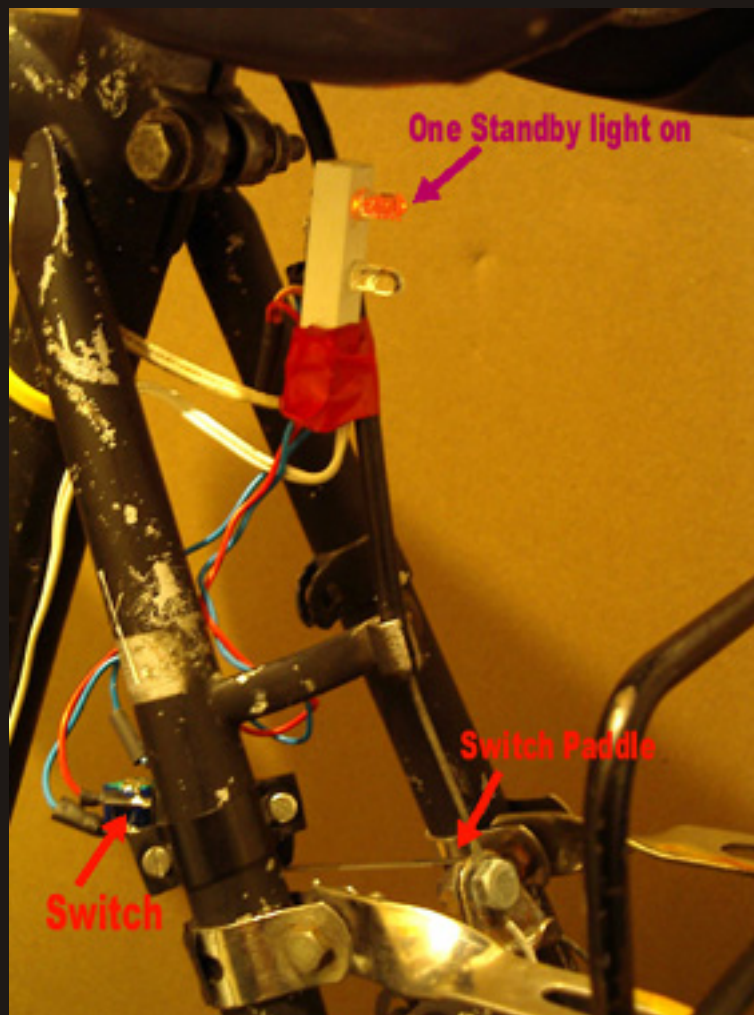
(Picture 3) Two red lights at back, one white light in front and wire from the generating unit.



(Picture 4)



(Picture 5) shown the standby version of the product. At back, the 2 LEDs are flashing if you ride the bicycle without holding rear-wheel brake. The standby light switch's paddle is at open position.



(Picture 6) shown the standby version of the product. As you held the rear-wheel brake to stop the bicycle at traffic lights, the movement of the brake cable will push the switch paddle into close position, 1 of the LEDs will be lit. The LED will keep on until you released the brake. On other bicycles, there may be some other designs of rear-wheel brake, the standby light switch can be installed at another convenient place in order to get same result.

## Buy on-Line

★ Normal flashing lights, £13 per unit, add £2 for worldwide postage.  
Click below to buy. Make payments with PayPal - it's fast, free and secure!

★ Flashing lights with standby light, £18 per unit, add £2 for worldwide postage.  
Click below to buy. Make payments with PayPal - it's fast, free and secure!

★ Do-It-Yourself (DIY) kit, £8 per kit, £2 for worldwide postage.  
The kit includes all components (except enamled copper wire for the coil) with  
step by step picture instructions. Click below to buy. Make payments with PayPal  
- it's fast, free and secure!

Contact Me

Address:

[www.freelights.co.uk](http://www.freelights.co.uk)  
63 Grays Inn Road  
London WC1X 8TL  
United Kingdom

Tel/Fax: 0207-6814718 (0044-207-6814718 call from abroad)  
Mobile: 0794-0149256 (0044-794-0149256 call from abroad)

Email: [iwico@yahoo.com](mailto:iwico@yahoo.com)

If you are in the UK and would like see the product, call me to make an  
appointment. I will install the product on your bike free of charge if you buy one.

Worldwide PCT patent application pending. We are looking for business  
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posted by iwico on 12/31/2003 05:51:06 AM MST  
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3. [Bicycle lights \(batteryless, No friction\)](#) ([Classifieds](#), [Free Energy](#))

posted by iwico on 12/31/2003 05:29:04 AM MST  
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### [12 Volts or 240 Volt Lighting](#)

By [JohnS](#), Section [Homebrewed Electricity](#)

Posted on Mon Dec 22nd, 2003 at 06:08:41 PM MST [Lighting](#)

Deciding whether to use an inverter or batteries to power my house lighting.

Hi All, Just after a bit of advice. I have converted most of our interior lighting to 12V spots. (the ones that use a 240V to 12V transformer) I was going to run in new 12V wiring from my battery bank to run these spots which would require additional switches and wiring. Would I be just as well using an inverter to tie in to the existing 240V wiring with a single changeover switch or stick to running in a separate 12V system. Are there any problems using modified sine wave inverters with lighting transformers?

Any thoughts or advice would be most helpful. Hang Loose. John S.

[12 Volts or 240 Volt Lighting](#) | 4 comments (4 topical, 0 editorial)

Re: 12 Volts or 240 Volt Lighting ([none / 0](#)) ([#1](#))  
by [drdongle](#) on Mon Dec 22nd, 2003 at 06:48:44 PM MST  
([User Info](#))

Transformers tend to saturate more easily with square waves but yes it will work.  
12 volt has the advantage of no conversions but larger wire is required to efficiently deliver it to loads. anything you do is a trade off.

Dr.D

Re: 12 Volts or 240 Volt Lighting ([none / 0](#)) ([#2](#))  
by [dconn](#) on Mon Dec 22nd, 2003 at 07:13:17 PM MST  
([User Info](#))

The other nice thing about using the power through your Inverter, rather than a 12v system, is that the Inverter will, most likely, have a low-power shutoff to protect your batteries from under-charge.

I find the CFL bulbs to be really good running on the Inverter (although I've killed one CFL bulb after about 2 years of life somehow and another has taken to buzzing when turned on - I should probably fork out for a sine-wave Inverter).

All the best,

Derek

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Re: 12 Volts or 240 Volt Lighting ([none / 0](#)) (#3)  
by RobD on Tue Dec 23rd, 2003 at 07:12:57 AM MST  
([User Info](#))

I like the idea of low voltage lighting. Even if you aren't getting the best efficiency now there are a lot of options coming along and you'll be ready for them. I'm going to run the house on 24 volts. (I'd like to go to 48 but my mills are 24).

The new LEDs coming out now are great in both power and color. It won't be long before even the CFL bulbs are out dated.

I also use the small 8 watt 8" long CFL lamps that I've built drivers for to run on 12 volts, 24 volts, 120 volts or D cells. So no matter what I have in power I get light.

The thing about low voltage is you can use several different sources to drive them and save your inverters for other needs.

Here's a trick to save power and have your incandescent lamps last forever. Put a diode in series with the lamp. I solder a 1N4007 diode, direction doesn't matter (use two for higher wattage bulbs), on the tip of the light, wind the other end in a small coil and stick a blob of solder on it. It drops the voltage down to about 55% so if you use 100 watt bulbs you get about 55 watts with a greatly extended life and half the power waste. Have you ever noticed how hard it is to get low wattage bulbs?

I buy the diodes from Digi-key 100 for \$7.00. I give them out to my neighbors.

RobD

Re: 12 Volts or 240 Volt Lighting ([none / 0](#)) (#4)  
by windrules on Tue Dec 23rd, 2003 at 06:00:50 PM MST  
([User Info](#))

Depending on the inverter you use you need to be carefull using the long fluro lights as on some cheeper inverters the fluro's will fry the inverter unless you remove the capacitor that is housed inside of the tube (not the start capacitor).Just found this out with a bad experience with 18 watt fluro on a cheep sine wave inverter, is now beeing repaired,realy dead.

Mos

[12 Volts or 240 Volt Lighting](#) | 4 comments (4 topical, 0 editorial)

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## [LED for headlamp](#)

By [Tim C](#), Section [Homebrewed Electricity](#)  
 Posted on Sun Dec 21st, 2003 at 04:58:18 PM MST [Lighting](#)

I have an inexpensive headlamp which takes a screw in incandescent bulb.

I think it is 4.8 v 700 m. I have look everywhere and have not found a replacement. I found two white LED's at The Electronic Gold Mine. One is a 5 mm and has a minimum output of 7,000 mcd@4.0V DC. The other is 10mm white LED operates on 3.6V to 4.2VDC @ 30ma.

My light uses 4 AA batteries. Can I simply wire this in or will I need a resistor. If so can anyone recommend one? I realize if operated at over the rated voltage, the LED may not last as long. This is OK since the current bulbs do not last long anyway. Thanks for any and all help.

Tim C.

[LED for headlamp](#) | 17 comments (17 topical, 0 editorial)

Re: LED for headlamp ([none / 0](#)) (#1)  
 by Norm on Sun Dec 21st, 2003 at 05:41:34 PM MST  
[\(User Info\)](#)

I just got a Dorcy solid state (white led) from QVC about 2 months ago the batteries (4-AA) last a lonnnngggg time and the bulbs probably lifetime. The only drawback...about half the length of a regular flashlight...so I keep misplacing them. BTW They would make a nice Christmas Present... (batteries last a lonngg time)  
 (:>) Norm.

Re: LED for headlamp ([none / 0](#)) (#2)  
 by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Sun Dec 21st, 2003 at 05:45:36 PM MST  
[\(User Info\)](#)  
<http://timmythy.home.mindspring.com/timmy.htm>

An LED without the resistor is just a diode. so with no resistor you have almost a Dead Short...

}=- W o o f -= {

Re: LED for headlamp ([none / 0](#)) (#3)  
 by Tim C on Sun Dec 21st, 2003 at 05:56:41 PM MST  
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Thanks for the help. So what would I need to make this LED operate? I have read the information on the board on the use of LEDs. They can work without the resistors, but may last a shorter time if you exceed their voltage.

[ [Parent](#) ]

Re: LED for headlamp ([none / 0](#)) (#4)  
by Gordy on Sun Dec 21st, 2003 at 08:39:18 PM MST  
([User Info](#))

If your worried a about over voltage, could'nt you just replace one of the batteries with a peice of wood dowl with a hole drilled down the center and some wire in the hole and a tack on each end. To pass the current through from the other batteries.

Just a  
thought,  
Gordy

[ [Parent](#) ]

resistor built in with the led? ([none / 0](#)) (#7)  
by Norm on Mon Dec 22nd, 2003 at 07:38:35 AM MST  
([User Info](#))

The 'Dorcy' looks almost like it has a regular flashlight bulb...except you can see the diode instead of a filament maybe they have a built in resistor?  
Norm

[ [Parent](#) ]

Re: LED for headlamp ([none / 0](#)) (#5)  
by visionarynz ([dynamics\\_feedback \(at\) hotmail \(dot\) com](mailto:dynamics_feedback@hotmai(dot)com)) on Mon Dec 22nd, 2003 at 01:12:34 AM MST  
([User Info](#)) <http://www.dynamics.orcon.net.nz>

Going by the formula I use for the LED lights I make, you would want a 150 ohm resistor wired in series with each LED.

Running from 4x 1.5volt cells, this should keep the current through each LED down to around 20mA, and at this current level the LEDs will work well, and likely last longer than you do. Also your batteries will last a very long time, even if you put 4 or 5 of them in there.

There are a few special cases where LEDs can be connected straight to batteries, but this isn't one of them, they will likely die in a matter of seconds without a resistor.

vis\_nz

Re: LED for headlamp ([none / 0](#)) (#6)  
by dburt on Mon Dec 22nd, 2003 at 07:22:40 AM  
MST  
([User Info](#))

Rechargeable batteries (NiCD or NiMH) have a nominal voltage of 1.2 volts, so if you use them, you'd need a smaller resistance value to get the same brightness from your LED... Or, if you get the 4.6V LED, you could get away with running without a resistor (as long as you dont forget and put regular 1.5v batteries in!)

Dave in PA

[ [Parent](#) ]

Re: LED for headlamp ([none / 0](#)) (#8)  
by RobD on Mon Dec 22nd, 2003 at 07:50:03 AM MST  
([User Info](#))

Yes, that's right. LED's are CURRENT devices. That means the voltage is relatively unimportant. What you want to control is the current.

I'm not sure how bright your LED needs to be but the 20 ma. ones won't give you much light.

I have several LED flashlights that I built using high power LEDs but they require a current limiting circuit.

If you are not concerned with brightness and want just a cheap indicator light you can figure your current with ohms law ( $E=IR$ ) this way:

First you will need to know the voltage and current specs of the LED for example, let's say your LED is rated at 20 ma(.020 amps) and 1.7 volts.

4.  $8 - 1.7 = 3.1$  volts.

3.  $1 / .020 = 155$  ohms.

The closest standard resistor to 155 is 150 ohms and this will be fine.

$.020 \times 0.020 \times 150 = .060$  or 60 mw (milliwatts) so you can use a 1/4 or even a 1/8 watt resistor.

What is happening here is the resistor is dropping the excess voltage (3.1) and allowing the 1.7 volts to go to your LED. The 1.7 volts will not overdrive the LED so the 20ma will not be exceeded.

You would put this in series with your LED(battery-----//----->|---ground). Make sure the LED is in the circuit in the right direction (The flat spot (collector) is the ground end and goes to the neg post on your battery).

Hope this helps,  
RobD

Re: LED for headlamp ([none / 0](#)) (#9)  
by jubalearly on Mon Dec 22nd, 2003 at 08:18:18 AM  
MST  
([User Info](#))



I think it is a good idea to always use some resistance to prevent thermal runaway. That having been said, I often power LEDs from NiCads or NiMH batteries at 3.6v (3 batteries or in a minim@g, 2 batteries @2.4-3.2v) with no resistor. However, if there is room, even a 10 ohm resistor will usually prevent thermal runaway.

Note that the rating of 3.6v or 3.6-4.2v is the SAME thing. The one that gives you the range is telling you the typical variation in Vf (forward voltage). Higher quality LEDs tend to vary less.

I would recommend the 3 batteries + a dummy as was mentioned above. With 4 batteries you waste most of the 4th battery (70%?) in heating the resistor. Also, I very rarely have any LEDs fail at 50ma, even when they are rated for 20-30ma max. So I would use something around 50 ohm for your 4 battery setup or 10-20 ohm for the 3 battery setup assuming alkaline batteries.

If you use NiMH rechargeables, the voltage will be much flatter (about 1.25v/battery with a 50ma load) and you can use a smaller resistor (22 or 27 ohm with 4 batteries). Note that the actual value of the resistor varies enough that exact values aren't critical. So just use whatever is closest to your calculations.

Thermal runaway ([none / 0](#)) (#10)  
by Norm on Mon Dec 22nd, 2003 at 09:38:45 AM  
MST  
([User Info](#))

Isn't this what would happen in fluroscent lights you have to have something to limit the current and whatever happened to the big heavy ballast that they used to have in the old fluroscent lights? To my understanding a ballast is a 'choke coil' they used to use them quite often in the old tube radios. Norm.

[ [Parent](#) ]

Re: LED for headlamp ([none / 0](#)) (#16)  
by Tim C on Wed Dec 24th, 2003 at 05:40:48 AM  
MST  
([User Info](#))

So could I simply replace one of the 4 AA batteries with "spacer" wired with a 10 to 20 ohm resistor?  
The light still needs to be practical but I do not want it to burn out right away.

[ [Parent](#) ]

Re: LED for headlamp ([none / 0](#)) (#11)  
by RobD on Mon Dec 22nd, 2003 at 05:34:17 PM MST  
([User Info](#))

Basically a ballast 'absorbs' the initial high inrush current of cool low resistance filaments. Now we don't need them because we have very good current limiting circuitry that never allows the inrush current to go above a specific point. In the old days the military used to keep their tubes on constantly because they found they lasted longer. Apparently they did because we changed very few of them. An important point about LEDs in flashlights is to keep the voltage of the source close to the working value of the LED to limit losses from heat through resistors. This is why I use PWM (pulse with modulation) drive circuits through MOSFETS with low internal resistance to cut my losses. If you are dropping half your current in a resistor your batts will burn down in half the time.  
RobD

Re: LED for headlamp ([none / 0](#)) ([#12](#))  
by Gordy on Mon Dec 22nd, 2003 at 07:56:22 PM  
MST  
([User Info](#))

While we're on the subject of led's, has anyone thought of using them on christmas light strings and what would be involved in doing so. A 50 light string at Wal-Mart is \$1.49 a 50 led light string would be \$???????

Just tierd of changing bulbs, and thinking of how much electricity the "old lady" insists on wasting with 1000+ of these little buggers running 12 to 18 hours a day.

wishfull thinking

Let me know if I'm just

Gordy

[ [Parent](#) ]

Re: LED for headlamp ([none / 0](#)) ([#13](#))  
by hydrosun on Mon Dec 22nd, 2003 at  
09:23:47 PM MST  
([User Info](#))

We bought a bunch of 120 volt Led Christmas lights last year. Only one hardware store in town carried them. We bought one string for \$15 but later they were discounted to \$7.50.

They plug in like regular strings and can be connected in series and parrallel and use 1/8th the power of regular bulbs. also check ebay or a search of the web to find who is carrying them this year. We really liked the blue almost glowing strings.

I've converted many regular bulb christmas strings into 12 volt led strings. I had to cut and splice and add resistors . I'd put 5 in each group for red, green or yellow, and 3 in each group of white or blue (I'd calculate 2 volts each for the first group and 4 volts each for the whites and blues) usually I'd use one resister for the whole string. The trickiest part is keeping the polarity straight with the direction

of the leds.

I've found the best deals for Leds at Superbrightleds.com I ve order from them 3 times. I used 50 in a string of 12 volt christmas lights that are on in the living room all year. Very bright and chearry. I especially like the 12 volt cluster of 24 white for \$15. I use it for my bike light.

I've used 12 volt 12 led clusters for a couple bright headlamps. I use 12 volt nmh battery packs to run these led clusters. One pack was two cell phone batteries I rescued from the recycling bin . One other battery was from a camcorder. I ususally take my multi meter when I take in my recycleables and rummage through the old batteries. Many still have lots of life for low power applications. they have great desriptions and outputs of each individual led.

[ [Parent](#) ]

Re: LED for headlamp ([none / 0](#)) ([#17](#))  
by desertratjack on Wed Dec 24th, 2003 at 10:52:44 PM MST  
([User Info](#))

Backwoods Solar sold LED light strings (12 vdc) but I found that by buying the WalMart colored light strings and rewiring the 120vac strings to 12 vdc that I could make the strings alot dimmer so that they are more pleasing to the eye and they also run on a lower voltage with longer life. If I remember right the bulbs I had were 5 in series for 12 vdc. Be aware that there is great variability in bulbs so different strings from different manufacturers have different resistances so it becomes a big puzzle (worse than just finding a bad bulb)if you mix different bulbs :-)

[ [Parent](#) ]

Re: LED for headlamp ([none / 0](#)) ([#14](#))  
by Bach On on Tue Dec 23rd, 2003 at 05:13:04 AM MST  
([User Info](#)) [change AT: bach\\_on AT hotmail.com](#)

I bought a couple of LED "bulbs" designed to retrofit to a standard flashlight. They were something like \$8.00 each from some guy on eBay. These were not screw-in, but the bayonet type. Each bulb was actually three LEDs. The resistors were internal and already wired in there. I used these to replace bulbs on a bike light. Worked pretty well. Just a bit of bluish tint to them.

Bach On.

- I'm just as happy as if I had good sense! -

Re: LED for headlamp ([none / 0](#)) (#15)  
by RobD on Tue Dec 23rd, 2003 at 07:18:24 AM MST  
([User Info](#))

Try the Luxeon Stars. They are up to 5 watts and the light is white.  
RobD

[LED for headlamp](#) | 17 comments (17 topical, 0 editorial)

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[LED and 12Volts power supply HELP!](#)

By [SamSaveMax](#), Section [Homebrewed Electricity](#)  
Posted on Thu Oct 23rd, 2003 at 12:26:03 AM MST  
LED

[Lighting](#)

Hello everyone!

I've been learning and fooling around with LEDs diodes for a month now and able to produce and modified a few things as for accent lighting around the house. BUT... till now....it got me wonder about the information listed on the back of most 12volt power supply.

I built a LED light using 3 LEDs in series inline with a resistor rated at 470 ohm 1/4 watt. Using with a 12volt power supply as listed below....my LED light works.

My 12volt power supply listed: input: 120V AC 60Hz 6W  
output: 12V DC 250mA

12V is usable for LED....but how about the 250mA current listed??

Most LEDs forward current in a range of 20mA to 30mA.

Would the rating on the power supply of 250mA matters? Would it ruin LEDs quicker?

I appreciate anyone with the technical knowledge could assure my LED design is OK !

Thanks

SamSaveMax

[LED and 12Volts power supply HELP!](#) | 9 comments (9 topical, 0 editorial)

Re: LED and 12Volts power supply HELP! ([none / 0](#)) ([#1](#))  
by [wpowokal](#) on Thu Oct 23rd, 2003 at 06:05:05 AM MST  
([User Info](#))

SSM, The 250ma means you can run 12 led's at 20ma each (250/20 ma). The voltage is aproximatly constant and is the paramiter you chose your resistance to suit. Voltage equates to water pressure while amps equates to water flow.

If I understand you correctly you have 3 led's in series ie +12v led led led -12v. If this is what you mean as oposed to paralell, then as each led has a voltage drop of 2v, 3 in series equal 6v drop. Therefore you could go as low as 220 ohm resistor with this arrangement, but please be sure of your arrangement before substituting a lower value resistor.

hope this helps regards Allan

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Re: LED and 12Volts power supply HELP! ([none / 0](#)) (#2)  
by veewee77 on Thu Oct 23rd, 2003 at 06:08:02 AM MST  
([User Info](#))

The 250MA rating on the transformer means that that is the max load you can put on it. It won't push more current than the load requires. If you put the 470 ohm resistor in there, and use the formula  $E/R$  where  $E=Volts=12$  and  $R=470$  ohms, that will mke the current in your circuit 25ma, within the range of your current limits on your LEDs.

DS

Re: LED and 12Volts power supply HELP! ([none / 0](#)) (#3)  
by 5kw on Thu Oct 23rd, 2003 at 07:51:25 AM MST  
([User Info](#))

DS don't forget the voltage drop of the LEDs ~ 6 + volts. Current is probably closer to 10-12 ma. If the supply is a wall wort it may have very poor regulation, it wouldn't hurt to check things with a meter.  
Make the wind fun!  
Victor

[ [Parent](#) ]

Re: LED and 12Volts power supply HELP! ([none / 0](#)) (#4)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Thu Oct 23rd, 2003 at 09:12:27 PM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

I use this page frequently in my 12vdc LED lighting projects

[http://www.otherpower.com/otherpower\\_lighting\\_leds.html](http://www.otherpower.com/otherpower_lighting_leds.html)

Hope that helps . . .

. >=- W o o f -=<

Re: LED and 12Volts power supply HELP! ([none / 0](#)) (#5)  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Thu Oct 23rd, 2003 at 10:44:41 PM MST  
([User Info](#)) <http://www.internetfred.com>

All devices take the amount of current that they need. They take no more or less than they are rated for generally. If the device is for example say 10 ma and your battery can handle 100 ma, it means that there is 100 ma available from the battery, The device will use 10 ma (presumed per hour in this example) for 10 hours. If the device requires more than 10 ma, say around 50 ma, then it will run for 5 hours using 50 ma of current per hour and run for 5 hours. Most batteries suggest a rating of Ah or amp hours. Example: 2.0 Ah at 12vdc. You can drain 1 amp per hour for 2 hours at 12 volts. Yours suggests 12vdc 250 ma which is milli amp hour.

Current is just the available power per unit time. Voltage is the pressure that a device requires to run optimal. Good Luck!

Re: LED and 12Volts power supply HELP! ([none / 0](#)) ([#6](#))  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Thu Oct 23rd, 2003 at 11:05:34 PM MST  
([User Info](#)) <http://www.internetfred.com>

say around 50 ma, then it will run for 5 hours using 50 ma of current per hour and run for 5 hours  
opppsssss.. Correction.. 100ma, 50 ma drain, 2 hours not 5 hours...

[ [Parent](#) ]

Re: LED and 12Volts power supply HELP! ([none / 0](#)) ([#7](#))  
by SamSaveMax on Fri Oct 24th, 2003 at 12:25:22 AM MST  
([User Info](#))

Thank you very much everybody. Those replies really helpful.  
I understand now.....it means maximum load rating.  
It means that I can be able to run maximum 4 series of 3 LEDs each in paralell.  
You guys are too advance for me.... :)

One question to Allan...If I use a 220 ohm resistor, would that makes my LED light any brighter??? Series arrangement of the light: +12v,resistor,led,led,led,-12v

To be honest with everybody...my power supply is just a regular AC adaptor.  
I collect for those useless no longer need AC adaptor that used to power small household electronics and use them to power LEDs. It doesn't have to be 12V. It could be 9v, but use 2 LEDs instead. I am sure that every house would have atleast 2 or 3 laying around somewhere useless.  
LED would make a perfect accent lighting, under kitchen cabinet lighting anyone?? nightlight? discrete spot lighting for your collectable? inside a curio cabinet??  
how about landscape lighting??.....which I just finished my project. I am a freak of LED for white light and low power

sip. Even my lighted house number has been converted. :0)  
Anyone has an advance project care to share with me? Thanks again everyone.

Re: LED and 12Volts power supply HELP! ([none / 0](#)) ([#8](#))  
by wpowokal on Fri Oct 24th, 2003 at 04:40:58 AM MST  
([User Info](#))

SSM, simply yes using 220 ohm will allow brighter led's.

The info you need is here

<http://www.dse.com.au/cgi-bin/dse.filereader?3f99010511fb1950273fc0a87f9c067d+EN/catalogs/DTS0000068>

regards Allan

[ [Parent](#) ]

Re: LED and 12Volts power supply HELP! ([none / 0](#)) ([#9](#))  
by SamSaveMax on Tue Nov 11th, 2003 at 11:15:25 PM MST  
([User Info](#))

I just used a 47 ohm resistor with 1/2 to 1/4 watt...a big difference in brightness.  
I am now experimenting with parallel instead of series connection.  
I notice that most of the resistor are rated at 1/2 to 1/4 watt.

Parallel: 14.4 volts with 12 LEDs = 47 ohm resistor with rating of 3 to 4 watt required.

Would it matters if I use the 47 ohm 1/2 watt rating that I already have with the above requirement?

Does anyone know a good source where I could purchase higher wattage rating resistor?

Thanks guys  
SamSaveMax

[ [Parent](#) ]

[LED and 12Volts power supply HELP!](#) | 9 comments (9 topical, 0 editorial)

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## [Compact Fluorescent Lighting](#)

By [mwhynt](#), Section [Homebrewed Electricity](#)

Posted on Wed Oct 22nd, 2003 at 04:39:08 PM MST

[Lighting](#)

### Compact Fluorescent Lighting

I built a cabin this summer and I am trying to design a 12VDC/120VAC system.

I currently have a solar panel, 12V, 17aHr batteries and a 400 watt inverter.

I was trying to use 120VAC Compact Fluorescent screw in type lights but they keep

blowing after several on/off cycles. Are these types of lights prone to failure

if used on an inverter. I have burnt out 3 so far. Maybe there is a better lighting

solution. I do have some older 4 tube 4' fixtures and fluorescent tubes with the 30 - 40w starters. Also have a couple of newer fixtures. maybe

these would be better suited if modified to blend into the camp environment. Any ideas or help is appreciated. Been reading all the

goodies.

Thx  
Mark

[Compact Fluorescent Lighting](#) | 9 comments (9 topical, 0 editorial)

Re: Compact Fluorescent Lighting ([none / 0](#)) (#1)  
by [wdyasq](#) on Wed Oct 22nd, 2003 at 05:10:40 PM MST  
([User Info](#))

Mark,

There is a company that sells 12V and 24V efficient lights.

<http://www.wondermagnets.com/cgi-bin/edatcat/WMSstore.pl>

They also sponsor this site. I've bought their products and admired their service but have no other connection.

Ron

Re: Compact Fluorescent Lighting ([none / 0](#)) (#2)  
by [DanB](#) on Wed Oct 22nd, 2003 at 08:35:01 PM MST  
([User Info](#))

I wonder what sort of inverter you have? I suspect (not sure) that an older square wave inverter might be hard on them. They seemed to have short life for me when running off my modified square wave inverter.... and they buzzed. I've had no problems (yet) since I got a true sine wave inverter.

Depending on your system (and your plans...) it may be wise to use 12 volts for lighting. I like the new 12 volt DC compact fluorescents.

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Re: Compact Fluorescent Lighting ([none / 0](#)) (#3)  
by jimU on Wed Oct 22nd, 2003 at 09:58:17 PM MST  
([User Info](#))

I agree with Dan on the CF 120 AC lighting. I use a Trace DR1512 to power some outdoor CF 120 AC fixtures, and, depending on the manufacturer, I have had some duds, and some that worked well with the Trace modified sine inverter..

Not really sure on the reason for the short life, but some will die after a few on/off cycles, while others will work with no problem. When I tried 12 volt CF lights, i havent had any issues..

Some food for thought,  
JimU

Re: Compact Fluorescent Lighting ([none / 0](#)) (#4)  
by mwhynot on Thu Oct 23rd, 2003 at 09:14:59 AM MST  
([User Info](#))

Thx guys

Looks like I will be looking for some CF 12VDC at the local RV place. Suppose 12 volt stuff costs a little more but if it works and is reliable then thats better than blowing 8\$ lights continually.

Re: Compact Fluorescent Lighting ([none / 0](#)) (#5)  
by Scott on Thu Oct 23rd, 2003 at 06:59:53 PM MST  
([User Info](#))

Wal-mart sells 12v fluorescent lights for about \$8. They are setup for 8 AA batteries but also have a 12V ac adapter jack or do like I did and clip the wires from the battery terminals and solder wires in. I set my cabin up last week with all new lights from walmart. Very low power usage and descent light, I use 2 where I need more light and 1 in the bedrooms. I got the idea from somewhere on this board.

Scott

Re: Compact Fluorescent Lighting ([none / 0](#)) (#6)  
by kurt on Thu Oct 23rd, 2003 at 09:25:29 PM MST  
([User Info](#))

<http://www.harborfreight.com/cpi/ctaf/Displayitem.taf?itemnumber=47564>



Re: Compact Fluorescent Lighting ([none / 0](#)) (#7)  
by gps on Fri Oct 24th, 2003 at 07:03:44 AM MST  
([User Info](#))

Don't know for sure but suspect they don't like nasty square wave power as suggested above. 120VAC CF's last for years on a Trace SW series inverter.

Re: Compact Fluorescent Lighting ([none / 0](#)) (#8)  
by mkseps on Fri Oct 24th, 2003 at 06:19:06 PM MST  
([User Info](#))

You should be aware that those Walmart and other similar lamps are under driven. By this I mean that if they are using 4 watt tubes, the power input should be something greater than 4 watts. In most cases, they are only driving them with about 2-1/2 watts (makes the batteries last longer). To make up the difference and to obtain adequate useable light, they use phosphors that emit light at about 5100 degrees Kelvin. This isn't the best spectrum for reading but it does get the job done - of sorts.  
Gene

Re: Compact Fluorescent Lighting ([none / 0](#)) (#9)  
by troy on Mon Oct 27th, 2003 at 05:07:16 PM MST  
([User Info](#))

Lot of vendors (Wal-Mart, Harbor Freight, most auto parts stores) now carry 12 fluorescent trouble lights. Pretty inexpensive and saves you the trouble of adding battery clips. Underdriven as noted by another poster, so not the nicest wavelength, but cheap and effective. For a warmer light, go with the RV fluorescents or get something from otherpower.com.

Good luck and have fun.

troy

[Compact Fluorescent Lighting](#) | 9 comments (9 topical, 0 editorial)

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### [Compact Fluorescent Lighting](#)

By [mwhynot](#), Section [Quarantine Zone](#)  
Posted on Wed Oct 22nd, 2003 at 04:36:20 PM MST [Lighting](#)  
**Compact Fluorescent Lighting**

I built a cabin this summer and I am trying to design a 12VDC/120VAC system. I currently have a solar panel, 12V, 17aHr batteries and a 400 watt inverter. I was trying to use 120VAC Compact Fluorescent screw in type lights but they keep blowing after several on/off cycles. Are these types of lights prone to failure if used on an inverter. I have burnt out 3 so far. Maybe there is a better lighting solution. I do have some older 4 tube 4' fixtures and fluorescent tubes with the 30 - 40w starters. Also have a couple of newer fixtures. maybe these would be better suited if modified to blend into the camp environment. Any ideas or help is appreciated. Been reading all the goodies.

Thx  
Mark

[Compact Fluorescent Lighting](#) | 1 comment (1 topical, 0 editorial)

Re: Compact Fluorescent Lighting ([none / 0](#)) ([#1](#))  
by [desertratjack](#) on Thu Nov 6th, 2003 at 07:19:52 AM MST  
([User Info](#))

No problems with compact fluorescents on our inverter (TRACE 2500 watt).

[Compact Fluorescent Lighting](#) | 1 comment (1 topical, 0 editorial)

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## [led lights](#)

By [gameman](#), Section [Homebrewed Electricity](#)

Posted on Fri Sep 5th, 2003 at 08:47:37 PM MST

[Lighting](#)

anyone have any led light Circuits

any one have any Circuits for hooking up about 10 white leds???

i have found one site with a led lamp circuit

<http://www.solorb.com/elect/solarcirc/4ledlit/index.html>

[led lights](#) | 3 comments (3 topical, 0 editorial)

Re: led lights ([none / 0](#)) ([#1](#))

by RobD on Fri Sep 5th, 2003 at 09:29:06 PM MST

[\(User Info\)](#)

Hi,

It depends a lot on the working voltage of the LEDs and how you want to hook them up.

RobD

Re: led lights ([none / 0](#)) ([#2](#))

by Bach On on Sat Sep 6th, 2003 at 10:20:09 AM MST

[\(User Info\)](#) [change AT: bach\\_on AT hotmail.com](#)

Gameman,

I've tinkered around with these right much. I even created an Excel spreadsheet to calculate the resistors needed. It calculates the milliamps of current that the LED will get based on the ohms of the resistor; too high, and the LED will be toast.

You need to know two things:

What is the voltage of your power source? (It must be higher than the LEDs voltage rating.)

What is the voltage rating of your LEDs?

Usually, whites and blues can tolerate 3.2 - 3.6 volts. Reds, greens, yellows, and other colors usually take 2.2 - 2.6 volts. They may take more, but it changes the current - and that can be bad.

Most LEDs are rated for 20 milliamps. You can go over that on most to about 35 milliamps, but it usually shortens the life of the LED. Too, white LEDs often start to turn blue if the current goes over 25 mAmps. Sometimes this change is permanent, so be careful.

Place the resistor between the source voltage and the LED. It doesn't usually matter which pole gets the resistor. Make sure the wattage rating of the resistor is high enough for the number of LEDs. Too much, and the resistor will get

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pretty hot. Don't try to run an LED without a resistor.

They're fun to play with, but they often don't put out a lot of light for general lighting. They are probably better for close-up spot lighting.

Bach On

- I'm just as happy as if I had good sense! -

Re: led lights ([none / 0](#)) (#3)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Sat Sep  
6th, 2003 at 01:47:07 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

I have always refered to this page . . .

[http://www.otherpower.com/otherpower\\_lighting\\_leds.html](http://www.otherpower.com/otherpower_lighting_leds.html)

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. T i m

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[A Cobbled "Solatube"](#)

By [Arletta](#), Section [Remote Living](#)

Posted on Thu Aug 28th, 2003 at 08:37:57 PM MST [Lighting](#)

Made from metalbestos stove pipe and tupperware...

My father is renovating an ancient log cabin which has one more smoke stack than he needs. It's brand new and shiny inside, it's already installed in the roof, and I think that with a little creativity it could be made to work like a "solatube".

He's thinking of putting a "ship's light"- one of those half diamond shaped multifaceted things used as skylights in boat cabins- in the bottom. Seems to me that this would diffuse the light too much- a focused beam would be better, but then it's not my cabin.

I'm thinking that a clear tupperware bowl would work for the dome on the top, with the additional thingy that catches low angle sunlight.

Has anybody tried this?

[A Cobbled "Solatube"](#) | 1 comment (1 topical, 0 editorial)

Re: A Cobbled "Solatube" ([none / 0](#)) ([#1](#))  
by [Motorhead](#) on Fri Aug 29th, 2003 at 08:59:10 PM MST  
([User Info](#))

My Solitube's works pretty well, I like the sunlight beaming into the rooms it occupy's (especially the bathroom).

During the winter months I swear it warms the house ev'n tho I never see frost here.

[A Cobbled "Solatube"](#) | 1 comment (1 topical, 0 editorial)

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### [My latest LED Flashlight](#)

By [RobD](#), Section [Homebrewed Electricity](#)

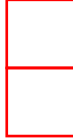
Posted on Thu Jul 24th, 2003 at 05:54:00 PM MST

[Lighting](#)

Finally out of the shop

Here's my latest flashlight using the Luxeon Stars. The drive circuit is a switching power supply I designed with On-Semis chips and the reflector is machined from a piece of T-6 aluminum. The light is very powerful and the batteries last several times longer than with a bulb.

RobD



[My latest LED Flashlight](#) | 2 comments (2 topical, 0 editorial)

Re: My latest LED Flashlight ([none / 0](#)) (#1)  
by [RobD](#) on Thu Jul 24th, 2003 at 06:01:23 PM MST  
([User Info](#))



Sorry forgot the pics!!



Re: My latest LED Flashlight ([none / 0](#)) (#2)  
by [nasher](#) on Mon Jul 28th, 2003 at 02:51:50 PM MST  
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well i am kinda curious how expensive and how hard it is to make things like that .. unfortunately i went the cash way out and bought a flashlight from sharper image

<http://www.sharperimage.com/us/en/catalog/productview.jhtml?pid=57680500&pcatid=1&catid=103>

-----  
Hummer Shake Flashlight  
\$29.95

Hummers® always have the right of way -- and Hummer Shake Flashlights are always ready! All the rugged Hummer® flashlight ever needs is a quick 30-second shaking to generate power for up to five full minutes of bright illumination. Inspired and licensed by GM's intrepid Hummer, this shockproof, rubber-guarded, waterproof and floatable flashlight is ideal for outdoor use and perfect for every vehicle or home emergency kit.

Its LED bulb never needs replacing and there are no batteries to worry about -- ever! Faraday's Law of Induction explains how the relative motion of the built-in magnet sliding between metal coils charges the light's capacitor. For prolonged use, just shake for an additional 10 seconds every three minutes. Rugged translucent plastic housing measures 8" long. Weighs 8 oz. Select translucent case of yellow or red. 90-day warranty.

-----  
not like im trying to advertise for them or such just though it was a nice LED flashlight that seemed to be somethign like your tryin to do and well they work well also

Nasher

[My latest LED Flashlight](#) | 2 comments (2 topical, 0 editorial)

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### [12 volt led's for houseboat?](#)

By [Anonymous Hero](#), Section [Remote Living](#)

Posted on Thu Jun 26th, 2003 at 02:37:30 PM MST

[Lighting](#)

Hi I'm looking for some reasonably priced 12 volt led bulbs or fixtures for my father for his houseboat. I am thinking that I'll have to make them which shouldn't be a problem either. Any tips on where to aquire premade bulbs or plans for making them up? I'd like to make about six fixtures that would each give off enough light so as not to be straining the eyes. Thanks, Joe

[12 volt led's for houseboat?](#) | 7 comments (7 topical, 0 editorial)

Re: 12 volt led's for houseboat? ([none / 0](#)) ([#1](#))  
by [Bach On](#) on Thu Jun 26th, 2003 at 04:39:13 PM MST  
([User Info](#)) [change AT: bach\\_on AT hotmail.com](#)

My advice is don't try to light things with the LEDs. Use fluorescents instead. You'll get a much better result for only slightly more than the battery usage. There are 12 volt fixtures out there that will do a nice job. The bluish tints so many LEDs provide will not be pleasant and will not provide nearly as much light. That might not be a problem now, but it might be as he (and you) get older.

Bach On  
- I'm just as happy as if I had good sense! -

Re: 12 volt led's for houseboat? ([none / 0](#)) ([#2](#))  
by [Anonymous Hero](#) on Thu Jun 26th, 2003 at 07:00:44 PM MST

you can buy 12 inch DC florecent lights at walmart for 10\$ they take 8 AA batteries. at 1.5 volts a piece thats 12 volts. I put them in my sail boat and they work great. very low power consumption and they throw great light. You have to take them apart and solder wires directly to the circuit board then hard wire them to the boats power. Be very carful about positive and negative wires they will not tolerate being hooked up backwards. I learned this the hard way and smoked one. I at least got a spare bulb out of the deal. I used 3m adhesive strips to install them without drilling holes they come with velcro strips but I wanted a more permanent instalation. good luck Bob

Re: 12 volt led's for houseboat? ([none / 0](#)) ([#3](#))  
by [ADMIN](#) ([admin@otherpower.com](#)) on Fri Jun 27th, 2003 at 10:31:11 AM MST  
([User Info](#))

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- [Also by Anonymous Hero](#)



LEDs are really great only for replacing tiny incandescent bulbs, for which there are not any fluorescent replacements. Reading lights, flashlites, map lights, etc. For room lighting, way better to go with fluorescents.

We have 12 and 24vdc compact fluorescents available on our site, and also 12vdc white LED clusters that fit a car taillight bulb socket.

Click "products" at the top of this page....

Cheers

DANF

Re: 12 volt led's for houseboat? ([none / 0](#)) ([#4](#))  
by Anonymous Hero on Sun Jun 29th, 2003 at 07:28:41 AM MST

I was at Autozone and saw some replacement tail lights with LED's. I thought they would work in my camper but the bulb was wrong size for my fixtures. I am not sure how bright they are.

Re: 12 volt led's for houseboat? ([none / 0](#)) ([#5](#))  
by Demetri ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Wed Jul 16th, 2003 at 10:28:24 PM MST  
([User Info](#))

Don't buy the Autozone bulbs, I finally bit, and they burnt out in two days. Took them back, got my money back. They weren't very bright to begin with. Good luck, just stay away from Autozone led's.

Demetri  
Always be the lead dog.

Re: 12 volt led's for houseboat? ([none / 0](#)) ([#6](#))  
by zbotrobot on Sat Aug 16th, 2003 at 08:58:05 PM MST  
([User Info](#))

leds are good - flouresents are "jumpy" fast flickers but nice and bright. White Leds come in two varieties: cheaper-dimmers and better-brighters. They are good for lighting an area like a table, but only really useful for times when you really need to conserve electricity like in a flashlight. Brigher leds like car headlamp could be very functional but the cost of course is more. Try a car led haedlight if cost isnt an issue :)

Re: 12 volt led's for houseboat? ([none / 0](#)) (#7)  
by 12volt dan ([dan12v@hotmail.com](mailto:dan12v@hotmail.com)) on Fri Aug  
22nd, 2003 at 10:16:58 PM MST  
([User Info](#))

I agree LED`s are too blue for house lighting but outdoors they work fine. The nice thing about LED`s is the light doesn`t diminish over distance so mount them high and they`ll light up a large area like moonlight. I`ve used a 57 diode light for 3 years now and am impressed with it`s lumens and durability. 7 years off the grid and counting  
[ [Parent](#) ]

[12 volt led's for houseboat?](#) | 7 comments (7 topical, 0 editorial)

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### [I want to build an LED lighting system but ...](#)

By [Maharaja](#), Section [Homebrewed Electricity](#)

Posted on Tue Jun 24th, 2003 at 04:46:32 PM MST

[Lighting](#)

Beginner attempts to build LED lighting system

... i have no experience in electronics really other than gcse electronics which i was crap at! although i have good common sense etc and i have soldering gear and can manage that much, this might not actually be that difficult, it certainly doesnt seem so but id appreciate some reassurance from you guys who i am guessing are experts. anyway to the point...

i want some LED 'fairylights' to dangle around my room when i use my LED headlamp in a darkened room it gives a cool spooky light which i want to recreate and im assume thats the 'LED look' not some other property of the headlamp.

Ive been doing some research and i cant see any reason why this WOULDNT work and wanna check it out...

this transformer

[\[http://www.maplin.co.uk/search/results.asp?CartID=03062422253282&ordercode=NL50E\]](http://www.maplin.co.uk/search/results.asp?CartID=03062422253282&ordercode=NL50E)

with these LED's

[\[http://www.maplin.co.uk/products/module.asp?CartID=03062422253282&moduleno=17821&modulecode=\]](http://www.maplin.co.uk/products/module.asp?CartID=03062422253282&moduleno=17821&modulecode=)

but i dont know which of the power supplys to choose for the number of LED's, im not sure how many i do want but im guessing there is a formula. and wiring up a few parrallel cicuits of x number of LED's in a series...  $12v / 3.6 = 10.8v$  + a resistor to resist the remaining bit as detailed on site.

visually i was going to leave bare dangling wires connecting the LED's for visual effect! and then dangle them from the ceiling of something.

any tips/advice or whatever would be much appreciated!

cheers.

N.

[I want to build an LED lighting system but ...](#) | 3 comments (3 topical, 0 editorial)

Re: I want to build an LED lighting system but ... ([none / 0](#)) (#1)

by Junkie ([madscientist@blownup.com](mailto:madscientist@blownup.com)) on Wed Jun 25th, 2003 at 03:42:04 AM MST

([User Info](#)) <http://www.akuma.dsl.pipex.com/chris>

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- [More on Lighting](#)
- [Also by Maharaja](#)

If you have a maplin catalogue, look in the LED's section. You will find how to calculate the series resistor.

If not,  
Resistance (ohms) = (Supply voltage - LED voltage) / LED current (AMPS).

So for running one led of 12V supply:  $(12 - 3.6) / 0.03A = 280$  ohms.

If you add LEDs in series, you must add the LED voltages up for that to work, if they are in parallel you add up the currents. If you wanted say, 50 LEDs to run of a 12V supply, you could connect sets of two in series and connect all those sets in parallel, then you would need to supply  $25 * 0.03$  (LED current for on set) which is 0.75amps... And the power supply would need to supply 9watts ( $12 * 0.75A$ ).

[http://www.otherpower.com/otherpower\\_lighting\\_leds.html](http://www.otherpower.com/otherpower_lighting_leds.html)

Hope this helps.

-Chris

Re: I want to build an LED lighting system but ... [\(none / 0\)](#) (#2)  
by Maharaja on Wed Jun 25th, 2003 at 04:28:59 PM MST  
[\(User Info\)](#)

yeah cheers thats helpful i think i have ammassed enough knowledge now to go ahead when i have the money. but i might be back when it doesnt work as is usual for any electrical project ive ever undertaken!

N.

Re: I want to build an LED lighting system but ... [\(none / 0\)](#) (#3)  
by Bach On on Mon Jun 30th, 2003 at 03:52:58 PM MST  
[\(User Info\)](#) [change AT: bach\\_on AT hotmail.com](#)

I bought a bundle of 100 white LEDs about a year ago from a guy on eBay. To be frank, most of these have a rather harsh - almost bluish color.

My goal was some spot lighting here and there around the house for when the power goes off. I already had a 12 volt back-up lighting system. I wanted something that had a very light drain on the battery to give more back-up time.

The best you can do is about 3 LEDs per resistor at 12 volts. Too, you'll need 1/2 watt resistors for 12 volts - 1/4 watt get very hot with 3 units. I did an Excel spreadsheet to help me play "what if" on the various resistors and voltages. Let me know and I can send it to you.

I was not happy with the results of the LEDs, but it may be that I just bought bad LEDs. I've since bought several 12 volt fixtures. They have better drain on the battery than incandescent bulbs, but put out a much better light than the LEDs. I think LEDs are better suited for close up spot lighting or flashlights.

Just thought I'd throw in my experience for whatever it might be worth.

Bach On

- I'm just as happy as if I had good sense! -

[I want to build an LED lighting system but ...](#) | 3 comments (3 topical, 0 editorial)

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## [Fluorescent voltages](#)

By [Andrew](#), Section [Homebrewed Electricity](#)

Posted on Thu Jun 12th, 2003 at 03:25:48 PM MST

[Lighting](#)

Fluorescent Voltage

Hi,  
I plan to make a simple inverter for small to medium sized fluorescent lights (4-10 watts) Does anyone know the voltage that a light would normally light up? (Hopefully without shortening the life of the tube.) I have the circuit designed, so all I need now is the voltage for the tube. I'm using a reversed step down wall wort transformer. The peak resonance is about 60khz so I'm using a 555 and a 1kohm, a 11kohm and a 1nF cap (I think this is right) If anybody wants I can post the circuit.

p.s. Is there a range of frequencies a light runs at?  
I think 60khz will be fine though.

-Andrew

[Fluorescent voltages](#) | 9 comments (9 topical, 0 editorial)

Re: Fluorescent voltages ([none / 0](#)) (#1)  
by [mkseps](#) on Fri Jun 13th, 2003 at 05:35:11 PM MST  
([User Info](#))

Consider the fluorescent tube to be just like a neon light. At low voltages, less than about 60 volts, the resistance is infinity. However, once the internal gasses fire into conduction, the resistance drops to a virtual short circuit. The operation of a ballast is to provide a high starting voltage and then introduce an inductive reactance to limit the current that limits the current through the lamp. The voltage must be AC lest the tube turns black on one end. I would suggest that the optimum frequency for maximum exitation of the phosfers is between 15 khz to 25 khz. I would expect your tube will fire about 125 volts but that the current must be limited to the power rating of the tube. To accomplish this, a capacitor should be placed in series with the tube. The size of the capacitors reactance is the element that limits the current.

Re: Fluorescent voltages ([none / 0](#)) (#2)  
by [Andrew](#) ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Fri Jun 13th, 2003 at 06:32:24 PM MST  
([User Info](#))

Ok, looks like I have to wind another transformer. I'll try it. My step up circuit boosts the voltage to about 300v. Would this change anything? Thanks.

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Re: Fluorescent voltages ([none / 0](#)) (#3)  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Fri Jun 13th,  
2003 at 08:30:22 PM MST  
([User Info](#))

Here, these schematics should make it easier. (I know  
theyre crappy, because I drew them in mspaint.) 

Re: Fluorescent voltages ([none / 0](#)) (#5)  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Sat Jun  
14th, 2003 at 02:48:31 PM MST  
([User Info](#))

Well, all goes well except for one thing, apparently I needed a cap across the primary windings of the transformer. I tried putting a 0.001uf Cap (1 nF), and it seemed to be damn close to resonance. I worked it out, and instead of the straight 60khz, I was resonating with the cap at 54.4khz. Anyone know a nifty program that can calculate the resonance between a capacitor and an inductor. I just assumed that for a resonance of 60khz on the transformer, the primarys should be around 5mh? What do you think, is this even in the ballpark? I might be looking on digikey for a real "step up" transformer, since mine is just a reversed 110v to 4.5v "wallwort". Also, the frequency is a bit high isn't it, so i probably need a new transformer anyways.

[ [Parent](#) ]

Overly wide posts ([none / 0](#)) (#4)  
by John on Sat Jun 14th, 2003 at 02:17:58 AM MST  
([User Info](#))

Admin. can/will you reduce/restrict the width of these posts to a size that most of us can read without moving the page back and forth? It makes it very hard to read without a large high resolution monitor!!!!  
Or at least give us a way to shrink it to fit our monitor.

John  
[Toxin absorber/Pain reliever](#)

Re: Overly wide posts ([none / 0](#)) (#6)  
by TomW on Sun Jun 15th, 2003 at 04:47:18 AM  
MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

John;

The wide display mode is almost exclusively from folks posting humongous pictures in the comments or stories. Large pictures can be reduced easily by an editor in a story but not in a comment because we cannot edit a comment's content. I am fairly certain it is on the "to do" list.

As a temporary work around you can simply set your browser to not display the pictures in the preferences but thats a kludge.

Cheers.

TomW

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Re: Overly wide posts ([none / 0](#)) (#9)  
by John on Sun Jun 15th, 2003 at 11:20:38  
PM MST  
([User Info](#))

TomW,

I certainly hope that it is on a "to do" list to restrict the text width in posts. If it isn't it sure needs to be. I believe that I saw somewhere (in preferences?) the user option to change the posting width, so it seems that the administration can easily change the maximum allowed post width, unless the maximum value is set and unchangeable without a hack into the code. I believe that these wide posts are from posters that have set their posting width to fit their monster screen without knowing how it affects the rest of us who don't have the large monitors that they have.

This thread starts with just text, no picture, so a monster picture has nothing to do with the wide text field here.

I am trying to control the width of this post by creating new lines with the "enter" key. We'll see if it works.

John

[Toxin absorber/Pain reliever](#)

[ [Parent](#) ]

Re: Overly wide posts ([none / 0](#)) (#7)  
by Bach On on Sun Jun 15th, 2003 at 11:52:27 AM  
MST  
([User Info](#)) [change AT: bach\\_on AT hotmail.com](#)

Hey guys:

I'm with John on this. That having to scroll back and forth to read posts and comments is a pain.

Bach On

- I'm just as happy as if I had good sense! -  
[ [Parent](#) ]

Re: Overly wide posts ([none / 0](#)) (#8)  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on  
Sun Jun 15th, 2003 at 11:06:11 PM MST  
([User Info](#))

Wow, I'm happy to see that my post has changed from answering any of my questions, to complaining that i oversize my posts....  
Thanks -Andrew

[ [Parent](#) ]

[Fluorescent voltages](#) | 9 comments (9 topical, 0 editorial)

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### [Light from a bubble](#)

By [Anonymous Hero](#), Section [Weird Science](#)  
Posted on Fri Jun 6th, 2003 at 05:58:34 PM MST  
Sonoluminescence

[Lighting](#)

You can create a dim blue light from a single bubble trapped in the water. This is called single bubble sonoluminescence (SBSL). Everyone can try it with very simple equipments. Very Cool!!! [Creating Sonoluminescence](#)

[Light from a bubble](#) | 0 comments (0 topical, 0 editorial)

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## [White led's](#)

By [Demetri](#), Section [Classifieds](#)

Posted on Fri May 23rd, 2003 at 11:00:39 AM MST

[Lighting](#)

Sixty cents(USD) each.....

Found a website that sells 6000 mcd white led's for \$0.60 each. Minimum order is ten led's, shipping is one dollar to the contiguous 48 states, two to anywhere else in North America, and four anywhere else in the world. That's one(two, four, whatever) dollar period, one dollar if you order ten led's, one dollar if you order a hundred, one dollar if you order ten thousand(except right now he's only got 200 white led's, but if they're popular enough he'll order more when they sell out.) The same guy also sells blue for \$0.45 each, same deal on shipping and minimum order.

Demetri

<http://www.whiteleds.tk>

<http://www.blueleds.tk>

[White led's](#) | 1 comment (1 topical, 0 editorial)

Update ([none / 0](#)) ([#1](#))

by [Demetri](#) ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Sat Jul 19th, 2003 at 11:10:23 AM MST  
([User Info](#))

Shipping is now two USD, anywhere in the world.

Demetri

Always be the lead dog.

[White led's](#) | 1 comment (1 topical, 0 editorial)

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### [converting ac flourescents to 12v dc](#)

By [sean](#), Section [Remote Living](#)

Posted on Thu May 22nd, 2003 at 08:43:49 AM MST

[Lighting](#)

Does anybody know how to convert ac flourescent tubes to run off a 12v dc supplie? ...sean

[converting ac flourescents to 12v dc](#) | 4 comments (4 topical, 0 editorial)

converting ac flourescents to 12v dc ([none / 0](#)) ([#1](#))  
by [kurt](#) on Thu May 22nd, 2003 at 02:30:34 PM MST  
([User Info](#))

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<http://www.uoguelph.ca/~antoon/>  
<http://www.google.com/>



lights ([none / 0](#)) ([#2](#))  
by [sean](#) on Thu May 22nd, 2003 at 04:10:44 PM MST  
([User Info](#))  
<http://homepage.ntlworld.com/s.amesbury/homepage.htm>

Thanks Kurt your a gent, i just couldnt seem to be able to find any circuits.....sean

[ [Parent](#) ]

Not a conversion exactly but a way to use them. ([none / 0](#)) ([#3](#))  
by [TomW](#) on Fri May 23rd, 2003 at 08:14:37 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Sean;

It seems to me that the easiest thing to do would be to find a cheap 140 or 150 watt automotive inverter and run them off that.

Cheers.

TomW

[Stuff I have Online](#)

[Contact Me](#)

lights ([none / 0](#)) (#4)

by sean on Fri May 23rd, 2003 at 08:50:31 AM MST

[\(User Info\)](#)

<http://homepage.ntlworld.com/s.amesbury/homepage.htm>

I know what your saying Tom but im toying with the idea of keeping as much stuff 12v as possible making my rather small system as efficient as possible. Other ideas i have is a 12v television and using a car stereo for sound.....sean

[ [Parent](#) ]

[converting ac flourescents to 12v dc](#) | 4 comments (4 topical, 0 editorial)

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## [800 watt inverter doesn't light a 500 watt light?!](#)

By [zmoz](#), Section [Homebrewed Electricity](#)

[Lighting](#)

Posted on Fri Apr 4th, 2003 at 11:44:33 PM MST

I'm trying to light up a 500 watt Halogen light with my 800 watt (1600 surge) power inverter.

Whenever I try and turn it on it comes on for a second then the inverter shuts off. What the hell?!

[800 watt inverter doesn't light a 500 watt light?! | 2 comments \(2 topical, 0 editorial\)](#)

No Uncommon ([none / 0](#)) ([#1](#))

by [ToddH](#) on Sat Apr 5th, 2003 at 02:51:07 AM MST ([User Info](#))

My wife has had the same trouble as you. It would take turning on & off the inverter a few time to get the TV to work. She is powering a 13" TV (32watts) and we kept returning the inverters until one worked as advertised. It was the fifth one that starts the TV everytime. Different wattages & brands were tried too. My guess is they all come from the same china factory.... My advice is to return em' till' you get a good one.

inexpensive imported inverters ([none / 0](#)) ([#2](#))

by [troy](#) on Sat Apr 5th, 2003 at 09:04:10 AM MST ([User Info](#))

Because the cheapie modified square wave inverters have become a comodity item, competition has become very fierce. So they are cutting corners like quality control and the wattage rating system is "generous" to put it mildly.

So I'd return it and try another, or step up to the really good inverters like Exeltech or trace. Of course, way more expensive, but they will start more than their surge ratings as they are rated conservatively.

Good luck and have fun!

troy

[800 watt inverter doesn't light a 500 watt light?! | 2 comments \(2 topical, 0 editorial\)](#)

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posted by zubbly on 10/05/2003 02:58:50 PM MST  
1 comment
10. [1.5 HP repair](#) ([Homebrewed Electricity](#), [Alternators](#))  
posted by zubbly on 10/05/2003 01:39:53 PM MST  
4 comments

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11. [wafer coil](#) ([Magnets & Magnetism](#), [Alternators](#))  
posted by zubbly on 10/02/2003 04:31:37 PM MST  
3 comments
12. [better drawing of flat coil](#) ([Homebrewed Electricity](#), [Wiring](#))  
posted by zubbly on 09/21/2003 08:12:42 PM MST  
7 comments
13. [pvc props](#) ([Homebrewed Electricity](#), [Wind](#))  
posted by zubbly on 09/21/2003 07:35:32 PM MST  
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14. [flat wire coils](#) ([Homebrewed Electricity](#), [Wiring](#))  
posted by zubbly on 09/21/2003 07:05:40 PM MST  
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15. [inserting pictures with posting](#) ([Homebrewed Electricity](#), [Alternators](#))  
posted by zubbly on 09/07/2003 04:40:30 PM MST  
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16. [pictures of pvc props](#) ([Homebrewed Electricity](#), [Wind](#))  
posted by zubbly on 09/07/2003 04:31:30 PM MST  
0 comments
17. [pvc props](#) ([Homebrewed Electricity](#), [Alternators](#))  
posted by zubbly on 09/07/2003 04:25:04 PM MST  
0 comments
18. [more questions on magnet spacing and sizing](#) ([Homebrewed Electricity](#), [Alternators](#))  
posted by zubbly on 08/21/2003 08:48:38 PM MST  
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19. [can you have too strong a magnet?](#) ([Homebrewed Electricity](#), [Alternators](#))  
posted by zubbly on 08/06/2003 05:31:14 PM MST  
10 comments
20. [where do i find info. on Jerry blades design and mike Mods?](#) ([Homebrewed Electricity](#), [Alternators](#))  
posted by zubbly on 07/28/2003 06:53:17 PM MST  
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21. [steel or aluminum blades](#) ([Homebrewed Electricity](#), [Alternators](#))  
posted by zubbly on 07/23/2003 08:04:26 PM MST  
11 comments
22. [1.5 HP DC GIFT](#) ([Homebrewed Electricity](#), [Alternators](#))  
posted by zubbly on 07/22/2003 06:11:17 PM MST  
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23. [machining of neo's](#) ([Homebrewed Electricity](#), [Magnetism](#))  
posted by zubbly on 07/20/2003 08:50:18 PM MST  
3 comments
24. [converting 25 hp motor to alternator----need your thoughts](#) ([Homebrewed Electricity](#), [Alternators](#))  
posted by zubbly on 07/19/2003 11:04:41 PM MST  
6 comments
25. [savonius turbine that looks like cork screw](#) ([Homebrewed Electricity](#), [Alternators](#))

posted by zubbly on 07/15/2003 06:02:00 PM MST  
3 comments

26. [need help-multiple magnets](#) ([Homebrewed Electricity](#), [Magnetism](#))

posted by zubbly on 07/10/2003 06:06:06 PM MST  
4 comments

27. [can neo's be bent?](#) ([Magnets & Magnetism](#), [Magnetism](#))

posted by zubbly on 07/10/2003 05:58:11 PM MST  
6 comments

28. [is bigger better?](#) ([Homebrewed Electricity](#), [Alternators](#))

posted by zubbly on 07/06/2003 07:56:58 PM MST  
1 comment

29. [how do i make regulator for wind genny](#) ([Homebrewed Electricity](#), [Controllers](#))

posted by zubbly on 06/16/2003 05:31:48 PM MST  
1 comment

30. [where to purchase NEO magnets](#) ([Magnets & Magnetism](#), [Alternators](#))

posted by zubbly on 06/11/2003 01:31:10 PM MST  
3 comments



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[1.5 hp induction conversion](#) | 3 comments (3 topical, editorial)

Re: 1.5 hp induction conversion ([none / 0](#)) ([#1](#))  
by zubbly on Fri Jan 2nd, 2004 at 03:50:15 PM MST  
([User Info](#))

Hello again.  
There is one important piece of information that I forgot to include with the posting concerning the multiple connections.

The winding was wound with 1#19 1/2 magnet wire. As you change connections, so does the number of magnet wire conductors to make up the connection. As you increase the number of circuits, the amount of copper handling the amperage also increases. Also, this makes it more versatile to match your battery voltage system. This is the added value of using multiple connections.

For this particular winding, here is how the magnet wire adds up.

- 1. Y-1 #19 1/2
- 2. Y-1 #16 1/2
- 1. D-1 #16 1/2
- 2. D-1 #13 1/2

Hope this makes it easier to understand my use of multiple connections.

Zubbly

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[1.5 hp induction conversion](#) | 3 comments (3 topical, 0 editorial)

Re: 1.5 hp induction conversion ([none / 0](#)) (#2)  
by RobC on Fri Jan 2nd, 2004 at 06:11:37 PM MST  
([User Info](#))

Very nice job and alot of good info.  
Thanks RobC

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[1.5 hp induction conversion](#) | 3 comments (3 topical, 0 editorial)

Re: 1.5 hp induction conversion ([none / 0](#)) (#3)  
by bill541 on Fri Jan 2nd, 2004 at 08:47:18 PM MST  
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That is a nice looking piece of hardware you have there. I especially like the machining you did on the rotor. Great stuff. Bill

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[Energy from sound?](#) | 10 comments (10 topical, 0 editorial)

Re: Energy from sound? ([none / 0](#)) (#1)  
 by Rich G on Fri Jan 2nd, 2004 at 07:23:50 AM MST  
[\(User Info\)](#)

The ear is a very sensitive and broad range detector. I believe that the energy of the least sound detectable by the human ear is something like 10 to the minus 12th watts/meter squared. For those who are not comfortable with scientific notation that is .00000000001 watts spread over a one square meter area (if I got the zeros correct). That is, I think the reference level for sound Db comparison. At 100 Db hearing damage is a threat. This level of sound energy is still less than 1 watt/meter squared. You are absolutly right, of course, that sound can be coverted to electrical energy. As you observed, microphones do just that. I suspect that the reason that ambiant sound is not tapped as an energy source is the low energy density. I may have this all wrong. These days, I am not an expert in anything -- just check with my wife! The world is a fun place to explore! Rich

[Energy from sound?](#) | 10 comments (10 topical, 0 editorial)

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Re: Energy from sound? ([none / 0](#)) ([#4](#))  
by stop4stuff on Fri Jan 2nd, 2004 at 09:01:41 AM MST  
([User Info](#)) <http://www.stop4stuff.com>

hey Rich,  
thanks for the input...  
my father (a V E R Y serious person) once tried explaining Db's... something like...  
for every 1Db increase the noise level increases by a factor of 10  
i also remember somewhere people melt at around 220 Db  
I hear what ur saying about the low energy density of sound...  
These days, appliances are smaller and use less energy.  
I once owned a Radiogramme... a beautiful piece of 1950's furniture that had a record deck and a LW/MW/SW radio built into it, 240v (UK) mains only and soaked up loads of juice.  
Now i have a mobile phone that can store+play 60+mins of MP3 music and recieve FM radio... the phone does the same job on much less power (and can be hooked up to an amp in car or home.) + i can talk to ppl too!  
places like under motorway bridges get very loud, as well as airports...  
sound may be low density energy... tap it and it's free energy for low powered devices :)

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[Energy from sound?](#) | 10 comments (10 topical, 0 editorial)

Re: Energy from sound? ([none / 0](#)) (#2)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Fri Jan 2nd, 2004 at 08:03:35 AM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

Sound does not contain very much power. In order to get power from a speaker you must move it mechanically like you were doing when you were tapping the speaker cone. I never hooked an LED up to a speaker, but I find it hard to believe an LED would light just from sound. Even if you could light the LED with sound, That is not very much power and you will want to run it through a Bridge Rectifier in so you can store the power in a battery. the bridge rectifier will pull the power down by 1.2 volts and you won't have anything left coming out.

I messed around with trying to get power from a speaker

<http://www.fieldlines.com/story/2003/10/11/204029/79>

But I could never figure out how to get enough 1/2 inch motion to generate anything usable.

} = - W o o f - = {

[Energy from sound?](#) | 10 comments (10 topical, 0 editorial)

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[Energy from sound?](#) | 10 comments (10 topical, 0 editorial)

Re: Energy from sound? ([none / 0](#)) (#2)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Fri Jan 2nd, 2004 at 08:03:35 AM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

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Re: Energy from sound? ([none / 0](#)) (#3)  
by Harry Luubovv on Fri Jan 2nd, 2004 at 08:50:13 AM MST  
([User Info](#))

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Happy New Year.

Luubovv.

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Re: Energy from sound? ([none / 0](#)) (#6)  
by stop4stuff on Fri Jan 2nd, 2004 at 09:19:06 AM MST  
([User Info](#)) <http://www.stop4stuff.com>

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[Energy from sound?](#) | 10 comments (10 topical, 0 editorial)



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## [Using a Speaker to make power](#)

By [wooferhound](#), Section [Homebrewed Electricity](#)

Posted on Sat Oct 11th, 2003 at 08:40:29 PM MST

[Magnetism](#)

mechanicly moving a speaker cone to generate power

I have talked about trying to make electricity by mechanically moving the cone on a speaker. After all a speaker is a tight wound coil of large gauge wire moving in a very thin airgap inside of magnets that weigh pounds. The arrangement is very similar to a dual rotor machine with 2 magnets and 1 coil.

So , I hooked it all up tonight, and it works. I used a 12 inch speaker with a 1 1/2 inch Voice Coil and about a 3 pound magnet. I hooked the terminals up through a Bridge Rectifer and then a 4700mfd capacitor, then added a 1000ohm resister across that so the capacitor would'nt top out with the voltage.

I don't have a good way to give motion to the cone so I did it by hand, I think I was able to get 4 cycles a second with a 1/2 inch of cone travel. I measured 4 volts with the 1000ohm load and 250ma short circuit.

With a 1/2 inch travel I'm getting about 1 volt per cycle, and about an amp at 16 cycles. At this point I really don't know a good way to get a 1/2 inch vibration, maybe a fast windmill with an offset rod mounted to the shaft, and the other end of the rod mounted to the Voice Coil ?

Also I would want to cut large holes in the cone to minimize air resistance. I have 15 inch speakers with 8 pound magnets and 4 inch Voice Coils, but these cost over \$120, I'm thinking that cheap 15" speakers off of E-Bay with large Voice coils would work fine.

[Using a Speaker to make power](#) | 8 comments (8 topical, 0 editorial)

Re: Using a Speaker to make power ([none / 0](#)) (#1)  
by bob golding ([yubba at clara dot net](#)) on Sun Oct 12th, 2003 at 03:28:04 AM MST  
([User Info](#))

i like it.. how about using pneumatics? could use a small actuator on the mill and pipe it all down a tube and seal the tube over the front of the speaker to start with. that way you could make it all weatherproof. I would assume you get the same power out as the rating of the speaker. at low impedance. Small spring return acuators run about 30 bucks in the uk but havent looked on ebay. A bike pump would be a start.

still having fun

bob

Re: Using a Speaker to make power ([none / 0](#)) (#2)  
by drdngle on Sun Oct 12th, 2003 at 08:28:24 AM MST  
([User Info](#))

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It's an interesting experiment but I doubt that you will ever generate usable amounts of power.

Dr.D

Re: Using a Speaker to make power ([none / 0](#)) (#3)  
by RobD on Sun Oct 12th, 2003 at 08:41:01 AM MST  
([User Info](#))

While it will work you are essentially making a low efficiency generator.

Re: Using a Speaker to make power ([none / 0](#)) (#6)  
by wooferhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Mon Oct 13th, 2003  
at 04:48:02 PM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

Well I'm getting 16 volts at 1 amp while moving it at 16 hertz, or 16 watts

If I quadruple the frequency to 64 hertz would'nt that be 64 volts at 4 amps, or 136 watts? The speaker is capable of taking 300 watts from an amplifier before burning out.

It would need a fast prop to run it at 16 hertz or 960rpm  
or 64 hertz would equal 3840 rpm

. >=- W o o f -=<

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Re: Using a Speaker to make power ([none / 0](#)) (#4)  
by monte350c on Sun Oct 12th, 2003 at 06:32:00 PM MST  
([User Info](#))

Hi Wooferhound-

Intriguing!

How about replacing the cone material with something that can stand some heat, and mounting several of these converted speakers into, say, a metal 10 gallon paint container, then using the whole thing as a muffler for your generator. The exhaust pulses from a single cylinder engine will be in the range of 15 hz or so assuming 3,600 rpm and a 4 cycle motor...

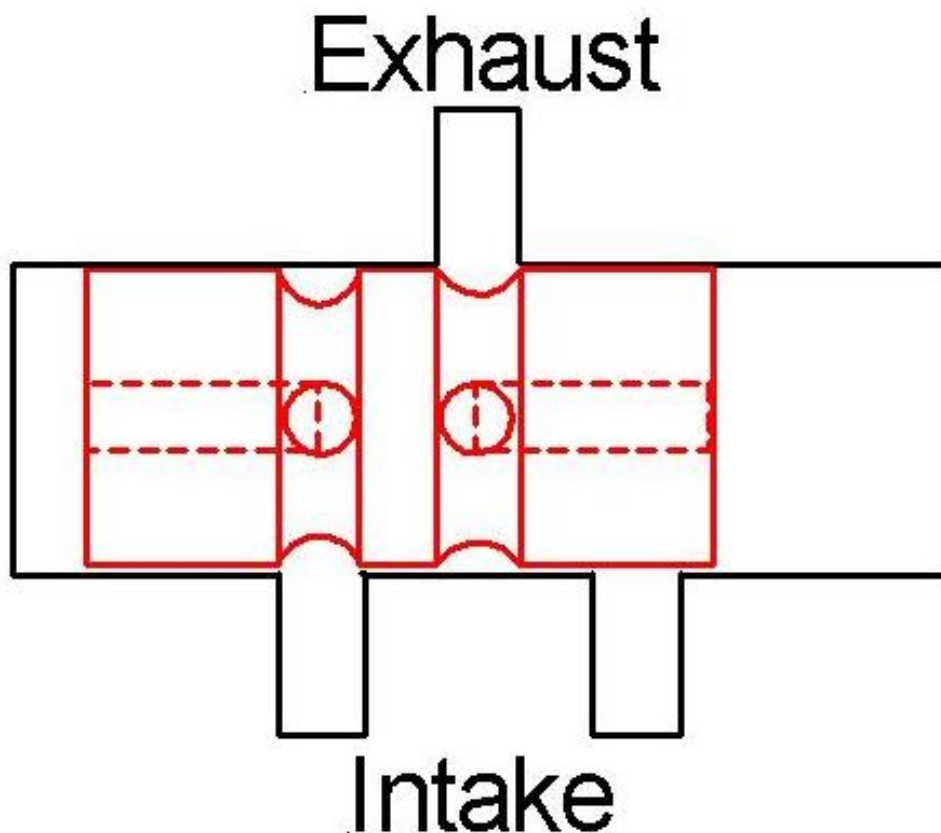
Re: Using a Speaker to make power ([none / 0](#)) (#8)  
by RobD on Tue Oct 14th, 2003 at 05:23:23 PM MST  
([User Info](#))

Now that's a clever idea!  
RobD

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Re: Using a Speaker to make power ([none / 0](#)) (#5)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon Oct 13th, 2003 at  
12:01:12 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Why not simply build a linear alternator. This way you'll actually make some power. If your still using rotary motion to drive the alternator why convert it to linear. The speaker components would make a cool free piston stirling project though! You could drive it with an air or steam powered linear piston engine. A tiny one would work quite well with speaker components. Have Fun Ed



Re: Using a Speaker to make power ([none / 0](#)) (#7)  
by wooferhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Mon Oct 13th, 2003  
at 04:58:45 PM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

I think your picture is of a Free Piston Stirling. This looks like it would reach the frequencies that I need. But it requires pressure that I really don't have. Also looks like it would wear out quickly?

. >-- W o o f --<  
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[Energy from sound?](#) | 10 comments (10 topical, 0 editorial)

Re: Energy from sound? ([none / 0](#)) ([#3](#))  
by Harry Luubovv on Fri Jan 2nd, 2004 at 08:50:13 AM MST  
([User Info](#))

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Happy New Year.

Luubovv.

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[Energy from sound?](#) | 10 comments (10 topical, 0 editorial)

Re: Energy from sound? ([none / 0](#)) ([#6](#))  
by stop4stuff on Fri Jan 2nd, 2004 at 09:19:06 AM MST  
([User Info](#)) <http://www.stop4stuff.com>

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[Energy from sound?](#) | 10 comments (10 topical, editorial)

About transformers and sound ([none / 0](#)) (#5)  
by Norm on Fri Jan 2nd, 2004 at 09:10:52 AM MST  
([User Info](#))

A transformer has moving parts....same as a guitar string, if something is humming its vibrating and if its vibrating ....whatever is vibrating is a moving part. Norm.

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Re: About transformers and sound ([none / 0](#)) (#7)  
by stop4stuff on Fri Jan 2nd, 2004 at 09:37:46 AM MST  
([User Info](#)) <http://www.stop4stuff.com>

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need more good input...

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Re: About transformers and sound ([none / 0](#)) (#8)  
by Electric Ed on Fri Jan 2nd, 2004 at 10:01:40 AM MST  
([User Info](#)) <http://www.electric-ed.com>

The sound is created by the core laminations vibrating.  
Transformers are given "sound ratings" by the manufacturers, and quieter models cost more.  
The laminations have to be clamped together more securely.

Electric Ed

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[Energy from sound?](#) | 10 comments (10 topical, 0 editorial)

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by Electric Ed on Fri Jan 2nd, 2004 at 10:01:40 AM MST  
([User Info](#)) <http://www.electric-ed.com>

The sound is created by the core laminations vibrating. Transformers are given "sound ratings" by the manufacturers, and quieter models cost more. The laminations have to be clamped together more securely.

Electric Ed

[ [Parent](#) ]

[Energy from sound?](#) | 10 comments (10 topical, 0 editorial)

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[Energy from sound?](#) | 10 comments (10 topical, 0 editorial)

Re: Energy from sound? ([none / 0](#)) ([#9](#))  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Fri Jan 2nd, 2004 at 12:40:19 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

Transformers buzz because the magnetic fields interact with the windings and the magnetic relationships between the wires that are next to each other in the winding. So the wires may all be attracting each other at one instant and then all repelling each other at another instant. And of course all of those magnetic forces are interacting with the iron core.

} = - W o o f - = {

[Energy from sound?](#) | 10 comments (10 topical, 0 editorial)

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- [jeanpaul](#)
- [DanB](#)
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[Energy from sound?](#) | 10 comments (10 topical, 0 editorial)

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[Energy from sound?](#) | 10 comments (10 topical, 0 editorial)

Re: Energy from sound? ([none / 0](#)) ([#10](#))  
by E man on Fri Jan 2nd, 2004 at 11:17:57 PM MST  
([User Info](#))

Speaking of sound, check out this cool article:

<http://www.memagazine.org/backissues/march98/features/sound/sound.html>

MacroSonix Corp. (Tim Lucas) has built these oddly shaped vessels to concentrate sound energy to be used as compressors, particle seperators, and combustion [generator] devices. The devices don't "receive" energy from the ambient noise around us; instead, they are driven with a solenoid at about 400 - 500 cycles per second, and although they are only displaced about 100 microns the gas inside is accelerated to generate resonant sound waves that build into enormously powerful compression waves. The resulting compression waves can then be valved for various uses. These guys also ganged up with Los Alamos National Labs to do interesting work with Acoustic Stirlings, apparently lending a hand with a resonance chamber that could be used for liquifying gases particularly natural gas that would normally be tossed while drilling for oil.

Happy New Year Everyone!

I love this website just as much as the day I found it.

-Elliott Bell

[Energy from sound?](#) | 10 comments (10 topical, 0 editorial)

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- [DanB](#)
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posted by ThomasK on 12/31/2003 11:08:48 AM MST  
5 comments
3. [All Posts Marked "New"](#) ([Rants & Opinion](#), [Rant](#))  
posted by Electric Ed on 12/10/2003 06:15:01 AM MST  
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posted by drdongle on 11/20/2003 08:36:02 PM MST  
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posted by 44toy on 11/16/2003 06:07:50 PM MST  
12 comments
6. [Contact Lost?](#) ([Rants & Opinion](#), [Rant](#))  
posted by RobC on 11/13/2003 11:10:42 PM MST  
8 comments
7. [Anonymous Hero](#) ([Rants & Opinion](#), [Rant](#))  
posted by Demetri on 10/21/2003 09:59:21 PM MST  
4 comments
8. [Fort Collins Sustainable Living Fair 2003 web page is up](#) ([Site News](#), [Rant](#))  
posted by ADMIN on 09/19/2003 07:55:00 PM MST  
2 comments
9. [Scrap yards you got to love them :\)](#) ([Rants & Opinion](#), [Rant](#))  
posted by Old F on 09/18/2003 02:20:56 PM MST  
1 comment
10. [Southwestern PV sales](#) ([Rants & Opinion](#), [Rant](#))  
posted by RogerAS on 09/12/2003 02:45:04 PM MST  
3 comments
11. [uploading pic](#) ([Rants & Opinion](#), [Rant](#))  
posted by Norm on 09/07/2003 09:01:12 PM MST  
3 comments
12. [To Elect. Ed](#) ([Homebrewed Electricity](#), [Rant](#))

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- Anonymous Users: 11

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posted by pearl on 08/18/2003 07:11:30 PM MST  
1 comment

13. [need info \(Homebrewed Electricity, Rant\)](#)  
posted by shane on 08/18/2003 01:03:10 AM MST  
5 comments

14. [Celebrities Protest Mass. Wind Farm \(Homebrewed Electricity, Rant\)](#)  
posted by tleser on 08/12/2003 02:46:12 PM MST  
4 comments

15. [Dilemma: Need excellent advice \[great advice is also acceptable :\) \] \(Homebrewed Electricity, Rant\)](#)  
posted by tleser on 07/31/2003 10:19:57 PM MST  
7 comments

16. [im getting the 50 word limit thing \(Quarantine Zone, Rant\)](#)  
posted by JB on 07/28/2003 10:20:30 PM MST  
2 comments

17. [Question about Poll ? \(Rants & Opinion, Rant\)](#)  
posted by Barnac on 07/24/2003 10:15:35 AM MST  
11 comments

18. [Poll question and answers ? \(Quarantine Zone, Rant\)](#)  
posted by Barnac on 07/24/2003 07:31:31 AM MST  
0 comments

19. [Posting corrections ? \(Rants & Opinion, Rant\)](#)  
posted by Barnac on 07/24/2003 07:26:43 AM MST  
2 comments

20. [Formula page \(Rants & Opinion, Rant\)](#)  
posted by Demetri on 07/18/2003 01:55:29 AM MST  
6 comments

21. [Radio Shack cookie \(Rants & Opinion, Rant\)](#)  
posted by John on 07/17/2003 12:13:14 AM MST  
4 comments

22. [50 word limit on replies? \(Rants & Opinion, Rant\)](#)  
posted by windstuffnow on 07/05/2003 01:28:21 PM MST  
4 comments

23. [New Board OK \(Homebrewed Electricity, Rant\)](#)  
posted by Anonymous Hero on 07/01/2003 10:02:16 PM MST  
1 comment

24. [Hey...New? \(Rants & Opinion, Rant\)](#)  
posted by Norm on 06/29/2003 09:33:37 PM MST  
3 comments

25. [Big Wind generator blades heading north on I-35 today \(Rants & Opinion, Rant\)](#)  
posted by Anonymous Hero on 06/23/2003 10:19:01 PM MST  
1 comment

26. [Bad Board!! \(Homebrewed Electricity, Rant\)](#)  
posted by Jbryce on 06/23/2003 04:34:45 PM MST  
10 comments

27. [link to members pics \(Rants & Opinion, Rant\)](#)  
posted by Anonymous Hero on 06/14/2003 08:12:54 PM MST

2 comments

28. [Referance to old board](#) ([Rants & Opinion](#), [Rant](#))

posted by iFred on 06/13/2003 10:31:52 PM MST

7 comments

29. [Friction Drive?????](#) ([Homebrewed Electricity](#), [Rant](#))

posted by windstuffnow on 06/10/2003 02:41:11 PM MST

8 comments

30. [old board](#) ([Homebrewed Electricity](#), [Rant](#))

posted by Anonymous Hero on 06/10/2003 11:16:26 AM

MST

3 comments



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[60 mpg Chevrolet](#) | 12 comments (12 topical, 0 editorial)

Re: 60 mpg Chevrolet ([none / 0](#)) ([#1](#))  
by monte350c on Thu Jan 1st, 2004 at 10:18:23 PM MST  
([User Info](#))

Yup!

It's true - they often hold back the best for other markets. Check this one out - it's from where I used to work. I had this thing doing 155 mph at least once a week, not really even breathing hard.

V8, rear wheel drive, all independant suspension - puts a lot of high performance offshore stuff to shame.

[http://www.gmarabia.com/content\\_data/LAAM/SA/en/GBPSA/chevrolet/models/lumina/lumina\\_coupe.htm](http://www.gmarabia.com/content_data/LAAM/SA/en/GBPSA/chevrolet/models/lumina/lumina_coupe.htm)

Oh well one can always hope!

Ted.

[60 mpg Chevrolet](#) | 12 comments (12 topical, 0 editorial)

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# Insolation Levels (Nth America)

## Average Insolation (10 year average) kWh/m<sup>2</sup>/day

Metric to Imperial Conversion:

State	City	Latitude	Longitude	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year Avg
AL	Birmingham	33' 34" N	86' 45" W	2.29	3.31	4.04	5.14	5.92	5.98	5.81	5.7	4.8	3.93	2.96	2.25	4.34
AK	Anchorage	61' 10" N	150' 1" W	0.21	0.76	1.68	3.12	3.98	4.58	4.25	3.16	1.98	0.98	0.37	0.12	2.09
AR	Little Rock	32' 25" N	94' 44" W	2.36	3.39	4.01	5.32	5.71	6.19	6.15	5.85	5.25	4.17	2.95	2.25	4.46
AZ	Phoenix	33' 26" N	112' 1" W	3.25	4.41	5.17	6.76	7.42	7.7	6.99	6.11	6.02	4.44	3.52	2.75	5.38
CA	Los Angeles	34' N	118' W	3.09	4.25	5.09	6.58	7.29	7.62	7.45	6.72	6.11	4.42	3.43	2.72	5.40
CA	San Francisco	38' 31" N	121' 30" W	2.35	3.33	4.42	5.95	6.84	7.39	7.55	6.51	5.75	3.92	2.65	2.06	4.89
CO	Denver	39' 45" N	104' 52" W	2.25	3.2	4.32	5.61	6.11	6.71	6.5	5.86	5.47	4.01	2.59	1.98	4.55
CT	Hartford	41' 44" N	72' 39" W	1.7	2.43	3.48	4.07	5.14	5.58	5.38	5.04	4.13	2.91	1.81	1.42	3.59
DE	Dover	39' 8" N	75' 28" W	1.85	2.62	3.6	4.33	5.44	5.91	5.64	5.3	4.38	3.23	2.21	1.66	3.84
FL	Miami	25' 48" N	80' 16" W	3.72	4.61	5.42	6.4	6.61	6.29	6.26	6.08	5.47	4.84	3.96	3.46	5.26
GA	Atlanta	33' 39" N	84' 26" W	2.31	3.37	4.08	5.2	6.02	6.01	5.81	5.59	4.76	3.95	2.98	2.33	4.37
HI	Honolulu	21' 20" N	157' 55" W	4.38	5.15	5.99	6.69	7.05	7.48	7.37	7.07	6.51	5.46	4.41	4.01	5.96
IA	Dubuque	42' 24" N	90' 42" W	1.64	2.58	3.34	4.57	5.54	6.06	5.81	5.26	4.33	3.03	1.72	1.35	3.77
ID	Boise	43' 34" N	116' 13" W	1.73	2.72	3.77	5.22	5.9	6.57	7.17	6.12	5.28	3.29	1.74	1.46	4.24
IN	Indianapolis	39' 44" N	86' 17" W	1.67	2.59	3.28	4.67	5.46	6.11	5.79	5.37	4.76	3.33	1.97	1.46	3.87
IL	Chicago	41' 53" N	87' 38" W	1.5	2.45	3.2	4.48	5.56	6.07	5.68	5.27	4.51	3.07	1.69	1.26	3.72
KS	Kansas City	39' 12" N	94' 36" W	2.06	2.89	3.62	4.92	5.58	6.17	6.21	5.59	4.9	3.49	2.2	1.75	4.11
KY	Louisville	38' 11" N	85' 44" W	1.71	2.65	3.32	4.73	5.38	6.08	5.79	5.35	4.8	3.42	2.1	1.56	3.9
LA	New Orleans	29' 37" N	90' 5" W	2.64	3.73	4.67	5.8	6.6	6.15	6.09	5.7	5.13	4.48	3.49	2.68	4.76
MA	Boston	42' 22" N	71' 2" W	1.66	2.5	3.51	4.13	5.11	5.47	5.44	5.05	4.12	2.84	1.74	1.4	3.58
MD	Annapolis	38' 35" N	76' 21" W	1.96	2.8	3.71	4.55	5.54	6.03	5.77	5.34	4.48	3.4	2.37	1.81	3.98
ME	Portland	45' 36" N	122' 36" W	1.38	2.33	3.49	4.57	5.46	6.09	6.64	5.78	4.8	2.79	1.41	1.1	3.82
MI	Detroit	42' 25" N	83' 1" W	1.43	2.33	3.19	4.34	5.44	5.98	5.64	4.99	4.25	2.73	1.52	1.14	3.58
MO	St. Louis	38' 45" N	90' 23" W	2.02	2.82	3.52	4.97	5.56	6.21	6.05	5.63	4.91	3.55	2.21	1.73	4.09
MN	Minneapolis	44' 53" N	93' 13" W	1.6	2.61	3.3	4.55	5.44	5.86	5.77	5.12	4.12	2.9	1.62	1.34	3.68
MS	Jackson	42' 16" N	84' 28" W	1.47	2.41	3.22	4.33	5.46	5.93	5.57	4.99	4.3	2.78	1.55	1.17	3.59
MT	Billings	45' 48" N	108' 32" W	1.55	2.57	3.52	4.82	5.63	6.45	6.39	5.75	4.67	3.19	1.77	1.3	3.96
MT	Great Falls	43' 33" N	96' 42" W	1.3	2.36	3.41	4.84	5.56	6.18	6.44	5.53	4.4	2.9	1.53	1.11	3.79
NC	Charlotte	35' 13" N	80' 56" W	2.22	3.17	3.95	4.98	5.8	6.01	5.76	5.27	4.58	3.75	2.76	2.21	4.2
ND	Fargo	46' 54" N	96' 48" W	1.44	2.39	3.36	4.79	5.62	5.82	5.94	5.14	4.01	2.83	1.59	1.31	3.68
NE	Omaha	41' 18" N	95' 54" W	1.92	2.76	3.45	4.74	5.6	6.14	6.11	5.46	4.74	3.34	2	1.57	3.98
NH	Manchester	42' 56" N	71' 26" W	1.66	2.5	3.51	4.13	5.11	5.47	5.44	5.05	4.12	2.84	1.74	1.4	3.58
NJ	Trenton	40' 13" N	74' 46" W	1.71	2.39	3.43	4.04	5.26	5.67	5.39	5.14	4.18	3	1.98	1.48	3.63
NM	Albuquerque	35' 3" N	106' 37" W	2.92	3.97	4.92	6.3	6.68	6.94	6.66	5.8	5.68	4.18	3.16	2.5	4.97
NV	Las Vegas	36' 18" N	115' 16" W	3.02	4.13	5.05	6.57	7.25	7.69	7.37	6.42	6.08	4.26	3.18	2.6	5.3
NY	New York	41' N	74' W	1.67	2.37	3.41	3.93	5.11	5.48	5.26	5.01	4.05	2.85	1.82	1.4	3.53
OH	Columbus	39' 16" N	85' 54" W	1.64	2.57	3.26	4.63	5.4	6.08	5.73	5.29	4.74	3.29	1.96	1.45	3.83
OK	Tulsa	36' 12" N	95' 54" W	2.33	3.22	3.9	5.25	5.58	6.32	6.4	5.8	5.08	3.8	2.62	2.06	4.36
OR	Portland	45' 32" N	122' 40" W	1.38	2.33	3.49	4.57	5.46	6.09	6.64	5.78	4.8	2.79	1.41	1.1	3.82



PA	Philadelphia	39' 53" N	75' 15" W	1.85	2.62	3.6	4.33	5.44	5.91	5.64	5.3	4.38	3.23	2.21	1.66	3.84
PA	Pittsburgh	40' 27" N	79' 57" W	1.59	2.4	3.26	4.07	5.05	5.53	5.27	4.94	4.05	2.88	1.86	1.41	3.53
RI	Providence	41' 44" N	71' 26" W	1.7	2.46	3.53	4.2	5.17	5.67	5.48	5.08	4.21	2.97	1.8	1.43	3.64
SC	Columbia	38' 58" N	92' 22" W	2.14	2.91	3.62	5.03	5.56	6.22	6.13	5.64	4.95	3.57	2.25	1.82	4.15
SD	Sioux Falls	45' 27" N	98' 25" W	1.72	2.71	3.31	4.65	5.61	6.1	6.04	5.42	4.47	3.2	1.78	1.43	3.87
TN	Nashville	36' 7" N	86' 41" W	1.94	2.9	3.54	4.76	5.57	5.9	5.86	5.62	4.63	3.53	2.45	1.82	4.04
TX	San Antonio	29' 32" N	98' 28" W	2.57	3.7	4.43	5.54	5.94	6.62	6.49	6.28	5.7	4.67	3.43	2.62	4.83
TX	Houston	29' 59" N	95' 22" W	2.47	3.5	4.4	5.59	6.03	6.45	6.36	6.07	5.46	4.61	3.3	2.44	4.72
UT	Salt Lake City	40' 46" N	111' 52" W	2.23	3.15	4.09	5.57	6.26	6.98	6.86	5.98	5.39	3.68	2.29	1.97	4.53
VA	Washington	38' 51" N	77' 2" W	1.95	2.8	3.66	4.46	5.42	5.88	5.63	5.22	4.38	3.36	2.34	1.79	3.9
VT	Montpelier	44' 16" N	72' 35" W	1.58	2.54	3.5	4.05	5	5.24	5.37	4.92	3.79	2.46	1.52	1.28	3.43
WA	Seattle	47' 32" N	122' 18" W	1.14	2.04	3.23	4.26	5.19	5.75	6.27	5.46	4.43	2.5	1.21	0.9	3.53
WI	Milwaukee	42' 57" N	87' 54" W	1.43	2.41	3.29	4.48	5.6	6.09	5.74	5.21	4.34	2.9	1.6	1.2	3.69
WV	Charleston	38' 22" N	81' 36" W	1.75	2.64	3.34	4.26	5.2	5.67	5.49	5.19	4.26	3.19	2.15	1.62	3.73
WY	Casper	42' 55" N	106' 28" W	1.93	2.8	3.79	5.13	5.9	6.68	6.5	5.9	5.13	3.59	2.06	1.65	4.25

**Data courtesy of:** [NASA - Surface meteorology and Solar Energy Data Set](#)

#### Reference:

Whitlock, C. E., et al., Release 3 NASA Surface Meteorology and Solar Energy Data Set for Renewable Energy Industry Use. Rise & Shine 2000, the 26th Annual Conference of the Solar Energy Society of Canada Inc. and Solar, Oct. 21-24, 2000, Halifax, Nova Scotia, Canada.

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**NEW friction drive rollers [below](#)**



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**Powerful-**  
**SC series Super-core Hyper powerful PMA's**

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**Create electricity from any  
type of rotating tire or wheel!**

**NEW friction drive rollers will solve  
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designers and open new doors of opportunity for  
others looking for remote and portable electric power  
generation!**

**Can't figure out how to get enough RPM's from your wind turbine to  
power your PMA? Now a 40/1 gear ratio is EASY to achieve!**

**Gears, chains and pulleys all have their own unique problems!  
Noise and the constant need for lubrication are just a few of those  
problems that our new friction drives have eliminated.  
Friction drives are VERY inexpensive and very dependable!!!**

Friction drives use ordinary rubber tires as the main





gearing mechanism. Gear ratios of 40 to 1 are easily achieved using cheap mass produced rubber tires. Many types of rubber tire hubs are also equipped with brakes so over speed protection is very inexpensive and in many cases built right in to the hub! We have used trailer tires with electric brakes, golf carts tires, buggy and carriage rims, motor cycle and even bicycle tires. Don't worry about flats as there are few nails or thorns floating around in the air. Tires can also be urethane filled and then balanced at your local tire shop for only a few dollars. Our roller drives have brought new life to many Darrieus turbine designs and other VAWT's with a horizontally mounted tire drive. Any slow turning turbine design can benefit greatly from roller drives and fast turning wind turbine designs can be turned into **really powerful machines!** With a roller drive system its easy to get your [PMA's](#) spinning at well over 10,000 RPM without very much work or expense. Our rollers have a 7/8" OD and are 3" long. They have a 17mm ID thread that fits right on [all our standard PMA's](#). We recommend using some type of industrial strength thread locking adhesive so they can't come off of the shaft unless you want them to. The best trick is to design your system to keep the roller spinning clockwise (Always tightening).



*Advantage ratios are easy to figure out.*

This 20" tire has about 62.8" of surface length per rotation (20" x 3.14) so with our roller you will get an output ratio of about \*23 to 1 at your [PMA](#) shaft. *Impressive!*

This means if your wind turbine is rotating at a mere 500 RPM your [PMA](#) will be screaming at about 11,500

RPM!!!!!!!!!!!!!!!!!!!!!! That's very useful advantage ratio for a drive mechanism that anyone can pick up at a junk yard for only a few dollars!



Roller and tire friction drives are also very silent unlike gears and chains plus they never require any type of lubrication or maintenance. We figure that a tubeless tire designed to handle 500 lbs. for 50,000 miles ought to last about 30 years+ under the minute amount of stress that a roller friction drive demands and that's the best news wind turbine designers have heard in a long time!

**Tech Notes:** Remember that a drive roller **MUST** have spacers on the shaft between the bearing and the roller to keep the rotor shaft from moving back and forth within the PMA housing!!!!!!!!!! Drive roller includes a 15/16" hex nut head (not shown) that needs to be driven on the PMA shaft with an impact gun.

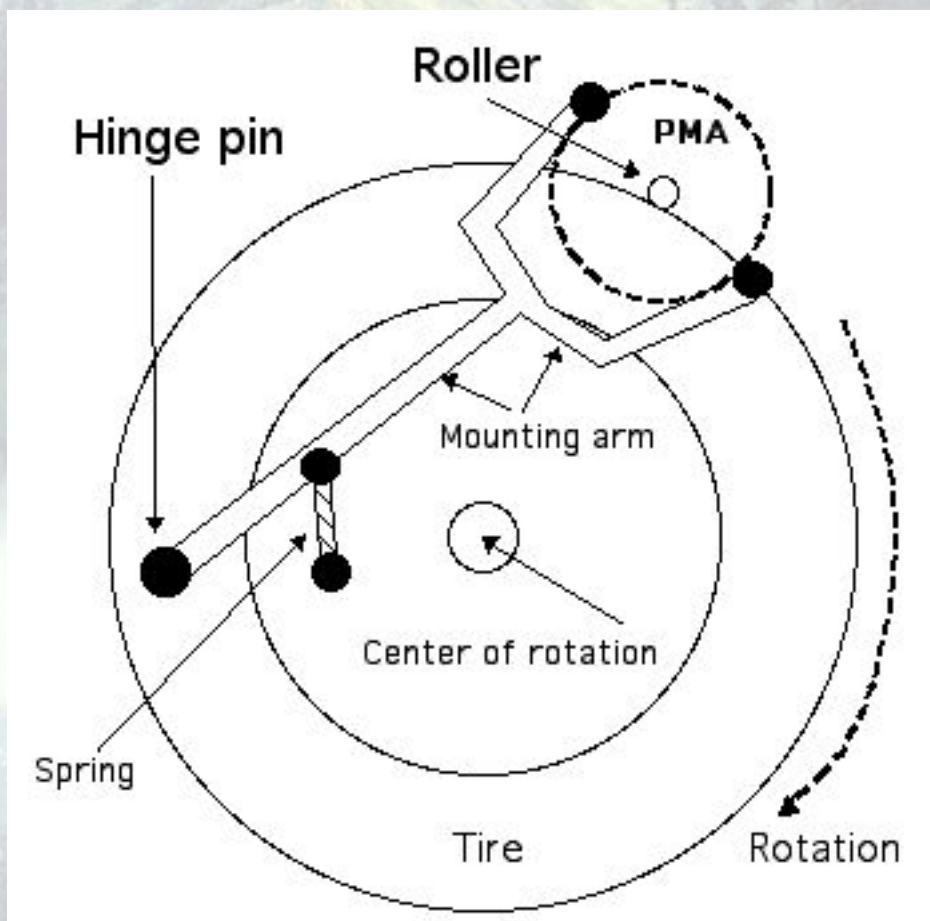
**Efficiency:** Tire pressure is critical to efficiency. A mushy tire causes lots of drag. Pump it up to maximum pressure and your power transfer efficiency will be 99% or better once the PMA is rev'd up. Friction drives are best suited for use on type [12 series](#) high revving PMA's

### **Design notes:**

If you design your mounting arm to pivot closely to the "center of rotation" the roller will get tighter as the RPM's go up and it will loosen as they go down providing "living" roller pressure. This is important as you would not want to have too much roller pressure dragging the turbine down at low start up speeds. As the tire spins faster and faster the PMA starts to create amperage causing the roller to "drag" thus pulling downward against tire harder and harder making more solid roller contact at precisely the time it is needed **most** and all because of the ingenious way this simple pivot design reacts to the rotation of the tire. The closer to the center of rotation you place your arm the more pull down or contact power this design will transmit to the roller. Be careful because if you design your pivot arm to be overly close to the center of rotation you can create so much pull down pressure that things start to get inefficient and also tire pressure can become overly critical. As a general rule a friction drive must be used with a heavily inflated tire so that the contact interface is extremely hard! A soft or mushy interface can be very energy inefficient.

The illustration below shows the arm placed in the "sweet spot" which is about 50% of the way between the center of rotation and the outside of the tire itself. This is what you should aim for and is exactly how we are going to be building our new Blue-Max Turbines when they are reintroduced in July of 2004. Testing is going VERY good!





PMA Selection Note: Drive rollers work best on [12's Series](#) PMA's. [SC series](#) PMA's can slip on the tire since they are so powerful and can create excessive drag. SC's series can be made to work with roller drives but only in applications with slow speeds and low amp loads.

**Part number #DR1 Steel Drive roller only \$49.95 plus \$6.50 S&H fee**

Made of hardened steel with a rough knurled finish for extra grabbing power on rubber tires.

**Part number #RDR1 Rubber Drive roller only \$89.95 plus \$6.50 S&H fee**

Tough urethane rubber coated for traction on steel wheels and rims. (1.5" OD)

\*More math ( $.875 \times 3.14 = 2.7475$  <rounded> 2.75 then  $62.8 \div 2.75 = 22.8$  RPM <rounded> 23)

## See PMA's powered with FREE used oil

---

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Re: water design ([none / 0](#)) ([#9](#))  
by RobC on Thu Jan 1st, 2004 at 07:27:53 PM MST  
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Something like this might work  
well. <http://www.hydrogenappliances.com/pma.html#anchor435622>

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Re: water design ([none / 0](#)) ([#10](#))  
 by charged on Fri Jan 2nd, 2004 at 07:31:36 AM MST  
[\(User Info\)](#)

Another way is to NOT use any gearing at all. Just use a big wheel with lots of small neodymium magnets around the outside edge. Make a modular cluster of stator windings having an even number of stators to match the magnet spacing on the wheel. Wire them in series. Make several of these stator clusters and place them around the wheel at ODD INTERVALS so that the wheel can't cog. Each stator cluster gets a single rectifier and an electrolytic capacitor. Wire the capacitors together in series, taking power from the top and bottom capacitors in the chain. Simply put, the larger the diameter of the wheel, the faster the velocity of the magnets on the rim. Voltage is determined by (flux strength X flux velocity X number of turns), roughly. Since wire resistance reduces available power, using fewer turns, stronger magnets and faster velocities is the preferred method.

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Re: water design ([none / 0](#)) ([#10](#))  
 by [charged](#) on Fri Jan 2nd, 2004 at 07:31:36 AM MST  
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### [Bio Diesel recipe](#)

By [Homebrewed12vdc](#), Section [Remote Living](#)

Posted on Thu Oct 9th, 2003 at 10:30:54 AM MST

[Bio-Fuels](#)

Easy way to amke Bio diesal

I just wanted to post this becuae I tried this recipe and found it works good for Bio Diesal.

First off all screnn out 40 gallons of WVO

second pump it into a 55 gallon drum

third add 4 gallons of kerosene to it

fourth using a subermisibile bidge pump let it stir for 24 hours

fifth let stand for 48 hours

sixth pump out from the top down to the last 4 inches in the barrel into a clean barrel

Now you have a fuel that well run in a diesel engine for the small amount of about 20 cents per gallon, I have been doing this for almost a year and have found it works good, and have had only one problem with it, I found that at first I went through 4 fuel filters before I didnt need to change them anymore. Hope this helps somebody out.

[Bio Diesel recipe](#) | 18 comments (18 topical, 0 editorial)

Re: Bio Diesel recipe ([none / 0](#)) ([#1](#))

by Barnac ([barnac@videotron.ca](mailto:barnac@videotron.ca)) on Thu Oct 9th, 2003 at 11:41:54 AM MST

[\(User Info\)](#)

What is WVO ?

Re: Bio Diesel recipe ([none / 0](#)) ([#3](#))

by kurt on Thu Oct 9th, 2003 at 12:13:15 PM MST

[\(User Info\)](#)

waste vegetable oil?



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Re: Bio Diesel recipe ([none / 0](#)) (#9)  
by Barnac ([barnac@videotron.ca](mailto:barnac@videotron.ca)) on Thu Oct 9th, 2003 at 02:20:54  
PM MST  
([User Info](#))

Many thanks, as my first language is french, I sometimes have problem  
to find initials (acronym) meanings :-)

[ [Parent](#) ]

Re: Bio Diesel recipe ([none / 0](#)) (#2)  
by Homebrewed12vdc on Thu Oct 9th, 2003 at 12:10:10 PM MST  
([User Info](#))

WVO = waste vegetable oil (commonly found at restrants out of the  
frylators)

Re: Bio Diesel recipe ([none / 0](#)) (#4)  
by Wolfie1 on Thu Oct 9th, 2003 at 12:27:34 PM MST  
([User Info](#))

Is this bio-diesel in the sense we know know and love (ie WVO + lye +  
methanol) or something different? Does the stuff stay mixed?

Martin.

Re: Bio Diesel recipe ([none / 0](#)) (#5)  
by Homebrewed12vdc on Thu Oct 9th, 2003 at 12:51:29 PM MST  
([User Info](#))

This recipe does not require the lie and methanol, just the kerosene,  
and yes it does stayed mixed if you do it the way I do.

[ [Parent](#) ]

Re: Bio Diesel recipe ([none / 0](#)) (#7)  
by troy on Thu Oct 9th, 2003 at 12:55:28 PM MST  
([User Info](#))

How is the viscosity in the dead of winter, with temps around  
10F?

Thanks in advance,

troy

[ [Parent](#) ]

Re: Bio Diesel recipe ([none / 0](#)) (#8)  
by Homebrewed12vdc on Thu Oct 9th, 2003 at 01:03:04  
PM MST  
([User Info](#))

it seems fine, we get temps down to -30f here, and the diesel has always started and ran on this with out any jelling problems.

[ [Parent](#) ]

Re: Bio Diesel recipe ([none / 0](#)) (#6)  
by John on Thu Oct 9th, 2003 at 12:54:11 PM MST  
([User Info](#))

Sounds good, but I have two questions. Will the Bio-Diesel stay stable (no more separation) for long term storage, and is the fallout on the bottom glycerin, the same as with recipes using heat and chemicals?

John  
[Toxin absorber/Pain reliever](#)

Re: Bio Diesel recipe ([none / 0](#)) (#10)  
by Homebrewed12vdc on Thu Oct 9th, 2003 at 02:21:37 PM MST  
([User Info](#))

What I find in the bottom of the barrel isnt really glycerin, but its a heavy dirty fuel that is only good for starting the woodstove or a bomb fire. As far as the seperation goes, I dont know, I use a batch up in about 4 weeks time and it seems to hold together fine. I well set soem aside next batch and let it sit for a few months and let people know what I find.

[ [Parent](#) ]

Re: Bio Diesel recipe ([none / 0](#)) (#11)  
by mkseps on Fri Oct 10th, 2003 at 07:02:05 PM MST  
([User Info](#))

Also see:

<http://journeytoforever.org/biodiesel.html>

Re: Bio Diesel recipe ([none / 0](#)) (#12)  
by Homebrewed12vdc on Sat Oct 11th, 2003 at 08:25:10 AM MST  
([User Info](#))



Cool site, thanks for the info, now if I could only find a way to amke a fuel that my gas powered car would run on.

[ [Parent](#) ]

Re: Bio Diesel recipe ([none / 0](#)) (#15)  
by icarus on Fri Nov 7th, 2003 at 04:45:12 PM MST  
([User Info](#))

hi re fuel to run gas converted car on im hoping to re fill my part full propane tanks by pumping natural gas or methane into the propane cylinder the methane should dissolve into the propane with an input pressure of 8 bar an old freezer cmpressor is nicely sealed gas tight with input and output pipes other possibility is to pump gas into acetone as a store should boil back off when cylinder is in use

[ [Parent](#) ]

Re: Bio Diesel recipe ([none / 0](#)) (#18)  
by bambam on Sat Jan 3rd, 2004 at 11:19:10 PM MST  
([User Info](#))

Check out this site for info on fuel for your gas powered engine.  
<http://ww2.green-trust.org:8383/2000/biofuel/batesmethane.htm>

[ [Parent](#) ]

Re: Bio Diesel recipe ([none / 0](#)) (#13)  
by Demetri ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Thu Oct 30th, 2003 at 09:39:54 AM MST  
([User Info](#))

All kinds of fun! I am definitely going to keep my eye out for a diesel Jetta. 45 mpg on fuel that I paid \$0.50 a gallon(and time) for DEFINITELY appeals to me. Woohoo, thanks everyone.

Demetri  
Always be the lead dog.

Re: Bio Diesel recipe ([none / 0](#)) (#14)  
by Demetri ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Thu Oct 30th, 2003 at 09:41:22 AM MST  
([User Info](#))

Oops, posted that in the wrong thread, I'll repost it in the correct thread, if the Admin's could delete this one please? Thanks.

Demetri  
Always be the lead dog.

Re: Bio Diesel recipe ([none / 0](#)) ([#16](#))  
by wildbill hickup on Sat Nov 8th, 2003 at 05:41:19 AM MST  
([User Info](#))

DO you thing this fuel would be clean enough to burn in an oil-fired furnace?

Re: Bio Diesel recipe ([none / 0](#)) ([#17](#))  
by Homebrewed12vdc on Tue Nov 11th, 2003 at 03:51:56 PM MST  
([User Info](#))

Well wildbill, I would think so sence its a lot cleaner than #2 fuel oil that is used in a oil furnance, I would say try it, worst that could happen is you plug a nozzle up.

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posted by rata on 08/26/2003 08:12:18 PM MST  
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posted by Demetri on 03/30/2003 11:22:35 PM MST  
18 comments

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### [WoodGas Generator plans](#)

By [wdyasq](#), Section [Homebrewed Electricity](#)  
Posted on Sun Aug 31st, 2003 at 07:01:35 PM MST  
[More on Woodgas generation](#)

[Bio-Fuels](#)

I was going throught all the links on wood gas of a few days back and came across this link:

[http://www.webpal.org/webpal/b\\_recovery/3\\_alternate\\_energy/woodgas/fema\\_wood\\_gas\\_generator.pdf](http://www.webpal.org/webpal/b_recovery/3_alternate_energy/woodgas/fema_wood_gas_generator.pdf)

It seems FEMA has prototyped and has plans for a woodgas generator at the proper price - FREE.

Ron

[WoodGas Generator plans](#) | 2 comments (2 topical, 0 editorial)

Re: WoodGas Generator plans ([none / 0](#)) ([#1](#))  
by [hvirtane](#) on Mon Sep 1st, 2003 at 04:49:30 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

Exactly.

This is the same plan I already pointed out.

One of my friends made a decision to try building one accoring to these plans. (Not in Finland.)

We hope to see some results later.

- Hannu

Re: WoodGas Generator plans ([none / 0](#)) ([#2](#))  
by [RobC](#) on Mon Sep 1st, 2003 at 03:39:00 PM MST  
([User Info](#))

I'm going to put one of these on my list of things to build.  
Thanks RobC

[WoodGas Generator plans](#) | 2 comments (2 topical, 0 editorial)

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## [Energy from wood](#)

By [hvirtane](#), Section [Homebrewed Electricity](#)

Posted on Thu Aug 28th, 2003 at 04:05:56 AM MST

[Bio-Fuels](#)

You can run your engine by chunks of wood

---

- 1)  
You can run your car with wood.
- 2)  
You can run your car with charcoal.
- 3)  
You can generate electricity from wood by running your engine generator set with charcoal or with wood.
- 4)  
It is not difficult to make yourself a wood gasifier for a normal combustion engine.

---

The technology was quite well developed during the second world war in Europe and in Australia.

Because there wasn't much shortage of oil in America, that technology is not very well known there.

To make a wood gasifier to make wood gas (producer gas) for the engine is maybe an easier way to make electricity from wood than by steam engines.

It is as well quite effective. According to

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- [http://www.wikipedia.org/wiki/Wood\\_gas](http://www.wikipedia.org/wiki/Wood_gas)
- [http://www.colostate.edu/programs/cowood/Useful\\_links/Wood-gasifiers.htm](http://www.colostate.edu/programs/cowood/Useful_links/Wood-gasifiers.htm)
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- [Also by hvirtane](#)

my old handbook of technology  
(printed 1946 in Finland)  
even 90% of the energy of wood  
can be converted into  
energy in burning gases,  
hydrogen, carbon monoxide and methanol.

During the time of the second world war  
more than 80% of all the traffic  
on Sweden's and Finland's roads  
was powered by wood gasifier  
trucks and cars.  
In Denmark the usage was even higher.

There were small workshops  
powered by wood  
gasifier engines, too.

Many of the wood gasifiers at that time  
were home made in Finland.  
There were as well many  
commercial producers of gasifiers.

At present there are about  
20 'wood gas' cars  
on the roads of Finland.

---

For a very general description  
of wood gasification chemistry,  
please see:

[http://www.wikipedia.org/wiki/Wood\\_gas](http://www.wikipedia.org/wiki/Wood_gas)

Recent ways how to do it  
in practice can be found here.  
There are as well links  
for very good descriptions of the theory:

[http://www.colostate.edu/programs/cowood/Useful\\_links/Wood-gasifiers.htm](http://www.colostate.edu/programs/cowood/Useful_links/Wood-gasifiers.htm)

---

Most otto engines work well  
without any modifications  
with producer gas.

To make them working effectively  
it is good to rise the combustion ratio a lot.  
Without that modification  
about 40% of the power is lost

compared to gasoline power.

Diesel engines work well with wood gas, too.  
But because the gas will not ignite  
under the pressure inside cylinders,  
it is necessary to inject  
a little diesel oil (biodiesel), too.

- Hannu

[Energy from wood](#) | 8 comments (8 topical, 0 editorial)

Re: Energy from wood ([none / 0](#)) ([#1](#))  
by TomW on Thu Aug 28th, 2003 at 04:41:13 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

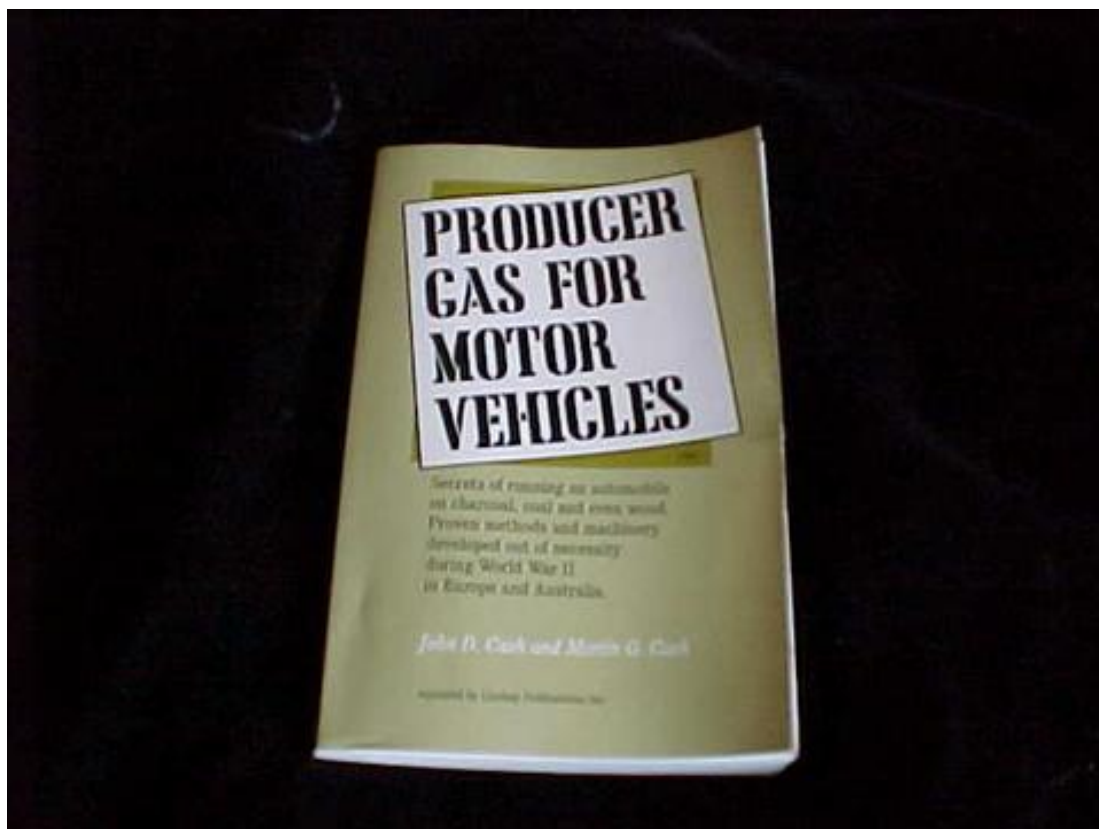
Hannu;

Nice pair of links to books you can buy.

Here is one they offer on wondermagnets.com:

<http://www.wondermagnets.com/> Item#: 1106

I would have included the direct link but it is so long it ruins the format of the forum. But heres a picture of the cover:



Producer Gas for Motor Vehicles by "John and Martin Cash. I am currently rereading it and it is quite interesting with lots of good information for the \$13 price tag.

Books are all well and good but take money to buy and you have to wait for them to arrive.

I much prefer the online resources for instant information. Here are a couple free links to enough info to build one from scratch without any cost for books or waiting for delivery of said books.

<http://www.fortunecity.com/greenfield/bp/16/woodfire3.htm>

<http://members.tripod.com/~highforest/woodgas/woodfired.html>

This is an area of interest to me because we have a fairly large tract of hardwood timber resources and I have an old rustbucket 4 cylinder pickup with a good strong motor I could convert to woodgas for experimental purposes to run a large induction motor for AC and heat from the coolant, etc.

Cheers.

TomW

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Re: Energy from wood ([none / 0](#)) ([#2](#))  
by Wolfie1 on Thu Aug 28th, 2003 at 05:52:30 AM MST  
([User Info](#))

There's been one thing that has always bothered me about gas producers. I wonder if anyone can help.

It seems to me that once the gas has been seperated from the wood it has lots of other stuff in it that you wouldn't want to put into an IC engine. I assume that there must be some sort of filtering needed and passing it through a water bubbler would do both filtering and cooling. My question/concern is that this water is going to quickly turn black with wood tar and who-knows-what-else. What do you do with the stuff - is it hazardous?

I'm guessing that a portion of it is creosote and that has some use but I can see you quickly getting overrun with the stuff unless you are in the fence painting business.

Martin.

[ [Parent](#) ]

Re: Energy from wood ([none / 0](#)) ([#4](#))  
by TomW on Thu Aug 28th, 2003 at 06:09:53 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>



Martin;

From what I have read you can feed the tar and creosote back into the gasifier and extract more gas from it. Plus it seems that if it is operating properly the gunk will be minimal.

Much like the creosote I get from my chimney when I clean it I simply feed it back into a hot fire in the wood burner and it burns up. Of course that stuff from the chimney cleaning is usually a dry residue not the oily tarry stuff you may get from a gasifier wet filter.

I have no experience with burning woodgas in an engine but actually create it often when making charcoal for my melting furnace setup.

I can tell you from experience the stuff burns quite well and more often than not once I start getting gas off a batch of wood I can remove the external heat source and the charcoal making becomes self sustaining as the flammable gas cooks off. It certainly isn't rocket science.

Cheers.

TomW

[Stuff I have Online](#)

[Contact Me](#)

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Re: Energy from wood ([none / 0](#)) (#5)  
by hvirtane on Thu Aug 28th, 2003 at 06:38:37 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

The most commented problem in the earlier days of wood gas engines was that there was tar in the gas. That created problems inside engines. Many kinds of filtering of course have been developed during 100 years of the development of wood gas engines. Filtering with water is one obvious solution. Some systems use centrifugal purifiers. One good solution is to use high temperatures (> 1000 C) to burn the tar in the process, when producing gas.

---

The idea, which I have, following many others, recommended is to use pure charcoal for the engine. Filtering charcoal gas is easy.

When making pure charcoal many really good stuff including tar and kinds of 'pyro-oils' (, which themselves as well can be used to run diesel engines!) can be manufactured from the process.

---

Tar was earlier one really valuable product of Finland. Most of the early wooden ships, which British empire used, to occupy half of the world, were coated by tar from the forests of Finland, for example. Tar was valued high by older time Finns for health care purposes, too. But remembering what the British colonialists did with tar, it has probably done more bad than good.

At present European Union is planning to get tar banned to be used for anything. Many people here use tar on the bottom of their cars to prevent rusting, put on their wooden boats to prevent them to rot. (I just put tar on my Saab 96 from 1978 on its bottom plate, too.)

- Hannu

[ [Parent](#) ]

More online and free ([none / 0](#)) ([#3](#))  
by hvirtane on Thu Aug 28th, 2003 at 06:04:03 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

I forgot to tell that this American  
really good booklet  
for practical construction  
is available online and free:

<http://www.gengas.nu/byggbes/index.shtml>

There is as well a .pdf version of the same available free in the Net. The link for the .pdf version  
is available from my second link in the original post.

I preferred to give only a few general links, because seeing those will lead to see that there  
are a lot of information available about  
those things... and then you get many other  
ideas, too.

- Hannu

Re: More online and free ([none / 0](#)) ([#6](#))  
by JW on Thu Aug 28th, 2003 at 07:58:05 AM MST  
([User Info](#))

I was hoping this sort of discussion would come up. I have speculated that this might be  
possible, I'm glad to see so much input. Presently I use corn burners for my AE  
experiments. I do use a gasification principle in the corn burners that I use. All I can say  
is if this mechanism loses its flame, then its smoke city. And trust me it will fill the whole  
yard with thick pure white smoke. I have not seen this in recent years of experimenting,  
but thinking about the sheer volume of smoke that can be achieved, I wonder about  
possibly running an Otto engine this way. Not sure about the tar content in corn smoke,  
but it must have a lower tar content than wood. I'm going to buy that book "Producer Gas  
for Motor Vehicles" Thanks for bringing that up TomW.

-JW

[ [Parent](#) ]

Re: Energy from wood ([none / 0](#)) ([#7](#))  
by hvirtane on Thu Aug 28th, 2003 at 11:21:03 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

Because lots of information about wood gas is available in Sweden and in Finland in native languages in Net, and links in those languages are not easy to find for people, who don't know the languages, I did some more search in the Net:  
(By the way, wood gas is 'puukaasu' in Finnish and the gasifier is commonly called 'häkäpönttö')

---

A Renault 1980 with a wood gas system running at present in Finland:

<http://www.joutsanseutu.fi/jutut/ihmeauto.htm>

-

Many pictures of the war time wood gas cars in Finland:

<http://groups.msn.com/n8g0fho8020re4ek2n80dhqts3/puujahiilikaasuttimet.msnw?albumlist=2>  
<http://groups.msn.com/n8g0fho8020re4ek2n80dhqts3/puujahiilikaasuttimet.msnw?Page=2>  
<http://groups.msn.com/n8g0fho8020re4ek2n80dhqts3/puujahiilikaasuttimet.msnw?Page=3>

-

Modern day Finns with old wood gas trucks:

<http://www.turunsanomat.fi/osasto/?ts=1,7,0,0,13035,1998-06-13>

--

In Sweden/in Swedish;

lots of information from Sweden and some from Finland:

<http://www.gengas.nu/>

Pictures:

<http://www.gengas.nu/bilder/index.shtml>

A filtering system from Sweden:

<http://www.gengas.nu/byggbeskrivningar/dukrenare/index.shtml>

--

Some more drawings besides the earlier links are available here. The first is by the president of the Finnish association of ecocars, Vesa Mikkonen.

You can order his drawings by a telephone call.

He speaks English well.

<http://www.gengas.nu/litteratur.shtml>

--

Wood gas/charcoal gas generators can be small, too:

<http://www.gengas.nu/bilder/cykel.shtml>

This one is not from Sweden or from Finland.

I'll reproduce the link here, if you missed it by going onward from my first starts:

<http://www.fluidynenz.250x.com/>

- Hannu

Re: Energy from wood ([none / 0](#)) ([#8](#))  
by JW on Thu Aug 28th, 2003 at 01:18:24 PM MST  
([User Info](#))

Those are some good links Hannu, Thank's.

-JW

[ [Parent](#) ]

[Energy from wood](#) | 8 comments (8 topical, 0 editorial)

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[steam engine](#)

By [rata](#), Section [Homebrewed Electricity](#)

Posted on Tue Aug 26th, 2003 at 08:12:18 PM MST

[Bio-Fuels](#)

any tried a steam engine?

hi there

in winter i get a bit short of power. the creek's dried up, the wind dont blow and the sun is pretty low in the sky. i could buy a stack more solar panels, but i reckon that a steam engine could be the go. powered by a renewable wood burner. i've found a few references to flash steaming on this board, but has anyone tried a good old fashioned steam engine, up to about 1kw in size? can you get them or do you have to make one?

[steam engine](#) | 14 comments (14 topical, 0 editorial)

Re: steam engine ([none / 0](#)) ([#1](#))  
by Electric Ed on Tue Aug 26th, 2003 at 08:45:55 PM MST  
([User Info](#)) <http://www.electric-ed.com>

I always wanted to try a steam engine. Years ago, I started gathering up parts, like 6" sleeves out of a big diesel engine, to build a steam engine.

The engine is the easy part. The boiler is the difficult part, unles you stick with "low" pressure.

Now that would be real fun,  
Electric Ed

Re: steam engine ([none / 0](#)) ([#2](#))  
by Norm on Tue Aug 26th, 2003 at 08:49:18 PM MST  
([User Info](#))

Rata, I think DanF posted a link a short time back...  
<http://www.mikebrowsolutions.com/1hpapic.htm>. Lots of interesting stuff about steam and steam engines here. Have Fun! Norm.

Re: steam engine ([none / 0](#)) ([#3](#))  
by elvin1949 ([elvin1949@wmconnect.com](mailto:elvin1949@wmconnect.com)) on Tue Aug 26th, 2003 at 10:16:36 PM MST  
([User Info](#))

www.tinypower.com  
small steam up to 2hp i think  
later  
elvin

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Re: steam engine ([none / 0](#)) (#4)  
by hvirtane on Wed Aug 27th, 2003 at 02:41:26 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

Hi,

I think that the idea is a good one.

The difficult part is the boiler.

My friends here have made one years ago.  
They are not using it, because it consumes  
too much wood About 2 kW machine.  
It is in working condition and they would  
like to sell it even...  
But maybe too costly to be sent to your place.

I asked them for the drawings  
of the whole machine and especially  
of the boiler to be  
sent to India,  
but they refused telling  
that it is too dangerous  
to build such things...  
but they made it themselves anyway...

You can find drawings here:

<http://www.rainbowtradingpost.co.uk/guides1.html>

There are other good drawings available there.

- Hannu

Re: steam engine ([none / 0](#)) (#5)  
by JW on Wed Aug 27th, 2003 at 08:06:40 AM MST  
([User Info](#))

I kind of agree with what was told to Hannu. Most steam engines are quite dangerous. Usually when an individual whole heartedly takes up the task of building a steam engine, they are aware that there taking there life into there own hands. Unfortunately some do get hurt, usually small burns etc. I think unless you are willing to put absolut full commitment into it, you should not do it.

Various new or modern evolved flash steam engines are exploring safer operation. This is mainly thru the removal of a large capacity live steam boiler. But in most cases high pressures are developed in a small low capacity tube arrangement. One way that these very recent designs deal with getting away from the large boiler, is the use of block heating. so that the engine block itself can become the boiler. I am currently involved in one of these projects. When we started this it was innitally just for the challenge. However over time these systems are proving to be way safer than predicted. So at this point things look good, but who knows where it will lead.

At this time, all things considered, Bio Diesel looks like the best bet. You can run any diesel engine from bio diesel, that would include a small 12 or 20kw diesel generator. This is one user freindly method of getting power without standard fossil fuels. Also If you really wanted to use wood you could try gasification, I belive some good results have been obtained using turbines, but unsure about running piston engines this way.

I believe in the future thermo-generators will fill this need. They are solid state devices that have no moving parts, or pressurized parts. And make DC current directly from heat. This will be the best solution for the end user. perhaps in our lifetime someone will make a significant break thru.

-JW

[ [Parent](#) ]

Re: steam engine ([none / 0](#)) ([#6](#))  
by troy on Wed Aug 27th, 2003 at 08:48:24 AM MST  
([User Info](#))

I have modest experience with hobby steam, and can tell you with certainty that a conventional boiler must be supervised at all times and built properly, or it can kill you. One gallon of water (not a big boiler at all) turned into superheated steam, contains approximately the same destructive force as a stick of dynamite.

The newer, higher tech tube boilers are indeed safer, but require much more sophisticated controls to operate. A conventional steam plant will keep a guy pretty much occupied all the time to keep it running and properly supervised. It is not by accident that running a steam engine locomotive required both an engineer and a fireman full time.

Tiny power has nice products at reasonable prices, including machines big enough to run a boat.

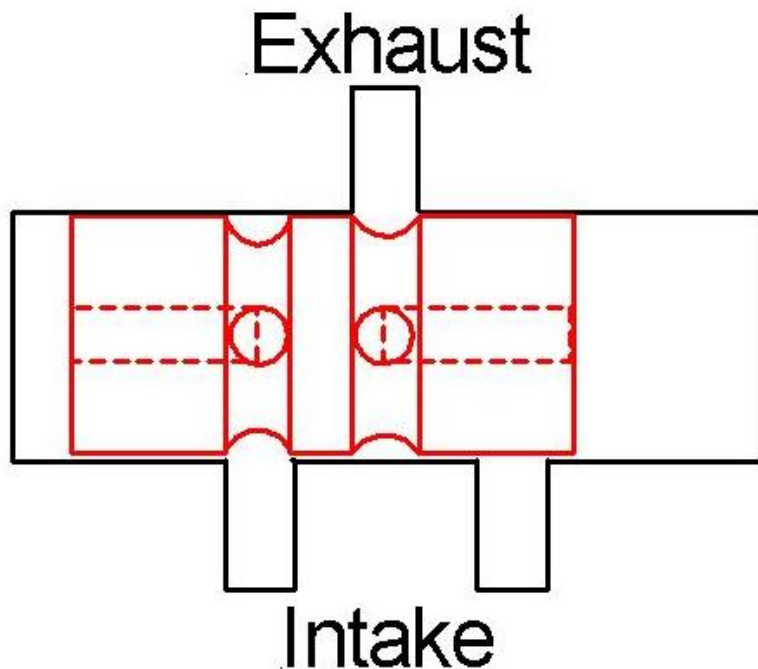
Best regards,

troy

Re: steam engine ([none / 0](#)) ([#7](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Wed Aug 27th, 2003 at 09:29:46 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

I've been exploring the possibilities of different engines ( gas, diesel, steam, stirling etc.) and reducing the amount of parts to achieve higher efficiencies. One of course was the possibility of steam. Unfortunately, like all has stated... steam is dangerous unless constantly monitored. Also, it is very inefficient because of the way we have to transfere one fuel into another. The typical steam engine is only around 15% efficient.

I have a tendency to design something then spend a mountain of hours trying to simplify its design. Below is a diagram of a reciprocating steam/air engine with only one moving part...



The cylinder is ported to match the ports on the piston. The piston doubles as the valve. As shown the piston is to the left which opens the port to the power chamber and the right side piston is ported to the exhaust. One side drops pressure the other side inserts pressure driving the piston to the other side to restart the cycle. This is the equivalent of a 2 cylinder steam engine.

This will drive a linear alternator with more efficiency than a standard crank driven unit. Since all the power going into the piston would be converted to torque you reap the benefits without the losses. A small model of this with a 1" piston inside a honed pipe goes like crazy. I don't know what the cycles ( or rpm equivalent) the one built had no output shafts for driving anything simply the reciprocating piston... a model to prove it would work basically.

Now, if only I could get a grip to simplify the diesel model to this extent... still working on that one...

Have Fun  
Ed

Re: steam engine ([none / 0](#)) (#10)  
by hvirtane on Fri Aug 29th, 2003 at 08:04:31 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

This engine is great in my opinion.

Do you have any idea how effective it is with compressed air?

Did you try it with steam?

Did you try with any coil outside?

- Hannu

[ [Parent](#) ]

Re: steam engine ([none / 0](#)) (#11)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Fri Aug 29th,  
2003 at 10:11:30 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

The model was driven by 40psi of compressed air. I haven't built a model with an output shaft as yet. To build one with magnets on the piston would take some special materials for the cylinder so the output shaft would be a better way to go for a linear alternator. I'm not convinced that the "air/steam" motor of this type is actually very efficient. Obviously would be much more efficient than a crank driven unit. It would provide 2x the torque directly to the alternator as opposed to running it through a crank and reducing the overall torque. I'm not sure I will build a practical working model of this, I'm concentrating on a diesel version of the same thing which will be much more efficient.

Trying to find the least amount of conversions from one fuel to another. Sort of like a gas can with a plug outlet... if only it were that easy...

Have Fun  
Ed

[ [Parent](#) ]

Re: steam engine ([none / 0](#)) (#12)  
by hvirtane on Fri Aug 29th, 2003 at 05:49:49 PM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

"To build one with magnets on the piston would take some special materials for the cylinder so the output shaft would be a better way to go for a linear alternator."

---

I think that you could just put the magnet inside your piston made of teflon cylinder? Running inside another teflon cylinder?

Or maybe you could just run two magnets glued on teflon parts S-N-TEFLON-S-N and the teflon parts a bit smaller so that only the nickel coated magnet parts would touch a teflon cylinder?

And the coil outside around it?

---

"I'm not convinced that the "air/steam" motor of this type is actually very efficient."

---

Probably not very efficient, but maybe enough...  
If using free solar energy...

Let's say, we would make the air pressure somehow with solar energy...

A bimetal rod bending because made hot by a solar concentrating mirror pushing a big piston making air pressure in a big cylinder... ?

The bimetal 'string' bouncing back, when some cold water was dropped on it... and at the same time



a shadowing sheet comes over the bimetal...?

Just rambling with ideas.

- Hannu

[ [Parent](#) ]

Re: steam engine ([none / 0](#)) (#13)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Fri  
Aug 29th, 2003 at 06:51:11 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Just to simplify it a bit, you could build it with 2 displacer chambers each feeding the opposite end. This would turn it into a stirling engine which could be run directly from solar. This would increase the complexity a bit and the piston valving would be a bit different as well as an offset arm to allow a slight timing offset. Easy enough to do but not as powerful.

Another possibility would be to make a large low delta stirling with part of the engine burried in the ground and a top plate exposed to the sun. A styrofoam displacer driving a large diaphragm piston. Depending on the size you could easily get 100-200 watts from a simple motor design. This would also run backwards at night drawing the heat from the ground and cool from the night air.

Tons of ideas, just low on time and funding for all of them...

Have Fun  
Ed

[ [Parent](#) ]

Re: steam engine ([none / 0](#)) (#14)  
by Gary on Sun Sep 7th, 2003 at 11:51:35 AM MST  
([User Info](#))

Nice.

If you compounded this engine so that the outlet went to the inlets of another that handled the lesser pressure it would become efficient. Since the design is cheap especially if the piston is a light ceramic magnet( housed in plastic), the pipe plastic and a coil wrapped on the outside, compounding isnt expensive.

[ [Parent](#) ]

Re: steam engine ([none / 0](#)) (#8)  
by rata on Wed Aug 27th, 2003 at 02:04:30 PM MST  
([User Info](#))

ok, i'm convinced now that maybe steam isn't such a great idea. sounds like you guys have thought about this a bit. yeah, maybe biodiesel is the go.

ta for the response

Re: steam engine => gasification ([none / 0](#)) (#9)  
by hvirtane on Wed Aug 27th, 2003 at 04:07:40 PM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

It is not difficult to make a wood gasifier for a normal combustion engine.

The technology was quite well developed during the second world war in Europe and in Australia. Because there wasn't much shortage of oil in America, that technology is not very well known there.

To make a wood gasifier to make gas ('producer gas') for the engine is maybe an easier way to make electricity from wood than by steam engines.

It is as well quite effective. According to my old handbook of technology (printed 1946 in Finland) even 90% of the energy of wood can be converted into burning gases, hydrogen, carbon monoxide and methanol.

During the time of the second world war about 80% of all the traffic on Sweden's and Finland's roads was powered by wood gasifier trucks and cars.

There were small workshops powered by wood gasifier engines, too.

Many of the wood gasifiers at that time were home made in Finland. There were as well about 20 commercial producers of gasifiers.

At present there are about 20 'wood gas' cars on the roads of Finland.

For a general description of wood gasification, please see:

[http://www.wikipedia.org/wiki/Wood\\_gas](http://www.wikipedia.org/wiki/Wood_gas)

And the American quite modern way to do it can be found here:

[http://www.colostate.edu/programs/cowood/Useful\\_links/Wood-gasifiers.htm](http://www.colostate.edu/programs/cowood/Useful_links/Wood-gasifiers.htm)

Most otto engines work well without any modifications with 'producer gas'. To make them working effectively it is good to rise the combustion ratio a lot. Without that modification about 40% of the power is lost

compared to gasoline power.  
Diesel engines work well with 'wood gas', too.  
But because the gas will not ignite  
under the pressure inside cylinders,  
it is necessary to inject  
a little diesel oil (biodiesel), too.

- Hannu

[steam engine](#) | 14 comments (14 topical, 0 editorial)

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## [Modular Methane System](#)

By [Arletta](#), Section [Homebrewed Electricity](#)

Posted on Mon Aug 11th, 2003 at 10:14:31 PM MST

[Bio-Fuels](#)

While I'm waiting for my alternator, let's discuss gas...

Hi all, have any of you read George Adkisson's book "Methane for the Masses"? He has a modular methane system (load it and forget it, he says) made of 55 gallon drums, assorted tubing, connectors, etc, and a 30 gallon plastic garbage can suspended in a drum of water for the gas trap. A nifty little system of counterweights automatically turns on a compressor when the trap is full. Unlike every other methane system I've ever read about, there is no energy used for heating because the drums are painted black and being so small the sun keeps them sufficiently toasty. It apparently works well enough that his wife cooks with the methane.

This is what I eventually want to build and run on my future homestead and the main reason for the wind turbine...to charge batteries to run a DC air compressor to move the gas from the trap into pressure tanks. I realize it won't reach propane pressures but a third of a tank of free, independently produced gas is better than a whole tank of propane at \$2.50 a gallon, in my opinion. Especially since there will be numerous chickens and several bovines producing the necessary raw material.

Anyway, my problem is figuring out how to get the DC air compressor to suck the gas from the gas trap- all the DC compressors I've seen have intakes on the sides and top, not simple intake hoses like AC compressors. I speak of DC because I'm too cheap and lazy to buy an inverter just for operating the thing for several hours once a week or so. Adkisson suggests building an airtight bladder around the compressor, but that would mean operating electronic equipment in an atmosphere which one can only greatly hope and pray is too oxygen deprived to combust. I view this with minimal enthusiasm.

Any other suggestions? Discussions of/improvements on Adkisson's system? Share your thoughts, especially if you've read the book and tried the plan.

Also, why is it that DC compressors are usually rated to 275 or 300 psi and AC compressors have much lower psi ratings, like 70 to 100?

Thanks.

Arletta

[Modular Methane System](#) | 12 comments (12 topical, 0 editorial)

Other considerations: Methane Systems ([none / 0](#)) (#1)  
by [hvirtane](#) on Mon Aug 11th, 2003 at 11:26:05 PM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

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Hello,

I've seen writings you pointed to.

I used to think that biogas is an interesting possibility.

I've been working with some people, who have done hundreds of small biogas plants in Nepal.

Recently I just sent a description of an even simpler biogas plant than made of drums to a friend.

It is basically a polyethene film tube. About 5 m long 1 m diameter, 0.2 mm - 0.4 mm gauge.

You close both ends, put there about 1 m long 20 cm diameter plastic tubes for inlet and outlet. Fix a small plastic tube in the middle for gas. Make a good hole on the ground to keep it without holes. Keep the inlet about 5 cm higher than the outlet. The stuff inside flows slowly out from the outlet. If you add it every day a suitable amount, it produces good amounts of gas for cooking even running a tiny engine.

Recently had a discussion with one of my friends here involved in RE business. He said that in his opinion small biogas tanks leaking there and there among a billion Indians, among a billion Chinese, among other billions in other countries would provide a problem.

He said that in the nature naturally created methane dissolves in the lower atmosphere, because amounts in one place are small.

But he said that if we have got a leaking biogas plant that would make such methane 'bubbles', which wouldn't dissolve in the lower atmosphere, but would go far up, where they would stay for a long, long time. Much worse than carbon dioxide he says.

What do the others think?

- Hannu

Re: Modular Methane System ([none / 0](#)) ([#2](#))  
by Demetri ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Mon Aug 11th,  
2003 at 11:30:38 PM MST  
([User Info](#))

AC compressors are designed to power air tools at reasonable pressure and useable volume, where as the little DC powered compressors are designed to air up tires. It's not possible to pull enough amperage from a cigarette lighter to produce high volumes of compressed air, but high pressure is quite easy even with a small power source. The 275 and 300 psi ratings are touted for the advertisement value, they sound impressive. I'm sure they actually do produce their stated psi, but at very little volume, so it will take a while to fill a tire and be impossible to run any air tools. Most tires are rated at 28-35 psi, with a few going to 65 or 70, and none to 300. You might make your own DC air compressor using an air conditioning compressor off of a car and a large DC motor. If you go this route, use a York compressor. They are piston compressors(as opposed to the more common vane types)



that have a crank case full of oil and do not require oil in the gas they are pumping to operate. However, for your application, one of the little DC compressors sounds fine, as it will draw far less power (ten to twenty amps, while the 3.5 hp motor needed to run the York compressor will draw about 218 amps @ 12 volts), albeit over a longer period of time. 300 psi would be better (and is close to what propane is stored at, I think) for methane storage than 150 psi (Which is what my home shop compressor max's at, though the York compressor will put out 300 psi no problem), and you don't need high volume because you won't be pumping much volume. Whatever you choose, I wish you luck.

Demetri  
Always be the lead dog.

Re: Modular Methane System ([none / 0](#)) (#3)  
by elvin1949 ([elvin1949@wmconnect.com](mailto:elvin1949@wmconnect.com)) on Tue Aug 12th, 2003 at 04:39:54 AM MST  
([User Info](#))

good morning  
some year's back the mother earth news  
did almost a yaer's worth of work on  
methane did not use a compressor on  
most of them

[www.themotherearthnews.com](http://www.themotherearthnews.com) i think  
elvin

Re: Modular Methane System ([none / 0](#)) (#4)  
by Wolfie1 on Tue Aug 12th, 2003 at 05:50:24 AM MST  
([User Info](#))

This might be off the subject but how do you get the sulfurous gases out of the methane. Apart from the smell of them, they are poisonous. Cooking outside may be OK for India etc but I am assuming that you would want to cook inside. Is there some kind of filter you could/should use.

Regarding your pumping issues, I heard of a man that did the gas thing. He stored the gas in old truck tires. When he was ready to use one, he would put a heavy stone on it and get instant presure.

Martin.

sulfur removal ([none / 0](#)) (#5)  
by TomW on Tue Aug 12th, 2003 at 08:30:55 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

wolfie1;

Another area I am no expert in but have read some on it years ago.

I seem to recall that they suggested bubbling it through water which dissolved the sulfur out of the gas.

That info is probably from that 70s era Mother Earth News string of articles.

I actually built a 30 gallon batch digester that let the gas out through a layer of water into an inverted barrel. The stuff worked OK for cooking and we used it inside with a standard kitchen range and I never noticed a sulfur smell or ill effects. We had to adjust the weights on the barrel when we used the gas but that was trivial.

Of course this is all from 30 years back so i may be mistaken. We quit doing it for some reason I don't recall exactly but probably related to a transition from unemployed with lots of time to employed with no time.

Cheers.

TomW

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Re: sulfur removal ([none / 0](#)) (#12)  
by elvin1949 ([elvin1949@wmconnect.com](mailto:elvin1949@wmconnect.com)) on  
Tue Aug 12th, 2003 at 10:22:17 PM MST  
([User Info](#))

good evening tomw  
if i remember tmen filtered it through iron filing's  
later  
elvin

[ [Parent](#) ]

Re: Modular Methane System ([none / 0](#)) (#6)  
by jubalearly on Tue Aug 12th, 2003 at 12:47:32 PM MST  
([User Info](#))

Methane is essentially the same as natural gas as far as burning it in appliances. IIRC, the normal regulated pressure is 11 oz. rather than the 5lbs. or so used for propane appliances. There is a reason that they don't normally try to store compressed natural gas. It must be more trouble than it is worth for domestic use.

Remember, propane turns to a low volume liquid at reasonable pressures at room temperature. Methane is only liquid under very high pressures or very cold. There's no reason you can't pressurize it, it's just expensive to store in the normal gaseous state. If your generation matches your use fairly closely, then you can do this economically. Most people can't produce enough to make it worthwhile, but it may work out for your situation. Good luck, HTH, Russ

PS, I've also considered using it but I think I'm going to have to buy propane instead.....

Re: Modular Methane System ([none / 0](#)) (#7)  
by C Via on Tue Aug 12th, 2003 at 03:52:39 PM MST  
([User Info](#))

I purchased a small dc compressor from ebay. it is a 2 stage type.  
combo vacuum,air compressor it will only pump 40 psi but draws minimal power. it can be run off of a 15 watt panel. and is not a piece of junk  
it's well built and cost 25.00 if you are interested I'll look it up for you.  
Caroll

Re: Modular Methane System ([none / 0](#)) (#8)  
by Arletta on Tue Aug 12th, 2003 at 05:37:05 PM MST  
([User Info](#))

What an interesting discussion...I was impressed by Adkisson's methane system because it's both small scale and scavenged. Also the passive solar heating thing- keeping the stew at gas production temps seems to be the achilles heel of most systems.

I checked my old issues of TMEN...they had a huge tank designed by Ram Bux Singh but apparently their welder didn't make it sufficiently air tight and the whole project died a quiet death. They were going to heat it either with warm waste water (say that five times fast) or a methane gas ring fed directly from the collection tank.

There's also an article about Harold Bates and his "Chicken Powered Car" in issue #10. He actually compressed his methane into liquid form (1,100 psi- good grief) and used it for his vehicle. TMEN sure was a great magazine back then... Another interesting thing; one TMEN article says that a nitrogen/carbon ratio of 30/70 (or something like that)is ideal, the other says just the opposite, and Adkisson doesn't use any plant material at all in his drums, just cow manure and water. Also the recommended optimum temperature range varies from 50-110 degrees F. So apparently methane has a pretty large margin of sufficient operation.

Drawing the gas directly from the collection drum to the stove or whatever would be ideal, but since I live in the frozen north I have a limited solar season and I'll have to store it in tanks for the winter. Why do I get the idea that gas won't store well at low pressure? Leaks? Or does it separate or something like petrol does?

Hannu, seems to me that the minimal leakage from worldwide methane systems wouldn't be more significant than the current natural evaporation of methane from barnyards (especially industrial size ones), compost piles, sewers, etc. where the material is just left lying around. If methane became a mainstream fuel, individuals and industries would be cleaning that stuff up as fast as it was produced. So I bet it would balance out. Besides, just imagine what the atmosphere must have been like when mighty herds of dinosaurs roamed the earth. And people complain about cows... :)

Thanks for all the compressor info. I think 100 lbs psi will be sufficient. Nothing I've read about methane so far has mentioned sulfur fumes...but isn't that the added "rotten egg smell" that propane has so we can smell leaks?

Well, the weather is crummy outside so I'm going to go find a chocolate chip cookie and read my book about tripods from outerspace who brainwash everybody and then take over the world. Have a great day folks.

Re: Modular Methane System ([none / 0](#)) ([#11](#))  
by troy on Tue Aug 12th, 2003 at 06:39:16 PM MST  
([User Info](#))

The methane doesn't really care about the temperature, but the bacteria and other microscopic wildlife that cause the fermentation of the cow poo which causes the production of the methane gas, ARE very sensitive to temperature. They like it at about the same temperature as the inside of a cow, so 100 is nice and chummy. They'll work at 50, but much slower, at 32 they've quit entirely.

Best regards,

troy

[ [Parent](#) ]

Re: Modular Methane System ([none / 0](#)) ([#9](#))  
by mkseps on Tue Aug 12th, 2003 at 05:59:55 PM MST  
([User Info](#))

You might want to look at:

<http://www.wisconsinpublicservice.com/farm/gasrecovery.asp>

Re: Modular Methane System ([none / 0](#)) ([#10](#))  
by mkseps on Tue Aug 12th, 2003 at 06:19:51 PM MST  
([User Info](#))

Also, check out:

<http://www.homepower.com/files/woodgas.pdf>

[Modular Methane System](#) | 12 comments (12 topical, 0 editorial)

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## [Flash steam](#)

By [hvirtane](#), Section [Homebrewed Electricity](#)

Posted on Thu Jun 26th, 2003 at 10:24:08 AM MST

[Bio-Fuels](#)

one quite interesting site

---

Started to look for 'flash steam engines' and found one quite interesting site:

<http://www.flashsteam.com/>

What do you think about the concept?

Anybody tried anything similar?

Instantly came to my mind that why not using instead of a four cycle engine a simple steam turbine and a solar parabolic mirror to make flash steam in the front of that turbine...

- Hannu

[Flash steam](#) | 35 comments (34 topical, 1 editorial)

Re: Flash steam ([4.00 / 1](#)) ([#4](#))

by E man on Thu Jun 26th, 2003 at 11:52:37 AM MST

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- <http://www.flashsteam.com/>
- [More on Bio-Fuels](#)
- [Also by hvirtane](#)

I also found it interesting in the article that he's using corn as fuel...not ethanol made from corn. That's great, no reprocessing just burn it. That could work good for a Stirling engine as well.

The idea of using flash steam in a turbine is a good idea since it would open up the possibility of using simpler valving and perhaps even utilize a batch process where you would heat a small reservoir of water (maybe a 50ml shot at a time); a temp senser could then pop a solenoid open to the turbine for a short burst and generate electricity. Then reload with condensate and start over. The vessel and tubing would have to handle serious pressures. Not something to taken lightly.

Here's an interesting aside: <http://www.blastwavejet.com/rocketcar.htm>

"Hot water rocket engine" that used a 2 foot metal ball filled with water, heated, then crack the valve...whoooosh!

E-man

tiny experiments ([4.00 / 1](#)) ([#34](#))  
by hvirtane on Wed Jul 23rd, 2003 at 08:37:44 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

I just made the first experiments with the flash steam (solar) turbine.

I got from a friend a tiny tin toy turbine.

I connected that with a coffeemaker, where I extended the tube where the hot water and steam comes out, with a plastic pipe, which goes into the inlet tube of the turbine.

It works well.  
There is very little power, of course, because the turbine is made with the vanes of flat metal sheets.  
About 5 cm in diameter.  
But it goes fast.

I will later send pictures of this experiment when I get my film from a lab.

Basically the coffee maker works exactly with the principle as described earlier.

I think that Andrew's suggestions

are just right.

As the flash tube, a metal tube works  
and we need no pressure to get water in.

There is a small very hot chamber and  
a ball valve letting  
the cool water to come in to the hot tube.  
The other end of the hot tube is open.

That system of the coffee maker  
of course works with electric heating  
for the hot chamber.

-----  
But you can use any heat of course.  
Solar heat, too.  
-----

If you will try to duplicate the experiment you  
might have to modify the valve, which lets  
the water in to the hot tube.  
Mine was just suitable  
broken so that it lets the water in as small droplets,  
when the water is quite finishing.  
Or maybe the extra pressure from the extended  
tube made the valve leaking.

Next I have to ask somebody to make for me  
a little bit bigger turbine,  
which I could connect to a bicycle dynamo.

I will maybe visit a workshop  
to ask them about the prices to make a small  
crossflow turbine.  
Or a Pelton wheel as suggested by Andrew.

I've got one solar concentrating mirror  
of 80 cm in diameter,  
made of a satellite antenna.  
Glued a kind of chromium tape on it.

I've once tried to run a toy piston steam engine  
(with a normal boiler) with that mirror.  
It works well.

Of course this kind of solar turbine is quite  
inefficient, however good technology  
we will use for the turbine wheel,  
but that is not necessarily  
a problem. Solar energy is practically unlimited.

The main thing is to make the system cheap and possible to be built with really low level technology so that any blacksmith in developing countries can make it.

The clockwork for moving solar mirror is maybe the trickiest part of the project, but Scheffler lens people have already shown how to make a clockwork simple using mainly bicycle parts.  
(Please see the link provided above.)

- hv

Re: tiny experiments ([none / 0](#)) ([#35](#))  
by James Newton on Wed Aug 27th, 2003 at 11:18:42 AM MST  
([User Info](#))

I'm very interested to see your pictures. I hope you haven't given up on this idea.

One concern I have is to the cost of the turbine and the safety of the high pressure connection between the boiler and the turbine.

Have you considered using an existing motorcycle engine with the intake valve blocked, a standard fuel injector in the sparkplug hole to feed water rather than fuel, and the exhaust valve modified to stay open until top dead center (to avoid pressure during injection). If you apply heat to the head (the fins make that easy) then you should be able to get a nice burst of steam inside the cylinder (designed for high pressure) on each water injection.

That should be easy to try. Just open the head and snap off the intake valve stem with a hammer or grind it down, then adjust the timing so the exhaust valve closes much later and grind off part of the exhaust cam so that it opens at the same time. Bodge some way of inserting the fuel injector into the spark plug hole and wire it to fire at TDC.

[ [Parent](#) ]

Re: Flash steam ([3.00 / 1](#)) ([#1](#))  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Thu Jun 26th, 2003 at 10:44:43 AM MST  
([User Info](#))

I had a similar design drawn up.

It was a simple engine that on the top of the piston, was a little thing that would poke a ball valve on top of the cylinder head. The boiler was simple, I tank of water that would have a one-way valve going in for air inlet so no vacuum was drawn, a tube leading from the bottom of tank with a one way valve going out, and the tubing would make a small coil at the heat source. The tubing from the tank to the heat source would be heatsinked, and so what happens is the water flows into the coil, instantly vaporized, gets pushed out in both directions from coil (to the tank, and away to engine) it cannot go into the tank and immediately gets cooled by the heat sinks. a vacuum is drawn that sucks up water instantly into the coil again and the process works the same. Also the tubing going to the engine should have a ballast so that the steam output is more even and not the usually putputting from the coils. Those little putput boats that you would put a candle under the coil and they would put around work on the same principle.

-Andrew

Re: Flash steam ([3.00 / 1](#)) ([#9](#))

by E man on Thu Jun 26th, 2003 at 06:55:43 PM MST

[\(User Info\)](#)

Hannu-

You just opened up a whole new can of corn. Check out:

<http://www.gov.on.ca/OMAFRA/english/crops/facts/93-023.htm>

Sounds great for Winter heating.

Thinking outside the box...but half in the bag.

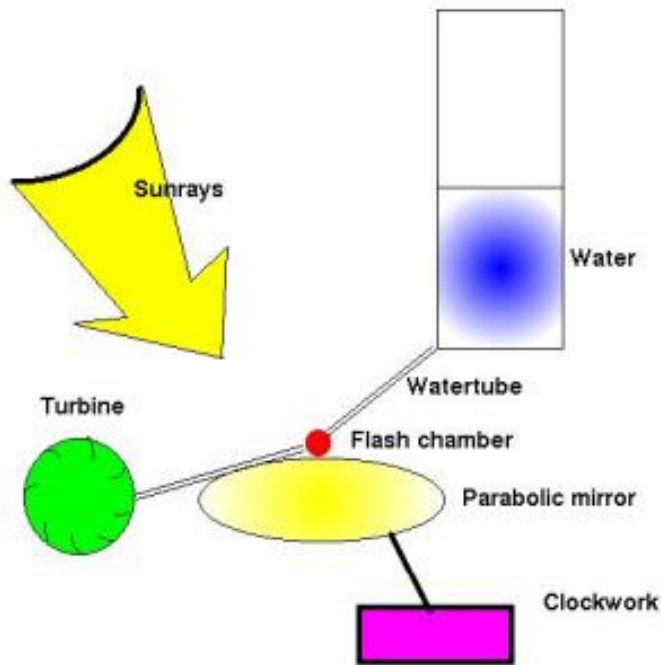
E-man

Re: Flash steam ([3.00 / 1](#)) ([#14](#))

by hvirtane on Fri Jun 27th, 2003 at 05:20:56 AM MST

[\(User Info\)](#) <http://www.cc.jyu.fi/~hvirtane/cooker/>





The above is my very rough picture of a solar flash steam turbine.

I simply got enough of drawing with a computer and wanted to put the main idea first here. I will make better pictures later.

#### DESCRIPTION:

##### Part A.

1. There is water in the container. In the bottom of the container there is pressure, because of the gravitation forces. A water tube starts from the bottom of the container.
2. Sun rays hit the parabolic mirror 3. The available power from the Sun is about one kW per one square meter.
3. The parabolic mirror of 2 square meters reflects all the sun rays hitting the mirror to the chamber 4. The water from the tube goes inside the chamber.
4. The flash steam chamber is finned inside with spiral fins so that the water coming in

is effectively suddenly heated.

There is needle valve letting the water in the chamber from a small hole.

The chamber is made of ceramic at least outside, so that it can be heated by the parabolic mirror more than 1000 C hot.

The chamber is expanding inside towards the outlet end. Inside the chamber flash steam is generated.

5. The flash steam coming out from the chamber hits a crossflow turbine made of ceramic. The crossflow turbine runs a generator.

--

#### Part B.

The parabolic mirror is arranged to be turning round on an axle, which is on the same angle as the axle of the earth.

There is a clockwork to move the mirror so that it all the time focuses in the chamber.

--

#### DISCUSSION:

1. The main power is coming from the Sun.
2. Water gravity is used to jet the water inside the flash steam chamber.
3. No big and complex boilers are needed for this kind of steam turbine.
4. This solar flash steam turbine is simple to build even in rural workshops,

if ceramic craftsmanship is known in the area and somebody teaches the right shape of the mirror (parabolic), which can be made of cement using small mirror pieces as reflectors.

Reflectors can be made quite easily by pressing machinery from steel as well:

--

5) The electric energy available out of the process?

a) As told above, there is about one kW heat energy available for one square meter from the sun.

It is quite safe to assume that we can arrange more than 50% of the sun rays' heat energy

to be absorbed as heat energy in the chamber body.

b) All that heat can be transferred into the flash steam heat and kinetic energy, because the energy cannot escape other way?


c) A simple crossflow turbine generator can be made maybe 20% effective.

---

So if our mirror is  
2 square meters,  
we might expect  
200 watts from the turbine?

- Hannu

Re: Flash steam ([4.00 / 1](#)) ([#15](#))  
by JW on Fri Jun 27th, 2003 at 10:18:07 AM MST  
([User Info](#))

 I like this idea because it incorporates the tall water towers. These water towers will receive sunlight from all angles of the sun's travel. Hence the only need for tracking is for the flash tube. And I believe these towers can accumulate allot of energy. Its definitely something to work with. If these towers are of significant height the solar reception qualities will improve. Also the pressure on the water should be significant. However at the top of the column you will most likely have some issues. Due to convection circulation. but it would be interesting to learn from such a device if it worked or not. I'm not quite sure how to deal with the exhaust from the turbine. Or how to get the water back in the towers. often solutions present themselves with diligence and discovered options. JW-

[ [Parent](#) ]

Re: Flash steam ([4.00 / 1](#)) ([#16](#))  
by JW on Fri Jun 27th, 2003 at 10:54:05 AM MST  
([User Info](#))

I've been throwing stuff across my office since I realized I spelled Hannu's name wrong, Please forgive me it was unintentional.

[ [Parent](#) ]

Re: Flash steam ([4.00 / 1](#)) (#18)  
by hvirtane on Sat Jun 28th, 2003 at 02:38:21 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

Hello,

don't worry.

It happens to many people.

My late aunt's name was 'Hanna'.

By the way 'Virtanen' is the most common surname  
in Finland.

Hannu is a quite common first name as well.

So there are hundreds of 'Hannu Virtanen'  
is this country.

If you want to correct it on the board,  
you can do it easily I think.  
You make the correction on  
the original, which you've got  
upload it with the same name as the original  
replacing the original.  
Then it is there?

- Hannu

[ [Parent](#) ]

Re: Flash steam ([4.00 / 1](#)) (#17)  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Fri Jun 27th, 2003 at 08:28:20 PM MST  
([User Info](#))

Looks promising.

I like the idea of using the water towers as solar collectors to build up some small pressure before the flash tube. The valve is a great idea, as it simply lets some low pressure water squirt in, and when the water flashes, it seals shut. Its a great idea. Looks promising. Might try and build a small solar flash boiler for fun.

Although I would reccomend some heat sinks installed before the valve to simply draw a slight vacuum at the valve. (as pointed out in my idea above.)

Also, I have seen solar boilers before that incorporate a darkend tube running through a focal point of an elongated parabla. (I think the Mojave desert solar thermal power plants runs this way)

-Andrew

[ [Parent](#) ]

Re: Flash steam ([4.00 / 1](#)) ([#19](#))  
by troy on Sat Jun 28th, 2003 at 08:50:07 AM MST  
([User Info](#))

The big advantage of parabolic trough collectors is that they only have to be tracked in one axis, in comparison to a parabolic dish collector which must be tracked in both altitude and azimuth. Plus the boiler/heater tube in a trough collector sees less photons and heat per square centimeter, reducing the need for exotic high temp materials that still have good heat transfer qualities. Furthermore, a very good approximation of a parabolic trough can be made using plywood ribs and aluminum foil or mylar, so the cost becomes very inexpensive. For something more durable, the trough may be made of many 1.5" wide strips of glass mirror mounted on parabolic ribs.

Best Regards,

troy

[ [Parent](#) ]

Re: Flash steam ([3.00 / 1](#)) ([#20](#))  
by Anonymous Hero on Sat Jun 28th, 2003 at 10:58:46 AM MST

I think if you can keep that parabolic mirror on the focus point (ball flash chamber) at 1000 degrees or close, you might not need a valve at all. The flash explosion would both spin the turbine AND back the water up for a brief moment. Who knows? anyone?

[ [Parent](#) ]



Re: Flash steam pictures (2.00 / 1) (#21)  
by hvirtane on Sat Jun 28th, 2003 at 03:47:35 PM MST  
(User Info) <http://www.cc.jyu.fi/~hvirtane/cooker/>

I changed the original  
hand drawn picture for a computer made  
rough picture.

The original 'hand made picture' is still  
among my picture uploads.

How to draw this simple picture easily with  
my computer I learnt from JCP.

- Hannu

[ [Parent](#) ]

Re: Flash steam (3.00 / 1) (#22)  
by hvirtane on Sun Jun 29th, 2003 at 05:21:00 PM MST  
(User Info) <http://www.cc.jyu.fi/~hvirtane/cooker/>

I started to think that there should be first  
(after the water pressure tank)  
a parabolic trough mirror heater to heat the water.

There would be a ball valve  
to stop water going back, if it starts boiling in that area.  
So there would be already some real steam power for the  
flash chamber.

Then there would be the real flash chamber, heated with  
a point focusing parabolic mirror. The water would  
come in trough a small hole, with a needle valve.

The focusing mirror can be going around  
with the same clockwork and axle as the trough mirror.

-----  
To Troy:

If a point focusing parabolic mirror is moving the same  
way as a trough mirror we have no need to  
track it with altitude and azimuth?

-----

How to make parabolic mirrors cheaply even in rural areas, there are many drawings, if you look at my pages with my 'user info'.

More drawings are available for example here:  
<http://www.solarcooking.org/>

-----

How to pump water high up?

Maybe the best way is to use solar.  
I've given some ideas how to build simple solar pumps earlier.  
Please look at my earlier comments.

- Hannu

Re: Flash steam ([4.00 / 1](#)) (#23)  
by troy on Mon Jun 30th, 2003 at 03:08:51 PM MST  
([User Info](#))

Any dish mirror that brings the sun's rays to a single point focus must be tracked in two axes very precisely, just like a telescope, which, come to think of it, uses a parabolic dish mirror.

The parabolic trough only needs vertical tracking, as the focal "point" is a long tube, so it doesn't matter where on the receiver tube the sun hits, so that lets you out of dual axis tracking.

Best regards,

troy

[ [Parent](#) ]

Re: Flash steam ([4.00 / 1](#)) (#24)  
by hvirtane on Mon Jun 30th, 2003 at 04:45:05 PM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

"Any dish mirror that brings the sun's rays to a single point focus must be tracked in two axes very precisely, just like a telescope, which, come to think of it, uses a parabolic dish mirror."

Please see:

<http://www.geocities.com/davidmdelaney/scheffler-precis/scheffler-precis.html>

An extract from that text:

-----  
The optical system of Scheffler's community solar cooker forms a heliostat. An article on heliostats in the eleventh edition (1910) of the Encyclopaedia Britannica defines a heliostat as "an instrument which will reflect the rays of the sun in a fixed direction notwithstanding the motion of the sun. The optical apparatus generally consists of a mirror mounted on an axis parallel to the axis of the earth, and rotated with the same angular velocity as the sun."

The heliostat of Scheffler's cooker comprises a primary reflector, a secondary reflector, and a clockwork powered by gravity or photovoltaic panels. The primary reflector produces a converging beam of sunlight aligned with an axis of rotation which is parallel to the axis of the earth, and which passes through the centers of both reflectors. The clockwork rotates the primary reflector around its axis of rotation at a rate of one revolution per day, keeping the reflected beam aligned with the axis of rotation as the sun moves. The fixed secondary reflector reflects the beam from the primary reflector onto a cooking pot or frying surface.

-----  
This kind of movement needs seasonal adjustments, however. The movement around the axis must be precise of course.

Scheffler reflectors are providing an example, which kind of simple powerful solar devices can be constructed. Even a 'normal' small steam engine boiler can be powered with these reflectors, of course.

- Hannu

[ [Parent](#) ]

experiments? (3.00 / 1) (#26)  
by hvirtane on Fri Jul 4th, 2003 at 05:33:30 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

In my opinion the problem  
is to make it cheaply and simple.

I'm not intending to make now any 500 kW power, but  
about 50 W - 500 W power.

Because sunshine is

(still, it might happen that big American companies  
will try to patent sunshine? <grin>)

free, the machinery doesn't need to be so  
efficient,

built cheaper than PV cells and possible to make  
in rural conditions.

-----

In my idea the water would come injected  
inside of a really hot  
chamber (about 1000 degree),  
where it instantly becomes steam, which  
goes into the turbine.

I got the idea to use ceramic (or stone) inside Sauna.

You ever go to any Finnish Sauna?

In a sauna there is a container ('Kiuas')  
with stones, which are made  
hot by a fire or by electricity.

You pour water on the stones, and  
steam is coming out.

(The air temperature inside sauna is normally  
about 80 degrees Celsius.)

The stones are generally about as hot  
as red hot iron.

Yes, I know about a problem with most metals  
and 'red hot'.

Normally a barrier of hot steam between water  
and metal stops steam formation if the metal is too hot.

This is the reason I suggested using ceramic or stone chamber and injecting the water inside. Injecting the water with reasonable pressure might solve that problem with metals. too.

Even if stones in a 'kiuas' are as hot as you can ever get them, it produces steam very effectively. In an electric sauna kiuas there are red hot electric resistors, in between the stones. It produces steam very effectively, you have no need to inject the water in. You just pour it on the stones. The water makes many many movements in between stone pieces, before it is all steam.

Many people probably got all the necessary machinery to try it.

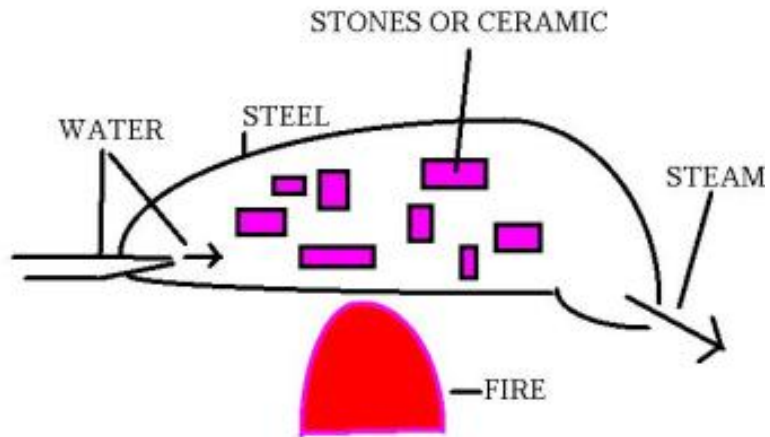
You might try with a quite big chamber made of reasonable good steel, put in stones or ceramic pieces (for example broken wares from your kitchen will do). Lead a pressurized water pipe in with a small pipe hole. Heat first the chamber outside red hot for half an hour.

Make the chamber body shaped such a way that the steam has a way to escape from the other end so that it produces a good flow of steam.

You certainly can produce steam this way. If it is cost effective, I don't know yet.

Here is a very rough picture of the concept





To refine the concept I think that the first thing to do is to make an adjustable needle valve for the water injection.

Hannu Virtanen  
hvirtane@cc.jyu.fi

P.S.

Did you see those homepages (User info) of mine?  
Including pictures from Nepal?  
It is possible to make good  
parabolic mirrors even in rural conditions.

Re: experiments? (2.00 / 1) (#27)  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Fri Jul 4th, 2003 at 01:16:18 PM MST  
([User Info](#))

Thats Ingenious!

I was thinking on just that on how to solve the problem of water just "skating" off.

I think a mesh of ceramic coated wire inside the flash chamber would be effective. (like steel wool) The problem now will be how to conduct heat rather quickly from the outside edges to the inside ceramic. (I have no idea on the thermal conductivity of ceramic)

-Andrew

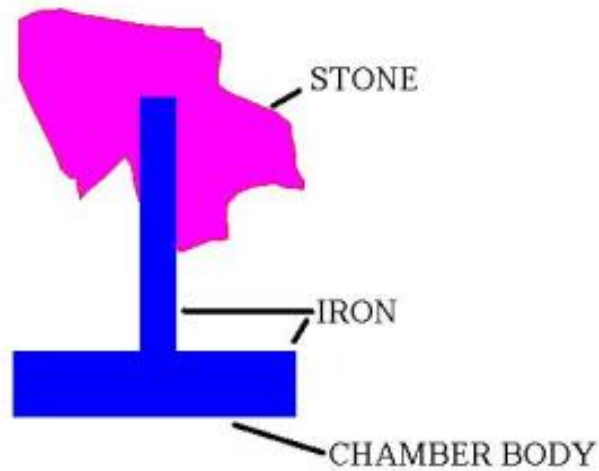
[ [Parent](#) ]

Re: experiments? (3.00 / 1) (#28)  
by hvirtane on Sat Jul 5th, 2003 at 05:07:28 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

"I think a mesh of ceramic coated wire  
inside the flash chamber would be effective.  
(like steel wool)  
The problem now will be  
how to conduct heat rather quickly from  
the outside edges to the inside ceramic."

You are probably right.  
It is a problem.

Your design is something similar  
I've got in my mind.  
We might make holes in some  
stones, but iron bars inside,  
weld the bars on the container body?



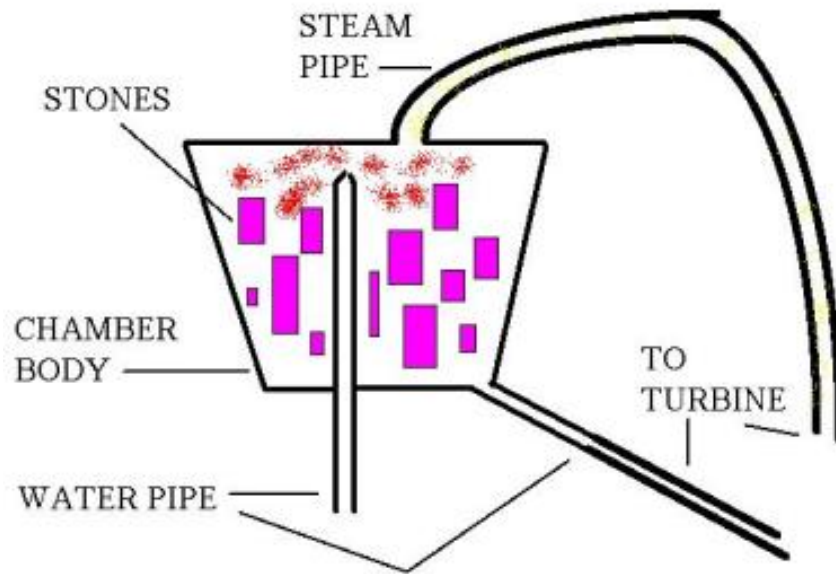
My design idea is coming directly from sauna kiuas. With electric kiuas the hot iron resistors are there in between the stones. They are conducting heat to various places in the stones.

With a fire wood kiuas the fire is under the stones, the water is poured on the top. Some of it boils directly on the top. Some of the water goes further deep in between the stones. Finally all the water becomes steam anyway.

It might be better to design the chamber such a way that the water is injected on the top of the stones, and the steam could go out from the top only?

We can make in the water heat and pressure enough already in the in coming water so that it comes inside the chamber as flash steam?

Some water maybe could escape from the bottom of the chamber as well, because we can maybe design the turbine such a way that it can accept both steam and water?



I'm thinking that we should just somehow transmit the all the heat to the water coming in so that the heat energy is there in the water and the steam coming out to the turbine.

Then we could use the heat still coming out from the turbine to power a heat pump to get the water back to the water tower?

- Hannu

[ [Parent](#) ]

Re: experiments? (2.00 / 1) (#29)

by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Sat Jul 5th, 2003 at 06:22:54 PM MST  
([User Info](#))

I would think that you would get more pressure if you went with a long and skinny chamber. It would vaporize the water in the front, and would be superheated along the way out by the rocks in front of it. As the pressure would increase, you would need the longer chamber because it would be too cool for steam because water boils hotter and higher pressures. Regarding the heats transmission. I was thinking that instead of drilling one hole in the rocks, just drill many smaller holes in the rocks (as much as you can) and weave a small iron or steel wire (6 guage?) through it. You would get more uniform heating as there would be more surface area covered. -Andrew

[ [Parent](#) ]

Re: experiments? (4.00 / 1) (#30)  
by hvirtane on Sun Jul 6th, 2003 at 02:12:17 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

I think that you are right.

a)

A long and skinny chamber is probably better.

b)

And we need enough surface to transmit the heat from the chamber body to the stones.

It is a matter of experimenting concerning the right dimensions.

And it might work quite well, if we just make quite many bars inside the chamber, welded inside the container, but not fixed on the stones? Because electric sauna kiuas works this way.

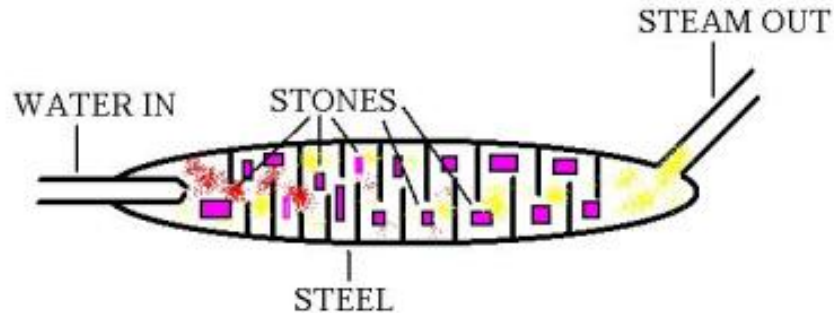
-----  
I'm trying to keep the pressure quite low and to use as low level technology as possible so that we could beat PV cells in price and power.

I'm trying to make this using 'village technologies'. For example in India and in Nepal I have seen that common blacksmiths in rural villages and in small towns are very very skillful (because many of them represent a tradition of the same 'clan', 'caste' or 'extended family' hundreds of years old) , but they are lacking modern materials and tools.

We people as well often are lacking the most



sophisticated tools and materials and in general normal 'self-made people' or school-educated engineers in the western world are far less experienced using their hands than village blacksmiths of the 'East' or of Africa'.  
-----



Concerning the chamber body itself.  
Maybe the easiest low level technology would be to use cast iron?

But the problems include

- a) welding on it is difficult.
- b) it rusts quickly if heated red hot.

So maybe the best would be to use a steel pipe?

The next problem is how to get the bars inside and...

Maybe we need to cut it open with an angle grinder, weld the bars, put stones in and weld it together?

Or we might just put in mixed steel bars and stones?

Concerning the water columns.

I think that it would be easiest to use normal black painted pipes.

- Hannu

[ [Parent](#) ]

Re: experiments? (4.00 / 1) (#31)

by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Sun Jul 6th, 2003 at 01:04:20 PM MST  
([User Info](#))

Your idea of iron is not a problem. First simply make a "half cast" of the chamber, and then forge it twice. On the inside simply weld or braze small iron bars. As many as you can. Next have one of the villagers mix up some clay or ceramic type mix. Simply paint the iron bars and the inside of the chamber as much as you can cover. Do this with the other half as well. Welding shouldn't be a problem if the ceramic has time to harden. Weld the halves together. For your water towers, gravity will be fine. Do not paint them black as you could get too much pressure that it could force open the intake valve prematurely. As for the efficiency. I don't think you can beat pv cells. This machine at MOST will be about 20% efficient. Simply because of the thermal losses of the chamber, the turbine only being pulsed by steam, and not continuous flow. (Probably compansate for this by adding a large flywheel.) The longer the chamber the better. A coil type chamber would be ideal. This is how I made mine. About 2 or 3 turns.

Now on the design....

Put the intake poppet valve right near the water towers (ball valve could work too). Add heat sinks (as much as you could machine or weld, etc.). When the high pressure steam shoots out both directions, it will head toward the chamber. It will approach the valve, and then cool off. It will draw a vacuum when cooling off forcing more water in the chamber. (The neat part about this design is it needs no water towers for pressure, it can intake the water straight up, vertically, which means that instead one could simply put the intake hose in a small pond or lake, etc) If you put the valve right next to the chamber it will not work like this. You WILL need water towers. As for your turbine.... A simple pelton wheel type turbine will be excellent. You will probably need access to a lathe, as balancing this will be a pain. (you are spinning at many tens of thousands of rpm) I got my little pelton wheel to about 22,000 rpm. Everything else looks fine. (if there is anything else)

-Andrew

[ [Parent](#) ]

Re: experiments? (5.00 / 1) (#32)

by Anonymous Hero on Mon Jul 7th, 2003 at 04:50:20 AM MST

I think if he returns to the smaller flash box and stays with solar mirror, it will again be 80% efficiency or higher. Also pulsing a turbine, instead of steady stream, is not going to be a problem for what he intends. You don't need 100,000 rpm, or even 22,000, to generate 1000 watts. At \$3.50 a Watt (Solar Panels) that is roughly \$3,500. If you can make this cheaper by keeping it simple you'll be better off than panels. Any needed valves can be found at a Boiler supply web site. You need nothing in the (small) chamber, no rocks or pipe. The air inside the chamber will be over 600 degrees. The water will not skate anywhere, the air alone will flash steam it. Cheers

[ [Parent](#) ]

Re: experiments? ([4.00 / 1](#)) ([#33](#))  
by hvirtane on Mon Jul 7th, 2003 at 05:54:36 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

-----  
Andrew:  
Your idea of iron is not a problem.  
First simply make a "half cast" of the chamber,  
and then forge it twice.  
On the inside simply weld or braze small iron bars.  
-----

- Hannu

You mean that after twice forged it will be easy  
to weld? I will consult my friends, who work  
for a very big foundry here.

-----  
Andrew:

As many as you can.  
Next have one of the villagers mix up  
some clay or ceramic type mix.  
Simply paint the iron bars and the inside  
of the chamber as much as you can cover.  
Do this with the other half as well.  
Welding shouldn't be a problem  
if the ceramic has time to harden.  
Weld the halves together.  
-----

- Hannu

Don't you think we should fire the whole thing  
in a kiln

after welded together?

-----  
-----  
Andrew:

For your water towers, gravity will be fine.  
Do not paint them black as you could get too  
much pressure that it could force open the intake  
valve prematurely.

-----  
- Hannu

Yes. One of the main problem will be to control the  
pressures.

I'm thinking that we might make the chamber that way  
that the steam starts flowing out fast  
and even creates a bit  
suction. If we make the chamber to expand towards  
the turbine and make it like a spiral inside?

-----  
Andrew:

As for the efficiency. I don't think you can beat pv cells.  
This machine at MOST will be about 20% efficient.  
Simply because of the thermal losses of the chamber,  
the turbine only being pulsed by steam,  
and not continuous flow.

-----  
- Hannu

Yes I think that we have got two possibilities for the  
design:

1. a pulsing steam system or
2. a continuous flow

system.

I'm trying to design this power system to be  
as much as possible 'village technology',  
'self-made'  
so that the cost in money would be low.  
PV cells you cannot make  
in a village easily, so they cost money.  
The cost will then depend heavily on the  
salaries of the local hired people, like blacksmiths.  
I'm thinking that some engineers in India, in Nepal,...  
could try making something like these  
in small villages there.

I agree that concerning how effectively we are using solar radiation, good PV cells are already hard to beat.

---

Andrew:

(Probably compensate for this by adding a large flywheel.) The longer the chamber the better. A coil type chamber would be ideal. This is how I made mine. About 2 or 3 turns.

---

You already made one???  
You seem to be very fast.  
Please describe more!

---

Andrew:

Now on the design....  
Put the intake poppet valve right near the water towers (ball valve could work too).  
Add heat sinks  
(as much as you could machine or weld, etc.).  
When the high pressure steam shoots out both directions, it will head toward the chamber. It will approach the valve, and then cool off. It will draw a vacuum when cooling off forcing more water in the chamber.  
(The neat part about this design is it needs no water towers for pressure, it can intake the water straight up, vertically, which means that instead one could simply put the intake hose in a small pond or lake, etc)  
If you put the valve right next to the chamber it will not work like this.  
You WILL need water towers.

---

- Hannu

I agree that making a pulsing steam flow would be easier to make.

Could you, please describe a bit more your 'heat sinks' concept?

---

Andrew:

As for your turbine....



A simple pelton wheel type turbine will be excellent.  
You will probably need access to a lathe,  
as balancing this will be a pain.  
(you are spinning at many tens of thousands of rpm)  
I got my little pelton wheel to about 22,000 rpm.

-----  
- Hannu

You think that a pelton wheel might work better than  
a simple crossflow?

Are you running your pelton with this  
steam system already???

-----  
Andrew:  
Everything else looks fine. (if there is anything else)

-----  
Thank you a lot  
for your very good contributions!

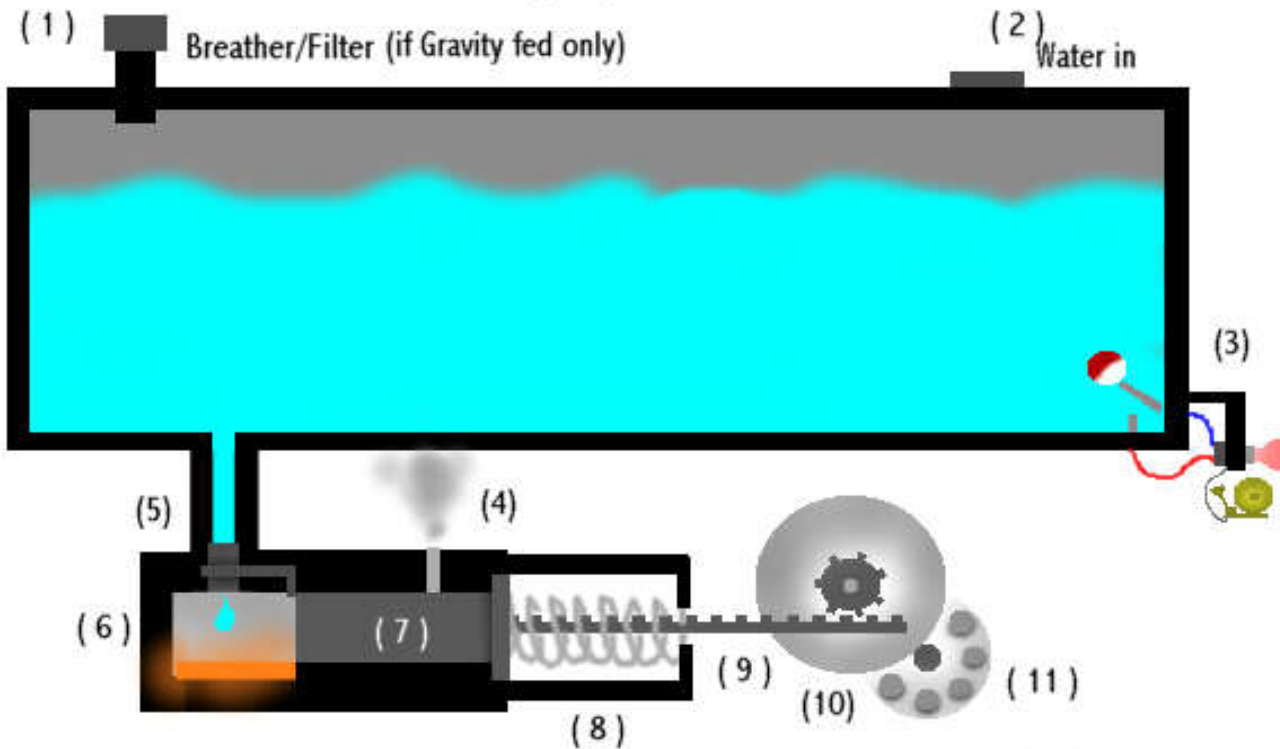
I've informed about this site some  
of my friends in Nepal and in India , too.  
Maybe some of them would start making  
these things.

- Hannu  
-Andrew

[ [Parent](#) ]

Re: Flash steam ([2.00 / 1](#)) ([#2](#))  
by Johnny Cool Pants on Thu Jun 26th, 2003 at 11:16:21 AM MST  
([User Info](#))

## Flash Steam Design by Kevin Charles Perkins



1. Breather if using gravity feed only.
2. Water in
3. Low water warning system
4. Exhaust, Note: If using pressure feed with gravity feed, the exhaust can heat the tank creating some pressure in tank, with breather closed.
5. Valve, works like camera shutter upon piston return.
6. Flash steam chamber heat box.
7. Piston
8. Some kind of piston return mechanism (just drawing a spring for now)
9. Rod with gear teeth driving a clutched flywheel.
10. Clutch gear flywheel.
11. Magnet wheel for generator.
12. Line 'em up!

I was fooling around with a different kind of drive system so the flywheel could spin freely and faster having nothing to do with returning the piston. Only where you see the "spring piston return" I would try to use an air pocket that the piston compressed when fired, thus the air pressure in the air pocket would return the piston when the steam escape through exhaust port.

The thing is, when the air pocket gets hot it may have an expanding mind of it's own, this could be countered by designing it to accomidate a set known running temperature. In anycase, a number of things can be used for piston return but I feel some sort of air pocket could last longer than replaceable springs. Bugs can be refined out of any system.

Johnny Cool Pants.

Re: Flash steam ([2.00 / 1](#)) ([#3](#))  
by Johnny Cool Pants on Thu Jun 26th, 2003 at 11:22:52 AM MST  
([User Info](#))

PS

If you get the flywheel running smooth, this can also be designed to fire the piston only once every ten seconds, with a delay on the shutter, so that even less energy would be needed in keeping the flash box coil at a maintained temperature.

JCP  
AKA Kevin

[ [Parent](#) ]

Re: Flash steam ([1.00 / 1](#)) ([#6](#))  
by xeroid ([centurion27@lycos.com](mailto:centurion27@lycos.com)) on Thu Jun 26th, 2003 at 02:18:12 PM MST  
([User Info](#))

Hmmmm... This is an interesting concept.

Thanks for posting the idea. I'd be interested in hearing about any experiment results. I'll bet this will spark off some experiments!

Burning cow corn, eh?

Hmmmm...

Regards,

Xeroid, a.k.a. Bill.  
Regards, XEROID.  
[ [Parent](#) ]

Re: Flash steam ([4.00 / 1](#)) ([#10](#))  
by Johnny Cool Pants on Fri Jun 27th, 2003 at 12:08:52 AM MST  
([User Info](#))

Yeah Xeroid/Bill,

I was in the Midwest not that long ago and while we were there we drove out to Amish country to look foolish with our cameras, but anyway I went off on my own and was watching these guys work in the field right next to the jelly shop and stuff.

And they were using an old steam engine about 3 foot high or so, for threshing, (spelling?) anyway that thing had to be 100 years old, still running. Yeah they burn the cobs, use the husks, whatever, I don't think anything goes to waste on those farms.

E-man,

I thought I had posted something here earlier but don't see it so must have hit "Preview" and bailed. Anyway it was in response to E-man and the steam ball rocket car. 300 MPH in the quarter mile, from a 2 foot round metal ball filled with water and heated.

This means you can launch a heavy weight (aerodynamic so it goes further) up a quarter mile rail, and that heavy weight can slowly come all the way back down the rail geared to spin a fast fly wheel or genny the whole way back down, or pump water, etc.

I know quarter mile rail kits are hard to come by, and the quarter mile flag poles even harder but I'm thinking of the energy used to heat the two foot ball, and how much you would get out of a turbine with the two foot ball, vs. the weight of that rail car geared to slowly roll all the way back down, while spinning a genny fast.

6 of one half a dozen of the other, but when calculating momentum of the launch at 300 miles per hour, that weight is still flying up the rail quite a distance after it has expended it's ball.

That extra distance is generation power all the way back down. It might prove more efficient than using the 2 foot ball of hot water to run a turbine for a short time. Yep.

JCP

[ [Parent](#) ]

Re: Flash steam ([3.00 / 1](#)) ([#12](#))  
by Johnny Cool Pants on Fri Jun 27th, 2003 at 01:46:26 AM MST  
([User Info](#))

I didn't intend to burn corn for this flash steamer but I suppose it could be done. I was thinking electric coil, the hot spot is small enough, maybe even friction heat. A lot of possibilities. Hannu is talking "Solar" The parabolic mirrors he's talking about can focus 1000 degrees, way more than enough. But if you're on a corn farm, use what ya got.

JCP

[ [Parent](#) ]

Re: Flash steam ([2.00 / 1](#)) ([#7](#))  
by hvirtane on Thu Jun 26th, 2003 at 04:54:33 PM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

To make a simple and cheap  
water/solar technology flash steam  
machine.

My general idea is as follows:  
I will later try making a picture of it.  
(At present it is past midnight here.  
Just came back from seeing my friend, who  
is very good at building small steam engines....)

(JCP's picture is really cool.)

1) The water pressure is generated  
by gravity (and maybe air pressure)  
in a water container on the top  
of the valve.  
(Pumped up by solar pumps... or by this machine itself)

2) Water is coming out of the container  
through a small needle valve,  
which can be adjusted and  
can as well close itself from the hot side, by



a big pressure.

3) Water goes into a tube,  
inside of it there is a spiral structure,  
the tube is expanding towards the turbine,  
the tube is made of ceramic.

4. In the ceramic tube flash steam is generated.

5. The flash steam goes into a steam turbine wheel.

(Maybe a simple crossflow 'Banki' turbine.)

6) The ceramic steam tube is heated  
by a solar parabolic trough mirror.  
About 1000 C degrees.

Something quite similar as my drawing here:

<http://www.cc.jyu.fi/~hvirtane/through.jpg>

-----  
So my concept is actually quite near to  
the concept of JCP.  
But instead of a piston engine, a steam turbine.

I think that it is possible to keep the needle  
jet for water flow open all the time.  
No valve closing mechanisms.  
What do you think?

Who would try to build one?

- Hannu

Re: Flash steam (2.00 / 1) (#8)  
by troy on Thu Jun 26th, 2003 at 05:33:02 PM MST  
([User Info](#))

I always liked a nice external combustion machine, less noise, less pollution, and potentially more efficient because the combustion process is both more complete and more controlled. And they'll generally run on anything that combusts nicely.

So this would apply to live steam, flash steam, stirling and other similar external combustion units.

Best Regards,

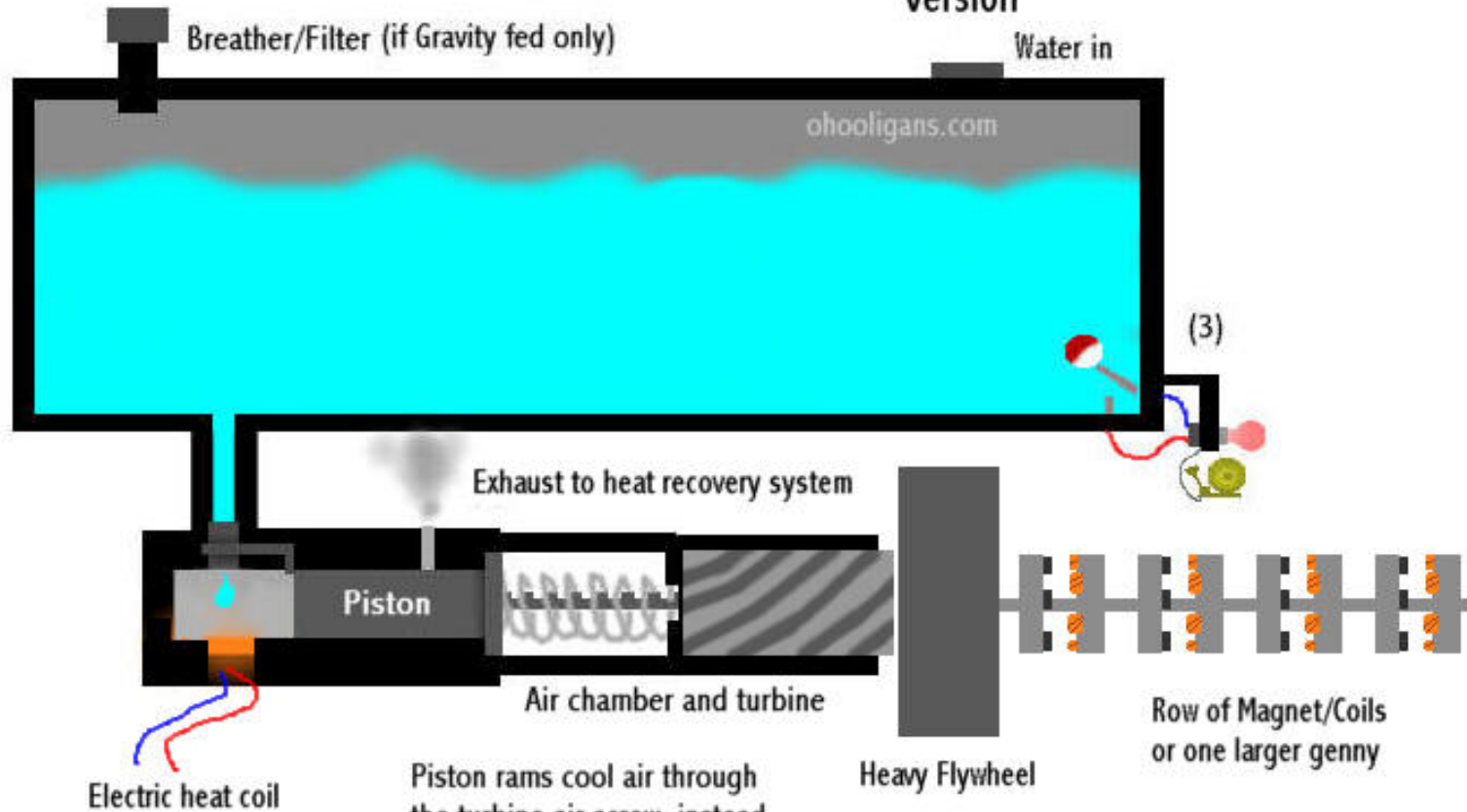
troy

[ [Parent](#) ]

Re: Flash steam ([2.00 / 1](#)) ([#11](#))  
by Johnny Cool Pants on Fri Jun 27th, 2003 at 01:33:16 AM MST  
([User Info](#))

Okay, here is my "Turbine" version only I'm using a piston AND a turbine in this design, the piston ramming forced air through the turbine instead of steam.

# Flash Steam Design by Kevin Charles Perkins (Piston/turbine) version



Piston rams cool air through the turbine air screw, instead of steam. With good flywheel, the piston need only fire once every 10 seconds. That will allow coil to maintain it's temperature with ease.

1/2 the power to run this machine is the little heat coil. The other 1/2 is the water's reaction (explosion)  
If this machine can keep it's tiny coil hot, it is providing 1/2 it's power source. (Not "Overunity")

Just nothing out of cool pocket.

JCP

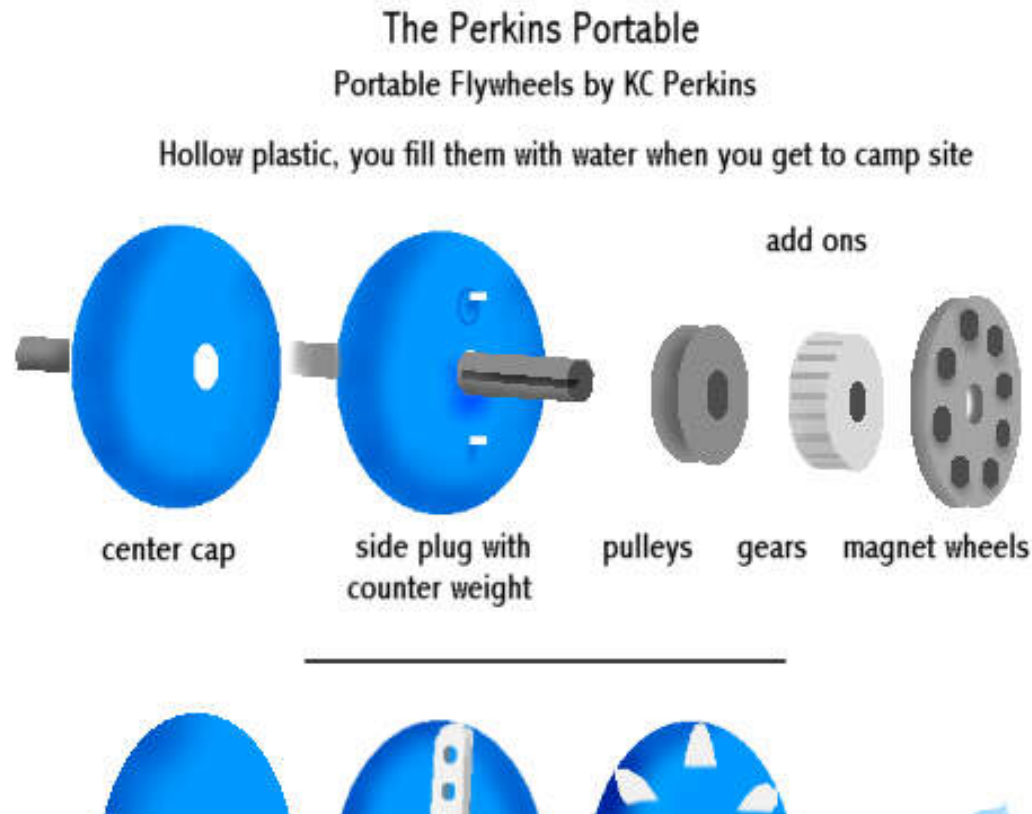
Re: Flash steam (3.00 / 1) (#13)  
by Johnny Cool Pants on Fri Jun 27th, 2003 at 01:58:36 AM MST  
(User Info)

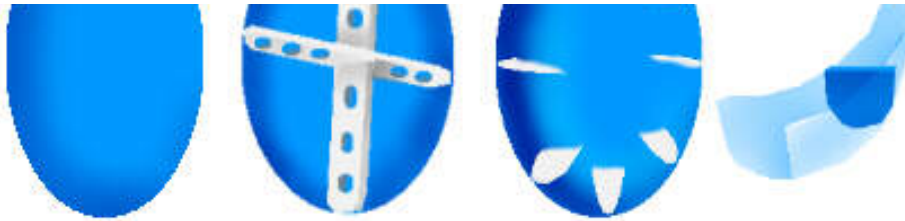
Oh yeah, also run a little air tube from somewhere in the ram air turbine action to the main water tank, to provide adequate pressure inside the tank, to maintain a good water injection on the heat coil. build, build, build,

JCP

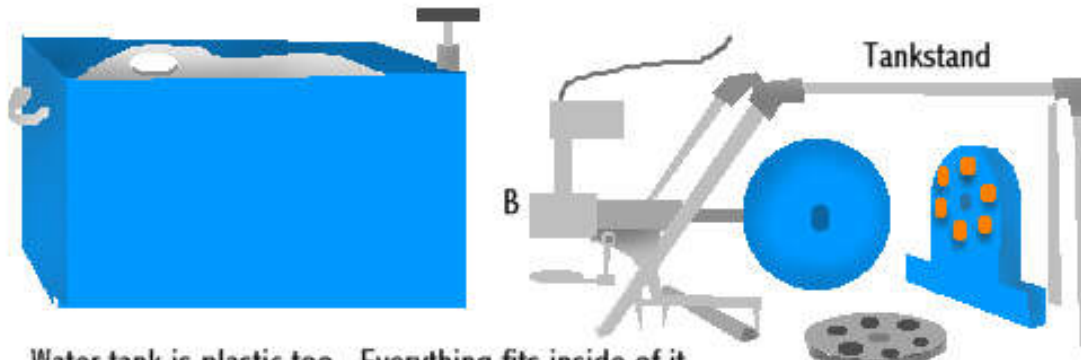
[ [Parent](#) ]

Re: Flash steam (5.00 / 1) (#25)  
by Johnny Cool Pants on Thu Jul 3rd, 2003 at 04:59:26 PM MST  
(User Info)





Inside, one will have nothing for easy start up, others will have paddles for immediate power (larger machine)



Water tank is plastic too. Everything fits inside of it for transport, including separate bladder and hand air pump in case one is having problems with gravity feed water. When the tank is on the tankstand you can stick the rear end of the Flash Steamer (B) into the camp fire slightly, or use waste oil, a can of sterno, some propane, what ever. The Perkins flash steam will give way more power than a Stirling engine on the same flame. (This is s a generator) These Ecology Friendly Perkins Portables will be different sizes, up to 7 hp.

[ [Parent](#) ]

[Flash steam](#) | 35 comments (34 topical, 1 editorial)

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### [methane carburator conversion](#)

By [Anonymous Hero](#), Section [Remote Living](#)  
Posted on Tue Jun 17th, 2003 at 08:44:29 AM MST [Bio-Fuels](#)

Does anyone know anything about methane carburator conversions

On this site . I would like to link up with someone who uses methane in their car motor or even a 2 stroke motor if that is even possible Thanks

[methane carburator conversion](#) | 3 comments (3 topical, 0 editorial)

Re: methane carburator conversion ([none / 0](#)) ([#1](#))  
by jubalearly on Tue Jun 17th, 2003 at 09:17:22 AM MST  
([User Info](#))

Do a search for natural gas conversions. Natural gas is mostly methane, and you would want the same carburator and very close to the same settings. In fact, the propane carb should work but it would need different orifice sizes & pressures just like natural gas does in appliances. So your local gas co. or propane distributor may have info on conversions. I'm not doing anything with methane myself, but I am interested at least for information purposes

Re: methane carburator conversion ([none / 0](#)) ([#2](#))  
by DanB on Tue Jun 17th, 2003 at 09:17:38 AM MST  
([User Info](#))

I know very little... so I could be wrong!  
But I think that methane is "natural gas" and it is common especially for large fleets and govt vehicals to run with it!  
So the conversion should be pretty common and straightfoward.

Re: methane carburator conversion ([none / 0](#)) ([#3](#))  
by troy on Tue Jun 17th, 2003 at 01:44:00 PM MST  
([User Info](#))

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You might also do a Google search for CNG or:

Compressed  
Natural  
Gas

There are quite a number of commercial vehicles like busses, service trucks, delivery vehicle that have been converted. I also went on a boat tour of the riverwalk in San Antonio Texas and was surprised that I didn't smell the typical stink from the outboard. AHA, they were running CNG as well.

Natural gas is methane, but not all methane is natural gas. "Natural gas" per se, must have very little in the way of other gasses like CO2, plus it must have odorant added so you can smell it.

Good luck and have fun!

troy

[methane carburator conversion](#) | 3 comments (3 topical, 0 editorial)

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## [Water engine](#)

By [Demetri](#), Section [Weird Science](#)

Posted on Sun Mar 30th, 2003 at 11:22:35 PM MST [Bio-Fuels](#)

Like a diesel, but water instead of #2.

I've got a wacky idea. We all know how a diesel engine works, right? Heat from compression is used to ignite fuel that is injected into the cylinder at the proper time. Now, I was thinking, what about water? An engine that had such high compression that it created a great enough heat that water could be injected instead of diesel. The water would burst into steam when it hit the incredibly hot air inside the cylinder(s), and force the piston down just like exploding diesel would. Wouldn't it? Sure, I can see several problems(bearings that'd stand up to 30:1 compression, lubricating the injector pump, lubing the injectors themselves, yadda yadda), I'm sure you all can too, but who cares right now. Is the idea sound?

[Water engine](#) | 18 comments (18 topical, 0 editorial)

water motor ([none / 0](#)) ([#1](#))

by ru Dave9 on Mon Mar 31st, 2003 at 12:09:37 AM MST  
([User Info](#))

maybe inject water and diesel at the same time

Exothermic vs. Endothermic ([4.00 / 1](#)) ([#4](#))

by Wyomingbob on Mon Mar 31st, 2003 at 01:21:03 AM MST  
([User Info](#))

There's one piece missing from the engine you describe: diesel (or most any hydrocarbon fuel, from coal tar to ethane) generates heat when ignited. Water doesn't. A hydrocarbon is a chain (or in the case of benzene & similar, a ring) of carbon atoms with various doodads hanging off it like legs of a centipede -- mostly hydrogen, a few atoms of oxygen, occasional nitrogen, sulphur, etc. The bonds holding these molecules together are not all that strong: a little external heat applied to them will cause the bonds to break, releasing even more heat, which is a form of energy and can drive a piston. The net reaction is "exothermic," meaning it gives off more energy than it takes on. The hydrocarbon reforms into smaller constituents (NO<sub>2</sub>, SO<sub>2</sub>, CO<sub>2</sub>, CO, etc): it is a \*chemical\* reaction, because the substance changes its identity. Breaking water into H<sub>2</sub> and O<sub>2</sub>, a process called electrolysis, requires vast amounts of energy: the bonds are ionic, not covalent, and quite amazingly difficult to break. The reaction is "endothermic," meaning you put more energy into breaking the bonds than they release

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### Poll

What should we do with DanF's moose?

Make him a co-mascot with Kodiak and Tarmac?

Make him his own solar powered outhouse?

Make him lunch?

Make him OUR lunch?

Who brings the BBQ sauce?

I'm bringing the potato salad.

Yes, I'm really just exploring the poll feature.

Isn't this fun?

One more!

Yeah, I know, we'll let the moose decide what he wants done with himself.

Votes: 19

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upon breaking. It's a chemical reaction, but a net energy loser. But what you describe is not a chemical reaction at all -- it is a physical one, called phase change (solid to liquid, liquid to gas, solid to gas, gas to plasma, etc). Same chemical composition, just a different form. Turning water into steam is always endothermic: it requires a net input of energy, and quite a lot of it. The engine you describe actually gets the phase change exactly backwards: \*compressing\* water vapor will produce liquid water; placing water in a vacuum will \*generate\* water vapor(steam). Try to compress liquid water, and all you'll do is explode the cylinder head -- because liquids are by definition not compressible. If you try to compress a carburated air/water mist, it will turn to water, not steam. You'd burn a huge amount of energy driving the piston & get nothing in return but a dripping exhaust pipe. See Universal Gas Law, a combination of Boyle's and Charles' Laws.

- [More on Bio-Fuels](#)
- [Also by Demetri](#)

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flash steaming ([none / 0](#)) (#10)  
by Johnny Cool Pants on Fri May 9th, 2003 at  
12:24:15 PM MST  
([User Info](#))

What you describe sounds like "Flash Steaming"

Rather than heating an entire boiler to high degree, you just heat a small coil in a chamber and the water is injected onto the coil, the valve closes as the injected water hits the hot coil and flash steams (driving the piston)

I do it on accident with my coffee maker all the time.

A steam engine might not be able to maintain a piping hot full boiler under it's own power according to the "Can't" Patrol (which is false) but it can deffinatly maintain a small hot coil in the piston chamber under it's own flywheel power while turning a few PM gennys at the same time.

A car battery get's it going, then you disconnect the battery.  
Free or near-free energy is everywhere dude.

Water injection is under it's own gravity weight pressure (just a valve at the bottom of a big full room temperature tank and a filtered breather at the top)

Steam water evaporates back into rain, nothing wasted, no polution. A Steam engine can pull a 100 ton freight train, a scaled down model can spin a few PM gennys easy, one to keep the coil hot, the rest to power you home.  
If you listen to the (Power Company "Can't" Patrol) you'll never try it.

[ [Parent](#) ]

Re: flash steaming ([none / 0](#)) (#16)  
by newpath4com on Thu Dec 25th, 2003  
at 09:22:14 AM MST  
([User Info](#)) <http://www.newpath4.com>

Yer on the right track.  
[www.newpath4.com](http://www.newpath4.com)

[ [Parent](#) ]

Newcomb engine ([none / 0](#)) (#2)  
by Wolfles ([wolfles-@-netzero.net](mailto:wolfles-@-netzero.net)) on Mon Mar 31st,  
2003 at 12:22:34 AM MST  
([User Info](#))

Study the Newcomb engine. Watt made it into a  
steam engine. Les

[ [Parent](#) ]

water motor ([none / 0](#)) (#7)  
by Dondos ([docmd@sympatico.ca](mailto:docmd@sympatico.ca)) on Wed Apr 2nd,  
2003 at 12:28:19 PM MST  
([User Info](#))

what about compressed air instead of water  
no problems oiling motor

[ [Parent](#) ]

Re: water motor ([none / 0](#)) (#11)  
by Mike G on Mon Jun 16th, 2003 at 03:06:16 PM  
MST  
([User Info](#))

I think that the energy that was used to compress  
the air (creating the heat) prior to water injection  
would be more than that absorbed by the water (and  
turning it to steam). So, the mechanical energy  
created by the expanding steam pushing the piston  
could not be more than that the energy of  
compression, and would be less, overall, due to  
inevitable losses. You'd need to get MORE mechanical  
energy out, somehow, to make it a continuous cycle.  
It was a thought-provoking idea, though, and one I'd  
never heard. I HAD heard of injecting small amounts  
of water into a convention ICE running on gasoline,  
which converted part of the heat into steam.  
Supposed to actually increase the horsepower, but  
I've never seen it verified.

[ [Parent](#) ]



Re: water motor ([none / 0](#)) (#17)  
by newpath4com on Thu Dec 25th, 2003 at  
09:31:44 AM MST  
([User Info](#)) <http://www.newpath4.com>

You're on the right track. 26 years ago I had a Monte Carlo that was hard to start in winter cold. I read of and rigged a water bottle with oh what's it called an aerator rock for fish tanks anyway. When I turned the big 8 over, air is drawn thru the fizzrock and a 2nd tube from the bottle cap over to a vacuum plug at the bottom of the carburetor drew the mist into the carburetion. It cost all of \$6 to put together. I used a throwaway 2 litre Coke bottle which subsequently collapsed because it wasn't able to withstand the pressure. But that car that took 15 minutes to warm up to where I could pull out into Chippenham Phy. (Richmond, VA) well it was like having a tiger under the hood. The H2O mist was just enough, didn't lock the engine, and definitely increased horsepower. That was a long time ago. More recently I solved the problem of the LN2000 nitrogen engine. It's on my website [www.newpath4.com](http://www.newpath4.com) and [www.newpath4.com/steamedheatengine.html](http://www.newpath4.com/steamedheatengine.html) . It uses the "Flash Steaming" mentioned also to pre-warm the engine so the directly-injected nitrogen does not freeze the engine, losing power...

[ [Parent](#) ]

Hrm . . . ([none / 0](#)) (#3)  
by Franklin Pierce on Mon Mar 31st, 2003 at 01:01:09 AM  
MST  
([User Info](#))

Curious, but diesel works by (still) an exothermic chemical reaction which is made more efficient via compression. With a water injected "engine", all of the energy of compression is being absorbed into the latent heat of vaporisation for the water, the remainder being lost to the subsequent expansion of the "cumbustion" chamber, although it might make a really groovy vacuum cleaner I'm pretty sure you have a net energy loss from the system. Now, certain high-performance engines DO employ water injection, but only to control combustion temperatures, since the water has a nice, high latent heat of vaporisation.

Love,  
Franklin Pierce

Humphrey Pump ([none / 0](#)) (#5)  
by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Mon Mar 31st,  
2003 at 07:25:31 PM MST  
([User Info](#))

This sounds kinda like a Humphrey pump, and I have to go look up the Newcomb engine now ;~) The Humphrey pump was a water piston engine, but was found to only be efficient on a large scale. They used coal gas, which ignited on one end of a 10 ft dia. tunnel...the entire, monstrous column of water would move, pump some out at high speed and pressure, then fall back -- compressing the coal gas for the next stroke, like a diesel. Interesting -- I think you can still order plans for a small water piston engine out of the back of Popular Mechanics.... DANF

OOps ([none / 0](#)) (#6)

by Demetri ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Mon Mar 31st, 2003 at 08:57:23 PM MST  
([User Info](#))

Well, glad I didn't try and build one. Thank you everyone. How many people have thought of this before? Always be the lead dog.

Water Engine ([none / 0](#)) (#8)

by MoonBoy on Fri May 2nd, 2003 at 05:04:15 AM MST  
([User Info](#))

The reason right now that I can't see this being viable is that steam needs great heat to become high pressure...Exactly what source of energy are you gonna hog to accomplish that?

Wacky idea ([none / 0](#)) (#9)

by Demetri ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Sat May 3rd, 2003 at 10:10:19 PM MST  
([User Info](#))

I was hoping to use the heat of compression as the heat source, but after reading the other posts and thinking on it some more, I realized that as pressure increases, so does the boiling point of water. The heat generated by compression in this engine would not be enough to overcome the pressure, and make the water boil. I talked to a friend about it, and he told me of an engine his dad used when he was a kid to pump water. The engine burned one part kerosene for the heat and four parts water to, along with air. He said that the engine didn't last very long, due to the heat involved, it just burned up, and his dad switched to a normal diesel engine. Always be the lead dog.

Re: Wacky idea ([none / 0](#)) (#12)

by cryonucleator on Wed Jun 25th, 2003 at 05:53:26 PM MST  
([User Info](#)) <http://www.makehydrogen.com>

Still, Demetri, like your thinking. Wonder if you might get added value with a couple of low-power UV lasers, while steam is superheated. This would convert some of it to hydrogen and oxygen. Oh, someone said that liquids "by definition" are not compressible. It's a minor point, but actually all things are compressible, including water and other liquids. But in the practical sense, they're right, since the degree of compressibility is very tiny for water. A simple proof of compressibility is to take a rigid metal container full of water, slide a piston through an opening and slam it with a hammer. Duck! The piston will come flying out with the same force with which it was struck. A cork works too, but everybody would say that was due to the cork's elasticity, not the water's. Any major physics reference has a bulk modulus for water, which tells how much compression of water can be achieved by how much force. Finally, black holes compress everything. Physics requires that everything be compressible- "electrons" are just "fields" that surround "fields" of neutrons and protons, which in turn are just "fields" with "fields" of gluons, quarks, muons, etc. Fields are "by definition" compressible. Not flaming the "incompressible" writer, though, whose point about tearing up the engine was certainly valid.

----Dennis  
<http://www.makehydrogen.com>  
[ [Parent](#) ]

Re: Water engine ([none / 0](#)) ([#13](#))  
by [oudie](#) on Mon Jul 14th, 2003 at 03:11:09 PM MST  
([User Info](#))

This is sort of related cause it may be a wacky idea(s).  
Okay we all know how gas powered cars work. They have batteries that power the starter to ignite the gas to power engines that power cars which in turn recharge the batteries.

Then we all know how electric cars work. They have batteries that power the motors to make the car run and you have to recharge them everynight or soon as they run out of charge.

As for Hybrid vehicles, that's foreign to me. But from what I understand, you have a car that has two types of power. It runs on battery but when you need to climb hills or need more power it kicks in the gas, or something. Okay maybe I have no idea how it works.

Then we have Fuel Cell Vehicles. I think, but not sure. They are basically electric cars that run on battery, but is being charged by a Fuel Cell Source at the same time, sort of like how your Laptop works. It runs off the battery and soon as it depletes the battery it will run straight off the energy from teh charger, But in the case of the FCV it will run straight off the Fuel Cell source soon as the battery power is depleted, and same as the Laptop, it will run charge the battery at the same time cause you have it plugged in.

So here is my wacky Idea(s).

#1. Why couldn't an electric car maker, instead of using the Hybrid technology, just use the Fuel Cell (or Laptop)idea. What I mean is, You have the electric car. And just install a Gas generator somewhere on it. When you run out of Power in the battery. Kick on the generator and it

will charge the battery and let you drive the rest of the day. Gas generators supposedly will give you power for an average of 6 hours on 1 gallon. I know driving my car to New York takes six hours but that's 25 gallons later.

#2. Or instead of a gas generator, wouldn't it be nice to see if all cars were electric and were required with some sort of built-on recharging device such as solar panels (not that great of an idea cause the sun isn't always out), so then what about built on wind power generators since they are moving anyway. Why not ass a fan on the fan that will generate power and recharge the battery while it is moving. Means less charging you have to do at night. Why not add a Solar panel to work together on that, and it can be charged while you're at work?

#3. Haven't thought #3 out too much, still working on it in the head, but I gotta go. Email me at [oudone\\_p@hotmail.com](mailto:oudone_p@hotmail.com) if you have any thoughts. Thanks

Re: Water engine ([none / 0](#)) ([#14](#))  
by Nick on Sun Sep 7th, 2003 at 04:59:21 PM MST  
([User Info](#))

Ok, I've been thinking along these lines as well for a while and came across this today. Ok, so it won't work because of the difference in physical and chemical reactions explained above.

How about creating the extra energy needed by using a magnetron to create microwaves? Microwaves are very efficient at turning water in to steam.

Re: Water engine ([none / 0](#)) ([#15](#))  
by charged on Fri Nov 14th, 2003 at 04:39:11 PM MST  
([User Info](#))

No engine will EVER run itself. Self-runners don't exist. There, I got that out of the way. Stop thinking in those terms or you'll just make yourself crazy.

What you CAN do is make your engine ABSORB energy from the environment and convert it to concentrated power for your personal use.

Requirements:

1. heat source that PUTS OUT more heat than the USER must input. Answer: Heat Pump  
Heat pumps have a C.O.P. (coefficient of performance). In other words, YOU put in a small amount of energy to compress a refrigerant. The refrigerant collects that energy PLUS energy from the surrounding ambient space. Then it concentrates and releases BOTH inputs for a combined output MUCH larger than the trivial bit you applied on your own.

Here's how you can do it.

Collect some working automotive AC systems.

Take the "hot" or "high" side of the compressor and feed it

directly into a small "coil" of tubing in the "flash boiler" chamber. This should, ideally, be right at the engine head or even built into it. Insulate the outside of this chamber.

Take the old AC condenser and submerge it in your water supply tank. Run the hot refrigerant line coming out of the flash boiler directly to the condenser. Insulate that line between the two. Also, insulate the water tank.

What you now have is your MAX TEMPERATURE freon right at the boiler. The slightly cooled freon will go to pre-heat the water supply. The closer to boiling you keep the water supply, the less energy that will be needed at the boiler to flash the water into steam.

Now, after the condenser, the line travels out of the tank to the "evaporator". This is where it get's to be fun!

What you want to do is have a VERY LARGE evaporator surface area. Inside the first part of the evaporator is a flow restriction valve. This valve is the dividing line between the high pressure side and the low pressure side. It sprays a very fine stream of liquid refrigerant into the low pressure of the evaporator space. This liquid begins to boil in the lower pressure and it absorbs ambient heat as it boils. This is why your AC can get so cold.

In this case, you'll need to put several evaporators in series with the last one connecting to the low side of the compressor. This is so that the refrigerant can spend a long time wandering around at low pressure. This will give it time to completely boil before it makes it back to the compressor to have the collected btu's squeezed out of it again.

Run the compressor with the steam engine.

For every one unit of input to the compressor, you will collect MANY units of environmental heat to flash-boil your water.

You must start the system by driving it up to speed with another motor until the heat pump reaches the break-over point.

Put a big flywheel on the engine shaft and put some magnets around the outside edge.

Add some stator coils and dump their output into large capacitors.

Then dump the capacitors into your batteries at a regular pulse rate.

Any questions?

Re: Water engine ([none / 0](#)) ([#18](#))  
by newpath4com on Thu Dec 25th, 2003 at 09:42:52 AM  
MST  
([User Info](#)) <http://www.newpath4.com>



What if the Steam Engine was the right way? And leaving it was the path to damnation? I've crossed the steam engine with the nitrogen engine and it looks REALLY GOOD. [www.newpath4.com/steamedheatengine.html](http://www.newpath4.com/steamedheatengine.html) . I solved the problems with the LN2000 by making the engine into a DUAL-ENERGY ENGINE, instead of following the rest of the pack who kept trying to make just one energy win. I cheated! And I'm proud of it. I found the synergy that was totally missing from everybody else's solutions. And this system is self-sustaining. It's all on my website [www.newpath4.com](http://www.newpath4.com) & [.../info](http://.../info) . The Newcomen steam engine used vacuum but everybody forgot it. I uses vacuum in the solution, in a different way, but it's there and integral to the nitrogen working with great power, explosive power. No pollution. Uses flashed steam in a closed loop, and nitrogen in a closed loop. The steam flashed into each revolution of the engine keeps the nitrogen from slowing the engine to a crawl. I call it my Double Energy Powerhouse Engine altho sometimes I think it should be called the No Waste Engine. Of course, the D.O.E. initially rejected my thesis... but now they visit my website so who knows?

[Water engine](#) | 18 comments (18 topical, 0 editorial)

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### [MERRY CHRISTMAS](#)

By [BrianK](#), Section [Remote Living](#)  
Posted on Thu Dec 25th, 2003 at 01:55:39 PM [Communications](#)  
MST

I just want tell everybody that comes here MERRY CHRISTMAS and I hope that everyone got what they wanted. :)

[MERRY CHRISTMAS](#) | 2 comments (2 topical, 0 editorial)

Re: MERRY CHRISTMAS ([none / 0](#)) ([#1](#))  
by bob golding ([yubba at clara dot net](#)) on Thu Dec 25th, 2003 at 05:40:43 PM MST  
([User Info](#))

didnt get the 24 1" x 1" neo magnets i wanted. ;-) merry christmas.

bob

Re: MERRY CHRISTMAS ([none / 0](#)) ([#2](#))  
by Old F on Thu Dec 25th, 2003 at 06:31:38 PM MST  
([User Info](#)) <http://www.oldf.homestead.com>

Merry Christmas

Old F

[MERRY CHRISTMAS](#) | 2 comments (2 topical, 0 editorial)

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### [Twas the night be for Christmas](#)

By [Old F](#), Section [Rants & Opinion](#)

Posted on Sun Dec 21st, 2003 at 01:47:22 PM [Communications](#)  
MST

Just for kicks and : )

Twas the night be for Christmas

Just for kicks and : )

Twas the night be for Christmas and across the land

Wind fans were checking a web site built by two guys named Dan

The stocking were hung by the chimney with care in hopes the EPA wouldn't smell them there

The wind fans were all snug in there beds with visions of wind gennys danced in there heads

The folks at Force Field with out flap had just turn in for a long winters nap

Upon the roof arose such a clatter they jump to the window to see what was the matter

Had a blade came off , Had a guy wire busted

And what to there wondering eyes did appear a miniature slay and eight tiny reindeer

And in one shout Santa explained two reindeer had stalled and the nose light was out

The folks at Force Field gave a nod an a wink, and with turn and a tweak had the nose glowing right at its peak

And with out a word they went to there links on how to jump start a reindeer with hamster power I think.

With the job done and high fives all a round Santa jump in to the sled in a single bound.

And he called out as he rose out of sight Merry Christmas to all an to all a good night.

The very best of the holidays to all

Old F

[Twas the night be for Christmas](#) | 1 comment (1 topical, 0 editorial)

Re: Twas the night be for Christmas ([none / 0](#)) ([#1](#))  
by [BrianK](#) on Wed Dec 24th, 2003 at 06:14:13 PM MST  
([User Info](#))

Thats just way to funny :)lol

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## [High-Gain Cell Phone Antenna For Sale](#)

-- 4 foot 9db Omni

By [ADMIN](#), Section [Classifieds](#)

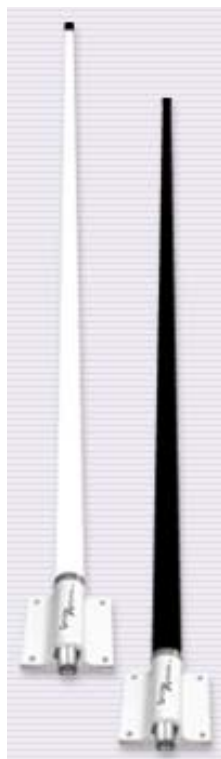
[Communications](#)

Posted on Thu Nov 6th, 2003 at 09:55:18 AM MST

If you are in a remote location with bad cell reception, this might help! Used only 2 weeks, \$50 off new price.

---

Asking \$100 plus S/H. New cost was \$150.00.



It's the white 4-foot long model 962-C from Digital Antenna with a female N connector on the wall/pole mount base, and you can read their web page about the product:

[http://cellantenna.com/Antennas/900\\_series\\_cellular\\_antennas.htm](http://cellantenna.com/Antennas/900_series_cellular_antennas.htm)

I'll have an article appearing in the next issue of Back Home Magazine regarding cell service in remote areas. I bought this antenna to get more data for writing my article.

As it turns out, a 9db Yagi works better in my location so I'm selling this one....since the omni receives signals from 360 deg. (with a narrowed vertical angle to get the gain) I had problems with scatter signals coming in from all directions, tricking my phone into switching towers constantly. In my location (in the mountains, no line of sight to a tower because of high ridges in the way), the highly directional Yagi rejects these scatter signals better so I chose it.

This Omni antenna would be ideally suited when your biggest problem with cell reception is a long distance to the tower. For example if you are many miles outside of a city that has towers. Also great for a mobile or marine installation where you can't use a Yagi--this Omni does not have to be aimed. In a deep valley, this antenna is probably NOT your best choice. On flat plains or on a ridgetop it could be ideal. Of course I can't guarantee it will work in

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your location -- as my article details, cell signals are VERY tricky and unpredictable.

While towers transmit at high power, handheld phones only put out half a watt or so. So keep in mind that while a high-gain antenna will improve both your reception and transmission, if you are too far away the tower still might not be able to hear you....in this case you would have to add a 3 watt booster to your system. This antenna of course works fine with a booster.

Please email me at: Danbob@starband.net if you have questions, need more details, or want to purchase this beauty. It's fiberglass, and extremely well-made and sturdy. This antenna will outperform your typical car cell antenna by 6db!

Cheers  
DANF

[High-Gain Cell Phone Antenna For Sale -- 4 foot 9db Omni](#) | 0 comments (0 topical, 0 editorial)

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## [4 component load control system](#)

By [kww](#), Section [Homebrewed Electricity](#)

Posted on Sat Dec 20th, 2003 at 09:47:35 AM MST

[Controllers](#)

Very cheap, simple, and it actually works very well!

First of all, I give a BIG thanks to "charged" who told me about this setup, it's exactly what I wanted. My turbine now can spin freely with no load until it reaches high enough rpm's to operate efficiently. Then, when the rpm's/voltage is high enough the triac switches the load on. When rpm's drop just a little too much the triac switches the load off. Right now I've just got two separate 4 component circuits which operate two halves of a modified electric heater, due to Radio Shack not having enough triacs :-), but I'm ordering more of them today. :-) Anyway, I highly recommend this to the rest of you out there looking to heat with the wind, but don't currently want to mess with batteries and/or expensive control gizmos. If you want more detail about the circuit just do a search on "4 component load control", it should take you right to the thread in which charged told me about it.

Kevin

[4 component load control system](#) | 25 comments (25 topical, 0 editorial)

Re: 4 component load control system ([none / 0](#)) ([#1](#))

by Dave B on Sat Dec 20th, 2003 at 12:29:37 PM MST

([User Info](#)) <http://www.madbbs.com/users/bruggelog>

More detail please ? I went back to the original post. Which circuit are you using ? What are the part numbers and what are your specs. for turn on - off etc. ? Is your alternator single phase ? Voltage output to the circuit etc. I want to do the exact same thing. My alternator is 18 coils single phase all series and outputs approx. 110 VAC @ 400 RPM. I want to switch on and off 2 hot water heating elements at different RPMs for no load start up and efficiency at higher RPMs. Please help, this has been a hold up. I don't mind experimenting but a place to start will be a great help, I have very little time to play. Thank you to anyone helping me make this happen. Dave B.

Re: 4 component load control system ([none / 0](#)) ([#2](#))

by kww on Sat Dec 20th, 2003 at 07:17:34 PM MST

([User Info](#))

Hi Dave,

The circuit is the one with the triac, two zener diodes, and resistor(s). The triac has three legs, one is the gate terminal, the others are for the hot wires. The triac is just an electrically controlled switch. The hot is split by the two non-gate terminals and the gate terminal is the electric switch. The power for the gate comes from the turbine output's terminal, but a resistor(s) is needed to keep from burning out the gate switch. The diodes, joined cathode to cathode keep current from flowing to the gate too soon. The diodes I got were 5.1v(cat.#276-565, Radio Shack), which I thought would trigger the gate too soon, but with the 2000ohm resistance I had to add the turbine has to make around 14 volts before the diodes see 5.1v so it's working well. The triacs I'm using are cat.#276-1000, but I just found out today Radio Shack is not selling them anymore so I've got to find another source. You may still be able to find them in stores around you, I've cleaned out the ones around here. Anyway, I've got a 3-phase alternator so I'm planning on using 3 of these circuits, one for each phase. You can divide your single phase up into however many circuits you want though. Two will work fine, that's how mine is running now. I think the Radio Shack 12v zener diodes would be the way to go for you, with the voltage your alternator makes. All you do to get the load to come on at different rpms is to add a little(10ohms more on mine) more resistance with the resistor(s). I'm really new at this stuff so I can't really tell you what you'll need exactly, but get some zener diodes(5.1 and 12v, they're only \$.99 for a pack of

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two), triacs(6amp, 400v from Radio Shack, if you can find them, about \$2-3 each) and resistors(even cheaper than diodes) that will keep the current down enough at your max. output voltage to not pass the gate's max. current rating, charged tells you how to calculate that in his reply to me. When you get your stuff I'll help you put it together right if you can't figure it out, but it's really not too bad, even for those of us who don't know what they're doing. :-) Good luck.  
Kevin

[ [Parent](#) ]

Re: 4 component load control system ([none / 0](#)) (#3)  
by Hank on Sat Dec 20th, 2003 at 07:42:21 PM MST  
([User Info](#))

Good post Kevin,

I'm also interested in doing this. Do you know what current you are putting thru these Triacs?

You said they are rated for 6 amp, if you have more current going thru will they fry?

Keep us posted of your progress.

All the best,  
Hank

[ [Parent](#) ]

Re: 4 component load control system ([none / 0](#)) (#4)  
by kww on Sat Dec 20th, 2003 at 08:12:00 PM MST  
([User Info](#))

That's 6amps at 400volts, which is 2400watts. If you need more triac than that check out jameco.com, I just found them, they've got lot's of triacs, up to 35amps at 1000volts I think it was. Anyway, I have no way of measuring the current my turbine is making, sorry. I can tell you this, heat sink the triac well, it does give off a little heat. Good luck.  
Kevin

[ [Parent](#) ]

Re: 4 component load control system ([none / 0](#)) (#5)  
by Hank on Sat Dec 20th, 2003 at 09:22:49 PM MST  
([User Info](#))

Thanks Kevin,

Also found Triacs at Digikey.com  
They have them up to 80 amps and possibly higher.

Don't know about 6 amps at 400 volts, my genny won't get up to 400 volts but it sure can pump out 40-50 amps. at 12 volts. I think this would make for some smoke using 6 amp triacs, but I really don't know.

If you are rectifying to DC then you can measure the current quite easily with a digital volt meter.

Tx,  
Hank

[ [Parent](#) ]

Re: 4 component load control system ([none / 0](#)) ([#6](#))  
by kww on Sun Dec 21st, 2003 at 06:44:05 AM MST  
([User Info](#))

Hi Hank,  
50amps at 12volts is just  $50 \times 12 = 600$ watts. Watts is the measure of power with electricity, so those 6amp at 400volt triacs should easily handle it, unless I'm making a mistake in my limited understanding of electronics.

I haven't gotten into rectifying to DC yet, but I've got rectifiers in waiting. :-) This summer I plan on getting a few batteries and an inverter that can run an air conditioner. I just have to find out how to get a triac to turn the ac on when the batteries get fully charged and then turn it off before the batteries lose much of that full charge. I'll basically keep the batteries at about full charge all the time.  
Kevin

[ [Parent](#) ]

Re: 4 component load control system ([none / 0](#))  
([#7](#))  
by Hank on Sun Dec 21st, 2003 at 09:06:08 AM MST  
([User Info](#))

I'm no wiz on electronics either but I think current is the limiting factor and not necessarily voltage. For instance you have those small glass fuses which, for arguments sake, are rated at 10 amps but 250 volts. They will fry at 10 amps even at 12 volts. I believe it's the internal resistance of the component that limits its current carrying capacity.

I guess another example would be using #14 wire to carry 1200 watts. In one case using 120 volts and 10 amps, in another case 12 volts and 100 amps. Both are 1200 watts but the wire will fry in the case of 12 volts and 100 amps.

But what the hell we will have fun trying and I hope someone else chimes in on this one.

By the way what type of genny do you have? Do you know what voltage it puts out and at what rpm, also your internal resistance of the coils?

[ [Parent](#) ]

Re: 4 component load control system ([none / 0](#)) ([#8](#))  
by charged on Sun Dec 21st, 2003 at 09:21:40 AM MST  
([User Info](#))

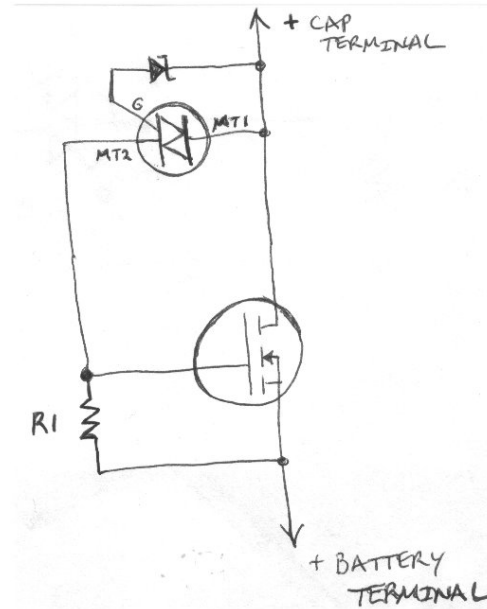


For the record, this can be "souped up" by using the triac to trigger a mosfet.

This difference will be that you need TWO mosfets and TWO triacs to control the mosfet gate to drive it positive.

OR, even simpler, put a FULL-WAVE rectifier across the generator AC and then use the single triac/transistor circuit to control the pulsed DC signal.

It's the same basic circuit you can use to discharge a capacitor bank. Bipolar transistors work better than mosfets for this application.



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Re: 4 component load control system ([none / 0](#)) (#9)  
by kww on Sun Dec 21st, 2003 at 09:31:53 AM MST  
([User Info](#))

I see what you're saying, makes sense to me.

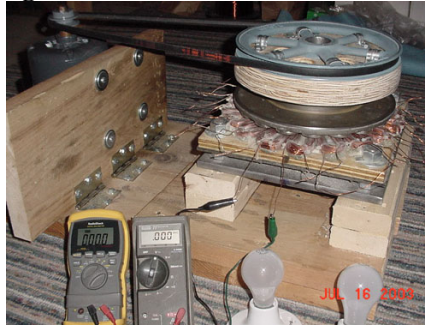
The genny I've been talking about has a 10 ft rotor and a 3-phase alternator. At around 1000rpms it makes 129volts, but I've only seen 52 volts with the 10 ft rotor driving it. The resistance of all the coils that make up each phase is 1.5ohms.

Kevin

[ [Parent](#) ]

Re: 4 component load control system ([none / 0](#)) (#10)  
by Dave B on Sun Dec 21st, 2003 at 10:11:23 AM MST  
([User Info](#))  
<http://www.madbbs.com/users/bruggelog>

Great information and thank you for your replys. Once I get a chance to work with this I'll keep you up to date on how it's all working out. It sounds as if I should be able to get the circuit working, all I need is some more time. I can't wait to get this up and flying, with the weather we have had lately and I'm still working out the details of my tilt up tower it looks like Spring will be a realistic target. This is a great group and I'm having alot of fun. Any other suggestions or modifications to the control circuit as you guys out there work with it would be great to see posted. Thanks again, Dave B.



[ [Parent](#) ]

Re: 4 component load control system ([none / 0](#)) ([#11](#))  
by [dualsporter](#) on Sun Dec 21st, 2003 at 12:35:20 PM MST  
([User Info](#))

A cautionary note about this type of energy transfer.

Accurately measuring energy actually being transferred with this kind of circuit is difficult.

DC ammeters are not capable of correctly measuring pulsed currents and an AC ammeter is calibrated to a 60 cycle, true sine current and would return an incorrect reading.

The only proper method is via an oscilloscope across an appropriate current shunt and is a little subjective as to how to read it. The energy in a pulse is interpreted as the "area" above/below the zero threshold and contained within the displayed waveform. (inside the trace)

Pulsed energy delivery systems are notorious for getting people excited about what actually is a less than stellar performance.

True energy transfer is measured not just in "watts" but in "watt time". (WattSeconds, KilowattHours, etc.)

Kevin (kww) made note that his triac can handle 6 amps at 400 volts for a wattage of 2400 watts. My question would then be "What is the duration of that pulse and how often does it refire?"

A 2400 watt pulse that lasts only 10 milliseconds (typical heavy current squarewave pulse) is only 24 wattseconds. If this circuit were pulsing once per second, the time averaged energy transfer would only be 24 watts.

Also, the 400 volts of the specified pulse is only the peak instantaneous voltage of the pulse and is proceeded and followed by the ramping voltages which compose the majority of the pulse. These ramping voltages are obviously lower and therefore these areas of the pulse carry wattage that is correspondingly lower.

Just a couple of notes of caution regarding getting overly excited before the numbers are in. I admit that the concept of transferring full mill energy via a small gauge feed line has me interested.

Dualsporter

Re: 4 component load control system ([none / 0](#)) ([#12](#))  
by charged on Sun Dec 21st, 2003 at 01:15:42 PM MST  
([User Info](#))

The "numbers are in" when you see the capacitor bank filling with charge between pulses. It also becomes quite evident when you see your batteries fully charged.

The difficulty in power transfer measurement only applies when one wishes to jam a wrench into the system that doesn't belong there. Instead of trying to make measurements on a line carrying electrostatic transients, measure the results at the battery.

The only measurements that count, when the "rubber hits the road" are what you put in at the generator VS the amount of charge in the batteries, nothing more. Taking measurements anywhere else in the system is only useful when you are "tuning" the process. It won't tell you jack about what's really happening. As you said, the resistor and scope produce a "subjective" measurement.

Coulombs built up in the cap bank translate to real power. Keeping the capacitors at a low voltage above battery voltage increases the system efficiency. This is why I've suggested using only a 5v zener for the simple setup.

If you have a 1f capacitor charged to 5v, you have 5 coulombs. Discharging this in 1 second is a 5 coulomb/sec or 5amps. Not rocket-science.

Using a digital pulse control system would allow you to adjust the cap bank pulse voltage down to whatever you like.

As far as the incoming HV pulses TO the cap bank, you'll measure almost no current on the wire UNLESS you draw the cap bank down below the generator voltage that's driving the 1:1 flyback at the generator.

The cap bank converts the pure transient potential back into usable current as it step-charges.

I have two small-scale models of this system running on my bench as I'm typing this. One of them is almost purely mechanical and works like a charm.

Once you really understand how to do it, you'll wonder why it hasn't been used for for the last 100 years since the systems were originally designed.

Keeping the battery bank "load" at a higher voltage than the source generator keeps the input pulse-width to the 1:1 transformer the same at all times. Putting a lower voltage battery or a pure resistive load directly across the caps draws them lower than the source voltage. This puts a "forward loading" on the flyback circuit and makes it draw excessive current. This also translates to hard current on the transmission line until the cap bank rises above the generator voltage again. Then you're back into the pure emf transfer range and the wire stays cold.

Tesla did this over and over again. All the patents are right there for anyone that cares to read them and understand what he was doing. His monster coils were not for his amusement. They were designed for long-distance power transmission. He also worked with lower voltage versions of his impulse systems to drive machinery and charge batteries.

HV transients are pure potential with no current component. This is crossing over into the realm of electrostatics, but in a relatively low voltage range. This is what the 1:1 transformer gives you.

[ [Parent](#) ]

Re: 4 component load control system ([none / 0](#)) ([#13](#))  
by dualsporter on Sun Dec 21st, 2003 at 06:07:09 PM MST  
([User Info](#))

It concerns me somewhat that you so readily dismiss proper engineering analysis in exchange for simple comparative analysis. That kind of comparative analysis can however give a good overview of the systems capability. Such a proper comparison would require, in this case, two identical mills feeding two identical battery banks located side by side for similar wind conditions. One would then compare loading and recovery of the storage batteries. A properly setup benchtop experiment might also be possible, but it must be an honest comparison. (No cheating to get the result you want.)

The "subjective" I spoke of regarding reading an oscilloscope relates to the fact that only a limited number of people invest the time to really learn how to read what they are seeing on the scope. Because of that different people read them differently. Newer scopes (digital) can actually give you a proper analysis of the trace, thus eliminating the human "subjectivity".

Regarding Tesla and his patents... He and his life's work are fascinating and I've spent many hours playing with several of his concepts, but several of them do not work well within the framework of well accepted engineering practices. Deep Tesla believers dismiss this as a "big government" conspiracy to keep his works down, yet have never been even close to properly proving any of these concepts. (When cornered, they will always find someone or something that kept them from succeeding.) Tesla contributed greatly to our current understanding of energy, but as with all great innovators, for every good concept that pays off, there are hundreds of ideas that aren't viable. Tesla does have a great number of patents, but one must keep in mind that at the time he was filing those patents, virtually any concept was allowed a patent and very few were challenged. The patent office does not "go back" and review old patents and cancel them if found unworkable. It truly was the golden age for any "would be" inventor.

I have no doubt this system will transfer energy and given line losses from high amperage, low voltage systems, may be comparable in performance, but for a market viable system a somewhat more scientific approach will be needed.

Dualsporter

[ [Parent](#) ]

Re: 4 component load control system ([none / 0](#)) ([#14](#))  
by kww on Sun Dec 21st, 2003 at 07:36:52 PM MST  
([User Info](#))

I don't know what you guys are talking about, but it sounds sort of interesting. :-)

I've got a question about the 4 component circuit. Yesterday the 4 component circuits worked perfect, but today I noticed one of them didn't seem to want to cut off every time when the voltage dropped below the cutoff point. I came to this conclusion because I was getting voltage at the gate and main terminal for the output when it should have been 0, which is how it was working yesterday. Is this an indication that the triacs can't handle the load and they're going bad?

Btw, I tried other diodes, thinking maybe they'd gone bad, but that's not it. The resistors are fine too. I figure I must be drawing too much current with the loads for the triacs to handle, but an opinion from someone who knows would be nice. Thanks.

Kevin

[ [Parent](#) ]

Re: 4 component load control system ([none / 0](#)) ([#15](#))  
by Dave B on Sun Dec 21st, 2003 at 09:39:10 PM MST  
([User Info](#)) <http://www.madbbs.com/users/bruggelog>

Kevin, glad you're back to report in on the original topic. There has been a mis-interpretation of what you and I are attempting to do with NO batteries as a controller that switches the load(s) depending on RPM. Our topic has strayed off into charging batteries with pulse charges from caps. and stories about past patents (all interesting I'm sure) but I think that topic was back a few. Anyway, I have purchased 2 solid state relays rated at 50A 240V (no these are not to use as switching pulses to charge batteries) but rather to switch on or off the load (hot water heating elements) depending on RPM. Let me know what you find to be the problem with the original 4 component circuit, I may be on to something with the solid state relays. We may have to start another thread to keep this on subject. Thanks, Dave B.

[ [Parent](#) ]

Re: 4 component load control system ([none / 0](#)) ([#19](#))  
by kww on Mon Dec 22nd, 2003 at 07:23:26 AM MST  
([User Info](#))

Hi Dave,  
I've been exploring some variations to the original 4 component circuit these guys have been typing about, it looks like the 3,4,5(?) component, but still simple, cheap, and reliable load control circuit will become a reality. I'll post updates as I make significant progress.  
Kevin

[ [Parent](#) ]

Re: 4 component load control system ([none / 0](#)) ([#16](#))  
by dualsporter on Sun Dec 21st, 2003 at 11:40:50 PM MST  
([User Info](#))

You may have exceeded the maximum voltage on the triac, but I rather think maybe your seeing some degradation of your gate caused by a parasitic back current. (Is it still pulsing or has that also stopped?)

Some manufacturer's Triacs-SCR's will generate a parasitic back current when cascade occurs (the semiconductor fires) should the circuit allow it. Repeated such firings will cause the gate integrity to degrade.

Any power circuit using a Triac-SCR should have protection designed into the support circuitry to protect against this. The problem circuit here is derived from the zener's ability to flow current either direction. (although only one direction displays the zener threshold for which the diode was selected) The current flow opposite to the zener direction is the problem. To stop this, insert a blocking diode between each of the zeners and the Triac-SCR's primary terminals. Since this is a power circuit a full blown rectifier such as a 1N4004 should be used. These are rated for 400 volt peak inverse voltage. (PIV or PRV) If you use a higher voltage Triac-SCR then use a similarly higher voltage set of rectifiers. 1N4005 - 600V, 1N4006 - 800V, 1N4007 - 1000V

Installing these diodes will raise your trigger threshold approximately 0.7 - 1.0 volts.

I believe the rectifier cathodes (the stripe) should be "away" from the Triac-SCR primary terminals, but if I'm wrong it will be immediately obvious (No... Not ZAP! :) as the circuit will do nothing at all. In that case just reverse them.

By the way... Not certain if the circuit will still pulse, but if you tried this circuit with just the 1N4004's and leave out the zeners,



you're trigger threshold will drop to 1 to 2 volts above your storage voltage and pulse rate will rise considerably. Might be worth an experiment.

Hope this helps.

Dualsporter

[ [Parent](#) ]

Re: 4 component load control system ([none / 0](#)) ([#17](#))  
by charged on Mon Dec 22nd, 2003 at 06:27:14 AM MST  
([User Info](#))

I like that change. You could actually use several HV diodes in "forward" mode to get the desired drop for the triac gate.

Sorry to drag all the other stuff into this thread. It gets really messy in side my head sometimes. heh.

[ [Parent](#) ]

Re: 4 component load control system ([none / 0](#))  
([#20](#))  
by kww on Mon Dec 22nd, 2003 at 07:33:17 AM MST  
([User Info](#))

Hi charged,  
Thanks for giving me another experiment. :-) I'm guessing you would still use the resistors when using the HV diodes? And do HV diodes allow parasitic currents?

I understand messy. LOL  
Kevin

[ [Parent](#) ]

Re: 4 component load control system ([none / 0](#)) ([#21](#))  
by charged on Mon Dec 22nd, 2003 at 09:11:06 AM MST  
([User Info](#))

I think dualsporter is absolutely correct. The zener won't block the parasitic reversals since they hit it in it's forward mode. Using a series of 1kv diodes in forward mode would certainly block any reversals, just short of a lightning strike.

[ [Parent](#) ]

Re: 4 component load control system ([none / 0](#)) ([#18](#))  
by kww on Mon Dec 22nd, 2003 at 07:10:51 AM MST  
([User Info](#))

You said: ...I rather think maybe your seeing some degradation of your gate caused by a parasitic back current. (Is it still pulsing or has that also stopped?)

kww: That's it exactly I think. Both triacs are still pulsing and the system is still working fine, I can see the difference looking out the window. :-)

You said: ...insert a blocking diode between each of the zeners and the Triac-SCR's primary terminals. Since this is a power circuit a full blown rectifier such as a 1N4004 should be used.

kww: So that's 4 blocking diodes/circuit(triac)? Is the rectifier used for something other than converting to dc electricity in this case?

The idea of hooking rectifiers in place of zeners in this circuit sounds interesting, but those are more complicated than triacs(4 prongs instead of 3 ;- ) and I haven't learned my triacs yet. :- ) I'll look at it though, hook a few wires here, then there... :- ) Sounds like that would be another solution to the parasitic back currents, unless rectifiers also have them occur. Anyway, thanks for all the good info. I can play with.  
Kevin

[ [Parent](#) ]

Re: 4 component load control system ([none / 0](#))  
([#22](#))  
by Dave B on Mon Dec 22nd, 2003 at 10:39:28 AM  
MST  
([User Info](#)) <http://www.madbbs.com/users/bruggelog>

Kevin & the gang. Sounds like you are working this out and so far I'm learning right behind you. Wish I could help but I'm pretty weak on circuit design, assembly will be no problem at all. I think I see the pulsing thing, wouldn't this be because of the lower AC frequency of your output voltage at your first "turn on" voltage ? I know we are switching AC and if we use a bridge rectifier wouldn't we then be dealing with DC ? Maybe I don't understand where this would be inserted into the circuit. Anyway, I'm rambling and look forward to hearing more on the testing out there. I can't wait to hear that "you got it", I'm trying to do the same thing. Thanks, Dave B.

[ [Parent](#) ]

Re: 4 component load control system ([none / 0](#)) ([#23](#))  
by kww on Mon Dec 22nd, 2003 at 03:57:07  
PM MST  
([User Info](#))

LOL, I think Dualsporter was talking about a rectifier diode/blocking diode/HV diode/1kv diode(charged) instead of a bridge rectifier, which is just a number of rectifier diodes hooked together. Too many names for these things.

Anyway, I need to buy some HV(high voltage I'm assuming) diodes or find them in the small pile of electrical junk I've been saving for around 20 years just for this occasion. :- ) I'll post when I get it together and observe what happens. I think I'm actually starting to enjoy electronics.

LOL  
Kevin

[ [Parent](#) ]

Re: 4 component load control system ([none / 0](#))  
([#24](#))

by dualsporter on Mon Dec 22nd, 2003 at 05:59:40 PM MST  
([User Info](#))

Kevin,

The rectifier I wrote about is a simple, high current, single diode with only two leads. (an Anode and a Cathode - The Cathode is usually indicated by the stripe on the body) They tend to be rather inexpensive (Usually less than \$1.00 USD) compared to your Triac and serve the function of allowing current to flow in only one direction as long as the peak inverse voltage (PIV or PRV) is not exceeded. (Once exceeded, they die, usually in a somewhat spectacular fashion.)

Installation of one these backing up each Zener will stop any parasitic currents. The PIV of the rectifier does not have to exceed the voltage rating of your Triac. If the Triac's peak voltage is exceeded, these rectifiers won't be able to save it. They are there only to protect your gate circuit from stray currents.

Hope this helps.

Side note - After reading DanB's post from last night I realized that I hijacked your thread. Probably caused by typing faster than the speed of thought. Hope I didn't derail the discussion. Deepest apologies.

Dualsporter

[ [Parent](#) ]

Re: 4 component load control system ([none / 0](#)) ([#25](#))

by kww on Tue Dec 23rd, 2003 at 06:56:22 AM MST  
([User Info](#))

Thanks Dualsporter,  
For clearing that up. I actually figured it out after doing more reading yesterday, but I do like confirmation. Btw, I have no problems with people going off on tangents on boards, unlike with live verbal discussion, I find it not to be a distraction since I'm in control of what I "hear"/read. Also, I'm a sucker for a good idea, no matter where it's inserted. :-)  
Kevin

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[4 component load control system](#) | 25 comments (25 topical, 0 editorial)

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posted by Dave B on 12/07/2003 12:06:34 PM MST  
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posted by bruce1 on 11/10/2003 01:24:49 PM MST  
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posted by Bach On on 11/08/2003 06:32:55 AM MST  
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10. [Anyone use one of these Charge-Max 1500-12/24 controllers](#) ([Homebrewed Electricity, Controllers](#))

posted by Scott on 09/24/2003 01:19:02 PM MST  
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15. [Anyone have a transfer switch?](#) ([Homebrewed Electricity, Controllers](#))

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16. [Need advice on Xantrex charge controller](#) ([Homebrewed Electricity, Controllers](#))

posted by troy on 08/16/2003 03:45:29 PM MST  
4 comments

17. [info](#) ([Homebrewed Electricity, Controllers](#))

posted by wpowokal on 08/04/2003 08:28:12 AM MST  
1 comment

18. [Heater as dump load?](#) ([Remote Living, Controllers](#))

posted by bobn on 07/20/2003 04:50:12 PM MST  
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19. [Transformer/ power supply](#) ([Homebrewed Electricity, Controllers](#))

posted by Anonymous Hero on 06/23/2003 10:09:01 AM MST  
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20. [No batteries, heating element load controller ?](#) ([Homebrewed Electricity, Controllers](#))

posted by Dave B on 06/18/2003 12:52:10 PM MST  
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21. [how do i make regulator for wind genny](#) ([Homebrewed Electricity, Controllers](#))

posted by zubbly on 06/16/2003 05:31:48 PM MST  
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22. [Diode sizing](#) ([Homebrewed Electricity, Controllers](#))

posted by Anonymous Hero on 06/11/2003 07:14:24 PM MST  
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posted by Coasting Rotor on 06/07/2003 09:15:53 PM MST  
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24. [bees wax hydraulic switch](#) ([Weird Science, Controllers](#))

posted by Anonymous Hero on 05/27/2003 08:21:30 PM MST

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posted by Juliang on 04/12/2003 08:45:59 AM MST

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### [Controller for Router](#)

By [mafox](#), Section [Homebrewed Electricity](#)  
Posted on Thu Dec 18th, 2003 at 06:43:57 PM MST [Controllers](#)  
Variable speed controller rated at 20 amps.

I have a single speed router which is rated at 19 Amps. There are plenty of variable speed controllers rated at 15 Amps. I want either to obtain a 20 amp rated device or make one. I think a triad circuit will do the trick. Has anyone such a circuit or knows where I can get a commercial one at a reasonable price.

[Controller for Router](#) | 5 comments (5 topical, 0 editorial)

19 amps? ([none / 0](#)) (#1)  
by [wdyasq](#) on Thu Dec 18th, 2003 at 06:50:14 PM MST  
([User Info](#))

My big -3 -1/4 HP - Porter Cable says it pulls a bunch mor than either of my two Am-Probes says it does. I have never seen a hand-held router pull more than 10.5 amps. And that was for only a short period of time.

I figure my 3-1/4 HP router actually produces about 1-1/4 HP.

Ron

20 amps ([none / 0](#)) (#2)  
by [JW](#) on Fri Dec 19th, 2003 at 07:45:06 AM MST  
([User Info](#))

mafox,

I did a quick google search on " 20 amp motor speed controller"

Here's what I found  
<http://www.rotronindustrial.com/products.htm>

when you get there to that page click the link for 'controllers" there are two choices for 20 amp controllers. when you hit those links it will automatically download a PDF file. so you will need acrobat reader to veiw details.

I have no idea what these units may cost, but its a start.

Have fun

-JW aka, Jeremy

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Re: 19 amps? ([none / 0](#)) ([#3](#))  
by Zack on Fri Dec 19th, 2003 at 10:21:27 AM MST  
([User Info](#))

I don't have any hard data, but I do have many years of observation. I am a carpenter, and it is obvious after buying and using modern power tools that their amp ratings are about as reliable as the "horsepower" ratings on household appliances. How do you run a "3.4 horsepower" vacuum on that 18 gauge cord, plugged into a 15 amp circuit, anyway? Just the other day, another carpenter and I had to share an outlet in a garage. We each have sliding miter saws, rated at 15 amps. We would occasionally each pull the trigger at about the same time, with no effect at all on the 20 amp circuit breaker. That's an alleged 30 amps, at startup, on one ordinary outlet circuit. I have often had to run my operation on a 100 foot extension cord, from a temporary power pole. That's a 3/4 horsepower table saw, air compressor, lights, saws, etc. I have noticed that a couple of halogen work lights will put the amp load over the top, if say, the air compressor starts while some other tool is running, in addition to the lights.

Anyway, I would not hesitate to try any normal hand-held router on the 15 amp device you mention. I have seen a 20 amp version in mail order catalogs, in years past, but they were much more expensive, and required heavy wiring. They did not come with normal power cords installed. A router that actually pulls over 2,000 watts would be an unwieldy thing, at best, I think.

Good luck!  
Zack

[ [Parent](#) ]

Re: 19 amps? ([none / 0](#)) ([#4](#))  
by wdyasq on Fri Dec 19th, 2003 at 03:38:42 PM MST  
([User Info](#))

Zac,

My comments were just on the facts as you stated. I started looking at it when I had a 3.25 hp router, a CNC machine drawing 5 amps and a vacuum- sometimes two, on a 20 amp breaker. I also knew 746 watts = 1 hp. The numbers just didn't add up. So I started measuring what each tool drew as power and found the 3.25 Hp router was 1.25 Hp, the 5.8 Hp vacuum drew 6 amps, 1 Hp, and I could run all of it without tripping the 20 amp breaker.

I have ordered a -Watts up PRO-. When it gets here, I will be tracking the power requirements of a lot of tools and appliances so I may plan my RE electrical system. I hope to have a fairly high voltage abttery bank where I may power many hand tools on pure DC and some on pulsed DC for speed control when I need it.

Ron

[ [Parent](#) ]

Re: Controller for Router ([none / 0](#)) (#5)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Fri Dec  
19th, 2003 at 05:34:04 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

I always wondered why manufacturers rate some electrical appliances in Amps. Like almost all Vacuum Cleaners are rated in amps. Some Hoover TV commercial says thiers is 10 Amps. Seems to me that they could just use a badly designed motor and draw 10 amps with very little work being done. It almost promotes inefficent thinking. The consumer thinks that they are getting a more powerful machine by buying More Amps, and manufacturers can use any old Crap motor that pulls that much power.

}=- W o o f -= {

[Controller for Router](#) | 5 comments (5 topical, 0 editorial)

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[Electric Ed, help, I think you da man ! \(anyone's invited\)](#)

By [Dave B](#), Section [Homebrewed Electricity](#)

Posted on Sun Dec 7th, 2003 at 12:06:34 PM MST

[Controllers](#)

Simple switching circuit with solid state relays (wind)

My alternator is single phase and outputs approx. 110 VAC @ 425 rpm. with all 18 coils in series. I have purchased 2 solid state relays that are rated at 50A 240 VAC that I plan to control 2 hot water heating elements independently depending on rpm. The trigger voltage is 3-32 volts AC or DC. I have played with this a bit taking the trigger voltage off of 1 coil which seems to work fine switching the main to the load at it's minimum trigger of 3 volts. I am temporarily using a light bulb to view what's happening and there seems to be some fluctuation in the output which I can expect at low frequency. Now the big question, what is the best way to regulate the next "turn on" voltage to my 2nd solid state relay and load ? Resistor in series to limit the voltage or maybe zener diode or what ever. Again I think the best way is to "tap" off one coil. Hope this makes sense, I'm getting a little frustrated with what should be a simple solution. Thank you for everyone's help.

Dave B

[Electric Ed, help, I think you da man ! \(anyone's invited\)](#) | 9 comments (9 topical, 0 editorial)

Comment and new(?) idea for load control ([none / 0](#)) ([#1](#))

by [kww](#) on Sun Dec 7th, 2003 at 12:50:10 PM MST

[\(User Info\)](#)

Hi Dave,

Glad you're doing it this way so if I can't get what I'm doing to work well I can ask you about your approach. :-)

I thought of a radical new way of controlling loads you may be interested in hearing. You start with a very small light bulb rated at a voltage in which it will glow well when your turbine gets up to speed. This bulb is always connected, but since the wattage is so low it's load is negligible. Near this bulb you have a photo switch that turns on a load when the bulb glows bright enough. Also, this load has a "trigger" bulb hooked in with it that trips another photo switch with another load and trigger bulb, if more steps/loads are needed. Seems like it'd be really simple and work well, but I'm new at this. Maybe it's not new at all even or won't work for some reason, but I figured someone here who knows will comment. Good luck.

Kevin

Re: Comment and new(?) idea for load control ([none / 0](#)) ([#2](#))

by [Dave B](#) on Sun Dec 7th, 2003 at 01:05:40 PM MST

[\(User Info\)](#) <http://www.madbbs.com/users/bruggelog>

Between us and anyone else we'll get this figured out. I like the solid state relays but they're kinda pricey at \$30.00 but it sure simplifies things and with no moving parts are extremely reliable. We'll see who else chimes in with suggestions, I can't wait to get things moving again, I haven't had much time to play lately. Dave B

[ [Parent](#) ]

Cheaper relays ([none / 0](#)) ([#3](#))

by [wdyasq](#) on Sun Dec 7th, 2003 at 03:33:35 PM MST

[\(User Info\)](#)

I'm not near my catalogs but many surplus places have the solid state relays for considerably less than \$30. I think I paid \$8 for 20 amp relays and \$12 or \$14 for 40 amp solid state relays.

Ron

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Re: Comment and new(?) idea for load control ([none / 0](#)) ([#4](#))  
by kww on Sun Dec 7th, 2003 at 03:46:25 PM MST  
([User Info](#))

At \$30 a rely the cost will add up fast, I hope what I'm doing works well enough. The triacs, diodes, and resistors were only around \$6 and I got enough to run two different loads, so around \$3 per load control circuit it looks like.

I've been busy building a solar collector and now I'm going to put another one on the house. These things are cheap, easy, and make a lot of heat. I actually heated to and maintained 63 degrees in my old rather poorly insulated 900 sq. foot farm house today. It was windy and cold 30-49 degrees and it wasn't in the high zone for long. My first collector is 6'x 7', made similar to the one pexring made, but this second one will be a transpired collector, even simpler/cheaper as there's no glass. The heat is sucked off the outer surface of the aluminum collection plate through lots of small holes and more heat is collected from the air flowing on the inside past the collection plate. It's all fun. :-)  
Kevin

[ [Parent](#) ]

Re: Comment and new(?) idea for load control ([none / 0](#)) ([#7](#))  
by desertratjack on Mon Dec 8th, 2003 at 12:00:43 PM MST  
([User Info](#))

Who is pexring? What is a "transpired" collector?

[ [Parent](#) ]

Re: Comment and new(?) idea for load control ([none / 0](#)) ([#9](#))  
by kww on Mon Dec 8th, 2003 at 09:36:01 PM MST  
([User Info](#))

Pexring is someone who posts here from time to time about his projects, that's about all I really know of the guy.

A transpired collector is what I described above, the thing that pulls air through tiny holes in a collector plate. After doing lot's of net research the other night I've decided it wasn't the one for me after all.

[ [Parent](#) ]

Re: help, ([none / 0](#)) ([#5](#))  
by wpowokal on Sun Dec 7th, 2003 at 05:00:46 PM MST  
([User Info](#))

Dan, from your data each coil develops around 6.1v ac at full speed. Switch the first relay off one coil( effectively @3v switching it in at half generator full volts) then use a voltage divider off the same coil to switch the second, if and when the generator reaches full speed.

Without some hysteresis there definatly will be some high speed switching happening. If this matters I would use a duel op amp or perhaps a LM3917 bar graph driver.

The op amp probally gives the best oportunity to build in hysteresis.

Just my musings, i'm sure someone has a purpose built device just waiting for you to buy.

regards Allan

Re: Load Switching Control ([none / 0](#)) (#6)  
 by Electric Ed on Sun Dec 7th, 2003 at 06:11:57 PM MST  
 (User Info) <http://www.electric-ed.com>

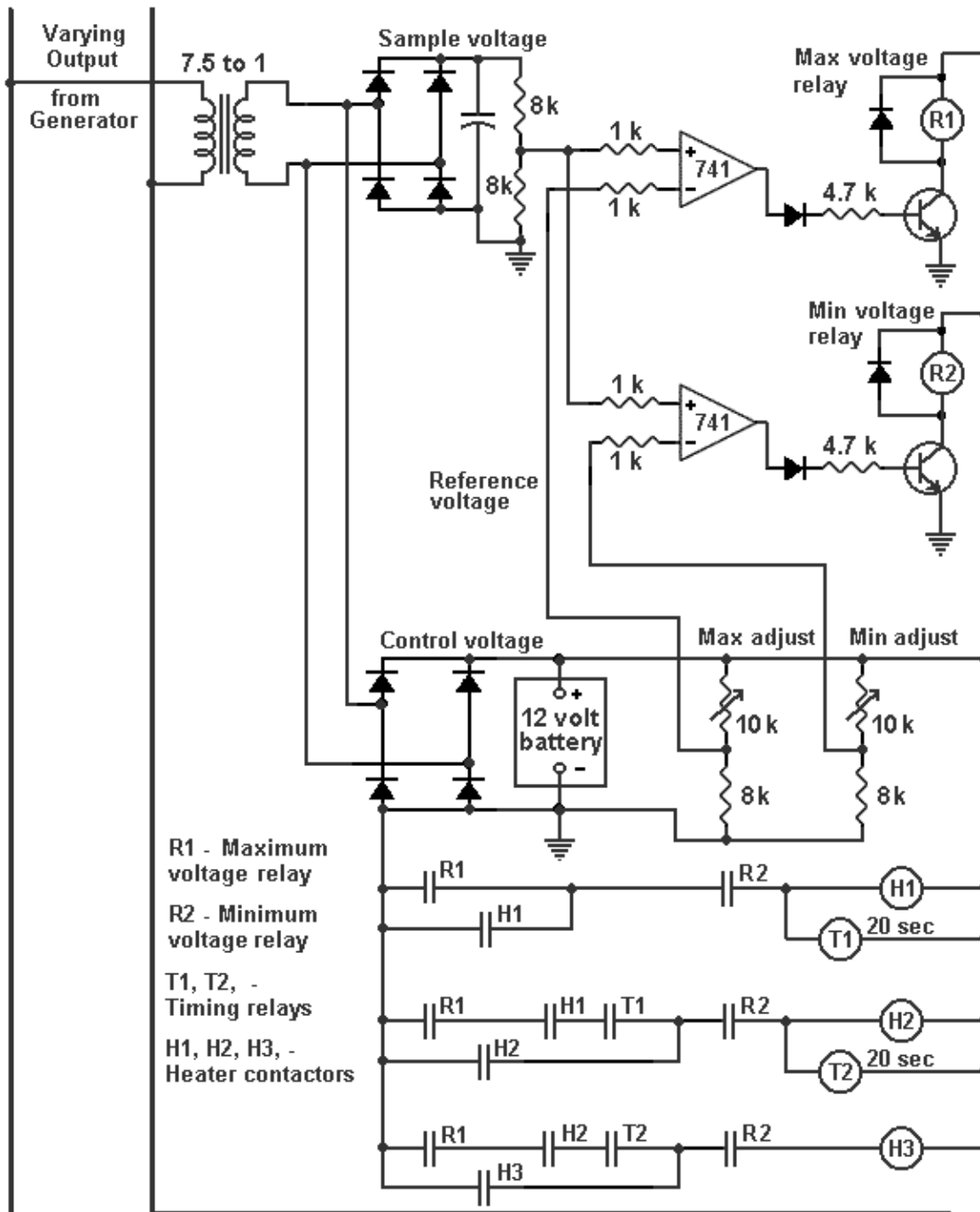
The control will definitely need hysteresis in order to prevent "short cycling".

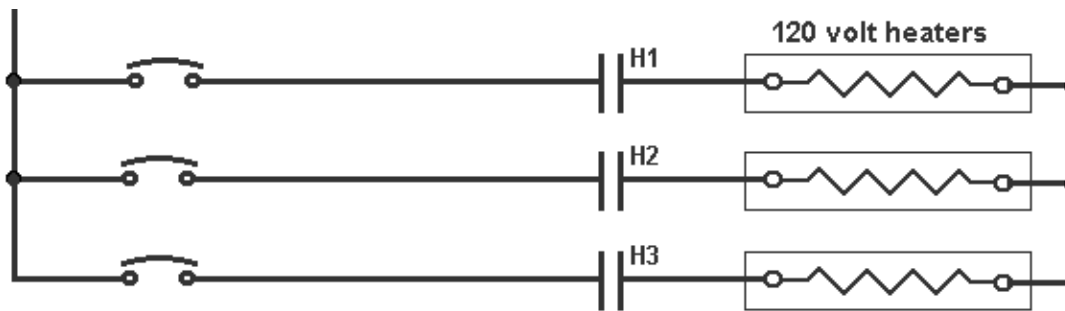
I'm working on a circuit similar to the sketch below. The basic principles are -

1. A 120 volt heater will produce some heat over a range of voltages, let's say 90 to 120 volts. Turn Load 1 on at 120 volts.
2. This will pull the voltage down some, so if the voltage drops below 90 volts, turn off load 1. But if it stays in the usable range (90 to 120 v) for say, 20-30 seconds, turn on Load 2.
3. This will pull the voltage down further. If the voltage drops below 90 volts, turn off load 2, but if it stays in the usable range with both Load 1 and Load 2 on for 30 seconds, turn on Load 3.

The circuit in the sketch will NOT YET DO what I described above. I may need another relay that operates at the mid-point of the usable voltage range. This is starting to look like a job for a mini PLC.

Electric Ed





Re: Load Switching Control ([none / 0](#)) (#8)  
by Dave B on Mon Dec 8th, 2003 at 07:50:57 PM MST  
([User Info](#)) <http://www.madbbs.com/users/bruggelog>

Boy, I didn't realize I was getting into such an involved circuit. Thank you Ed and anyone else who's been looking at this. It just seems like it should be so simple. I'll have no problem building the circuit from a schematic but I'm not too well versed on circuit design. Maybe a little overkill on the relays I have but it could be (I hope) some pretty serious current to switch and I didn't even want to think about how many times they will trigger. First one to make this simple and reliable using the solid state relays gets my business, I am willing to pay. I'll keep playing when I get the chance but that's the big problem, limited time. Dave B.

[ [Parent](#) ]

[Electric Ed, help, I think you da man ! \(anyone's invited\)](#) | 9 comments (9 topical, 0 editorial)

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### [Four component load control circuit](#)

By [kww](#), Section [Homebrewed Electricity](#)

Posted on Sat Dec 6th, 2003 at 08:40:12 PM MST

[Controllers](#)

I'm missing something, doesn't work.

Someone here ("charged" I think it was) told me of a simple circuit I could make that would work as a load control so I went to Radio Shack the other day and got what I thought would work. I'm rather sure I got everything hooked up right, but I think maybe I don't have the right stuff. Anyway, what I got was two 1k ohm resistors, one 6 amp 400V triac with a gate voltage of 3V and current of 25ma, and two 5.1V Zener diodes. I then took two of the three output wires from the turbine and hooked one right to one screw of a light fixture. The other wire was hooked to one of the main terminals on the triac and on that same wire the resistors were hooked in series to give 2k resistance(calculated by  $R=V/I$ ,  $2k=50(\text{max. alternator voltage})/.025A(\text{gate current, max. I guess})$  and that was hooked in series to the two diodes hooked together cathode to cathode. The last free diode leg was hooked to the gate terminal on the triac. Finally, the second main terminal on the triac was hooked to the other terminal on the light fixture. I hooked it all up to test it and found the thing never seemed to cut on or off, when the turbine made any power it was there, even below the 5.1 volts where I was expecting to see the voltage drop suddenly to 0. An odd thing I saw: I measured voltage(up to 20v, more than enough to see a glow) between the two light fixture terminals but the light bulb never came on. Anyway, please enlighten me somebody. :-) Btw, I tried, about 10 times, to get a usable picture of this test

Kevin

[Four component load control circuit](#) | 27 comments (27 topical, 0 editorial)

Re: Four component load control circuit ([none / 0](#)) ([#1](#))

by [charged](#) on Sat Dec 6th, 2003 at 10:04:23 PM MST

[\(User Info\)](#)

Is your turbine single-phase or multi-phase output?

The zener-triac circuit will only work correctly with single-phase output. If you have three phase legs coming out of the generator, you'll need one of these circuits on each leg.

Here's the basic circuit. In my haste to scribble it out, I neglected to draw the resistor in series with the zeners. But, I'm sure you get the idea.

The triac will shut off whenever there is a zero-crossing. It can only turn on if the voltage rises high enough to break over the zener and activate the gate.

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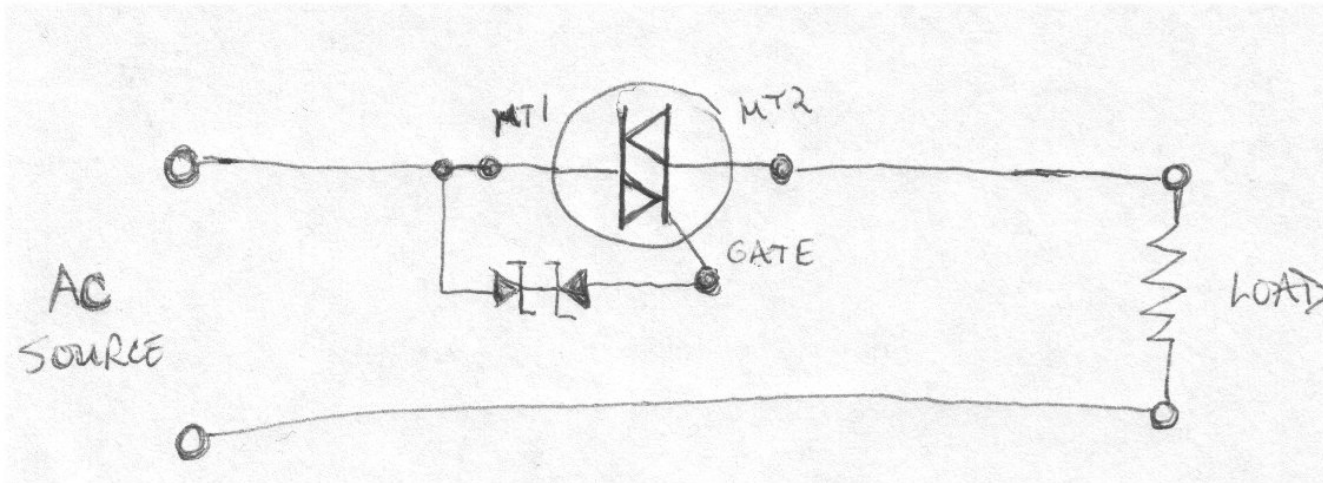
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Re: Four component load control circuit ([none / 0](#)) (#3)  
by kww on Sun Dec 7th, 2003 at 07:54:15 AM MST  
([User Info](#))

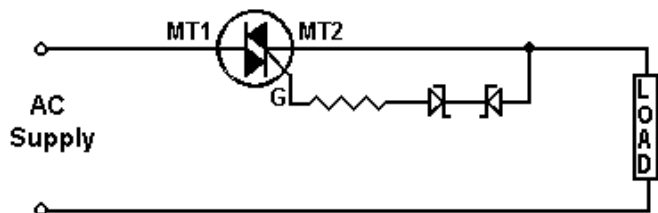
I've got 3-phase and I'm using 2 legs out of the 3 outputs, which is my problem. Thanks. Btw, 5.1v is when I should see the diodes turn the load on right? Hooking them up in series, parallel, or any way else(if there is another way) doesn't change anything with these right?  
Kevin

[ [Parent](#) ]

Re: Four component load control circuit ([none / 0](#)) (#2)  
by Electric Ed on Sun Dec 7th, 2003 at 07:43:29 AM MST  
([User Info](#)) <http://www.electric-ed.com>

Guys,  
I believe the gate voltage should be taken from MT2 instead of MT1. Give it a try anyway, and don't forget the gate resistor.

Electric Ed



Re: Four component load control circuit ([none / 0](#)) (#4)  
by kww on Sun Dec 7th, 2003 at 08:02:46 AM MST  
([User Info](#))

I guess the hot wire(not neutral) goes to MT2? If it were the other way around the zeners would never see the voltage to activate? That's what I'm thinking, but I know I don't know enough about electronics to believe in what I think. LOL  
Kevin

[ [Parent](#) ]

Re: Four component load control circuit ([none / 0](#)) (#5)  
by charged on Sun Dec 7th, 2003 at 09:53:52 AM MST  
([User Info](#))

It won't matter which end of the triac is used. Until the triac is "on", the only path for current flow is through the gate. And that's not a path until the voltage rises enough to pass through the zener.

Once the triac is "on", the potential across the zener is less than 1v. The triac shuts off when it hits a zero crossing and then the whole process repeats.

[ [Parent](#) ]

Re: Four component load control circuit ([none / 0](#)) (#6)  
by wooferhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Sun Dec 7th, 2003 at 09:03:03 PM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

Can't you replace the 2 Zeners with 1 Diac, then it would only be 3 components.

}=- W o f -={

Re: Four component load control circuit ([none / 0](#)) (#7)  
by charged on Mon Dec 8th, 2003 at 05:48:02 AM MST  
([User Info](#))

Sure can.

My local R-shack is pretty weak on small parts. Assuming this was the universal standard for those guys, I suggested the zeners, since they're probably something they keep in stock.

I get cranky whenever I have to order parts via UPS before I can test a circuit.

[ [Parent](#) ]

Re: Four component load control circuit ([none / 0](#)) (#8)  
by Nando on Sun Dec 28th, 2003 at 02:37:22 PM MST  
([User Info](#))

My question is :

What are you trying to do ?

What is the AC voltage range, is it single phase or 3 phase ?

How much power do you need to switch on/off ?

If you have a 3 phase ( rectified) once the triac is triggered it can not be turned off, unless the 3 phase goes to Zero

Nando

Re: Four component load control circuit ([none / 0](#)) ([#9](#))

by kww on Sun Dec 28th, 2003 at 02:43:15 PM MST

[\(User Info\)](#)

What I'm doing is hooking a wind turbine straight to a load control circuit which controls a heater. AC voltage range is around 0-40 and it's 3-phase. Max. total power is around 1000watts I'd guess. Anyway, I've got it working right now and I'm pleased to say it's working very well. :-)

Kevin

[ [Parent](#) ]

Re: Four component load control circuit ([none / 0](#)) ([#10](#))

by Dave B on Sun Dec 28th, 2003 at 11:25:40 PM MST

[\(User Info\)](#) <http://www.madbbs.com/users/bruggelog>

Kevin,

I had a chance to play with my solid state relays. The trigger voltage of these is 3-30 vdc. My very simple circuit for each load to turn on at an adjustable RPM is : to tap off any number of the stator coils in series and rectify this AC then run the DC through a pot. Use this adjustable voltage as the trigger voltage for the solid state relay. The relay will trigger at approx. 3 VDC so the pot allows adjusting it up or down depending on the RPM (voltage) you want the load to turn on. The load is then wired in series from the total output of the alternator to the relay. So far so good, I'm switching 2 hot water heating elements on (and off) at different RPM, no load for start up and I'm experimenting with dialing things in with bench testing. If things go according to plan I'd like to see this set up flying 80-90' early Spring. Too little time to play. Dave B.

[ [Parent](#) ]

Re: Four component load control circuit ([none / 0](#)) ([#11](#))

by kww on Mon Dec 29th, 2003 at 07:25:00 AM MST

[\(User Info\)](#)

Hi Dave,

Sounds good. The other day I finally got to radio shack and got those rectifier diodes and hooked them up to the load control circuit.

One triac was still doing fine, but the other didn't want to turn completely off. Once I put in a diode at the triac gate though it started turning off like the other triac. I'm still waiting on new triacs to complete this thing, but two phases are now controlled well. Anyway, I think you should try this circuit as it's dirt cheap(about \$3/circuit for the 500?watt/circuit capacity I'm needing), very simple and compact, and should be very reliable and long lasting. What you're doing sounds good, but I remember you had to pay a bit for those relays, which you may want to save for something else later on. Anyway, I'm going to add a transformer to one output phase, the one going to the hot water heater element, and control it with a triac too. When I've got it all together I'll make a new post and tell you about it.

Here's how the final load control circuit is hooked together: The triac has 3 terminals(the gate and two for the hot interruption). The hots are hooked up to it like you would hook up a light switch(the gate is the switch). Then off one(the one your turbine is hooked to) of the hot terminals you put a resistor to limit current for what your gate can handle. This is also how you control when the gate switches, each circuit should have a little different resistance. To the resistor you add your two zener diodes(5.1v zeners work well). The zeners are hooked together cathode to cathode. To the last zener you add a rectifier diode(number 1N4004 at Radio Shack) and hook the cathode end of it up to the gate, that's it. From the hot(source) terminal all these gizmos are hooked in series to the gate, really easy.

You can get everything you need, except the triacs, from Radio Shack.

Kevin

[ [Parent](#) ]

Re: Four component load control circuit ([none / 0](#)) ([#12](#))  
by Dave B on Mon Dec 29th, 2003 at 10:55:27 AM MST  
([User Info](#)) <http://www.madbbs.com/users/bruggelog>

Kevin,

Sounds great and I look forward to hearing when you get it all wired up. Maybe you could attach a diagram too. My relays were pricey but I don't think I'll ever burn em up, we're pulling a fair amount of current with what we're doing. I've been working on my tower sections that I aquired from a dismantled unit awhile back, that's another project altogether. Keep me posted, thanks. Dave B.

[ [Parent](#) ]

Re: Four component load control circuit ([none / 0](#)) ([#13](#))  
by kww on Tue Dec 30th, 2003 at 09:20:56 AM MST  
([User Info](#))

The control circuit for the hot water heater will be the same as the two circuits for the two stage heater. However, I may use capacitors or a transformer to boost the voltage after the control circuit. Anyway, I don't have a way of posting a diagram. I tried taking a picture, but it's too blurry close up and the stuff's too small far enough away where the picture's clear, sorry.

Kevin

[ [Parent](#) ]

Re: Four component load control circuit ([none / 0](#)) ([#14](#))  
by Dave B on Tue Dec 30th, 2003 at 11:53:11 AM MST  
([User Info](#)) <http://www.madbbs.com/users/bruggelog>

Kevin,

I think I missed your specs. on your alternator other than 3 phase. Since I am doing something very similar could you enlighten me on voltage, wire size etc. and blade set as well ? I'm crunching numbers trying to figure the best match for specs. on my blade set to carve. What do you estimate your power out to be at what RPM and what value are your load(s) ? Sorry for all the questions, I can't get enough of this stuff. Dave B.

[ [Parent](#) ]

Re: Four component load control circuit ([none / 0](#)) ([#15](#))  
by kww on Tue Dec 30th, 2003 at 08:15:20 PM MST  
([User Info](#))

I've got a 10 foot rotor and I'm guessing my max. rpm's are around 400-500. At that max. rpm I see around 50 volts. The wire size is 18ga., 50 turns/coil, 18 coils total. The magnets are 1x2x.5inch and there's 12 of them. My loads have 8 ohms of resistance, but I think I need to reduce that or increase the voltage with caps. or transformers. I'm guessing it'll make around 1000watts total output. I'm thinking of shortening the rotor to 9 foot, maybe 8, to get higher rpms(voltage) since I have small/18ga. wire. I think I could boost the upper end power output a lot by doing this, but I don't want to hurt the low rpm power so I'm still thinking about it. :-) Too many variables. Whatever you do you'll wish you'd done something different so don't think about it too hard, just do it, watch it, and then do it some more. LOL Eventually you'll get it just like you want, but it's not going to happen the first time around no matter how much thought you put into it I've concluded. Btw, don't put it up high at first and do use one of those \$9.99 1000lb winches for one of the guy wires so you can easily and quickly lower and raise it for changes. Enjoy.

Kevin

[ [Parent](#) ]

Re: Four component load control circuit ([none / 0](#)) ([#16](#))  
by Dave B on Wed Dec 31st, 2003 at 12:39:08 AM MST  
([User Info](#)) <http://www.madbbs.com/users/bruggelog>

Thanks for the info. We have similar alternators only mine is single phase. 18 magnets (actually 36, these are stacked double) 18 coils 18 guage wire 100 turns per coil all in series and my output is 100 Volts @ 400 RPM. I want the torque and can sacrifice some speed because of my output so I'm thinking 12' rotor possibly tsr-7 should create some heat to my hot water heating elements. I'd rather have my rotor turning more often in lower wind that to wait for higher winds just to get it moving. Should be fun to tweak the controller circuits too, this gives us another option to compensate and dial things in. Like you say, always something to change. Keep me posted, I'll do the same, thanks. Dave B.

[ [Parent](#) ]

Re: Four component load control circuit ([none / 0](#)) ([#17](#))  
by kww on Wed Dec 31st, 2003 at 07:54:27 AM MST  
([User Info](#))



Thanks for your info. too. Something you should know: I've noticed that when I put a large load on my voltage drops a lot. I'm guessing this is due mostly to the high resistance of the small(18ga.) wire. I think it'd be a good idea if you hooked up your element(s) and ran the alternator at 400rpm to see what kind of voltage you're getting under load. Whatever it is though I think it'll still heat the water just fine, even at 20 volts the 220v water heater element I have will get hot to the touch.

Also, if you did supply 115volts to the element it would put a load of 4500(?) watts on your alternator which would stop it in most winds. The cool thing is, you don't need to run the element at the power it was intended to run at since you'll be supplying power continuously(when the wind's blowing) and not for just a few minutes. The main thing is that you've got enough load. With my alternator's voltage the 220v element I'll be using doesn't provide enough load because my voltage is so low, which is why I'll probably boost the voltage with something. One other thing you may be interested in knowing: The first alternator I made used 14ga. wire. It's similar to this second one, but made around 1/3 the voltage. However, when I put a load on it the voltage hardly dropped. I'm wondering now if the 14ga. wire alternator will make a lot more power, but it's going to be awhile before I get it hooked up so I can compare the two.

Kevin

[ [Parent](#) ]

Re: Four component load control circuit ([none / 0](#)) ([#18](#))  
by charged on Wed Dec 31st, 2003 at 01:46:36 PM MST  
([User Info](#))

Try charging a capacitor off the genny and then dumping the cap through your heating element in pulses.

Just shuttle the capacitor back and forth between the two.

This will do away with the mismatched impedance between the genny and heating element.

[ [Parent](#) ]

Re: Four component load control circuit ([none / 0](#)) ([#20](#))  
by kww on Thu Jan 1st, 2004 at 08:17:23 AM MST  
([User Info](#))

That's what I want to try. Is there a really simple way to hook this up? Can you throw a diagram at me? I found a diagram of a voltage doubler circuit using 2 diodes and 2 capacitors hooked up to an ac source and load, but seems to me something is missing, something to trigger the capacitors to fire. Maybe they don't need a trigger with this circuit? I don't know and the wind's not blowing for me to play so I've been impatiently waiting. Btw, I took apart an old 400watt microwave oven and I've got a nice big(?) capacitor(1600wac, whatever that is), transformer, and some other cool gizmos which I have no idea what they are, but I'm having fun anyway. LOL Also, the load control circuit you told me about is working perfect since the diode was added to the gate of the triac, thanks again for that circuit idea. Feel free to send more. ;-) Kevin

[ [Parent](#) ]

Re: Four component load control circuit ([none / 0](#)) ([#21](#))  
by charged on Thu Jan 1st, 2004 at 09:42:40 AM MST  
([User Info](#))

First, go here. Download and install the "Alternatiff" freeware.  
http://www.alternatiff.com/ Then go here: http://www.uspto.gov/patft/index.html  
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20030117111 Enjoy!

[ [Parent](#) ]

Re: Four component load control circuit ([none / 0](#)) ([#22](#))  
by kww on Thu Jan 1st, 2004 at 05:06:01 PM MST  
([User Info](#))

Thanks for the info. I tried it out, but it won't display any drawings and gives no reason why now since I changed my security settings(I have a love/hate relationship with computers. LOL). I did read about it some, sounds a bit complicated to me. I'll go back and read more later, I think I pulled a muscle in my head. :-) Any idea how much it'd cost to make such a thing? Kevin

[ [Parent](#) ]

Re: Four component load control circuit ([none / 0](#)) ([#23](#))  
by charged on Fri Jan 2nd, 2004 at 07:05:02 AM MST  
([User Info](#))

Actually, the SG3524 chip in the patent is less than \$1. The opto-couplers are about \$1 each and the transistors/mosfets are about the same. The only thing the patent doesn't show is the actually pin numbers on the SG3524 flip-flop controller. I believe he chose that particular chip because it's dirt-cheap, internally voltage-regulated, and it can't cause an overlap in the two "on" states for the two transistor banks. I'm trying to work out the pin-outs in the diagram right now. I have a few of those in my "magic junk box" that I plan on using. Not sure where I got them. But then, I've torn apart a lot of stuff over the years. Here's a CHEAP AND DIRTY way to get the non-overlapping "flip-flop" effect. This is one of the basic systems that I've built. Make a simple 50% duty-cycle 555 timer pulse circuit. Drive a tiny, low-power relay with the coil hooked up between pin 3 and ground. Also put a protector diode across the pin 3-grnd connection so the relay coil's emf doesn't zap the chip. Use the relay contacts to alternately connect the transistor base-leads to their respective collector-leads. Place a 3v zener diode across the base and emitter leads of each transistor to keep them from getting an overvoltage and popping. Now your relay is conducting almost nothing since it's just controlling the transistor bases. You can put as many transistors in parallel as you want. A slightly more effective method for further reducing the relay contact wear would be to drive two mosfets from the relay contacts. The mosfets would then control the two large banks of power transistors.

[ [Parent](#) ]

Re: Four component load control circuit ([none / 0](#)) ([#24](#))  
by kww on Fri Jan 2nd, 2004 at 07:22:24 AM MST  
([User Info](#))

Holy cow. :-) If you're interested, how much \$ would it take to get you to make and ship such a thing to me? I could most likely duplicate it once I had it to look at and study. If I can take something apart without destroying it I've always been able to put it back together, that's how I learned to rebuild rotary engines and whole lot of other rather complex things. When it comes to electronics the 4, now 5, component circuit was a "big" step for me. LOL Anyway, I got to looking all over the net for circuits and found a voltage multiplier circuit that's got my interest, nothing but caps. and diodes. Seems to me if I put some of these on my alternator I could step up my voltage output range as high as I wanted to. I'll just arc the power to the house, no wire. ;- ) Kevin

[ [Parent](#) ]

Re: Four component load control circuit ([none / 0](#))  
(#25)  
by charged on Fri Jan 2nd, 2004 at 10:37:26 AM MST  
([User Info](#))

Go to Radio Shack and pick up some of their little electronics manuals. They have one dedicated to the 555 timer. It shows, in very plain terms, just how to wire it up to make it do all sorts of things.

One of the best starter books there is called "Getting Started in Electronics". It will take you step-by-step through the use of each basic type of solid-state component.

You really don't want anything that comes out of my "little shop of horrors". I tend to build things that look like rat's nests. Although, they usually work, for some reason.

[ [Parent](#) ]

Re: Four component load control circuit ([none / 0](#)) (#26)  
by kww on Fri Jan 2nd, 2004 at 04:17:45 PM MST  
([User Info](#))

The last time I was in Radio Shack I asked about electronic manuals, of course they don't stock them anymore. The next time I go I'll get them to order those two manuals you mention. I've been finding a lot of info. over the net and I really hate to buy something I can find that's free, but to have something I can afford to throw would be nice. :-)  
Thanks. Kevin

[ [Parent](#) ]

Re: Four component load control circuit  
([none / 0](#)) ([#27](#))  
by charged on Sat Jan 3rd, 2004 at 05:29:21  
PM MST  
([User Info](#))

Here's a good program for deciding what  
resistors and capacitors to use with your 555  
IC's.

<http://www.circuitsonline.net/download/view/26>

[ [Parent](#) ]

Re: Four component load control circuit ([none / 0](#)) ([#19](#))  
by Dave B on Wed Dec 31st, 2003 at 02:17:30 PM MST  
([User Info](#)) <http://www.madbbs.com/users/bruggelog>

This is great ! Yes, my voltage does drop under load and it is because of the smaller wire and higher resistance. Your 14 gauge wire could carry more current (easier flow) so you noticed less drop. It's all a trade off, bigger wire, fewer turns less room less voltage more current. It's good to hear that even at a lower voltage we are creating substantial heat, I was hoping it would work this way, I am in no rush and don't expect quick recovery on hot water, just would like to supplement if and when the wind blows. I'll keep you informed and thank you for all of your information, this is going to work. Dave

[ [Parent](#) ]

[Four component load control circuit](#) | 27 comments (27 topical, 0 editorial)

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### [Air-X/Solar Panel Conflict](#)

By [dburt](#), Section [Homebrewed Electricity](#)  
 Posted on Wed Nov 19th, 2003 at 05:52:20 AM MST [Controllers](#)  
 Connecting Air-X and solar together...

My neighbor put up a new Air-X wind unit about 3 weeks ago, which has a built-in controller that senses battery voltage and adjusts the charge accordingly. It has a LED that is normally off, on when charging, flashes when the batteries are full or the wind is too fast (over about 30 mph). I don't think the wind has been over 10-12 MPH lately either. He keeps his batteries pretty well charged. He has both Air-X and 30W solar panel wired directly to 4 golf-cart batteries wired up for 12 volts, 10AWG wire about 65 feet down the tower to the battery. There has been NO sun here for several days. He reports:

"I've been watching my windmill, and when it reach's 7mph an red led is suppose to come on and stay on until the system slows down. But what I have seen is, it's been taking much higher winds to turn on the led. But instead of staying on it would blink rapidly. So last night I disconnected the solar panels, and the led came on and stayed on while in a good rotation. No more fast blinking, just a steady charge.

Why do you think the solar panels would confuse the windmill controller system?"

I'm at a loss. Any ideas?

Thanks,  
 Dave in PA

[Air-X/Solar Panel Conflict](#) | 1 comment (1 topical, 0 editorial)

Re: [Air-X/Solar Panel Conflict](#) ([none / 0](#)) ([#1](#))  
 by [drdongle](#) on Wed Nov 19th, 2003 at 06:30:17 AM MST  
[\(User Info\)](#)

The 403 may be seeing the panels as a load, try adding an isolation diode to the + lead of the panel.

Dr.D

[Air-X/Solar Panel Conflict](#) | 1 comment (1 topical, 0 editorial)

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## Homebrew MPPT

By [drgeeforce](#), Section [Homebrewed Electricity](#)  
 Posted on Thu Nov 13th, 2003 at 11:40:44 AM MST [Controllers](#)  
 Trying to squeezing out the last electron.

I have a Xantrex 35D connected to 2-80W 36Vmax, 2.4Isc, BPSolar panels and 1 60W 24Vmax, 3.2Isc, Solatron in parallel hooked up to a 12V battery bank all with 6A diodes. I was considering upgrading to a MPPT controller OutbackMX60 costing \$433. I was wondering if I can create a pseudo-MPPT by connecting a 48Vin 12Vout @ 8A DC-DC converter between the controller and panels. This way the panels can operate at maximum voltage delivering all it can to the converter. The converter can then deliver the 12v load to the controller. The controller cost me \$75 and the converter will cost me \$25. The converter efficiency is rated 85% whereas a straight panel connect to the controller is about 44% at best. Any thoughts on this homebrew setup?

[Homebrew MPPT](#) | 3 comments (3 topical, 0 editorial)

Re: Homebrew MPPT ([none / 0](#)) ([#1](#))  
 by [drgeeforce](#) on Thu Nov 13th, 2003 at 11:55:32 AM MST  
[\(User Info\)](#)

Also, the MX60 is rated at 95% efficiency, but I don't know if the cost, \$433 will offset a 10% difference in efficiency, as compared to \$100 for the converter+controller. I saw a batteryless grid-tie 1500W inverter/MPPT combo for \$995 wholesale/\$2,245 retail. My battery bank is over 8 yrs old and I was considering going batteryless. I figure I would need 10-12 100W panels to make this worth buying. I live in rolling blackouts sunny California, but my electrical needs are not much nor critical.

Re: Homebrew MPPT ([none / 0](#)) ([#2](#))  
 by [Adrian L](#) on Thu Nov 13th, 2003 at 10:33:32 PM MST  
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The problem with a plain dc-dc converter is they won't keep the input constant, soon as you put a heavy load on the output (battery charging) the solar input voltage will drop down close to the battery voltage, so any bonus you would have got has vanished!

You could give it a try I guess, but don't invest too much money in it, and be ready to take the dc converter unit back to the store!

Unfortunately those MPPT controller units cost so much for a reason, very hard to homebrew, I have attempted it and had mixed success:

<http://members.optusnet.com.au/~adiman>

Cheers

Adrian L

Re: Homebrew MPPT ([none / 0](#)) (#3)  
by [charged](#) on Sun Nov 16th, 2003 at 04:07:38 AM MST  
([User Info](#))

Build yourself a direct DC-to-DC capacitive charge transfer system.

<http://www.fieldlines.com/story/2003/10/16/16947/477>

A large capacitance can be nearly 100% efficiently charged with an inductive step-charger until it reaches the required charging voltage for the batteries. Then disconnect the capacitor from the panel and dump the charge into the batteries.

This can be done for the cost of a few power mosfets, a couple of 555 timing chips and a large capacitor rated for at least 200v. You could probably scrounge enough electrolytic caps from old TV sets to make it even cheaper.

[Homebrew MPPT](#) | 3 comments (3 topical, 0 editorial)

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## [Dump Load](#)

By [bruce1](#), Section [Homebrewed Electricity](#)

Posted on Thu Nov 13th, 2003 at 10:32:14 AM MST [Controllers](#)

**Can I get excess power from my controller to my house**

My battery bank and tower is about 200'-300' from my house. I will have my inverter and controller at the tower/battery bank. I will bury wire to my house from my inverter. At the tower, I have no use for that extra power from my controller, except to just burn it off as heat. In the winter I could heat the battery shack, but in the summer I wouldnt need that. I know I cant run 24DC that far efficiently, I wonder if I can step up the power the controller is putting out, somehow, send it in a separate cable to the house, so I can use it for something, maybe a preheater to the hot water heater. I doubt I can use a small inverter since the DC voltage will vary and not always be present. I am unfamiliar with any ways of doing this, any help would be very appreciated.

The next thing would be the cost of the equipment and second cable. It may not be cost effective to do so.

Thanks everyone for past,present and future help.

Bruce

[Dump Load](#) | 9 comments (9 topical, 0 editorial)

Re: Dump Load ([none / 0](#)) (#1)  
by drgeeforce on Thu Nov 13th, 2003 at 10:51:43 AM MST  
([User Info](#))

Distance is your main enemy, I would consider a cooling fan (or a small a/c) for the shed during the summer months, that way the battery banks would benefit. You could possibly shunt the excess to a portable battery, that way you could carry the power to the house.

Re: Dump Load ([none / 0](#)) (#2)  
by laskey on Thu Nov 13th, 2003 at 12:39:09 PM MST  
([User Info](#))

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You could put up a bank of lights on the tower to burn off the excess, and that way you could see if your battery bank is full.

But honestly, I like the winter heating, and summer cooling idea. I suppose your shed roof is good.

Maybe just use the extra to pump water onto the shed roof... maybe that would cool it off a bit in the summer?

Cya,  
Chris

[ [Parent](#) ]

Re: Dump Load ([none / 0](#)) (#3)  
by wpowokal on Thu Nov 13th, 2003 at 07:30:32 PM MST  
([User Info](#))

If you have use for the excess at hour house, why not run a small comms cable from controller and use that to switch an AC load.

regards Allan

Re: Dump Load ([none / 0](#)) (#4)  
by dburt on Fri Nov 14th, 2003 at 05:41:21 AM MST  
([User Info](#))

Bruce,

How do you keep your inverter from freezing in the winter? Most inverters are only rated for temperatures down to about 30 degrees F (because of the capacitors??).

I have a simular situation (long distance from house to tower), don't know how to handle it short of berming/burying/insulating the battery/inverter shack.

Dave

Re: Dump Load ([none / 0](#)) (#5)  
by laskey on Fri Nov 14th, 2003 at 08:34:22 AM MST  
([User Info](#))

I assume that if it's running it's got heat to spare, and if it's in dump mode he's probably dumping to heaters which will keep it warm in there. Am I right?

Cya,  
Chris

[ [Parent](#) ]

Re: Dump Load ([none / 0](#)) (#6)  
by bruce1 on Fri Nov 14th, 2003 at 09:30:41 AM MST  
([User Info](#))

Well, to be honest, I dont even have the shack built, or an inverter. My c35 controller is to be here Tuesday via UPS, and I'm in the process of making some sort of heater for my dump load. I only hoisted my first ever tower 2 wks ago. I like to try to plan ahead, so I'm asking questions about things I havent gotten to yet, so I can understand them better when I do get to that point.

I've got my mill shut down most the time, and run it when I'm home. I have 2 deepcycles at the base right now to serve as a battery bank while messing and experimenting with it. I havent thought about the cold actually, I assumed the inverter and controller would handle it and put out some of their own heat, enough to keep themselves warm at least. Am I wrong on that? I guess heating the shed through a dumpload is where I'm heading with my last experimenting. I have nothing else to do with it out in my pasture.

Allan, can you elaborate, or anyone, on his suggestion? I'm not as electric/electronic literate as most people on this board, but I'm sure learning fast!

Thanks all, Bruce

Re: Dump Load ([none / 0](#)) (#7)  
by wpowokal on Fri Nov 14th, 2003 at 05:11:45 PM MST  
([User Info](#))

Bruce, apologies for my short reply, but if you don't need the excess power at "the shack".

Instead of buying more heavy cable you could run a light cable to send a signal from the charge controller to a switching device (relay/triac) at the inverter end and switch an AC load, like water heating.

regards Allan

[ [Parent](#) ]

Re: Dump Load ([none / 0](#)) (#8)  
by bruce1 on Mon Nov 17th, 2003 at 12:16:19 PM MST  
([User Info](#))



I'm trying to follow you on this, not sure I am. Tell me if I'm right.....

The controller would send DC to a relay inside my house, which would kick on an AC load, drawing more power through my inverter and my grid, thus using more voltage from my battery bank. Using more power from my battery bank would pull down the voltage, and in turn be doing the same thing a dumpload heater would do.

If I'm correct on that, what sort of cable would I use? How much DC voltage can I get into my house, through a light cable, 250' away? Or do I have the relay at my 'shack', send AC through a different cable into my house from the shack.

Sorry if I'm still not following you, but I am interested in your scenario, so if you can step me through it, I would be grateful.

Thanks, Bruce

[ [Parent](#) ]

Re: Dump Load ([none / 0](#)) ([#9](#))  
by wpowokal on Sun Nov 23rd, 2003 at  
02:51:58 AM MST  
([User Info](#))

Bruce, You basically have the idea, staying mechanical ie a relay, you would only need say a 1mm sq cable(aroung 17AWG) + and - run to your house.

Clearly the relay would have to have a coil of the same voltage as your batteries and the contact rating sufficient to switch the proposed load current.

Allan

[ [Parent](#) ]

[Dump Load](#) | 9 comments (9 topical, 0 editorial)

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## [C35 Controller Questions](#)

By [bruce1](#), Section [Homebrewed Electricity](#)

Posted on Mon Nov 10th, 2003 at 01:24:49 PM MST [Controllers](#)

**Making a dump load burner upper thingy**

What ever you call it, something to burn power that is being diverted from your controller. I have my wind setup up and in the wind, now I need to get a controller. I have C35 found for pretty reasonable money I will be ordering. What do I need, something to burn a max of 35A? Should I have something that can burn more, or will 35A all you will ever see come from the controller?

This may not be the ideal thing, but what if I wire a series of taillight bulbs that will burn up to 35A? I wired some up today(boss is gone ;-)), 2 #1157 double filament bulbs in series and hooked them to a 24v battery setup. It burned just over 2.5A. I hooked up 2 sets in parallel and of course burned just alittle over 5A. Could I set up 7 sets of lights in parallel to burn 35A? These bulbs cost me .48 cents each, that would be about \$7, plus some misc. wire and such.

I realize that if one light burns out, I lose a circuit which will lose the ability to burn 2.5A, the others would have to be able to absorb that extra amperage, if/when the controller diverts a full 35A. Should I put in 8 or 9 sets of lights, that can burn 40A or so, and if I lose one, I can still burn in excess of 35A?

I know there are setbacks to this, like not being able to just replace a bulb without doing some soldering, but its something I have easy and cheap access to, so thats the first thing that I thought of.

Thanks for any input anyone has.

Bruce

[C35 Controller Questions](#) | 6 comments (6 topical, 0 editorial)

Re: C35 Controller Questions ([none / 0](#)) ([#1](#))  
by [bruce1](#) on Mon Nov 10th, 2003 at 01:31:59 PM MST  
([User Info](#))

I need to correct myself, I would need 28 bulbs, which would make the cost about \$14, and double the soldering as I first thought.

Bruce

Re: C35 Controller Questions ([none / 0](#)) ([#5](#))  
by [troy](#) on Wed Nov 12th, 2003 at 01:08:45 PM MST  
([User Info](#))

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Other than the durability issue, bulbs will work. Keep in mind that incandescent bulbs are 5% efficient (or less) at making light. So really what you have in your bank of lights is an air heater that makes 5% light as a by-product. Put it someplace that's a bit cool, and you have a nice little heater.

Using resistance wire from a salvaged heater will also work, keeping in mind that the element from a 120 volt heater will be ten times too long for the resistance you want for a 12 volt setup. So if you were going to convert an element like that for diversion use, snip into ten pieces and run them in parallel to get sufficient capacity for a 12 volt setup.

As mentioned, it's hard to solder that resistance wire, so crimping may work. None of this stuff would pass code or get UL listing, so you are totally on your own for safety. If it burns the house down, your insurance won't cover it without both code and UL approval. What a nuisance...

Good luck and have fun,

troy

[ [Parent](#) ]

Re: C35 Controller Questions ([none / 0](#)) (#2)  
by scoraigwind ([magnet@scoraigwind.co.uk](mailto:magnet@scoraigwind.co.uk)) on Mon Nov 10th, 2003 at 04:27:00 PM MST  
([User Info](#)) <http://www.scoraigwind.co.uk>

bulbs are not ideal because they do burn out and their resistance is not linear.

I prefer to use a water heater if I can because then I get some use out of it.

The load should not be much over 35 amps rated or you may burn out the controller.  
Hugh Piggott <http://www.scoraigwind.co.uk>

Re: C35 Controller Questions ([none / 0](#)) (#3)  
by bruce1 on Tue Nov 11th, 2003 at 07:22:56 AM MST  
([User Info](#))

I do hate the thought of wasting that power that I've worked on generating, but my tower and batteries will be quite a distance from the house, so I think heating water wont help me, but using the heating element may work?

Thanks for the input, Bruce

Re: C35 Controller Questions ([none / 0](#)) (#4)  
by Scott on Tue Nov 11th, 2003 at 08:03:30 PM MST  
([User Info](#))

I use a heating element from an old 120vac electric heater that I shortened to 2.8 ohms(if I remember right). I also have a C35 and today it was dumping plenty into my dump load heater, well, plenty meaning 150 watts, not much as compared to most systems here. But the heater was getting warm. It was easy to build the heater although I found you can't solder the heating element and have to use crimp connectors. I don't remember the calculations off hand but I remember seeing it here how to size your dump load. Might try a search for diversion load.

Scott

Re: C35 Controller Questions ([none / 0](#)) ([#6](#))  
by [bruce1](#) on Wed Nov 12th, 2003 at 02:28:51 PM MST  
([User Info](#))

Thanks everyone. I now have in my possession some old stovetop burners from the salvage yard. I wanted some oven elements so they werent all circular, but found some other straight elements that may work. Cost me nothing, and if they arent exactly what I needed, I will surely learn something working with them. I did also find some formulas on sizing the load from Hugh P. on this board, so I'm loving all the info I'm gaining from the people and past posts.

Thanks again, Bruce

[C35 Controller Questions](#) | 6 comments (6 topical, 0 editorial)

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[Question](#)

By [Bach On](#), Section [Homebrewed Electricity](#)  
 Posted on Sat Nov 8th, 2003 at 06:32:55 AM MST [Controllers](#)  
 Watt meter

I bought one of those manual transfer switches used to wire a generator to your electrical panel. This was one with a bad circuit breaker. I have a better one now, so the old one is surplus.

These came with 2 "Watt Meters" to help you monitor power use. Does anyone know if I could use these meters as part of a wind/solar system to monitor use? I really don't know how they work or if they are calibrated only for 120 volt current.

Any thoughts out there?

Bach On!

[Question](#) | 4 comments (4 topical, 0 editorial)

Re: Question ([none / 0](#)) ([#1](#))  
 by [drdongle](#) on Sat Nov 8th, 2003 at 07:04:22 AM MST  
[\(User Info\)](#)

You can use them on the output of your inverter(s). I would suspect that they have 4 leads, one to the common white and two that splice in to the black ( hot) lead, one will be for the black wire from the inverter and the other for the black wire to the load and lastly a ground.

Dr.D

Re: Question ([none / 0](#)) ([#2](#))  
 by [bob golding](#) ([yubba at clara dot net](#)) on Sat Nov 8th, 2003 at 03:19:36 PM MST  
[\(User Info\)](#)

be careful about using watt meters with "modified sine wave" inverters. they are designed for use with 50/60 hz sine waves. i have a plug in type that shows al sorts of crazy readings from the inverter. works fine on mains.

still having fun  
 bob

Re: Question ([none / 0](#)) ([#3](#))  
 by [Scott](#) on Sun Nov 9th, 2003 at 07:28:57 PM MST  
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I have a pile of old meters including watt meters. I use a 0 - 150watt meter to monitor a small tape drive mill. Hooks up like ampmeter to positive output from mill and also to mill output voltage, amps x volts = watts. I like it, I have a smaller 0 - 50watt meter I might put on my 30W solar panel to see what it's putting out.

Scott

Re: More questions ([none / 0](#)) (#4)  
by Bach On on Sun Nov 9th, 2003 at 07:48:31 PM MST  
([User Info](#)) [change AT: bach\\_on AT hotmail.com](#)

Thanks for the responses guys.

These watt meters have a scale ranging to 3,750 watts. They were each wired to monitor 3 of the six circuits for a genset of up to 7,500 watts.

I had considered using them with a modified sine wave converter. I doubted they would be real accurate since they probably aren't RMS. But they might at least get me in the ballpark to determine the power being drawn. I have a volt meter on it already. Why not a wattmeter too?

Does anyone know if these can also be wired to work with DC? Somehow, I doubt it.

Bach On!

- I'm just as happy as if I had good sense! -

[Question](#) | 4 comments (4 topical, 0 editorial)

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## [Anyone use one of these Charge-Max 1500-12/24 controllers](#)

By [Scott](#), Section [Homebrewed Electricity](#)

[Controllers](#)

Posted on Wed Sep 24th, 2003 at 01:19:02 PM MST

This or Trace C40 for controller/dump load of tape drive wind gennie

I fund this on Ebay and was curious if anyonw is familiar with them. I need a controller for my tape drive gennie that I'm building, it's a 40V motor with 2 Jerry blades W/mike mod charging 4 golf cart batteries. My camp only sees occasional use so there will probably be plenty of dump load. I also have a 30W solar panel with controller.

Any opinions?

Thanks  
Scott

[Anyone use one of these Charge-Max 1500-12/24 controllers](#) | 3 comments (3 topical, 0 editorial)

Charge-Max 1500-12/24 controllers ([none / 0](#)) (#1)  
by [Scott](#) on Wed Sep 24th, 2003 at 01:25:18 PM MST  
([User Info](#))

Sorry, forgot to post the link.

<http://cgi.ebay.com/ws/eBayISAPI.dll?ViewItem&item=2348772081&category=3240>

Re: Charge-Max 1500-12/24 controllers ([none / 0](#)) (#2)  
by [troy](#) on Fri Sep 26th, 2003 at 12:23:15 PM MST  
([User Info](#))

Hi Scott,

Coincidentally, I just bought one two weeks ago, got delivery a week ago and hope to hook it up tonight. I can tell you a couple of things already. The insides look pretty professional, but the outside doesn't look as slick as the trace controller. For example, the cooling holes look like they were done with a die, but they don't really line up nicely. The spatter paint on the cover looks ok, but not really professional. Mine did have a loose nut rolling around inside, which I liberated through a cooling slot so as to not short things out on a board, so there could be quality control issues at the factory. Or maybe the UPS guy was practicing his juggling routine...

I'll let you know when I get some actual experience in the next couple of days.

Oh yeah, it's definitely not "UL" listed, so would never pass an electrical inspection unless they do you a favor.

Best regards,

troy

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Re: Charge-Max 1500-12/24 controllers ([none / 0](#)) ([#3](#))  
by troy on Mon Sep 29th, 2003 at 11:56:57 AM MST  
([User Info](#))

Hi Scott,

I have everything hooked up and it seems to work as advertised. Hook up is straight forward, and then just set bat voltage with the switch (12/24) and dial in the cutoff voltage to whatever you want to fine tune it to your pack.

Best regards,

troy

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[Anyone use one of these Charge-Max 1500-12/24 controllers](#) | 3 comments (3 topical, 0 editorial)

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[controller circuit with triac](#)

By [bewotec](#), Section [Homebrewed Electricity](#)  
Posted on Thu Sep 18th, 2003 at 08:57:20 AM MST  
nothing

[Controllers](#)

Hello there,

i read the description on <http://homepages.enterprise.net/hugh0piggott/circuits/index.htm>

from Hugh Piggott.

i wonder if the MOC6031 and the BTA06 triac can be a replacement to a relay or not?

i mean in a charge controller circuit when it opens loads at different charge levels by a comparator chip. my original plan was to open the loads via relays, but those consumes quite a lot. this triac offers much less consumption, but i am suspicious a bit, because in my situation the triac would control DC, not AC and it must switch down consumers, which i am not sure if it is capable.

anybody with electronics experience can have an opinion?

i thank for everything.

viktor

[controller circuit with triac](#) | 8 comments (8 topical, 0 editorial)

Re: controller circuit with triac ([none / 0](#)) (#1)  
by 5kw on Thu Sep 18th, 2003 at 09:11:54 AM MST  
([User Info](#))

Triacs do not work on DC as there is no way to turn them off.

Victor

Re: controller circuit with triac ([none / 0](#)) (#2)  
by laskey on Thu Sep 18th, 2003 at 10:18:02 AM MST  
([User Info](#))

Right... You need a device that can be forced off. Like a power transistor, or a MOSFET.

There is also a device that is SCR and triac like called an SCS (silicon controlled switch) which can be turned on and off, but they are generally used for lower power applications and are pretty rare (since I had to look it up in a textbook).

Cya,

Chris

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Re: controller circuit with triac ([none / 0](#)) (#5)  
by drdongle on Thu Sep 18th, 2003 at 06:10:16 PM  
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([User Info](#))

Actually you can use an SCR but to turn it off you must apply a reverse polarity pulse, this technique was used for DC motor controllers such as used in early electric vehicles. This might be an interesting challenge to build.

Dr.D

[ [Parent](#) ]

Re: controller circuit with triac ([none / 0](#)) (#3)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Thu Sep 18th, 2003 at 03:12:18 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

The SCR is the DC version of the Triac which an AC switch (but not DC).

SCRs have the same voltage drop problem as a normal Diode has.

If I'm understanding an SCR correctly, you could call it a switched Diode

I'm even thinking that you could completely replace the diodes that are normally in your charging circuits with SCRs and switch them on and off however you wish.

. T i m

[ [Parent](#) ]

Re: controller circuit with triac ([none / 0](#)) (#4)  
by BT Humble ([za2bb@optusnet.com.au](mailto:za2bb@optusnet.com.au)) on Thu Sep 18th, 2003 at 03:42:11 PM MST  
([User Info](#)) <http://www.geocities.com/za2bb/>

> my original plan was to open the loads via relays, but those consumes quite a lot

True, but since you're only switching the relays on when your batteries are full and you need to use up some power, is this \*really\* a problem? ;-)

BTH

Re: controller circuit with triac ([none / 0](#)) (#6)  
by scoraigwind ([magnet@scoraigwind.co.uk](mailto:magnet@scoraigwind.co.uk)) on Fri Sep 19th, 2003 at 12:51:43 AM MST  
([User Info](#)) <http://www.scoraigwind.co.uk>



Triacs can only used to switch AC but I do it before the rectifier. I use two triacs to control the 3 phase feed to a rectifier for each load. There is some volt drop across the triac but that's OK for the high voltage loads I use them for.

You can also use relays, but triacs are more robust. Relays are better for low voltage stuff because there is not volt-drop across the contacts.

Most of my efforst to use MOSFETs for charge control have failed. MOSFETs are easily destroyed.  
Hugh Piggott <http://www.scoraigwind.co.uk>

Re: controller circuit with triac ([none / 0](#)) (#8)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Fri Sep 19th, 2003 at 07:17:41 AM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

Instead of using Triacs to switch the voltage to your Recifiers.  
Use SCRs in place of the rectifiers and switch them on and off.  
Half the voltage drop . . .

Two SCRs wired in parallel but reversed to each other, equals a Triac

One SCR with the Gate pin enabled, equals a Diode  
-- W o o f  
[ [Parent](#) ]

Re: controller circuit with triac ([none / 0](#)) (#7)  
by bewotec on Fri Sep 19th, 2003 at 05:09:30 AM MST  
([User Info](#))

ok, understood. i thought so. so i remain with the relays.

does anybody has experience with a tachometer driven 3p2t relay which switches between star and delta config at a given rpm?

the itdg manual says it is too complicated, but it does not seem so even for me.

thanks for the opinions.

[controller circuit with triac](#) | 8 comments (8 topical, 0 editorial)

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### [Does this exist?](#)

By [Wolfie1](#), Section [Homebrewed Electricity](#)  
Posted on Wed Sep 17th, 2003 at 06:08:52 AM MST [Controllers](#)  
none

Hi guy. This one has bugged me for a while, so I thought I better ask.

It seems like your first machine will only produce a fraction of your required power - as expected. To use that power, the common approaches are to wire into only a few house circuits or to send it back into the grid through some kind of net metering. While both OK, I am looking for an alternative.

Is there a device that takes inputs from both the utility supply and your homebrew source(s) and produce a 120 ac source that goes to your home fuse/breaker box. The aim of this is to use ALL of your alternative source and only suppliment from the utility to meet your current needs. As your alternative sources grow, the utility suppliment will drop as will your electricity bill.

Does such a thing exist?

Martin.

[Does this exist?](#) | 8 comments (8 topical, 0 editorial)

Re: Does this exist? ([none / 0](#)) ([#1](#))  
by troy on Wed Sep 17th, 2003 at 12:40:05 PM MST  
([User Info](#))

There have been some rumors that some of the commercial mills can be had with an intertie inverter without batteries. That will accomplish what you are after. I'm not sure, but I don't think you can buy anything like that independantly just yet.

Best regards,

troy

Re: Does this exist? ([none / 0](#)) ([#2](#))  
by jubalearly on Wed Sep 17th, 2003 at 02:02:02 PM MST  
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I agree with Troy, AFAIK the only way to do this like you are talking is to use an intertie inverter. This normally involves an extra panel box with the critical circuits and their breakers. This would be set up like the transfer switch and panel you would need if you had a generator. But a grid tie inverter can perform the transfer functions.

A grid tie inverter does not always mix with the utility power as you seem to want, however. The problem is that in order to put two 60 cycle (50 or 60 Hz) power sources in parallel they have to be synchronized EXACTLY. A grid tie inverter has the electronics that allow it to synchronize with the utility and could run in parallel with it, and some grid tie systems are set up that way.

There are a lot of advantages to keeping the systems separate, however. But that's not really what you are asking for, so I'll save that for later. Search this web site, Homepower magazine, and the web using some of the key words I've given above along with "solar power", "wind power", etc. & you'll be busy reading up on this for some time...

Re: Does this exist? ([none / 0](#)) ([#5](#))  
by Wolfie1 on Thu Sep 18th, 2003 at 05:55:53 AM  
MST  
([User Info](#))

Which of these is true: -

- 1) It is this something that is possible in theory but no product yet exists.
- 2) Given our current knowledge, such a device isn't possible.
- 3) No one has bothered to make one because the power losses would be too large.
- 4) There is a fundamental flaw in wanting to do this in the first place.

I give number three because it would seem possible (to me at least) to rectify your utility input, add your RE sources (also DC), invert the total and run the house on that. That way seems very inefficient but seems like a contender until something better comes along.

Martin.

[ [Parent](#) ]

Re: Does this exist? ([none / 0](#)) ([#3](#))  
by bruce on Wed Sep 17th, 2003 at 08:25:58 PM MST  
([User Info](#))

Being a newbie, I thought the same way. When my system is charged up and ready to provide power, I thought how great it would be to use my 10%, use 90% from the grid. Everytime my system was ready and charged, it would use all of my power, never having to bury any through regulator. When my system is discharged, go back to the grid 100%. I've been told, for the most part, thats not really how it works, and how am I do disagree. Theres alot I need to learn, but I know where your coming from.

Later, Bruce

Re: Does this exist? ([none / 0](#)) (#4)  
by bruce on Wed Sep 17th, 2003 at 08:29:40 PM  
MST  
([User Info](#))

I had a typo in the last posting, I meant to say 'who am I to disagree', not 'how am I do disagree'. Sorry.

Bruce

[ [Parent](#) ]

Re: Does this exist? ([none / 0](#)) (#6)  
by 5kw on Thu Sep 18th, 2003 at 09:34:50 AM MST  
([User Info](#))

Xantrex SW inverters do exactly this opperation in float mode. It is accomplished by the inverter synchronizing with the grid. any time your battery voltage tries to exceed a user difined set point the inverter suppliments the grid power enough to hold your batteries at that voltage. The Xantrex inverteres also have a LBX mode where loads are transfered from grid to inverter and back at user difined set points.

Outback inverters also have this LBX feature but it is more appropiatly called HBX , high battery transfer, and is more versital and has lower standby losses as the inverter actually turns itself off when batteries are low and you are grid powered.

Make the wind fun!  
Victor

Re: Does this exist? ([none / 0](#)) (#7)  
by troy on Thu Sep 18th, 2003 at 10:19:59 AM MST  
([User Info](#))

Excellent! I have been impressed with what I have heard of Outback products so far. A bit spendy yet :-)

I'm just glad Xantrex has some real competition now.

Good luck and have fun!

troy

[ [Parent](#) ]

Re: Does this exist? ([none / 0](#)) ([#8](#))  
by rgudgel on Fri Sep 19th, 2003 at 08:36:52  
PM MST  
([User Info](#))

Too expensive? Based on what? OutBack is very competitive with Xantrex but with much newer technology. The OutBack boys designed the Xantrex products you are talking about ten years ago. I'm sure they have learned a thing or two in the meantime  
Robin

[ [Parent](#) ]

[Does this exist?](#) | 8 comments (8 topical, 0 editorial)

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## [charge shunt regulators printed circuitboards](#)

By [paulpic](#), Section [Homebrewed Electricity](#) [Controllers](#)  
Posted on Sun Sep 7th, 2003 at 04:43:40 AM MST  
**shunt regulators**

i noticed some time ago on <http://www.bioelectrifier.com/charge.htm> there was printed circuit boards for sale.Its gone now does anyone have another source?

thanks Paul

[charge shunt regulators printed circuitboards](#) | 0 comments (0 topical, 0 editorial)

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- <http://www.bioelectrifier.com/charge.htm>
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- [Also by paulpic](#)



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[Anybody with experience with this charge contrl??](#)

By [troy](#), Section [Homebrewed Electricity](#)

Posted on Thu Aug 28th, 2003 at 03:23:49 PM MST

[Controllers](#)

Anybody with experience with this charge contr.??

I ran across this on ebay, and it looks like a reasonably priced piece of hardware and even made in the USA. Anybody have any experience with this company???

<http://cgi.ebay.com/ws/eBayISAPI.dll?ViewItem&item=2343122669&category=3240>

thanks in advance,

troy

[Anybody with experience with this charge contrl??](#) | 3 comments (3 topical, 0 editorial)

Anybody with experience with this charge contrl?? ([none / 0](#)) ([#1](#))

by [JackS](#) on Thu Aug 28th, 2003 at 08:39:50 PM MST

([User Info](#)) <http://home.bresnan.net/~j3s/index.html>

i haven't had experience with the controiler but u have bought their nax extractor and it worked as expected

JackS

experience with this charge contrl?? ([none / 0](#)) ([#2](#))

by [Windswept Cypress](#) on Thu Aug 28th, 2003 at 11:36:46 PM MST

([User Info](#))

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[PI.dll?ViewItem&item=2343122669&category=3240](http://cgi.ebay.com/ws/eBayISA/PI.dll?ViewItem&item=2343122669&category=3240)
- [More on Controllers](#)
- [Also by troy](#)

Troy,  
Yeah, I've used the 30A capacity model for about 8 months on a small one-panel (64W) system to run my laptop. Bought on eBay. Think these could be repair/returns. Had my doubts cause never heard of company outside of ebay listing. It is a pretty good design. Only noticeable flaw is underbuilt terminal posts (strippable if not careful) that are too closely spaced/poorly located. Can't comment on the charging efficiency cause no way to measure or compare really. Don't know what the algorithm is--they say its is not PWM but then they dont mention anything about MPPT either, so it is something else. But it is still working. The cabinet is not waterproofed and they recommend keeping ventilated (I keep in plastic container which has ventilation). It seems to be ok for a reasonably high capacity (30A) diversion controller with LED's that tell when charging or diverting, but maybe I got lucky on a repair/return that I am not running a lot of current through.

Hope this helpful

Andy

Re: experience with this charge contrl?? ([none / 0](#)) (#3)  
by troy on Fri Aug 29th, 2003 at 08:49:16 AM MST  
([User Info](#))

Hey thanks Andy. Any info is better than just guessing.

Best regards,

troy

[ [Parent](#) ]

[Anybody with experience with this charge contrl??](#) | 3 comments (3 topical, 0 editorial)

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## [Anyone have a transfer switch?](#)

By [tleser](#), Section [Homebrewed Electricity](#)

Posted on Sat Aug 16th, 2003 at 11:59:40 PM MST

[Controllers](#)

Curious on some stuff about transfer switches if anyone has one and has installed it themselves

Does anyone have a transfer switch installed? I'm also a little curious how you went about it if you in fact did it yourself, and how long it took. I'm doing a little google'ing on them right now, and says that you need to have an electrical permit to install one and must be installed by a licensed electrician. However, I know that when you're building your own house, you just get the license and you can do all the work yourself. My wife and I were supposed to have our house built this summer by her dad. He has his own construction company but it would have been basically us getting a "build it yourself" permit and he would've done all the work for us. Are there any ways to to do it yourself without being a licensed electrician for something like a transfer switch? Thanks,

Tom

[Anyone have a transfer switch?](#) | 6 comments (6 topical, 0 editorial)

Re: Anyone have a transfer switch? ([none / 0](#)) ([#1](#))  
by TomW on Sun Aug 17th, 2003 at 01:43:18 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcespowr/>

Tom;

I'm rural and we don't have too much problem with licenses or inspectors bugging us. We had our manual transfer switch professionally installed. I watched the guy do it it was very straight forward grid in, house feed out and generator in lines.

I could have installed it myself I suppose but crawling up ladders and such is not an option for me anymore. Around here as long as the power company [rural electric co-op] approves the install its OK. Essentially for us, anything beyond the meter is our call and that switch is on my side of the meter.

We had the switch and the install was only around \$100. All my wife can remember about the switch was it was very expensive and that she had bought it several years before we were married for the farm and had just never gotten it installed. When I asked the electrician he said new ones cost \$450 and up but I never checked further on prices. That was in 1999. Our 5KW gasoline generator simply plugs into an outlet on the pole and you throw the switch to switch the grid off and the generator on to the house circuits.

Cheers.

TomW

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Re: Anyone have a transfer switch? ([none / 0](#)) ([#4](#))  
by tleser ([tleser at purdue edu](#)) on Sun Aug 17th, 2003 at 12:20:09 PM MST  
([User Info](#))

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Hey Tom, thanks for the reply. So you're sayin if you wanted to install it yourself, all you would've had to have done was let your power company know that you were doing it and that's it? If you've seen that post I made a few weeks ago regarding the RE business I want to go into after I graduate, this part is really my main concern because I have never gotten into a house electrical system, let alone after the house is already finished and everything is behind walls! My dad has a generator (unfortuneatly I couldn't talk him into some PV's) and I'd like to at least maybe hook up a transfer switch to get the experience. I don't know, thanks for your reply again!

Tom

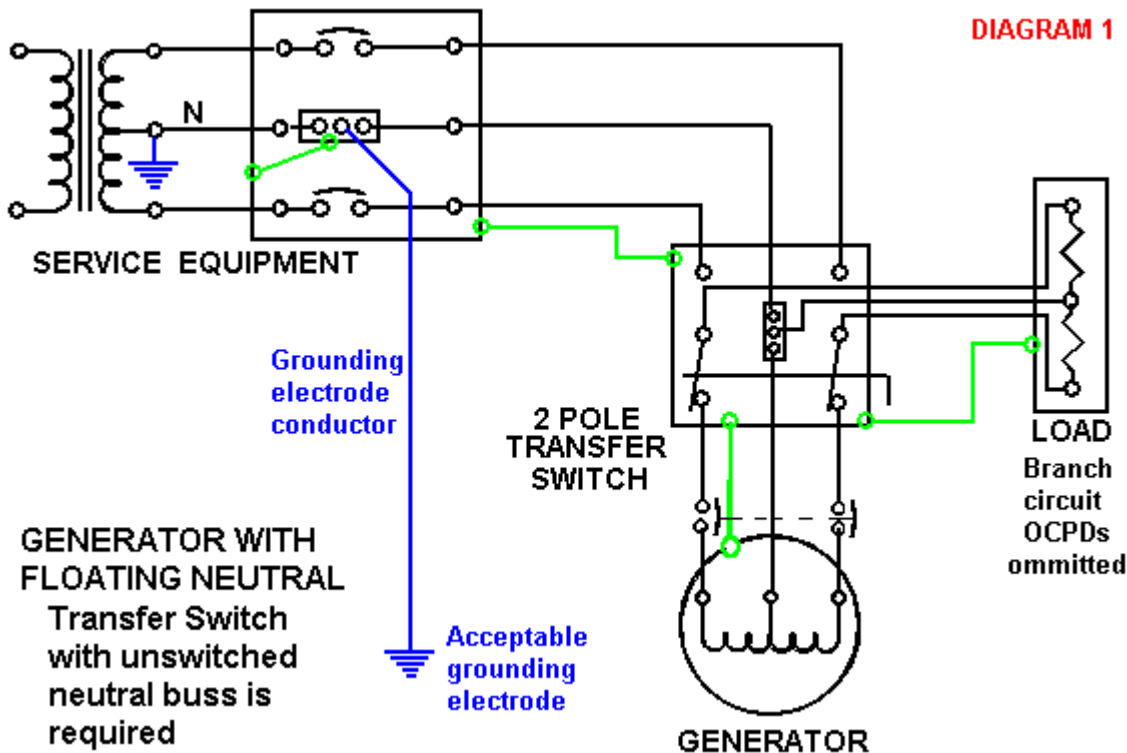
[ [Parent](#) ]

Re: Anyone have a transfer switch? ([none / 0](#)) (#2)  
by Electric Ed on Sun Aug 17th, 2003 at 06:43:54 AM MST  
([User Info](#)) <http://www.electric-ed.com>

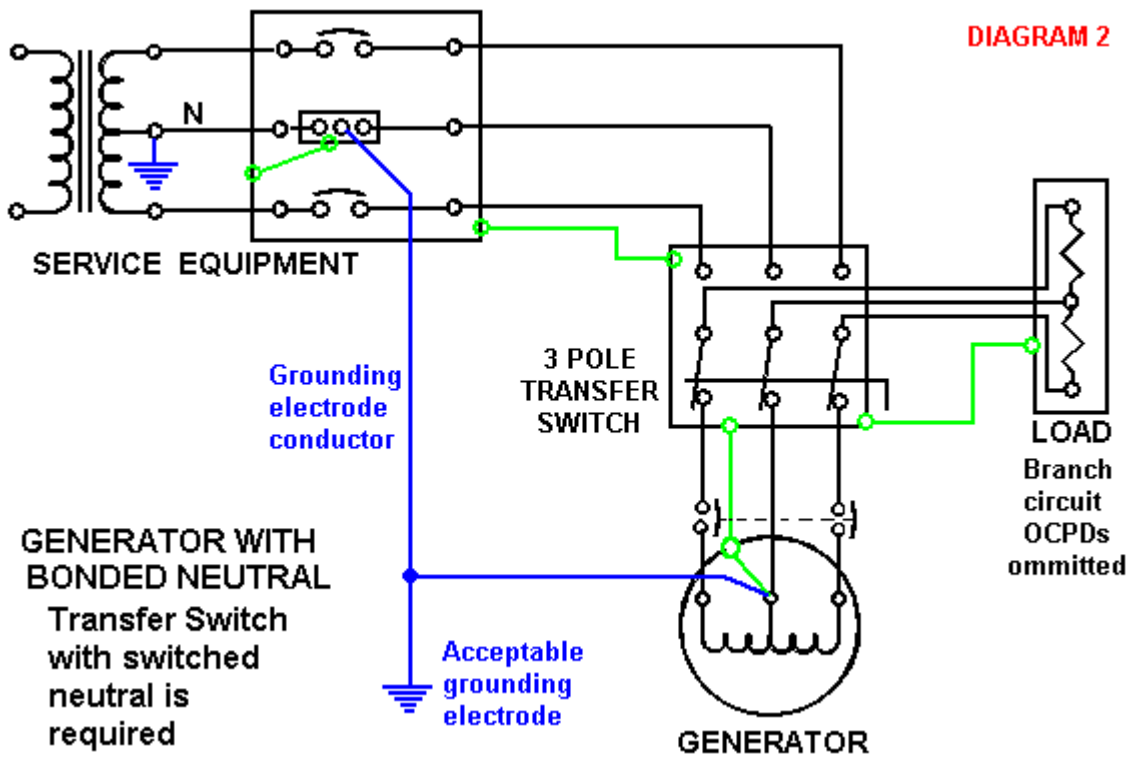
Be very careful with the selection and installation of a transfer switch. The type of switch, that is, whether it switches the neutral conductor or not, depends on the type of generator it is used with.

The "portable" generators that are designed for "stand-alone" use were never intended to be connected to a building wiring system. They are required by code to have the neutral bonded to the frame, and if used with a transfer switch, the switch must open the neutral conductor.

Generators that have a "floating" neutral require a transfer switch that does not switch the neutral conductor.







Electric Ed

Re: Anyone have a transfer switch? ([none / 0](#)) ([#3](#))  
by [tleser \(tleser at purdue edu\)](#) on Sun Aug 17th, 2003 at 12:15:23 PM MST  
([User Info](#))

Hey thanks Ed for posting those schematics. That is some good info you posted about and also your site! I will have to look around there, but do you know anything about obtaining the electrical permit to install the switch and the requirement for a licensed electrician? I'll be getting my b.s. in EcET this december and have taken a high power course that went from designing generators, to xfmr's, to sizing fuses and breakers, and even PLC's (Hate those things!). That's why I'm thinking of designing my own transfer switch that will have better automatic features. I'm goin in to talk to the power system prof's this week about it. Do you possibly know any resources?

I'm really just concerned about the licensed electrician bit, would I just have to get the license then? What does that entail too? Thanks again!

Tom

[ [Parent](#) ]

Re: Anyone have a transfer switch? ([none / 0](#)) ([#5](#))  
by [laskey](#) on Sun Aug 17th, 2003 at 05:37:59 PM MST  
([User Info](#))

Let me tell you one very important thing. Designing your own transfer switch may be cool and exciting, BUT in Canada (and I`m sure the states too) if you install it in a house with out CSA (or UL) approval you not only void the house`s fire insurance, but make your self liable for any damages it may cause if it goes faulty. An electrical or building inspector will tell you to remove it if it dosen`t have safety certification sticker on it. Oddly enough CSA isn`t hard to get, but they`re very picky.

I also know of quite a few Dead Electrical Engineers who thought they knew what they were doing instead of having a qualified experienced electrician do the work they specify. It looks easy (and it is), but you need to be trained specifically how to do that work.

Cya,

Chris

[ [Parent](#) ]

Re: Anyone have a transfer switch? ([none / 0](#)) ([#6](#))  
by tleser ([tleser at purdue edu](#)) on Sun Aug 17th, 2003 at 11:53:22 PM  
MST  
([User Info](#))

great tips Chris, definitely something for anyone to follow. I wasn't plannin on goin in without doin it properly. Keep in mind I just started lookin into this, so I guess if I want to be a transfer switch competitor I will have to look up info on getting UL approval. I've learned quite a bit today from the keywords I've gotten from this thread and a couple a couple of email replies from a buddy of mine, who's a LEGALLY unlicensed apprentice electrician. Yep, IN is a weird state where there's no state-wide electrician licensing, his county doesn't require it. Thanks again for the replies.

Tom

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[Anyone have a transfer switch?](#) | 6 comments (6 topical, 0 editorial)

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## [Need advice on Xantrex charge controller](#)

By [troy](#), Section [Homebrewed Electricity](#) [Controllers](#)

Posted on Sat Aug 16th, 2003 at 03:45:29 PM MST

Will a C35 Xantrex act as a dump load controller?

Will a C35 Xantrex act as a dump load controller?

Here's an excerpt from their advertising:

C35 Charge Controller, 35A, 12 or 24V

Product Datasheet

A Controller for Virtually Any DC Charging Source The C40 has long been the mainstay of our charge controller line-up, its versatility and reliability have made it an industry standard. Now the C40 is joined by two companion controllers, the C35 and C60.

All three of these fully solid state, microprocessor-driven controllers are UL and cUL listed. C Series controllers may be configured for PV battery charging, or DC load control or DC diversion operation. Whatever the charging source, a C Series controller is sure to meet your DC controller needs."

To me, the phrase, "DC diversion operation" sounds like you could hook up a dump load. Anybody have one of these that can say one way or the other?

Thanks a 10^6

troy

[Need advice on Xantrex charge controller](#) | 4 comments (4 topical, 0 editorial)

Re: Need advice on Xantrex charge controller ([none / 0](#)) ([#1](#))

by TomW on Sat Aug 16th, 2003 at 04:20:27 PM MST ([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Troy;

DC diversion operation means it can switch in a dump load.

Cheers.

TomW

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Re: Need advice on Xantrex charge controller ([none / 0](#)) (#2)  
by jimU on Sat Aug 16th, 2003 at 07:48:35 PM MST  
([User Info](#))

Hi Troy.

I use the Trace C-40 charge controller, and has been online for over 5 years working perfectly..Highly recommended..

Just wanted to remind you that yes, it can be a load diverter OR a charge controller, but not both at the same time..

Laterz,  
JimU

Re: Need advice on Xantrex charge controller ([none / 0](#)) (#3)  
by scoraigwind ([magnet@scoraigwind.co.uk](mailto:magnet@scoraigwind.co.uk)) on Sun Aug 17th, 2003 at 12:52:20 AM MST  
([User Info](#)) <http://www.scoraigwind.co.uk>

The diversion load mode will control a dump load. It makes a fairly loud buzz as it switches it on and off quite fast. There are two voltage settings, bulk and float. Its a great controller except it does have a bit of a time lag in it so that if the wind is gusty you will see it dumping way above or below the set voltages at times.

The c-40 can be used at 12, 24 or 48 volts but the c35 is only 12 or 24 volts.  
Hugh Piggott <http://www.scoraigwind.co.uk>

Re: Need advice on Xantrex charge controller ([none / 0](#)) (#4)  
by troy on Mon Aug 18th, 2003 at 11:52:53 AM MST  
([User Info](#))

Hey thanks guys! I can't tell you what a great resource this group of people is! It would have taken weeks/months to get an understandable response from Trace/Xantrex.

Have a lovely day,

troy

[Need advice on Xantrex charge controller](#) | 4 comments (4 topical, 0 editorial)

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[info](#)

By [wpowokal](#), Section [Homebrewed Electricity](#)  
Posted on Mon Aug 4th, 2003 at 08:28:12 AM [Controllers](#)  
site of interest, maybe!

This site may be interesting to some who tread the boards of this great site. Although this points to a particular project, just scroll down and hit return to projects.

[http://www.acs.comcen.com.au/12\\_24reg.html](http://www.acs.comcen.com.au/12_24reg.html)

regards Allan

[info](#) | 1 comment (1 topical, 0 editorial)

Re: info ([none / 0](#)) ([#1](#))  
by RobC on Wed Aug 6th, 2003 at 11:22:53 PM MST  
([User Info](#))

Great site Thanks

[info](#) | 1 comment (1 topical, 0 editorial)

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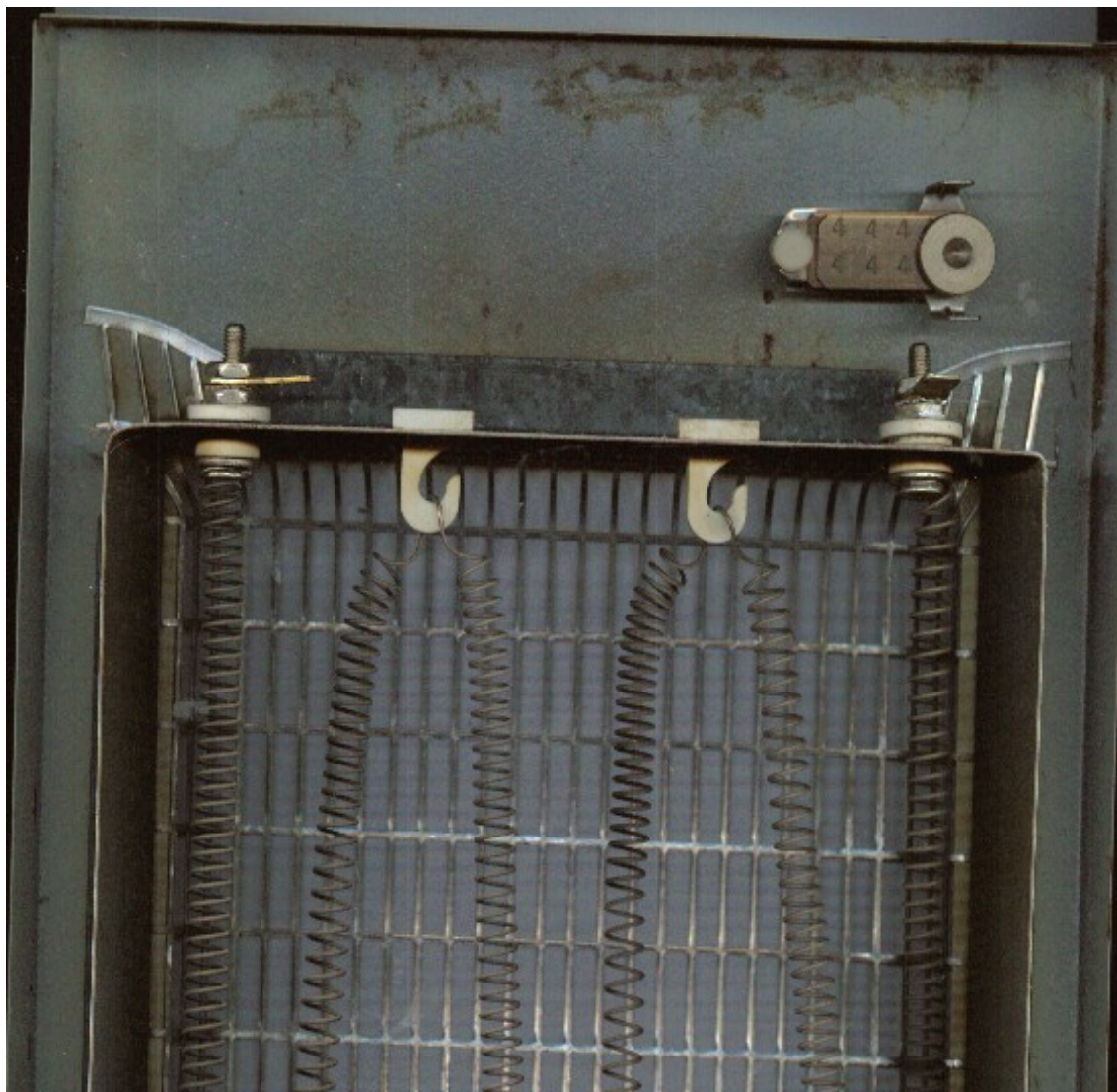
### [Heater as dump load?](#)

By [bobj](#), Section [Remote Living](#)

Posted on Sun Jul 20th, 2003 at 04:50:12 PM MST

Anyone used a resistance heater as dump load?

[Controllers](#)



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Any body ever think of using an old electric heater as a dump load. after rewiring it for 12 volts it should pull a lot of amps / watts.

bobn

[Heater as dump load?](#) | 9 comments (9 topical, 0 editorial)

Re: Heater as dump load? ([none / 0](#)) ([#1](#))  
by laskey on Sun Jul 20th, 2003 at 08:44:27 PM MST  
([User Info](#))

Well... Kinda.

You see it has a set resistance which you can calculate. For example if it's 120volt 1000 watt heater. Then it'll draw 8.33333 amps, and thus it's resistance is 14.4 ohms. Now if you put 12 volt into 14.4 ohms, you draw .83333 amps which gives you about 10 Watts.

You see it's the resistance of the element that drives how much current you draw at a give voltage, and thus how much wattage you can use.

so... Stick an ohm meter across the element. Take the voltage you're going to feed it (say 12 volts) divide by the meter reading (12/14.4 ohms), you'll get the current it draws (.83333amps), multiple the input voltage by the current (12X.8333333= 9.99996 watts) to get the wattage.

I think the saving grace of the thing is that the element can still handle 8 amps (in my example), and when you switch into dump mode you are switching away from your batteries, meaning that your generator voltage can skate up away from what your battery bank was holding it at (say about 12 volts), meaning the you're actually feeding it much more voltage (say 50 volts) meaning it'll eat more wattage

if that makes any sense. :)

Cya,  
Chris

Re: Heater as dump load? ([none / 0](#)) (#3)  
by woferhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Sun Jul 20th, 2003 at 10:51:56 PM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

I would use a very large lightbulb, that says  
"Batteries Charged"

}- W o o f -= {

[ [Parent](#) ]

Re: Heater as dump load? ([none / 0](#)) (#4)  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Mon Jul 21st, 2003 at 12:59:09 AM MST  
([User Info](#))

Using it to power 5 50watt halogens for track lighting always works...  
What do you think lights up my shop from time to time?

-Andrew

[ [Parent](#) ]

Re: Heater as dump load? ([none / 0](#)) (#2)  
by Seth on Sun Jul 20th, 2003 at 09:14:50 PM MST  
([User Info](#))

U could always cut the wire in two and X4 the power.....

Re: Heater as dump load? ([none / 0](#)) (#5)  
by Jimbob on Mon Jul 21st, 2003 at 07:14:52 AM MST  
([User Info](#))

I prefer surplus large 1000 watt resistors with say 1/2 ohm resistance to load lower voltage sources with an air heat exchanger. (go to: [www.fairradio.com](http://www.fairradio.com)). I will be using a commercial water heater that can take 6- 1500 watt @ 120 volt elements. At 24 volts, the load would be 1800 watts. Additional load will be the air exchanger heater using the resistors mentioned above. My air heat exchanger is good for 4KW load.

Re: Heater as dump load? ([none / 0](#)) ([#6](#))

by troy on Mon Jul 21st, 2003 at 12:20:19 PM MST

([User Info](#))

As mentioned, resistance is the key. And here is a source for low voltage heating elements to convert a standard 120 or 220 water heater to 12 or 24 volt if you want free hot water out of the excess juice. I've never actually dealt with these people, but their website has been around for several years, which is more than you can say about many of them.

Best regards,

troy

[http://www.kansaswindpower.net/water\\_heaters.htm](http://www.kansaswindpower.net/water_heaters.htm)

Use one or more of these elements as a diversion load with Trace C35, C40, C60, TC60 controllers. They fit most standard water heaters with screw-in elements. An adapter is used for the square flange type element. The dual 12/24 element has two separate 25 elements. It can be wired for 25 amps or 50 amps at 14.5 volts or 25 amps at 29 volts. The dual 24/48 volt element has two separate 30 amp elements. It can be wired for 30 or 60 amps at 29 volts or 30 amps at 58 volts. Order enough elements with a total current draw greater than your charging system's maximum output, but no more than about 75% the maximum amp rating of controller. 150 watt hours will raise 1 gallon of water about 60°.

D380 12/24 volt Dual 25 amp 3 lbs \$65

D381 24/48 volt Dual 30 amp 3 lbs \$65

Square Flange Adapter 1 lb \$20

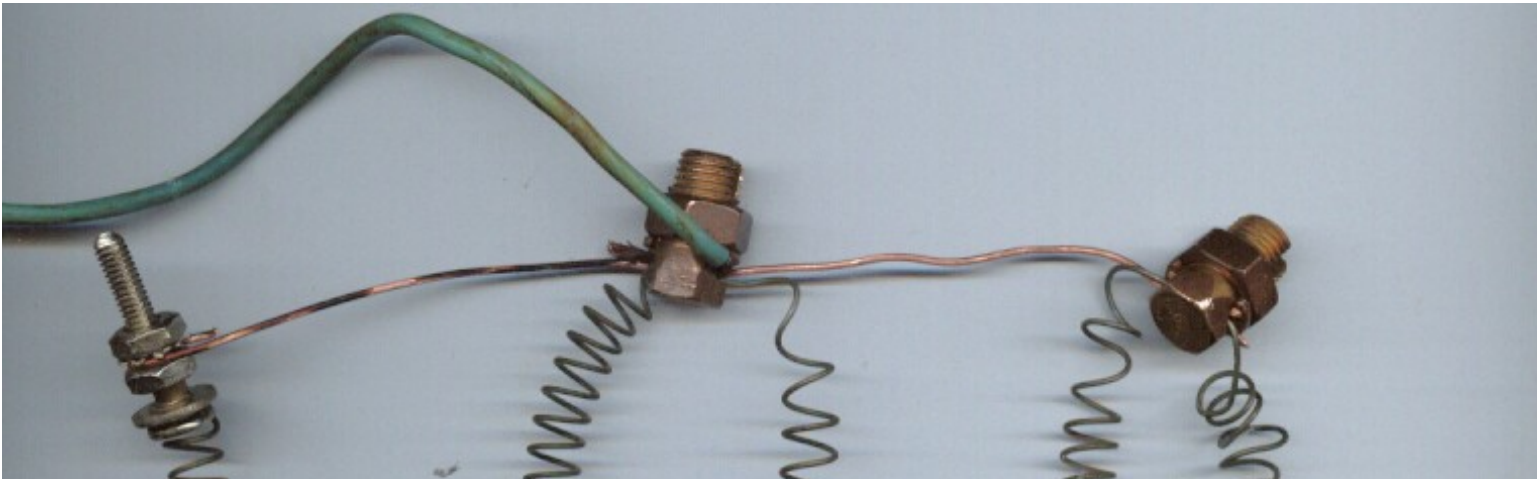
Re: Heater as dump load? ([none / 0](#)) ([#7](#))

by bobn on Mon Jul 21st, 2003 at 02:14:32 PM MST

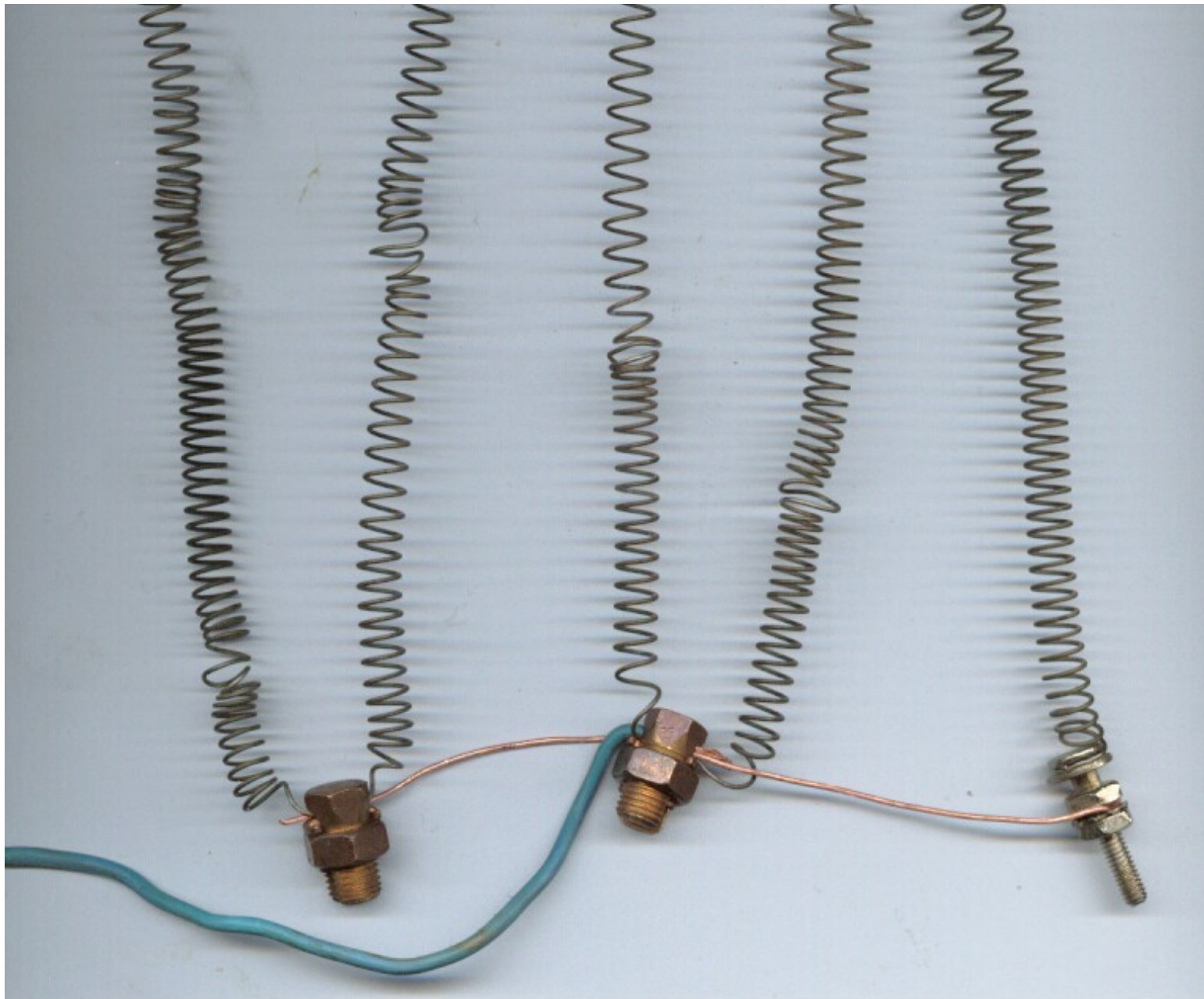
([User Info](#))

Well i rewired the heater for lower volts and it draws 25 amps at 12 volts in its current configuration.

bobn







Re: Heater as dump load? ([none / 0](#)) (#8)  
by troy on Tue Jul 22nd, 2003 at 05:23:19 PM MST  
([User Info](#))

Excellent Job!

I always root for the re-users/recylers. And now it's almost fashionable to go dumpster diving because you're saving the environment too. I guess I was cool all these years and didn't even know it.

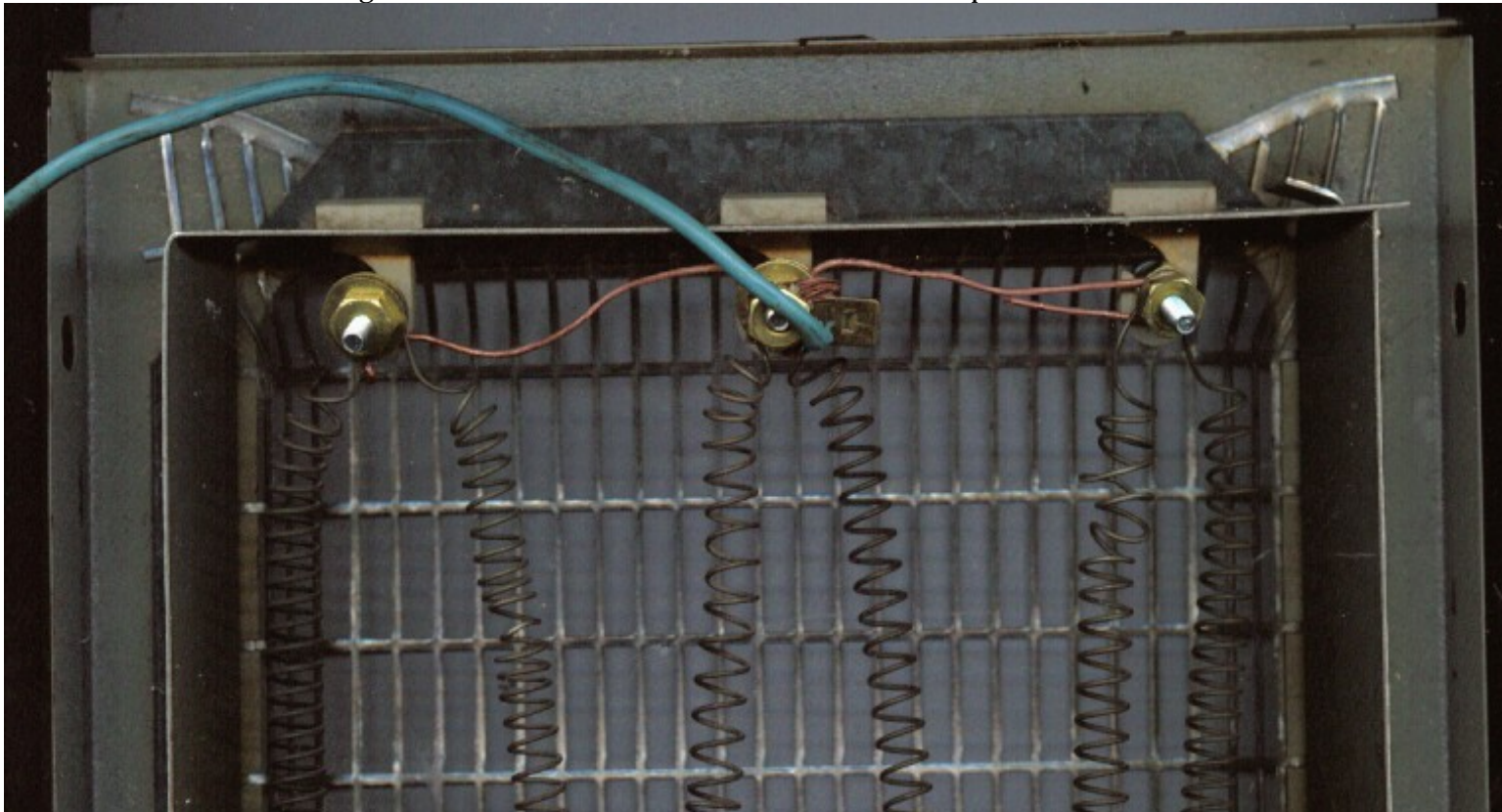
Best regards,

troy

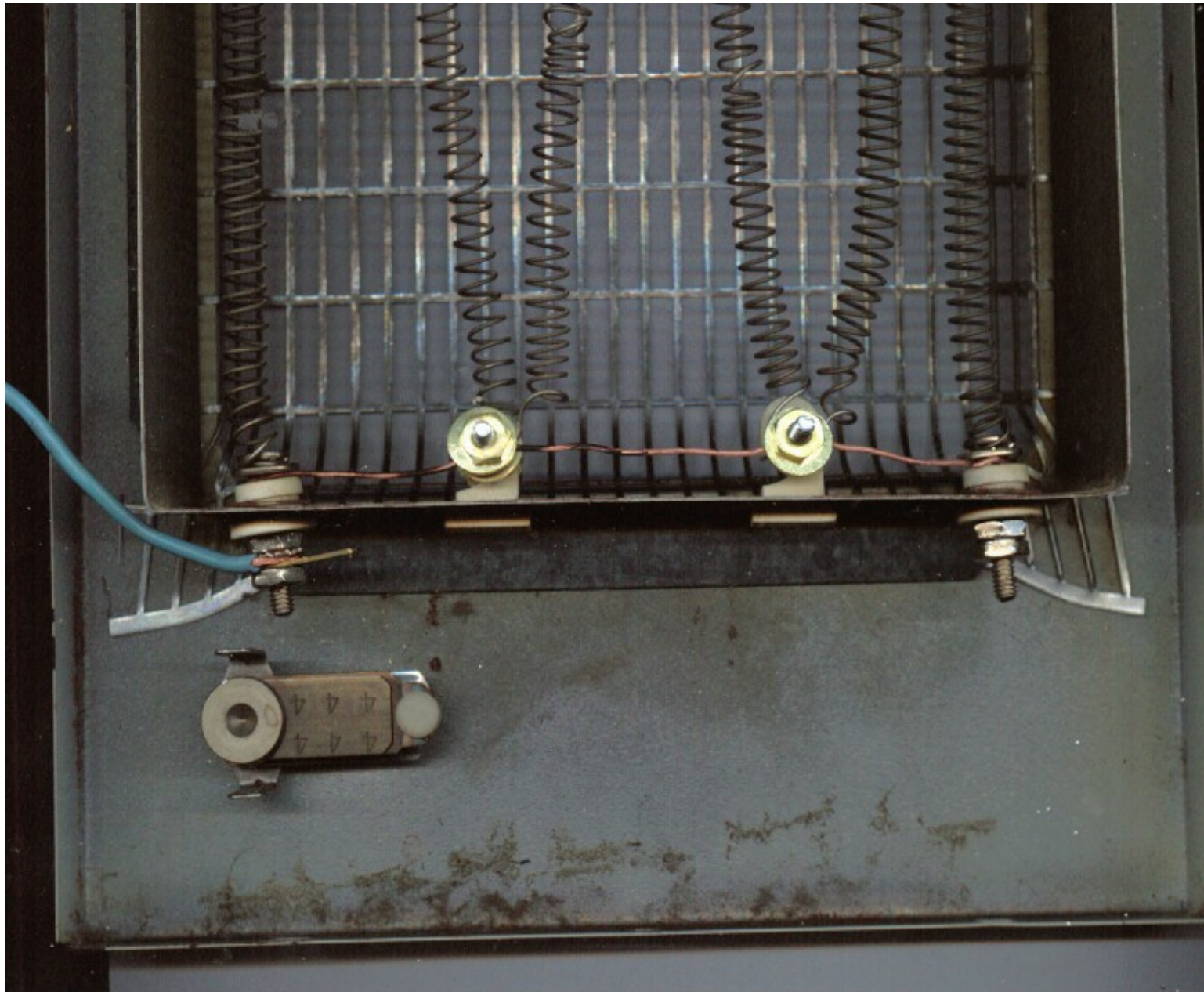
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Re: Heater as dump load? ([none / 0](#)) (#9)  
by bobn on Wed Jul 23rd, 2003 at 02:13:41 PM MST  
([User Info](#))

OK here it is in its final configuration lol total investment \$2.74 draws 30 amps at 12 volts.







[ [Parent](#) ]

[Heater as dump load?](#) | 9 comments (9 topical, 0 editorial)

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[Transformer/ power supply](#)

By [Anonymous Hero](#), Section [Homebrewed Electricity](#)  
 Posted on Mon Jun 23rd, 2003 at 10:09:01 AM MST [Controllers](#)  
**I blew my Magnetics USA 3-12 VDC 1AMP POWER SUPPLY**

Manetics USA are not getting back to me. Ionly need to replace 1 , 1/2 watt resistor that I can no longer read. ANYone help out here, or know of a standard power supply schematic with the same parameters as a Magnetics USA ac-dc adaptor "Mag -1000). Buzz

[Transformer/ power supply](#) | 2 comments (2 topical, 0 editorial)

Re: Transformer/ power supply ([none / 0](#)) (#1)  
 by jubalearly on Mon Jun 23rd, 2003 at 03:30:25 PM MST  
[\(User Info\)](#)

There are several common ways to do this, so I don't think you can find a generic scematic. If you put 12v power supply in a search engine with scematic you'll find a few dozen. I personally like LM317 voltage regulators.

Does this have a chip controlling the voltage? Or is it simply a resistor for each voltage? Older ones might have a couple of transistors for voltage regulation. As cheap as these are, I suppose you are doing this for experience more than money saving. So, I recommend you put on a 10K pot (or whatever you can scrounge) and see what that gets you - HTH, Russ

Re: Transformer/ power supply ([none / 0](#)) (#2)  
 by Anonymous Hero on Wed Jun 25th, 2003 at 12:29:35 PM MST

Russ ( jubalearly), The 10K pot idea is truly excellent. I can then use a VOM to "tune"the correct resistance as I achieve the correct output. Then I can measure that resistance and replace the resistor. PERFECT . THANKYOU !!! Jungle Bill.

[Transformer/ power supply](#) | 2 comments (2 topical, 0 editorial)

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[No batteries, heating element load controller ?](#)

By [Dave B](#), Section [Homebrewed Electricity](#)  
Posted on Wed Jun 18th, 2003 at 12:52:10 PM MST  
I'm willing to pay for solution .....

[Controllers](#)

I have designed my alternator to power 120vac 1500 watt hot water heating element(s). 120vac @ approx. 450-500rpm. I do not want to charge batteries but rather run these direct. I am needing a load controller circuit that would vary the load depending on rpm or voltage of the mill. This will allow start up and more power efficiency at various wind speeds. I would also like to adjust the "time-on" and off to help smooth out when the winds are gusty. I can run this alternator up to 400 rpm with plenty of torque for testing with a 2 hp electric motor. I have spun it up to 900 rpm inloaded @ 230 vac with my drill. I am willing to pay for a working schematic or at least a rough circuit drawing to get me started on completing this part of my project. I can wire, build and test it no problem but do not have the time for the design work. I'd really appreciate any feedback (no pun intended) on help with this controller circuit.

Thank you everyone for your support, I'm having a blast. Dave B. 

[No batteries, heating element load controller ?](#) | 11 comments (11 topical, 0 editorial)

Re: your gennie?? ([none / 0](#)) (#1)  
by StanB ([solar4@juno.com.nospam](mailto:solar4@juno.com.nospam)) on Wed Jun 18th, 2003 at 02:48:43 PM MST  
([User Info](#))

Do you have a web page with more pics?? Thanks!

Re: your gennie?? ([none / 0](#)) (#2)  
by Dave B on Wed Jun 18th, 2003 at 03:52:03 PM MST  
([User Info](#)) <http://www.madbbs.com/users/bruggelog>

I have more photos but not on a website at this time. Do you have anything in particular you would like to see ? I guess I could set this up in my diary. I'll have to figure it out.  
Dave B

[ [Parent](#) ]

Re: your gennie?? ([none / 0](#)) (#3)  
by laskey on Sat Jun 21st, 2003 at 02:58:40 PM MST  
([User Info](#))

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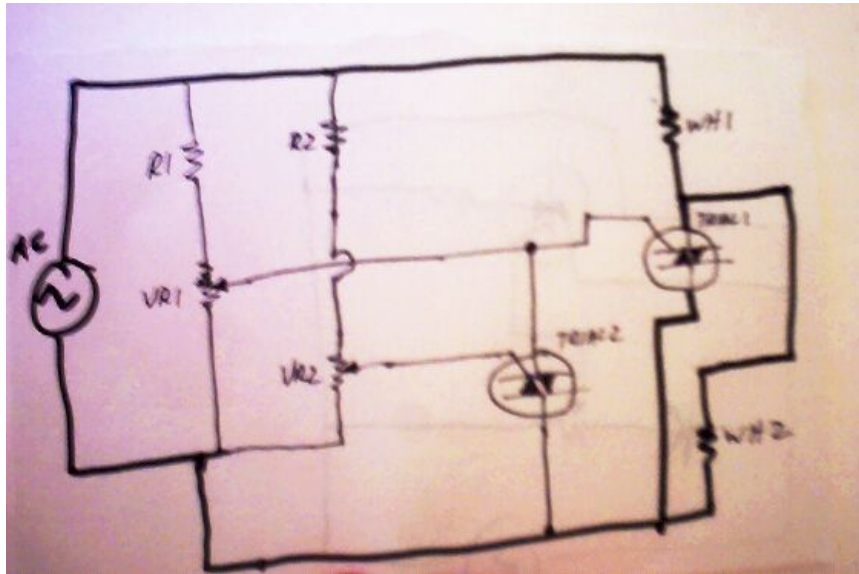
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Well, I'll take a stab at it.

This my Blurry Concept Circuit. (remember it`s a concept, and my scanner`s not working.)

WH1 and WH2 (Water heater elements) are put in series so that they can handle 240VAC when your gen gets that high. R1 and VR1 control the turn on voltage for Triac1. It would be set to come on right away. This provides a short across WH2 so that WH1 is the only one on. R2 and VR2 control the turn on for Triac2. It would be set to come on when the incoming AC is up around 150-180VAC (maybe more, or less) and it prevents Triac1 from turning on, thus leaving the 2 loads in series for high voltage times.

Once again it`s a concept. I don`t know if it`ll work with out tinkering. But maybe it`s a starting place. I think it`s pretty good for a cola induced mid-night raving. >:)

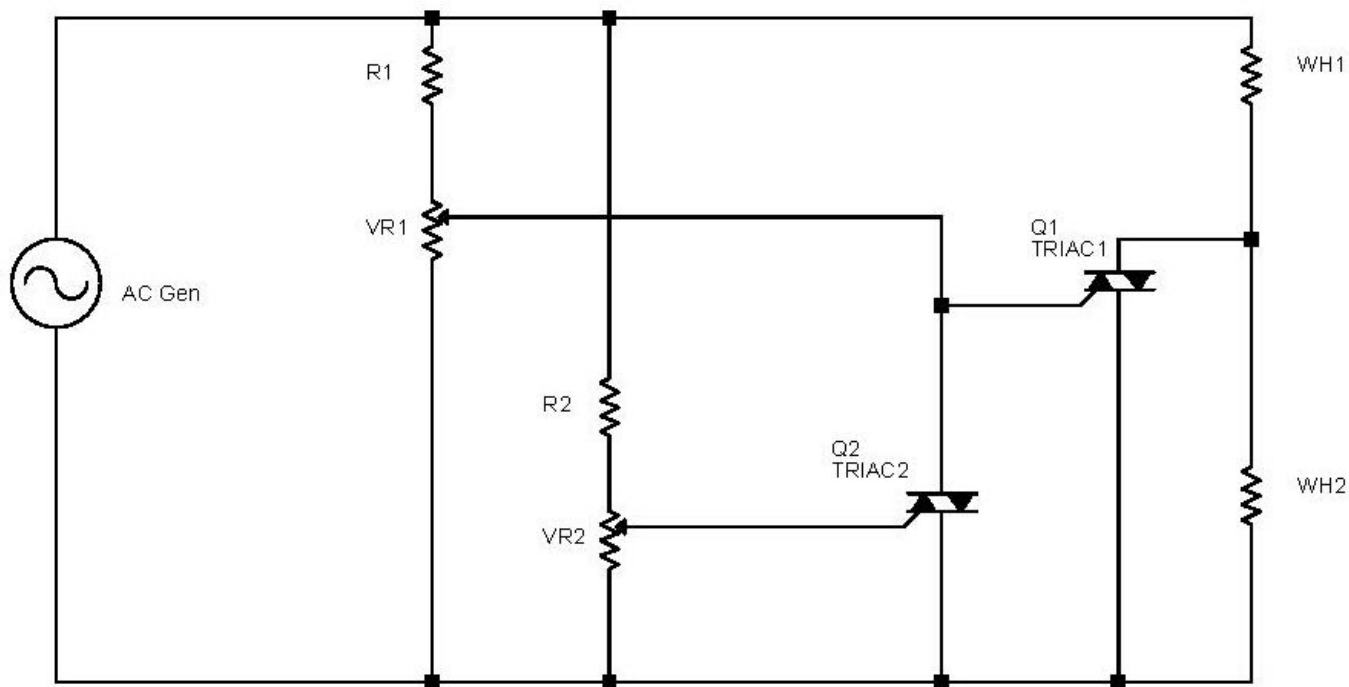
Cya, Chris

[ [Parent](#) ]

Re: your gennie?? ([none / 0](#)) (#4)  
by laskey on Sat Jun 21st, 2003 at 04:43:13 PM MST  
([User Info](#))

Okay I figured out a better way to make this drawing.

Here's a Clear Blurry Concept Drawing.



Cya, Chris

[ [Parent](#) ]

Re: your gennie?? (none / 0) (#5)  
by Dave B on Sat Jun 21st, 2003 at 10:03:52 PM MST  
([User Info](#)) <http://www.madbbs.com/users/bruggelog>

Chris,

Thank you very much for your circuit idea. As I mentioned, my circuit design skills are a bit lacking but I am very experienced with assembly and repair of PC boards along with testing. Here's the interesting thing about what I'm trying to do. As the resistance increases the genny will spin more freely so actually I want to have an unloaded or open circuit at low RPM to allow start up. As the rpm increases I want to add a high resistance (possibly several heating elements) This will be a gradual loading of the alternator so as not to "brake" it too soon before it continues to increase in RPM. As the RPM increases I can reduce the resistance (shut off another element) More power at each element as now the voltage will be much higher. Being able to adjust the delay of the on and off switching will be important to try to most efficiently balance the windspeed with the power output. Basically this will automatically load the alternator with the desired resistance and still allow it to turn as easy as possible for the available windspeed. Does this make sense ? Can your circuit be made to work this way ? I understand how your circuit will function as drawn but is this the opposite of what I need ? I sure appreciate your help, this is great fun. Dave B.

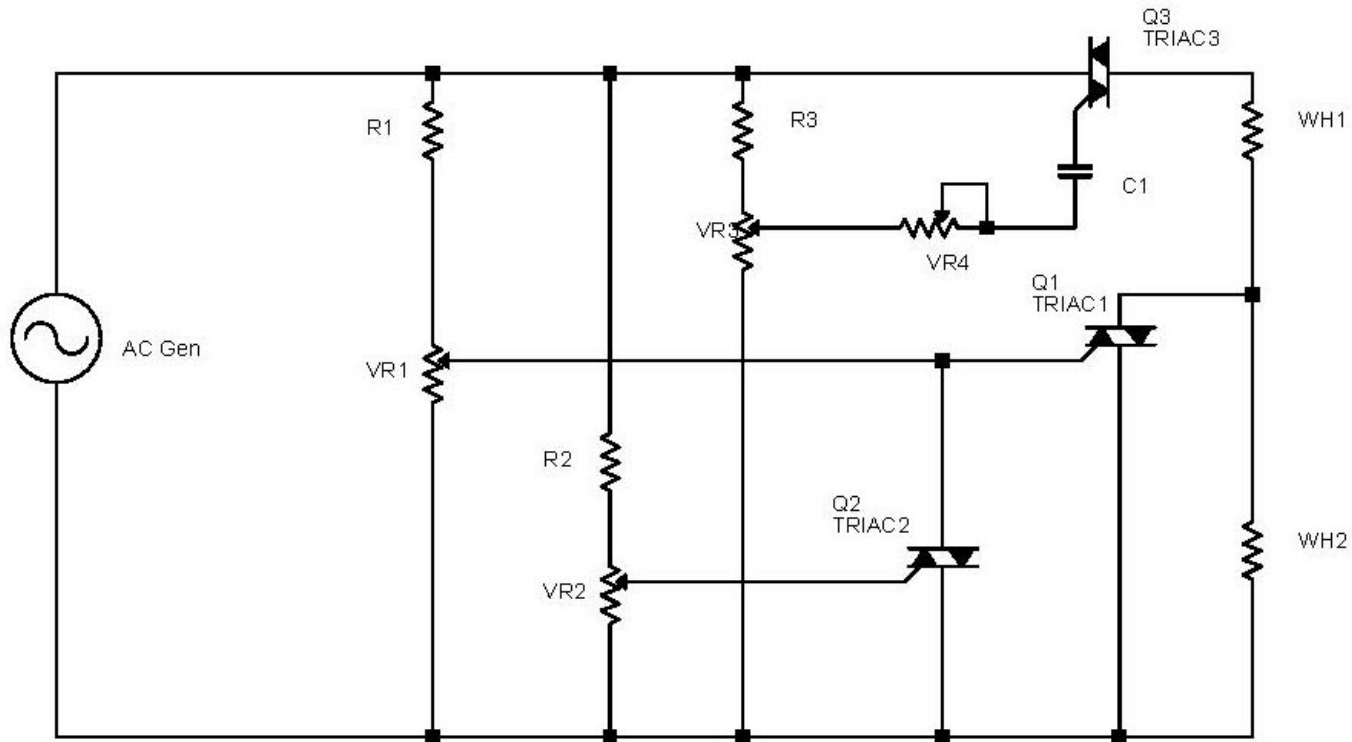
[ [Parent](#) ]

Re: your gennie?? (none / 0) (#6)  
by laskey on Sun Jun 22nd, 2003 at 01:07:02 AM MST  
([User Info](#))

Hmmmm, Okay I get it.

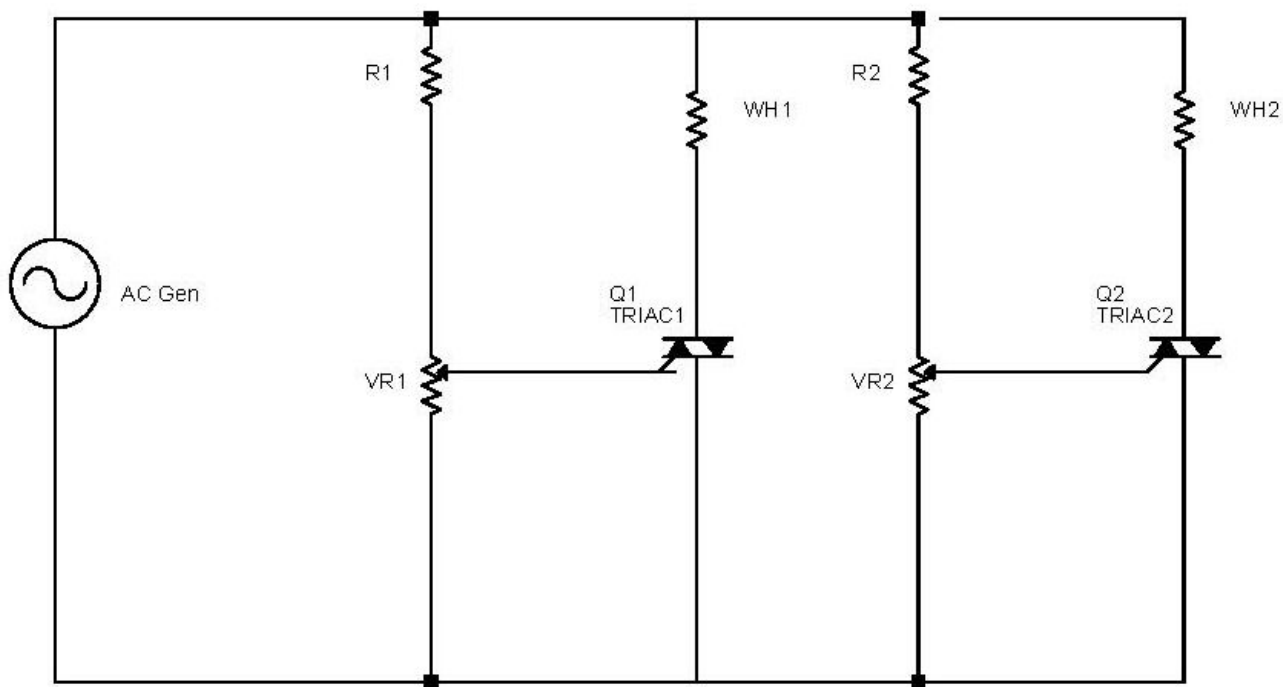
You see I was concerned with over voltageing your heating elements at peak time, thus the load adds on in series. You start out with one load and add a second, but I see now. You want to remove the load all together for start up and add it in later.

Try this out for a basis.



The third triac can be set to delay turn on until voltage gets up high enough, as well (with the RC circuit delay the turn on during each cycle so that the load comes on later in the cycle cutting back the power it gets as the voltage goes up this delay should get shorter until there is very little delay.

If you want you could keep adding loads in parallel with R and VR group and a triac in series with the load. and you`d set the load to come on every so many volts. Think of it like this.



It`s getting too late for me to think straight. I`ll look at again tomorrow when I`m fresher.

This is fun isn`t it. :)

Cya,  
Chris

[ [Parent](#) ]

Re: your gennie?? ([none / 0](#)) (#7)  
by Dave B on Sun Jun 22nd, 2003 at 11:32:30 AM MST  
([User Info](#)) <http://www.madbbs.com/users/bruggelog>

Chris,

I wish I could "read" circuits as easily as you can. I have printed these that you have drawn and they sure seem to make sense even for me. I think you've got the idea, all I need to do is learn more. Are the triacs capable of switching such high current ? Sure seems to me the way to go instead of relays, these will be switching frequently so the reliability and circuit life is very important. Again, the "backward" seeming thing about the load is that the higher the resistance the easier the genny will turn. It's almost like I want to lessen the resistance as the voltage (or speed) of the alternator increases. I'll need a good size blade set for the torque necessary, I believe a 3 blade of at least 10' will be needed, I don't think this is too large to still be able to hit 500 rpm max. in 25-30 mph wind. This will be slightly over 120 vac. I need time to play, I have a bread board and all the tools I need to experiment with the circuit. Do you know of any part numbers for the triacs that could work with this setup ? Thank you again for your time, any further thoughts or ideas to help me get this working is greatly appreciated and I'd be happy to slip you a few bucks for your experience. This is great fun ! Dave B.

[ [Parent](#) ]



Re: No batteries, heating element load controller ([none / 0](#)) (#8)  
by laskey on Sun Jun 22nd, 2003 at 03:24:38 PM MST  
([User Info](#))

Yeah, you should be able to find Triacs that switch this kind of load. A 120 volt element putting out 1500 watts is 12.5 Amps max (figured that out with my solar powered calculator >:)). So to be a good engineer we have to design for that even though I doubt we're going see 1500 watts per element. I'd have to dig for a part number. I'll see what I can come up with at work tomorrow if I get a second.

A triac is one of those strange devices that no one knows much about. I call them zero-cross devices, because they has to be triggered after every time the voltage goes to zero, and what's worse is the trigger voltage have to be the same direction as the way the main current's flowing. Most people find them a pain to work with, but they are real good at controlling AC loads. You can actually trigger the thing in the middle of each AC cycle half somewhere to get reduced apparent power to you load. If you build a variable delay circuit that can delay the Triac's on time from 0 to 8.333 Milliseconds then you can control the apparent load power from 0 to 100%. You actually get that kind of circuit in in most modern day light dimmers. The whole thing falls apart with inductive loads. No simple circuit will serve their needs.

Anyway, I digress, Triac turn on voltages are fairly low, so you need a pretty big voltage divider to get down there (R:VR ratio has to be high)and it'll take some tuning to get them to turn on when you want, but I think the crazy thing might just work. :)

Cya,  
Chris

[ [Parent](#) ]

Re: No batteries, heating element load controller ([none / 0](#)) (#9)  
by Dave B on Sun Jun 22nd, 2003 at 09:12:46 PM MST  
([User Info](#)) <http://www.madbbs.com/users/bruggelog>

Man, this is great stuff. So much to learn and so little time. I guess triacs are magic and it seems like the answer to my continuous switching of the heating elements. Just wish I knew more at the component level and circuit design. If you come up with a component number for triacs that will handle the current that would be great. I'll do a search also and learn what I can about setting up and testing this type of circuit. It sure would be nice if I didn't have to work besides, I really had hoped to have this up and flying sometime before this Winter. Thanks for your help Chris, I'll let you know of any success I may have with testing of this setup. Any other ideas or information you might think could help make this work I sure would appreciate it. Dave B.

[ [Parent](#) ]

Re: No batteries, heating element load controller ([none / 0](#)) (#10)  
by laskey on Mon Jun 23rd, 2003 at 06:14:44 PM MST  
([User Info](#))

If you can get NTE parts, a NTE56006 will do the job.

Cya,  
Chris

[ [Parent](#) ]

Re: No batteries, heating element load controller ([none / 0](#)) (#11)  
by Dave B on Tue Jun 24th, 2003 at 10:41:12 PM MST  
([User Info](#)) <http://www.madbbs.com/users/bruggelog>

Thank you Chris, I'll check for this and hope to start testing some of your ideas soon. Wish there was more time for all the fun. Any thoughts or ideas from you or anyone are always welcome. Much appreciated, Dave B

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## [how do i make regulator for wind genny](#)

By [zubby](#), Section [Homebrewed Electricity](#) [Controllers](#)  
Posted on Mon Jun 16th, 2003 at 05:31:48 PM MST  
regulators for wind gennys

before making my final plans to construct wind genny, i must consider how i am going to regulate this future jewel. i am not sure what voltage output there will be or the amps. can i use an old GM fender mount regulator. what is the voltage range and amp range that i can input. does anyone have a schematic that i can build or adapt. any suggestions or answers will be kindly appreciated. thanks guys.

[how do i make regulator for wind genny](#) | 1 comment (1 topical, 0 editorial)

Re: [how do i make regulator for wind genny](#) ([none / 0](#)) (#1)  
by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Tue Jun 17th, 2003 at 05:57:09 AM MST  
([User Info](#))

Are you building a permanent magnet alternator, or using a vehicle alternator? In any case, the regulator from your GM won't work -- it's made to change the field strength of the electromagnets in the armature.

With a wind genny, you don't ever want the alternator (no matter what type it is) to become unloaded....the mill will overspeed and possibly blow up. Your battery bank basically serves as the regulator for the genny, until the batteries fill up. At that point, you need something that will turn on to use up the extra power.

The simplest way to do that is just a voltage-controlled switch that turns on a 12V heating element (which should draw about the same as what the mill can put out) when your batteries are full, with a little hysteresis thrown in so it doesn't just cycle rapidly on and off. You can use a Trace C-40 solar charge controller for this purpose -- it has a switch setting built-in to turn it into a dump load controller.

Have Fun!

DANF

[how do i make regulator for wind genny](#) | 1 comment (1 topical, 0 editorial)

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## [Diode sizing](#)

By [Anonymous Hero](#), Section [Homebrewed Electricity](#) [Controllers](#)  
Posted on Wed Jun 11th, 2003 at 07:14:24 PM MST

What is the smallest size diode I can use... ( Jungle Bill)..

For a one way valve into a battery. I am charging a battery with a PM motor. I am charging 12 volt battery with 15 vdc. About 2 amps is total out put or 25 watts I don't know what actually goes into the battery , I have not tested that yet. Anyway I want safety diode so the power does not reverse and head back to the motor ( generator) incase the water stops running or the thing falls over in an earthquake ,or,or, ,,you know. What size diode could handle this>?? Jungle Bill

[Diode sizing](#) | 5 comments (5 topical, 0 editorial)

Re: Diode sizing ([none / 0](#)) ([#1](#))  
by TomW on Wed Jun 11th, 2003 at 08:45:44 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepow/>

Bill;

Well since you probably don't have a Radio Shack nearby I will give you a general opinion.

Almost any general purpose diode will do the trick. Most are rated 1 amp or more. In your case I would use a pair or more side by side.

I have some salvaged diodes and bridge rectifiers I will gladly send you something that will work no charge if i had your address.

Go over here to contact me if you want some:

<http://portslave.oneota.net/~tom/fromail.html>

Cheers.

TomW

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Re: Diode sizing ([none / 0](#)) ([#2](#))  
by RobD on Thu Jun 12th, 2003 at 07:20:26 AM  
MST  
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If you can get to a Radio Shack I think they sell 3Amp 1N5400 to 1N5408 diodes anyone in the series will work. If you can get any schottky diodes the 1N5820 should do fine and they are more efficient.  
RobD

[ [Parent](#) ]

Re: Diode sizing ([none / 0](#)) (#3)  
by Anonymous Hero on Thu Jun 12th, 2003 at 12:06:47 PM MST

Tom , thanks for that very generous offer, however inlight of the distance / postage, I should try to exercise a different option. I have afew small diodes. I don't know the rating , but I have 4 small ones that are the same size as a 1/2 resistor. Would one of these work? OR would several work in parralell to "share "the load. ?? ( I have 4 for a bridge) I also have an old inverter that got toasted ( STATPOWER GARBAGE and they refused to help me one bit when I asked for a schematic in order to repair/ replace the smoked unreadable componenets) The inverter has some fairly large diodes that are similar in size to 3-5 watt diode. But first, do you think those small ones would work? ( Even a few in parrallel)? Thanks for your kind offer and information, gentleman.

Re: Diode sizing ([none / 0](#)) (#4)  
by TomW on Thu Jun 12th, 2003 at 12:53:18 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Bill;

If I was in a remote location with just what you have on hand I would just go aherad and parralel a few of the diodes I had on hand. They will share the load nicely and with several if one opens up the rest are there to keep it working.

On the other hand, that dead inverter may have a couple diodes and a good FET or two in it that can be used in a pinch as blocking diodes and properly heat sinked should handle the load that you are describing. I can't recall exactly how to get a FET to act as a blocking diode just that it has been done. I think it is a matter of tying two legs together.

Maybe someone else has that info onhand.

As far as sending you diodes they are small and would go first class postage in a letter easily.

Cheers.

TomW

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Re: Diode sizing ([none / 0](#)) (#5)  
by Anonymous Hero on Thu Jun 12th, 2003 at 01:31:08  
PM MST

Tom , thats great . I'll first try what I have. After which I'll post you . Really appreciate the suggestions and offer. I know a guy who has some old TV's as well. He pretends to be a tv repairman , but honestly , who in their right mind repairs tv's anymore? He could not fix one if his life depended on it. Never the less there lots of components in there. I can trade him for coffee! Thanks again, I'll keep you posted . Look out for future postings of "Turgo Turbine"! Cheers to YOU! Jungle Bill Jungle Bill

[Diode sizing](#) | 5 comments (5 topical, 0 editorial)

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## [Hornet as Training Wheels?](#)

By [Coasting Rotor](#), Section [Homebrewed Electricity](#)  
Posted on Sat Jun 7th, 2003 at 09:15:53 PM MST [Controllers](#)

**Will the HTH-3 charge a 48v system in light winds?**

Being new to homebrewed energy I think the Hornet HTH-3 might be a good place to start. I want to set up a 48vdc system using a couple of inverters for loads I cannot or should not build on DC.

I'm trying to **\*\*understand\*\*** what these comments @ <http://www.hydrogenappliances.com/Hornet.html> mean (the e-mail address cited on page bounced).

- HT3H ideas and suggestions:
- Avoid dead batteries! Provides a maintenance charge for 12-24 volt batteries even in calm wind areas. (4 TO 10 MPH)
  - Charges 24 or 48 volt batteries in medium wind conditions. (10 TO 19 MPH)
  - Charges 48 and super charges 90 volt battery systems in high wind conditions with over 12 amps of power! (19 TO 33 MPH)

Does this mean, for example, that at 4-10 mph I can charge ONLY 12v batteries? If so, is it possible to charge a 48v array of 4 12v batteries as individual 12v batteries (without diconnecting the series ties)? I'd want to use all wind capable of spinning the turbine.

I want to go to 48 volts because of less restrictive transmission limits (unless I'm wrong) and smaller wiring. The short question is really 'How would this Hornet work with a 48v system'?

Thanks for any hints and advice. Sorry if I sound stupid to gurus, I am, it's not my expertise (yet).

--chip\_\_k0301@globe--chop\_\_trotter.net

[Hornet as Training Wheels?](#) | 2 comments (2 topical, 0 editorial)

Re: Hornet as Training Wheels? ([none](#) / [0](#)) ([#1](#))  
by [Geek](#) on Sun Jun 8th, 2003 at 07:14:48 AM MST  
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Chip,

To answer your question you really must consider the amount of wind you have in your area. If you have average wind speeds of 15 mph this will most likely work great for you. If not, you will need to find a turbine more suited for your wind conditions. The only way I know to charge a 48 volt battery bank with 12 volts is to disconnect and wire it in parallel.

Good Luck,

Geek

Always have a dream. Those with out dreams are just waiting to die.

Re: Hornet as Training Wheels? ([none / 0](#)) (#2)  
by Anonymous Hero on Tue Jun 10th, 2003 at 11:26:33  
PM MST

Not really, he could have a switch tied to his charger, that automatically switches them from series to parallel. You might also want to try relays, as they might work too.

[Hornet as Training Wheels?](#) | 2 comments (2 topical, 0 editorial)

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### [bees wax hydraulic switch](#)

By [Anonymous Hero](#), Section [Weird Science](#)  
Posted on Tue May 27th, 2003 at 08:21:30 PM MST [Controllers](#)  
well,, uh ,, ever heard of one....? I mean a bees wax hydraulic window opener??

[bees wax hydraulic switch](#) | 12 comments (12 topical, 0 editorial)

Wax ([none / 0](#)) (#1)  
by Johnny Cool Pants on Wed May 28th, 2003 at 12:01:41 AM MST  
([User Info](#))

I know I should probably be minding my own Bees Wax here but they use it for all kinds of things and certain types of Bees Wax are more sought after than others.

Big blocks of it still wash up on the coast here once in a while, (well a little south of here in Oregon, I'm across the state line in Washington) from a ship wreck over 200 years ago.

The Bees Wax was part of a valued cargo on the spanish vessel and it was far North and lost when it ran aground. It like any ship of the day also had some gold and silver for trading.

The wax and honey have health benifits too. Honey is energy food but you can submerge other food in a jar of honey and it will keep for many years, longer than canned goods by far.

Damn The Stingers  
Johnny Cool Pants

SEX WAX ([none / 0](#)) (#2)  
by Johnny Cool Pants on Wed May 28th, 2003 at 12:41:58 AM MST  
([User Info](#))

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Surfers use sex wax on their boards, but got beat up trying to offer my services.

Turtles though endangered, are a good source for, alright skip the chit mon.

I'm doing my front door entery right now, cement turned into "Hey look at that fake stone path mold for \$14.95!"

And a few weird homemade statues later I'm still going with my own little coral castle. I found beeswax to be used in many things. an exerpt:

"Mahogany cement, for filling up cracks in wood, consists of 4 parts of beeswax, I of Indian red and yellowochre to give colour.

Cutler's cement, used for fixing knife-blades in their hafts, is made of equal parts of brick-dust and melted rosin, or of 4 parts of rosin with I each of beeswax and brick-dust,..."

Source:

<http://48.1911encyclopedia.org/C/CE/CEMETERY.htm>

Could find it's way into Windmill/Hydro use, ya never know.

DTT

JC Pants

[ [Parent](#) ]

hydraulic swith ([none / 0](#)) (#3)

by Anonymous Hero on Wed May 28th, 2003 at 08:58:10 AM MST

I have seen this hydraulic switch to open and close a window in a green house. It automatically expands and contracts in a piston which is connected to the window. Pretty neat. Not sure where to find one , though. Jungle Bill

Expanding ([none / 0](#)) (#4)

by Johnny Cool Pants on Thu May 29th, 2003 at 01:03:09 AM MST

[\(User Info\)](#)

Yeah there are a number of things that could be used for this purpose. Just about anything that expands with heat.

Getting it into a crude piston rod is another story but if you did and experimented with any kind of insulation, you could find the right combo of insulation layers to to get it to expand at the desired temperature of the green house.

Likewise, if it needed to be hotter than the greenhouse to expand, having it in a sealed jar on a steel table might make it hotter than the rest of the greenhouse.

Somewhere I posted something on "Memory Metal"

that is being used for little pistons in battle bots, or something. Same stuff the trick spoon is made out of, stir hot coffee with it and it curls up real fast.

Do you remember if the Beeswax or other greenhouse hydraulic operated on heat alone? both opening and shutting? With no external power source? I'd like to see that myself.

DTT, JCP

[ [Parent](#) ]

wax opener ([none / 0](#)) (#5)  
by Anonymous Hero on Thu May 29th, 2003 at 10:33:03 AM MST

I've got one of those self openers. It's a metal cylinder about as thick as my little finger and a foot long with a metal plunger attached to a lever to multiply it's movement length. It's filled with some type of wax that melts and expands at a temperature range of 60 to 80 degrees. A thread on the cylinder allows adjustment of the opening temperature. I've used mine for the last ten years or so to open up my cold frame. I burst the first one because I had it opening two 3 by 6 windows. Then I counter balanced it to relieve the weight. I think its limited to about 15 pounds thrust. I bought mine from a local greenhouse supply but I've seen them in catalogues and peaceful valley farm supply on the web(you'd have to do a search I can't remember the web address.) These things use no outside energy. I could see someone experimenting with using something like this to automatically opening valves in a solar water system. Chris

[ [Parent](#) ]

Wax ([none / 0](#)) (#7)  
by Johnny Cool Pants on Thu May 29th, 2003 at 08:30:34 PM MST  
([User Info](#))

It's filled with "some type of wax" eh?  
hmmm? Beeswax is a safe assumption  
but,  
could be ear wax, is the absent buzzing  
louder?

J  
C  
P

[ [Parent](#) ]

giggle ([none / 0](#)) (#8)  
by Johnny Cool Pants on Thu May  
29th, 2003 at 08:33:23 PM MST  
([User Info](#))

Just playing chris.

[ [Parent](#) ]

wax piston ([none / 0](#)) (#6)  
by Anonymous Hero on Thu May 29th, 2003 at 11:17:02  
AM MST

JCP, As far as I can see the ones for the greenhouses operate purely in the expansion process to open, then the reverse of closing is an action assisted by some hefty (looking) springs. Yep, other feller is right. They are good for a thrust of about 15 lbs. There is a heavy duty one good for 29 lbs. This thing has very interesting applications. The operating temperatures around room of course is what makes this so neat. I am not sure what the propeller heads can use this for, but we'll put it up on the shelf for sure. Some great future idea may use this application . ( Like opening and closing a penstock or something/// who knows) Jungle Bill

Wax ([none / 0](#)) (#9)  
by Johnny Cool Pants on Mon Jun 2nd, 2003 at  
11:54:00 PM MST  
([User Info](#))

Bill do you know how fast it expands? and what the ratio of expansion is? If I could get a 4 foot lift out of 99 degrees heat, with in a minute and a half, I can think of a few good ideas.  
Might even have to put the bowling ball ferris wheel back together (not kidding)

JCP

[ [Parent](#) ]

Maybe ([none / 0](#)) (#10)  
by Anonymous Hero on Tue Jun 3rd, 2003 at  
07:44:33 AM MST

I see what you are thinking , but it is limited to "energy in" and so far that is limited to the bias heating of external vs internal temperatures. That bias pressure is the temp and the flow ( amps) is regulated by the volume of the flux transfer. This unfortunately is only a black plastic piston tube 3/4 inch by maybe 12 inches long. IE small energy. The action is slow and is levered to improve range ( I think based on photos) . Maybe you could build a big one. The medium is called a "Mineral" but further research shows that it is bees wax mixed with brick dust, (Presumably as a stabilizer in super hot conditions) Thats about it. Jungle Bill

[ [Parent](#) ]

ball buster ([none / 0](#)) ([#11](#))  
by Anonymous Hero on Thu Jun 5th,  
2003 at 02:03:49 AM MST

He has one already, he used compressed air to launch the ball back up, with one short little burst of air into what he calls "The Perkins Piston"  
The way it was geared it took a long time for the ball to come back down before another little burst of air was needed.  
Only he had three balls so there was a ball on the wheel at all times.  
He dismantled it after he built something better.  
"The Perkins Perpetual" he calls it. I think he called it a "dogless dog run" here. He said he's given alot of clues and hints on the board.  
Some of you are so sure nothing will ever work and he is so sure anything can work if you keep trying. He is possitive, not negative. So the two wont mix well on the board. Hopefully they can stay clear of eachother. Because he can Bozo a team of them into a little circus car before they know it.  
I know him personally.  
Pod.

[ [Parent](#) ]

ok ([none / 0](#)) ([#12](#))  
by Anonymous Hero on Thu Jun  
5th, 2003 at 07:19:31 AM MST

ok . Does JCP use a window opener to eject these balls into the air? I am unclear. I have seen the Perkins perkulator picture on a wood stove, is this the same thing? Jungle Bill

[ [Parent](#) ]

[bees wax hydraulic switch](#) | 12 comments (12 topical, 0 editorial)

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### [In need of a voltage regulator](#)

By [Juliang](#), Section [Homebrewed Electricity](#)  
Posted on Sat Apr 12th, 2003 at 08:45:59 AM MST [Controllers](#)

If memory serves me I recall seeing someone selling either a do it yourself voltage regulator kit or an already made one in the range of about \$10.00 to \$25.00

\_\_\_\_\_ somewhere buried down in the old discussion board. I tried doing search but when I get 12000+ hits on voltage regulators I figure asking you all might be a little easier. Does any one recall or know who I can contact on this? Thanks Julian

[In need of a voltage regulator](#) | 3 comments (3 topical, 0 editorial)

charge controller ([none / 0](#)) (#1)  
by troy on Sat Apr 12th, 2003 at 10:27:30 AM MST  
([User Info](#))

I believe this is the site you are looking for. As a bonus, he's also a member of our fun group here.  
<http://www.bioelectrifier.com/> best of luck, troy

cool ([none / 0](#)) (#2)  
by 12volt dan ([dan12v@hotmail.com](mailto:dan12v@hotmail.com)) on Sat Apr 12th, 2003 at 04:24:26 PM MST  
([User Info](#))

Thanks troy I`ll make use of that myself  
7 years off the grid and counting  
[ [Parent](#) ]

Charge Controller ([none / 0](#)) (#3)  
by Juliang on Sun Apr 13th, 2003 at 08:41:35 AM MST  
([User Info](#))

Thanks Troy this is the page I was looking for. Julian  
[ [Parent](#) ]

[In need of a voltage regulator](#) | 3 comments (3 topical, 0 editorial)

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## [To DanB](#)

By [Alex](#), Section [Weird Science](#)

Posted on Sat Aug 23rd, 2003 at 11:36:36 AM MST

[Ebay](#)

internet

hi,  
what's your internet connection highly in the mountains ?

[To DanB](#) | 1 comment (1 topical, 0 editorial)

Re: To DanB ([none / 0](#)) ([#1](#))  
by [DanB](#) on Sat Aug 23rd, 2003 at 01:27:21 PM MST  
([User Info](#))

I use starband. (www.starband.com) It's a two way satellite system.  
I think directway now has a competetive system too. I'm unsure which is better, but starband has been pretty reliable and customer support has been good so far!

[To DanB](#) | 1 comment (1 topical, 0 editorial)

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1 comment
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posted by Eviljosh on 07/19/2003 05:54:29 PM MST  
4 comments
3. [Blade plans on ebay??](#) ([Homebrewed Electricity](#), [Ebay](#))  
posted by StanB on 04/09/2003 09:57:41 AM MST  
7 comments

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### [Link 10 Emeter](#)

By [Eviljosh](#), Section [Classifieds](#)

Posted on Sat Jul 19th, 2003 at 05:54:29 PM MST

[Ebay](#)

Emeter up for sale

Heya folks,

just thought you should know I'm parting out some of my equipment to make room for some bigger and better stuff.

Thought you guys might take interest

Link 10 Emeter with shunt

<http://cgi.ebay.com/ws/eBayISAPI.dll?ViewItem&category=25413&item=2546686925>

Thanks guys

Evil

[Link 10 Emeter](#) | 4 comments (4 topical, 0 editorial)

Re: Link 10 Emeter ([none / 0](#)) ([#1](#))

by Seth on Sun Jul 20th, 2003 at 12:55:22 AM MST

[\(User Info\)](#)

Dont u haft to pay e-bay some for selling this.. u should of just listed it here first.....

Re: Link 10 Emeter ([none / 0](#)) ([#2](#))

by Eviljosh on Sun Jul 20th, 2003 at 03:14:46 PM MST

[\(User Info\)](#)

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- [Also by Eviljosh](#)



Well I do have an older one an Actual E-Meter by cruise pro. Doesn't have the fancy RS-232 port on the back. Been sitting unused since I got that newer one. Anyone interested?

Eviljosh

[ [Parent](#) ]

Re: Link 10 Emeter ([none / 0](#)) ([#3](#))  
by Eviljosh on Sun Jul 20th, 2003 at 03:19:53 PM MST  
([User Info](#))

guess I should add if interested send me an email to [joshg@arkansas.net](mailto:joshg@arkansas.net)

[ [Parent](#) ]

Re: Link 10 Emeter ([none / 0](#)) ([#4](#))  
by Eviljosh on Wed Jul 23rd, 2003 at 05:08:29 PM MST  
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Here's a picture of the actual Meter



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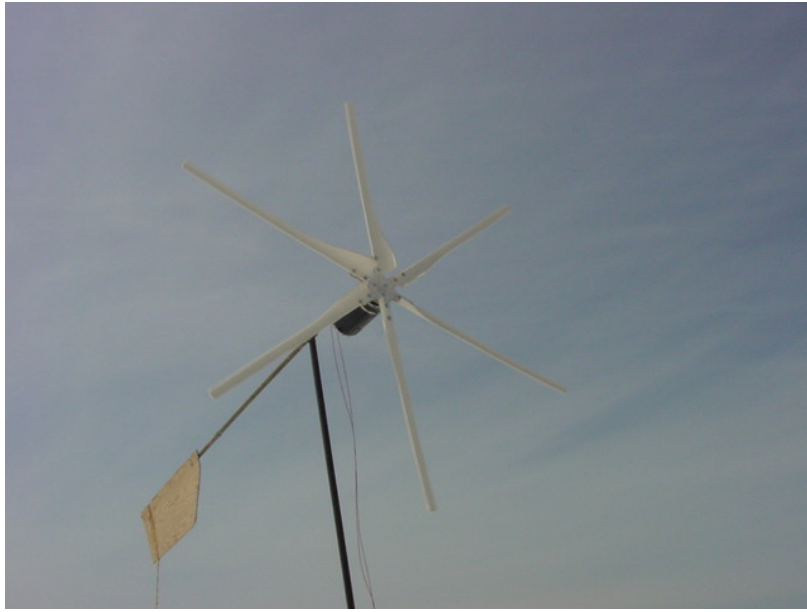
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### [Blade plans on ebay??](#)

By [StanB](#), Section [Homebrewed Electricity](#)  
Posted on Wed Apr 9th, 2003 at 09:57:41 AM MST  
Has anyone seen these plans on ebay?



### [Blade plans on Ebay](#)

[Blade plans on ebay??](#) | 7 comments (7 topical, 0 editorial)

made your link live ([none / 0](#)) ([#1](#))  
by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Wed Apr 9th, 2003 at 10:41:53 AM MST  
([User Info](#))

I took the liberty of editing your message to make the link live (so you can click it and go there). Will check those plans out here shortly. DANF

Blades ([none / 0](#)) ([#5](#))  
by Old F on Wed Apr 9th, 2003 at 04:37:46 PM MST  
([User Info](#)) <http://www.oldf.homestead.com>

The call sine looks familiar I think he has posted on the old board I could be wrong.  
Interesting design I would use fiber glass resin to bond and weather proof it.  
Old F

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[Ebay](#)

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blade plans on ebay ([none / 0](#)) (#2)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Wed Apr 9th, 2003 at  
12:19:55 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Sounds interesting, It would have been nicer to see a blade not spinning and up close. I suppose this would give away the design. I imagine If you took some 1/4" thick plywood and laminated them together and jiggged them into the twist you need would make some fairly decent blades. Being plywood and laminated would hold up fairly well as long as it was exterior grade and coated well. Sounds simple enough. Small blades would be quick and simple... not sure I'd try a set of 14ft blades made this way. Possibly using aircraft grade plywood (expensive)... Sounds like a simple project to try for a small unit... Interesting....

blade photo ([none / 0](#)) (#3)  
by StanB ([solar4@juno.com.nospam](mailto:solar4@juno.com.nospam)) on Wed Apr 9th, 2003 at  
01:40:13 PM MST  
([User Info](#))

I have a better pic of the blades..  
But can't get it to upload??  
Help!!

[ [Parent](#) ]

pic posting ([none / 0](#)) (#4)  
by StanB ([solar4@juno.com.nospam](mailto:solar4@juno.com.nospam)) on Wed Apr 9th, 2003 at  
01:44:44 PM MST  
([User Info](#))

[http://www.otherpower.com/images/scimages/63/pvc\\_blades.jpg](http://www.otherpower.com/images/scimages/63/pvc_blades.jpg)

[ [Parent](#) ]

Maybe something with your browser ([none / 0](#)) (#6)  
by hvirtane on Thu Apr 10th, 2003 at 04:20:57 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

Hi,

your picture is already loaded on the server  
as seen on a note posted.

But if you cannot get it included easily with your post,  
there is maybe something missing or wrong with your  
browser program.

I'm using a Debian GNU/linux operating system and tried  
with two browsers.

- a) With Mozilla 1.0.0. it was OK.
- b) With Konqueror 2.2.2. I had first no success, but  
after putting in the 'preferences' 'java' and 'javascript'  
'included' it started working.

- A) Please have a check, if your browser program supports 'Java'.
- B) If not, please try to update for example latest 'Mozilla' available for your operating system.

- Hannu

[ [Parent](#) ]

Blade Plans on Ebay ([none / 0](#)) (#7)  
by Anonymous Hero on Thu Apr 10th, 2003 at 11:11:26 AM MST

I put the blade plans on ebay. They're cut from pvc pipe (4" for the small ones and 8" for the big ones). I have tested both of them to see that they start and spin, but my generator won't run at a high enough voltage to get meaningful load data. Cutting blades from pipe allows you to build a blade with an angle of attack that remains relatively constant along the blade length for a given wind speed to rpm ratio. As for pvc being brittle, I've heard the same thing but I had a small disaster that seemed to suggest that they aren't. My hub broke (1/4" luan is not a good idea) and one blade out of six came off. The other 5 kept spinning and found the natural frequency of my boom (3/4" pipe). It took about 30 seconds to fatigue the boom to the point that it broke. The generator came crashing to the ground blades first. All of the arms of the hub broke, but all of the blades were fine, and it was about 15 degrees outside at the time. The big blades are cool. Once they start, it's hard to stop watching them. -Dan M

[Blade plans on ebay??](#) | 7 comments (7 topical, 0 editorial)

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[144,000 pulses and counting.](#)

By [Jerry](#), Section [Homebrewed Electricity](#)

Posted on Wed Dec 31st, 2003 at 07:10:37 PM MST

[Electronics](#)

The testing continuse.

I have 2 Optima deep cycle 12 volt batteries. A freind barowed them for a camping trip last sommer. They were new then. They've been sitting around the shop till now. I tested there voltage and found one to be 10.67v and the other at 8.43v. I'm thinkin this aint good. I don't know if they're good or scrap? So 80 hrs ago I hooked one of these batteries up to the capacitor pulse charging expiriment. I think Charge said the relays wouldn't like doing much more than 100,000 pulses. Right now the relay pulse count is over 144,000 and they are goin strong. I think I'll run them up to 1 million and see if they survive. The 21 volt power supply is just slightly warm and the battery is cold and battery rest voltage is 13.95 and 14.40 when the cap pulse hits them. I'll disconnect this battery and hook up the 8 volt Optima and run a couple 100 thousand more pulses on the relays. I'll let the charged Optima rest over night to see if it holds a charge. Thats all on this test for now. JK TAS Jerry

[144,000 pulses and counting.](#) | 15 comments (15 topical, 0 editorial)

Re: 144,000 pulses and counting. ([none / 0](#)) ([#1](#))  
by [RobD](#) on Thu Jan 1st, 2004 at 08:23:16 AM MST  
([User Info](#))

Jerry, Make sure you don't over heat the batts. They have a one way valve allowing gas buildup to escape and prevent explosion. If the gas escapes the batteries will dry out and be unuseable. RobD

Re: 144,000 pulses and counting. ([none / 0](#)) ([#2](#))  
by [Reno](#) on Thu Jan 1st, 2004 at 09:19:04 AM MST  
([User Info](#))

Great job Jerry Can i assume you a producing AC and the pulse charge circuit is after the rectifier(s). keep the info coming. Would this idea of Charges be usable as a low wind device and when the wind is strong it can be taken out of circuit or would the high voltage cap bank have to be designed for the highest input foreseeable.

Re: 144,000 pulses and counting. ([none / 0](#)) ([#3](#))  
by [charged](#) on Thu Jan 1st, 2004 at 09:46:16 AM MST  
([User Info](#))

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<http://www.fieldlines.com/story/2003/12/6/204012/956> Now that you are seeing a little bit of what is possible with this system, go take a look at the patent info that I posted to this other thread. Enjoy!

Re: 144,000 pulses and counting. ([none / 0](#)) (#4)  
by dualsporter on Thu Jan 1st, 2004 at 02:06:41 PM MST  
([User Info](#))

"So 80 hrs ago I hooked one of these batteries up to the capacitor pulse charging experiment."

80 hours to recharge 1 battery?!!

Dualsporter

Re: 144,000 pulses and counting. ([none / 0](#)) (#5)  
by Reno on Thu Jan 1st, 2004 at 05:13:26 PM MST  
([User Info](#))

I think Jerry is doing an experiment. Of course it must be scaleable to be of use but the preliminary results look good. If we can turn those 5 and 10 mph winds into stored energy that would be great. I know my mill without the resistance of the battery spins up past charging voltage no problem.

[ [Parent](#) ]

Re: 144,000 pulses and counting. ([none / 0](#)) (#7)  
by Jerry on Thu Jan 1st, 2004 at 09:46:11 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Reno Yep this is just playing with caps for fun. Since I have a zillion caps I'll be trying higher voltages and higher UF also. What I really need to do is get the solid state switching thing working. But I like the idea of charging the caps to 20 to 60 volts or higher and then dumping that voltage onto the 12 volt batteries. I guess you could do the same with 24v or 48v also. The battery never got even slightly warm and the charger stayed pretty cool also. The caps were cold. I think however the relay was taking a beating. This is where solid state switching would help. Reno your right about helping the genny in low wind. And then maybe switch over to normal genny operation when the wind speed goes up? At least this will help the genny to make some power in low wind. JK TAS Jerry

[Airheads Page](#)

[ [Parent](#) ]

Re: 144,000 pulses and counting. ([none](#)  
[/ 0](#) (#8)  
by dualsporter on Fri Jan 2nd, 2004 at  
12:15:23 AM MST  
([User Info](#))

Experimenting for fun is good. Pulse circuits are very entertaining. In your case it sounds like you have all the parts setting around which is the perfect situation for playing with an idea any time you want. That's got to be great. I don't have enough room to be able to collect much "stuff".

The life expectancy of any component (relay, SCR, etc.) is directly related to loading. The more energy it has to move, the shorter it's life. (The candle that burns twice as bright, burns half as long.) Things also pretty much work the other way around too. If a component is surviving well beyond it's rated life, then it's not being required to move a heavy energy load. It's also possible you just have a very good quality relay that has not yet met it's rated life expectancy.

Designing and building a circuit to last for 40 years of non-stop operation is not a problem as long as it is designed with an appropriate margin of safety for the components.

The interesting question is how well this circuit transfers energy from your mill as compared to just running a heavy cable and sending low voltage.

A standard heavy copper cable system is somewhat expensive. For that reason, if the pulse concept only moves energy, maybe 2/3 as efficiently as copper cable, it might still have merit because of the comparative prices of the two systems. That's why knowing how well the pulse system transfers energy is the key bit of information someone needs to have before deciding whether it is worth investing in for their final, permanent system.

Also knowing the circuit's efficiency is what tells you if it's worth investing in even for a "starter" circuit for your mill. (followed by switching over to standard cables when wind speed is up) The fact that it's not loading your mill and allowing it to start up in low wind should be telling you something. (The loading on the mill is a direct relationship to how much energy it's trying to move.) "Does the little bit of energy it moves in a low wind condition justify purchasing the parts required?" Also, if it's not loading the mill significantly in lower wind conditions it probably won't in higher wind conditions either setting you up for a runaway self-destruct.

Regarding pulse charging your batteries... Pulse charging borderline batteries does rejuvenate them somewhat. The higher voltage spikes blast the sulfate bridges shorting the plates together. These sulfate bridges form in the sulfate sludge at the bottom of the battery that forms when they are allowed to set uncharged for extended periods of time. The bridges will begin to set up again within a short period of time because the pulse charge does not destroy the sulfate. It just moves it temporarily. It's possible, if you could remove the sludge layer, your battery's life would be pretty much restored.

For all experiments, if it was fun, it was worth the investment.

Dualsporter

[ [Parent](#) ]

Re: 144,000 pulses and counting. ([none / 0](#)) ([#11](#))  
by Jerry on Fri Jan 2nd, 2004 at 09:39:41 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Dualsporter I'm not sure if gell batteries have sludge that settels to the bottom. I've opened one up and the gell guu stuff seems prety stiff. I has a pie dough consistancy but its almost clear. Can't see how much stteling could happin? This is 24 hrs latter and the voltage is still 12.6 v and it still burns the end off the old screwdriver. I hope this works this good on the other battery. JK TAS Jerry

[Airheads Page](#)

[ [Parent](#) ]

Re: 144,000 pulses and counting. ([none / 0](#)) ([#6](#))  
by Jerry on Thu Jan 1st, 2004 at 09:31:47 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

The 80 hr test was for Relay longevity. I wanted to see how the relays held up in continuous duty. Also the battery I was charging appeared to be no good. That is after charging it in a normal fashion it would lose voltage in just a few hrs. It's been holding 12.67 for 1 1/2 days now. I haven't done a load test yet. But it did burn the end off an old screw driver and after a short time the voltage was still at 12.6. I don't know what the pulse charging did but the battery seems to be back to full capacity. I have a 125 amp load tester at the store shop so I'll load it down tomorrow and see if the battery is still good. I hooked up the other battery it was worse than I thought. It was down to 2.5 volts and the 40 Bosch relay stop working after a couple hrs. I'm going to replace the Bosch with some 100 amp relays and place some 2 uf/ 400 volt mylar caps across their terminals to stop the arcing and pitting. I'll see how long they last. If they hold up this system might just bring this other battery back to life also. Hey Charged could you explain again how this pulse charge helped this otherwise junk battery? If it did? Or maybe this battery wasn't junk? I da no? I guess I'll find out with the really dead battery? JK TAS Jerry

[Airheads Page](#)

[ [Parent](#) ]

Re: 144,000 pulses and counting. ([none / 0](#))  
(#9)  
by BSparky on Fri Jan 2nd, 2004 at 07:59:33 PM  
MST  
([User Info](#))

Jerry about the supply voltage ac or dc? Look for it on your Cap pulse testing posting. Maybe I've miss it.  
Bob

[ [Parent](#) ]

Re: 144,000 pulses and counting. ([none / 0](#)) (#10)  
by Jerry on Fri Jan 2nd, 2004 at 09:29:27  
PM MST  
([User Info](#))  
<http://www.dplusv.com/Photo-03.html>

Sorry if I left that out Bob. The power supply is 21 volts DC. I'll be trying higher voltage caps and higher power supply voltage. But first I must upgrade the relays. JK TAS Jerry

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Re: 144,000 pulses and counting. ([none / 0](#)) ([#12](#))  
by charged on Fri Jan 2nd, 2004 at 09:49:50 PM MST  
([User Info](#))

At 21v you're at just about optimum. For desulfating you can use smaller capacitors at higher voltage(100v) for short periods. This "cracks" the sulfate barrier. THEN you discharge to help dissolve the crystals in an orderly manner. Once you fully discharge, then start applying you're standard 21v pulsing.

You might want to build a dedicated charger with two voltage settings specifically for desulfating/reclaiming old batteries. That way you can scavenge batteries here and there and see if they'll come back to life. Some will, some won't, so what.

[ [Parent](#) ]

Re: 144,000 pulses and counting. ([none / 0](#)) ([#13](#))  
by Budgreen on Sat Jan 3rd, 2004 at 02:43:07 PM MST  
([User Info](#))

here is also something to check, when you start the next battery pulsing take a voltage reading of the pulses at the battery, I would imagine them to be a higher voltage untill the battery starts to reach a full charge then being around 14.5v. the relays should last upwards of 1 million pulses if the pulse is not near the full current rating of the relay but I would suggest a FET to do the switching, if you let me know what kind of voltage/current source you have available to trigger the relay I could draw up a very simple fet switch for you to use. FET's are much cheaper than relays in the long run unless you have an unlimited supply of course.

Re: 144,000 pulses and counting. ([none / 0](#)) ([#14](#))  
by Jerry on Sat Jan 3rd, 2004 at 09:31:27 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>



Thanks Budgreen. I'm using a 13.8 volt 3 amp regulated power supply to supply power for the 12 volt flasher unit and the Bosch relay. I would very much like to remove the Bosch relay and replace it with an FET. What FET would I use if I increase voltage to 100 and amperage to 50? Or is that combination not doable or recommended? I did the load test on the battery today. Its a 10 second test and the tester said the battery is a good 770 cold cranking battery. I was surprizes because Optima calls this battery a 750 CCA battery. And this was after burning the end off that old screwdriver a few times. (REDNECK battery tester burning the end off old screwdrivers.) Looking forward to the schimatic. I'll try to hook up the 100 amp relays inplace of the 40 amp Bosch tommorow. This will be to see if I can bring the other Optima battery back to life. Thanks again Budgreen and Charged. You guys are an insperation. JK TAS Jerry

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Re: 144,000 pulses and counting. ([none / 0](#))  
([#15](#))  
by Jerry on Sat Jan 3rd, 2004 at 09:42:26 PM  
MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

PS. Thanks to Reno, Bsparky and Dualsporter I didn't mean to not thank you guys to. And another ? for you guys. I use an audio generator at work. These things are small and work from 9 v to 15 v. They have square, tryangle and sign wave output from 1 HZ to 1 meg HZ. I guess that would be 60 pulses per min. Could I use this unit to sequence the FETs instead of the 30 pulses per min. flasher unit. You know make this hole thing solid state? JK TAS Jerry

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[144,000 pulses and counting.](#) | 15 comments (15 topical, 0 editorial)

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posted by zmoz on 11/25/2003 08:05:45 PM MST  
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posted by kww on 11/24/2003 06:47:14 AM MST  
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posted by Norm on 11/19/2003 03:25:42 PM MST  
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posted by kell on 11/03/2003 09:55:42 AM MST  
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posted by ChrisW on 11/01/2003 08:55:01 AM MST  
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posted by Arletta on 10/26/2003 07:49:46 PM MST  
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posted by 44toy on 10/22/2003 04:19:52 PM MST  
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posted by 44toy on 10/17/2003 03:37:00 PM MST  
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posted by Homebrewed12vdc on 10/15/2003 03:03:08 PM MST  
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posted by Budgreen on 10/15/2003 08:14:13 AM MST  
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posted by wdyasq on 10/12/2003 06:58:24 PM MST  
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30. [Full wave rectifier](#) ([Homebrewed Electricity, Electronics](#))

posted by Norm on 09/24/2003 08:56:04 PM MST  
3 comments



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### [Solar Photovoltaic charge controller](#)

By [danny](#), Section [Remote Living](#)

Posted on Tue Dec 30th, 2003 at 08:20:42 AM MST

[Electronics](#)

Hi!<p> I am very interested in solar photovoltaic based power generating units and am a hobbyist but without formal electronics training.

I have a couple of circuits of solar charge controllers designed to work for 12/24 volts DC. Is there any electronic expert who could kindly do me a favour and care to advise me of modifications required to convert this 12/24volt charge controller to work on 48/60V dc input so that four 12v batteries in series can be charged?

I would appreciate any offer of help. My email: [aaditis@iqara.net](mailto:aaditis@iqara.net)

thanks!

danny

[Solar Photovoltaic charge controller](#) | 6 comments (6 topical, 0 editorial)

Re: Solar Photovoltaic charge controller ([none / 0](#)) ([#1](#))  
by [jubalearly](#) on Tue Dec 30th, 2003 at 01:01:38 PM MST  
([User Info](#))

If you have 2 24v controllers, Then you can probably use them in series for 48v, just like the batteries. If you want more details, you will have to provide some specific information about the particular charge controllers that you have.

Re: Solar Photovoltaic charge controller ([none / 0](#)) ([#4](#))  
by [danny](#) on Sun Jan 4th, 2004 at 07:27:23 AM MST  
([User Info](#))

Thank you for taking the trouble to write in.

As a matter of fact I have not yet built the charge controller. I was planning to use Forest Cook's charge controller featured in <http://www.solorb.com/elec/solarcirc/scc2/index.html> which however works for 12/24 volts whereas I actually have a system where output DC from SPV panels array is 100V(at present driving a DC water pump) and I need to charge 4x12v batteries connected in series and charge current would be 12-15A from this 100V source.

[ [Parent](#) ]

Re: Solar Photovoltaic charge controller ([none / 0](#)) ([#2](#))  
by [VermontMaple](#) on Tue Dec 30th, 2003 at 01:34:01 PM MST  
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If your circuits are of a switching regulator nature (ie buck, boost or flyback)it should be possible to change the coils/transformer configuration to produce a higher charging voltage. Can you post the circuits so we may have a better look at what you are attempting? I am currently working on a 12 to 48 volt switching design myself, so I can charge my 48 battery bank from more common 12 volt equipment. It seems most everything out there is geared at 12 volt systems.

Re: Solar Photovoltaic charge controller ([none / 0](#)) ([#5](#))  
by danny on Sun Jan 4th, 2004 at 07:33:40 AM MST  
([User Info](#))

Good to know someone is working along the same lines. I had the circuit of Forest Cook posted on <http://www.solorb.com/elec/solarcirc/scc2/index.html> in mind and if this could be modified? I wonder if it is possible and could anyone please help out?

My current array of spv panels gives 100V dc and I have a power inverter running on 4x12v batteries connected in series and my plan is to charge the batteries from the spv panels without disturbing their present configuration as this source is used to run a water pump.

[ [Parent](#) ]

Re: Solar Photovoltaic charge controller ([none / 0](#)) ([#3](#))  
by charged on Wed Dec 31st, 2003 at 01:53:57 PM MST  
([User Info](#))

Here's a DC-to-DC conversion tutorial page. It explains all the basic configurations for building switching regulators.

[http://www.maxim-ic.com/appnotes.cfm/appnote\\_number/710/ln/en](http://www.maxim-ic.com/appnotes.cfm/appnote_number/710/ln/en)

Figure 6, the "flyback" method is probably the best for what you want to do.

Re: Solar Photovoltaic charge controller ([none / 0](#)) ([#6](#))  
by danny on Sun Jan 4th, 2004 at 08:14:27 AM MST  
([User Info](#))

Thanks!

[ [Parent](#) ]

[Solar Photovoltaic charge controller](#) | 6 comments (6 topical, 0 editorial)

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## Need strange waveform output

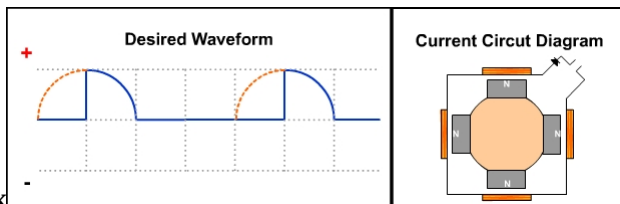
By [CrookedScepter](#), Section [Homebrewed Electricity](#)  
 Posted on Tue Dec 23rd, 2003 at 07:48:37 AM MST [Electronics](#)  
 Please help :)

From what you can see in the image above, I'd like to get an output shaped like that waveform in blue. The circuit shows how currently I have pulsating DC with that diode connected to it. I was wondering what can I do to make a passive filter to produce the waveform in blue? I'm guessing I need some capacitors, but I'm not sure what kind and how to arrange them in the circuit.

The specs on the current setup are that the rotor goes about 250 rpm at max, and the output power is (at max) 1v and 100ma. So That may help in finding out what I need, but again, not sure.

I know this is a bit much to ask, so I really appreciate any help along with this.

Also, are there any freeware programs that use the mic/line input to input the electric signal to an oscilator for display? This would be a great way to confirm the signal that I want.



Thankx

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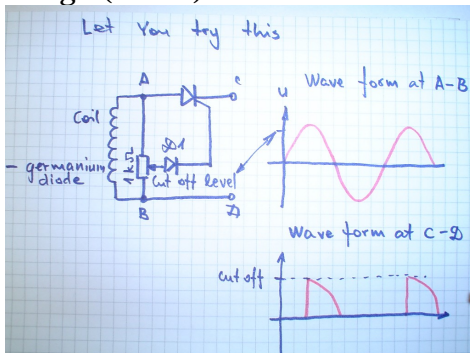
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Re: Need strange waveform output ([none / 0](#)) ([#1](#))  
 by [Virgis](#) on Tue Dec 23rd, 2003 at 10:23:43 AM MST  
[\(User Info\)](#)

Hi,  
 let you try this circuit. You need to use germanium diode D1 with low drooping voltage < 0.35 V and triac with low control voltage. Would be better to have a little higher AC voltage (> 1.5V).



Best regards

Virgis

Re: Confusing Schematic... ([none / 0](#)) (#3)  
by CrookedScepter on Wed Dec 24th, 2003 at  
06:30:13 AM MST  
([User Info](#))

I see the drawing and was wondering what the component was between points 'A' and 'B', and I see that the component between 'A' and 'C' is a diode, but its split off weird, does that diode have 2 leads coming off the end of it? or is C just 2 wires connected to the same single lead from that diode?

Thanx-

[ [Parent](#) ]

Re: Confusing Schematic... ([none / 0](#)) (#4)  
by Virgis on Fri Dec 26th, 2003 at 04:35:53  
AM MST  
([User Info](#))

It isn't diode, it is thyristor. The symbol is the same as for diode, but with additional connection, Gate or Knob. Thyristors can be characterised as two transistors connected to each other. Thyristors do not become conductive (ignite) until the knob is connected to a positive voltage and control current  $I_{gt}$  is added. The thyristor will remain ignited irrespective of whether the control current is broken or whether a voltage with negative polarity is connected to the knob. It can be returned to blocking mode by:

- reducing the anode current below the holding current  $I_h$  (this is specified in data sheets),
- breaking the anode current.

Virgis

[ [Parent](#) ]

Re: Need strange waveform output ([none / 0](#)) (#2)  
by Insomnian on Tue Dec 23rd, 2003 at 11:47:59 AM MST  
([User Info](#))

Check out this post for the PC oscilloscope thing...  
<http://www.fieldlines.com/story/2003/11/1/8551/83725>

Re: Need strange waveform output ([none / 0](#)) (#5)  
by Nando on Sun Dec 28th, 2003 at 09:49:04 AM MST  
([User Info](#))

It is a very curious the arrangement that you want.  
Why this arrangement, please give a detailed reason for it.

You can get a lamp dimmer and adding one diode to get the waveform you want and it is capable of about 400 to 1000 watts ( depending on the dimmer).

Let me know if you need assistance, I come to this site not very often, so email direct to: [nando37@comcast.net](mailto:nando37@comcast.net)

Regards

Nando

[Need strange waveform output](#) | 5 comments (5 topical, 0 editorial)

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### [Loop Connectors, revisited](#)

By [drdongle](#), Section [Homebrewed Electricity](#)  
Posted on Sun Dec 21st, 2003 at 01:57:45 PM MST  
Found what I need...on the net

[Electronics](#)

I was doing a bit of surfing and found the two following companies that carry a large variety of loop as well as spade connectors for wire from very small to very large. Prices seem reasonable as well.

<http://nelcoproducts.com/terminals/index.cfm?action=Zrterminals>

<http://trickcableandswitch.com>

Dr.D

[Loop Connectors, revisited](#) | 0 comments (0 topical, 0 editorial)

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### [Where can I find a 3hp 12v electric motor?](#)

By [zmoz](#), Section [Weird Science](#) [Electronics](#)

Posted on Mon Dec 8th, 2003 at 11:22:18 PM MST

Anybody know where I can find a reasonably priced 3hp 12v or 24v motor?

I'm looking for an electric motor of aproximately 3hp that I can run from either 12v (preferably) or 24v. Anybody know where I might be able to find one relatively cheap?

[Where can I find a 3hp 12v electric motor?](#) | 6 comments (6 topical, 0 editorial)

Re: Where can I find a 3hp 12v electric motor? ([none / 0](#)) ([#1](#))

by Jerry on Mon Dec 8th, 2003 at 11:52:53 PM MST ([User Info](#)) <http://www.dplusv.com/Photo-03.html>

You might check the local hydrolic shop. The kinda shop that makes car hop. I bought one of these morors from a catalog place for 60 bux. It looks like a car starter but can handle more on time and it draws less power. If you could do 24 volts try this. I got mine at the local golf cart dealer. He had 2 used Melex carts. I got the pair for \$50. They had 3 hp at 24volt to 4.5 hp at 36 volt motors. These motors work great. I'm using one in a 1978 Ford Curier PU at 32 volts, 4 X 8 volt cart batteries. I made the speed control with 200 amp relays and a small 5 position rotary switch. It selects off, 8v, 16v, 24v or 32 volts works good and its cheap. Did the same thing on one cart. It has 4 speeds and 48 volts. Goes prety fast for a golf cart.

JK TAS Jerry

[Airheads Page](#)

Re: Where can I find a 3hp 12v electric motor? ([none / 0](#)) ([#2](#))

by zmoz on Wed Dec 10th, 2003 at 04:23:46 PM MST ([User Info](#))

So you converted a pickup to electric with a golf cart motor? What's the top speed on that thing? Hmmm.....-D

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Re: Where can I find a 3hp 12v electric motor?

([none / 0](#)) ([#3](#))

by Jerry on Wed Dec 10th, 2003 at 09:22:29 PM  
MST

([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Yep I did.

I freind and I were thinking of building an electric car. Older small PUs are the best for this conversion. They carry the batteries good, have low wind resitance front end, most are manual trans and a guy gave him one.

Well he had a baby on the way and mom to be said get rid of your projects for a while. He gave me the PU. It didn't have a motor.

I was looking at that time for a small vehickel to build a compition car strereo system in. This one was a natural. But it has to move under its own power to go through the competion lains.

I had an extra golf cart motor so we got creative and droped it in. I used a speaker frame or basket to addapt the motor to the transmision. I used a love joy coupler to connect the 2 together. Its a 24 to 36 volt motor. we are using it at 32 volts. Its only purpus is to move the car around parking lots. We don't drive it on the streets.

We've had it up to 20 mph but even that is more speed than we need.

This truck holds the NW Iasca SPL record at near 170 db. We have 54,000 watts on board. We use 4 masive 14,000 watt 15 inch subs in this vehickel. Amp rack wire 4-0 diesle locomotive power cable. We expect to improve preformance in this little pu this winter.

BTW, the world record SPL is 178.9 DB, 5 15s in an Astro van. In my personal astro van I have 8 15s and 12,000 watts. Its ok for a daily driver.

JK TAS Jerry

[Airheads Page](#)

[ [Parent](#) ]

Re: Where can I find a 3hp 12v electric motor? ([none / 0](#)) ([#4](#))

by RayW on Thu Dec 11th, 2003 at 02:09:36  
PM MST

([User Info](#))

Hey Jerry; how do you protect your ears??????  
RayW

[ [Parent](#) ]

Re: Where can I find a 3hp 12v electric motor? ([none / 0](#)) (#5)  
by Jerry on Thu Dec 11th, 2003 at 10:02:21 PM MST  
([User Info](#))  
<http://www.dplusv.com/Photo-03.html>

IASCA the sanctioning organization Will not allow you to be in the vehicle while competing. Its done remotely.

I use this analogy for the cars we do listen to at high levels. If its a hot summer day say 110 degrees and you step out side for 1/2 a minute your fine. If you go outside and stand in one stop for an hr. you get burnt. I've been involved with high pressure sound levels since the 70's and my hearing is excellent. However my spelling is bad.

Bottom line short term your fine. Long term your cooked. Just like most exposures.

Our record holding truck is actually quiet on the outside while there is a tremendous pressure on the inside. The NRA folks or drag race people or noise football stadiums create very high noise level also and we listen to those without question?

JK TAS Jerry

[Airheads Page](#)

[ [Parent](#) ]

Re: Where can I find a 3hp 12v electric motor? ([none / 0](#)) (#6)  
by Nando on Sun Dec 28th, 2003 at 10:45:08 AM MST  
([User Info](#))

Jerry:

If you need more AUDIO power let me know, I have made up to 30 KW units; It is possible to make 100 KW using an air speaker (throat) and a huge air compressor.

Regards

Nando

[ [Parent](#) ]

[Where can I find a 3hp 12v electric motor?](#) | 6 comments (6 topical, 0 editorial)

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[Looking for large "ring " connectors](#)

By [drdongle](#), Section [Homebrewed Electricity](#)  
Posted on Mon Dec 8th, 2003 at 09:32:04 PM MST [Electronics](#)  
Auto parts stores are too expensive

Ha guys I'm looking for "ring" or "loop" type connectors for # 8 wire, I have checked all the auto parts stores and they either don't have them or want \$3.00 for two of them! I have also checked Diga-Key, Mouser Electronics and several other electronics suppliers with no success. Has any one got a source for connectors that big and in quantity? I know their made as I have seen them in use on automotive electrical equipment and other industrial electronics.

Thanks

Dr.D

[Looking for large "ring " connectors](#) | 5 comments (5 topical, 0 editorial)

Re: Looking for large "ring " connectors ([none / 0](#)) (#1)  
by TomW on Mon Dec 8th, 2003 at 11:18:08 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Dr. D;

A possible substitute might be a piece of copper tube soldered to the cable with the end flattened and the proper hole drilled in it. Add some shrink tube if you want or some tape and you can duplicate almost any ring connector for very cheap.

Most of my battery interconnects are done this way but with larger cable and tube for ends. Basically free from the copper pipe I have salvaged over the years.

Cheers.

TomW

[Stuff I have Online](#)  
[Contact Me](#)

Re: Looking for large "ring " connectors ([none / 0](#)) (#2)  
by Jerry on Mon Dec 8th, 2003 at 11:18:20 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

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Hi Dr D.

We use these every day at My car stereo store. The Audio Source in Salem Or.

We have standard nickle plated or the fancy gold plated. 8 ga. in screw hole size #8 up to 1/2 inch.

What size and how many? I'm sure I can help you out a bunch. We buy bulk by the 100s or 1000s depending on size or metal.

If any of you Guys are needing hardware like this. I'll make a partial list.

Ring tungue connectors from very little to very large, 18 ga. to 4-0 ga. golt or nickle, crimp or screw down on some of the big stuff.

Gold or platimun distribution blocks.

Gold or platimun fuse blocks in 2, 3, or 4 gang, for fuse type ATC, AGU, or ANL with amperage ratings from 3 to 250 amps.

Power wire the prety car stereo flexable stuff red, black, rootbear brown, clear and purple all in 10 ga. to 4-0.

Spit loom bunch of sizes, wire ties, gromets ruber, gromets plastic snap in.

Butt conectors 18 ga. to 4 ga. t-taps, mail and feamale spade connectors

And on and on I guess I'd better make a list with prices, YA.

These is so much hardware needed for hi-end car stereo & security. I've just scratched the surface.

I can tell you this all this hardware shure is handy when your doing wind power and such.

You guys need this stuff and I can get you good bulk prices. I'll make a list and you guys pick what would be good items.

Give me a day or 2.

JK TAS Jerry

[Airheads Page](#)

Re: Looking for large "ring " connectors ([none / 0](#)) ([#3](#))  
by drdongle on Tue Dec 9th, 2003 at 06:05:47 AM MST  
([User Info](#))

Thanks, though I would prefer to buy directly from a distributor ( I am a telephone and sound contractor and I am tax exempt). I also generally buy in bulk ( yes, I need 200 surface mount telephone jacks, thank you :)I can get all that stuff from several companies except it seems for the larger wire size loop connectors.  
The number of a national distributor would be what I need.

Thanks

Dr.D

[ [Parent](#) ]

connectors ([none / 0](#)) ([#4](#))  
by Norm on Tue Dec 9th, 2003 at 06:50:43 AM MST  
([User Info](#))

.....Well make out that list Jerry ...I for one would like to be able to get some connectors once in a while ...you've probably checked the prices of those ones in Kmart...Walmart little packages, big prices, assorted (some you'll never use...I hate assorted!)(;>) Norm.

[ [Parent](#) ]

Re: connectors ([none / 0](#)) ([#5](#))  
by Jerry on Tue Dec 9th, 2003 at 10:29:46 AM MST  
([User Info](#))  
<http://www.dplusv.com/Photo-03.html>

OK thanks Norm. Depending on size and metal the pkg. counts will be 25 to 100.

JK TAS Jerry

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[Looking for large "ring " connectors](#) | 5 comments (5 topical, 0 editorial)

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## [Rectifier Question](#)

By [Hank](#), Section [Homebrewed Electricity](#)

Posted on Mon Dec 8th, 2003 at 05:37:39 PM MST [Electronics](#)

Rectifier help

I purchased several Bridge rectifiers rated at 50 amps 400 volts. They have wire lead outs that appear to be to thin (.040" dia) to carry 50 amps. Can any of you electronic experts out there give me some advice as to whether or not this is acceptable. I plan to use these in my PMA which I guesstimate will be putting out up to 40 amps before it furls.

I would not want to fry these rectifiers and have a run away genny.

All comments appreciated,  
Hank

[Rectifier Question](#) | 10 comments (10 topical, 0 editorial)

Re: Rectifier Question ([none / 0](#)) ([#1](#))  
by [DanB](#) on Mon Dec 8th, 2003 at 05:48:02 PM MST  
([User Info](#))

Is it 3 phase?

My only suggestion would be to make sure youve got a very good heat sink, and parallel however many rectifiers it takes so the rating of the whole assembly is at least twice that which you think you'll see. A dead rectifier could mean a wrecked windmill.

Re: Rectifier Question ([none / 0](#)) ([#2](#))  
by [Hank](#) on Mon Dec 8th, 2003 at 06:06:17 PM MST  
([User Info](#))

DanB,

No these are not a 3 phase but rather single phase rectifier. I'm currently using 35 amp rectifiers purchased from WonderMagnet which have spade leads and are much larger. I wanted to beef up my system that's why I bought the 50 amp rectifiers. On paper they should be of higher rating but the size of the leads has me concerned. I always pallel two rectifiers as a safey precaution.

Thanks for the reply,

Hank

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Re: Rectifier Question ([none / 0](#)) (#3)  
by Electric Ed on Mon Dec 8th, 2003 at 06:10:41 PM MST  
([User Info](#)) <http://www.electric-ed.com>

A wire of .040" dia. would be #18 AWG and has a continuous current carrying capacity of about 15 amps if exposed to air, about half that if it's in a cable or conduit.

For 50 amps, a #10 AWG (about .10" dia.) would be recommended if exposed, #6 if in a cable or conduit.

Electric Ed

Re: Rectifier Question ([none / 0](#)) (#4)  
by Hank on Mon Dec 8th, 2003 at 06:37:04 PM MST  
([User Info](#))

Thanks for the response Electric Ed,

It is exactly that that has me concerned. The wire leads coming out of the rectifiers appear to be too small for that rating. I would be using a AWG size of 10 or larger wire, but to me it makes no sense to solder these to the .040 dia. lead wires coming out of the rectifiers.

Just curious why they are rated so high yet have such thin wires.

Hank

[ [Parent](#) ]

Re: Rectifier Question ([none / 0](#)) (#6)  
by 5kw on Mon Dec 8th, 2003 at 07:17:04 PM MST  
([User Info](#))

Hank,

The "thin wires" are very short, aren't they. The current capacity of a conductor is very dependant on its heat sinking ability. For example I have a TIG welding torch with a continuous rating of 150 amps. The torch is water cooled and the lead feeding it is run inside the feed water tube, the tube is 1/4" and the conductor can't be larger than #10. The designers of the rectifier are relying on the heat sinking of the device, don't forget the 50 amp rating is for a case temp. of 25 deg. C in the fine print. Also if you over size your leads to the device you can dissipate a lot of heat into the leads themselves. Rectifiers are relatively cheap and paralleling allows you to spread the heat into your heat sink, when I do this I use equal length wires to parallel diodes to aid in the current sharing.

Make the wind fun!

Victor



[ [Parent](#) ]

Re: Rectifier Question ([none / 0](#)) (#5)  
by kell on Mon Dec 8th, 2003 at 07:05:22 PM MST  
([User Info](#))

Are they rated 50 amps continuous? Or surge? Did you get written specs? Look at the power dissipation in watts. A silicon rectifier has a voltage drop of a little less than a volt if it doesn't get too hot. So the watts divided by about 0.7 (nominal) gives you the amps it will conduct and stay within its power rating. Amperage ratings can be very misleading with semiconductors.

Re: Rectifier Question ([none / 0](#)) (#7)  
by Hank on Mon Dec 8th, 2003 at 07:34:59 PM MST  
([User Info](#))

Thanks for all the responses and help,

No wattage specs on these but they are 50 amp continuous with a 400 amp surge rating and with short wire leads

I'll give them a try on a test stand with a very large heatsink first but from the sounds of it they should work just fine.

Hank

[ [Parent](#) ]

Re: Rectifier Question ([none / 0](#)) (#8)  
by laskey on Tue Dec 9th, 2003 at 07:49:33 AM MST  
([User Info](#))

The bridge rectifier you're talking about is designed to be soldered to a PC board, thus the smaller leads. The only reason they'd put bigger lugs on the bridge is to accommodate hooking wire directly to it. You'll notice that those lugs conveniently accept a specific solder-less connector, or in the case of really big bridges, a specific bolt size in the hole.

What you really want to worry about is (as stated above) how hot the bridge itself gets.

Cya,  
Chris

[ [Parent](#) ]

Re: Rectifier Question ([none / 0](#)) (#9)  
by jimjjnn on Tue Dec 23rd, 2003 at 07:12:14 AM MST  
([User Info](#))

Semi-conductors are current devices. Don't exceed their current ratings by very much unless you heatsink them with large heatsinks.  
you can cool them also with a fan on the heatsink too.  
Voltage ratings are pretty much the same thing. I hope this helps. Great discussions here !!!!  
Jim Nelson

Re: Rectifier Question ([none / 0](#)) (#10)  
by Harry Luubovv on Wed Dec 31st, 2003 at 01:45:23 PM MST  
([User Info](#))

I can think of three things. One, even the wires are small, but since they each is very very short in length, it does not mean too much difference there. Anything less than a 1/4" is Ok when it is smaller than what you are used to seeing. Two, there are Peak Inverse Voltage rating, there are Forward voltage rating, usually they are wide apart from each other with the same rectifier. Three, if you had a rectifier rated at PIV of 400 Volt and 40 amp, you can safety use it at 50 amp if you only use it in a circuit of say, 12 or 24 volts volts.

Thanks for reading mate.  
Luubovv.

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[Rectifier Question](#) | 10 comments (10 topical, 0 editorial)

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### [one Hell of a Super Cap](#)

By [ibedonc](#), Section [Homebrewed Electricity](#)

Posted on Mon Dec 1st, 2003 at 11:28:47 AM MST

[Electronics](#)

#### Super Cap

<http://www.nesscap.com/prod/General/EMHSP-0051C0-340R0.PDF>

Man I want a few of these

who needs Batteries with enough of these

[one Hell of a Super Cap](#) | 0 comments (0 topical, 0 editorial)

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### [Home Made Capacitors](#)

By [Kevin L](#), Section [Homebrewed Electricity](#)  
Posted on Sat Nov 29th, 2003 at 10:10:28 AM MST [Electronics](#)

#### Home Made Capacitors

Has anyone on the boad ever made ther own capacitor bank with aluminum foil and wax paper, or plastic sheet? I would like to have a very large filtering bank for use at my home. If you have any experiance or input please let me know.  
Thank You  
Kevin L

[Home Made Capacitors](#) | 1 comment (1 topical, 0 editorial)

Re: Home Made Capacitors ([none / 0](#)) ([#1](#))  
by Garry on Sat Nov 29th, 2003 at 10:36:54 AM MST  
([User Info](#))

Yes I have. It was a learning experience but otherwise a waste of time. Take apart a modern oil filled capacitor. It is a thing of beauty and economy. I have used plate glass and foil to make very high voltage caps that I couldn't find when I was a kid.  
Garry

[Home Made Capacitors](#) | 1 comment (1 topical, 0 editorial)

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### [What would happen...](#)

By [kww](#), Section [Homebrewed Electricity](#)  
Posted on Fri Nov 28th, 2003 at 04:35:34 PM MST [Electronics](#)  
if I hooked a cheap 2/6amp battery charger to the variable ac coming from my wind turbine and tried to charge with it?

I thought this might be a good way to do a little battery charging on the side.  
Kevin

[What would happen...](#) | 6 comments (6 topical, 0 editorial)

Re: What would happen... ([none / 0](#)) ([#1](#))  
by [drdongle](#) on Fri Nov 28th, 2003 at 05:11:51 PM MST  
([User Info](#))

When the turbines output drops enough so will the chargers and you will get no charging of the battery. If you had a rectifier and regulator system from the turbine you could proved, more reliable charging directly to the battery.

Dr.D

Re: What would happen... ([none / 0](#)) ([#2](#))  
by [Jerry](#) on Fri Nov 28th, 2003 at 10:05:17 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

We had a discussion going a while back about a similar idea.

High speed switching power supplies, for computers and such operate 100 volts to 260 volts ac. Some anyway. Some of my motorpma conversions do this kinda voltage swing fairly well. These power supplies are very regulated. Your genny could have a voltage swing all over the place and the power supply would have a rock solid stable output. Within its amperage capability any way. Many of these supplies are 5 volt with bvoltage adjustments so just wire up 3 in saries a dial in 14 volt or so.

We do this at my stereo store. The diferance is the supplies are big and operate off 240 ac grid power. We have the strapped as 3 packs.

One unit is 120 amps at 15 volts. This is 3 5 volts at 120 amps bolted together and wired saries. We've also done this to a 400 amp and a 600 amp.

All together for our instore demo systems we have a 1120 amps at 15 volt power supply. Thats 16,800 watts of power supply. We've can strap this to our RE battery bank to power our deth demo

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room 35 fifteen inch sub powered by 27,238 watts of digital amps.

We can crank this unit up and dim the store lighting a little.

JK TAS Jerry

[Airheads Page](#)

[ [Parent](#) ]

Re: What would happen... ([none / 0](#)) (#3)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Fri Nov 28th, 2003 at 11:27:38 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

As I understand it, A wind genny will spin up to the battery voltage, at that point it will encounter drag due to the load that the battery presents for charging and regulate it's speed until your batteries are charged. At that point you need to divert (dump) the load to help control the speed of the genny.

Your Trickle charger attached at the same time is the same as a second wind ginny connected to the same batteries. As long as the batteries are charging it is fine, but once they are charged you will be dumping this load as well.

}=- W o o f -= {

Re: What would happen... ([none / 0](#)) (#4)  
by laskey on Sat Nov 29th, 2003 at 10:27:54 PM MST  
([User Info](#))

A Battery Charger is designed to operate at 60Hz. Running it outside of that frequency will cause all kinds of nasty side-effects. Most of which are heat related.

A cheap battery charger is usually little more than a slightly refined equivalent of your wind gen set-up anyway. Power source, and bridge rectification, maybe a smoothing capacitor. A more expensive one will have a voltage detector circuit that will shut the thing off when the battery is charged.

I agree with the posts above. You want to do your own battery charging.

Cya,  
Chris

Re: What would happen... ([none / 0](#)) (#5)  
by kww on Sun Nov 30th, 2003 at 06:45:21 AM MST  
([User Info](#))

Thanks everybody.

[ [Parent](#) ]

Re: What would happen... ([none / 0](#)) (#6)  
by Harry Luubovv on Thu Jan 1st, 2004 at 12:04:49  
AM MST  
([User Info](#))

Generally speaking, a transformer operated  
equipment will have no problem operated at line  
frequencies other than its own designed frequency.

Ciao  
Luubovv. H N Y !

[ [Parent](#) ]

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## [How many amps does a starter motor use?](#)

By [zmoz](#), Section [Homebrewed Electricity](#) [Electronics](#)

Posted on Tue Nov 25th, 2003 at 08:05:45 PM MST

**How many amps does a starter motor use?**

I've just been kind of curious lately, does anybody know approximately how many amps a starter motor for something like a V8 uses? I know most cheap batteries say they have around 500 CCA, does the motor actually use all of that?

[How many amps does a starter motor use?](#) | 5 comments (5 topical, 0 editorial)

Re: How many amps does a starter motor use? ([none / 0](#)) ([#1](#))  
by [monte350c](#) on Tue Nov 25th, 2003 at 08:22:48 PM MST  
([User Info](#))

Hi zmoz,

A short answer - most likely! For example a GM 27MT starter's test specs are as follows:

(No-Load test at 10 volts)

Amps - min: 120

Amps - max: 210

rpm - min: 9,000

rpm - max: 13,400

Of course under load (like cranking a high compression engine) the current will be a lot higher and the rpm a lot lower. GM suggests a maximum cranking time of 30 seconds for a 27MT.

Hope that helps!

Ted.

Re: How many amps does a starter motor use? ([none / 0](#)) ([#2](#))  
by [Budgreen](#) on Wed Nov 26th, 2003 at 09:56:48 PM MST  
([User Info](#))

and if you added a real bearing to the end and some magnets in it would it generate anything? I already have one partially torn apart (was using it to drive something for a test) might be a worthwhile project

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Re: How many amps does a starter motor use?  
([none / 0](#)) (#3)  
by zmoz on Thu Nov 27th, 2003 at 12:22:56 AM  
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Hmmm...don't electric motors generally produce about as much electricity as they would use? 500 amps is.....more electricity than I would know what to do with. :-D

[ [Parent](#) ]

Re: How many amps does a starter motor use? ([none / 0](#)) (#4)  
by DanB on Thu Nov 27th, 2003 at 10:11:51 AM  
MST  
([User Info](#))

If you installed magnets in the armature (or just wired up the existing motor right) and spun it fast enough (10,000 + rpm??) you might get a ton of current out. But - like any starter motor, they are not made for continuous operation. It'd heat up fast and melt at 500 amps... either input, or output.

I suspect its a poor choice for a low rpm alternator - Im sure it could be done, but you'd wind up changing everything about the motor (windings, armature, bearings) except maybe the case before you were done I think.

[ [Parent](#) ]

Re: How many amps does a starter motor use? ([none / 0](#)) (#5)  
by monte350c on Thu Nov 27th, 2003 at 10:28:57 AM  
MST  
([User Info](#))

Hi All,

As DanB said, probably not a great choice to make low rpm power. GM's not kidding either about the 30 second duty cycle on heavily loaded starters. After one 'warmed-up' Chevy 350 rebuild I did a few years ago, the 20MT started basically had an internal meltdown after about 2 minutes worth of heavily loaded cranking. Switched to a 27MT and had no more problems - mainly because the 27MT had enough poop to crank the engine fast enough so it started right away. Put another way, 500 amps at 10 volts while cranking is 5KW, or about 6 horsepower. Compare a starter motor with a 6 hp

electric motor. It's pretty small for that output - which is why the short duty cycle!

Ted.

[ [Parent](#) ]

[How many amps does a starter motor use?](#) | 5 comments (5 topical, 0 editorial)

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### [DIY controller kits](#)

By [kww](#), Section [Homebrewed Electricity](#)

Posted on Mon Nov 24th, 2003 at 06:47:14 AM MST

[Electronics](#)

What many of us could really use is a DIY load control kit much like the DIY radio, etc. kits Radio Shack sells.

Those are great kits for people like me who like to do things in which they have no idea what they're doing. LOL I got the idea when I saw those load control system diagrams Hugh mentioned below and knew figuring out what all that meant and trying to find the right parts would give me a major headache.

So, any chance someone would be interested in putting together such kits to sell? I guess I could go buy some Radio Shack kits and learn this stuff in that way, which I prefer as I'm a hands on sort of person.

Kevin

[DIY controller kits](#) | 8 comments (8 topical, 0 editorial)

Re: DIY controller kits ([none / 0](#)) ([#1](#))

by [windstuffnow](#) ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon Nov 24th, 2003 at 07:22:57 PM MST

([User Info](#)) <http://www.windstuffnow.com/main>

kww, There is a simple one at

[http://www.homepower.com/search/search\\_result.cfm?search=shunt%20regulator&CFID=147145&CFTOKEN=53556173](http://www.homepower.com/search/search_result.cfm?search=shunt%20regulator&CFID=147145&CFTOKEN=53556173)

Quite simple to build and costs about 5bux in parts and their stackable...

Have Fun

Ed

Re: DIY controller kits ([none / 0](#)) ([#2](#))

by [kww](#) on Mon Nov 24th, 2003 at 08:38:13 PM MST

([User Info](#))

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Hi Ed,

I might figure out how to make that one(I'm currently very electronically challenged :-), but I want one that needs no battery, which seem a bit more complicated. Looks like there'd be one simple gizmo that'd connect a load/switch when a certain voltage was reached. That's all I'd need for what I'm doing I think.

Triacs sound like such a thing, but Radio Shack didn't have any the other day. I figured I'd buy one to play around with. What I've got going now seems to work okay, just a heater hooked straight to the alternator. There's very little load until the voltage goes high enough, but I can see two ways it'd be better to have no load until a certain rpm or voltage is reached. Anyway, I'll get more into this area when I finish improving the two turbines I have up. They've endured some hard gusts(60+ mph) and I'm pleased at how tough they appear to be, but they do need to turn better with the wind. Thanks.

Kevin

Re: DIY controller kits ([none / 0](#)) ([#3](#))

by Larsanderss ([larsanderss@brevet.nu](mailto:larsanderss@brevet.nu)) on Tue Nov 25th, 2003 at 06:20:32 AM MST

([User Info](#))

Would not the device on Hugh Piggots home page be like the one asked for...?? It seems to look at turbine rpm via Hz.... and connect loads in adjustable steps...

If anyone need a pcb layout for the homepower device i have just drawed it (still have not tested if it is correct but i will soon).

Lars A

Re: DIY controller kits ([none / 0](#)) ([#4](#))

by charged on Tue Nov 25th, 2003 at 07:41:04 AM MST

([User Info](#))

Four component method:

1. A triac that's big enough to handle the load.
2. Two zener diodes rated for the MINIMUM required voltage for the load.
3. A current limiting resistor for the gate lead on the triac

The two zener diodes are wired face-to-face (cathode to cathode). This is in series between the gate, the current limiting resistor and either one of the other triac terminals.

The triac is then just wired in series between the generator and load.

When the zener voltage is reached, the gate lead is triggered and the triac begins to conduct until there is no more current flowing through the load. This repeats on each positive and negative voltage peak.

When your generator drops below the zener voltage, the triac won't turn on.

Find the absolute maximum voltage that the generator will produce and use  $R=V/I$  to determine how much resistance you'll need on the triac gate to keep it below it's maximum current rating.

This also works well in some DC applications for discharging a capacitor through a load. In that case, use an SCR and a single zener between the gate and anode. When the capacitor voltage climbs enough to pass the zener, the scr conducts and dumps the capacitor charge. No gate resistor is required in that application.

Re: DIY controller kits ([none / 0](#)) (#5)  
by TomW on Tue Nov 25th, 2003 at 09:33:09 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

charged;

You post some very interesting circuit ideas. While I can take the words and draw a schematic to match I am sure lots of the less electronically savvy folks would find a schematic very informative. Any chance you have a way to transform your words to diagrams?

What the internet needs is a good online schematic generator that outputs nice, lean schematics graphics. A picture is worth a few dozen words for sure.

Another great idea, charged, simple and probably cheap too.

Thanks for sharing

Cheers.

TomW

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Re: DIY controller kits ([none / 0](#)) (#7)  
by Jerry on Wed Nov 26th, 2003 at 10:22:59 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hey Tom W

How about an Other Power Circuits Page? If those of us how are not computer savy could e-mail or even snail mail a coupy of some circuts to one that is computer savy and could aply them the this page we could all benifit.

I think these schimatics could be cretiqued and enhanced by the experts as time progreses.

I'd be willing to through a few of mine in and if they are not correct the experts could give a review and sugjest improvements.

List these as uncertified till tryed or proven. Through in a disclaimer for site protection?

I love looking at diagrams.

JK TAS Jerry

[Airheads Page](#)

[ [Parent](#) ]

Re: DIY controller kits ([none / 0](#)) (#8)  
by TomW on Thu Nov 27th, 2003 at 10:21:17 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Jerry;

Certainly sounds like a good idea to me.

Some kind of review would be good too.

I see circuits on websites a lot that  
I would not trust to work as represented.

Simply claiming they are untested and presented  
as examples to be evaluated only would probably  
be enough of a disclaimer.

I'm pretty sure I don't want people sending me  
those monster megabyte size .bmp files of a simple  
drawing that takes 10 minutes to download tho.

Never the less a good idea to have a circuits  
section or sub section. I have plenty of web space  
too so I probably could do something there or in  
my diary if I ever start getting motivated again.

Cheers.

TomW

[Stuff I have Online](#)

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Re: DIY controller kits ([none / 0](#)) ([#6](#))  
by kww on Tue Nov 25th, 2003 at 10:47:53 AM MST  
([User Info](#))

That sounds exactly like what I want, very simple. :-) I'll have to find those parts and try it out, see  
if it works well with what I'm trying to do. Thanks.  
Kevin

[ [Parent](#) ]

[DIY controller kits](#) | 8 comments (8 topical, 0 editorial)



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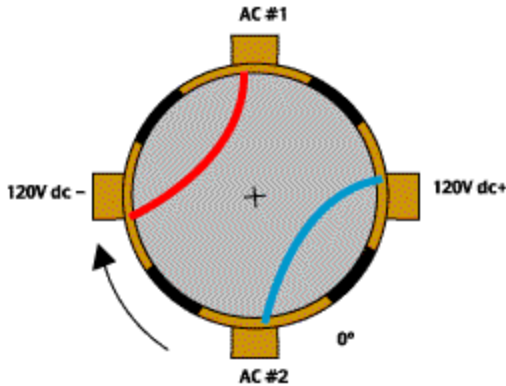


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## Mechanical Inverter Again

By [RogerAS](#), Section [Homebrewed Electricity](#)  
 Posted on Wed Nov 19th, 2003 at 03:53:04 PM MST [Electronics](#)  
 all



Greetings,

Here is what I was talking about with a mechanical inverter.

This is an end view of the rotor and brush setup I mentioned in an earlier thread. The colored lines are connections between the commutator positions. As the commutated rotor spins the direct current is redirected in an alternating current fashion. A really small motor could be used to turn this rotor as only the brush resistance is a factor (in my tiny mind anyway :-). The brushes are on the sides and top, no feed or supply wires shown. I think for 60 hertz the RPM would have to be 3600, but it could be half that(it's late in the day). Or with more commutation slots far less RPM.

I think that 12V DC could be fed to this with the addition of the stepup transformer on the AC side. I feel, but don't know, that if the right size motor run capacitors were used on the AC side this could make some pretty good quality AC.

What do you guys think?

RogerAS

[Mechanical Inverter Again](#) | 14 comments (14 topical, 0 editorial)

Re: Mechanical Inverter Again ([none / 0](#)) ([#1](#))  
 by Old F on Wed Nov 19th, 2003 at 04:58:26 PM MST  
[\(User Info\)](#) <http://www.oldf.homestead.com>

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Roger

In stead of a transformer you could use a DC to DC converter 12 volts in 120 out.

I don't see why your commutator would not work. Its like a two pole alternator you would find on an engin driven gen set 3600 rpm gives you 60 hz and a good wave form.

Have fun

Old F

Re: Mechanical Inverter Again ([none / 0](#)) (#2)  
by drdongle on Wed Nov 19th, 2003 at 05:04:00 PM MST  
([User Info](#))

No mater the speed/frequency the output will be a square wave. Just soze you know:)

Dr.D

Re: Mechanical Inverter Again ([none / 0](#)) (#3)  
by Norm on Wed Nov 19th, 2003 at 06:14:53 PM MST  
([User Info](#))

If you put some capacitors in the circuit would that 'round the corners' a little? Know how I could make a home-brewed Electronic ignition for the LawnBoy? (:>) Norm.

[ [Parent](#) ]

Re: Mechanical Inverter Again ([none / 0](#)) (#6)  
by zubbly on Wed Nov 19th, 2003 at 07:32:39 PM MST  
([User Info](#))

hello Dr. D. first i will admit that i am not much of an electronics person. i do understand that the ac output will be in the square wave form. if Roger uses a step up transformer ( 12vac-120vac) and two seperate coils in the transformer, would the 120vac coil round off the sine wave somewhat because of the slight lag behind the primary coil? just a hunch. also, could you reply with what items can be succesfully run from a square wave form and what cannot.

thanks--zubbly

[ [Parent](#) ]

Re: Mechanical Inverter Again ([none / 0](#)) (#4)  
by drdongle on Wed Nov 19th, 2003 at 07:10:48 PM MST  
([User Info](#))

While caps can "round off the corners" you need to use them in conjunction with a transformer or inductor. I have built low frequency inverters 20-30 Hz for ringing telephones that I have done this with. Basically I had a 555 timer driving two out put transistors ( 1 NPN and 1 PNP)which in turn drove a transformer connected backwards ( 12 volt secondary became the primary) so that I had a 120 volt square wave output, I would then hook up my scope and try various caps bridged across the secondary to get the best approximation of a sine wave. It was never a perfect sine wave and it had some transient artifacts but it was better than with out the cap. What I had was a "resonant tank circuit" that was tuned to 30 HZ. So if you did build one yes you can approximate a sine wave but you will need to experiment with the caps and you will definitely will need a scope. Note that if the speed and frequency change the "resonance" will be lost and you will no longer have a sine wave output.

Dr.D

Re: Mechanical Inverter Again ([none / 0](#)) (#5)  
by zubbly on Wed Nov 19th, 2003 at 07:22:32 PM MST  
([User Info](#))

hellow Roger. i have sort of been dreaming along the same lines. your idea does seem much more simple than what i was thinking. i was thinking of using a commutator from an old large dc motor, but then couple the connections to a set of slip rings on a common shaft. basically would come out to the same thing i think. the current if from a 12vdc source will be of significant high amps. may i offer the idea of using brushes from an industrial lift truck motor as these are designed for very high current and are often arranged in a row in the brush holder. perhaps you may be able to salvage some parts from a lift truck motor. another source for high current brushes are from the old motor and gas driven Lincoln and Hobart welders. hope this helps and please post your results. i am very interested to here how it goes.

keep having fun--zubbly

Re: Mechanical Inverter Again ([none / 0](#)) (#7)  
by Norm on Wed Nov 19th, 2003 at 08:12:07 PM MST  
([User Info](#))

As for brushes and brush holders wouldn't just plain old parts from car starters be a good source they carry about 300 amps or so....well maybe not probably weren't meant to carry a lot of amps for more than a minute at a time? Norm.

[ [Parent](#) ]

Re: Mechanical Inverter Again ([none / 0](#)) (#8)  
by Simon ([simon@guyo-inc.com](mailto:simon@guyo-inc.com)) on Wed Nov 19th, 2003  
at 11:12:44 PM MST  
([User Info](#)) <http://www.guyo-inc.com/engineering.htm>

Hallo Roger,

I have been thinking about the same thing! A mechanical inverter. The only thing obvious which will result in a pure square wave is the ON-OFF effect of the commutator contacts. Maybe the solution is to use wider contacts on the stationary part of the inverter which have variable resistance. This will sort of create a curve just like on a "potentiometer". You might need a bigger wheel to do this and many contact points to enable 60Hz at lower RPM than 3600! You could try with lower voltages first for this setup. Have fun and tell me when it works.

Simo'

Re: Mechanical Inverter Again ([none / 0](#)) (#9)  
by RogerAS ([rogeras@cei.net](mailto:rogeras@cei.net)) on Thu Nov 20th, 2003 at  
07:11:49 AM MST  
([User Info](#))

Thanks guys,

For the advice and encouragement.

I really don't know when I can find time to build my little idea, so anyone with a little motivation go ahead and try.

I'm building a house, not like on HGTV "build" but rather actually doing the work, all the work! So, little time for anything else.

It seems this could work for a cheapie square wave inverter. Maybe only good for lights or heating, Sure the brushes will wear out and the commutator will go south, but oh well. Thanks for showing me how tuff it would be to approximate a sine none-the-less.

If I used a step up transformer with the square wave output, wouldn't that create another set of problems? I think I read somewhere that trying to setup the output of a square wave inverter was bad, or would the output from my spinner work differently?

DrD? Others?

P.S. I only have net access at work so excuse any delays in responses.

RogerAS



"Put the bunny back in the box!"

Re: Mechanical Inverter Again ([none / 0](#)) ([#10](#))  
by drdongle on Thu Nov 20th, 2003 at 08:26:14 PM MST  
([User Info](#))

Square wave forms tend to saturate a transformer more so than sine waves and induction motors don't really like them either. They can also produce more RF noise, which is bad for radios and such.

Dr.D

Why not use two motors? ([none / 0](#)) ([#11](#))  
by dconn on Fri Nov 21st, 2003 at 06:13:29 AM MST  
([User Info](#))

Why not make an old-fashioned mechanical Inverter and use a universal motor on the DC side and couple it to a induction motor on the other side - you'd get a perfect sine wave output and the only brushes to wear out would be in the universal motor - and at least they are engineered to carry the current.

I've often thought about a mechanical inverter but really I'm [and everyone probably] better off using an off-the-shelf inverter.

Derek

Re: Why not use two motors? ([none / 0](#)) ([#12](#))  
by RogerAS ([rogeras@cei.net](mailto:rogeras@cei.net)) on Fri Nov 21st, 2003  
at 07:12:46 AM MST  
([User Info](#))

Hi Derek,

I'm thinking this might be useful in places where electronic inversion is impractical or outside the budget. In the developing world this little gizmo might come in handy, or in Stone County Arkansas, where I live.

If one had a hydro setup OR maybe a distant VAWT it seems it would be a simple matter to run a take off to drive the spinner. This would make long distance runs to the primary battery bank more efficient, maybe, if run as AC. If one could build a real good rectifier on the storage end.

I dunno, I think I think too much.

RogerAS  
"Put the bunny back in the box!"  
[ [Parent](#) ]

Re: Why not use two motors? ([none / 0](#)) ([#13](#))  
by drdongle on Fri Nov 21st, 2003 at 07:50:54 PM  
MST  
([User Info](#))

It would work, in the past these were called MG sets  
( Motor/Generaters) and Dynomiters.

Dr.D

[ [Parent](#) ]

Re: Why not use two motors? ([none / 0](#))  
([#14](#))  
by Jerry on Wed Nov 26th, 2003 at 11:30:29  
PM MST  
([User Info](#))  
<http://www.dplusv.com/Photo-03.html>

I have this set up. I couldn't afford the inverter to power my well pump. I wanted power for the pump if we had a grid power failer. I couldn't afford the big inveter that could start and run my pump.

I did however have some surplus 2 HP dc motors that are rated 180 volts. I had 24 12 volt batteries from a hospital power backup system.

The motors were rated 1750 rpm. I purchased a stand alone belt drive ac generator rated 5000 watts 120/240 v. Its requiered power was listed at 10 hp 3600 rpm.

I used larger pullys on the motors and smaller on the genny. I put a motor on each side of the genny with a double belt pully on the genny.

I used 20 of the batteries (240 volts) and used a 400 amp aircraft relay to swich power to the motors. No load the genny puts out 260 volts and has no truble starting the pump. And while the pump is pumping the voltage is 242. Close enough. These two 2 hp dc motors have no problem meating the 10 hp power requierment for this genny.

I figure the pump wont run continuas so the system is good for back up. I'll post pics.

My small batteries went bad last winter and I've not replaced them yet but the setup is still in the pump house wich is inside my 40X60 shop. Its a small room in the back.

JK TAS Jerry

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[Mechanical Inverter Again](#) | 14 comments (14 topical, 0 editorial)

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[How can you check electronic ignition?](#)

By [Norm](#), Section [Magnets & Magnetism](#)

Posted on Wed Nov 19th, 2003 at 03:25:42 PM MST

[Electronics](#)

I used to check the coils on the old lawnmower engines by

hooking neg to the ground of a coil and then briefly touching positive to the tab that goes to the kill switch which would result in a spark at the plug but I don't know what to check on the electronic ignition. Can a multimeter be hooked up some way to check the primary or secondary or the electronic part the sensor perhaps something is shorted out? I'd hate to buy a new coil for this 4.5 hp Lawn Boy since it was given to me investing any money in it just rubs me the wrong way takes some of the fun out of it. I sure wouldn't want to throw it away tho' self propelled looks like new I think they are in the \$300 range when new. Thanks for any help guys! (:>) Norm.

[How can you check electronic ignition?](#) | 13 comments (13 topical, 0 editorial)

Re: How can you check electronic ignition? ([none / 0](#)) ([#1](#))  
by [kell](#) on Wed Nov 19th, 2003 at 03:55:01 PM MST  
([User Info](#))

Low tech: pull the plug, ground it, turn over the engine and look for a spark.

Re: How can you check electronic ignition? ([none / 0](#)) ([#2](#))  
by [Old F](#) on Wed Nov 19th, 2003 at 05:01:23 PM MST  
([User Info](#)) <http://www.oldf.homestead.com>

That the way I have allways done it. : )  
Old F

[ [Parent](#) ]

Re: How can you check electronic ignition? ([none / 0](#)) ([#3](#))  
by [Norm](#) on Wed Nov 19th, 2003 at 05:37:31 PM MST  
([User Info](#))

Oh...sorry forgot to mention that is what I did first thats why I went to the next step energize the coil. O K...so far that doesn't happen no juice going to it but I thought well maybe that's not so bad maybe because the electronic circuit will not allow it to go into the primary winding. I turn off the lights and in the darkness I see just the barest glimmer of a spark at the point where I make contact to the tab going to the primary (but no spark at the spark plug). I hook up the multimeter probes to the primary windings and can get a reading of about 5 volts when I rock the flywheel past the coil. And so this is as far as I've got for now...Norm.

[ [Parent](#) ]

Re: How can you check electronic ignition? ([none / 0](#)) ([#4](#))  
by [TomW](#) on Wed Nov 19th, 2003 at 06:55:31 PM MST  
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Norm;

If that mower has one of those fancy blade brake / kill switch on the handle dead man things they get crudded up and ground out the ignition and don't release properly sometimes.

Been there done that.

Cheers.

TomW

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Re: How can you check electronic ignition? ([none / 0](#)) ([#6](#))  
by Norm on Wed Nov 19th, 2003 at 08:29:30 PM MST  
([User Info](#))

Nope...not that either Tom ...disconnected the wire to that switch right at the coil as soon as I saw that I wasn't getting a spark at the plug. That switch is now as clean as the day it rolled off the assembly line. but right now it isn't connected. Thanks for the reminder tho' Norm.

[ [Parent](#) ]

Re: How can you check electronic ignition? ([none / 0](#)) ([#8](#))  
by jubalearly on Thu Nov 20th, 2003 at 08:05:41 AM MST  
([User Info](#))

Pardon me if I'm wrong, but doesn't that switch (the dead man switch) DISCONNECT the ground? I'll have to look at my mower, but I'm thinking it's supposed to fail safe.....

[ [Parent](#) ]

Re: How can you check electronic ignition? ([none / 0](#))  
([#10](#))  
by Norm on Fri Nov 21st, 2003 at 05:45:24 PM MST  
([User Info](#))

No the switch connects the coil to ground shorting the coil and shuts off the ignition sometimes this wire runs close to metal rubs the insulation off shorts out and cuts off the ignition.Norm..

[ [Parent](#) ]

Re: How can you check electronic ignition? ([none / 0](#)) ([#5](#))  
by gameman on Wed Nov 19th, 2003 at 08:28:33 PM MST  
([User Info](#))



Norm

un hook the wire that goes to the kill switch take a spark plug open the gap to 1/4" then ground the plug to the head and crank it if the ignition system is good it will jump the 1/4" gap on the plug .....i have a small engine repair shop and most of the lawnboy's that i get have bad coils very common problem  
gameman

[ [Parent](#) ]

Re: How can you check electronic ignition? ([none / 0](#)) ([#7](#))  
by Norm on Wed Nov 19th, 2003 at 09:11:13 PM MST  
([User Info](#))

Yeah, I'll try that...too bad it doesn't have points...Electronic coils cost.. ?  
I used to have a small engine repair shop. Briggs mostly...They were easy... points,plugs or new keys solved about 70% of the problems. The things some people do to lawnmowers! (:>) Norm

[ [Parent](#) ]

Re: How can you check electronic ignition? ([none / 0](#)) ([#9](#))  
by Norm on Thu Nov 20th, 2003 at 09:14:31 PM MST  
([User Info](#))

Gameman: Did almost like you said, didn't open the gap anymore than normal (about .030 ) it was laying on the plate that the blower shroud/recoil starter is bolted to plugged in to the coil, kill switch wire disconnected....spun the flywheel with my 14.4v drill and it sparked like it should ....tried it again and again...worked everytime and I was thinking it has to spin faster than a briggs...good old briggs with points...I used to get them so they would fire just by rocking the flywheel mags past the coil. So I tried it with the lawnboy...didn't work ...well I'll spin it with the drill again just to make sure it's going to work....it's stopped working can't get it to work at all! Hooked up the digital multimeter to the primary and spun it with the drill and I get 5 to 7 volts... out of it but can't put juice into it tho'... must have a blocking diode/s . Might be an internal short in the secondary?...moisture? I'm going to try one little trick...put the coil in a warm place for a couple of days...yeah I know they're supposed to be waterproof but its worth a try...couldn't hurt anything. (My dad used to do something like this with Model T coils put 'em in the bun warmer above the cook stove!)  
Have you ever had experience with these 'on again...off again' coils? I imagine you probably have. Hey I don't think it would be any fun if you didn't have any problems to solve (:>) Norm.

[ [Parent](#) ]

Re: How can you check electronic ignition? ([none / 0](#))  
([#11](#))  
by monte350c on Sat Nov 22nd, 2003 at 10:32:02 PM MST  
([User Info](#))

Hi Norm,

I just had a bout of "fun" with ignition troubles - not electronic - but of the on again, off again variety. Tecumseh motor - sometimes would fire right up, other times took a lot of pulling, one day wouldn't start at all. Took off the flywheel, points like new, condenser checked with the Fluke - looked OK. Coil checked out. Reassembled, started first pull. But the problem - I didn't find anything wrong!

One week later, same hard starting problem - and a very weak and intermittent spark. Pulled the flywheel again, and this time when I checked the coil I got about 4 Ohms on the primary, and the secondary was open! (should be something like several k-ohms anyway). So this tricky little sonofa... was a bad secondary on the coil. Sometimes the spark presumably jumped over inside the coil and gave out a bit of spark and sometimes not.

Replaced the coil and it starts first pull every time now. Not sure if the LB coil is 'checkable' like this or not.

Not sure if you can find anything useful at this link:  
<https://lookup2.toro.com/request/request.cfm?xcaller=lawnboy>

Also lots of LB specs and engine ID info here:

<https://lookup2.toro.com/gateway/acrobat/manuals/lball64.pdf>

Good luck with it - LB has always been my favorite. I've got one really neat older model, not sure of exact vintage but it's got a choke combined with the on-off switch, you rotate the switch and pull up for choke.

Ted.

[ [Parent](#) ]

Re: How can you check electronic ignition? ([none / 0](#)) ([#12](#))  
by Norm on Tue Nov 25th, 2003 at 10:18:18 AM MST  
([User Info](#))

Thanks for the links Ted. Back at it....still drying the coil out in case that's the trouble...it was sitting outside for about a year I guess according to the manuals it's a '94 model the electronic ignition even has an electronic advance...learn something new everyday. (:>) Norm.

[ [Parent](#) ]

Re: How can you check electronic ignition?  
([none / 0](#)) ([#13](#))  
by monte350c on Tue Nov 25th, 2003 at 07:59:18 PM MST  
([User Info](#))

Hi Norm,

Good luck with it - give a post if you get it going. Never know - you might save me a lot of time someday if I have the same problem!

Ted.

[ [Parent](#) ]

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[Curiosty](#)

By [CAIN505](#), Section [Homebrewed Electricity](#)  
Posted on Sat Nov 15th, 2003 at 12:55:55 PM MST [Electronics](#)  
Motor's and Generator's

Alright I know powering a motor with a generator wired to it with the generator being pulled by the motor wont work too much resistance BUT, with you all making your own motor's and generator's can a generator be built into a motor and/or a generator be built on the motor shaft either/or/both powering the motor

[Curiosty](#) | 1 comment (1 topical, 0 editorial)

Re: Curiosty ([none / 0](#)) ([#1](#))  
by Electric Ed on Sat Nov 15th, 2003 at 02:53:14 PM MST  
([User Info](#)) <http://www.electric-ed.com>

There are machines, called rotary converters, that have both motor and generator windings in the same housing.

These are normally used for generating three phase power in a facility where only single phase service exists.

Such a machine could be built to operate from batteries (DC) and produce AC, in lieu of an electronic inverter.

If you are thinking of supplying a motor from a generator driven by the same motor, forget it. That's been tried.

Ed

[Curiosty](#) | 1 comment (1 topical, 0 editorial)

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## [Hot Neutral?](#)

By [storrence](#), Section [Remote Living](#)

Posted on Sat Nov 15th, 2003 at 06:00:23 AM MST

[Electronics](#)

Have installed new service and am getting shocks through what seems to be the neutral line.

Anyone know what could be causing this? I'm using a laptop for example that is plugged into 126v here in Brazil and using the power adapter ac/dc converter and when I'm barefooted on our cement floor I get shocks touching the laptop which has a metal casing. I also get light shocks from touching the metal on some light switches (haven't tried them all). Also I have one of those plug in testers that have 3 LEDs to give the status of the plug and it shows HOT NEUTRAL REVERSAL but I know the neutral is on the right part of the plug. The hot wire is on the shiny screw and marked HOT on the plug and is also the smaller of the 2 holes on the plug. The way our service is set up may be causing the problem though. We have 3 phase (3 126v lines and 1 neutral) coming 350 meters from the street to the house. It looks like the grounded the neutral at the poll where the meter is. So we have 4 wires going 350 meters to the house. All 4 of these go to our siemens breaker box and the neutral is on the neutral bar. We then have a 4mm2 ground wire going from the ground bar on the box outside the house and connected to a 2 meter copper stake in the ground. We are not doing this with the neutral as it was done at the meter 350m from the house. The other thing that is different in how they do things here compared to the U.S. is they seem to share the neutral in some places. For example they run individual wires through plastic conduit and don't always run a separate neutral from the box to a particular circuit. Most of the time yes but I think may be in some cases they are connecting into a neutral from another circuit. Doesn't seem to me though that it would matter since all the neutrals are connecting together. With my limited knowledge of how this works I'm wondering if when something is turned on anywhere it will be sending electricity back through the neutral and it will look to connect to ground. Since our connection to ground is so far away 350M then maybe it's finding a shorter path through my legs!

Anyone have a solution or know what is going on here?

TIA,  
Steve

[Hot Neutral?](#) | 56 comments (56 topical, 0 editorial)

Re: Hot Neutral? ([none / 0](#)) ([#1](#))

by [Ocean](#) on Sat Nov 15th, 2003 at 06:21:50 AM MST

([User Info](#))

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my guess is that it is getting colder out side, and you are wearing cotton.

Perhaps your computer is on a glass table. Anyway your body builds up an electrical charge from moving. If you could drop set your computer onto a bare electrical wire and the other end which is bare dropped to the floor this may help.



Re: Hot Neutral? ([none / 0](#)) (#2)  
by storrence on Sat Nov 15th, 2003 at 06:24:46 AM MST  
([User Info](#))

My computer is on a glass table but it also happens on a wood (particle board) table. It's a pretty strong shock that builds from weak to strong quickly and then it's impossible to not jerk away. Also what would explain why my little plug in tester is showing HOT NEUTRAL reversal status when they are wired correctly. All of them are testing that way.

[ [Parent](#) ]

Re: Hot Neutral? ([none / 0](#)) (#3)  
by Ocean on Sat Nov 15th, 2003 at 06:33:52 AM MST  
([User Info](#))

on second thought dont send a hot wire to ground because your electric bill will skyrocket. I presume that your wires are reversed from the start at the fusebox.

[ [Parent](#) ]

Re: Hot Neutral? (problem found) ([none / 0](#)) (#4)  
by storrence on Sat Nov 15th, 2003 at 06:39:14 AM MST  
([User Info](#))

I did a little testing at the breaker box and found the problem. When I turn off the 220v breaker to the hot water heater the problem goes away and the tester reads correct on the plugs and I don't get the shock. What I see is that the hot water heater doesn't have a ground wire (Brazil mostly still uses plugs without a ground). So what I did when I hooked up the hot water heater is to take a wire from a screw on the housing and connected it to ground. Now I would think this would not be a problem but it seems that the housing has a fault because it should not be receiving power. It must be touching 1 of the 2 phases somewhere. So I removed my ground wire from the housing of the tank and problem went away. My only concern is that this tells me the housing of the tank is live so it could be a dangerous situation. Correct?

[ [Parent](#) ]

Re: Hot Neutral? (problem found) ([none / 0](#)) (#5)  
by Ocean on Sat Nov 15th, 2003 at 06:44:13 AM MST  
([User Info](#))

Very possibly dangerous or maybe the thing itself is wired backward

[ [Parent](#) ]

Re: Hot Neutral? (problem found) ([none / 0](#)) (#6)  
by storrence on Sat Nov 15th, 2003 at 07:02:48 AM MST  
([User Info](#))

It can't really be wired backwards because it's a 220v two phase connection. 2 hot wires and no neutral and no ground. It seems though that 1 of the 2 phases is shorting out to ground but not a strong short or otherwise the breaker would have never stayed on when I had the casing connected to the ground on the plug. Still some energy was passing but not enough to trip the 30amp breaker (fuse).

[ [Parent](#) ]

Re: Hot Neutral? ([none / 0](#)) (#7)  
by richard on Sat Nov 15th, 2003 at 08:08:46 AM MST  
([User Info](#))

hot water has a bad heater in it

Re: Hot Neutral? ([none / 0](#)) (#8)  
by storrence on Sat Nov 15th, 2003 at 08:23:32 AM MST  
([User Info](#))

The element in it is defective? It only has one element and is functioning. The unit has only been in use for 2 weeks. It seems like one of the phases going to the element is leaking power to the case of the unit. I can't be a low resistance connection because it would have surged to ground and tripped the breaker. I would imagine this might have been wasting power since some of the power would be going to ground instead of the heating element. Possibly even when the thermostat was off. It's possibly still doing that through the feet on the floor. I would have to see what they are made out of. It's surprising that they would sell these units here without ground.

[ [Parent](#) ]

Re: Hot Neutral? ([none / 0](#)) (#9)  
by BrianK on Sat Nov 15th, 2003 at 08:43:28 AM MST  
([User Info](#))

220 hotwater heaters should have 2 elements

[ [Parent](#) ]

Re: Hot Ground ([none / 0](#)) ([#13](#))  
by storrence on Sat Nov 15th, 2003 at  
11:45:16 AM MST  
([User Info](#))

Maybe in the US but not here. It has one element with points to connect 2 hot wires. I have a clothes driver from the US and it has 2 connections for each phase and a ground and a separate neutral but the hot water heater I bought here in Brazil only has the 2 hot wires and nothing for ground or neutral.

[ [Parent](#) ]

Re: Hot Neutral? ([none / 0](#)) ([#10](#))  
by laskey on Sat Nov 15th, 2003 at 08:45:45 AM  
MST  
([User Info](#))

You may have a decayed anode rod or something like that. The heater is in need of inspection by an electrician at any rate. It is very dangerous to have a live hot water heater casing, especially if you have copper pipes.

Cya,  
Chris

[ [Parent](#) ]

Re: Hot Ground ([none / 0](#)) ([#14](#))  
by storrence on Sat Nov 15th, 2003 at  
11:50:30 AM MST  
([User Info](#))

I have PVC but I agree it's dangerous. It's difficult to get an electrician to my location and even if I did, they would not consider it dangerous. You have no idea how they are with electricy here. Many people just connect wires directly to the overhead street lines so they don't have to pay but that's another story. Since I'm not so courageous to take this risk, is there any tests I can do to confirm I have a problem and what the problem would be? I have a multimeter.

I don't believe the casing is completely hot because it would have tripped the 30amp breaker when I had it's casing connected to ground.

[ [Parent](#) ]

Re: Hot Neutral? ([none / 0](#)) ([#11](#))  
by drdongle on Sat Nov 15th, 2003 at 09:33:50 AM MST  
([User Info](#))

If the heater element is partially eaten through this would provide a path through the water to the metal housing and make it "live". If your using metal water pipe this could be a fatal situation. this device needs immediate inspection and repair!!!!  
Dr.D

Re: Hot Neutral? ([none / 0](#)) ([#15](#))  
by storrence on Sat Nov 15th, 2003 at 11:55:33 AM MST  
([User Info](#))

The complete unit is only 2 weeks old so I don't suspect that it's eaten through but there should be some way to test this. I am using PVC but wouldn't the water itself provide a path, making taking a shower dangerous?

[ [Parent](#) ]

Re: Hot Neutral? ([none / 0](#)) ([#17](#))  
by TomW on Sat Nov 15th, 2003 at 12:21:36 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

storrence;

I hate to tell you this but "new" does not necessarily mean "good". A lot of manufacturers do not do rigid testing / inspections and simply replace defective units when detected by the consumer because its overall cheaper. A faulty element could quite easily allow the water and you to complete a lethal circuit. An element that looked ok to the person who installed it at the factory could easily have small cracks or other defects that only show up after its cycled a few times, too.

Bottom line seems to be that you need a professional to take a look at it and give you an opinion. Remote troubleshooting something like this is not really a good idea.

Good luck.

Cheers.

TomW

[Stuff I have Online](#)

[Contact Me](#)

[ [Parent](#) ]

Re: Hot Neutral? ([none / 0](#)) (#18)  
by storrence on Sat Nov 15th, 2003 at  
12:37:44 PM MST  
([User Info](#))

Hi Tom,

Being it was built here in Brazil, the quality issues you talk about are not far off the mark. The model I got is:

<http://www.jmsaquecimento.com.br/jmsini.htm>

I don't know if it's possible to get anyone out here because of our location but I have contacted them at their website to see what the procedure is.

Seeing that it's possible to have a defective element or even one that is old, it seems crazy that they would not have a ground wire in the installation. Without the ground wire, the element could come into contact with the water and could that complete a circuit all the way to the shower through me?? Seems it could.

Steve

[ [Parent](#) ]

Re: Hot Neutral? ([none / 0](#)) (#12)  
by WNC on Sat Nov 15th, 2003 at 10:23:03 AM MST  
([User Info](#))

Hi Steve,

You could also possibly have a neutral or hot wire in the breaker box cut or scrapped and resting against something in there. Turn your Mains off and check all your connections on your hot and neutral side. Whoever did the wiring might have skinned up one of the wires coming into the breaker box. If you have a meter, check both the neutral and the hot in relation to ground with the breaker turned off. If you're showing any voltage on a receptacle with the breaker off, you have something touching in the wrong place somewhere.  
Hope you get it fixed:-)

WNC

Re: Hot Neutral? ([none / 0](#)) (#16)  
by storrence on Sat Nov 15th, 2003 at 12:07:38 PM MST  
([User Info](#))



I did all the wiring and my box is a siemens 3 phase box. All the hot wires connect directly to each breaker and there are no problems with the wires that I can see. You said to test it with a meter but I'm not sure how I would go about testing to see if I have a bare wire somewhere. It seems you are saying to turn off the bipole breaker to the hot water heater and test for any voltage on those lines but with the breaker off it would be impossible to have voltage on that plug since the breaker would be cutting voltage to both of those lines and there is no neutral.

What I've tested so far is that the problem completely goes away when I either turn off the bipole breaker to the hot water heater OR I leave it on but disconnect the ground that I connected from the plug to the casing of the heater. So it seems to me that some electricity is passing from one of the 2 phases on the single heater element to the casing either from inside passing through the water or from the point that it mounts to the tank. What is strange is that the unit is only 2 weeks old and the mounting point looks ok.

[ [Parent](#) ]

Re: Hot Neutral? ([none / 0](#)) ([#19](#))  
by ThomasK on Sat Nov 15th, 2003 at 05:11:41 PM MST  
([User Info](#))

Hi Steve,  
Sorry You are in BIG trouble!  
You say You have a meter, so disconnect the Waterboiler and check the lines in and out of the boiler with the OHMmeter in every range of Ohm´s - this both lines to the outside of the tank!! This MUST be in every range No reading of resistance!!  
If not so the Heatelement is BAD!  
IF this happend so NEVER use hot water from the boiler DISCONNECT it immediately until you have replaced it with a new Boiler or element!  
Think about a leakage current protection and a electricially SAFE unit!  
Myself dont want Your Family nor You ELECTROCUTED!!!!!!  
Greez Thomas

Re: Hot Neutral? ([none / 0](#)) ([#21](#))  
by storrence on Sun Nov 16th, 2003 at 03:38:46 AM MST  
([User Info](#))

Hello Greez,

The breaker to the boiler has been off since I started this thread and I don't plan on turning it back on until I solve this problem. I'm not as daring as the locals. I play more on the conservative side which is why I have all my circuits grounded and all my plugs and switches are all from the US. Even all my appliances except the boiler are from the US. So with this boiler now I'm trying to mix Brazilian daring with US conservative :)

Would you mind to give me a little help with testing the resistance. I'm not sure I understand what you are explaining. The points I would think to check would be with the element installed, one terminal of the element to the other terminal. This I guess would see low resistance indicating a good element. Then would I test one terminal of the element and the metal of the boiler looking for 100% resistance on all ohm ranges. Then the other terminal with the metal of the boiler.

Is my thinking correct???

[ [Parent](#) ]

Re: Hot Neutral? ([none / 0](#)) ([#20](#))  
by monte350c on Sat Nov 15th, 2003 at 08:16:42 PM MST  
([User Info](#))

Yikes!

I just moved back to North America from somewhere where there was lots of "interesting" stuff going on with 220 volt power.

The previous suggestion about checking between the power connections and the case of the water heater is good.

If there's a thermostat on this water heater, you should have a look at it, and all of its wiring too to make sure nothing's shorting to the case.

Good luck and I hope you can solve this soon - it's not a good or safe situation at all...

Ted.

Re: Hot Neutral? ([none / 0](#)) ([#22](#))  
by storrence on Sun Nov 16th, 2003 at 04:22:44 AM MST  
([User Info](#))

Hi Ted,

I put up some [pictures](#) to see this better.

BTW, where did you move back from? Here in Rio you can't imagine how the favelas connect to the grid! They all connect directly to the overhead wires and it's a huge spaghetti mess of wires. Completely out of control. I knew 'free energy' was making progress but here they've had it for years ;-)

After I ran the 350M of cable from the meter to my house I was surprised to see how the local checked for neutral. He just touched each wire with one and and put the back of his hand on ground. :)

I'm going to do some testing with my mmeter and post my results here.

Steve

[ [Parent](#) ]

Re: Hot Neutral? ([none / 0](#)) ([#23](#))  
by Michael G on Sun Nov 16th, 2003 at 05:23:42 AM MST  
([User Info](#))

Im no electrician but cant you tie neutral to ground at the circuit panel? Those ground rods need to be in damp ground too. Seems that would fix the problem.

Re: Grounding Neutral ([none / 0](#)) ([#24](#))  
by storrence on Sun Nov 16th, 2003 at 06:25:38 AM MST  
([User Info](#))

Yes I believe so. It's really the same thing and in some boxes you only have one bar to tie your neutral and ground together. I think it's just separated in this box for clarity.

I think I don't even need the 4th neutral wire going back that 350M to the meter. I should be able to just connect it to the ground stake.

Anyone else know about this?

[ [Parent](#) ]

Re: Hot Neutral? ([none / 0](#)) ([#25](#))  
by brock ([nevermab at uwgb dot edu](#)) on Sun Nov 16th, 2003 at 11:17:57 AM MST  
([User Info](#))

You have an open side to the water. One of the two (or really both since they are in the water) are leaking power in to the water. When you add the ground the power is running back up the ground line and leaking in to all the other grounds on you system.

You have two problems.

1. Your water heater element is bad, it could be a defect, it could be worn, no matter the case it is somehow leaking in to the water and it should not be doing that.
2. You need a better ground. Since the power is leaking from the water heater back to the ground and the voltage is raising enough to shock you, your ground isn't doing what it is supposed to do. It should pass all that power back in to the ground but for some reason it isn't.

This is sometimes called a floating neutral or floating ground. In any case make sure you have a good connection to ground in the panel and especially at the water heater itself. As other have noted if you have the heater on and take a shower your likely to get zapped since the power will want to flow from the shower head to the ground (or the drain). As you can imagine, this is a bad thing.

Re: Hot Neutral? ([none / 0](#)) ([#26](#))  
by storrence on Sun Nov 16th, 2003 at 01:03:36 PM MST  
([User Info](#))

I've done some testing on the element while it was still installed and came up with these readings.

I'm wondering also if this unit is really a bi-phase 220v. I'm starting to think it's a single-phase 220v which is strange because I don't know how I would hook it up with my type of service (3 phase, 3 126v lines + neutral).

[Here are the pictures](#) of the element and thermostat:

The markings on the thermostat read:

```
=====
THERMOSTAT
Single Pole
Type R-T-M Water Heater
THERMOWATT
=====
```

Everything in English so maybe it's from the states or the UK.

The markings on the element read:

```
=====
2. 5KW
220. v J-M-S
=====
```

The readings from my ohm meter are:

Connecting to both terminals of the element reads 19?

From the left terminal to the casing (screw hole) reads 4?

From the right terminal to the casing reads 15?

So what I deduce from this is that I the right terminal should really be neutral which is connected to the casing and why I'm seeing a 15? reading.

The left terminal should be a 220v or 110v depending if I was

using a 220v or 110v element. Here I'm getting a 4? reading or should it really be 0? ?

The element seems ok.

Does all this seem correct? If so then how would I wire this to my 3 phase circuit panel without installing a transformer to step up the 110v to 120? I don't have a single 220v phase.

TIA,  
Steve

Re: Hot Neutral? ([none / 0](#)) (#34)  
by drdongle on Sun Nov 16th, 2003 at 08:51:40 PM MST  
([User Info](#))

Your meter readings indicate a short between one side of the heating element and the metal housing I suggest that you replace it ( hopefully under warrenty).

Dr.D

[ [Parent](#) ]

Re: Hot Neutral? ([none / 0](#)) (#27)  
by storrence on Sun Nov 16th, 2003 at 01:36:10 PM MST  
([User Info](#))

Since this now seems to be a uniphase 220v boiler what I've done for now is to take one of the phases going to the biphas breaker in the circuit panel and moved it to the neutral bar. So now I have it set just like a normal 110v circuit except that I'm using a biphas breaker using just one side of it.

It has eliminated the shocks in the ground line and I suppose it will just be less efficient than if I changed the actual element for a 110v.

This makes me wonder though how I could wire it the way it was intended. I don't see how I can get a single 220v phase from my 3 phase service.

Also this has made me think about the safety of grounding.

1. Since I had connected wrong in the first place having 1 of the phases connected to what should have been a neutral terminal which is connected to the casing then why wasn't the shock stronger and why did it not trip the breaker. Was it just because the phase found an easier path into the other phase via the element and this was just the overflow that went to the casing?
2. Connected the way it is now with 1 phase + neutral why would I need a ground hookup for safety? If a dangerous situation occurred like the insulation coming off the hot wire and touching the casing wouldn't it in this case rush the power to the neutral wire since it's in connection with the casing and then trip the breaker?? I don't see how the casing could remain hot in this situation since it would rush electrons through the neutral and build up heat in the wire and trip the breaker.

Why are ground wires needed if neutral is connected to the same thing? Why can't all devices just have the metal casing connected



to the neutral wire for safety? I'm sure there is a reason but I can't figure it out. Why is a neutral AND a ground needed for safety?

TIA,  
Steve

Re: Hot Neutral? ([none / 0](#)) (#28)  
by drdongle on Sun Nov 16th, 2003 at 02:03:49 PM MST  
([User Info](#))

In many cases the ground is redundant and as so normally carries no current, if however there was a situation such as you just had that, that current is redirected to the system ground and hopefully popping the circuit breaker alerting you to the problem and cutting off the current, baring the breaker being tripped that voltage is diverted away from secondary grounds like water pipes and people. Even if you keep the 120 volt set up I highly recommend that you employ a safety ground.

It's simply a matter of safety versus cost, is you life worth more than a few feet of copper wire?

Dr.D

[ [Parent](#) ]

Re: Hot Neutral? ([none / 0](#)) (#31)  
by storrence on Sun Nov 16th, 2003 at 03:34:17 PM MST  
([User Info](#))

All my place is grounded. I'm paranoid about that. :)

Do most appliances in the US that are grounded have the ground and neutral connected together inside the unit? I mean in a toaster for example is the metal frame connected to the neutral on the plug? If not then why not since they end up connecting inside the circuit box anyway. And if the ground pin is connected to the neutral pin then why the redundancy? If it was connected such that the casing of a toaster was connected to the neutral pin which would go to ground at the circuit box and the ground outside the circuit box, if the hot wire got damaged and came into contact with the casing then the power would rush through the casing to the neutral pin to the box and to the ground causing a rise in the wire temperature and shutting off the breaker. The object would never stay in a dangerous situation if the breaker functioned.

I must be confusing something here.

[ [Parent](#) ]

Re: Hot Neutral? ([none / 0](#)) (#29)  
by ThomasK on Sun Nov 16th, 2003 at 02:32:19 PM MST  
([User Info](#))

Hi Steve,

Now I'm getting abit confused.

Is it right that the Heater element is/was connected to Two of the phases?

If yes, and your supply/line voltage is 110 Volts so it is very clear that this heater was operated between the phases which gives the element about 209 Volts.

This can be done to uprise the Voltage for a 220 Volts Consumer like this Appliance.

(the missing 11Volts are in the tolerance)-so called Ohmic Consumers

About the readings of the meter - 19 Ohm overall is Ok for a 2.5kW element.

on one side 15 and on other 4 is classical break in the insulation - what happend could be that the heaterwire touches the metal tube were the wire is in .

This is COMPLETELY DANGEROUS for you - NO WAY you connect it to mains!!!!!!

So throw this out, a measure to live longer ... for YOU and OTHERS.

GREETINGS

Thomas

[ [Parent](#) ]

Re: Hot Neutral? ([none / 0](#)) ([#30](#))  
by storrence on Sun Nov 16th, 2003 at 03:22:15 PM MST  
([User Info](#))

Hi Thomas,

The way it WAS connected when I was having the problem was I was connecting 1 phase to one terminal and another phase to the second terminal using a bipolar breaker. No neutral and the ground I rigged up myself to a screw on the casing. I'm utilizing ground on all my plugs and appliances.

Our supply line I tested at 127.7V 60Hz. We have 3 phase and each phase is 127.7V. When we hook up a 220V drill for example we use 2 of the 127V phases and no neutral. I assumed the boiler would be hooked up the same way but now I think not.

Did you see the pictures I put up?  
[homepage.mac.com/stevetorrence/PhotoAlbum4.html](http://homepage.mac.com/stevetorrence/PhotoAlbum4.html)

It really seems that it should be connected with 1 neutral and 1 220V phase but is that possible? With my service I don't think so but how is it in the US when you have a 220V circuit? Are both lines hot or is one a 220V line and one a neutral??? This I would really like to know because I know there are different ways of delivering 3 phase power.

Is it ever correct to wire a unit like this the way I did? The way I see it, the white wire is really intended to be neutral since it seems to be connected to the casing. It seems if it's a single pole unit (the thermostat is marked single-pole) then the white wire or right terminal in the picture would be ok if it was connected to the frame acting as a ground also. I mean even if it didn't have a physical connection to the boiler frame but it did have a ground wire

attached then it would be connected via the circuit box anyway since ground and neutral are one and the same. BUT... I should be seeing a zero ? reading right? But I'm receiving a 15? reading. Would 15 and zero both indicate a good connection? I guess all materials have 'some' resistance?

AND the other problem I see is that the black wire, left terminal (phase as I have it connected now) is getting a 4? reading indicating a better connection to the frame than the right terminal but this should have a very high ? reading since there should be no connection to the frame.

With these readings, is there no question that I have a hot to ground situation, most likely with the element coming into contact with the internal pipe? Any other tests I can do to narrow this down? This has a 3 year tank warranty but I can imagine what the experience will be to get it repaired here.

I just thought of something else. If the element which I suppose is designed with a very long coiled wire inside a metal tube which forms the two terminals. This metal must come into contact with the water which must be ok since I can see no way to avoid it. Why does the electricity not travel through the water to the metal casing and cause an unsafe condition? Is the outside of the element insulated? If so then why does touching the metal pipe create a problem assuming the insulation is still intact?

Maybe the answer is that the water is a conductor but just not a very good one.

Now I'm wishing I had a transparent acrylic boiler :)

Steve

[ [Parent](#) ]

Re: Hot Neutral? ([none / 0](#)) (#32)  
by BrianK on Sun Nov 16th, 2003 at 04:32:14 PM MST  
([User Info](#))

Just my 2 cents In the U.S.A. all the 220v hotwater heaters that I have ever seen had 2 elements, and one line goes to each element with individual therms. anyone can correct me if i'm wrong

[ [Parent](#) ]

Re: Hot Neutral? ([none / 0](#)) (#33)  
by drdongle on Sun Nov 16th, 2003 at 08:48:19 PM MST  
([User Info](#))

Keep in mind that in the US even though we have many 220 VAC appliances they are in fact only single phase, 3 phase is never used for residential installations.

For clarification what we use in the US is a 220 V supply with a grounded ( earth) tap at the center of the transformer on the pole ( or pad). This tap is brought in to the load center ( circuit breaker panel) as one of 3 wires and is tied to the main ground buss, which in turn is connected to the ground rod, all 120 volt circuits and safety grounds are also terminated on the ground buss.

Some 220 volt appliances like stoves ( electric cookers) use 220 V and have a combined neutral/ground lead, newer ones will also have a 4th connection for seperate safety ground. 220 volt circuits like a water heater don't use a or need a neutral connection, but do have ground.

Some appliance like toasters are generally only two wire devices using only a hot and a neutral and have no safety ground, their housings are usually plastic or insulated from the hot and neutral.

If you in fact have 3 phase coming into your house there will be at minimum 4 wires coming from the meter box on the street. 1 for each phase and the neutral/ground (earth), and you can read 120 volts from each phase to the neutral.

Dr.D

[ [Parent](#) ]

Re: Hot Neutral? ([none / 0](#))

([#39](#))

by storrence on Mon Nov 17th, 2003 at 12:30:10 PM MST

([User Info](#))

Thanks Dr. D. for all your help!

We have exactly what you subscribe. 3 phase with 4 wires coming from the box. 1 for neutral and 3 others which each read 127.7V on my true rms multimeter. 60Hz. Here 3 phase seems pretty common. Many hand tools here are 220v but they are 2 phase 220v. I say 220 but I guess it's 127\*2 no neutral. What's crazy is there they use the same plugs so you could blow a 110 appliance if you are not careful what you are plugging into. I'm anxious to do some work with 3 phase motors.

This difference in 220v I had thought a little about before but now you have me thinking.

Is there a difference between a drill for example or a computer that is

designed to run on 220v single compared to dual phase? like in the US with a 220v phase + neutral and/or ground compared to the way it's done here with 2 126V lines and no neutral.

I bought my clothes dryer in the states and have it hooked up to 2 phase (2 126V phases + neutral + separate ground) and it works fine. Should it?

I have a computer that will run on 110-250v. Would it be ok to plug it into a 2 phase 126v \* 2 outlet or would it need to be a US type 220v + neutral?

OR is 2 phase and 1 phase 220v essentially the same to the load device?

[ [Parent](#) ]

Re: Hot Neutral? ([none / 0](#)) ([#42](#))  
by ThomasK on Mon Nov 17th, 2003 at 12:49:45 PM MST  
([User Info](#))

Hi Steve,  
as far as i know it is not applicable to connect a computer to 2\* 126 V (bi phase) better is to connect to one phase plus neutral ( 127V + N )  
The connection between Phases give no neutral so the Voltage difference is only because the phases are 120 degree shifted so this can damage all electronic Devices. Myself have seen a UPS in Venezuela fried by doing so. For Ohmic Loads and Motors there is usually seldom a harm.  
Greetings Thomas

[ [Parent](#) ]

Re: Hot Neutral? ([none / 0](#)) ([#50](#))  
by storrence on Mon Nov 17th, 2003 at 04:03:20 PM MST  
([User Info](#))



Just curious because  
the computers say  
110v-240 and I know  
I've used them in  
Poland before at 220v.  
Don't know if it was  
biphase or uniphase  
though. All my plugs  
here I installed as  
110v+n. Just this utility  
equipment that is 220v.

[ [Parent](#) ]

Re: Hot  
Neutral? ([none](#)  
[/ 0](#)) ([#51](#))  
by Thomask on  
Tue Nov 18th,  
2003 at  
11:17:39 AM  
MST  
([User Info](#))

Hello Steve,  
In Poland there is  
220V + N - that is  
single Phase.  
Myself havent  
seen up to now  
computers with  
wide range input  
for mains. Which  
is not saying that  
itis not possible.  
If you have it  
runnig on 127 +  
N it is OK - what  
should it bring to  
run it there on  
220V? Faster?  
more Powerful?  
pls explain.  
greetings Thomas

[ [Parent](#) ]

Re: Hot  
Neutral?  
([none / 0](#))  
([#54](#))  
by  
storrence  
on Tue Nov  
18th, 2003  
at  
04:06:19  
PM MST  
([User Info](#))

I don't think it would make any difference at all unless it was a motor type of device. Just trying to understand the difference between the two types of 220v services.

[ [Parent](#) ]

Re: Hot Neutral? ([none / 0](#)) ([#40](#))  
by ThomasK on Mon Nov 17th, 2003 at  
12:31:48 PM MST  
([User Info](#))

Hi Steve,  
It seems That you have a short to the tank.  
to measure out a Short disconnect all wire at  
the element.  
So you have the bare connectors / no wire on.  
measure from one pole / connector to the  
metal outside of the tank, also the same  
with the other pole /connector.  
This readings must be high Ohm resistance. No  
reading.  
If it is low resistance its a short.

To the element setup -  
yes indeed it is a wire in a metal pipe and to  
insulate the wire (live) to the pipe  
there is some material like quartzsand or a  
stuff similar to avoid contact of the wire to the  
pipe. this bar then is wound to some shape to  
form the element.  
When the wire touches the pipe then its a short  
to the case / tank. to avoid more damage thats  
why a so called Protection Earth is mounted to  
the tank -

Also myself think the line from the meter to  
your house in too long for the diameter of the  
wire. The way your electrical line outlet you  
described is a 3 phase 1 Neutral  
supply where you can obtain about 220 by  
taking it between the Phases, as you said.  
The Ground ( Protection Earth ) has to be take  
near your house.  
To do all this things i suggest to get a skilled  
electrician !

So now you might see more clear,  
Im technician in Germany so I´m cant tell you  
much about electric outlets like in the States  
but as a servicetechnician in worldwide activity  
I´m seen also lots of  
dangerous appliances and wiring, also it took  
me these days to understand what was going

on with your problem by reading the posts.  
So if there was sometimes a unclarity in my explanations its because my english is not the best.

Thankyou for your understanding and ihope you have solved this problem SOON and SAFE!!  
Greetings Thomas

[ [Parent](#) ]

Re: Hot Neutral? ([none / 0](#)) (#46)  
by storrence on Mon Nov 17th, 2003 at 01:10:29 PM MST  
([User Info](#))

Hi Thomas! I've been a few times to your country and have some friends in Ankara.

I will test the element again. My first test was with the wires still connected.

The cable we have going the 350M is 4 wires and each one is 25mm<sup>2</sup> (read squared). I know the welders that were here recently commented how strong the power was and we haven't experienced any problems other than this heater. Our power seems strong.

Getting a skilled electrician where I'm at is easier said than done :)

[ [Parent](#) ]

Re: Hot Neutral? ([none / 0](#)) (#52)  
by ThomasK on Tue Nov 18th, 2003 at 11:36:38 AM MST  
([User Info](#))

Hi Steve,  
Fine that you have been to Germany as well, but Ankara is in Turkey  
- or do you talk about a place in Germany which sound similar which i don't know?  
About the wire / line from the meter to your home it seems to me that 25 sq mmm is OK - i thought that it is only 2.5 sq mm - which could be to less. Possibly thats why i'm thought it is not sufficient.  
Sorry for that!  
greetings Thomas

[ [Parent](#) ]

Re: Hot Neutral? ([none / 0](#)) (#53)  
by storrence on Tue Nov 18th, 2003 at 04:03:56 PM MST  
([User Info](#))

LOL!! I really confused the two. Well I've also been in Ankara Turkey but what I meant to say was Aachen if that is the way it's spelled. Very cool and gloomy the time we were there.

[ [Parent](#) ]

Re: Hot Neutral?Aachen ([none / 0](#)) (#56)  
by ThomasK on Wed Nov 19th, 2003 at 01:33:51 PM MST  
([User Info](#))

Hi Steve,  
now we come closer  
what place you have  
been in Germany.  
I've to pass this city  
when i'm go to Belgium  
or Netherland for a Job  
in my Business.  
Have you been there at  
the University?  
Greetings  
Thomas

[ [Parent](#) ]

static electricity shocks ([none / 0](#)) (#35)  
by Simon ([simon@guyo-inc.com](mailto:simon@guyo-inc.com)) on Sun Nov 16th, 2003 at 11:34:50 PM MST  
([User Info](#)) <http://www.guyo-inc.com/engineering.htm>

Working with a heap of manustcripts one day i realised that my body was building charge as i flipped trough page by page. Since my printer is locate in another room i had to go through a door to get more fresh prints. And just when I reach the door handle -- there goes again!!! an electrical sting. I did not realize what was happening for some time until I tried discharging this electrical current by touching the wooden office wall before i go for the door handle. This helped a great deal. There is electricity around us -- its just waiting for us to pick it up!!!

Re: static electricity shocks ([none / 0](#)) (#36)  
by laskey on Mon Nov 17th, 2003 at 07:28:58 AM MST  
([User Info](#))

I went to the manufacture's website, and while my spanish (I pretty sure it was spanish) isn't all that great (actually it's terrible), but a product table is still a product table.

Their 2500 watt electric water heater is indeed 220. Which means it has to be 2-phase.

And that means, you have a bad element, but if I understand the language correctly... you have a 3 year warranty.

Drain the tank, remove the element, take it back, and have it replaced.

Look around that website, you understand the language better than I do, there may just be installation instructions.

Cya,  
Chris

[ [Parent](#) ]

Re: static electricity shocks ([none / 0](#)) (#45)  
by storrence on Mon Nov 17th, 2003 at 01:00:28 PM MST  
([User Info](#))

Is it possible to visually see if an element is bad once I pull it? It's new so what would I be looking for for verification? The only manual that came with it was a sticker on the side of the tank that is now turned against the wall so difficult to see. I will check their site.

I remember that when we ordered it they asked if we wanted 220 or 110 which I guess here is really 126\*2 (should it be called 152V) and 126+neutral. But it only has 1 element and some body here said a 220V has 2 elements in the US. Well I don't see why 1 element wouldn't work if you put 1 phase on each terminal and grounded it. In our case we have some defect but otherwise it seems it doesn't need 2 elements to be a 220v at least not down here.

I'm curious why you say because it's 220v it has to be 2 phase? Aren't the 220V hot water heaters in the states single phase 220v?

[ [Parent](#) ]

Re: static electricity shocks ([none / 0](#)) (#49)  
by storrence on Mon Nov 17th, 2003 at 04:00:25 PM MST  
([User Info](#))

Actually it is Portuguese :-)

[ [Parent](#) ]



Re: static electricity shocks ([none / 0](#)) (#44)  
by storrence on Mon Nov 17th, 2003 at 12:52:46 PM MST  
([User Info](#))

I know in my case here it's not static electricity. We have a concrete floor and no rugs. Plus it's nice at 24° this time of year. Hell it's nice all year :-)

[ [Parent](#) ]

Re: Hot Neutral? ([none / 0](#)) (#37)  
by jubalearly on Mon Nov 17th, 2003 at 10:27:34 AM MST  
([User Info](#))

350 meters is plenty far enough to generate a voltage difference between your ground and the grounding electrode conductor (neutral). Also, any imbalance between the 3 phases (unequal loads) causes a current to flow on the neutral which will generate a voltage. In the USA the neutral would be connected to ground in the main panel. I suggest you consult the local code authority (if there is one) or at least talk to an engineer at the power company before you do anything, but it sure sounds like you need the ground and neutral connected at the house. Without it, you will certainly have a voltage difference. It's better if you don't ground the neutral thru your body.

Re: Hot Neutral? ([none / 0](#)) (#43)  
by storrence on Mon Nov 17th, 2003 at 12:49:47 PM MST  
([User Info](#))

Interesting what you say about the balancing of the 3 phases. I was concerned about this when I laid out the circuit board but not for this reason. I was wanting to equal use each of the 3 lines since I knew my distance was a factor. On the positive side we are the only house after the transformer where it drops from what I guess is 7.5kV when we had some welding done on our house recently they commented at how strong the 3 phases were. They were using a 3 phase welder. The problem was it seemed impossible to equal share the load. I was mainly looking at the computers because I have 5 or 6 always on + the dryer, hot water tank, clothes washer and a circuit of outdoor flood lights. But the way the box is laid out has the 3 phases going down the center on copper bars that have pins at each point alternating 1 2 3 1 2 3 on each side of the board. And since the bipole breakers could only be on 12 23 or 31 I just put them the best I could and I don't notice any problems with lights dimming when heavy loads come on. When I just put a test meter on an open plug, I read 127.7V. I've never done readings from the box or our box. I blew my last 10A fuse and need to find another. I don't remember why it blew last time but what is the correct way to test V at the circuit breaker? Don't I need to have some load on? Do I put the jumpers right on one of the phases and neutral?

Here the electrician said it was no problem to connect the

neutral and ground bars together. He said many boxes come with only one bar used for neutral and ground. Is it important the size of the wire I use to connect the ground and neutral bar together? Will a 10AWG or 4mm<sup>2</sup> do it since it's such a short distance?

[ [Parent](#) ]

Re: Hot Neutral? ([none / 0](#)) ([#38](#))  
by jubalearly on Mon Nov 17th, 2003 at 10:35:47 AM MST  
([User Info](#))

I don't know about your water heater, it may cause a load imbalance on your 3 phases. But just the 350 meter run could be your problem. Figure the voltage drop on your wire for that 350 meters. Measure your current in the neutral and find the worst case (whichever appliances on gives you the most neutral current). Figure your voltage drop with that current, round trip, since your neutral to ground connection is a total of 360 meters x 2. You should see that voltage between neutral and ground at the meter (or where ever the ground actually is). The voltage diffence at your house is 1/2 the voltage drop you just figured, and it can easily be enough to shock you

Re: Hot Neutral? ([none / 0](#)) ([#41](#))  
by storrence on Mon Nov 17th, 2003 at 12:38:59 PM MST  
([User Info](#))

I'm not sure I understand how to do this. I don't have much experience with this but have a multimeter. Can you be more specific in how to do these tests? I'm very interested to get these figures to see if we have a potentially dangerous situation here. I'm sure if I asked someone to do this here in Brazil they would give me a puzzled look. I remember them being very impressed with my meter. Not because it was fancy or anything but because they didn't have one! I'm not saying this is true for all places around here but I'm in a rural area so it's worse. I'm learning a lot here though!

[ [Parent](#) ]

Re: Hot Neutral? ([none / 0](#)) ([#47](#))  
by brock ([nevermab at uwgb dot edu](#)) on Mon Nov 17th, 2003 at 01:29:18 PM MST  
([User Info](#))

Again, the more you explain what is going on the more I think it is the element. I would be willing to bet if you pulled it out you would see a worn spot somewhere in the casing.

And to answer your question, the power never touches the water. Think of it like a burner on a stove. You can touch it and not get a shock because it is electrically insulated from the outside part, same situation with a water heater element. Again my guess is some of the insulation has deteriorated away.

Yet you still have a grounding problem that lead you to find this problem in the first place. You need to check where ever the main ground lug is inside and OUTSIDE the home and power box and make sure it is good. Even with the bad water heater element it should have gone out to ground, and tripped the breaker and not through the rest of the grounds in the house.

[ [Parent](#) ]

Re: Hot Neutral? ([none / 0](#)) (#48)  
by storrence on Mon Nov 17th, 2003 at  
03:54:41 PM MST  
([User Info](#))

Thanks. I'm considering connecting the neutral to ground inside the circuit box and checking to see if the ground rod is ok. I put it in myself and basically just drove the 2 meter copper rod into the earth. The earth here is fairly organic. Type of soil that is good for growing. I'm going to pull the element tomorrow.

[ [Parent](#) ]

Re: Hot Neutral? ([none / 0](#)) (#55)  
by monte350c on Tue Nov 18th, 2003 at  
08:20:36 PM MST  
([User Info](#))

Hi again,

If you're disconnecting everything on this hot water tank - I'll go back to the thermostat issue again!

If you're getting readings between either of the thermostat connectors and the case, this very well could be the source of the problems. ie. if you check resistance between each terminal on the 'stat and the case, there should be no conductance at all. If you're showing 4 ohms or whatever it means there's a problem.

220 single phase that's being derived from two 127 volt hots is using two hots for power. That means neither of them can touch anything or there's going to be

problems.

I don't really know for sure but if the 'stat was a U.S. model that was expecting one of the leads to be attached to a neutral/ground that could explain it.

If you DO get a conductance reading between either of the 'stat terminals and its case, you should go shopping for a new thermostat - AND take your ohm meter with you! Check the new ones in the stores and only buy one if it's electrically isolated from its case!

Best of luck - BTW that looks like a really cool spot you have there - I'm envious!

Ted.

[ [Parent](#) ]

[Hot Neutral?](#) | 56 comments (56 topical, 0 editorial)

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## [White LED experiment - failed](#)

By [J Steele](#), Section [Weird Science](#)

Posted on Fri Nov 14th, 2003 at 09:47:31 AM MST [Electronics](#)

**experiment to produce more light didn't work out**

Hello All,  
I've been experimenting with white LED's for use as off-grid home lighting. I wanted to experiment with this idea, If a LED can handle 30 milli-amps of continuous current then could it handle pulses of 60 mA if I gave it time to cool off between pulses and would it be any brighter. I attempted all sorts of pulse lengths and duty cycles and found that the LED was happy as long as the average current did not exceed 30 mA. The failed part of the experiment was that none of the pulsed versions were any brighter than the continuous set up. Oh well, now I know.

If you are wishing to use white LEDs for home lighting consider adding one red and one yellow LED for every 8 white ones. This gives a much more pleasant light.  
Have a good day  
John

[White LED experiment - failed](#) | 7 comments (7 topical, 0 editorial)

Re: White LED experiment - failed ([none / 0](#)) (#1)  
by [Bach On](#) on Fri Nov 14th, 2003 at 03:24:05 PM MST  
([User Info](#)) [change AT: bach\\_on AT hotmail.com](#)

J,

I also experiemented with LEDs for indoor back-up lights. The prospect of light with a very low power drain sounded good. I bought a hundred that were billed as WHITE from a guy on e-Bay for just over a buck each.

To be fair, they do put out light. But it is very directional and focused in a very tight area. It was a very cold blue color, not what I would call white. Running it at anything above 35mA only made the color worse. I also tried to experiment with mixing yellows and reds. But the tightly focused area made it difficult to blend the various colors into something that had a warmer feel to it.

I've read that some of the more recent white LEDs are better, but I'm still not convinced. I shifted my focus (pun unintended) over to low voltage fluorescents. It's not as light a battery drain, but a much better quality light output. And it is still better than incandescents.

My conclusion is that LEDs may work for lighting a very small area, but not for general room lighting.

Bach On

- I'm just as happy as if I had good sense! -

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Re: White LED experiment - failed ([none / 0](#))

([#2](#))

by Chagrin on Fri Nov 14th, 2003 at 04:19:02 PM MST

([User Info](#))

Be sure to check out the "LED Museum" (google for it). The site has excellent pictorials of the color and radiation pattern of various LEDs.

[ [Parent](#) ]

Re: White LED experiment - failed ([none / 0](#))

([#3](#))

by kww on Fri Nov 14th, 2003 at 08:04:36 PM MST

([User Info](#))

Did you try putting lots of mostly white and a few yellow and red LED's bunched up together and behind one of those cloudy white light difussers? Just curious.

Kevin

[ [Parent](#) ]

Re: White LED experiment - failed ([none / 0](#)) ([#4](#))

by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Fri Nov 14th, 2003 at 09:20:38 PM MST

([User Info](#))

<http://timmythy.home.mindspring.com/timmy.htm>

At one time I was very interested in making LED lighting because I thought LEDs were more efficient than any other light. After searching and reading I found that LEDs are just more reliable, and in terms of efficiency are rated between Incandescent and Fluorescent. Fluorescents are currently the cost/efficiency leader. Plus they have better color light.

}=- W o o f -= {

Re: White LED experiment - failed ([none / 0](#))

([#6](#))

by Wolfie1 on Mon Nov 17th, 2003 at 07:20:21 AM MST

([User Info](#))

The orange, sodium street lights are probably the most efficient lighting available. With their orange color and slow warm-up time, you won't be finding them as an accepted replacement any time soon.

As some kind of backup lighting or outside, "non-white required" light, they may hold some promise.

Martin.

[ [Parent](#) ]

Re: White LED experiment - failed ([none / 0](#)) (#5)  
by kurt on Fri Nov 14th, 2003 at 11:23:15 PM MST  
([User Info](#))

But it is very directional and focused in a very tight area.

they are made both ways with a focused beam usually 20° or multidirectional like a regular lightbulb just have to order the right ones



Re: White LED experiment - failed ([none / 0](#)) (#7)  
by charged on Wed Nov 26th, 2003 at 07:43:18 AM MST  
([User Info](#))

White LED's are best applied to small work-light applications where you need to look at things up close. I have one on the electronics bench on a gooseneck holder.

I like them for "guide" lights in the hallways and such too. Since, individually, they consume almost no power, you can mark all your "emergency" items or storage areas in case the power goes out.

That way, you won't really NEED a flashlight to walk through your house and find something like, say, a fire extinguisher, in the dark.

Each marker is just a small rechargeable battery and one LED. If you want to get fancy, run a single length of speaker wire from room to room and connect each battery

to them with a single diode to allow charging from the wire.

At the source, make yourself a small capacitive discharge charger that dumps the capacitor charge across that wire. NiMh and NiCad batteries seem to like type of charging. Make sure you use all the same type, whichever you choose. Stick with something like 150uf and let it rise to about 5v above battery voltage before each pulse.

To battery at lowest voltage will get most of the charge on any given pulse. Just measure the capacitor voltage after any pulse to show the battery charge level for the whole group.

[White LED experiment - failed](#) | 7 comments (7 topical, 0 editorial)

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## [Trace Sw4048 Inverter Trouble can anyone help?](#)

By [NeedHelp03](#), Section [Homebrewed Electricity](#) [Electronics](#)

Posted on Fri Nov 7th, 2003 at 09:28:47 AM MST

Trace Sw4048 Inverter troubles

I have a SW4048 Trace Inverter that is out of Warranty, sadly being so expensive it was purchased 3 years ago and never used, until now. It worked great for 2 months. We had some strong winds. I think what happened was the voltage was to high or something, maybe the dump load didn't work, anyway the inverter is configured to put 120V out, the inverter is only pushing 99Volts out, therefore not synching to the grid, or inverting properly. I called Trace they told me I have to take it in, I really don't want to spend more big \$\$\$, it has to be something simple, since the inverter hums, it just won't synch, invert at 120V, or battery charge, because the voltage is only 99 volts instead of 120. Can anyone help? Any ideas, suggestions? Thanks in advance. Battery Volts are 52 Volts presently. One Thing I noticed is if the Inverter Battery volts rise to 55Volts the inverter will push 103Volts.

[Trace Sw4048 Inverter Trouble can anyone help?](#) | 10 comments  
(10 topical, 0 editorial)

Re: Trace Sw4048 Inverter Trouble can anyone help? ([none / 0](#)) ([#1](#))  
by [RobD](#) on Fri Nov 7th, 2003 at 10:18:28 AM MST  
([User Info](#))

I think the Trace SW's work by using several transformers that combine to make the sine wave. You could have one transformer bad and the unit would work about the way you say. It could have the Mosfets out to that transformer and it would act similarly.  
Just my thoughts on it.  
RobD

Re: Trace Sw4048 Inverter Trouble can anyone help? ([none / 0](#)) ([#2](#))  
by [NeedHelp03](#) on Fri Nov 7th, 2003 at 10:59:18 AM MST  
([User Info](#))

Thanks Rob, That makes sense, in other words if this is the case, it could get costly. Thanks again for your response.

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Re: Trace Sw4048 Inverter Trouble can anyone help? ([none / 0](#)) ([#3](#))  
by gps on Fri Nov 7th, 2003 at 12:19:42 PM MST  
([User Info](#))

We had a 4048 smoke FET board for no apparent reason several years ago a little beyond the warranty. Trace replaced it for free but because they had recently revised the design.

The description above of how it works is accurate but that's as deep as I understand it myself. Its a good product but it is complex. Its probably not a transformer but possible. Its probably a FET, especially if there's any chance the lightning got in and let the smoke out (arrestors on the AC and DC sides are a really good idea). Some chance there's something wrong upstream but my money's on the transistors.

Good luck.

Re: Trace Sw4048 Inverter Trouble can anyone help? ([none / 0](#)) ([#4](#))  
by NeedHelp03 on Fri Nov 7th, 2003 at 01:54:24 PM MST  
([User Info](#))

I did a volt meter test, no fluke meter, just a cheam dvm, and on the output of the 120V I get 181Volts, The inverter registers 99Volts on the menu, when transistors smoke, do they leave a black circle, or burned smell? I don't see any evidence of burned circuitry, or any odd smells. But it very well could be a transistor, I'll probably end taking it in for service in about 2 weeks.

Also can anyone show me a url where I can get some ac and dc lightning arrestors?

[ [Parent](#) ]

Re: Trace Sw4048 Inverter Trouble can anyone help? ([none / 0](#)) ([#5](#))  
by RobD on Fri Nov 7th, 2003 at 03:55:20 PM MST  
([User Info](#))

Finding a blown FET can be a problem because you are working with low transformer resistances. You almost have to remove the xistor to check it even with a Fluke. you can take a shot and check across the coils to see if one is less than the rest or open but after this it starts to get technical so you might want to send it in especially if Trace has an update on the board.  
RobD

[ [Parent](#) ]



Re: Trace Sw4048 Inverter Trouble  
can anyone help? ([none / 0](#)) (#6)  
by drdongle on Fri Nov 7th, 2003 at  
08:50:41 PM MST  
([User Info](#))

As a general rule when a fet goes it blows  
open not shorted.

Dr.D

[ [Parent](#) ]

Re: Trace Sw4048 Inverter  
Trouble can anyone help? ([none  
/ 0](#)) (#7)  
by RobD on Sat Nov 8th, 2003 at  
10:11:01 AM MST  
([User Info](#))

Hi DrD,  
Are we saying the same thing?  
The open FETs are masked by the  
low transformer resistance.  
RobD

[ [Parent](#) ]

Re: Trace Sw4048  
Inverter Trouble can  
anyone help? ([none / 0](#))  
(#8)  
by drdongle on Sun Nov 9th,  
2003 at 09:02:42 AM MST  
([User Info](#))

Testing components in  
circuits like this ( and in audio  
amps, which are similar) can  
be tedious and frustrating,  
often you need to remove all  
the output transistors so as  
to facilitate accurate testing  
and to avoid interaction  
between the various  
components in the circuit, so  
I guess I'm saying "yes".

I have a gadget I built when  
I was in the Navy that when  
used with an O-scope is great  
for testing solid state  
components. We called it an  
"octopus" ( I'm not sure of the  
origins of it's name, except  
that it probably had a bunch  
of wires coming out of it).  
Any way it gives a visual  
display of the junctions in any  
solid state devices on the

screen and allows you to quickly determine there quality.  
If any one is interested I'll (try to) post the circuit.

Dr.D

[ [Parent](#) ]

Re: Trace Sw4048 Inverter Trouble can anyone help? ([none / 0](#)) ([#9](#))  
by VermontMaple on Tue Nov 25th, 2003 at 05:49:15 PM MST  
([User Info](#))

I have had similar experiences where I work. We employ Trace SW4048 type invertors for Remote radio Transmitter site power controllers . You know charge and maintain the batteries -start and exercise the generators and be the psuedo UPS. I have on more than one occasion thought we have blown the outputs on the unit, We removed and replaced the unit with a brand new one . Once the bad unit was repowered up on the test bench in reset itself and worked fine once again... the next two times we only removed the battery leads and all power leads to the unit for a few Minutes (not seconds). Reapplied the batteries and power and like magic it somehow lost some internal bias and started functioning normally again.  
This may nor be your problem ...but what could it hurt.  
If it does help I would guess your Fets are bad on the output. If you change them- do it in pairs..if one is bad it's partner will be badly wounded too.

Good Luck

Re: Trace Sw4048 Inverter Trouble can anyone help? ([none / 0](#)) ([#10](#))  
by VermontMaple on Wed Nov 26th, 2003 at 06:51:59 AM MST  
([User Info](#))

I meant to say "if this doesn't help", you probably have bad output FETS - they should be changes in pairs.

[ [Parent](#) ]

[Trace Sw4048 Inverter Trouble can anyone help?](#) | 10 comments  
(10 topical, 0 editorial)

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## [ceilingfans to windmill....?](#)

By [1 Roach](#), Section [Homebrewed Electricity](#)  
Posted on Thu Nov 6th, 2003 at 09:23:03 PM MST [Electronics](#)  
anyone made a windmill from a ceilingfan, can it be done.  
?

[ceilingfans to windmill....?](#) | 3 comments (3 topical, 0 editorial)

Re: ceilingfans to windmill....? ([none / 0](#)) (#1)  
by [dburt](#) on Fri Nov 7th, 2003 at 05:46:59 AM MST  
([User Info](#))

I tried this, machined the rotating part out to fit in some magnets, and bolted on blades. The frustrating part was that the original coils were of really tiny wire, varnished so it was near impossible to change the way the coils were connected (they were all in series to begin with). At any rate, I found that the thing clogged pretty bad, takes a stiff breeze to get it spinning. I decided that my time would be better spent building a dual rotor axial machine similar to DanB's.

Dave

Re: ceilingfans to windmill....? ([none / 0](#)) (#2)  
by [1 Roach](#) on Fri Nov 7th, 2003 at 04:13:47 PM MST  
([User Info](#))

thank's for the info.on the fan...i'm still looking to do something.maybe ( an alt} back to the board. thanks again.

Re: ceilingfans to windmill....? ([none / 0](#)) (#3)  
by [santi](#) on Sat Nov 8th, 2003 at 08:52:48 AM MST  
([User Info](#))

I rewired and add magnets to a ceilingfan, it had two phase 14 poles in a waded wound, i use 100 turns of about 0,5 mm wire, and add ceramic magnets. I have 12 v at about 120 rpm with to phase rectified and then in series, and the max. amp. i have seen is 1,5 amps, with neos sure can be more; with ceramic magnets its low cogging, but with neos can be higger; probably if you put a diferent number of magnets than poles diminish cogging.

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## [For Sale Vintage Analog High Quality Meters](#)

By [paulc](#), Section [Classifieds](#)

[Electronics](#)

Posted on Wed Nov 5th, 2003 at 07:10:00 PM MST

Daystrom Weston

Hello Folks,

I have a qty of single purpose meters forsale. These are made by Daystrom Weston, Singer, Sensitive Instruments Corp. These units are from the 1960's. Each has a leather handle and is about 4" X4" square. I use a pair of these to monitor the current and voltage into my battery pack from the solar panels. All are in excellent condition.

Email me with your requests as there are AC or DC meters, volts Amps, millivolts, milliamps of all different ranges. Most of the meters have several scale. made of almost indestructable bakelite.

I have pix of some so you can get a look at the meter.

prices

QTY

1. \$24.00 ea.
2. \$22.00 ea.
3. or more \$20.00 ea. plus shipping from 06791

Thank you

PauLC  
W1VLF

[Paulc@snet.net](mailto:Paulc@snet.net)

[For Sale Vintage Analog High Quality Meters](#) | 0 comments (0 topical, 0 editorial)

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## [switching regulator](#)

By [kell](#), Section [Homebrewed Electricity](#)  
 Posted on Mon Nov 3rd, 2003 at 09:55:42 AM MST [Electronics](#)  
 looking for circuit diagrams etc.

I have a charging situation where I need a regulator that will pass about 10 amps. The voltage drop is variable, up to about 40 volts. Tried making my own linear regulator with a bunch of 2N3055 pass transistors, because I know how to build the circuit, but have come to understand that the power dissipation is just too much. Now I would like to find info about how to build a switching regulator.

Something based on a N-Channel MOSFET would be convenient because I have some IRF540N's. But all knowledge is useful. If I could find out how to introduce hysteresis into a linear regulator I could probably work it out how to build the circuit on my own, now.

[switching regulator](#) | 5 comments (5 topical, 0 editorial)

Re: switching regulator ([none / 0](#)) ([#1](#))  
 by [N9WOS](#) on Mon Nov 3rd, 2003 at 11:53:51 AM MST  
[\(User Info\)](#)

Here is one thing that may give you an idea or so.

<http://n9wossolar.home.att.net/schem/bpwm/bpwm.html>

The best way to introduce hysteresis in the circuit or send it into a switching operation is to modify the control element or to increase the regulating element gain then increase the response time of the control system and put inductance in the circuit to produce time lag. The output voltage will always be out of phase with the Drive voltage. That will keep the current control elements in a full On, or off condition.

Switching frequency will not be controllable, but it has a lot lower loss than a linear regulator.

Re: switching regulator ([none / 0](#)) ([#2](#))  
 by [kell](#) on Wed Nov 5th, 2003 at 01:26:12 PM MST  
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Recently I came up with a better idea. I should just use an off-the-shelf automotive voltage regulator. I won't have to try to design, test and build a switching regulator from scratch. I know how hard it is. My power in this project comes from a generator, and I have a plan to regulate the output by controlling the generator's field current (electromagnets). An alternator regulator will do this, I just have to connect the field coils of the generator to the regulator's field connections. I found a schematic of the Delco SI regulator and understand how it works and have figured out how wire it with the generator I have. Here's the challenge: how do I go into an auto parts store and just ask for a voltage regulator for the 12 volt Delco SI alternator, without having an answer for their inevitable question, "What kind of car is that from?" Any suggestions?

[ [Parent](#) ]

Re: switching regulator ([none / 0](#)) ([#3](#))  
by 12volt dan ([dan12v@hotmail.com](mailto:dan12v@hotmail.com)) on Wed  
Nov 5th, 2003 at 07:11:06 PM MST  
([User Info](#))

You should be ok if the parts man knows his stuff. If not say it's a 1975 GMC pickup. There weren't to many varriations of that reg.

I use a 12 si on a 5 horse to charge my batts. Works fine for about 50 bucks. :^)  
7 years off the grid and counting  
[ [Parent](#) ]

Re: switching regulator ([none / 0](#)) ([#4](#))  
by BrianK on Thu Nov 6th, 2003 at 06:25:45  
AM MST  
([User Info](#))

Hey on the going to the parts store thing you forgot that they also need to know what size tires LOL :) just kiddin

[ [Parent](#) ]

Re: switching regulator ([none / 0](#)) ([#5](#))  
by jubalearly on Fri Nov 14th, 2003 at 09:01:05 AM MST  
([User Info](#))

Take a look at the ACE catalog for Delco 10SI alternators here:

<http://www.aceelectric.com/PDF/Altpage.htm>

Otherwise the parts place should have an electronic regulator that is a 'universal' replacement for the old mechanic regulators. But in my opinion the regulators for a starting battery don't have the proper charge characteristics for deep cycle batteries. Richard Perez had an excellent article in Homepower magazine with a circuit for a better charge controller. It's been mentioned on this site a few times or you could look for it on the Homepower site. HTH,  
-RussH

[switching regulator](#) | 5 comments (5 topical, 0 editorial)

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## PC Oscilloscope

By [ChrisW](#), Section [Homebrewed Electricity](#)

Posted on Sat Nov 1st, 2003 at 08:55:01 AM MST [Electronics](#)  
freebies!

For all the electronics wizards out there:

I was surfing the 'net for PC-based oscilloscopes and was horrified by the prices for new and even used equipment. After refining my Google search a bit, I came upon a freebie oscilloscope program that uses the PC's sound card for input. My intuition told me that it'd be great for very low voltage signals, but the risk of frying a perfectly good sound card seemed quite high when checking PMA coil voltages. After searching a bit further, I found a buffer circuit to protect the sound card. I haven't built this circuit yet, but it's on my To Do list. For anyone interested, you can download all the files I collected via this link:

<ftp://ftp.greatspiritsoftware.com/pub/misc/oscope.zip>

The zip file contains the oscilloscope program as distributed by its author, along with a text file explaining the buffer circuit and a JPEG of the schematic (long story here -- the schematic was originally in PostScript format; after downloading about 10 megs of stuff, I was finally able to convert it to JPEG format). If anyone builds and tests the buffer circuit and scope program, please post your results here. I'm in the process of moving (arrgh!) so it'll be a while before I can warm up my soldering iron!

Cheers,  
ChrisW

P.S. The board's code for handling A HREF tags is unbelievably strict!

[PC Oscilloscope](#) | 1 comment (1 topical, 0 editorial)

Re: PC Oscilloscope ([none / 0](#)) ([#1](#))  
by [Insomnian](#) on Mon Nov 3rd, 2003 at 02:40:31 PM MST  
([User Info](#))

Hi, I've used some free DSO programs, using the soundcard as the input channel. I've posted a screenshot. Here I was testing the squarewave output of a 555 timer circuit I'm planning on using in a PWM. I didn't build a buffer circuit as such. I just used a potential divider setup, to divide the signal voltage by 10. Figured I'd be safe upto 12V signal/10=1.2V It took less than a minute to build. For a higher signal voltage I'd use a higher divider. Best to check signal voltage with a DMM before calculating the required divider, and also before hooking up to the soundcard.

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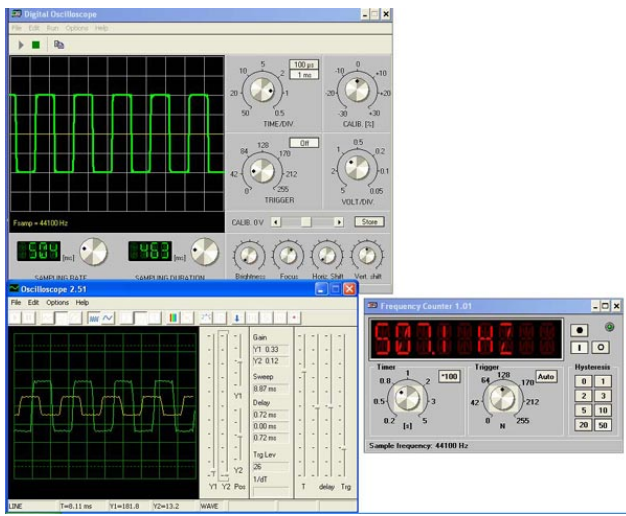
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Having Fun...

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## [Rectifier usage](#)

By [bruce1](#), Section [Homebrewed Electricity](#)  
 Posted on Thu Oct 30th, 2003 at 02:04:15 PM MST [Electronics](#)  
 Using a rectifier as a blocking diode.

Can you use a rectifier for a blocking diode? Isn't that all a rectifier is anyway, just 2 diodes in a heat sink? I have been using a rectifier off of a charging system from an old model Mercury Outboard motor, about a 70's vintage. Is is an aluminum block about 1.5 inches by 4 inches, has a mounting flange, has 3 terminals sticking out of the black potting material, 2 yellow and one red. The yellows are the AC in , the red is the 12vdc hookup. I've been using this as a diode while messing around, was wondering if I can use it for permanent? I could even split the incoming DC between the 2 yellows to spread out the amperage. The casing is not electrified, I can bolt it to the side of my battery box( metal medicine cabinet), and use that to distribute heat. I looked up some specs in an old Merc manual, it says 'gross amps output at rectifier' 12-14 amps. It doesnt tell the output of the stator. The newer ones, when you do a cranking test, you should have about 200acv with a peak reading meter. I'm telling you this so maybe you can guess how this would hold up.

I would be running 24-28vdc into the rectifier from my wind charger, amps could be anywhere between 1 and 20-50 on the top side, really not sure yet. Since it was on a 12v system, will it work with 24vdc hooked to the red terminal where there was meant to be 12vdc? I had it hooked up as 12vdc before, so there was no 24vdc there.

Any guestimates would be great, thanks everyone!

Bruce

[Rectifier usage](#) | 6 comments (6 topical, 0 editorial)

Re: Rectifier usage ([1.00 / 1](#)) (#1)  
 by [drdongle](#) on Thu Oct 30th, 2003 at 05:57:02 PM MST  
[\(User Info\)](#)

The term Rectifier denotes a diode designed for high power applications.  
 Dr.D

Re: Rectifier usage ([none / 0](#)) (#2)  
 by [wooferhound](#) ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Thu Oct 30th, 2003 at 07:48:58 PM MST  
[\(User Info\)](#)  
<http://timmythy.home.mindspring.com/timmy.htm>

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It's best to use a bridge rectifier which is really 4 diodes hooked together in a square configuration. This type of rectifier will recover power from both the positive and negative swings of the your source voltage.

Also , don't use things made for 12vdc with 24vdc feeding them.

>=- W o o f -=<

Re: Rectifier usage ([none / 0](#)) (#6)  
by 5kw on Fri Oct 31st, 2003 at 03:02:37 PM MST  
([User Info](#))

Don't forget to heatsink your bridge rectifier, those ratings only apply if device is kept below 25 deg.C  
Make the wind fun!  
Victor

[ [Parent](#) ]

Re: Rectifier usage ([none / 0](#)) (#3)  
by wpowokal on Fri Oct 31st, 2003 at 04:52:42 AM MST  
([User Info](#))

Sounds a little like you have a seliem (I think thats how its spelt) rectifier.

As others have advised simply buy a bridge rectifier of sufficient voltage and current, cheep and effective.

regards Allan

Re: Rectifier usage ([none / 0](#)) (#4)  
by laskey on Fri Oct 31st, 2003 at 01:38:00 PM MST  
([User Info](#))

If you've really got AC coming in from the gen you want a bridge rectifier rated for your maximum voltage and maximum current, any thing else and you run the risk of burning it out. Remember, a bridge rectifier has didoes pointing both directions for each half of the AC cycle, so using one in a DC application is the electrical equivalent of using nothing at all.

If you've really got DC coming from the gen then you'll only need a single rectifier, and the same voltage and current rules apply.

Cya,  
Chris

[ [Parent](#) ]

Re: Rectifier usage ([none / 0](#)) ([#5](#))  
by jubalearly on Fri Oct 31st, 2003 at 01:54:53 PM  
MST  
([User Info](#))

That's Selenium - it's an element. Where is the 12vdc negative if it isn't the case? You won't get much current thru this until you have a complete circuit.

[ [Parent](#) ]

[Rectifier usage](#) | 6 comments (6 topical, 0 editorial)

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## [Choosing a DC motor from Surplus Center](#)

By [Arletta](#), Section [Homebrewed Electricity](#)

Posted on Sun Oct 26th, 2003 at 07:49:46 PM MST

[Electronics](#)

Help help help help...

Hi Everyone, I'm back again. I finally recieved a Surplus Center catalog and in it I'm trying to find the ideal motor/generator for my little wind turbine. I've never dealt with the company before but I've seen them mentioned on this board so I assume they're ok. All the PM alternators I've looked at are simply way too expensive. For \$2,000 I could just buy a complete system.

I'm looking, in my ignorant way, at the DC motors on pp.131-133 of the catalog. All the ones I'm considering are permanent magnet, reversibile of course. I'm shooting for reasonably cheap, maximum efficiency, and the most minimal maintenance possible. The motors vary annoyingly in what information is given about them, so I'll start with this confusion:

1. Only one of the motor descriptions mentions brushes. If the description doesn't actually say brushless, do I assume that the motor has brushes? I'd really prefer brushless, of course, but maybe I'm being too picky. Are brushes a big enough pain as far as expense, maintenance, replacement, or anything to the point that I would be wise to just completely avoid them?
2. Must a motor be 12 volts or a multiple thereof to work for battery charging? In other words, a variable speed motor (0-6750 RPM) rated 95-130 VDC would not work for charging a 12 volt battery even at very very low RPMs?? It is incapable of producing voltages lower than 95? I see that the motor they recommend for "experiments with wind, water power, etc" says 10,000 RPM, 120 volts-- which would suggest to me that voltage output varies with speed and therefore if one were working only in a low range of RPMs the voltage would correspondingly be lower than rated. I do plan to get a charge controller...
3. Speaking of RPM, if my turbine works like it should, it will be turning only at very low to moderate wind speeds due to the design of the vanes which utilizes air pressure instead of air speed. Therefore I'm looking at motors that have very low RPM ratings. If a motor is 12 volts and 3600 RPM, does this mean that it will not produce even a trickle charge at, for example, 40 RPMs? It must reach 3600 RPMs to produce any charge, or it must reach 3600 RPMs to produce 12 volts? I guess this is pretty much the same question as above...trying to figure out if I need to base my motor choice on voltage, RPMs, or both.
4. For people who have built a vertical axis turbine, how did you attatch your vanes to the central axle so they didn't flap around, and how did you attatch that axle to the motor's shaft? None of the shafts on the motors I'm looking at have keyways...a few are threaded. I've got PVC pipe for my axle and I can't figure out how I'm going to fasten it securely to the motor.
5. Most of the motors are open, or unsealed. Is it fairly easy to build a little shelter for them for

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protection from the elements?

6. I'm still a bit foggy on how HP enters into the whole thing. One of the motors is 1.5 to 2.5 HP, one is 0.2 HP, and several don't have the HP listed. What should I know about this, or does it even matter for generator use?
7. Are sleeve bearings liable to wear out more rapidly than ball bearings, and can they be replaced cheaply and easily? Should I avoid them?
8. Must dual shaft motors be driven from both shafts, or can one be used and the other ignored?
9. Does a high torque rating mean that it's going to take more effort to start the shaft turning than a lower torque rating?

OK, that's all for now. Thank you for your wisdom on this...truly couldn't do it without you guys. :D

[Choosing a DC motor from Surplus Center](#) | 2 comments (2 topical, 0 editorial)

Re: Choosing a DC motor from Surplus Center ([none / 0](#)) ([#1](#))  
by Norm on Mon Oct 27th, 2003 at 06:59:29 AM MST  
([User Info](#))

Okay I don't know that much about it, have yet to test it for rpm to get a charging voltage of about 13-14 volts load. I have a Leeson 1hp. 10 amp. 1800RPM 110volt.DC. motor. Someone else with a 2HP Leeson motor rated at 3600RPM (I think) has suggested that 600rpm would be sufficient to reach charging voltage...Mine a little less, I guess the lower the rpm rating ... (the better?) Hope this helps in some small way. Don't start out too big on this. A bargain for some may not be a bargain for you. Mileage may vary....have fun! (:>) Norm.

Re: Choosing a DC motor from Surplus Center ([none / 0](#)) ([#2](#))  
by Scott on Mon Oct 27th, 2003 at 05:28:00 PM MST  
([User Info](#))

I'm new but I'll give it a shot

1. I wouldn't worry about the brushes in a tape drive motor. I heard they last awhile and it's a good way to get your feet wet.
2. No, but it won't start charging until it hits 12V so it should be rated over 12V.
3. I suspect you may have trouble getting a tape drive or similar motor up to cut in speed with a VAWT. Although I've read hear of using capacitors to charge at low rpm's and volts, could be a possibility. I'm using a 40V Ametek tape drive motor like the one in the link below and it likes to spin fast. I'm getting close to 10 amps in a good wind with 2 jerry blades.

<http://www.surpluscenter.com/item.asp?UID=2003051913523979&item=10-1563&catname=electric>

4. don't know
5. Tape drive motors seam pretty well sealed.
6. I suppose as hp increases so does the physical size of the motor as well as it's power generating potential.
7. I would think so.
8. No, yes
9. Not sure,

I have no experience with VAWT and only a little with HAWT but to me the tape drive motor was a great way to get my feet wet and I learned quite a bit. The biggest thing I learned is how important tower height and location is.

Scott

[ [Parent](#) ]

[Choosing a DC motor from Surplus Center](#) | 2 comments (2 topical, 0 editorial)

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[watt/hour meter ?](#)

By [44toy](#), Section [Homebrewed Electricity](#)  
Posted on Wed Oct 22nd, 2003 at 04:19:52 PM MST [Electronics](#)  
constructing a watt hour meter.

Want to test the output of my experiments with a meter that would tell me at least how many watts or any other measure the generators put out in a days time. With hydro I can pretty well figure but wind is not constant, and will be trying wind power. Have been looking at used watt/hour meters from electric company but not sure since mine is a 12volt system and they are for 120 ac

If you have made one or know any tricks to collect info beside setting there for a few days with a volt meter let me know. Sorry for beeing dumb and-----thanks in advance.

[watt/hour meter ?](#) | 1 comment (1 topical, 0 editorial)

Re: watt/hour meter ? ([none / 0](#)) (#1)  
by TomW on Thu Oct 23rd, 2003 at 05:55:32 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

44toy;

I have been logging solar data with an RS232 meter and a computer.

JImU is doing the same. He wrote the perl scripts to interpret the data. I think he is about to go live with it.



This just graphs battery voltage but in and out current is being added at some point in the near future. It runs on a grid connected full size PC now but hopefully this weekend it will maybe get transfered to a laptop running off the batteries.

Being the R&D graph there are gaps and inconsistencies.

This setup will work on ac or dc and volts or amps . I got the meter for around \$20 on ebay I have the PC anyway, all the software is free which runs on Linux which is also free. Using perl you can combine multiple data samples to calculate watts and the graphs make a nice visual so you can see whats going on at a glance.

Cheers.

TomW

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[new with ?s](#)

By [44toy](#), Section [Magnets & Magnetism](#)  
 Posted on Fri Oct 17th, 2003 at 03:37:00 PM MST [Electronics](#)  
**Converting ac amp draws to dc amps**

O.k. I am trying to get my first system going, and no body around here can tell me if I am figuring my load correctly.

Lets say these are the specs on an item. .72 amps (read with amp clamp,) 120 volts ac (read with my meter.)

I was using the following formula-

$$\frac{P}{I \times V} = \frac{A \times v}{.72 \times 120} = 86.4 \text{ watts}$$

$$\frac{P}{V} = A \quad \frac{86.4 \text{ W}}{12 \text{ v}}$$

dc = 7.2 amps dc

I am using The total of the (basic items) dc amp loads + a 50% cushion for additions etc, to figure the amps my hydro powered generator will need to put out.

This may be confussing the electronic teachers at my college look at me funny and will not stand firm. My questions are--

1. Will this work to figure the amount of power I will need? I know I could simplify the process and any better conversion formulas would be nice
2. Will there be any drop other than the loss to the inverter? the main thing I am unsure of is using the formula to convert from dc to ac.
3. If you guys look at this and just have a funny look on your face, You can get the idea of what I am trying to figure and please HELP.

[new with ?s](#) | 3 comments (3 topical, 0 editorial)

Re: new with ?s ([none / 0](#)) ([#1](#))  
 by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Fri Oct 17th, 2003 at 03:50:38 PM MST  
[\(User Info\)](#)  
<http://timmythy.home.mindspring.com/timmy.htm>

when converting amps between 120v and 12v, I just multiply by 10

1 amp at 120v will be 10 amps at 12v

or using your formula  
 .72 X 120= 86.4 watts  
 7.2 X 12v= 86.4 watts

. >-- W o o f --<

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Re: new with ?s ([none / 0](#)) (#2)  
by 44toy on Fri Oct 17th, 2003 at 04:00:15 PM MST  
([User Info](#))

Thanks for the reply, I posted this here by accident and then in homebrewed electricity also, please repond there. I cant figure how to delete this post.

Re: new with ?s ([none / 0](#)) (#3)  
by drdongle on Mon Oct 20th, 2003 at 03:00:55 PM MST  
([User Info](#))

Don't forget to account for loss of energy when converting from 120 V to 12 V, in other words you wont get the 7.2 amps that the formula leads you to expect, probably more like 5 amps.

Dr.D

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## [electrical switch](#)

By [Homebrewed12vdc](#), Section [Remote Living](#)  
Posted on Wed Oct 15th, 2003 at 03:03:08 PM MST [Electronics](#)  
forced hot air furnace

I have a good ? for those electrically inclined ones, I have a nice big wood furnace with a blower on it, the heat activated switch that turns the blower on, is there any way I can run 12v dc through this switch to turn on a 12v dc motor on that I bolted to the squirrel cage fan. Thanks in advance for your help. From Mike

[electrical switch](#) | 6 comments (6 topical, 0 editorial)

Re: electrical switch ([none / 0](#)) (#1)  
by 12volt dan ([dan12v@hotmail.com](mailto:dan12v@hotmail.com)) on Wed Oct 15th, 2003 at 04:34:42 PM MST  
([User Info](#))

Honywell makes a machanical fan swich (or they used to) that should work fine.

One drawback though is that it has a rather long stinger. There's probably smaller more better suited swiches out there  
7 years off the grid and counting

Re: electrical switch ([none / 0](#)) (#2)  
by jubalearly on Thu Oct 16th, 2003 at 08:24:18 AM MST  
([User Info](#))

You can probably find a 12v switch in the Grainger catalog (they have a web site). If not, I'd use a 12vdc relay, 120vac activated (or whatever it is now). Most furnaces (actually the controls) have several voltages that can be used. But this approach means you have to continue to supply 120vac or whatever the current control voltage is. Note that RV and marine applications often require 12vdc (optional 24vdc?) ONLY - you might try West Marine or search under RV heaters.

The switch is basically a relay activated by a thermocouple, usually also controlled by a 12vdc, 24vac(or dc), or 120vac thermostat. You probably will have a hard time figuring out which of the dozens of models you can find will fit.

Re: electrical switch ([none / 0](#)) (#3)  
by RobD on Fri Oct 17th, 2003 at 01:38:07 PM MST  
([User Info](#))

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Ok, Mike, I just want to make sure I understand your problem. You want to turn on a 12 Volt blower motor when the temperature is at a certain level. Is the correct? Do you have anything else in the circuit?

RobD

Re: electrical switch ([none / 0](#)) (#4)  
by Homebrewed12vdc on Fri Oct 17th, 2003 at 02:50:53 PM MST  
([User Info](#))

Yes that is correct, I put a 12v dc motor on the squirrel cage, and I want to set it up so when the wood furnace comes up to a certain temp, the motor comes on, and when the temp drops to a certain point the motor is shut off. Basically just looking for a heat activated switch that well handle 12vdc at about 4 amps.

[ [Parent](#) ]

Re: electrical switch ([none / 0](#)) (#5)  
by RobD on Fri Oct 17th, 2003 at 03:48:14 PM MST  
([User Info](#))

The best way to do this is with an LM339 comparator and a MOSFET. The mosfet takes the place of a relay so you have no mechanicals to break down. I have a similar circuit around here somewhere. Can you build your own board? If you can I'll try to dig it up and get it too you. How many amps is the motor?

RobD

[ [Parent](#) ]

Re: electrical switch ([none / 0](#)) (#6)  
by Homebrewed12vdc on Fri Oct 17th, 2003 at 04:13:38 PM MST  
([User Info](#))

The motor is 4 amps @ 12v dc, thanks for the help, I want to get this going its getting cold up here, and already has snowed twice.

[ [Parent](#) ]

[electrical switch](#) | 6 comments (6 topical, 0 editorial)

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### [more than 3 phases?](#)

By [Budgreen](#), Section [Homebrewed Electricity](#)  
Posted on Wed Oct 15th, 2003 at 08:14:13 AM MST [Electronics](#)  
what if I...

just out of curiosity, has anyone here ever experimented with multiple phases (more than 3) in a stator? I would imagine that having say 6 phases could boost voltges higher for better power outputs and smother waveorms for filtering, possibly better efficiency. or even 2 3phase outputs to charge multiple banks of batteries. if anyone could point out some information or experience along these lines it would be much appreciated

Josh

[more than 3 phases?](#) | 4 comments (4 topical, 0 editorial)

Re: more than 3 phases? ([none / 0](#)) (#1)  
by [DanB](#) on Wed Oct 15th, 2003 at 08:31:58 AM MST  
([User Info](#))

Hughs plans are for a 5 phase alternator.

The only thing that worries me a bit about more than 3 phases, is that youll have more rectifiers, and theyll need tto be up on the windmill unless you want to run lots of wires down. 3 phase can come down on 3 wires.

The advantage to having rectifiers on the tower is that theyll cool better, and DC will cover distance with slightly lower losses than AC.

The disadvantage is that... if they burn out, youll have to drop the tower! And... if you want to have a brake switch, youll have to also have a blocking diode (no big deal), and if you throw the brake switch, youd want to be sure the machine was turning slowly when you did or else I think you'd run the risk of blowing the rectifiers (just guessing).

But - basicly, if you don't mind having rectifiers on top of the tower - the more phases the better! Although I think the advantages gained with more phases than 3 would be very small....

Re: more than 3 phases? ([none / 0](#)) (#2)  
by [bewotec](#) on Thu Oct 16th, 2003 at 02:45:12 AM MST  
([User Info](#))

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other disadvantage is that a star/delta switch cannot be used or only with more relays.

if you compare the sinewaves for 3 phase and 5 phase, you can see the voltage gain. i dont think it is more that 5%, because the sinewave on the top half is quite low.

viktor

Re: more than 3 phases? ([none / 0](#)) ([#3](#))  
by troy on Sat Oct 18th, 2003 at 11:14:54 AM MST  
([User Info](#))

Plus, keep in mind that every rectifier drops the voltage. Lots of rectifiers means lots of voltage loss, so eventually, more phases leads to less efficiency.

Best regards,

troy

[ [Parent](#) ]

Re: more than 3 phases? ([none / 0](#)) ([#4](#))  
by Jerry on Sat Oct 18th, 2003 at 08:36:26 PM MST  
([User Info](#))  
<http://www.dplusv.com/Photo-03.html>

Hi Troy, I think there would be a voltage lose if the diodes were in siriess but the are in some what of a perelell configuration. The only diferance is the peak voltage of each phase arives at a slightly diferant time. So there is only voltage lose equal to that of one phase or diode bridge no matter how many phases you have. This is my take on it anyway. Lets try it this way. Lets say phse 1 through its diode bridge has 1/2 volt drop and its producing 10 volts and phase 2 has a 1/2 volt drop when you perelell these 2 phases the voltage won't be 9 it will still be 10 and the same when phase 3 is added. I can see the volage drop idea in star but not in delta. Someone steer me straight if I'm all wet here. JK TAS Jerry

[Airheads Page](#)

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### [Small power meter](#)

By [wdyasq](#), Section [Homebrewed Electricity](#)  
Posted on Sun Oct 12th, 2003 at 06:58:24 PM MST  
Kill A WATT meter

[Electronics](#)

Looks like a good tool for determining powere requirements:

<http://www.p3international.com/products/special/P4400/P4400-CE.html>

[Small power meter](#) | 3 comments (3 topical, 0 editorial)

Re: Small power meter ([none / 0](#)) (#1)  
by Seth on Mon Oct 13th, 2003 at 10:23:03 AM MST  
([User Info](#))

Yes it is.. im using one right now... wanted to see the power draw of my puter...

And i was suprised... it only draws 110W, 140W When burning a cd... was lower than what i exspected.... 117W under full cpu load running S.E.T.I. at home....

Re: Small power meter ([none / 0](#)) (#2)  
by RobD on Tue Oct 14th, 2003 at 05:29:58 PM MST  
([User Info](#))

I didn't see a price. Is this a supplier or an outlet?  
tnx,  
RobD

Re: Small power meter ([none / 0](#)) (#3)  
by Adrian L on Wed Oct 15th, 2003 at 07:30:46 AM MST  
([User Info](#))

I believe these great little units are \$40ish dollars, commonly advertised in HomePower magazine adverts. They also reviewed the unit and loved it.

If only they made one of those that cheap down here in Australia...cheapest you will find here is like \$130US!

Cheers,  
Adrian L

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## [Full wave rectifier](#)

By [Norm](#), Section [Homebrewed Electricity](#)

Posted on Wed Sep 24th, 2003 at 08:56:04 PM MST [Electronics](#)

I stopped in at RadioShack today...just browsing

and was surprised to see a full wave rectifier specifications said 50volts 25 amp for \$2.99, really? Would this little gadget be able to handle over a 1000 watts? It looked like it had an aluminum heat sink about the size of a postage stamp and about 1/4 inch thick. Would this be big enough to charge a 12 volt battery at about 10 or 15 amps? Well anyway just havin fun ...finally had a good wind here this afternoon the kind that slams shed doors back and forth!(Just gotta finish building that anemometer with the bike speedometer so I know what kinda wind that is!) (:>) Norm.

[Full wave rectifier](#) | 3 comments (3 topical, 0 editorial)

Re: Full wave rectifier ([none / 0](#)) ([#1](#))  
by jubalearly on Thu Sep 25th, 2003 at 07:51:44 AM MST  
([User Info](#))

I have bought several of those from various surplus electronics places over the past several years. The RS price isn't bad. You should attach it to a larger heat sink if you run it at higher currents. I can't tell you just what currents will need a bigger heat sink, maybe 20% of rating or more. If it gets too hot to touch then you need a bigger heat sink. The heat sink that is made on it is no where near 1/4 in. thick (maybe 1/16?), take a closer look at the bolt hole and you can see how thick it is. The diode bridge is epoxied into that little block & to the aluminum which is there to provide a good surface for heat transfer to a large heat.

The 50 volt ones are OK for 12 volt systems, but I usually pay a few cents more & get the 200v, or for a 120v application, I use 400v or 1000v. When you rectify AC often you are dealing with higher voltages than you think. For example, one battery charger I built had 21v RMS AC at the transformer. That means it was 30v peak AC, and the rectifier would also see 30v reverse voltage on the other half cycle.

Re: Full wave rectifier ([none / 0](#)) ([#2](#))  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Thu Sep 25th, 2003 at 11:09:37 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

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I like to go to the "Ham Fest" at the local exhibit center. It's a Ham Radio flea market. I bought the 2" x 2" x 1/2" ferrit magnets that I'm using for 50cents each. I bought \$20 worth, incredibly strong.

At the last show I got some 25amp diodes at 1 for \$1 or 11 for \$10. well thats not as good as the RS prices but still the deals abound.

-- W o o f

Re: Full wave rectifier ([none / 0](#)) ([#3](#))  
by Norm on Fri Sep 26th, 2003 at 05:46:25 PM MST  
([User Info](#))

Those magnets sure sound like a pretty good deal, they probably are quite a bit stronger than the domino sized ceramic magnets that I have at \$1 each? I guess I'll have to find a good flea market...sure is fun shoppin around for bargains like that...isn't it? (:>) Norm.

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### [anyone need a kill a watt meter??](#)

By [gameman](#), Section [Classifieds](#)  
Posted on Thu Dec 11th, 2003 at 02:49:28 PM MST [For Sale](#)  
**anyone need a kill a watt meter?? with free shipping**

hi  
i have some new kill a watt meters for sale \$ 29.99 with free shipping  
thanks for looking  
gameman

[anyone need a kill a watt meter??](#) | 0 comments (0 topical, 0 editorial)

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## [INDOOR/OUTDOOR DIGITAL THERMOMETER](#)

By [gameman](#), Section [Classifieds](#)

[For Sale](#)

Posted on Mon Dec 8th, 2003 at 09:04:40 AM MST

**i have a few new thermometers for sale \$14.99**

these's are new thermometers ..i removed them from there original package to test them ..they come with a free AAA battery and 90 day warranty ..there great to use with solar heaters .. 3/8"W x 3/4"H digital display  
Free standing with rear hanger hole  
Temperature reading: 10 second intervals  
Temperature range: -58 deg. to +158 deg. Fahrenheit (-50 deg. to +70 deg. Celsius)  
Overall dimensions: 4"W x 4-3/8"H  
thanks for looking  
gameman

[INDOOR/OUTDOOR DIGITAL THERMOMETER](#) | 0 comments (0 topical, 0 editorial)

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## [Propane-Fueled Onan Generator For Sale](#)

By [mckee](#), Section [Classifieds](#)

[For Sale](#)

Posted on Sat Nov 29th, 2003 at 08:31:52 PM MST

Onan Emerald Plus 6.5k watt generator for sale.

1999 Onan Emerald Plus 6.5 NHE 6500 watt generator, factory-converted to propane. 1/10th hour use, very clean, includes muffler kit, remote hour meter/electric starter switch, regulator. If you are off-the-grid, this is the workhorse that will get you through. Located in Portland, OR. Asking \$3100, but we will consider offers.

Write us at Lemmese1966(AT)hotmail.com . Substitute @ for (AT) to email.

[Propane-Fueled Onan Generator For Sale](#) | 1 comment (1 topical, 0 editorial)

Re: Propane-Fueled Onan Generator For Sale ([none / 0](#)) (#1)  
by Bach On on Tue Dec 2nd, 2003 at 05:39:23 AM MST  
([User Info](#)) [change AT: bach\\_on AT hotmail.com](#)

McKee,

I think the lack of response may partly be because of concern over shipping charges from Portland. I also believe that many on this board are looking for generators that can run on alternative fuels.

The unit you have sounds like a good one. But the Briggs or Tecumseh engines aren't always that long-lived. Plus, they usually have to run at 3,600 RPMs. That often means a louder unit than on the 1,800 RPM units. I do have to tell you that \$3,100 sounds a bit high for only 6.5 Kw.

eBay may be your best route on this unit.

Bach On

- I'm just as happy as if I had good sense! -

[Propane-Fueled Onan Generator For Sale](#) | 1 comment (1 topical, 0 editorial)

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[India built Lister slow speed engines](#)

By [MrLister](#), Section [Classifieds](#)

Posted on Sat Nov 29th, 2003 at 11:13:59 AM MST

[For Sale](#)

Lister type diesel engines

I am importing the "Lister" type engines from India. They come in sizes from 6hp 8hp and 10hp in the single cylinder model and sizes from 12hp 16hp and 20hp in the 2 cylinder model. The prices for the 6hp w\ tapered roller bearings are \$950. The 8hp are \$1000 and the 10hp models are \$1100. The 2cyl 12hp models are \$1400, 16hp are \$1500, and the 20hp are \$1650. These are water cooled engines so you can build a cooling tank out of a old hot water heater or the like. Or you can buy one with a factory mounted automotive style radiator w\ water pump for an additional \$235. These engines are built to run for 100,000 hours that is 11 years 24 hours a day. They run on diesel, you can run them on cooking oil! I have run one of these in my shop for over a year with just about every kind of cooking oil I could find. All of my engines have an oil pump. I have these engines shipped after I receive payment. The reason I do this is I simply do not have enuf room to store them. It takes about 90 days to ship from Bombay India to my shop in Tulsa Oklahoma. At this time the customers can pick them up here or I can arrange having them trucked. If you just have any questions about these great engines feel free to drop me an email [WesternStar66@aol.com](mailto:WesternStar66@aol.com) I can also email pictures of these engines. Thanks!

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[India built Lister slow speed engines](#) | 0 comments (0 topical, 0 editorial)

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## Turns Counter

By [Jerry](#), Section [Classifieds](#)

Posted on Sun Nov 16th, 2003 at 09:12:54 PM MST

[For Sale](#)

Small coil turns counter.

Hellow fellow coil winders.

I found a neat little numerical counter at the local surplus store the other day.

It has a 1"X1.25" face X 2" deep. It has 9 digets. Wow thats lots of turns. But siriusly though. It operates on a 24 volt pulse. Each time you pulse it it counts one then 2 ECT. up to 9 digits. I don't see a reset so just write the face # down when you start winding.

I'm going to use it on my coil winder. I'll just make a little bump or cam or something to hit a small micro swich.

I'm concerned when I try to wind coils I'll be interupted and loose my count. Or maybe just forget. I'm getting old you know.

Anyway the store has a factory PKG of 20 or so. If anyone wants one I'll pick up a few more befor there gone.

\$5 and the shipping should doit. If not thats OK to. Just thought this might be a little helper.

JK TAS Jerry

[Turns Counter](#) | 5 comments (5 topical, 0 editorial)

Re: Turns Counter ([none / 0](#)) (#1)  
by [BrianK](#) on Mon Nov 17th, 2003 at 08:05:22 AM MST  
([User Info](#))

heck I'm not old but I would still loose count.  
That sounds like a good idea.

Re: Turns Counter ([none / 0](#)) (#2)  
by [ibedonc](#) on Tue Nov 18th, 2003 at 04:52:31 PM MST  
([User Info](#))

I would like one , let me know how to get one from you

Re: Turns Counter ([none / 0](#)) (#3)  
by [Jerry](#) on Tue Nov 18th, 2003 at 05:52:15 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

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Hi ibedonc.

send me an e-mail with your ship to address and I'll get the shipping chrg. for you.

audiosourcesalem@aol.com

Jerry

[Airheads Page](#)

[ [Parent](#) ]

Re: Turns Counter ([none / 0](#)) (#4)  
by NJ JOHN on Wed Nov 19th, 2003 at 06:45:56 AM MST  
([User Info](#))

Hi  
New to this board and this is my first comment. Here's a way I made a counter/tach with a Dollar Store calculator. What I did was soldered 2 wires to the leads going to the EQUAL key and the other ends to an earphone jack and mounted this to the case of the calculator. To make a sensor I connected a normally open micro switch (or magnetic switch) through a toggle switch in parallel with a normally open pushbutton switch. This was then wired to a jack.

To use this setup just plug the jack in when needed and remove when being used as a calculator.

To use as a counter just turn on the calculator enter + 1 on the keypad and each time the switch is closed the calculator increases by 1 until you reach your desired count. If you put in a starting number and enter - 1 on the keyboard and when the display reads -1 you have completed your count.

To use as a tach open the toggle switch and push the push button switch for 15 seconds then multiply by 4 for RPM.

I hope this helps.

John

Re: Turns Counter ([none / 0](#)) (#5)  
by 5kw on Wed Nov 19th, 2003 at 10:55:23 AM MST  
([User Info](#))

I prefer a mechanical counter so you can back up, it happens. also no double counts if you dwell or stutter at the trip position.  
Make the wind fun!  
Victor

[Turns Counter](#) | 5 comments (5 topical, 0 editorial)

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[SALE: 50 lbs #10 GUAGE 0.1051" DIA. ESSEX ALLEX 240 DEGREES C MAGNET WIRE : \\$6/lb](#)

[For Sale](#)

By [Christina](#), Section [Classifieds](#)

Posted on Fri Nov 7th, 2003 at 12:09:06 PM MST

SALE: 50 lbs #10 GUAGE 0.1051

Hi Everyone,

I have for sale 50 lbs of #10 Guage (0.1051" Inches Diameter) Essex Allex High Temperature 240 Degrees C Magnet Wire. Price: \$6 per pound (lb).

This type of magnet wire is used in applications where temperature specific requirements are paramount and is ultra high quality stuff with proprietary insulation methodology being used from Essex. It is their highest temperature rated magnet wire that they sell. Here is a URL to Essex's Website for more information on this magnet wire: [<http://www.essexwire.com/oem/products/magnet/allex.htm>].

Will accept Paypal, or any other payment method including Escrow, USPS Money Order, Cash, etc. You can come and pick this up also for free if you are in the area (Zip 33147, Miami, FL).

Please note shipping would be whatever method you choose including your own FEDEX or UPS Account Number (insurance option must be used with these methods) and will be based on the exact amount of what is quoted to me from the Carriers. Please note I only use World Class Trackable Carriers/Shippers so that when product ships you will be emailed a Tracking #.

Will also be willing to sell this batch on a per pound basis.

I am a verified user of Paypal with paypal email being [[cyrix333\\_1999@yahoo.com](mailto:cyrix333_1999@yahoo.com)]. Also note that for Paypal payments sent online I will not ship to unconfirmed addresses for reasons relating to fraud. I am aware that someone might just want to have their stuff drop shipped to another location but as Paypal have it and to protect you and me it cannot be done.

Thanx a lot for your patience reading this.

Respectfully Yours,

Christina

[SALE: 50 lbs #10 GUAGE 0.1051" DIA. ESSEX ALLEX 240 DEGREES C MAGNET WIRE : \\$6/lb](#) | 1 comment (1 topical, 0 editorial)

STOP continually reposting this! ([none / 0](#)) ([#1](#))  
by TomW on Fri Nov 7th, 2003 at 12:56:16 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

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▪ <a href="#">More on For Sale</a>
▪ <a href="#">Also by Christina</a>

Christina;

In my opinion it was highly inappropriate of you to spam this board by posting this to every section on the board.

I moved it here where it should be just like the first one you posted several days ago:

<http://www.fieldlines.com/story/2003/10/28/01540/999>

I hid the other multiple copies. This board is not intended as your personal billboard.

Cheers.

TomW

[Stuff I have Online](#)

[Contact Me](#)

[SALE: 50 lbs #10 GUAGE 0.1051" DIA. ESSEX ALLEX 240 DEGREES C MAGNET WIRE : \\$6/lb](#) | 1 comment (1 topical, 0 editorial)

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[Heat Sink for sale.](#)

By [Jerry](#), Section [Classifieds](#)

Posted on Thu Nov 6th, 2003 at 10:56:34 PM MST

[For Sale](#)

Small heat sink for sale.

Hi group

For those of you who might need a heat sink for your fullwave bridge diode/rectifiers.

I have about 70 of these left over from a 10,000 watt audio amplifier I was manufacturing 7 years ago. We would use a bank of 20 of these with 4 fans in a tunel for cooling the amp. It was a clas A/B.

They measure 3 1/8 in. long, 1 3/4 in. wide, and fin plus deck highth is 1 inch. Fin hight 7/8 in. and there are 13 fins in the lngth spaced 3/16 in. apart. There is room for 2 of the fullwave bridges to fit with room to spare. They are black and have no holes. \$2.00 each plus shipping. hope this ends up in the right spot this time. Clasifides?

JK TAS Jerry e-mail

[audiosourcesalem@aol.com](mailto:audiosourcesalem@aol.com)

[Heat Sink for sale.](#) | 0 comments (0 topical, 0 editorial)

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## [5hp Honda engine](#)

By [windstuffnow](#), Section [Classifieds](#)

Posted on Sun Nov 2nd, 2003 at 08:26:23 AM MST

[For Sale](#)

For Sale....

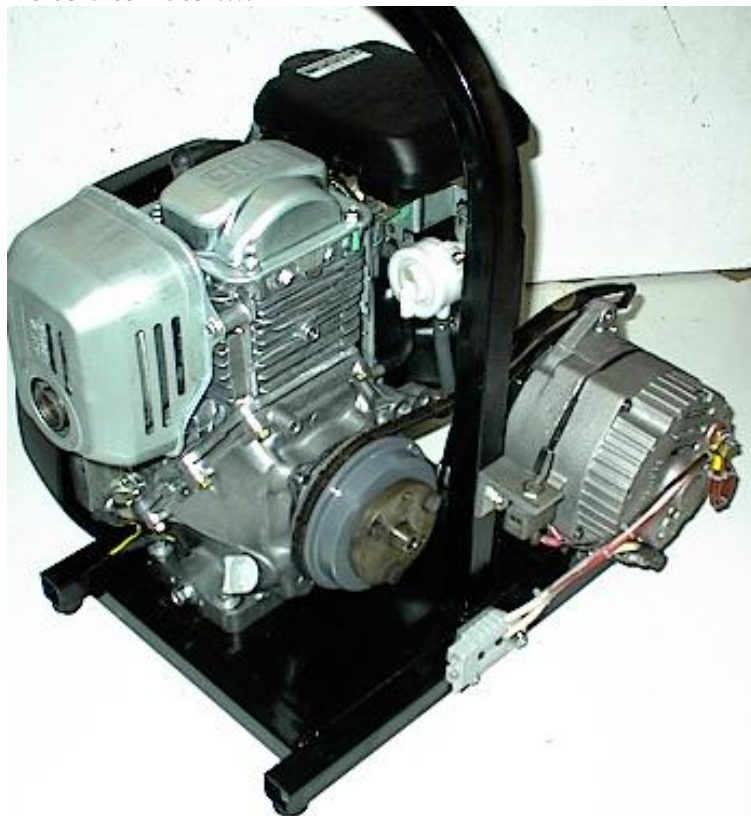
I have a fairly new 5hp Honda engine for sale. It was used for misc set ups and testing. It has about 5 hours run time on it. I'm switching things around a bit and the engine is no longer needed. I'm asking 250.00 plus shipping. Smooth running and very quiet. Great for light weight power. It has a 4 inch pulley installed on the output shaft for driving a car alternator or belt driven gen head. If no-one needs it here it'll go to ebay. Let me know...

Have Fun  
Ed

[5hp Honda engine](#) | 2 comments (2 topical, 0 editorial)

Re: 5hp Honda engine ([none / 0](#)) ([#1](#))  
by [windstuffnow](#) ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Sun Nov 2nd, 2003 at 08:31:44 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Here is a picture of it when it was driving a 100 amp Delco alternator....



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Price Revised... ([none / 0](#)) ([#2](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Sun Nov  
2nd, 2003 at 11:54:12 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

I must appologize, I found my reciept from when I purchased it 2 years ago and found the price I placed on it was close to what I paid for it. I bought it for 259.00. So with that being said and only having about 5 hours use on it I'll let it go for 200.00 + shipping.

Have Fun  
Ed

[5hp Honda engine](#) | 2 comments (2 topical, 0 editorial)

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[early Bergey generator for sale](#)

By [5kw](#), Section [Classifieds](#)

Posted on Sun Oct 26th, 2003 at 03:55:58 AM  
MST

[For Sale](#)

The generator for this wind turbine is rated at 13 amps at 120 volts and could be configured for 26 amps at 48 volts

The generator consists of two three phase delta wound alternators, mechanically offset 60 electrical degrees to reduce cogging. The outputs are individually rectified and then wired in series inside the nacelle at the tower top. They could easily be paralleled at this point for lower voltage higher current. The generator, rectifiers, nacelle cover, mainframe, and tower stub are in good condition both electrically and mechanically. The plastic ( nylon?) yaw bushings need to be replaced and the sliprings and brushes need some work. The original blades are unusable except as patterns. The tail is missing. Asking \$400.

Make the wind fun!  
Victor

[early Bergey generator for sale](#) | 4 comments (4 topical, 0 editorial)

Re: early Bergey generator for sale ([none / 0](#)) ([#1](#))  
by BruceDownunder on Sun Oct 26th, 2003 at 09:54:50 AM MST  
([User Info](#))

Where is the gennie -what country ,please  
bruce

Re: early Bergey generator for sale ([none / 0](#)) ([#2](#))  
by DanB on Sun Oct 26th, 2003 at 12:06:30 PM MST  
([User Info](#))

Hi Victor... sounds like a good deal!  
Just out of curiosity... what was the original swept area of the machine? Does Bergey still sell replacement blades for it, and if so ... how much? Were the originals wooden, or extruded plastic like the new ones?

Re: early Bergey generator for sale ([none / 0](#)) ([#3](#))  
by 5kw on Sun Oct 26th, 2003 at 02:15:07 PM MST  
([User Info](#))

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The original diameter was 10' , it was the predecessor to the Bergey 1500 sn# 00145. I'm not certain that 1500 blades fit , if they do they are aprox \$ 600 for the set. The original blades are wood with a thin fibreglass coating. these blades have the passive Powerflex tm pitch weights near the tips. The machine is in Lafayette Colorado USA 303-665-3991

[ [Parent](#) ]

Re: early Bergey generator for sale ([none / 0](#)) ([#4](#))  
by gary1747 on Fri Oct 31st, 2003 at 04:22:19 PM MST  
([User Info](#))

I am keenly interested in your Bergey generator. I just bought an XL.1 and expect to be happy with it, but need more power (two will come much closer to my needs) I would like the damaged blades to attempt to resurrect them, or at least use one for a pattern. I will pay your price plus shipping.

[early Bergey generator for sale](#) | 4 comments (4 topical, 0 editorial)

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### [Neo magnets for sale](#)

By [paulc](#), Section [Classifieds](#)

Posted on Thu Oct 9th, 2003 at 07:25:21 PM MST

[For Sale](#)

Neo's for sale

Hello Folks,

I have a quantity of 1" X 1/8" Neo's for sale. I bought these about a year to build a dual rotor axial alternator. I no longer have the time to build one so these are up for sale. I believe these are grade 40's or 42's The magnets stack nicely so you can build what ever height magnet you need. N/S poles are on the faces.

I have approx 200 of these magnets to sell.

\$1.25 ea plus shipping

respond to

[Paulc@snet.net](mailto:Paulc@snet.net)

Thank you

PaulC

[Neo magnets for sale](#) | 5 comments (5 topical, 0 editorial)

Re: Neo magnets for sale ([none / 0](#)) ([#1](#))  
by [RogerAS \(rogeras@cei.net\)](#) on Fri Oct 10th, 2003 at 07:15:58 AM MST  
([User Info](#))

Hi,

I would be very interested if you could part with 24 of these, I have a UPS Shipping #. I assume these are disc magnets.

RogerAS

"Put the bunny back in the box!"

Re: Neo magnets for sale ([none / 0](#)) ([#2](#))  
by [filico](#) on Fri Oct 10th, 2003 at 07:50:49 AM MST  
([User Info](#))

hello poul:

i'm interesting in magnets. 24 can you send to mexico or to california whit a sister?

I'm waiting for answere.

thanks

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- [Also by paulc](#)

Re: Neo magnets for sale ([none / 0](#)) (#5)  
by paulc on Fri Oct 10th, 2003 at 09:24:02 AM MST  
([User Info](#))

Filco,

Please send me an email to the address below and I will calcute shipping.

PaulC@snet.net

Thanks

PaulC  
W1VLF

[ [Parent](#) ]

Re: Neo magnets for sale ([none / 0](#)) (#3)  
by RogerAS ([rogeras@cei.net](mailto:rogeras@cei.net)) on Fri Oct 10th, 2003 at  
07:58:27 AM MST  
([User Info](#))

Hey,

If sisters are part of the deal forget it, my wife barely tolerates the windmill junk all over the place. :-) !

RogerAS  
"Put the bunny back in the box!"

Re: Neo magnets for sale ([none / 0](#)) (#4)  
by paulc on Fri Oct 10th, 2003 at 09:16:04 AM MST  
([User Info](#))

Roger,

No way are sisters included.. :>) And my poor mother having had 200 children. Sorry I forgot to include that a key fact that the Neo's are round.

I you can send me an email with your address, I can figure the cost and shipping when I get home from work later today.

Thanks

Paulc@snet.net

PaulC  
W1VLF

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[Neo magnets for sale](#) | 5 comments (5 topical, 0 editorial)

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### [Batteries Inverters for sale](#)

By [Garry](#), Section [Classifieds](#)

Posted on Wed Sep 17th, 2003 at 06:24:40 AM MST [For Sale](#)

24 volt components for sale

I have 24 Trojan L-16 6 volt batteries for sale. These have been connected as two banks of 24 volts each. They are three years old and in very good condition. I will include the 4-0 connections and the copper bus bar. I also have two Trace modified square wave inverters DR 2424 ( 24vdc and 2400 watts ), two Trace C-40 charge controllers, and a 24 vdc 1000 watt Statpower sine wave inverter, all in excellent condition. Any reasonable offer on any of the above will be entertained. The batteries are located in north central Oklahoma and will have to be picked up. I have acquired a 22kw propane backup generator and am buying a new grid tie inverter for my solar cells and wind generator.

I will be happy to answer any questions.

[Batteries Inverters for sale](#) | 11 comments (11 topical, 0 editorial)

Re: Batteries Inverters for sale ([none / 0](#)) ([#1](#))  
by RogerAS ([rogeras@cei.net](#)) on Wed Sep 17th, 2003 at 07:25:42 AM MST  
([User Info](#))

Hi Garry,

I live in N. central Arkansas. How much? And total weight, geuss ok.

RogerAS

"Put the bunny back in the box!"

Re: Batteries Inverters for sale ([none / 0](#)) ([#4](#))  
by Garry on Wed Sep 17th, 2003 at 05:53:38 PM MST  
([User Info](#))

Roger,  
They weigh about 2880 pounds as far as I can tell. I paid \$3120. for them without connectors or bus bar. Make me an offer. I'm easy.

Garry

[ [Parent](#) ]

Re: Batteries Inverters for sale ([none / 0](#)) ([#2](#))  
by wind pirate on Wed Sep 17th, 2003 at 09:37:49 AM MST  
([User Info](#))

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Gary

I'd be interested in the Trace C-40s. I assume these would work on 12V systems as well -> how much for the pair?

SB

Re: Batteries Inverters for sale ([none / 0](#)) ([#5](#))  
by Garry on Wed Sep 17th, 2003 at 05:56:01 PM  
MST  
([User Info](#))

SB,

I paid \$145. each for them. I won't let them go until I sell either the Batts or one of the inverters. Make me an offer. I'm easy.

Garry

[ [Parent](#) ]

Re: Batteries Inverters for sale ([none / 0](#)) ([#3](#))  
by Seth on Wed Sep 17th, 2003 at 11:21:11 AM MST  
([User Info](#))

Hey i want a C-40,... i have a C-60 to give up too....

I want to go to 48V... and the c-60 wont handle that kind of voltage

Re: Batteries Inverters for sale ([none / 0](#)) ([#6](#))  
by Garry on Wed Sep 17th, 2003 at 06:00:12 PM  
MST  
([User Info](#))

Seth,

I paid \$145. each for them. I won't let them go until I sell either the Batts or one of the inverters. Make me an offer. I'm easy.

By the way, for anyone else looking. The two inverters I paid \$952. for but the best price I can find on the net now is \$852. Again if you're interested make me an offer. I am grid connected and would rather back up my meter than divert the extra to heat.

Garry

[ [Parent](#) ]



Re: Batteries Inverters for sale ([none / 0](#)) (#7)  
by JB on Wed Sep 17th, 2003 at 06:53:05 PM MST  
([User Info](#))

are these the trace inverters that run can hook up to get 230 volt power. maybe post your email adress. JB

[ [Parent](#) ]

Re: Batteries Inverters for sale ([none / 0](#)) (#10)  
by Garry on Wed Sep 17th, 2003 at 07:30:01 PM MST  
([User Info](#))

Yes they can be stacked. It requires a cable that costs about \$50. Email above

Garry

[ [Parent](#) ]

Re: Batteries Inverters for sale ([none / 0](#)) (#8)  
by Seth on Wed Sep 17th, 2003 at 06:54:46 PM MST  
([User Info](#))

ok, i can wait till u sell the bats... but on making a bid = so to speak, do you have an e-mail account??

Re: Batteries Inverters for sale ([none / 0](#)) (#9)  
by Garry on Wed Sep 17th, 2003 at 07:28:12 PM MST  
([User Info](#))

Guys here is my email. gwhitmanduh@wiredok.com  
Just take out the "duh" to keep the spam harvesters down. this phone will work evenings till 9:00 central until Friday.  
580-363-3521  
Garry

[ [Parent](#) ]

Re: Batteries Inverters for sale ([none / 0](#)) (#11)  
by Seth on Sun Oct 5th, 2003 at 05:07:11 AM MST  
([User Info](#))

Garry,  
U still around??

[Batteries Inverters for sale](#) | 11 comments (11 topical, 0 editorial)

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[Link 10 Amhr/Voltage/Current monitor](#)

By [Eviljosh](#), Section [Classifieds](#)

Posted on Wed Aug 27th, 2003 at 01:20:48 PM MST

[For Sale](#)

[Link 10 Amhr/Voltage/Current monitor](#)

One barely used Link 10 battery monitor for sale 100\$

Description

Link 10

Single Battery Bank Monitors

Provides Battery Status Information At-A-Glance

The Link 10 (part#84-2016-01) uses sophisticated microprocessor technology to provide complete battery status information for one and two battery banks, respectively. Simple and easy-to-use multicolor displays show volts, amps, amp hours consumed, and operating time remaining. The Link 10 allows you to select Automatic, Sleep and Scanning modes and automatically calculate and display charging efficiency. By adding an optional prescaler, Link 10 can monitor single battery banks up to 500 volts.

Product Features

- Digital Numeric Display - LED display shows numeric read out of volts, amps, amp-hours and time remaining
- Easy to read multi-color LED bar graph
- Splash proof panels allow for outdoor mounting and hands free operation
- Displays key historical battery information such as charge efficiency, deepest discharge, and average discharge
- Compatible with 12 and 24 volt DC systems
- Works with any battery type

This version does have the RS-232 port.



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- [Also by Eviljosh](#)

Email [joshg@arkansas.net](mailto:joshg@arkansas.net) if interested.

[Link 10 Amhr/Voltage/Current monitor](#) | 0 comments (0 topical, 0 editorial)

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## [garbage disposal stator](#)

By [jemitch](#), Section [Classifieds](#)

Posted on Wed Jul 23rd, 2003 at 07:25:49 PM MST

[For Sale](#)

garbgen

---

1. hp garbage disposal stator with mount price \$40.00 plus shipping.
4. 3/4 hp stators only garbage disposal.\$20.00each plus shipping.zip for info.78112.pay pal or money orders only.thanks jemitch

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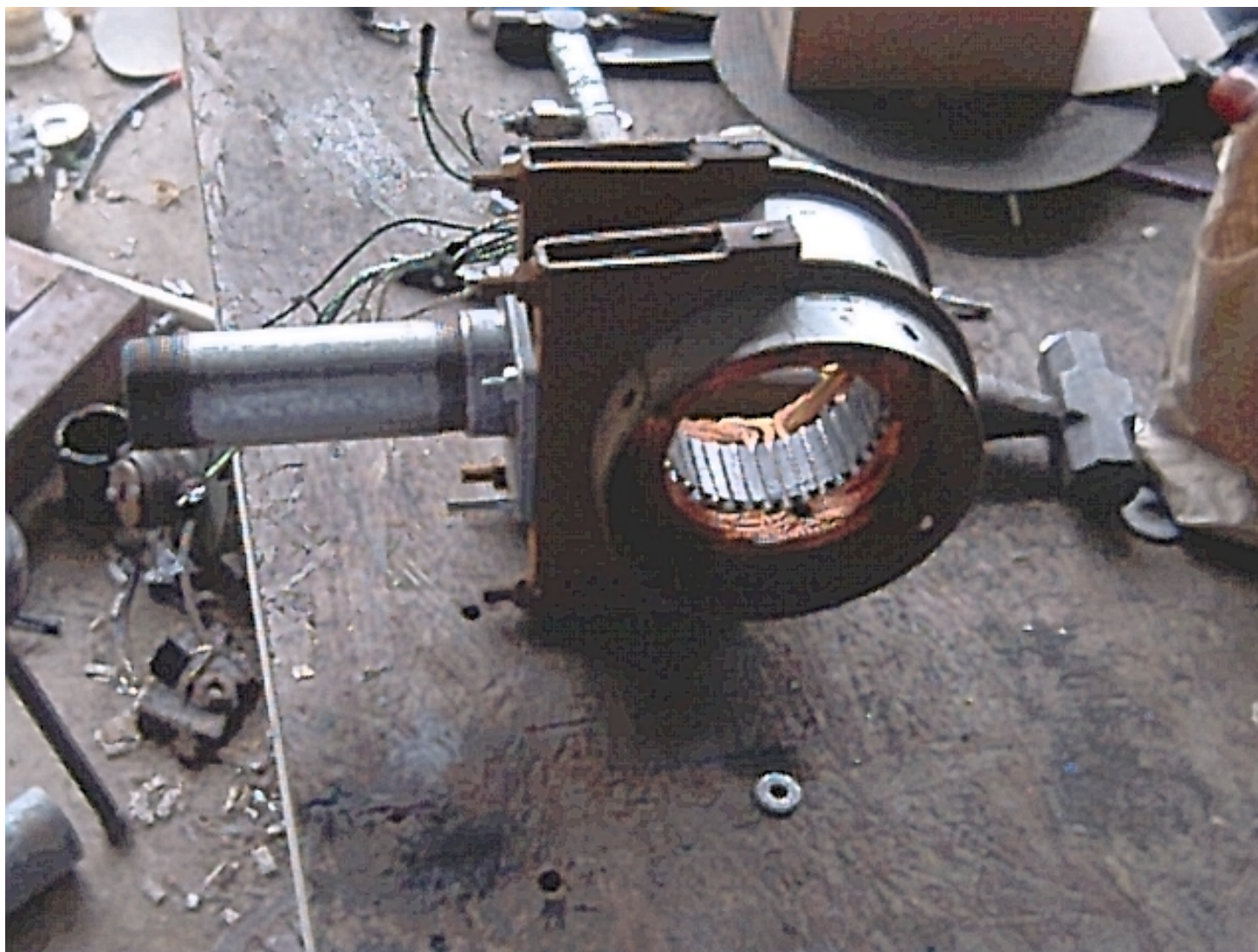
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- [More on For Sale](#)
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[garbage disposal stator](#) | 2 comments (2 topical, 0 editorial)

Contact info? ([none / 0](#)) ([#1](#))

by TomW on Thu Jul 24th, 2003 at 06:03:08 AM MST

([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Jemitch;

You did not include any contact info, which seems like it would be a good idea if you are trying to sell something.

Cheers.

TomW

[Stuff I have Online](#)

[Contact Me](#)

Re: garbage disposal stator ([none / 0](#)) ([#2](#))  
by jemitch ([mitch1a@email.com](mailto:mitch1a@email.com)) on Thu Jul 24th, 2003 at 05:39:31 PM MST  
([User Info](#))

If you want more info email me at [mitch1a@email.com](mailto:mitch1a@email.com)

[garbage disposal stator](#) | 2 comments (2 topical, 0 editorial)

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## [Wincharger Parts](#)

By [winchargerman](#), Section [Classifieds](#)

Posted on Fri May 9th, 2003 at 09:20:26 AM MST [For Sale](#)

If you are running or plan to run a big Pre REA Wincharger and need new or used parts contact us. We have many new and excellent used parts available.

For example we stock slip ring brushes, generator brushes, bearings, seals, gasket kits, shafting, new galvanized tails new mounting stud kits, and special hardware kits in stainless and galvanized. We have the dies, tooling and parts to bring your Wincharger back to perfect condition! We also buy, sell, and trade Wincharger parts. If your Wincharger needs parts or expert service, this IS the place!! Thanks!!

[Wincharger Parts](#) | 4 comments (4 topical, 0 editorial)

Got contact info?? ([none / 0](#)) ([#1](#))  
by TomW on Fri May 9th, 2003 at 12:53:03 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Winchargerman;

If you have contact info I suggest you include it in a comment so people can find you.

Cheers.

TomW

[Stuff I have Online](#)  
[Contact Me](#)

Bryant Wind Electric ([none / 0](#)) ([#2](#))  
by winchargerman ([bryantwind@sbcglobal.net](mailto:bryantwind@sbcglobal.net)) on Sun May 11th, 2003 at 12:11:24 AM MST  
([User Info](#))

You can reach us with your Wincharger parts needs at: [bryantwind@sbcglobal.net](mailto:bryantwind@sbcglobal.net) or Bryant Wind Electric 4629 Hoxie Hill Road Randolph, NY 14772. We are also on the Otherpower wind energy links. Thanks!

Small world. Hello Neighbor ! ([none / 0](#)) ([#3](#))  
by Dave B on Sun May 18th, 2003 at 12:22:18 AM MST  
([User Info](#))  
<http://www.madbbs.com/users/bruggelog>

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- [More on For Sale](#)
- [Also by winchargerman](#)

Winchargerman, Dave B. here outside Frewsburg. I recently met up with Dave at Royal Welding and he had dropped your name. Reason being, I am building an axial alternator and the connection was made. I also know L J as he has cleared out for my future tower location. I plan to pre-heat water and recent testing shows all positive results. I got started in this adicting hobby about a year ago and have many questions that I'm sure you can help me with, towers, blades, furling systems etc. I'll contact you by e-mail or call very soon. Visit my website at [www.madbbs.com/users/bruggelog](http://www.madbbs.com/users/bruggelog) Great to know you're out there. Dave B.

[ [Parent](#) ]

Re: Wincharger Parts ([none / 0](#)) (#4)  
by DonG on Sat Sep 20th, 2003 at 07:18:42 PM MST  
([User Info](#))

The parts that I've bought from you for my Wincharger have been excellent quality and I will be buying more parts from you for this rebuild,

[Wincharger Parts](#) | 4 comments (4 topical, 0 editorial)

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### [BIG Genny for sale](#)

By [Gorilla Boy](#), Section [Classifieds](#)

Posted on Tue Apr 29th, 2003 at 10:42:12 PM [For Sale](#)  
MST

Runs on digester gas (550 to 650 BTU/cubic foot heating value), natural gas, or propane.

I stumbled across this in my searching maybe someone out there might be interested. [ESurplus Site](#)

[BIG Genny for sale](#) | 0 comments (0 topical, 0 editorial)

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## [10KW Windmill System For Sale](#)

By [Anonymous Hero](#), Section [Homebrewed Electricity](#)  
Posted on Mon Apr 14th, 2003 at 12:30:55 PM MST [For Sale](#)  
10KW Windworker System For-Sale \*PIC Below\*

Two blade, 10KW Alternator, 70' guyed tower, 10KW synchronous inverter, and more...

10KW Windworker System For-Sale \*PIC Below\*

Gentlemen and gentle ladies,

I've moved from my old homestead with lots of land, to the burbs with effectively no land and considerably more rules. The new owners do not have any interest in the old system, so move it I must.

Two blade, 10KW Alternator (80 pole - rotating magnet fixed field - 3' diameter armature - 10,000 watts at 150 rpm - direct drive - gearless), 70' guyed tower, 10KW synchronous inverter (programmable load presentation), dual detent meters & tray, System manufacturer Omnion Power Systems:  
<http://www.omnion.com/omnion/index.htm>

Price: \$9,000 - come and get it (as is).

\$12,000 - down, checked out, ready to load on your trailer

\$??? - all of the above and help putting it up and getting it all humming

Tom Eletto: 518-587-0285 or [tom@diamonddridge.com](mailto:tom@diamonddridge.com)



Click this link for the rest of the pics <http://www.geocities.com/lindaofsaratoga/images/Windmill/>

[10KW Windmill System For Sale](#) | 0 comments (0 topical, 0 editorial)

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- <http://www.omnion.com/omnion/index.htm>
- [tom@diamonddridge.com](mailto:tom@diamonddridge.com)
- <http://www.geocities.com/lindaofsaratoga/images/Windmill/>
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## [So you want to build a waste oil heater, eh bunky?](#)

By [robotmaker](#), Section [Rants & Opinion](#)

[Fossil Fuels](#)

Posted on Fri Dec 19th, 2003 at 03:47:34 PM MST

New designs, variations on old designs, and idea swapping...

I was an old subscriber to the MEN (mother earth news) back when the rag first started. This is where I learned about savonious rotors, digesters and a whole bunch of alternate energy stuff.. Well, I moved to Florida back in 1980, and really didn't need all that then, but now I live in Arkansas and let me tell ya...it's a bit colder here. Well, still being into the alternate energy stuff, I got tired of cutting the tree, chopping the tree, splitting the logs, carrying the logs, stacking the logs, carting in the logs, burning the logs, and emptying the stove. Not to mention having to sit around in yer jockey shorts and having a boiling pan of water on the stove because you can't regulate the heat output worth a hoot without alot of expense and besides...cleaning the chimney isn't all that much fun either. Well... along came the idea of making the waste oil burning stove. Since I was already making my wood stoves out of old hot water heaters, I had a source for them. I downloaded that brief article from the old MEN article and built my version of that stove. Let me tell ya, I'm STILL sitting around in my jocky shorts cause it gets so hot, but have learned a few things from it as well. First, that burner design lends itself to oil being splashed out into the sand bed and it clogs up the holes in the burner. It doesn't go too long before you have to rip it apart and clean it up to get it working again. The longer you let it go, the more fuel it uses and smokes like hell. Well, I looked for other designs without any luck. I saw a few variations on the subject, but for the most part found lots of professionally made devices for sale, but the price tag was way above what I wanted to spend. I'm kind of a cheapskake when it comes to this stuff. I figure if I can't build it out of bailing wire and bubble gum wrappers, it ain't worth building. I have done a small windplant using a servomotor, but the wind quality around here is the reason my sailboat is still in Florida. But I still like to tinker with it. Seems that when you need the heat the most in the winter is when the wind starts to howl...

(Imagine that) So now, when it howls, I put the output across some heating coils with a little muffin fan blowing the hot air out. Anyway, back to oil...I came up with a much better design on that burner, but the only downside to it is that it needs forced air. Want to know how many GM cars that are in my local junk yard without the heater motors in them now? (Heh heh) They work perfectly!!! This design starts up without smoking, and runs without smoking, and burns extremely hot. The original intent of just sipping oil has been kept foremost in my design also. I get my oil at the local jiffy lube for next to nothing, and with this design, am burning some old peanut oil in it too! Smells so good you want to keep the door open.

Bottom line is to see if anyone wants to share designs on this variation, and see if anyone else had trouble with that original MEN design, and if anyone else modified it? you can reach me at robotmavr@aol.com or.. i'll be watching this board.

Thanx... rj

[So you want to build a waste oil heater, eh bunky?](#) | 6 comments (6 topical, 0 editorial)

Re: So you want to build a waste oil heater, eh bu ([none / 0](#)) ([#1](#))  
by [veewee77](#) on Fri Dec 19th, 2003 at 05:25:18 PM MST  
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Robotmakr, huh?

I build robots, too, and am also into RE, and I also live in AR.

Wierd, huh?

I'd like to see your waste oil heater, or at least some plans for it. . .

May want to build one. . .

DS

Page 3 ([none / 0](#)) (#2)  
by wdyasq on Fri Dec 19th, 2003 at 05:42:58 PM MST  
([User Info](#))

[http://journeytoforever.org/biofuel\\_library/ethanol\\_motherearth/me4.html](http://journeytoforever.org/biofuel_library/ethanol_motherearth/me4.html)

if one goes to the bottom of the article and reads the page 3 information, modifications to add the blower are commented on.

Ron

Re: So you want to build a waste oil heater ([none / 0](#)) (#3)  
by drdongle on Fri Dec 19th, 2003 at 06:24:02 PM MST  
([User Info](#))

I built one of these back in the early 80's and experienced similar problems with the burner unit which I had to disassemble every few days and beat with a hammer to remove the baked in oil sludge. But did it keep the house warm!! It was the one thing that kept my first marriage together as long as it did! My then wife told me that it was the only time in her life that that house had been warm.

Dr.D

Re: So you want to build a waste oil heater ([none / 0](#)) (#4)  
by Gordy on Fri Dec 19th, 2003 at 10:08:39 PM MST  
([User Info](#))

robotmaker,

I as well as others here ( I think ) would like to see some pics and plans of what you have working for you. If you have the time and don't mind sharing.

Thanks,  
Gordy

Re: So you want to build a waste oil heater ([none / 0](#)) (#5)  
by robotmaker on Mon Dec 22nd, 2003 at 06:41:34 AM MST  
([User Info](#))

To answer DS, where in Arkansas are you? I am in the Fort Smith area. Maybe we should share a few notes.

To answer Ron, I knew about the modifications to the MEN article, and yes, I tried that too. That guy explained how he added a down tube and dripped the oil AND the air flow down to make it run hotter etc. Yes indeed, it did burn hotter, I think I went one better and added a 6" deep cast iron vessel in the bottom. I continued to get the clogging tho, and not only in the burner, but in the down tube as well. I thought that the air should go UP from the assembly, not down into it. The next modification I did was to make a burner assembly out of two electric motor casings, one 8" in diameter and one 6" in diameter that were about 8" tall. I drilled about 16 - 1/4" holes in the inside piece about two inches above the bottom, placed one inside the other and welded it to a bottom plate. Next, cut out a 1" ring and welded it to the top of this assembly. Cut a 1 1/2" hole to accept a piece of tailpipe near the bottom and use this to blow the air into. Now the only way the air can get inside this weldment is to go thru the 1/4" holes. Drip the oil in as before with the down tube extending to just about the top of this assembly, and this thing heats up fast, burns clean, and sips fuel. I still have a problem with buildup tho, and get a ring of unburned oil deposits all around the ring of holes, from the holes down to the bottom. So I changed the design from holes about 2" above the bottom to holes at about 1/2" above the bottom. I can also see that mild steel isn't going to last very long, so I scrounged a couple of motor cans made out of stainless steel. The down tube keeps clogging up also, so I changed it to a 3" diameter tube, and now there isn't any clogging in the tube anymore. But.. it STILL get residue in the bottom of this burner assembly. How come I don't hear anyone ELSE complaining about this? I will try and get some drawings posted as soon as I figure out what format I can put them in. That is, if there is any interest...and I would like to see anyone ELSE'S attempts at getting this clogging phenomenon down to a minimum too..

rj

[ [Parent](#) ]

Re: So you want to build a waste oil heater ([none / 0](#))  
(#6)  
by RogerAS ([rogeras@cei.net](mailto:rogeras@cei.net)) on Mon Dec 22nd, 2003 at  
09:29:10 AM MST  
([User Info](#))

Hi

Stone County here, east end.

RogerAS  
"Put the bunny back in the box!"  
[ [Parent](#) ]

[So you want to build a waste oil heater, eh bunky?](#) | 6 comments (6 topical, 0 editorial)

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6 comments
2. [Multiple generators](#) ([Homebrewed Electricity](#), [Fossil Fuels](#))  
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3. [Homemade fuel stabilizer?](#) ([Remote Living](#), [Fossil Fuels](#))  
posted by zmoz on 09/10/2003 03:07:15 PM MST  
1 comment
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5. [Fuel economy- The Rant continues](#) ([Rants & Opinion](#), [Fossil Fuels](#))  
posted by windstuffnow on 08/12/2003 07:42:13 PM MST  
14 comments
6. [Chainsaw parts](#) ([Classifieds](#), [Fossil Fuels](#))  
posted by Demetri on 07/27/2003 09:46:48 PM MST  
5 comments
7. [Ethanol Engine \(Updates once again\)](#) ([Homebrewed Electricity](#), [Fossil Fuels](#))  
posted by Andrew on 07/10/2003 11:24:10 AM MST  
9 comments
8. [Ethanol Engine \(updated\)](#) ([Homebrewed Electricity](#), [Fossil Fuels](#))  
posted by Andrew on 06/27/2003 11:39:53 PM MST  
24 comments
9. [Ethanol Engines](#) ([Homebrewed Electricity](#), [Fossil Fuels](#))  
posted by Andrew on 06/18/2003 03:36:31 PM MST  
28 comments
10. [From old board -- Gaseous VS liquid fuel](#) ([Rants & Opinion](#), [Fossil Fuels](#))  
posted by John on 06/12/2003 05:42:00 AM MST  
10 comments

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11. [Woodstoves Poll](#) ([Remote Living](#), [Fossil Fuels](#))

posted by ADMIN on 03/29/2003 07:16:40 AM MST

10 comments



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## [Multiple generators](#)

By [wdyasq](#), Section [Homebrewed Electricity](#)  
 Posted on Sun Nov 9th, 2003 at 06:45:29 PM MST [Fossil Fuels](#)  
 Will generators "Sync"

Thinking of a theoretical situation in a shop where one might need - say 15 kW of energy, but not often. Most of the time, this shop would use 5 kW at the most. Could one run an 8 kW generator and then when more power is needed crank up another 8 kW? These would be 3 Phase units running both single and 3 Phase tools.

My mind says it will work - the second generator will immediately synchronize with the first one and they will run happily together. The reason two identical generators would be used is to switch the running of them so there would always be a spare or at least spare parts. But, in this scenario, one might use a 5 kW and a 10 kW unit to achieve the needed level of power.

I'd like to hear the opinions - even if they are wrong and don't agree with me....

Ron

[Multiple generators](#) | 10 comments (10 topical, 0 editorial)

Re: Multiple generators ([none / 0](#)) (#1)  
 by Electric Ed on Sun Nov 9th, 2003 at 07:27:42 PM MST  
[\(User Info\)](#) <http://www.electric-ed.com>

The alternators will not automatically synchronize. They can be manually synchronized and paralleled by using a system of "synchronizing lights" or an instrument called a synchroscope.

When operating in parallel, they will divide the load equally only if their prime movers are running at the same speed.

In other words, to operate alternators successfully in parallel, their prime movers speed must be precisely governed.

Electric Ed

Re: Multiple generators ([none / 0](#)) (#2)  
 by drdongle on Sun Nov 9th, 2003 at 07:44:01 PM MST  
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I'm afraid that Ed is right, and as wind can be extremely variable even over a small area, there is no practical way to sync two 3 phase or even single phase alternators. I might suggest that you divide the shop into two "zones" one on each alternator and independent of each other. This also has the advantage of being redundant.

Dr.D

Re: Multiple generators ([none / 0](#)) ([#3](#))  
by wdyasq on Sun Nov 9th, 2003 at 08:11:51 PM MST  
([User Info](#))

These will be diesel motor driven generators - I KNOW if one hooks a generator to a power system, the generator will - lock in - on the cycles of the grid. I'm wondering if two generators will synchronize like mechanical devices.

I have also been told a 3 phase motor - hookes up to the grid and 'overdriven' will actually generate electricity. If so, could one generate electricity and then 'overdrive' a standard 3 phase motor and produce enough power - on a temperary basis, to run the additional machinery.

Ron

Re: Multiple generators ([none / 0](#)) ([#4](#))  
by laskey on Sun Nov 9th, 2003 at 08:46:28 PM MST  
([User Info](#))

You're right its called "infinite bus" synchronization. The grid is so large an powerful that the generators conform to the Grid, because they can be "forced" into sync by the grid, the main problem for you would be if the grid went down. In free running mode those two gens would fight each other and likely do damage to each other. You'd be well off to build yourself a synching setup so that you can match them to the grid and each other.

As a side note, the "infinite bus" effect is exactly the same reason that a non-grid-tie inverter will explode if you hook it straight to the grid. Inverters don't normally have the ability to synch to the grid, and if you try to force them something will burn out.

Cya,  
Chris

[ [Parent](#) ]

Re: Multiple generators ([none / 0](#)) ([#10](#))  
by troy on Wed Nov 12th, 2003 at 11:44:35 AM MST  
([User Info](#))

Not all types of generators will automatically sync with grid phase. Approach with caution. Overdriven induction motor/generators generally will, but there are lots of other types of gennies out there which can produce spectacular failure if hooked up directly to the grid or each other.

Good luck and have fun.

troy

[ [Parent](#) ]

Re: Multiple generators ([none / 0](#)) (#5)  
by kurt on Mon Nov 10th, 2003 at 06:18:57 AM MST  
([User Info](#))

copy pasted from  
[http://www.3e-co.com/onsite\\_power.html](http://www.3e-co.com/onsite_power.html)

KOHLER switchgear is designed to manage your power needs by carefully monitoring and adjusting the load between generators that have been installed to work in tandem. The paralleling of multiple generator sets is a long accepted technique for increasing the amount of available electrical power required for variable load conditions.

The switchgear will automatically synchronize, parallel, and match the electrical power from a number of generators, to the size of the load requirement.



Multipule inputs vs. multipule generators ([none / 0](#)) (#7)  
by Norm on Mon Nov 10th, 2003 at 07:37:08 AM MST  
([User Info](#))



One interesting setup is to have a large electric motor turning the main generator coupled with a large flywheel, the split-second there is the slightest hint of an interruption in power from the grid a large diesel is instantly engaged to the flywheel on the generator, the diesel is up and running with no problems. Actually what I'm leading up to as in this case is one generator with alternate multiple inputs. Seems like it would be easier to just add more power to a generator when needed (same speed...just add more torque) Norm.

[ [Parent](#) ]

Re: Multiple generators ([none / 0](#)) (#6)  
by wpowokal on Mon Nov 10th, 2003 at 07:11:24 AM MST  
([User Info](#))

Ron, All of the above adresses your theoretical situation and all are correct, however none individually solve your question.

So with 29 years of main stream power generation behind me diesel and thermal albiet in OZ I suggest the following.

The advice to split your shop is the most aproprate, cost effective way to aproach this proposal. Coupled with aproprate switches it will give you the redundancy we all need.

I could bore all with tails of being back-up station and having to use synchronizing light as opposed to the syncroscope to add in diesel plant, cause the frequency had fallen so low, but I won't, it's potentialy very damaging to the generators.

Split your shop load and start the back when needed, it will save much heart ache, cost etc. Ohhh one day I may write a book. Ops sorry one of those days, old farts should just fade away.

regards Allan

Re: Multiple generators ([none / 0](#)) (#8)  
by gps on Mon Nov 10th, 2003 at 10:18:02 AM MST  
([User Info](#))

Not quite what you asked but IIRC a Trace SW series inverter can 'back up' a generator, adding its own capacity to the generator's (4 or 5kw continuous, 10kw surge).

fwiw

Killed this one ([none / 0](#)) (#9)  
by wdyasq on Mon Nov 10th, 2003 at 05:50:56 PM MST  
([User Info](#))

Thanks guys for all the advice and information -

I got what I needed to figure this one out. When I decide what and how it and what must be done, I'll take a decision and tell of the results.

Ron

[Multiple generators](#) | 10 comments (10 topical, 0 editorial)

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[Homemade fuel stabilizer?](#)

By [zmoz](#), Section [Remote Living](#)  
 Posted on Wed Sep 10th, 2003 at 03:07:15 PM MST [Fossil Fuels](#)  
 Anybody know how to make some fuel stabilizer?

I used to know a guy a few years ago that made his own fuel stabilizer - I thought he was nuts! Anyway...I have recently learned that most fuel stabilizers are made with a high percentage if isopropyl alcohol. (rubbing alcohol) Anybody have any thoughts on making my own? I already have about 20 gallons of 99% pure isopropyl that I use for other things. Probably would only be slightly cheaper to make my own...but I think it would be pretty damn cool...:-D

[Homemade fuel stabilizer?](#) | 1 comment (1 topical, 0 editorial)

Re: Homemade fuel stabilizer? ([none / 0](#)) ([#1](#))  
 by [jubalearly](#) on Thu Sep 11th, 2003 at 08:22:09 AM MST  
[\(User Info\)](#)

These stabilizers work by breaking down the heavier molecules into lighter fractions at a more or less slow but constant rate. Gasoline is made up of a mixture of hydrocarbon molecules with various chemical formulas, and it is the lighter ones that evaporate. Breaking up some of the heavier ones that otherwise become gum or varnish replaces the lighter ones so that the gasoline will burn properly.

The isopropyl alcohol is just a carrier for whatever small amount of chemical accomplishes the above. Call a chemical engineer at a refinery near you & ask him what could do that. Or, get the MSDS for Sta-Bil or better yet whatever the military uses (it's much better than Stabil) and see what chemicals it lists.....And be sure & let us know how it works.  
 Russ

[Homemade fuel stabilizer?](#) | 1 comment (1 topical, 0 editorial)

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### [More power for portable generator?](#)

By [petegresser](#), Section [Homebrewed Electricity](#)  
 Posted on Tue Aug 26th, 2003 at 11:24:34 AM MST [Fossil Fuels](#)  
 I need help with this line of thought

I have a portable generator rated at 2200 watts powered by a 5 HP Briggs and Stratton engine, My question is this. Is it the HP of the engine that determines the maximum output of the unit? I realise the generator itself must have a bearing on this, but if I were to install a drive motor of considerably more power would I be able to make a substantial increase in generating capacity? My line of thought is that if I were to drive it with a modern, small fuel injected car engine I could connect it at a 4-1 ratio, govern the engine at 650 rpm to maintain the desired 3400 rpm at the generator and have a more fuel efficient unit that would also be capable of running a good size 12 v alternator to charge my battery bank at the same time. In cold weather the coolant could be routed to provide heating for living areas. I have not done any testing yet but I figure a 1500 cc Honda Car engine running at 650 rpm is going to consume less fuel than the Briggs running at full boogie, not to mention quieter, remote start, etc. I really need brainpower input on this, and all comments would be greatly appreciated Thanks Pete

[More power for portable generator?](#) | 7 comments (7 topical, 0 editorial)

Re: More power for portable generator? ([none / 0](#)) (#1)  
 by [laskey](#) on Tue Aug 26th, 2003 at 12:45:48 PM MST ([User Info](#))

Well... Look at it this way. A HP = 746 Watts (power wise) meaning you so your 5HP motor is capable of 3730 Watts, or just over 58% efficient. There is no way you're going to get that with a car motor.

Plus a generator is design to hit a maximum somewhere. Give it more horsepower than that and you'll just be wasting it. (mostly as heat into the generator)

It's worth a try if you're going to use the car engine to feed other stuff as well. It's going to give you the most bang for the buck "loaded well".

Cya,  
 Chris

Re: More power for portable generator? ([none / 0](#)) (#2)  
 by [wdyasq](#) on Tue Aug 26th, 2003 at 02:11:24 PM MST ([User Info](#))

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Most commercial engines have a fuel/HP/hour chart or graph available. Study of these charts will show which engine produces the most horsepower from a gallon of fuel. The "old" industry standards showed Gas engines would produce 12-15 HP from a gallon of gasoline. Many diesel engines will get 18-22 HP from a fuel that is less dangerous to handle and was less expensive.

If you do the research you will find some types of engines are much more efficient than others; there is a particular range in which an engine is most efficient and with the proper enclosure, an engine can be made quiet.

You will also find the quiet, efficient generators are not cheap and they are not found at discount tool and food stores or other "consumer" type businesses.

Ron

Re: More power for portable generator? ([none / 0](#))  
(#3)  
by petegresser on Tue Aug 26th, 2003 at 03:29:09 PM  
MST  
([User Info](#))

I guess I didn't explain myself very clearly in my original post, sorry guys. When I am using this generator and am pulling near maximum power from it the Briggs will load down and lose RPM. As this happens the voltage drops off and the throttle is wide open. If I had a more powerful drive motor that would maintain the 3400 RPM would the voltage remain at 120 even if I were attempting to pull more than the rated 2200 watts from the unit? Seems to me like the limiting factor here is the ability to keep the generator up to speed.

Thanks again  
Pete

Re: More power for portable generator? ([none / 0](#))  
(#4)  
by drdongle on Tue Aug 26th, 2003 at 04:24:42 PM MST  
([User Info](#))

A larger engine will be able to handle peak demands better than your current 5 HP unit. As to whether it's more efficient I can't say, the ability of the small car engine to perform several tasks may be a plus that negates the efficiency issue. If you have a workshop you could also connect a compressor for air tools, or even a water pump depending on your needs. Don't forget that not only the coolant but air from around the engine can be used to heat your house or the workshop or whatever.

Dr.D



Re: More power for portable generator? ([none / 0](#)) (#5)  
by JB on Tue Aug 26th, 2003 at 07:18:02 PM MST  
([User Info](#))

i was going to make a heater generator unit also. my choice is a datsun a14 engine. The water cooled continal 4 cylinder on my mash military generator is quite the gas hog and noisy than ??? but man does it blow out some heat and it does have 3 phase. JB Dayton Nevada

[ [Parent](#) ]

Re: More power for portable generator? ([none / 0](#)) (#6)  
by jubalearly on Wed Aug 27th, 2003 at 08:06:16 AM MST  
([User Info](#))

You won't be able to get much more than the 2200 watts the generator is rated for no matter what engine you drive it with. You can't get something for nothing. In this case, you have a voltage and a maximum amps that the alternator can output without overheating. Maybe you could increase the output 10-15% at the expense of engine/alternator life.

It also sounds like your existing engine is a little tired, and no longer producing rated horsepower. It is rare for a lawnmower engine to actually produce rated power for any length of time. You might try changing pulley ratio's so that the engine turns faster, and (maybe) can put out more power.

But lawn mower engines wear out very fast when they are run over 3000RPM. I'd use a bigger engine at lower speed (1800-2400 RPM would give you 3-5 times the life of one running at 3000+ RPM).

Using a small car motor for a co-generation scheme could be a good idea. But you don't want to run it at idle. Idle means that the engine is not only barely running, but barely able to run. The fuel mileage will SUCK and the engine will run terribly, and the whole thing will wear out quickly. You really want them in the 1800-2400RPM range where they can make useful power efficiently.

No matter what you do, a gasoline engine is not a cheap way to produce electricity. A good setup might cost \$.80 a kwh. By using the heat that normally is wasted, you could get about half of that back (get \$.40 of heat, if you can use it).

Re: More power for portable generator? ([none / 0](#)) (#7)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Thu Aug 28th, 2003 at 06:34:16 AM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

The wire inside of the generator will only handle the amount of power the generator was designed for. If it's a 2400 watt generator it is probably wound with 12 gage wire whis is generally rated at 2400 watts and would start overheating if you tried to pull more power from it. I suppose if you could cool the generator coils. then you could put a stronger engine on there and get more power.

How fast do you have to turn it to get 12 volts ?

.

}=- W o o f -= {

[More power for portable generator?](#) | 7 comments (7 topical, 0 editorial)

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## [Fuel economy- The Rant continues](#)

By [windstuffnow](#), Section [Rants & Opinion](#)  
 Posted on Tue Aug 12th, 2003 at 07:42:13 PM MST [Fossil Fuels](#)  
 100+ mpg and 250mpg cars now

Although back in the 70's there were cars that achieved between 50 and 100 mpg today's cars have the potential to get much better. The engines are getting smaller and more powerful... ever wonder why?

Toyota has a prototype that gets 104 mpg but by their own admission will never go into production. Look up the Toyota ES3 (Eco Sprint cubic). This is a hybrid/diesel combination. Or better yet how about a 265 mpg VW... although a bit awkward, is a tandem 2 seat with a 1 liter diesel. What do you suppose Ford, GM, and Daimler-Chrysler is up to? I believe they have more to do with trying to keep them out as opposed to trying to compete with them. Just think of the money being spent on marketing these big expensive low mileage vehicles.

See even the government promotes gas guzzlers by giving tax breaks for those that own them... are they really concerned about the environment? Probably more concerned with their pocket books. It's not technology that's to blame here it's Politics. Actually the average mpg now is lower than it was in the 80's. The government wants to set standards for fuel economy of 35mpg by 2010... 35mpg? The US is only 5% of the world population and accounts for 25% of the world's energy use ... AND contributes 36% of all greenhouse gasses!

The technology is already here... multivalve engine for better flow, change valve timing during light loads and close the exhaust valve sooner (6% increase in efficiency), let the computer set up lean burn for light loads as in cruising down the highway (another 6% in efficiency)... Optimize the transmission with better gearing (up to 9% increase in efficiency). The list continues including materials other than steel, better tires, low friction lubricants, aerodynamics, more efficient pumps, alternators that work from the motion of the car (free recovery of lost energy), more efficient power steering units and on and on and on....

You see the point any way... whew... I feel better... But I've only touched on a very small and tiny tip of what could be... and in all reality should be.

Have Fun  
Ed

[Fuel economy- The Rant continues](#) | 14 comments (14 topical, 0 editorial)

Re: Fuel economy- The Rant continues ([none / 0](#))  
(#1)

by [windtech](#) on Tue Aug 12th, 2003 at 08:38:31 PM MST  
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I agree Ed . I see those gas guzzlers every day at work and it's not only the bad fuel economy that hurts. The government controls the taxes on the fuel we put in our vehicles. What do you think will happen if all vehicles got 50,60 mpg or more. Less gas being bought, less taxes the government collects, less pocket money for the energy companies pencil pushers. Not to mention the political effects of all this. I'm not even going to go there. I heard a story on our local news about taxing electric vehicles based on the mileage on the odometer. Come on give me a break. It's obvious the old saying still holds true. The two things in life gurrenteed, Death and taxes. All this neggaitve, Government, control stuff is one of the reasons I escape in my workshop to build things out of the ordinary. Its my way of keeping my sanity.

have fun.

Re: Fuel economy- The Rant continues ([none / 0](#)) (#2)  
by Norm on Tue Aug 12th, 2003 at 09:27:25 PM  
MST  
([User Info](#))

I do the same thing go to my workshop instead of driving the car, there I try to use hand tools to save using electricity. All the time I'm spending in the shop, is time spent off the road where I don't have to watch someone trying to hurry up and get to the red light so they can slam on the brakes and stop before it changes back to green. The sad part of what I just said is that this will be read by someone that won't understand (what the \*9#! is he talking about?) Well I got that off my chest and I feel better too. Norm.

[ [Parent](#) ]

Re: Fuel economy- The Rant continues ([none / 0](#)) (#5)  
by RobC on Tue Aug 12th, 2003 at 10:21:10  
PM MST  
([User Info](#))

Yes it's a very sad situation those at the top only care about stuffing their pockets. I doubt anything will change untill the oil is gone or we can no longer get it. I believe the technology for change is here to day like Ed said but nothings going to change as long as there is plenty of oil. I am also sorry to say that I don't believe any of us can make a change in the big picture. We could sent a man like us to Washington but he would be eaten alive before he got to first base.

[ [Parent](#) ]

Re: Fuel economy- The Rant continues ([none / 0](#)) (#8)  
by windstuffnow  
([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Wed Aug 13th, 2003 at 08:20:47 AM MST  
([User Info](#))  
<http://www.windstuffnow.com/main>

I believe we can make a difference.  
Maybe not in the big picture of Politics but possibly of a secret society of tinkerer's that share devices that work.  
I'm not talking about perpetual motion machines or anything outlandish (although in my heart I would like to believe its possible for such a device to work). The Dan's have provided a window to those tinkerer's.

I don't drive much either and try to consolidate all my trips into one outing.  
If I could get groceries online.. I probably would. Some things such as materials for my projects can't be ordered online so I'm stuck with having to go and get them. My vehical already gets above the government standard for 2010 but its my right to complain about it... since I was getting better mileage in 1970. I believe there are millions of people out there that would opt for devices that would cut their utility bill, increase their mileage or simply reduce the cost of living.

Granted if one of the car manufacture's did release one of these prototypes and fuel consumption was cut in half, there would be no savings whatsoever. They would simply increase the cost to match the loss and we would be no farther ahead than when we started although we may breath much easier and storms would digress.

Enough complaining... back to the shop...

Have Fun  
Ed

[ [Parent](#) ]

Re: Fuel economy- The Rant continues ([none / 0](#)) (#9)  
by DanB on Wed Aug 13th, 2003 at 08:49:48 AM MST  
([User Info](#))



It's funny that my '30 model A gets upwards of 30mpg... I think a BIG part of good fuel milage - at least in my case, is lousy brakes :-). If the brakes are not so good, it kind of forces a person to drive in a very defensive and predictable way. Driving this way actually makes things even safer than if I had good brakes I think, and it helps fuel economy greatly!

[ [Parent](#) ]

Re: Fuel economy- The Rant continues ([none / 0](#)) ([#12](#))  
by dualsporter on Wed Aug 13th, 2003 at 04:01:15 PM MST  
([User Info](#))

Study it. Develop it. Improve it.  
Make it work. Share it only with those who understand. Then wait.  
The day will come.

Dualsporter

[ [Parent](#) ]

Re: Fuel economy- The Rant continues ([none / 0](#)) ([#3](#))  
by RobD on Tue Aug 12th, 2003 at 10:14:09 PM MST  
([User Info](#))

I go to my workshop, build things out of the ordinary and it hasn't helped my sanity one bit.  
My vehicle gets 125 mpgs. My other vehicle gets about 170 mpgs. They are both mopeds.  
My Honda 150 scooter (not one of those cheapo tiny things) gets 55 to 60 mpgs but it will do 60 mph. It's the gas guzzler of the group. The new mopeds are coming out in 4 cycle now, I'm thinking of retrofitting. I shouldn't be telling you guys (sorry ladies it's just to much of a machine for you) about the secret world of mopeds, low cost (I buy mine used with adds in the local papers), zero insurance, high mileage and the chicks you'll pick and heads you'll turn on a 'cool' moped cause there just aren't enough to go around and besides I don't want to be the one to slow the oil flow down when we just got our own oil rich country to keep the SUVs rolling along.  
Now that I'm entering 'geezerdom', well that's what Nancy says anyway, 35 mph on a moped is about right, although I do kick up the speed on the 150.  
Ed, I think you need a moped. Maybe two. Let that breeze run through your hair, chill out and thumb your nose up at Uncle Exxon.  
RobD

Re: Fuel economy- The Rant continues ([none / 0](#)) (#6)  
by elvin1949 ([elvin1949@wmconnect.com](mailto:elvin1949@wmconnect.com)) on Wed  
Aug 13th, 2003 at 12:31:48 AM MST  
([User Info](#))

say Robd  
what ever happened to the old honda S90 built in the  
late 60's  
60 mph 200 mpg  
later  
elvin

[ [Parent](#) ]

Re: Fuel economy- The Rant continues  
([none / 0](#)) (#7)  
by RobD on Wed Aug 13th, 2003 at 06:41:27  
AM MST  
([User Info](#))

Still there but I think the specs are generous.  
Figure 125-150 to the gallon and a lower top  
speed. Check Ebay. Don't want to go gas?  
Check out the electrics, charge them from your  
mill. I'm not crazy about the little scooters. Get  
the larger wheeled mopeds, they're more  
stable. Good brands are Honda, Yamaha,  
Tomos, Puch and Vespa. Nancy likes the Velo  
solex, it's claimed to have over 200 mpgs.  
Tomos sells new mopeds in the USA and in  
Europe you can still get the great names. You  
might be surprised to know that some mopeds  
have run 40 and 50 thousand miles. I'll take  
some pics and post them.

Elvin, sounds like you need a moped too!

RobD

[ [Parent](#) ]

Re: Fuel economy- The Rant  
continues ([none / 0](#)) (#14)  
by elvin1949  
([elvin1949@wmconnect.com](mailto:elvin1949@wmconnect.com)) on Wed  
Aug 13th, 2003 at 08:51:33 PM MST  
([User Info](#))

i don't need a moped  
i live in louisiana  
here you have to have everything you  
need to drive a car PLUS a motorcycle  
endorsment on your drivers lisencc to  
ride one turn signals to  
hand signals arent allowed

the specks on the honda are right i  
bought one new in 1967  
the 65cc would get 235mpg  
friend or mine had one it would do  
50mph  
later  
elvin

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Re: Fuel economy- The Rant continues ([none / 0](#))  
(#4)

by elvin1949 ([elvin1949@wmconnect.com](mailto:elvin1949@wmconnect.com)) on Tue Aug  
12th, 2003 at 10:16:12 PM MST  
([User Info](#))

good evening Ed  
i solved that problem  
[i quit driving ]  
it is 50 mile's from home to the grocery  
store and back. by no mean's is my health the best in the  
world [heart problem's]  
i ride a bicycle and pull a trailer behind it.  
it takes 5 hour's.  
50 MILE'S TO THE HAMBURGER AINT BAD  
no insurance or gas or plates to by  
later  
Elvin

Re: Fuel economy- The Rant continues ([none / 0](#))  
(#10)

by Demetri ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Wed Aug  
13th, 2003 at 09:38:21 AM MST  
([User Info](#))

Here's my take on it, for better or worse, wrong or right:

Automakers build what people will buy, and a tiny, gutless  
120mpg vehicle isn't it. Personally, I like having the  
horsepower to pull a hill without downshifting, pass the  
slower folks when I need to, and haul a load/pull a trailer.  
Fossil fuels are going to run out, whether our group does  
our part to save them or not; others won't. In the mean  
time, I want a vehicle fast enough to keep up with traffic in  
general, and still have a good bit of metal around me too.  
There's gonna be all kinds of hell breaking loose when  
fossil fuels do go down, and it will probably calm down  
after a decent alternative is found. I would rather that  
happens sooner, and gets over quicker, rather than later.  
Another consideration: I can only afford to own/operate  
one vehicle. The insurance and maintenance for second are  
beyond my means. I must be able to haul things and tow  
trailers, so I need a truck, and it's not possible to build a

high mileage truck that'll still get work done. Unloaded and driving it easy, I regularly pull 22 mpg from my truck. That's nothing compared to what you people are talking about, but I consider it a great step up from the 6 mpg my Nova got. I think a lot of people are in the same boat as me, they can only afford one vehicle, a big truck or the like may be it for the same reasons I have my truck, and hence they have nothing else to get groceries with. Though this argument does not work for the soccer mom driving the Escalade or the Navigator. Those vehicles just disgust me.

Ok, I'm getting off my soapbox now.

Demetri

Always be the lead dog.

Re: Fuel economy- The Rant continues ([none / 0](#)) (#11)  
by Dave B on Wed Aug 13th, 2003 at 11:49:18 AM MST  
([User Info](#))  
<http://www.madbbs.com/users/bruggelog>

The technology is always available to do much better. Politics regulates the release of much of this technology to a great extent and therefore the availability of current product. We will see (and are seeing) solutions to our energy needs only as it becomes critical, funny how this happens. I'm not fooled into thinking that the people on top don't care about our energy situation, quite the contrary. Milking the dollar for what it's worth demonstrates a total understanding, unfortunately these rules frustrate some (most) of us on this board who care more for prompt solutions to our environmental issues than stalling to line our pockets. Our concern and involvement in AE is the "fuel" that eventually releases either the old or our new technology (one way or the other) that will solve many of our energy problems. I don't totally agree with the system but I'm not a pot calling the kettle black either. I'm happy with my gas guzzler, I'm also happy being a part of this great group and learning AE ways because the issues are important to me and the real kicker is that it is fun. Just had to voice my opinion also. Dave B

[ [Parent](#) ]

Re: Fuel economy- The Rant continues ([none / 0](#)) (#13)  
by RobD on Wed Aug 13th, 2003 at 05:25:47 PM MST  
([User Info](#))

All and all Ed a worthy rant.

RobD

[Fuel economy- The Rant continues](#) | 14 comments (14 topical, 0 editorial)

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## [Chainsaw parts](#)

By [Demetri](#), Section [Classifieds](#)

Posted on Sun Jul 27th, 2003 at 09:46:48 PM MST [Fossil Fuels](#)

Takers, anyone?

GREAT magneto, jumps a bright blue spark 1/4 inch. I rebuilt the carb, I replaced the spark plug, and the thing won't even cough. Had fuel, had spark, checked the compression. 15 psi. Put oil in the cylinder, came up to 25 psi. I was forced to come to the conclusion that the saw was dead. It's a Craftsman/Paulan model 358.

Everything's in good shape, the bar and chain are already spoken for. I can post carb numbers if anyone's interested (maybe to cross reference to a different engine), but I'll let the whole thing, or pieces, go for the cost of shipping.

Demetri

[Chainsaw parts](#) | 5 comments (5 topical, 0 editorial)

Re: Chainsaw parts ([none / 0](#)) ([#1](#))  
by [RobD](#) on Mon Jul 28th, 2003 at 06:13:46 PM MST  
([User Info](#))

Two things. Check the reed valve, usually these things have them. Sounds like rings to me. Easy job and cheap. 2 cycle engines are mean little varmints if you ask me. That's why I like the new Honda 1.5 hp 4 cycle. Small, quiet, dependable and it doesn't shake like the diesels.  
RobD

Re: Chainsaw parts ([none / 0](#)) ([#2](#))  
by [pearl](#) on Mon Jul 28th, 2003 at 10:35:11 PM MST  
([User Info](#))

Make sure that the key that holds the fly wheel to the crank shaft has not sheared off, this will through the timing off and it will NOT fire at the right time, .  
Just a thought.

[ [Parent](#) ]

Re: Chainsaw parts ([none / 0](#)) ([#3](#))  
by [Demetri](#) ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Mon Jul 28th, 2003 at 10:38:58 PM MST  
([User Info](#))

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Thanks for the response, RobD. There's no reed valve in this engine, just a port. The way I understand it, a faulty reed valve would allow the charge to flow back out of the carburetor from the crank case when the piston is on it's down stroke, but the compression would still be fine(correct me if I'm wrong). The cylinder walls are pretty scored up, not worth the hassle or expense to have it bored(we're talking .080" here), get oversized rings and piston, all that. If you think it's worth it to you, you know the offer. Carrying case comes too.

Demetri

Always be the lead dog.

Re: Chainsaw parts ([none / 0](#)) (#4)  
by Gorilla Boy ([No Spam/gwmorris@fgisp.com](mailto:No Spam/gwmorris@fgisp.com)) on Sun  
Aug 3rd, 2003 at 09:48:38 PM MST  
([User Info](#)) <http://www.livetheword.info>

Demetri, One thing you can try (which I have to do on just about every 2 Cycle I do a carb rebuild on)is - take an oil can (you know the type you put oil in and squeeze a handle on when you want oil) and put some gas in it with a little bit of oil (or some of your mixed Gas/oil). Remove the breather and open the choke with the throttle wide open squirt a little of the mixed gas down the carb (one to two is plenty). Now try to crank it (with throttle open full and choke closed). You will probably have to do this a couple of times before it will run for more than a few seconds at a time. When it seems it may have warmed up a little you can then try to adjust the high side adjustment screw while it is running (for those brief seconds and make sure throttle is open full). 2 cycles can be tricky after a carb clean and rebuild. If you still don't want it or just don't want to mess with it, could you get me a quote for shipping to 75474.

Good Luck!

Be blessed! Gary

Re: Chainsaw parts ([none / 0](#)) (#5)  
by Demetri ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Wed Aug  
27th, 2003 at 10:38:05 AM MST  
([User Info](#))

Sorry Gorrilla, I know about priming the engine to get it to crank up. Fuel was dripping off the spark plug. I already yanked the carb and the flywheel and the magneto and tossed the rest. If any of you have a saw like this, come up with a better air cleaner. The unoled foam is junk. And no, it's not supposed to be oiled. I tried, and the saw got warmer than I like it to, and I shut it down before it over heated. That was also the case after I'd readjusted the air/fuel mix to match the lower air flow. The manufacturer does not recomend oil either.

Demetri

Always be the lead dog.

[Chainsaw parts](#) | 5 comments (5 topical, 0 editorial)

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## [Ethanol Engine \(Updates once again\)](#)

By [Andrew](#), Section [Homebrewed Electricity](#) [Fossil Fuels](#)  
Posted on Thu Jul 10th, 2003 at 11:24:10 AM MST  
**Engines coming along perfectly**

Hi,  
Brian asked how the engine was coming along.  
Well, I got the reamers 2 days ago, so now I up and back to production.  
I have most of the parts machined, but I'm rinning into some problems....  
How do I make or get rings that small?????

Also, I cannot drill and tap the top of the cylinder, until I buy a glow plug, because of the chance that I might get the thread wrong.

Its stainless piston, aluminum head, and crankcase, and I'm still working on the carburator, so that might be aluminum too.

-Andrew

[Ethanol Engine \(Updates once again\)](#) | 9 comments (9 topical, 0 editorial)

Re: Etanol Engine (Updates once again) ([none / 0](#)) (#1)  
by Demetri ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Thu Jul 10th, 2003 at 12:17:28 PM MST  
([User Info](#))

Hey Andrew, great to hear things are coming along! Most engines that size (and slightly larger, like my Magnum) don't use rings at all. The piston tapers towards the crown, so the diameter at the skirt is bigger than the diameter at the crown. As the engine runs and heats, the crown gets hotter than the skirt, and expands more, bringing the piston out to fit the cylinder. I'm sorry if you know all this already, but maybe you could do something similar? Good luck.

Demetri  
Always be the lead dog.

Re: Ethanol Engine (Updates once again) ([none / 0](#)) (#2)  
by TomW on Thu Jul 10th, 2003 at 01:19:58 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

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Andrew;

May I suggest that you post future updates on this ethanol engine to your diary rather than the front page?

It just seems to me that is a better place for it rather than posting it to the front page every time it gets down the queue a ways. After all this is exactly the kind of thing the diaries are for.

Cheers.

TomW

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Re: Ethanol Engine (Updates once again) ([none / 0](#)) (#3)  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Thu Jul 10th, 2003 at 06:18:38 PM MST  
([User Info](#))

I suppose, but it seems no one really pays attention to diaries, and it takes weeks for me to get a response.

As far as the piston, demitri, I did not know that. It seems like an interesting idea, but wouldn't it be pretty hard on the piston? Also, it seems like it could seize really easy.

-Andrew

[ [Parent](#) ]

Re: Ethanol Engine (Updates once again) ([none / 0](#)) (#4)  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Fri Jul 11th, 2003 at 04:34:59 AM MST  
([User Info](#))

Well demitri,  
I used your idea.

YESSSS!!!!

I put the tapered piston into the head, and.... I made a gas spring!  
No leaks!!!!  
It will work beautifully in the engine.

I'm leaving for Wisconsin tomorrow, so I won't be able to machine or make any progress on the engine until I come back on Tuesday.

From now on, I will post my progress on the diaries page.

For the glow plug, I'll wait until Brian gets back to me on the heat range.

Until then,



All is good!

Everything is panning out perfectly!

I expect this engine to be sputtering along late next week!!!!

It should make an interesting battery charger (probably only like 10 watts),  
I picked out a hoover vacuum motor that is 6v at 10.5A, and should work beautifully for this application.

Thanks!

-Andrew

[ [Parent](#) ]

Re: Ethanol Engine (Updates once again) ([none / 0](#))  
(#5)  
by Demetri ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Fri Jul 11th, 2003 at 11:15:32 AM MST  
([User Info](#))

I'm glad it's working out, hope you have fun in Wisconsin.

Demetri  
Always be the lead dog.

Re: Ethanol Engine (Updates once again) ([none / 0](#)) (#6)  
by Brian on Sun Jul 13th, 2003 at 12:35:19 AM MST  
([User Info](#))

I agree a tapered piston would work well, but we all know metal expands as it heats up. If the clearance between the skirt and the cylinder wall is too tight when the engine is cold, you could end up with a seized piston and a busted crankshaft if the thermal expansion isn't taken into account. If you know the exact composition of the metal you're dealing with, it's possible to calculate the thermal expansion of the piston so you can machine for the proper clearances at normal operating temperatures to ensure the engine will operate at temperature without excessive wear...or worse. The one good thing about burning ethanol as opposed to gasoline is the fact that the engine should run close to 40 degrees cooler which could lessen the thermal effects.

I would hate to see your hard work go down the drain, so just something to think about.

Regarding the temp calculations, you haven't given me the exact dynamic compression ratio so any numbers would not be accurate. Have you actually machined the intake and exhaust ports yet? I can't run the numbers without it!! :-)

I didn't see any intake or exhaust ports in your drawings, nor did I see an internal passage which would allow the pressurized fuel to flow from the

crankcase to the intake. How will the fuel get from the crankcase to the cylinder?

Brian

[ [Parent](#) ]

Re: Ethanol Engine (Updates once again) ([none / 0](#)) (#7)  
by Demetri ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Mon Jul 14th, 2003 at 10:00:39 PM MST ([User Info](#))

I'm sorry Andrew, I had it backwards. The cylinder in the engine I spoke of is tapered, the piston is straight. The top of the cylinder is ever so slightly smaller than the bottom, and when cold the piston actually binds a little at tdc. The best way I can think of to achieve this would be to heat the cylinder on one end to operating temperature, bore straight, and let it contract as it cools. Hope I didn't goof up things too badly. You might try running that piston anyway, I believe aluminum would expand more than stainless steel, your cylinder would pull itself away from the piston, probably allowing excess blow by but I doubt it will ruin anything. I'm really sorry, good luck.

Demetri

Always be the lead dog.

Re: Ethanol Engine (Updates once again) ([none / 0](#)) (#8)  
by Brian on Tue Jul 15th, 2003 at 08:22:52 PM MST ([User Info](#))

Yes, aluminum does expand thermally more than steel does. Mild steel has a thermal expansion coefficient of around 0.0000126/deg C and aluminum is around 0.0000240/deg C. These numbers will obviously change depending on the exact composition of the steel and aluminum. The above numbers have no unit of length associated with them either. Here's a sample calculation of how you would calculate the expansion of a mild steel rod.

Length of rod= 50 mm  
Change in temperature= 200 deg C  
Thermal expansion= 50mm x 0.0000126/deg C x 200 deg C= .126 mm expansion in all directions.

Andrew, I noticed you said you used an aluminum head and steel piston. Did you sleeve the cylinder? The steel piston against the aluminum will cause it to wear out pretty quick.

Good luck, Brian.

[ [Parent](#) ]

Re: Ethanol Engine (Updates once again)  
([none / 0](#)) ([#9](#))  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on  
Wed Jul 16th, 2003 at 04:06:26 PM MST  
([User Info](#))

I'm back!

No, I do not have a sleeve.

It would wear pretty quickly now that I think about it.

I'm going to have to machine the cylinder head. I'll make the piston out of aluminum, and a slightly taper piston, top being biggest, and then have the head machined out of stainless. Since the aluminum will expand about twice as much as the steel, I'll have large heat sinks machined on the side of the head. The aluminum should expand ever so slightly in the cylinder, thus the top being a perfect seal, and the bottom expanding to fit. About the seizing, I'll probably have to heat up the engine a bit before I start it, just so I avoid this problem.

I'll get back to you on where the intake and the exhaust ports will be.

Thanks!

-Andrew

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[Ethanol Engine \(Updates once again\)](#) | 9 comments (9 topical, 0 editorial)

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## [Ethanol Engine \(updated\)](#)

By [Andrew](#), Section [Homebrewed Electricity](#)

Posted on Fri Jun 27th, 2003 at 11:39:53 PM MST

[Fossil Fuels](#)

Ethanol powered lawn boy.

---

Hi,  
I just got a old stihl weed eater motor. The thing was trashed! After an afternoon of fixing up the piston, the recoil unit, I got it running! Just need to adjust the carb to allow lower idling speeds. The nasty oily smoke though just screamed for the engine to be converted to ethanol. (I know one distributor down here in Colorado Springs, on 8th street I think) So, I was told that I need to adjust the carb for a richer mixture of ethanol/oil mix. How do I go about this.  
Finally, anyone know a alcohol soluble oil for 2 cycles. If so, what proportions should I mix?

Thanks  
-Andrew

P.S.  
The Machining process of the tiny ethanol engine is progressing! Got the pistons and the crankcase done. But when I went to machine the head I found out I have a chipped reamer! Looks like I'll have to take it in the shorts and buy a 3/8ths reamer and a 1/2 one too. (Anyone know any good machine tool places for internet order?) (3/8 needed for valve assembly) I'll keep you posted as both projects progress.

-Andrew

[Ethanol Engine \(updated\)](#) | 24 comments (24 topical, 0 editorial)

Re: Ethanol Engine (updated) ([none / 0](#)) ([#1](#))  
by Demetri ([corvettemach1@yahoo.com](#)) on Sat Jun 28th, 2003 at 12:21:43 AM MST  
([User Info](#))

Castor works, and there are a couple synthetics and synthetic/castor blends, though I don't know if they'll offer enough protection for the weed eater motor. Most model airplane engines burning the same stuff use 10-30% oil <I'm not a small engine mechanic, nor a fuel chemist, try at your own risk>. You might find it sold separately from the fuel at hobby shops(or buy the fuel pre-mixed, with nitro!) for those who like to mix their own fuel. Good luck. Demetri  
Always be the lead dog.

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Re: Ethanol Engine (updated) ([none / 0](#)) (#2)  
by Brian on Sat Jun 28th, 2003 at 01:07:01 AM MST  
([User Info](#))

Sorry I took so long but I have been busy with other projects. That weedeater will run just fine on ethanol. Adjust for about a 9:1 air/fuel ratio which is richer compared to the 12:1 mixture used in gasoline engines. Just find the mixture adjusting screw on the carb and back it out to richen it up. Run it for a while and be sure the plugs arent white. If they are, the fuel mixture is too lean and it will run hot. As far as the fuel/oil mixture, try to mess with the fuel/oil mixture ratio until it smokes just a LITTLE while on the throttle to be on the safe side. Now for the temps for your other project....I believe you said u were going for a 12:1 compression ratio. How did you figure this is what you will end up at? Dynamic compression ratio will be lower than the static compression ratio. I would have to see the intake and exhaust design to know what volumes to use to figure out the CR you will be running at. If you want, send me your latest drawing and I'll take a look and tell you what to use to compute the actual compression ratio. It doesn't make much sense to do the math on the temps until I have that. If you're sure it's 12:1, let me know and I'll figure the temps using that ratio. Keep us posted of your progress. I expect it will run just fine using a glow plug setup!

Re: Ethanol Engine (updated) ([none / 0](#)) (#3)  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Sat Jun 28th, 2003 at 01:26:27 AM MST  
([User Info](#))

This is static I believe. I did it by just checking the heights. I'll send you the dxfs. I'll post them asap. Thanks for your help.  
I can change the compression ration if this is a problem.  
-Andrew

[ [Parent](#) ]

Re: Ethanol Engine (updated) ([none / 0](#)) (#4)  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Sat Jun 28th, 2003 at 02:59:10 AM MST  
([User Info](#))



Well here is a pic of the rendered pattern but showing the hidden lines to reveal the piston and the crankshaft.



Sorry, it is big, admin could you reduce it again.

You can also see the glow plug and the coil at the top of the cylinder.  
I do not have the exhaust or intake on this. I will do this upon request.

Keep in mind that this thing is a two cylinder machine, and I have only drawn up one cylinder to keep it simple.

Here is the dxfs of this...

["http://www.otherpower.com/images/scimages/248/crankcase\\_and\\_cylinderhead.dxf"](http://www.otherpower.com/images/scimages/248/crankcase_and_cylinderhead.dxf)

just right click it and hit "save link target as" or some thing similar.

It should start downloading. Open it with autocad or similar.

I can also put up a 3d cadkey pattern if yall want to do cool stuff with it (like spin the rendered model at any angle, etc. just another reason to get cadkey)

-Andrew

(Brian, the total stroke length is 0.4 the and the the cylinder depth is 0.43 excluding the height of the piston (which if included the total height would equal 0.83) and the volume in the glow plug. I look forward to seeing the temp ranges. If you need the exhaust and intake, I will add them asap THANKS!)

[ [Parent](#) ]

Re: Ethanol Engine (updated) ([none / 0](#)) ([#5](#))  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Sat Jun 28th, 2003 at 03:00:56 AM MST  
([User Info](#))

Wow, Admin did you change the code? It was posted normal sized! Thank you!

-Andrew

[ [Parent](#) ]

Re: Ethanol Engine (updated) ([none / 0](#)) (#7)  
by Brian on Mon Jun 30th, 2003 at 02:42:05 PM MST  
([User Info](#))

Sorry I haven't replied sooner. In order to figure out the dynamic compression, you need to take some measurements. How did you design the intake and exhaust?? The dynamic compression will vary greatly depending on how you set it up. Go ahead and post a description of your design and I'll tell you where to take your measurements from to figure the ratio.

BTW, if you want the picture to show up the same size on everyone's computer regardless of the resolution they're running at, use the HTML formatted option when posting and use the tag below. I'll use the filename engine.jpg but you can change it depending on your file name and server addy.

```

```

This will make the picture take up 80% of the screen width no matter what size monitor the person viewing it is using!! No more scrolling sideways!

[ [Parent](#) ]

Pictures, reducing them in comments. ([none / 0](#)) (#9)  
by TomW on Mon Jun 30th, 2003 at 03:26:09 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Andrew;

Sorry, I would gladly do that but Admin / Editors cannot alter comments in any manner other than deletion. And thats how it should be. Can't be revising ppls comments you know.

But i feel fairly confident your program should be able to output a smaller picture or you can learn the height and width tags for html in about 10 minutes.

Cheers.

TomW

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[ [Parent](#) ]

Re: Ethanol Engine (updated) ([none / 0](#)) ([#6](#))  
by RobD on Mon Jun 30th, 2003 at 08:00:58 AM MST  
([User Info](#))

Nice Job! I have a Stihl chain saw that has run great for years. The fuel oil ratio is 50/1. You shouldn't get that much smoke out of it, I don't. Also 2 cycle engines are more prone to ceasure when the oil is RICH in the mixture. These engines also run on Hi-test gas. For those of you not familiar the difference in hi-test and regular is the speed of burning. Hi-test burns SLOWER than regular this prevents ugly things like pinging that can eventually burn a hole in your piston. I don't know the octane of ethanol but you might want to play with your timing if it is on the low side. RobD

Re: Ethanol Engine (updated) ([none / 0](#)) ([#8](#))  
by Brian on Mon Jun 30th, 2003 at 02:51:44 PM MST  
([User Info](#))

Ethanol has a higher octane rating that gasoline does so he shouldn't have any problem with pre-ignition.

You're right about the speed of combustion. Many people confuse a high octane rating for high volatility which is wrong. The octane rating is the fuels ability to resist knock, AKA pinging or preignition. The slower the fuel burns, the better it is at resisting preignition. The higher the octane rating of the fuel, the higher one can raise the compression ratio without preignition. A higher compression ratio creates more power!!

It will be interesting so see what fuel/oil ratio will end up working the best for this application. This is definitely a guess and check type experiment!! All very good points though! Brian

[ [Parent](#) ]

Re: Ethanol Engine (updated) ([none / 0](#)) ([#10](#))  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Mon Jun 30th, 2003 at 04:06:33 PM MST  
([User Info](#))

I make the intake/exhaust on the drawing. I'm not really sure where to put them other than the exhaust should be a little bit higher in the cycle than the intake.  
I think one problem with high octane fuel though is the fact that with lean fuel mixures you will get detonation. I believe this you will also hear a "ping" because its the speed of the engine slamming down so fast that it get hit against the side of the cylinder. This is probably why most engines run on a rather rich fuel/air mix like 10: 1  
I think pinging starts for normal gasoline at about 18-22: 1

-Andrew

(Could you post why and where the intake/exhaust is where they are.)

[ [Parent](#) ]

Re: Ethanol Engine (updated) ([none / 0](#)) ([#11](#))  
by mkseps on Mon Jun 30th, 2003 at 04:12:01 PM MST  
([User Info](#))

Pure ethanol has an octane between 107 to 113. It is much higher than automobile high test gasoline. Gene

[ [Parent](#) ]

Re: Ethanol Engine (updated) ([none / 0](#)) ([#12](#))  
by Brian on Mon Jun 30th, 2003 at 05:08:00 PM MST  
([User Info](#))

Hi, I'm guessing you meant that the intake and exhaust are labeled on the drawing file you posted. I wasn't able to open it so I can't comment!! Does Cadkey allow you to save it as a \*.dwg file?

Regarding the intake and exhaust design....in a 2-cycle engine the fuel/air mixture is forced into the combustion chamber during the down stroke of the piston. During the upstroke the mixture is compressed. When the piston gets close to TDC, the glow plug ignites the mixture.....forcing the piston back down. As the piston moves back down, exhaust gases escape through the exhaust port while the fuel mixture re-enters the cylinder.

Regarding pre-ignition, you are correct for the most part. High octane fuels do not vaporize as well as lower octane fuels do. This lack of vaporization causes much of the mixture to remain as a liquid instead of the dry vapor necessary for efficient combustion. Since there is less fuel in the fuel/air mixture, the mixture is often way too lean....causing detonation and internal damage!! So in the case of higher octane fuels, it is the octane rating iteself that often causes the lean mixture, resulting in detonation. This is the reason you need to richen the mixture when burning ethanol.

However, most gasoline engines do not run at a fuel/air ratio of 10:1. Between 11.5 and 12:1 is the norm for most 4 stroke gasoline engines.

Hope this helps, Brian.

[ [Parent](#) ]

Re: Ethanol Engine (updated) ([none / 0](#)) ([#13](#))  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Mon Jun 30th, 2003 at 08:39:12 PM  
MST  
([User Info](#))

Sure, I can do \*.dwg files.  
I was meaning that I haven't drawn the exhaust or intake on the engine. I really don't know the exact height of where they should be placed. Could you tell me how this is done? (what exact height should the exhaust and intake be.)

I'll post the \*.dwg.

-Andrew

[ [Parent](#) ]



Re: Ethanol Engine (updated) ([none / 0](#)) ([#14](#))  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Mon Jun 30th, 2003 at 08:42:10  
PM MST  
([User Info](#))

Here they are.

Just right click and hit "save file as" or some sort like that.

["http://www.otherpower.com/images/scimages/248/ethanolengine.dwg"](http://www.otherpower.com/images/scimages/248/ethanolengine.dwg)

Hope this helps

-Andrew

[ [Parent](#) ]

Re: Ethanol Engine (updated) ([none / 0](#)) ([#15](#))  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Wed Jul 2nd, 2003 at  
02:37:24 AM MST  
([User Info](#))

Brain, whats the deal?

I posted the dwgs, and you haven't got back yet. Sorry to sound impatient, your probably just busy.

Anybody can look at the schematics if they want. I would bw happy to recieve any feedback.

Also does anyone know any good cheap machine tool places?

-Andrew

[ [Parent](#) ]

Re: Ethanol Engine (updated) ([none / 0](#)) ([#16](#))  
by Brian on Thu Jul 3rd, 2003 at 12:47:43 AM MST  
([User Info](#))

Yes, I have been busy....Sorry about that. I have been working on a prototype solar collector for OREC. Fun stuff!!

Regarding your drawings....very nice. The conversion worked just fine. How does Cadkey work for coil/spring drawings like those used for your glow plug drawing? Just curious if it's easier than the method used in AutoCAD. In AutoCAD, you have to use an AutoLISP to extrude a 2D object about the spring path to create the 3D solid drawing of the coil. Kind of a pain.....

Ok, now for the intake and exhaust. The exhaust port will need to be slightly higher than the intake port to allow the exhaust gases to escape just before the fresh fuel mixture enters the cylinder. You will want the intake port to be fully open just as the piston hits bottom dead center. When the piston reaches BDC, the pressurized fuel mixture will flow through the intake port into the combustion chamber for the power/exhaust stroke.

In order to make this work, you need to incorporate a reed valve into your design. It's essentially a one way valve that allows the upward motion of the piston to suck fuel in from the carb but not allow it to leave when the piston begins its downward motion....pressurizing the mixture for injection once the piston moves past the intake port.

In your design, I see no intake port that will utilize the downward motion of the piston to pressurize the fuel. The fuel MUST enter the crankcase in a 2 stroke design, not through the top of the cylinder head.

I'll try to make some time in the next few days to tinker with your drawing and post the required design features.

Hope this helps. Brian

[ [Parent](#) ]

Re: Ethanol Engine (updated) ([none / 0](#)) ([#17](#))  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Thu Jul 3rd,  
2003 at 12:58:30 AM MST  
([User Info](#))

## Solar collectors... Tricky business

Thanks for the tips.

I do have a valve. I can't believe you didn't see it. Its that green thing sticking out the side. It has that yellow valve on the inside. It is a poppet valve instead of a reed, and the fuel intake for it is on the side, drilled at an angle.

Take a close look.  
I'll post a close up of the valve system for you.

-Andrew

[ [Parent](#) ]

Re: Ethanol Engine (updated) ([none / 0](#)) ([#18](#))  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Thu Jul 3rd, 2003 at 01:09:12 AM MST  
([User Info](#))

First, its easy for the springs. Just go over to draftpak (a part of cadkey package) and select spring. It will ask how many windings, and the thickness of the wire.

Here are the images of the valve I was talking about.



Sorry if they are big.

Thanks  
-Andrew

[ [Parent](#) ]

Re: Ethanol Engine (updated) ([none / 0](#)) ([#19](#))  
by Brian on Thu Jul 3rd, 2003 at 11:19:04 AM MST  
([User Info](#))

LOL, I saw your valve on the side of the crankcase. I'm not that blind!! What I didn't see is how the pressurized fuel/air mixture is going to flow from the crankcase to the cylinder!!! There is normally an internal passage from the crankcase to the cylinder that is opened when the piston passes a certain part of the stroke, allowing the fuel/air to flow into the cylinder to be burned on the next intake/combustion stroke.....somewhere near BDC.

How will you accomplish this???

Regarding the solar collector, it's not as bad as one would think. We're working on a new design that will maximize efficiency without tracking regardless of the time of day. The design is meant to concentrate the rays in order to quickly heat water while also generating electricity. It's the first of it's kind design wise, and we hope to have refined the design by next summer for testing. Preliminary data look very promising, but only time will tell.

[ [Parent](#) ]

Re: Ethanol Engine (updated) ([none / 0](#))  
([#20](#))  
by Brian on Thu Jul 3rd, 2003 at 11:25:46 AM  
MST  
([User Info](#))

One more thing...PLEASE use the image tag I posted a few posts ago to keep the pictures smaller than the screen. In case you didn't see it, here it is again.

```

```

This will scale the image down to only take up 80% of the width of the screen without changing the aspect ratio. You can change the percentage to whatever you'd like if 80% is too large. Please use it!!

[ [Parent](#) ]

plain and simple courtesy ([none / 0](#))  
([#21](#))  
by Anonymous Hero on Thu Jul 3rd,  
2003 at 11:54:52 AM MST

Yeah i see a lot of attitude from this user.  
I have some ideas for andrew but i don't  
respond to attitude.

Anonymous because i want to be.

[ [Parent](#) ]

Re: plain and simple courtesy  
([none / 0](#)) ([#22](#))  
by Andrew  
([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on  
Thu Jul 3rd, 2003 at 06:07:39 PM  
MST  
([User Info](#))

Attitude???? What do you mean? I try and be as curious and friendly as possible. Sorry to offend you.  
-Andrew

[ [Parent](#) ]

Re: Ethanol Engine (updated) ([none / 0](#))  
(#23)  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Thu Jul 3rd, 2003 at 06:18:39 PM MST  
([User Info](#))

I was thinking on just using an endmill, and buzz the side a bit at the appropriate length. I just ordered a couple of reamers yesterday, so production should be up and running by next week. (I can't wait to get the new swivel vice for my mill) Also, I'm having trouble figuring this out, how do such tiny engines use rings, and how does one go about manufacturing them. I was thinking on using a cobalt or tungsten disc the right size, and very slowly drill out a hole, and then grind a tiny slot on the side to allow compression against the walls of the cylinder. -Andrew

[ [Parent](#) ]

Re: Ethanol Engine (updated) ([none / 0](#)) (#24)  
by Brian on Thu Jul 10th, 2003 at 12:50:11 AM MST  
([User Info](#))

Hey Andrew. Been gone for a while.  
How's the engine coming??

[ [Parent](#) ]



[Ethanol Engine \(updated\)](#) | 24 comments (24 topical, 0 editorial)

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[Ethanol Engines](#)

By [Andrew](#), Section [Homebrewed Electricity](#)

Posted on Wed Jun 18th, 2003 at 03:36:31 PM MST

[Fossil Fuels](#)

Does anyone know the differences.....

Hi,  
 I'm drawing up some dxfs for a 2 cycle alcohol engine, but i'm running into trouble.  
 First, I have been researching on the web, and nobody really has a site explaining the differences between a gasoline, and a alcohol 2 stroke engines.  
 I plan to make this a diesel cycle.  
 Second, one problem I have, is I don't want to mix lubricant with the alcohol, as it totally voids all reasons for using alcohol in the first place.  
 Third, the only solution I can come up with is designing an otto cycle engine. (sealed crankcase) this would prevent the mixing between oil, and alcohol.  
 Finally, I would like to stay away from otto cyles, until I get some experieance machining engines.  
 Thanks.  
 -Andrew  
 (p.s., is there any funky carborator I need to machine to run a ethanol otto cycle?)

[Ethanol Engines](#) | 28 comments (28 topical, 0 editorial)

Re: Ethanol Engines ([none / 0](#)) ([#1](#))  
 by [Brian](#) on Wed Jun 18th, 2003 at 05:59:21 PM MST  
[\(User Info\)](#)

That'll be a tough one for sure. You could just as easily set up an oiling system similar to a 4 stroke engine while burning ethanol to lubricate your cylinders, bearings, etc. Sounds like you're building the engine from scratch so that shouldn't be a problem in your 2 stroke.

If I had to choose I would go with the Otto over the diesel or any two stroke cycle any day for burning ethanol. Otto cycles are more efficient IF you can up the compression without pre-ignition. Ethanol or ethanol blends(gas/ethanol mix) allow you to increase the compression ratio substantially which increases efficiency.

Is this just an experiment to see what can be done or is it going to be used for something? If it's actually going to be used just pick up a used 2 stroke engine about the size you need and make the convesion over to ethanol. It's just a matter of changing the jets to accomodate a richer mixture. Increasing the compression ratio is not required, although it will aid in increasing the efficiency and power output of your engine.

Ethanol is definitely a much cleaner burning fuel so I can see why you woudn't want to mix it with 2 stroke oil for lubrication. You're machining the engine yourself so add an oil pump and oil galleries to splash lube the cylinder, rings, and get some decent oil pressure to the bearings.

Hope this helps! Brian

Re: Ethanol Engines ([none / 0](#)) ([#3](#))  
 by [Andrew](#) ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Wed Jun 18th, 2003 at 06:37:57 PM MST  
[\(User Info\)](#)

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It is an experierment, but it will be used for something. The one i'm machining will fit in the palm of your hand. I plan to build a much larger one after this (probably otto cycle) to power a small battery charger. I'm confused. Do I need a much larger compression stroke than a normal gas burning one? How do I prevent preignition on an ethanol engine? The reason I'm leaning towards a diesel cycle is It would be a much simpler design, and I wouldn't need a sparkplug. Now, I'm not sure about the compression ratios of ethanol, and what point does it ignite? I'm not trying to sound stupid, I just never worked with ethanol before.

[ [Parent](#) ]

Re: Ethanol Engines ([none / 0](#)) (#4)  
by Brian on Wed Jun 18th, 2003 at 08:48:05 PM MST  
([User Info](#))

Wow, that's tiny!! Given the extreme compression ratios of a compression ignition engine, I'd be worried about it holding together. It's definitely easier than trying to set up a spark ignition system for an engine of that size though. Timing it would be a pain.

Regarding the compression ratio.....you DO NOT have to increase the compression ratio over common Otto cycle pressures as it will run regardless. 8.5-9.5:1 is perfectly fine for ethanol although not ideal for power output.

Ethanol has a higher octane rating which allows you to run a higher compression without pre-ignition problems which increases power. However, since you're planning on making this a compression ignition engine, the compression ratio needs to be much higher to ignite the ethanol without a spark.

I'll look in my books to see if I can find the info on what compression ratio is required to ignite ethanol and post back later tonight or tomorrow.

[ [Parent](#) ]

Re: Ethanol Engines ([none / 0](#)) (#27)  
by jubalearly on Mon Jun 23rd, 2003 at 04:38:23 PM MST  
([User Info](#))

I'm not sure you can use alcohol to diesel. It has to ignite and BURN CORRECTLY under the compression you can apply. I think you can go to about an 18:1 compression with ethanol, but it won't diesel (it will knock or detonate first, just like gasoline does when the octane (or cetane) is too low. See if there is a Cetane number for alcohol - if there ain't it isn't a sane diesel fuel.....

How about a Wankel rather than a 2-cycle?

Russ

[ [Parent](#) ]

Re: Ethanol Engines ([none / 0](#)) (#28)  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Mon Jun 23rd, 2003 at 08:10:32 PM MST  
([User Info](#))

Wankel engines seem rather impossible to machine for the current hobbist. I was thinking on an atkinson type engine too...

-Andrew

[ [Parent](#) ]

Re: Ethanol Engines ([none / 0](#)) (#2)  
by elvin1949 ([elvin1949@wmconnect.com](mailto:elvin1949@wmconnect.com)) on Wed Jun 18th, 2003 at 06:08:47 PM MST  
([User Info](#))

Andrew

a 2 stroke motor has to have oil in the fuel  
an alcohol motor uses castor oil [regular oil will not mix with alcohol].  
Needs a much higher compression ratio to work well  
[won't run on gas it will melt down].  
It will have to have larger jet's in the carb  
than a gas motor [much larger].  
have fun  
Elvin

Re: Ethanol Engines ([none / 0](#)) (#5)  
by Brian on Wed Jun 18th, 2003 at 08:54:58 PM MST  
([User Info](#))

Just another thought.....most RC engines are two stroke and run on an alcohol/oil blend.  
If you can get your hands on one of those, just rig up an adaptor to connect a  
compression tester to it to get an idea of the kind of pressure you'll need to have to ignite  
the fuel and just go ahead and burn RC fuel. 20% or so would be great. Using the  
pressure reading from the RC car, you can easily calculate the compression ratio you'll  
need to achieve that pressure. You will have to run a glow plug though.....

Re: Ethanol Engines ([none / 0](#)) (#6)  
by Anonymous Hero on Thu Jun 19th, 2003 at 02:02:47 AM MST

Andrew, just like brian sayed you will need to mix the alchol. Your best bet is to talk  
to some model airplane flyers. they have experience with cox engines and be able to  
tell you what compression ratios you need and what percentage alcohol blend you  
need.

[ [Parent](#) ]

Re: Ethanol Engines ([none / 0](#)) (#7)  
by Gordy on Thu Jun 19th, 2003 at 11:22:41 AM MST  
([User Info](#))

Andrew,

As a fomer R/C (remote control) junky I can add that as you go from spark to glow to  
diesel the compresion goes up. The R/C diesels use a specal blend of feul, containing a  
certain amount of either (starting fluid) to lower ignition presure.

You might want to try checking out Dasvis Diesels , they advertize in the back of most  
R/C mags. And are probably on the net too. What they offer is a diesel conversion kit,  
which is prety much an adjustable compression head. The head is a little over sized than  
the original contianing a cylinder, a piston, and a set screw. The set screw alows you to  
adjust the heads piston up or down to control ignition timing.

Don't forget that the higher the compresion ratio the heavier duty every thing has to  
be. I found this out after boring , stroking, ect..... my Harly . It goes like hell , but it just  
isn't lasting like a stock one would.

Hope some of this helps,  
Gordy

Re: Ethanol Engines ([none / 0](#)) (#8)  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Thu Jun 19th, 2003 at 03:58:01 PM MST  
([User Info](#))

Thats a novel idea. Adjusting the height for optimum compression. I'll try that. Now.... What is the different between a glow plug and a diesel? I'm currently machining heat sinks and the head, how hot do you think this thing will run? Also, I have a small poppet valve as the fuel intake to the crankcase. will this be a problem for the fuel inlet? Finally, I saw a design on the net a while ago, and it was an alcohol burning engine, that was 2 cycle, but had a completely seal crankcase, so the fuel was injected into the cylender when the piston reached a certain height. It worked on the principle, that when you first started it, there would be alcohol vapor in the intake. when you started it, it would heat up and heat up the coils of small copper wire around the head. this would then vaporize the alcohol, and it would be ready to be injected into the cylender. It would have a weird type of carbtorator, in which the alcohol vapor would blow by a tube with air inlets, (kinda like a propane torch) to get the right fuel/air mixture, right before it reached the cylender. Does this sound at all possible?

[ [Parent](#) ]

Re: Ethanol Engines ([none / 0](#)) (#9)  
by Brian on Thu Jun 19th, 2003 at 04:23:44 PM MST  
([User Info](#))

There is no difference. Diesels have glow plugs that get the engine started. Once the engine is running, the compression alone is enough to ignite the fuel. Believe it or not, Ethanol has a higher self ignition temperature diesel does. The auto ignition temperature of ethanol is between 365-425 degrees C which is around 750 deg F. Diesel self ignites at temps of around 480 deg F which makes it much more ideal to use in a compression ignition engine.

You're going to have trouble starting the engine on ethanol without a glow plug. Once the engine is warmed up, take the glow starter off the glow plug and it should remain running on compression ignition alone assuming the compression is high enough. Preheating the alcohol using exhaust gases would be optimal to ensure proper vaporization and combustion.

Regarding the fuel/air mixture, around 9:1 is optimal for ethanol. I would use a needle valve type carb like those found on small RC engines for simplicity and ease of adjustment. Throttle and mixture control is simple and easy to adjust.

I'll crunch the numbers and post them to give you an idea of what compression ratio you'll need to ignite the ethanol on compression alone. It won't run if you don't have it right.....

[ [Parent](#) ]

Re: Ethanol Engines ([none / 0](#)) (#10)  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Thu Jun 19th, 2003 at 09:09:56 PM MST  
([User Info](#))

Thanks! That would be a great help, as I can now get the heights, and the compression ratios right on my design. The head is the only thing I have to finish, and I'm done. I'll give you the cadkey files if you want them (autocad dxfs if you dont want to download the cadkey viewer) Its looking very impressive! Especially in solids 99, it is amazing what it looks like in 3D! Now, how much of a vacuum do you think the piston will pull in the case as it is compressing (intake, letting fuel in the crankcase via the valve) Do you think it will be enough to open a poppet valve? (probably, considering the fuel on the otherside is probably under pressure.) For the compression ratios, what do you think would be easier to control for timing: Octane percentage, fuel/air ratio, or height of stroke/ compression ratio. (within reason)

[ [Parent](#) ]

Re: Ethanol Engines ([none / 0](#)) ([#15](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Fri Jun 20th, 2003 at 07:26:44 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Oil and oxygen under pressure is an explosive mixture. Hence the warning about using oil as a seal on your torches oxy tank . Also this is why they don't use air as the working gas of a pressurized stirling engine.... The bearings explode.

Have Fun!  
Ed

[ [Parent](#) ]

Re: Ethanol Engines ([none / 0](#)) ([#12](#))  
by Gordy on Fri Jun 20th, 2003 at 11:34:11 AM MST  
([User Info](#))

Andrew,

Gordy here, the differences between glow and diesel are

1. compression ratio, the diesel being higher.
2. is the ignition process once running. The glow plug engine does not create enough heat to start with out energizing the glow plug . Once running the combustion process keeps the element in the glow plug red hot so the power can be disconnected from the plug. I read (years ago) that the element is coated with platinum to give it a catalitic efect to keep it hot.

The diesel does'nt need a glow plug to start, because of the higher compression ratio. Exept in cold whether it does make it easier to start them. As witnessed by my 84 suburbine with a 6.2 diesel it will start easily in temps down to 25 or 30 degrees with out engaging the glow plugs. Also for the 5 or 6 years I've been driving dump trucks, tankers ect none of them have glow plugs. At 10 degrees and below it's a good idea to have a can of starting fluid on hand, though use it sparingly to much can make things go boom in a bad way!!!

3. the feul is also a different recipe or blend if you will.

An interesting note one of the trucks I drive (a 50,000# gross tanker) has a 300 somthing two strock Detroit diesel. This engine has a standard oil type crank case and a gear driven blower mounted to the side of the engine. At 60 mph the engine turns 2,200 rpms, and is screaming so loud I wear ear plugs.

Good luck,  
Gordy

[ [Parent](#) ]

Re: Ethanol Engines ([none / 0](#)) ([#11](#))  
by Anonymous Hero on Fri Jun 20th, 2003 at 11:07:09 AM MST



diesel engines commonly have around 450 plus psi of compression other problems you will encounter with you design will be preignition, as you cannot have a diesel cycle with carburation, the fuel mix will ignite too early as the engine warms up and this will quickly melt it down, destroying it you will need some form of injection system to get the methanal into the chamber at the precise time needed. smaller engines are more tolerant of detonation or preignition. the larger the bore size the less tolerant they become. other concerns with diesel engines are they have to be made heavier as vibration is a problem and a small 2 cycle engine converted to diesel operation would not last very long, in my opinion. glow plugs in diesel engines serve a different purpose to that of a RC engine, in a diesel they heat the intake air charge to get the engine running, and then they are shut down. in a RC engine they not only start the engine but they also retain heat from the previous ignition cycle to ignite the next cycle. the RC engines are not running as diesels when you disconnect the glow plug. bob g

Re: Ethanol Engines ([none / 0](#)) ([#13](#))  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Fri Jun 20th, 2003 at 03:55:21 PM MST  
([User Info](#))

Just a thought.... Has anyone ever tinkered with piezo spark ignition? -Andrew

[ [Parent](#) ]

Re: Ethanol Engines ([none / 0](#)) ([#14](#))  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Fri Jun 20th, 2003 at 04:01:19 PM MST  
([User Info](#))

Very strange.... So the glow plug is the ignitor for the next cycle? It doesn't make sense, wouldn't you get pre-ignition before the piston reached the top of the stroke? Also I read somewhere, that normal "diesel" glow plugs were made out of tungsten, I thought that sparkplugs were always plated in platinum at the spark gap. -Andrew

[ [Parent](#) ]

Re: Ethanol Engines ([none / 0](#)) ([#16](#))  
by Anonymous Hero on Fri Jun 20th, 2003 at 08:58:50 PM MST

preignition on these tiny engines, as most all of the RC versions are is of little consequence, the chambers ability to dissipate heat is much greater than in larger displacement engines, also one might note that the life span of an RC engine is quite small in comparision to the 10 of thousands of hours larger diesels are designed to run. first spark plugs were mostly a steel electrode as they still are on the cheaper ones at least on the negative electrode or strap, then as time went on tungsten was used to increase life span of the plug and more recently platinum has been used on both center and ground electrodes, to further increase lifespan bob gayle

Calculations..... ([none / 0](#)) ([#17](#))  
by Brian on Sat Jun 21st, 2003 at 01:24:47 AM MST  
([User Info](#))

Ok, I'll run the numbers IF you want to run on compression ignition alone and let you make the choice on what's best for your design.

State 1 will be piston at bottom dead center and state 2 will be the piston at top dead center. We'll use a relatively cold outside air temperature to ensure the engine will fire even on colder days.

$$(P2)/(P1) = (Pr2)/(Pr1)$$

$$---P1 = 14.7 \text{ psi}$$

Pr1 = relative pressure of state 1

Interpolation from relative pressure table at T1 = 45 deg F yields:

$$---Pr1 = 1.0954$$

P2 = cylinder pressure required to ignite ethanol

Pr2 = relative pressure at temp required for auto ignition of ethanol

Interpolation from aforementioned table at T2 = 797 deg F yields:

$$---Pr2 = 28.555$$

Simple algebra to solve the first equation for P2 yields:

$$---P2 = 383.2 \text{ psi}$$

So, to ignite the ethanol on compression ALONE will require a PRESSURE RATIO of 26:1

At those pressures and temperatures, I think it would be difficult to hold an engine of that size together.

In my opinion, you would be better off machining a hole in the top of your head for a glow plug with the correct heat range. You can cut the required cylinder pressures WAY down to reduce wear and tear and make it a whole lot easier to start. Turning over an engine of that size at those cylinder pressures would not be easy!!!

You also mentioned CAD files. I use AutoCAD2000 for my drafting, so if you can save them in that format I would be very interested in seeing your plans. You using CNC???

In any case, Good luck!! Brian

Re: Calculations..... ([none / 0](#)) (#18)  
by Anonymous Hero on Sat Jun 21st, 2003 at 09:11:36 AM MST

what you have calculated is static compression ratio, the dynamic compression ration could end up being much higher or much lower,, lower and the engine would not run at all as a diesel, higher and it only exacerbates the detonation problem unless some sort of direct fuel injection is incorporated,

direct injection of ethanol will be very difficult as it has no lubrication qualities to aid in injector and pump plunger operation.

i would be leaning toward a glow plug fired engine too,, i think it is the only way of making this scheme work. short of spark ignition.

there are so many factors involved in this design, and if one is to go to all the time and trouble to build one i think i would research very well..

i have a 2 volume set on internal combustion engine , engineering,, i think they were 85 bucks for the pair soft bound..

if you are interested i will get the name and isbn number for you, i think one would be well served to get this set if you are serious about engine design.

another option may be the conversion of an old lawn boy 2 stroke engine to glow plug operation, this would leave you with redesigning a head possibly, and the carburation is already in place.

just more thoughts,, good luck with the project

bob g

[ [Parent](#) ]

Re: Calculations..... ([none / 0](#)) (#19)  
by Brian on Sat Jun 21st, 2003 at 01:07:59 PM MST  
([User Info](#))

You're right, that is a static compressio ratio. I should have mentioned that those calculations assume no intake and exhaust valves opening and closing, as with an engine of that size it would be nearly impossible to set up a cam/pushrod/rocker/valve or overhead cam setup. If it were an Otto cycle, I would have to account for that but since this is a two stroke without valves, it's a pretty close estimation \*\*without actually having the engine in my hand to get the actual numbers.\*\* Hope that clears it up, Brian.

[ [Parent](#) ]

Re: Calculations..... ([none / 0](#)) (#20)  
by Brian on Sat Jun 21st, 2003 at 01:23:48 PM MST  
([User Info](#))

Sorry, forgot to mention that the dynamic compressio ratio is ALWAYS lower than the static compression ratio. It's dependent on when the exhaust valve opens and closes. Have fun! Brian

[ [Parent](#) ]

Re: Calculations..... ([none / 0](#)) (#24)  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Sun Jun 22nd, 2003 at 12:29:21 AM MST  
([User Info](#))

That would be great...  
Thanks  
Those books sound helpful.  
-Andrew

[ [Parent](#) ]

Re: Calculations..... ([none / 0](#)) (#21)  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Sat Jun 21st, 2003 at 08:56:49 PM MST  
([User Info](#))

CNC? Ya....  
GO look at my diary for some rendered images of this. Ill post some exported autocad dxfs for ya....  
:)  
Thanks!  
-Andrew

[ [Parent](#) ]

Re: Calculations..... (none / 0) (#22)  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Sat Jun 21st, 2003 at 08:59:44 PM MST  
([User Info](#))

Here you go...  
The dxfs...  
(I'm not sure how they will look out of cadkey.)



[ [Parent](#) ]

Re: Calculations..... (none / 0) (#23)  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Sat Jun 21st, 2003 at 09:02:00 PM MST  
([User Info](#))

WTF!  
Sorry, It didn't  
upload. <http://www.otherpower.com/images/scimages/248/crankcase.dxf>  
See if this works... If not I'll email them to ya.  
-Andrew

[ [Parent](#) ]

Re: Calculations..... (none / 0) (#25)  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Sun Jun 22nd, 2003 at 12:38:57 AM MST  
([User Info](#))

Ok,  
So it looks like glow plug or spark ignition for me.

I have never worked with glow plugs before.  
I assume that the compression ratios for a glow plug would be fairly similar to a spark igiton. So...  
about 10-1 compression ratio sound reasonable?  
If so, how do I machine a glow plug, and how do I make it the right temp ranges for my engine. I would think all it is a piece of metal, that has a certain specific amount of heat sinks on it, so i will always be at the right temp. maybe I'm wrong.

Any advise on this would be great.

[ [Parent](#) ]

Re: Calculations..... (none / 0) (#26)  
by Brian on Sun Jun 22nd, 2003 at 03:37:04 PM MST  
([User Info](#))

Ok, I'm not the expert on RC glow plugs so this link will be a great place to start. They have a lot of great info on how they work, etc.

<http://www.rcnitro.com/rn/articles/glowplugs.asp>

You can go to a hobby shop and pick up the correct glow plug for your application. You'll have to read about them and decide what temp. range would be best as I really couldn't tell you. Then you can go ahead and machine the hole in your cylinder head with the correct threads. Hopefully you haven't gotten too far along making your head, as the glow plug could contact the piston if you're not careful. I have done quite a bit of RC stuff messing around with my MP-6 but that's about it so that's all the help I can offer on this one.

[ [Parent](#) ]

[Ethanol Engines](#) | 28 comments (28 topical, 0 editorial)

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## [From old board -- Gaseous VS liquid fuel](#)

By [John](#), Section [Rants & Opinion](#)

[Fossil Fuels](#)

Posted on Thu Jun 12th, 2003 at 05:42:00 AM MST

This is copied over from the old board so I can answer it here:

-----  
I guess I can't really add anything to the debate about whether the fuel is or should be fully vaporized but can someone tell me if burning a gas (say propane) gets more MPG than gasoline. I know that propane has a lower energy density than gasoline but if vaporization is that much better, then propane should still get more MPG. So, does propane get more MPG?

Martin.  
-----

Not really. Propane burns cleaner than gasoline as gasoline is now normally used. The mileage is about the same or a little less for propane, but performance can be improved for either fuel. If gasoline is totally gaseous and when enough oxygen is provided for a clean burn then gasoline will give many more MPG than propane. The problems with using totally gaseous gasoline are greater heat (burnt valves), and explosion and fire danger. I'm sure that the heat problem could be handled, but the explosion and fire danger is so great that no manufacturer wants to touch it.

John

[From old board -- Gaseous VS liquid fuel](#) | 10 comments (10 topical, 0 editorial)

Re: From old board -- Gaseous VS liquid fuel ([none / 0](#)) (#1)  
by [richard](#) on Thu Jun 12th, 2003 at 01:04:25 PM MST ([User Info](#))

gasoline to burn REAL good ned to be .5 micron or less.

Re: From old board -- Gaseous VS liquid fuel ([none / 0](#)) (#2)  
by [Brian](#) on Thu Jun 12th, 2003 at 01:43:38 PM MST ([User Info](#))

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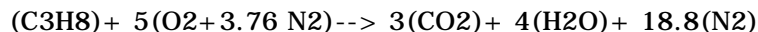
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- [More on Fossil Fuels](#)
- [Also by John](#)

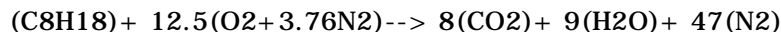


What's this? For once we agree on something? Nah.

Propane does indeed burn cleaner in the real world as it gets closer to complete combustion than gasoline does. Here's the equation for complete combustion of propane with air:



You can see the only byproducts of combustion given complete combustion of propane are carbon dioxide, water, and nitrogen. The exact same byproducts, but in different quantities, result from the complete combustion of octane:



Unfortunately all the stabilizers, additives, etc. they add to gasoline make it a lot "dirtier" fuel to burn. Gasoline isn't pure octane either. The exact chemical composition of gasoline is tough to track down as the seasonal changes made to aid in vaporization effect the composition of the fuel. Neither propane nor gasoline completely combust, but propane gets closer to it so it doesn't indeed burn cleaner than gasoline.

90% combustion of gasoline will yield more carbon monoxide and unburned hydrocarbons than 95% combustion of propane will. More of the propane is burnt, so it burns cleaner.

Re: From old board -- Gaseous VS liquid fuel  
([none / 0](#)) ([#4](#))  
by John on Thu Jun 12th, 2003 at 02:36:34 PM MST  
([User Info](#))

No argument here! All the additives do hinder truly clean and complete combustion. All combustion has some byproduct, so "clean" really is a relative term.

John  
[Toxin absorber/Pain reliever](#)  
[ [Parent](#) ]

Re: From old board -- Gaseous VS liquid fuel ([none / 0](#)) ([#3](#))  
by Anonymous Hero on Thu Jun 12th, 2003 at 01:56:31 PM MST

E-man here. My password may not be working just yet.

In the 1950's there was one fellow willing to take on the mechanical challenges associated with using a very lean fuel mixture. His name was Russell Bourke, and he developed a very ingenious engine that ran on a 1000 to 1 air/fuel ratio. His first commercially available engine came out in 1954. The basic layout was an opposed two cylinder engine having pistons arranged on opposite ends of a straight rod connected by a Scotch yoke drive mechanism in the center.

The exhaust temp was cool enough to put your hand near due to the almost complete combustion of fuel (including the hydrogen which favors an oxygen rich environment and high heat). Also, the fuel burned so quickly, driven by the hydrogen flame propagation, that the end of the piston stroke during expansion was actually a refrigeration cycle which cooled the spent gasses before exhausting them. The combustion "event" is very much like a sharp detonation and only the in-line piston design saves the engine from becoming a pile of aluminum sand. The traditional Bourke engine has no flywheel and reaches ungodly rpm's. The torque vs. rpm plotted curve looks similar to that of a turbine.

It's a real treat to study Bourke's engine if you've never been introduced. They are still being produced by enthusiasts; here's a url:  
<http://bourke-engine.com/index1.htm>

E-man

Re: From old board -- Gaseous VS liquid fuel ([none / 0](#)) (#5)  
by Bach On on Sun Jun 15th, 2003 at 11:56:41 AM MST  
([User Info](#)) [change AT: bach\\_on AT hotmail.com](#)

But don't I remember reading that propane doesn't supply as much horsepower as gasoline per cubic centimeter? Or did I hallucinate that?

Bach On

- I'm just as happy as if I had good sense! -

Re: From old board -- Gaseous VS liquid fuel ([none / 0](#)) (#6)  
by Wolfie1 on Mon Jun 16th, 2003 at 05:43:31 AM MST  
([User Info](#))

That's right Mr On :) If it is claimed that a gasoline engine can be converted to 100+ MPG through just vaporization of the fuel, a propane fueled engine should be able to get close to that number. So where is this super efficient engine? Martin.

[ [Parent](#) ]

Re: From old board -- Gaseous VS liquid fuel ([none / 0](#)) ([#7](#))  
by Brian on Mon Jun 16th, 2003 at 03:19:44 PM MST  
([User Info](#))

The oil companies have it under a sheet in their garages!!

[ [Parent](#) ]

I've heard this for years..... ([none / 0](#)) ([#9](#))  
by Bach On on Mon Jun 16th, 2003 at 04:25:10 PM MST  
([User Info](#)) [change AT: bach\\_on AT hotmail.com](#)

"The oil companies have it under a sheet in their garages!"

Please know: I'm not taking pot shots at this particular comment. But I've seen and heard charges like this for years from a number of sources. I wonder if everybody thinks this is really true?

If they are true, how could it be proven?

Seems like a patent would have been filed for the engine. Then it seems like the inventor's name would be listed. Somebody could then contact the inventor and ask. I suspect that has not been done. Or if the patent was sold, does the patent office maintain the current owners of a patent? Sure would make for an interesting research project.

I wouldn't put this tactic by the oil companies, but I doubt we can really prove it.

Bach On

- I'm just as happy as if I had good sense! -

[ [Parent](#) ]

Re: I've heard this for years..... ([none / 0](#)) ([#10](#))  
by Brian on Mon Jun 16th, 2003 at 09:11:52 PM MST  
([User Info](#))

LOL, All I've ever heard is rumors as well. In my humble opinion, the oil companies are bad, but not as bad as the cigarette companies!!!

"What the American public doesn't know is what makes them the American public"

[ [Parent](#) ]

Re: From old board -- Gaseous VS liquid fuel  
([none / 0](#)) ([#8](#))  
by Brian on Mon Jun 16th, 2003 at 03:40:25 PM  
MST  
([User Info](#))

True!! Propane does generate less power when compared to the burning the same amount of gasoline.

Ethanol is the way to go anyway. Burning ethanol greatly reduces emissions while making us free from our dependance on crude oil. It also allows you to increase the compression of the engine to 15 or 16 to 1 which increases efficiency.

Ethanol is fairly easy to come by as well. While you will get roughly the same fuel economy and about the same power when not pulling a load when compared to gasoline, the increase in compression and efficiency actually maintains the fuel economy at a constant level while towing, etc. I wish my truck did that....

Diesel engines are more efficient than current gasoline engines in that they run a higher compression ratio, but if it were possible to increase the compression of a gasoline engine (Otto cycle) the efficiency would be greater than that of a diesel engine operating at the same compression ratio. The Otto cycle is simply a more efficient process.'

You would lower emissions, maintain fuel economy, and generate the same amount of power, all without any crude oil!!

[ [Parent](#) ]

[From old board -- Gaseous VS liquid fuel](#) | 10 comments (10 topical, 0 editorial)

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## [Woodstoves Poll](#)

By [ADMIN](#), Section [Remote Living](#)

Posted on Sat Mar 29th, 2003 at 07:16:40 AM MST

[Fossil Fuels](#)

This section of the board is devoted to to folks who live way back in the sticks, where the topic is NOT related to generating electricity. Read on...

So questions about woodstoves, passive solar home construction, water pumping, guns, water heating, and a bunch of other topics are quite appropriate here. I heat almost entirely with wood (plus a propane backup), as do DanB and Matt from Forcefield. We love our woodstoves. What kind do you use? We already filled the answers from our neighbors up here near Otherpower HQ.

[Woodstoves Poll](#) | 10 comments (10 topical, 0 editorial)

replying to someones post, I think? ([none / 0](#)) ([#2](#))  
by Anonymous Hero on Sat Mar 29th, 2003 at 04:08:02 PM MST

Not sure how to use this new area yet, so I'm just replying to you. Put a little steam engine on that wood stove to power up that Lava Lamp while you're watching Dr. Who.

Woodstove hunting ([none / 0](#)) ([#3](#))  
by Wyomingbob on Sat Mar 29th, 2003 at 09:35:49 PM MST  
([User Info](#))

I'm currently browsing little woodstoves, trying to find a 'kicker' unit that will heat my new house when the passive and active (hot water) solar aren't doing enuf. The house is roughly 1500 sq. feet and will be extremely well-insulated, and the stove will be backed by a concave brick wall (interior wall). Right now, I'm looking at Jotul and Vermont Castings. Model recommendations? Are they worth the sick money they command? I'd prefer non-catalytic stoves, and the thing must have a glass door: no television, so watching logs burn qualifies as entertainment around here. The floors in this house are concrete and/or tile; is anything gained by raising the stove onto a hearth, or should I sit it right on the floor?

this what i was looking into getting.... ([none / 0](#)) ([#7](#))  
by Seth on Wed Apr 2nd, 2003 at 06:14:31 PM MST  
([User Info](#))

this what i was looking into getting....  
<http://www.spiritelements.com/ProductDetail.aspx?c=1039&p=1065&t=GenProduct>  
But i was thinking that a babington burner might be more usefull  
<http://www.geocities.com/wastewatts/babington.html>

[ [Parent](#) ]

hot water and floor ([none / 0](#)) ([#11](#))  
by Anonymous Hero on Sat May 24th, 2003 at 10:02:50 PM MST

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### Poll

What brand of woodstove do you use to heat?

- Riteway
- Shenandoah
- Jotul
- Vermont Castings
- Hearthstone
- Soapstone
- Outdoor furnace
- Sotz Barrel stove kit
- Home-made
- Other

Votes: 42

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### Related Links

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- [Also by ADMIN](#)

this rocks: I used to live in the cold. 8 months a year burning. Crappy old house , with an excellent Pacific Energy wood stove. I built two copper manifolds and mounted them on the top and back of the stove. 1/2 "copper. poured concrete on them right on the top of the stove. This water pipe was then lead to the bathroom floor full of 120 feet of pex pipe and poured 3 inches of concrete and a tile surface. The system was circualted by a TYCO 50 watts circ pump which operated 24/7. Fianlly using clack valves I tapped into my water system and exited into the hot water tank ( electric. Every time I used hot water , the system drained 120 F water into the hot water tank. Meanwhile the bathroom floor was wonderfully warm to hot. I no longer needed to use the electric heater in the bathroom. I saved about 60 -70 % on my power bill. U-HUH! Plus the bathroom was super hot ( floor) . This system pushed about 2-3000 watts of energy into the water and circulated about 40 -60 degree celcius water. Smooth as silk. Jungle Bill

[ [Parent](#) ]

Woodstove ([none / 0](#)) (#4)

by ToddH on Sun Mar 30th, 2003 at 02:06:13 AM MST

([User Info](#))

I use a Fisher brand woodstove, one of the smallest ones they made. My house is still in the process of additional insulation and already this winter the stove is "closed" so I don't overheat the place. The big negative is the cresote build up I get. I need to brush the chiminey out weekly.

That did not quite come out right ([none / 0](#)) (#5)

by ToddH on Sun Mar 30th, 2003 at 02:27:33 AM MST

([User Info](#))

When I say closed it meant the two air inlets are screwed in the closed position while the wood is burning.

[ [Parent](#) ]

wood stoves ([none / 0](#)) (#6)

by Old F on Sun Mar 30th, 2003 at 08:48:37 AM MST

([User Info](#)) <http://www.olf.homestead.com>

This the first winter for the Wood master an I haven't burned the first drop of propane this winter. It keeps 1800 square feet heated evenly. I love it. For the whole saga check out my web site. <http://www.olf.homestead.com>

Old F

wood boiler ([none / 0](#)) (#8)

by ROSCOE ([roscoe.s@sympatico.ca](mailto:roscoe.s@sympatico.ca)) on Sat Apr 5th, 2003 at 07:48:26 AM MST

([User Info](#))



I built a wood fired boiler last fall. I used 3/8" high carbon checker plate for the fire box, and 1/4" plate for the water jacket. 2 annodes from hot water tanks (to keep the corrosion down).the fire box measures 59" x 36" wide x 42" high. I used catch basin grates for the bottom (they'll never rotout)with a cleanout tray onder neath. I took the water off the top back with an armstrong pump,and returned it to the bottom front. I pumped the water to the house (from my shop where the boiler sits) through 3/4" poly pipe that has been wrapped with closed cell insulation, then boxed with 2" S M ,then wrapped with plastic before being burried. Iused 3 airconditioning condensers from full size chevys in the plenum of my forced air furnace. I installer a seconed thermostat and wired this through a second honeywell controler to the furnace fan. I burn hard wood slabwood which I can buy for \$10.00 a bundle. cut in half these slabs work great.

My kind of adapting ([none / 0](#)) ([#9](#))

by 12volt dan ([dan12v@hotmail.com](mailto:dan12v@hotmail.com)) on Thu Apr 10th, 2003 at 01:29:09 PM MST  
([User Info](#))

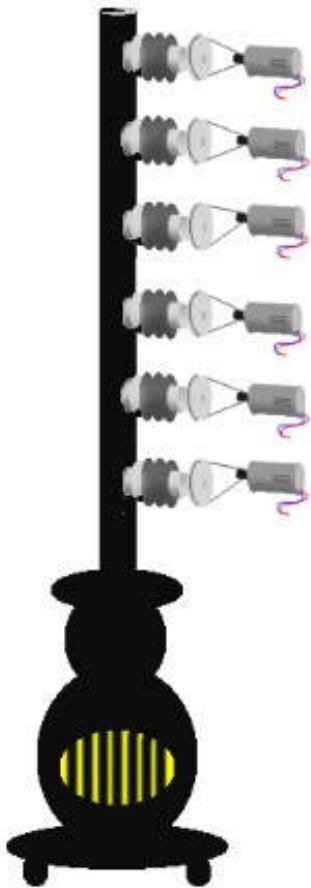
Love the idea of building with spare parts. I`m going to capture heat from the diesel genny exhaust with school bus rear heaters. We heat our home with a regency medium free standing stove for the last 5 years. Seen about a months worth of -30c this year hense we burned about 7 cord poplar and 8 cord of mixed hardwood

7 years off the grid and counting

[ [Parent](#) ]

Hot Oppertunist ([none / 0](#)) ([#10](#))

by Johnny Cool Pants on Wed May 14th, 2003 at 10:13:36 AM MST  
([User Info](#))



Sterling Stacker AKA "Perkins Pipe" "Perkins Perkulator" going nowhere fast. (wink)

## Damn the torpedos, Johnny Cool Pants

[Woodstoves Poll](#) | **10** comments (10 topical, 0 editorial)

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[How to fix a 'bad' lawnmower coil...\(maybe\)](#)

By [Norm](#), Section [Magnets & Magnetism](#)

[High Voltage](#)

Posted on Fri Dec 5th, 2003 at 01:57:40 PM MST

If you don't get a spark after you've tested the coil...

Some people would assume the coil is bad and replace it . If they're like me.. I would simply get one of my used coils that I have readily available, but there comes a time when that isn't all that easy...about a week or so ago I had a lawnboy with electronic ignition ...a '94 model...now this is a different story! Had it been a Briggs with points... A new coil for this Lawnboy cost about \$50.

If the primary is putting out a few volts, why isn't the secondary working? Burnt out? Possible...but I doubted it...doesn't take much for high voltage to find a different unintended path...a little moisture? Of course! It had been sitting around outside for a couple of years(only a Briggs can tolerate something like that according to some actual personal experience) on closer inspection...what some people think of as being waterproof...really isn't that much...just because the coil is encased in plastic...that just makes it water-resistant...over time the plastic can peel away from the metal laminations or moisture can seep between the laminates and inside to short out the coil.(my theory anyway )

So I let the coil lay around in the sun for a day, set it on top of the water heater for a couple of days, then just to make sure I put a hair dryer on it.. I'm not sure which of the three had done the trick... but I put it back on the engine and WE HAVE IGNITION! and I saved about \$50. After making sure it was going to keep on working I took it off and sprayed a couple of coats of clear (polyurethane or whatever) on it. Maybe this might work for someone else someday! I always have fun when I see that I've saved some money...money for another new battery, wire, magnets, or another inverter etc. (:>) Norm.

[How to fix a 'bad' lawnmower coil...\(maybe\)](#) | 6 comments (6 topical, 0 editorial)

Re: How to fix a 'bad' lawnmower coil...(maybe) ([none / 0](#)) (#1)  
by monte350c on Fri Dec 5th, 2003 at 03:26:59 PM MST ([User Info](#))

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Hi Norm!

Woo - hoo!! (as Homer would say!)

That's a great tip and may very well come in useful some day.

I got a free lawnmower last week with a Briggs 3.5 Classic on it. I was looking for something to load test alternators - and this just showed up. Took the head off and decarbonized it and the piston top - no scores in the bore. The old owner complained it was hard to start and wouldn't rev up. The choke plate was completely missing from the carb (!), and the control cable was all jammed up. Fixed the control cable, got a new choke plate from our local small engine shop, put in a new carb diaphragm while I was at it, and now this thing runs like new. Total: \$10

Here are another couple of small engine links I've found useful:

For good exploded views of engines, plus part numbers and prices (haven't actually ordered anything from here yet):

<http://www.partsandservice.com/index.html#home>

and a good general forum for small engines:

<http://forums2.gardenweb.com/forums/lmower/nph-ind.cgi?n=60>

Both links probably good for folks looking for generator engine parts or troubleshooting tips.

Lots of fun!

Ted.

on decarbonizing a Briggs ([none / 0](#)) ([#2](#))  
by Norm on Fri Dec 5th, 2003 at 09:04:02 PM MST  
([User Info](#))

Yeah I used to get them all the time one time one was so bad it lost compression got a chunk of carbon lodged under the exhaust...now that's carbon!

Another time saw this lawnmower in the junk...looked like new after taking it home wouldn't turn over...took the head off the cylinder wall had a deep gouge in it about 1/8" deep the owner tipped it over to check the blade gas from the carb had washed all the oil from the cylinder wall. ...still I had a lot of like new parts. Lot of fun almost unbelievable what some people do to lawnmowers. Norm.

[ [Parent](#) ]

Re: on decarbonizing a Briggs ([none / 0](#)) ([#3](#))  
by monte350c on Fri Dec 5th, 2003 at 09:30:52 PM MST  
([User Info](#))

Hi Norm,

Yeah, it's pretty unbelievable what people expect out of their small engine products. If you took a car, only used it at full throttle, stored it for 6 months at a time, and never changed the oil or otherwise maintained it, I suspect it wouldn't last half as well as most Briggs last.

Hats off to the Briggs company - where else can you buy a brand new source of 3.75 hp for \$60?

Ted.

[ [Parent](#) ]

speed? ([none / 0](#)) (#4)  
by Norm on Sat Dec 6th, 2003 at 06:58:26 AM  
MST  
([User Info](#))

Full throttle? One guy even mentioned to me one time the secret of cutting grass...'You don't really need a sharp blade ...the speed is what does it! ....then another person says 'Yeah you know you shorten that little spring on the carbuerator and you get a lot more power!...(Oh Wow!) Next year ....those very same people were asking me if I could fix their mowers! They didn't even have a clue! Big mystery! Norm.

[ [Parent](#) ]

Re: speed? ([none / 0](#)) (#5)  
by monte350c on Sat Dec 6th, 2003 at  
08:06:00 AM MST  
([User Info](#))

Hi Norm,

Makes me wonder just how long those 3,600 rpm generators will really last. Seems to me it might be better to use a larger engine and make it 4-pole to run at 1,800 rpm instead. 3,600 is really honking for most stock 1 cyl. engines.

Ted

[ [Parent](#) ]

Re: speed? ([none / 0](#)) (#6)  
by Norm on Sat Dec 6th, 2003 at  
01:56:21 PM MST  
([User Info](#))

Yeah if it was up to me as I look at emergency generators at Sears....why emergency when you could have a Liston engine powered with bio-diesel as the main power supply and heat your home to boot with a nice quiet lugging engine would be music to my ears instead of a screaming engine that sounds like it might fly apart at any moment! Norm.

[ [Parent](#) ]

[How to fix a 'bad' lawnmower coil...\(maybe\)](#) | 6 comments (6 topical, 0 editorial)

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2. [DC converters](#) ([Homebrewed Electricity](#), [High Voltage](#))  
posted by Joseph Turrisi on 10/10/2003 05:19:27 PM MST  
6 comments
3. [quick question about transformer winding](#) ([Homebrewed Electricity](#), [High Voltage](#))  
posted by headhunter on 09/12/2003 09:31:10 PM MST  
2 comments
4. [220 V Converter](#) ([Homebrewed Electricity](#), [High Voltage](#))  
posted by Stillen on 09/08/2003 10:06:11 AM MST  
1 comment
5. [HV Caps](#) ([Weird Science](#), [High Voltage](#))  
posted by Inquiring Mind on 06/27/2003 05:25:34 AM MST  
3 comments
6. [howdy xray in canada](#) ([Quarantine Zone](#), [High Voltage](#))  
posted by Anonymous Hero on 05/21/2003 05:40:50 PM MST  
1 comment
7. [what a pain](#) ([Rants & Opinion](#), [High Voltage](#))  
posted by JB on 04/27/2003 08:29:58 AM MST  
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### [DC converters](#)

By [Joseph Turrisi](#), Section [Homebrewed Electricity](#)

[High Voltage](#)

Posted on Fri Oct 10th, 2003 at 05:19:27 PM MST

Does anyone know how to convert high voltage dc to low voltage dc

I need help in converting 120 volts DC to 12 volts DC with a couple of amps of power. Anyone have any ideas how to do this

[DC converters](#) | 6 comments (6 topical, 0 editorial)

Re: DC converters ([none / 0](#)) (#1)  
by [scott h](#) on Fri Oct 10th, 2003 at 09:18:41 PM MST  
([User Info](#))

the way to do this is with a dc to dc converter.look on ebay they usullay have odd size coverters like that. good luck scott h

Re: DC converters ([none / 0](#)) (#2)  
by [drdongle](#) on Sat Oct 11th, 2003 at 07:16:24 AM MST  
([User Info](#))

DC to DC converters are readaly available new and used, and there are numerous sited that have info on DIY check out [www.maxim-ic.com](#) , [www.irf.com](#) ,[www.artesyn.com](#) do a google search for "DC to DC converter".

Dr.D

Re: DC converters ([none / 0](#)) (#3)  
by [Homebrewed12vdc](#) on Sat Oct 11th, 2003 at 08:26:42 AM MST  
([User Info](#))

Try radio shack they have them.

Re: DC converters ([none / 0](#)) (#4)  
by [wooferhound](#) ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Sat Oct 11th, 2003 at 12:00:04 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

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- [Also by Joseph Turrisi](#)

Where are you getting 120 volts DC from ?  
if you rectify the voltage from your wall outlet with a filter  
capacitor across it, you will get voltage closer to 170 volts  
DC

. >=- W o o f -=<

Re: DC converters ([none / 0](#)) ([#5](#))  
by Joseph Turrisi on Sat Oct 11th, 2003 at 04:02:26  
PM MST  
([User Info](#))

The 120 volt DC comes from my welder for running  
AC/DC power tools. I converted it to electric start and  
need some way to charge the battery. I would add an  
alternator but that would be another pulley on the  
crank shaft a add more load to the engine. since it all  
ready produces DC it would be nice to step it down  
for battery charging and forget the price of an alt.,  
pulley, and home made brackets.

[ [Parent](#) ]

Re: DC converters ([none / 0](#)) ([#6](#))  
by drdongle on Sun Oct 12th, 2003 at  
08:19:07 AM MST  
([User Info](#))

I was looking over a used "Power One" brand  
switching converter that I have and it occurred  
to me that as the AC input is rectified, filtered  
and then is converted to a high frequency AC  
voltage to drive a small ferrite transformer, one  
could feed it DC directly, the rectifiers are  
superfluous in this case, but as long as the unit  
receives enough voltage to make it happy it will  
still work. Many of these units are available for  
85 to 120 volts AC. 85 volt ac in reality peaks  
at about 145 volts, I have no idea how tolerant  
these units are, so there is the possibility that  
it might not start up and run. Experimentation  
is obviously in order.

Dr.D

[ [Parent](#) ]

[DC converters](#) | 6 comments (6 topical, 0 editorial)

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### [quick question about transformer winding](#)

By [headhunter](#), Section [Homebrewed Electricity](#) [High Voltage](#)

Posted on Fri Sep 12th, 2003 at 09:31:10 PM MST

#### [question about transformer winding](#)

When ya wind a transformer, do you have to have the wire wrap around an iron core from north to south? Would just winding the iron core without thought of north to south windings still work(am assuming not as well)?

[quick question about transformer winding](#) | 2 comments (2 topical, 0 editorial)

Re: quick question about transformer winding ([none / 0](#)) ([#1](#))

by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Fri Sep 12th, 2003 at 10:36:48 PM MST

[\(User Info\)](#)

<http://timmythy.home.mindspring.com/timmy.htm>

Since a transformer works on AC voltage, as long as the windings were in close proximity to each other, it would'nt matter.

. T i m

Re: quick question about transformer winding ([none / 0](#)) ([#2](#))

by Ocean on Fri Nov 7th, 2003 at 09:10:42 PM MST

[\(User Info\)](#)

The only difference I have noticed is that there is 180 degrees phase shift. IE, instead of this wire green and that one yellow this one is yellow and that one is green.

[ [Parent](#) ]

[quick question about transformer winding](#) | 2 comments (2 topical, 0 editorial)

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## [220 V Converter](#)

By [Stillen](#), Section [Homebrewed Electricity](#)  
 Posted on Mon Sep 8th, 2003 at 10:06:11 AM MST [High Voltage](#)

I wish to plug in my hairdryer from the US which has the polarized pin on it. The converter I am using to plug into 220 does not have the distinction for polarized plugs...meaning, you could plug it in both ways. On the rear of the converter, each pin is labeled. The two horizontal pins are labeled L and N, and the "ground" pin is labeled "E." How can I distinguish these and what do they mean?

[220 V Converter](#) | 1 comment (1 topical, 0 editorial)

Re: 220 V Converter ([none / 0](#)) ([#1](#))  
 by [laskey](#) on Mon Sep 8th, 2003 at 10:45:17 AM MST  
[\(User Info\)](#)

Well. Here you go.

L= Live  
 N= Neutral  
 E= Earth (which the same as Ground)

Your polarized plug goes:  
 Thin= Line  
 Wide= Neutral  
 And of course the U shaped one is the ground (if present)

**BUT!!!!** It really doesn't matter. Your hairdryer will run either way. That's why your converter isn't polarized.

Cya,  
 Chris

[220 V Converter](#) | 1 comment (1 topical, 0 editorial)

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### [HV Caps](#)

By [Inquiring Mind](#), Section [Weird Science](#)  
Posted on Fri Jun 27th, 2003 at 05:25:34 AM MST [High Voltage](#)  
Homebrew Use?

Has anyone found a good use for the high voltage capacitors salvaged from microwave ovens? Those that I have range from .8 to 1.2 microfarads with WVAC ranging from 2100 to 2400.

[HV Caps](#) | 3 comments (3 topical, 0 editorial)

Re: HV Caps ([none / 0](#)) ([#1](#))  
by Junkie ([madscientist@blownup.com](mailto:madscientist@blownup.com)) on Fri Jun 27th, 2003 at 06:58:41 AM MST  
([User Info](#)) <http://www.akuma.dsl.pipex.com/chris>

<http://www.4hv.org/> Lots of ideas here.

Re: HV Caps ([none / 0](#)) ([#2](#))  
by nasher on Mon Jul 28th, 2003 at 01:37:32 PM MST  
([User Info](#))

last time i played with a HV cap I hooked it in wrong and blew a hole through a door (electrolitic cap)

you could hook it up to a solar cell and a LED and have a light that will last a few min after the sun isnt on the sell .. sorry cant think of anything usefull right now :(

Nasher

Re: HV Caps ([none / 0](#)) ([#3](#))  
by charged on Fri Nov 14th, 2003 at 09:26:49 AM MST  
([User Info](#))

Go find some of Tesla's old patents. There's lots of uses for HV caps in those. Especially after around 1890.

[HV Caps](#) | 3 comments (3 topical, 0 editorial)

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[howdy xray in canada](#)

By [Anonymous Hero](#), Section [Quarantine Zone](#)

Posted on Wed May 21st, 2003 at 05:40:50 PM  
MST

[High Voltage](#)

xxxx

Not a big deal Xray. I was just having a rough time with the new board. im self taught on this computer stuff and most things in life. sometimes I think im better without a computer, dont know how to cut and paster and post on the new board and a lot of other puter stuff but I usually get by. When patience takes over frustation ill try this p??p scoop thing again but not right away. its ate my password twice already and i aint got the time and patience right now to dink around with it. I think just cause things are free and hitech doesnt always mean they are worth a darn unless you want to be a slave to it. The simpler the better for me. Oh well nuff of this bs. I got to make a dollar and get things done . Buy this book for your Savinorus type genny. You wont regret it Technicians And Experimenters guide to Sun Wind and water power by Richard Pierson. Im glad I did. Take er ez up there in Canada. My apologies. JB Dayton Nevada

[howdy xray in canada](#) | 1 comment (1 topical, 0 editorial)

X-Ray??? ([none / 0](#)) (#1)  
by xeroid ([centurion27@lycos.com](#)) on Thu May 22nd, 2003 at 02:06:11 PM MST  
([User Info](#))

Hi JB.

Maybe the thing to do is to go to the FAQ section to see if there is something you're doing (or not doing) to cause your passwords to get eaten. Failing that, send an e-mail to the admin. They're a good couple of guys, and always willing to help.

I agree you can be a slave to technology. I don't even own a decent computer. The one I post from is at work (shhhhh!).

The book you mentioned sounds interesting. When funds allow, I'll see if I can track down a copy. I have written it down and filed it in my pocket file folder (wallet) where I keep all kinds of interesting bits of info for later reference. Thanks.

Xeroid.

[howdy xray in canada](#) | 1 comment (1 topical, 0 editorial)

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[what a pain](#)

By [JB](#), Section [Rants & Opinion](#)  
Posted on Sun Apr 27th, 2003 at 08:29:58 AM MST

[High Voltage](#)

trying to post a message but that 30 word thing keeps on coming up. what a pain

[what a pain](#) | 2 comments (2 topical, 0 editorial)

Well thats simple to fix ([none / 0](#)) ([#1](#))  
by TomW on Sun Apr 27th, 2003 at 09:30:21 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

JB;

Simply go to the next text window. You are trying to put it all in the "intro" text window. By next window i mean further down on the post message page is a second window that is for the story itself and as far as I know there is no limit on length of that text. Its dead simple but may not be obvious at first.

Might be time for the admins to eliminate the intro text altogether anyway its confusing and it clutters the main page.

Cheers.

TomW

[Stuff I have Online](#)

[Contact Me](#)

rants 30 word limit guy - response ([none / 0](#)) ([#2](#))  
by Fancy Pants on Tue Apr 29th, 2003 at 08:30:57 AM MST  
([User Info](#))

Yes but is the "Intro text" window really necessary? (Hello, the following text is about the, ...following text) I mean we had to get steered through alot of catagory options before getting to type any text anyway.

[what a pain](#) | 2 comments (2 topical, 0 editorial)

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## [Hydrogen motor conversion](#)

By [Geek](#), Section [Homebrewed Electricity](#)

Posted on Tue Dec 9th, 2003 at 04:48:55 PM MST

[Hydrogen](#)

Has anyone ever seen a regular internal combustion engine to run on hydrogen?<br>

Has anyone ever seen a regular internal combustion engine to run on hydrogen? I am thinking of trying this and was wondering if anyone on the board has tried.

I plan on testing by remote since hydrogen likes to go boom but I think with the proper precautions it could be a viable way to use home made fuel for low wind periods.

Geek

[Hydrogen motor conversion](#) | 5 comments (5 topical, 0 editorial)

vacuum ([none / 0](#)) ([#1](#))

by [wdyasq](#) on Tue Dec 9th, 2003 at 07:08:36 PM MST

[\(User Info\)](#)

One of the problems of running and Internal Combustion engine on hydrogen is the by-product is pure steam. Until the engine becomes hot enough to were the steam will not condense, the vacuum caused by ignition will not produce power.

Been there, done that..... unfortunately, I didn't have an accountant good enough to even dedcut the cost of the game from my income. And, it was "prior art", meaning I was not the only one stupid enough to try it.

Ron

Re: vacuum ([none / 0](#)) ([#3](#))

by [Geek](#) on Wed Dec 10th, 2003 at 09:56:09 AM MST

[\(User Info\)](#)

I'm thinking about a almost constant run genset so even if I had to heat the engine to 150 degrees C to start it really would not be a big deal. I hope to take a motor and run it a very low rpm (like 200 rpm) with the addition of a large flywheel. to produce around 3 HP for charging a battery bank. I plan on making the hydrogen by from solar and wind resources and storing it in a 1000 gal. propane tank. My goal it to have enough hydrogen stored up to run the place for a month if I run into a low wind low light situation. I plan on using the waste heat to supplement a outside wood burner. Check out this link for using hydrogen in ICM.

[http://www.ott.doe.gov/otuf/field\\_ops/pdfs/fcm03r0.pdf](http://www.ott.doe.gov/otuf/field_ops/pdfs/fcm03r0.pdf)

Always have a dream. Those with out dreams are just waiting to die.

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Re: vacuum ([none / 0](#)) ([#5](#))  
by troy on Fri Dec 12th, 2003 at 08:17:10 AM MST  
([User Info](#))

As a fuel, pure hydrogen works beautifully, similar to propane but with less pollution. Expensive to make and store though.

Good luck, have fun, don't blow anything up that's attached to your body.

Troy

[ [Parent](#) ]

Re: Hydrogen motor conversion ([none / 0](#)) ([#2](#))  
by desertratjack on Wed Dec 10th, 2003 at 08:23:23 AM MST  
([User Info](#))

The indications are that hydrogen is a good fuel for gasoline engines with no modifications to the gas carburetion system is from [hydrogenappliances.com](http://hydrogenappliances.com)  
Perhaps starting them on gasoline and then suppling the hydrogen is workable.

Re: Hydrogen motor conversion ([none / 0](#)) ([#4](#))  
by Old F on Wed Dec 10th, 2003 at 04:15:34 PM MST  
([User Info](#)) <http://www.oldf.homestead.com>

Geek

Running a engin on hydrogen should not be any harder than running one on propane.

I think all you would need is a demand regulator for propane and a supply of hydrogen at 12 psi to feed the regulator .

I did a duel fuel conversion on my back up generator this summer I can run ether propane or gasoline starts easy in cold weather on propane .

Check out this post  
<http://www.fieldlines.com/story/2003/9/1/82526/70829>  
It not hard to do.

Old F

Have so much fun it should be illegal

[ [Parent](#) ]

[Hydrogen motor conversion](#) | 5 comments (5 topical, 0 editorial)

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posted by chirp on 10/31/2003 04:11:59 PM MST  
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posted by Tom in NH on 10/05/2003 03:24:04 PM MST  
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6. [Hydrogen](#) ([Homebrewed Electricity](#), [Hydrogen](#))  
posted by RobC on 08/30/2003 04:01:18 PM MST  
1 comment
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### [Someone asked about generating hydrogen](#)

By [dagnew](#), Section [Homebrewed Electricity](#)

Posted on Tue Nov 18th, 2003 at 07:14:53 AM MST

[Hydrogen](#)

A site about unconventional hydrogen generation

I ran across this and thought about this board.

<http://www.layo.com/index.htm>

Have not tried it. Thought others might be interested

Dick Agnew

[Someone asked about generating hydrogen](#) | 9 comments (9 topical, 0 editorial)

Re: Someone asked about generating hydrogen ([none / 0](#)) ([#1](#))  
by J Steele ([JvsinThai@yahoo.com](mailto:JvsinThai@yahoo.com)) on Tue Nov 18th, 2003 at 08:25:15 AM MST  
([User Info](#))

I gave this experiment a fairly honest attempt but had no luck. The Hydrogen that came off of the electrode still had plenty of Oxygen mixed in.  
Have a good day  
John

Re: Someone asked about generating hydrogen ([none / 0](#)) ([#2](#))  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Tue Nov 18th, 2003 at 01:20:00 PM MST  
([User Info](#)) <http://www.internetfred.com>

THEN TRY THIS!!

<http://blazelabs.com/index.htm>

.VERY COOL WEB SITE! lot's of info, click on new energy research.

Re: Someone asked about generating hydrogen ([none / 0](#)) ([#3](#))  
by monte350c on Tue Nov 18th, 2003 at 07:55:12 PM MST  
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Hi IFred,

Enjoyed your web!

Wonder if anyone has any direct experience with that Aqua-fuel or whatever they're calling the gas that comes off the underwater arc thing. It would be interesting to make a bit, capture it, and have it properly analysed. If it's safe to store it might be a way to use wind energy and save it for times when the wind's not blowing.

It would be especially good if it was compressible like propane - where 90 psi or so will get you a liquid.

But I've read so many of these that claim this and that I must admit I'm a little sceptical!!

Lots of fun!

Ted.

[ [Parent](#) ]

Re: Someone asked about generating hydrogen ([none / 0](#)) (#4)  
by J Steele ([JvsinThai@yahoo.com](mailto:JvsinThai@yahoo.com)) on Wed Nov 19th, 2003  
at 10:23:31 AM MST  
([User Info](#))

I can find no mention of COH<sub>2</sub> in any of my chemistry books so I rather doubt it is a stable or possible compound. I suspect he's getting a mixture of H<sub>2</sub> O<sub>2</sub> CO<sub>2</sub> and CO. Even I'd be careful with this one.  
John

[ [Parent](#) ]

Re: Someone asked about generating hydrogen ([none / 0](#)) (#5)  
by Tom in NH on Wed Nov 19th, 2003 at 09:15:37 PM MST  
([User Info](#))

There is information about COH<sub>2</sub> on the web. For instance:  
<http://www.21stcenturyradio.com/futureenergytech-11.24.00.htm>  
Biomass Gasification

quotation begins . . . . .

Figure 5. Biomass Gasification

Clean fuels are difficult to find today. One example that satisfies a limited definition of "clean" is the carbo-hydrogen gas produced from biomass. David Wallman has patented the process for producing COH<sub>2</sub> from a high voltage discharge through any biomass solution (Pat. #5,417,817). This gas burns cleanly, producing water vapor and only the amount of CO<sub>2</sub> that was originally absorbed by the biological mass when it was growing in the ground.

/Tom



Re: Someone asked about generating hydrogen ([none / 0](#)) ([#6](#))  
by J Steele ([JvsinThai@yahoo.com](mailto:JvsinThai@yahoo.com)) on Thu Nov 20th, 2003 at 10:32:37  
AM MST  
([User Info](#))

I found the reaction responsible for "aqua fuel" in the book General Chemistry by Ralph Petrucci. Solid Carbon exposed to high temperature steam yields Carbon Monoxide, Carbon Dioxide and Hydrogen gas. This process is very old and was common in the early days of metal processing. Our fore fathers would inject steam into hot coke and then burn the resulting gas. It was called "Water Gas." So the "aqua fuel" is just a modern version of "water gas." Oh well. Any chemist out there? If COH<sub>2</sub> did exist, would it be a type of sugar?  
John

Re: Someone asked about generating hydrogen ([none / 0](#)) ([#7](#))  
by monte350c on Thu Nov 20th, 2003 at 08:40:06 PM MST  
([User Info](#))

Yup!

I did a little looking around too. Just do a google search on "Town Gas" and you'll find lots of info about this gas combo. You can get it by blowing steam over red hot coal, or coke.

But I am still not too convinced that this is what's happening in the underwater arc apparatus.

I suppose the only way to know for sure is to either present the experiment to a qualified chemical engineer - or make a very small quantity and have it assayed to find out what is actually in it.

My suspicions are that it still contains lots of oxygen and therefore would be impractical to store....

Ted.

[ [Parent](#) ]

Re: Someone asked about generating hydrogen ([none / 0](#)) ([#8](#))  
by charged on Sun Nov 23rd, 2003 at 04:31:24 AM MST  
([User Info](#))

If the water is "jetted" through the arc you get something quite different from "town gas" or the like.

Here are the folks that are holding all the U.S. and international patents on this process.

<http://www.usmagnegas.com/news/>

Re: Someone asked about generating hydrogen ([none / 0](#)) ([#9](#))  
by monte350c on Mon Nov 24th, 2003 at 08:39:48 PM MST  
([User Info](#))

Hi charged,

Spent some more time reading about Aqua fuel, MagnaFuel, Bingo fuel, GEET, etc. etc. - I still have my original questions unfortunately. I'm not at all convinced that any of these gases are over-unity as some of these guys claim, nor that there are any 'unexplained' contents of any of them.

I think, though, that if there's a safe way to make some kind of gas using electricity that might be a good way to store energy in a really usable way. Then you could decide later whether to use it to make heat, or even generate electricity with a genset on demand.

But the key(s) to the whole thing are - is it compressible, or I should say, can it be stored fairly efficiently like propane, and what exactly is in the mixture? It's important to know, for example, if the process makes a lot of hydrogen mixed with oxygen, then it's "Look out Scout" if you're thinking about storing it!

So I guess once my current project(s) are finished up I should make some of this gas - outdoors - and send it out for an assay. There are a few labs close by that will do that for about \$100. They will tell you exactly what's in your sample - then suitability can be determined from there.

Ted.

[ [Parent](#) ]

[Someone asked about generating hydrogen](#) | 9 comments (9 topical, 0 editorial)

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## [Homemade hydrogen?](#)

By [zmoz](#), Section [Remote Living](#)

Posted on Thu Nov 13th, 2003 at 05:09:35 PM MST

[Hydrogen](#)

What's the best way to make it?

I want to do a little experimenting with running an engine on hydrogen. I know I won't end up making very much hydrogen, but I would like to make the most that I can. I know you need to run some electricity through salty water, but what do I need to do to make the most? Should it be high volts or amps to make alot? Is there something better to use in the water besides salt? Should the wires be close together or far apart? And is it the + or - that makes the hydrogen?

Thanks :)

[Homemade hydrogen?](#) | 11 comments (11 topical, 0 editorial)

Re: Homemade hydrogen? ([none / 0](#)) ([#1](#))  
by [kww](#) on Thu Nov 13th, 2003 at 07:38:58 PM MST  
([User Info](#))

Use high quality stainless steel for the electrodes and just a little baking soda in distilled water for a long lasting generator. I think it's simply the amount of power supplied that determines output. Also, the neg. attracts the hydrogen I'm rather sure, but a simple match can show you the light. ;-) Be careful, hydrogen needs no containment to explode, only some mixing with air(oxygen). A plastic gallon milk jug half full of hydrogen and mixed with air explodes like a 12ga. shotgun going off(I don't really know that. ;-). Kevin

Re: Homemade hydrogen? ([none / 0](#)) ([#5](#))  
by [bob golding](#) ([yubba at clara dot net](#)) on Fri Nov 14th, 2003 at 03:36:18 AM MST  
([User Info](#))

a blow up doll full of hydrogen goes off like a bomb :- ) dont ask.....

bob

[ [Parent](#) ]

Re: Homemade hydrogen? ([none / 0](#)) ([#9](#))  
by [kww](#) on Fri Nov 14th, 2003 at 08:29:30 PM MST  
([User Info](#))

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Yet another reason not to smoke? LOL  
Kevin

[ [Parent](#) ]

Re: Homemade hydrogen? ([none / 0](#)) (#11)  
by wildbill hickup on Wed Dec 10th, 2003 at 07:22:45  
AM MST  
([User Info](#))

Ya at one suggestion I used a pepsi bottle and water as a flame arrestor for a torch GLAD I did, flame backed up split the bottle right down the side. Not much hydrogen either ( 12oz bottle half full of water. Big bang!!! Wife says if Dr Frankinstien is going to do more experiments she wants better life insurance and laboratory outside on other end of property. I guess I go back to wind for now.

[ [Parent](#) ]

Re: Homemade hydrogen? ([none / 0](#)) (#2)  
by zmoz on Thu Nov 13th, 2003 at 08:02:58 PM MST  
([User Info](#))

Yeah...just a test tube full that I made tonight made a pretty loud noise. :-) In terms of more power, do I need more amps or volts...or both?

Re: Homemade hydrogen? ([none / 0](#)) (#3)  
by gameman on Thu Nov 13th, 2003 at 08:30:46 PM MST  
([User Info](#))

hi  
there's lots of info on this site  
<http://www.hydrogenappliances.com/hydrogengeneration.html>  
they also have a heater that burns hydrogen...and a hydrogen generator.  
gameman

[ [Parent](#) ]

Re: Homemade hydrogen? ([none / 0](#)) (#4)  
by kww on Thu Nov 13th, 2003 at 08:34:44 PM MST  
([User Info](#))

Both will increase output.  
Kevin

[ [Parent](#) ]

Re: Homemade hydrogen? ([none / 0](#)) (#6)  
by E man on Fri Nov 14th, 2003 at 09:58:16 AM MST  
([User Info](#))

There's also good hydrogen info over at the Homepower website:

<http://www.homepower.com/magazine/downloads.cfm>

...not so much about making homebrew electrolyzers but good technical info on how to process the hydrogen (scrub out the O<sub>2</sub>), safety, storage, making a hydrogen grill/cooker, etc. A hydrogen powered barbeque...hmmmmm.

Take care

E-man

Re: Homemade hydrogen? ([none / 0](#)) (#7)  
by zmoz on Fri Nov 14th, 2003 at 06:10:17 PM MST  
([User Info](#))

Today I tried some stainless steel nails in a peice of PVC pipe with some salt water. (didn't have any baking soda) After about an hour running @ 12v and about an amp, the positive nail was completely liquified! Also there didn't appear to be any bubbles coming off of the positive. (oxygen) Why?? And what can I do to make this thing last a little longer than an hour?

Re: Homemade hydrogen? ([none / 0](#)) (#8)  
by kww on Fri Nov 14th, 2003 at 08:25:01 PM MST  
([User Info](#))

You were making some chlorine gas at the positive nail, that's what happened to it. :-) That stuff will eat about everything and will do major damage to your skin and lungs in large enough amounts. That's another reason to use baking soda.

Since water is H<sub>2</sub>O there's only half the O molecules so there's less gas at the positive electrode. Also, the O bubbles are very small and aren't very noticable unless you've got lots of it being produced. Btw, stainless steel pipe in varying sizes makes a great generator used with large 2-4" diam. rubber pipe caps. I have a little unit that will make one liter of H and O gas in about a minute, I think it was.

Kevin

[ [Parent](#) ]

Re: Homemade hydrogen? ([none / 0](#)) (#10)  
by charged on Sun Nov 23rd, 2003 at 05:35:14 AM MST  
([User Info](#))

Electrolysis is driven SOLELY by the current flowing through the cell. The lower the resistance of the cell, the lower the voltage required to produce a given amount of current.

For maximum efficiency you DO NOT want the cell to produce heat. This means that you'll need lot's of electrode surface-area in each cell.

You'll also need a GOOD electrolyte. A light Lye solution (sodium hydroxide) will work just fine.

You can make a simple cell by using two large stainless plates of equal size with a separator membrane (artificial chamois from the autoparts store). Leave about 1/8" of space between each plate and the membrane. You'll end up with about 3/8" overall distance between the plates.

The two plates must vent at the top into two different gas outlets that are isolated from eachother.

Place about 400uf (electrolytic) of capacitance across the two plates in that cell.

You can push about 10amps per square inch MAX before you start making heat and reducing the efficiency.

Your power supply, for the best outcome, should be a pulsed DC supply. A standard PWM chip is used to control a power transistor to produce what you need.

The transistor emitter is connected to a heavy inductor. The other end of the inductor goes to the positive on the cell capacitor. A heavy current recifier diode is connected in reverse-bias mode with it's cathode connected to the transistor emitter and it's anode connected to the cell capacitor negative.

The negative lead from your power-supply is also connected directly to the cell-capacitor negative.

The power supply voltage is not critical in this instance, but using higher voltages will allow greater flexibility when you build the system larger.

Here's how you adjust it. Make all your initial adjustments with your scope across the inductor.

1. Set your PWM duty-cycle and frequency to their minimum settings.
2. Gradually turn your duty-cycle (ON time per pulse) up until you reach the point where you see the top of the waveform becoming a DC "flat-line". Then back off the duty-cycle to get rid of that DC line. This is your ABSOLUTE MAXIMUM position for duty-cycle before the system starts wasting power. Mark it and don't ever exceed it.
3. Leaving the duty-cycle at the max setting, turn your frequency up gradually reduce the space between the pulses on the scope. Get the frequency as high as you can without letting the pulses overlap. This is your ABSOLUTE MAXIMUM frequency setting. Mark it and don't exceed it.

You should now see some gas being generated. You can place an ammeter in series between the capacitor and the cell plate to monitor cell amperage. If your cell is getting hot, back off on the frequency a little. Keep backing off until you don't see any cell temp increase. This is the most efficient gas production point.

If you want to further increase your gas production efficiency, find a way to introduce EXTERNAL warming of the cell(s) while they are running in this thermal "sweet spot".

4. Don't automatically believe most of what you read on the web about hydrogen production.



Try it this way and you'll see that most of those so-called hydrogen "experts" are overlooking some very basic principles in their haste.

For expanding the system, make more cells just like the first, with a single capacitor across the plates. Wire the cells in SERIES. Connect the positive pulse-supply output to the topmost cell positive and the supply-negative to the bottom-most cell negative.

Each cell needs a minimum of about 2 volts. So, for a 12v supply, use a max of 5 cells in series. This gives you a tiny bit of voltage overhead to account for resistance anomalies that might crop up from time to time in the cells.

Most important, don't blow yourself up. Homemade hydrogen and oxygen are dangerous toys.

I still believe you're better off just buying lots of batteries and storing your power in a relatively safe ionic solution. Easier to use this way too.

[Homemade hydrogen?](#) | 11 comments (11 topical, 0 editorial)

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## [fuel cell and hydrogen generation](#)

By [chirp](#), Section [Homebrewed Electricity](#)

Posted on Fri Oct 31st, 2003 at 04:11:59 PM MST

[Hydrogen](#)

Why do only the big guys get to hydrogen fuel cell?

Hydrogen fuel cells are quite the buzz. I like the idea of having water coming out the tail pipe at home or on the road. I am learning about hydrogen fuel cells now and the first thing I have learned is they cost too much. This problem of the right kind of electrolyte for the cell seems to me just couldn't really be THAT big a deal. But it is stopping the show. Can anybody out there help?

I am an injection molder with time on his hands ( made in china has helped that! ). If a polymer with a Ph around 14 can be formulated it could be a start. If that polymer could be compounded into a thermoplastic we could make plastic batteries. It is time to get the thinking cap on.

Chirp

[fuel cell and hydrogen generation](#) | 7 comments (7 topical, 0 editorial)

Re: fuel cell and hydrogen generation ([none / 0](#)) ([#1](#))  
by [DDT77](#) on Fri Oct 31st, 2003 at 08:47:06 PM MST  
([User Info](#))

yes, they are exciting, and damned expensive.  
And that's not counting the cost of the hydrogen, ahh but they don't have to run on hydrogen alone, the different types of fuel cells (FCs) can run on a variety of fuels, including a quite common fuels. And at the time of the impending shortage of crude, and natural gas, we will be able to change the fuel. Hate to say it, but FCs should be used for baseline power generation way before they will effectively be used in mobile applications (something about the various materials expanding and contracting as the FC is turned on and off). The increase of efficiency (FC = 70%+ ) over coal (40%) and NG (50-60%) powered generation will be the driving force behind adaptation.

the earth has finite resources, let our legacy not be of stupidly using them!

darren

Re: fuel cell and hydrogen generation ([none / 0](#)) ([#2](#))  
by [JW](#) on Sun Nov 2nd, 2003 at 12:50:51 PM MST  
([User Info](#))

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Hi All,

Dont really want to burst anyones bubble, but lets face it the Hydrogen economy is Quite laughable... Ya water coming from the tail pipe is nice, but at what price? lets just drain the oceans... its not like water is more important than Oil or anything... Besides what about the residues from electrolsis? thats pollution isnt it? By the way, has anyone really contimplated how much energy is required to liquify gassious hydrogen to liguid, anyone really know how cold liguid hydrogen gets? what about energy for electrolsis??? You can use the stuff all you want, but I wont..

I want to make it clear this is my own opinion....  
-JW

[ [Parent](#) ]

Re: fuel cell and hydrogen generation ([none / 0](#)) (#3)  
by TomW on Mon Nov 3rd, 2003 at 09:33:13 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

its not like water is more important than Oil or anything

Amen to that.

Hydrogen is kinda neat but it does not spontaneously appear in the tank. Energy is used to make it. Its great stuff for, say, a space station where power density is important but on earth and for day to day power needs its well in the future. In general you still need to use carbon based fuels to get hydrogen so its just s different way to use the same resources.

In the future water will be far more difficult to find in a usable form than fuel and quite a bit more essential to life as we know it. Better to invest in stillsuits than hydrogen generators.

Again just one mans opinion.

Cheers.

TomW

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Re: fuel cell and hydrogen generation ([none / 0](#)) (#4)  
by DDT77 on Mon Nov 3rd, 2003 at 10:46:55 AM MST  
([User Info](#))

guys,

its not like the "conventional" energy sources don't require water for conversion into usable sources.

ex:

[http://www.fhrpinebend.com/refinery/raw\\_materials\\_detail.asp](http://www.fhrpinebend.com/refinery/raw_materials_detail.asp)

I would have to argue that use of 2/3 of a gallon of water per gallon of crude oil is significant.

A lengthy report of the current state of fuel cells (and associated technology) can be found at:

<http://www.seca.doe.gov/tutorial/pdf/FCHandbook6.pdf> (451 pages, ~6.5MB)

this will show that FCs are still in their infancy, and that they don't have to run on H2 alone.

And for baseline generation- condense the water and the cycle begins anew.

regards,

darren

Re: fuel cell and hydrogen generation ([none / 0](#))  
([#5](#))  
by JW on Mon Nov 3rd, 2003 at 01:01:53 PM MST  
([User Info](#))

Tom W,

I could'nt agree with you more. Water is indeed a precious resource.

DDT,

/and for baseline generation- condense the water and the cycle begins anew./

Indeed water is the major by product of fuel cells. However for a fuel cell to work effectively, water as humidity must also be introduced to the fuel cell. I am certian this allows the actual figures to be fudged somewhat. I guess what im trying to say is when you "crack" water molecules it is an irreversible process. The actual "subtraction factor" is like 95%, so if you start out with 100 gallons of water then electrolisize it you get so much hydrogen, take this hydrogen pump it into your fuel cell, minus the "whole" water introduced for humidification, and you get some thing like five gallons water back. DDT, you are infering the cycle approaches perpetualablity, this is just not true. there is no such thing as a free lunch. By the way yes they do use water for refinment purposes, however it should be confused with "cracking" the water molecule, as is done to produce hydrogen. Lets not forget about sticometry here, all fossil fuels release water and carbon dioxide thru proper combustion. So, how much water is in a gallon of propane, the only way to release this water is thru combustion.

I do recognize the advantages of reformer technology, and thru this methodology the mean efficiency may be increased over what is currently possible with internal

combustion technology(IC) so there you go, both will emit water as an emission.

-JW

[ [Parent](#) ]

Re: fuel cell and hydrogen generation ([none / 0](#)) (#6)  
by DDT77 on Mon Nov 3rd, 2003 at 11:09:55 PM MST  
([User Info](#))

JW,

What you seem to be saying is that stoichiometry doesn't apply for FCs but does in combustion. When you say that we get say 5 gallons back from the 100 gallons of electrolyzed water, where did the other 95% go?

Irreversible process? What is combustion of  $2H_2 + O_2$ ? I would have to argue that this is the reversal of the process of electrolysis, and fuel cells use an electrochemical instead of the chemical reaction of combustion.

And the 2/3 of gallon used per gallon of crude oil I wrote was just that (the amount of water that is used in the process of refining crude oil) not that of the equivalent water content of the crude oil. What the point of that was that when we look at the amount of water that is used in electrolysis to generate  $H_2$  (and have to take a step back) we should also be aware of the amounts of water that is used elsewhere in other (competing?) technologies and processes that are used to transfer mechanical <---> electrical <---> chemical energy(ies) to their more convenient forms.

If I understand you correctly, what you are referring to is the use of water in the reformation of whatever (non-  $H_2$ ) fuel may be used.

What I was trying to get across was that especially for the more promising technologies (SOFC) the fuel is broken down into the components that are usable by the FC at the high temperature of FC operation.

hell, in a couple more posts we might even be on the same page,

hope this clarifies my previous posts,

darren

[ [Parent](#) ]

Re: fuel cell and hydrogen generation ([none / 0](#)) (#7)  
by JW on Tue Nov 4th, 2003 at 07:45:19 AM MST  
([User Info](#))

DDT77,

Ya, I was referring to "PEM" type fuel cells. However you are correct the "SOFC" fuel cells do show much promise. I am especially exited about about the hybredization process thats occuring now, with them, regarding the adapation of thermopiles, utilizing the "SeeBeck Effect" and the "Pyroelectric Effect". Believe me I'd love nothing more, than to see some large cooling fins, or water jackets, and radiators on these proposed new units.

Just as I would'nt want someone stifling my research, I dont want to do this to someone else's. But at times we must be critical.

-Someone who does not believe BioSphere 2 was a failure-

-JW

[ [Parent](#) ]

[fuel cell and hydrogen generation](#) | 7 comments (7 topical, 0 editorial)

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## [Hydrogen Generation](#)

By [Tom in NH](#), Section [Homebrewed Electricity](#)  
Posted on Sun Oct 5th, 2003 at 03:24:04 PM MST

[Hydrogen](#)

Any experimenters out there?

Is anyone out there doing anything with do-it-yourself hydrogen generation and storage? I've built a small electrolyzer that runs off a solar panel. It bubbles away quite nicely, but I'd like to talk with people who have figured out some good ways to store it.

Tom

[Hydrogen Generation](#) | 12 comments (12 topical, 0 editorial)

Re: Hydrogen Generation ([none / 0](#)) (#1)  
by [zubby](#) on Sun Oct 5th, 2003 at 07:33:41 PM MST  
([User Info](#))

hi Tom. i really know very little about hydrigen production or storage, but with all the battery banks out there for power storage someone must have a good way to capture and utilize all that hydrogen. thanks for bringing up this topic.

happy hydrogenating---zubby

Re: Hydrogen Generation ([none / 0](#)) (#2)  
by [TomW](#) on Sun Oct 5th, 2003 at 09:05:39 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Tom;

Nice name your folks gave you!

Anyway I think the biggest problem with storing hydrogen is that it can move through most containers we think as good for holding gases.

Not any kind of expert but I seem to recall that being an issue.

Cheers.

TomW

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Re: Hydrogen Generation ([none / 0](#)) (#3)  
by [kww](#) on Sun Oct 5th, 2003 at 10:19:45 PM MST  
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Hi Tom,

I've played around some with hydrogen generation. The best way (electrically) I know to make it uses stainless steel pipe in varying diam. all inside each other, but insulated from each other (I used short pieces of vacume tube for spacers). Then there's the center electrode (also stainless) and the baking soda (sodium bicarbonate) water solution.

Big rubber pipe caps (at Lowes, etc.) make great top and bottom. About 4 neg. electrodes (the outer pipe is also an electrode and where the neg. wire goes) seems to give the best efficiency. Seems like such a unit would make about 1-2 liters/min. of hydrogen and oxygen gas from 12 volt dc at 7 amps input and will run continuously for days, weeks? at this output. As for storing it, Mazda has a tank with something in it that absorbs hydrogen, but takes a little heating to get it to release.

Kevin

Re: Hydrogen Generation ([none / 0](#)) (#4)  
by wpowokal on Mon Oct 6th, 2003 at 06:17:21 AM MST  
([User Info](#))

what you need is a large blader, like a weather baloon.

Hydrogen's ability to escape is relative to the fact that it is some 50 times less dense than air, that is all.

regards Allan

Re: Hydrogen Generation ([none / 0](#)) (#5)  
by kww on Mon Oct 6th, 2003 at 12:15:55 PM MST  
([User Info](#))

Hindenburg comes to mind. :-)

[ [Parent](#) ]

Re: Hydrogen Generation ([none / 0](#)) (#6)  
by RobC on Mon Oct 6th, 2003 at 12:57:32 PM MST  
([User Info](#))

Actually the people weren't killed by the burning hydrogen. Alot of them leaped to their deaths needlessly if I remember right.

[ [Parent](#) ]

Re: Hydrogen Generation ([none / 0](#)) (#7)  
by troy on Mon Oct 6th, 2003 at 02:52:02 PM MST  
([User Info](#))

Storing H2 is interesting for a number of reasons.

1. very light buoyant molecule
2. very small molecule, 16 times smaller than O2 molecule. it can leak through the pores of sheet metal unless special precautions are taken. If you think metal doesn't have much pore structure, ask a welder who is trying to heliarc a piece of oil soaked aluminum. Oil molecules are enormous compared to H2, yet they manage to penetrate aluminum for some distance.
3. the range of flamability of H2 is amazing. Methane (natural gas) by comparison has a very narrow range, it has to be a very particular fuel/Oxygen ratio range or it won't burn. H2 will burn at almost any fuel/oxygen ratio. That's what makes electrolysis fussy, it's hard to trap the liberated hydrogen without getting a little oxygen in there also, thus making the mixture explosive.

Not that it can't be done, it just wants to be done right.

www.homepower.com has several back issues with very detailed descriptions of H2 setups.

Good luck and don't blow anything up you don't mean to!

troy

[ [Parent](#) ]

Re: Hydrogen Generation ([none / 0](#)) (#9)  
by Tom in NH on Mon Oct 6th, 2003 at 11:22:10 PM  
MST  
([User Info](#))

A weather balloon would be fairly inexpensive. It's time to check out eBay, I guess. One thing that's becoming apparent is that H2 production is a good thing to do with solar panels because it occurs even when it is cloudy.

I think low pressure and short-term storage will help cut down on the losses. The idea is to use H2 as an energy storage medium instead of a battery.

Tom

[ [Parent](#) ]

Re: Hydrogen Generation ([none / 0](#)) (#8)  
by J Steele ([JvsinThai@yahoo.com](mailto:JvsinThai@yahoo.com)) on Mon Oct 6th, 2003  
at 03:59:24 PM MST  
([User Info](#))

When I was a kid, my parents wouldn't buy me a dog so I turned to a life of making Hydrogen. One of the best ways to store the stuff is trapped under water. Hydrogen has a hard time penetrating water.

John

Re: Hydrogen Generation ([none / 0](#)) (#10)  
by troy on Tue Oct 7th, 2003 at 04:39:39 PM MST  
([User Info](#))

I have seen photos of two different low pressure methods:

Big truck inner tubes, all tied together with a weighted board on top to provide a few inches water column pressure to feed it to the stove. The other system used a cylinder shaped tank, closed at the top, open at the bottom. This fits inside a second tank that holds water. As the H<sub>2</sub> enters the movable tank, it rises and provides modest pressurization. It had several weights on the top to provide more/less pressure and a cable/pulley attached to the top to adjust the counterweight and keep it nice and vertical.

Good luck and have fun.

troy

[ [Parent](#) ]

Re: Hydrogen Generation ([none / 0](#)) (#11)  
by TomW on Tue Oct 7th, 2003 at 07:28:26 PM MST  
([User Info](#))  
<http://oneota.net/~earthsourcepowr/>

Troy;

I tried both of those methods on my methane digester and both worked pretty well. That was very long ago. I adjusted the weight to get a good burn on the range we burned it in. Admittedly methane is not hydrogen but the principle is the same. Took forever to turn pigstuff into burnable gas in any quantity but it did work. The tractor tube developed leaks pretty quickly but was not new. The inverted water heater tank in a barrel of water seemed better long term and never gave any problems. Plus, if I recall correctly the bubbling the gas through water acted to purify it of some ugliness like sulphur or??

The first question to be asked will be how big / how much gas etc. All I can remember was about a 300 gallon stainless steel milk bulk tank as the digester and adding pig manure as it reduced in volume. Once it got working good it made enough gas to use it a couple times a day to cook with. Had pigs right on the place and all the waste I wanted to haul from the

manure pit under the confinement building. If you have the "feedstock" I think methane is pretty easy to pull off and seems to work fine in gas equipment set up for propane. I simply scaled plans I found in a Mother Earth News circa 1972 or something.

Cheers.

TomW

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Re: Hydrogen Generation ([none / 0](#))  
(#12)

by Tom in NH on Tue Oct 7th, 2003 at 09:01:24 PM MST

([User Info](#))

I remember that Mother Earth News article. I was thinking about an inverted drum for hydrogen storage, but I'd want to keep it outside and I'd somehow have to keep it from freezing in the winter.

I've read how methane can be produced using hydrogen and carbon monoxide and offers several advantages over pure H2. Hopefully it would be a little less noxious than the original method that used chicken or pig sh--.

[ [Parent](#) ]

[Hydrogen Generation](#) | 12 comments (12 topical, 0 editorial)

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## [Hydrogen](#)

By [RobC](#), Section [Homebrewed Electricity](#)

Posted on Sat Aug 30th, 2003 at 04:01:18 PM MST

[Hydrogen](#)

Best place to find plans?

Where's the best site on the net for electrolysis cell plans?

[Hydrogen](#) | 1 comment (1 topical, 0 editorial)

Re: Hydrogen ([none / 0](#)) ([#1](#))

by Tom in NH on Thu Oct 2nd, 2003 at 11:18:26 PM MST

[\(User Info\)](#)

It's been quite awhile since you first posted, but there's a pretty cool hydrogen site at <http://www.hydrogenappliances.com/hydrogengeneration.html>

They don't have plans though, but a pretty detailed description of a product they manufacture.

I'm building a small hydrogen generator now to hook up to a solar panel. Is anybody out there interested in do-it-yourself hydrogen production? --Tom

[Hydrogen](#) | 1 comment (1 topical, 0 editorial)

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## [Water wheel and 12 or 220 volt?](#)

By [Anonymous Hero](#), Section [Homebrewed Electricity](#)  
 Posted on Wed Jun 25th, 2003 at 07:06:45 PM MST [Hydrogen](#)  
**Water wheel and 12 or 220 volt?**

Greetings People,

I have a fishing camp on the banks of the Zambezi river in Africa. We want to put in a water wheel to drive an alternator or similar. Could anyone give me some ideas on what would be best. The speed of the water is approx 5 kilometers an hour but there is tons of it, the river is about half a mile wide :-). Revolution speed of the water wheel will be slow but we can make the paddles any size and therefore generate any amount of torque. However, we don't want to build a monstrosity. Lastly, i don't have any idea on what size wheel i would need to build so that we could drive a 1Kva 220 volt alternator. If anyone has experience with this, any help or clever ideas would be greatly appreciated.

Thanks

Dave Adams

[Water wheel and 12 or 220 volt?](#) | 2 comments (2 topical, 0 editorial)

Re: Water wheel and 12 or 220 volt? ([none / 0](#)) ([#1](#))  
 by troy on Thu Jun 26th, 2003 at 04:17:24 PM MST  
[\(User Info\)](#)

Homepower magazine has published a couple of articles describing similar installations. You might find the info on their website:

[www.homepower.com](http://www.homepower.com)

(it's a great website anyway by the way)

or you might have to purchase a back issue on cd to get all the details.

Best of luck,

troy

Re: Water wheel and 12 or 220 volt? ([none / 0](#)) ([#2](#))  
 by jubalearly on Thu Jun 26th, 2003 at 04:42:47 PM MST  
[\(User Info\)](#)

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There's a micro turbine group on Yahoo, if I recall correctly that can probably refer to a web page that would answer your question. If you only need 1kw (1000w), it shouldn't need to be very big (I'm thinking 6 ft. diameter, not very wide, just off the top of my head). I've been looking other types of water powered generators, so I don't have the formulas for your situation, but they are out on the web.

If you need 1kva, you'll probably need to generate 1500-2000w to allow for losses. Do you have the 220v alternator? If you don't need 12v, then I would generate at 220v - you can use much smaller wires or make much longer runs from source to load. HTH, Russ

[Water wheel and 12 or 220 volt?](#) | 2 comments (2 topical, 0 editorial)

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[Inverter or 12 V DC](#)

By [Amun](#), Section [Homebrewed Electricity](#)  
Posted on Tue Dec 23rd, 2003 at 09:35:18 AM MST [Inverters](#)  
12 v pump or inverter

Hi there,  
I`m living in the north of Germany building my first genny.  
My question is is there a 12or 24 V DC Water Pump for my well (26 ft deep)wich give me water pressure for garden watering.  
Or is it better to use a 220 V inverter (really pricy).

Thanks a lot Armin

[Inverter or 12 V DC](#) | 1 comment (1 topical, 0 editorial)

Re: Inverter or 12 V DC ([none / 0](#)) ([#1](#))  
by [drdongle](#) on Tue Dec 23rd, 2003 at 04:30:46 PM MST  
([User Info](#))

simple is always best, given my choice of the three I would pick 24V.

Dr.D

[Inverter or 12 V DC](#) | 1 comment (1 topical, 0 editorial)

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posted by RogerAS on 11/17/2003 10:46:45 AM MST  
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posted by Junkie on 11/16/2003 03:20:43 AM MST  
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posted by RayW on 11/02/2003 07:53:11 PM MST  
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posted by clankhankel on 11/01/2003 02:04:32 PM MST  
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posted by 44toy on 10/17/2003 03:56:35 PM MST  
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posted by shane on 09/14/2003 09:16:24 PM MST  
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posted by Old F on 09/04/2003 06:44:28 PM MST  
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posted by Reno on 09/03/2003 06:25:01 AM MST  
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posted by waldo on 08/21/2003 02:31:13 PM MST  
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posted by LowTechWreck on 08/14/2003 05:41:18 AM MST  
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20. [DC to AC power inversion](#) ([Homebrewed Electricity](#),  
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posted by pete on 08/05/2003 02:32:14 PM MST  
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21. [Looking for 12vdc to 240vac simple inverter  
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posted by Simon on 07/28/2003 01:46:31 AM MST  
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22. [Got my new inverter !](#) ([Homebrewed Electricity](#),  
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posted by Old F on 07/26/2003 06:17:17 PM MST  
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23. [Portawattz 3000 inverter any one have one?](#)  
([Homebrewed Electricity](#), [Inverters](#))  
posted by Old F on 07/20/2003 09:05:01 AM MST  
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posted by Windnutone on 07/15/2003 11:04:26 PM MST  
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posted by myke on 07/10/2003 12:00:25 AM MST  
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posted by Windnutone on 07/08/2003 07:21:06 PM MST  
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posted by Larry755 on 07/07/2003 06:57:24 AM MST  
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posted by Andrew on 07/04/2003 06:32:36 PM MST  
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[Lightning protection](#)

By [halfcrazy](#), Section [Remote Living](#)  
Posted on Sun Dec 21st, 2003 at 07:39:56 AM MST [Inverters](#)  
How many and where?

My question for everyone is with a completely off grid system in central maine how many surge suppressors and where do i need them for lightning protection? I have a dc disconnect for the panels and charge controller i figured one there. and i have a main 120 panel and i also have a 240 volt panel from the generator that ties into the inverter should there be one there or is it overkill? and i also have a auto transformer for a deep well pump i was told i should have one there to? what is everyones opinion?

[Lightning protection](#) | 3 comments (3 topical, 0 editorial)

Re: Lightning protection ([none / 0](#)) ([#1](#))  
by [drdongle](#) on Sun Dec 21st, 2003 at 11:20:39 AM MST  
([User Info](#))

If you have a wind turbine there you definitely want to ground the tower, and add arrestors to the incoming lines. Any equipment that is exposed out side, particularly if it is elevated or near high objects needs to be grounded, if possible and have arrestors.

Dr.D

Re: Lightning protection ([none / 0](#)) ([#2](#))  
by [charged](#) on Sun Dec 21st, 2003 at 11:57:34 AM MST  
([User Info](#))

As another addition, just for the sake of greater system integrity, consider a heavy DPDT flip switch with the incoming power tied to the center. "Up" goes to your charging system, "down" shunts the outside genny line into a low impedance liquid dead-load with a good earth-ground.

That way you can completely isolate your system when thunderbangers come through and still have some loading on the generator.

Re: Lightning protection ([none / 0](#)) ([#3](#))  
by [wpowokal](#) on Mon Dec 22nd, 2003 at 07:36:37 AM MST  
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Halfcrazy,

all of the above but also, Homepower 98 (current issue)  
page 106 "Old world Charm with Modern Convenience, a  
follow up artical on 2 previous issues, worth a read on this  
subject.

<http://www.homepower.com>

Allan

[Lightning protection](#) | 3 comments (3 topical, 0 editorial)

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### [Inverter Questions?](#)

By [halfcrazy](#), Section [Remote Living](#)

Posted on Sun Nov 23rd, 2003 at 05:35:16 PM MST [Inverters](#)

I Have a Trace inverter it is a sw2524 my question is

I Have a Trace inverter it is a sw2524 my question is it has a generator input and i was wondering if you could tie that int a modified sine wave inverter to charge the batteries? the reasin i ask this is i spend a lot of time on the road and my truck has 4 deep cycle batteries and a xantrex inverter set up that charges right from the high output alternator. seemed like seing that it runs a lot of miles anyhow i could use some of that power for my house? what do you think sound feasible or hal brained?

[Inverter Questions?](#) | 2 comments (2 topical, 0 editorial)

Re: Inverter Questions? ([none / 0](#)) ([#1](#))  
by [gps](#) on Mon Nov 24th, 2003 at 06:53:26 AM MST  
([User Info](#))

I've tried that with a UPS and a SW4048. The AC2 in light flashed indicating it recognized the input but never went solid, which would indicate it had synchronized with and was happy with the input. I don't know why it didn't work but it didn't. Your mileage may vary.

Maybe someone else will have more info.

Re: Inverter Questions? ([none / 0](#)) ([#2](#))  
by [troy](#) on Wed Nov 26th, 2003 at 12:36:26 PM MST  
([User Info](#))

The real problem is not technical, but economics. Any electricity you make from your truck, even if diesel, will cost you more in mileage than the grid will charge you per kilowatt hour. If you're off grid, and you make all your electricity, then your idea has some good potential.

Good luck and have fun!

troy

[Inverter Questions?](#) | 2 comments (2 topical, 0 editorial)

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## [Possible Inverter](#)

By [RogerAS](#), Section [Homebrewed Electricity](#)  
Posted on Mon Nov 17th, 2003 at 10:46:45 AM MST

[Inverters](#)

Hi All,

Recently there was a thread here where someone was using mechanical switching and a stepup transformer to make an inverter.

Couldn't one use a battery bank, series wired, to get 120V DC to start with, and thus eliminate the stepup transformer. Then all one would have to do is switch polarity on a 60Hz basis. It seems that with the right balance of capacitance it would be fairly simple to achive sine wave output to the AC side.

Now, it seems to me that if a 4 brushed common shaft were spun at the right speed the iversion could be done with a very small motor. I mean the spinning could be set up to direct power one way then the other. I must be missing something.

RogerAS

[Possible Inverter](#) | 6 comments (6 topical, 0 editorial)

Re: Possible Inverter ([none / 0](#)) ([#1](#))  
by [Budgreen](#) on Mon Nov 17th, 2003 at 11:28:24 AM MST  
([User Info](#))

series wires 120v dc battery banks are quite common for large inverters. I know a person with one that's a 10Kva ups that uses 120Vdc for the input.

as for that form of switching (chopping) is quite easy in theory, but the voltage will drop from 120v under load.. plus the switching would need to handle X ammount of amps which is usually not a small task.

Re: Possible Inverter ([none / 0](#)) ([#2](#))  
by [bob golding](#) ([yubba at clara dot net](#)) on Mon Nov 17th, 2003 at 12:59:20 PM MST  
([User Info](#))

if you not trying to change voltage it is fairly easy to do dc to conversion using silicon. a h bridge inverter using IGBTs would work and is 99% effcient.

bob

Re: Possible Inverter ([none / 0](#)) ([#3](#))  
by [RogerAS](#) ([rogeras@cei.net](#)) on Mon Nov 17th, 2003 at 01:32:31 PM MST  
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Hi Bob,

What the heck is an IGBT? Also I've never heard of an H bridge, but then again I'm pretty ignorant!

RogerAS

"Put the bunny back in the box!"

[ [Parent](#) ]

Re: Possible Inverter ([none / 0](#)) (#4)  
by Budgreen on Mon Nov 17th, 2003 at 01:42:43 PM MST  
([User Info](#))

IGBT Insulated Gate Bipolar Transistor  
it's similar to a fet, basically a transistor with an insulated base, they can handle up to multiple kilowatts of power

and H bridge is a configuration of FET's or IGBT's usually that form an H, I don't have a picture handy but a quick google of it should turn one up fairly fast.

[ [Parent](#) ]

Re: Possible Inverter ([none / 0](#)) (#5)  
by TomW on Mon Nov 17th, 2003 at 04:07:58 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepower/>

RogerAS;

IGBT:

Insulated  
Gate  
Bipolar  
Transistor

Basically [usually] a high power transistor that works much like a mosfet.

Some info is over here:

[http://www.elec.gla.ac.uk/groups/dev\\_mod/papers/igbt/igbt.html](http://www.elec.gla.ac.uk/groups/dev_mod/papers/igbt/igbt.html)

Cheers.

TomW

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Re: Possible Inverter ([none / 0](#)) (#6)  
by bob golding ([yubba at clara dot net](#)) on Tue Nov 18th, 2003  
at 03:47:05 AM MST  
([User Info](#))



hi roger this should help. must admit i have yet to build one, waiting on some cheap IGBTs as they can get expensive as the power goes up, and being silicon can fail spectaculaly without warning. hope this helps.

<http://www.dprg.org/tutorials/1998-04a/>

bob

[ [Parent](#) ]

[Possible Inverter](#) | 6 comments (6 topical, 0 editorial)

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## [Mechanical DC - AC convertor experiment](#)

By [Junkie](#), Section [Homebrewed Electricity](#)

Posted on Sun Nov 16th, 2003 at 03:20:43 AM MST

[Inverters](#)

DC - AC convertor using a solenoid oscillator

See my page:

<http://www.akuma.dsl.pipex.com/chris/dctoac.html>

It makes a quit hum, and some really small sparks across the solenoid switch. Ouput voltage was measured at 241 Vac.

It should have really been in a closed box but...

Have fun,

-Chris

[Mechanical DC - AC convertor experiment](#) | 16 comments (16 topical, 0 editorial)

Re: Mechanical DC - AC convertor experiment ([none / 0](#)) ([#1](#))  
by Norm on Sun Nov 16th, 2003 at 07:59:54 AM MST  
([User Info](#))

It's neat, now just add a switch on each end that sends current thru the transformer one way then reverses polarity at the other end of the stroke have some adjusting screws so you can adjust the frequency to about 60 cycles.

Back in '56 they had power inverters with a oscillator in fact even car radios had ocllators to step up the voltage to about 45vdc for part of the tubes a little later they came out with 12vdc tubes to eliminate the ocllator in cars.

I got one of those power inverters to run my 45rpm record player (110vac.) figured where to put the input into my push-button, non-station-seeking radio and had the only '56 Chevy around with a record player in it!  
Watch the bumps, worse than a cd player without anti-skip!  
the power inverter had a schematic(wish I had even just kept that)  
Its a nice project tho' I like the stirling engine project even better.Please don't take any of this as sarcasm....just an old man reminising about the 'good ol days' (:>) Norm.

Re: Mechanical DC - AC convertor experiment ([none / 0](#)) ([#2](#))  
by Old F on Sun Nov 16th, 2003 at 08:24:38 AM MST  
([User Info](#)) <http://www.oldf.homestead.com>

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- <http://www.akuma.dsl.pipex.com/chris/dctoac.html>
- [More on Inverters](#)
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Norm

Throes were the days Real radios glowed in the dark.  
And a fellow could make a good living repairing just car radios.  
As most repair men did not want to mess with them.

We called them multi vibrators. I still have one or two in a junk box some where.

Old F

[ [Parent](#) ]

Multipule vibrators ([none / 0](#)) ([#3](#))  
by Norm on Sun Nov 16th, 2003 at 09:08:58 AM MST  
([User Info](#))

Yeah....parked car listening to the radio then then you hear the vibrator go BRR....rrrr..rr...then silence oh oh! Course that never happened to you...eh!?(:>) Norm.

[ [Parent](#) ]

Re: Multipule vibrators ([none / 0](#)) ([#4](#))  
by elvin1949 ([elvin1949@wmconnect.com](mailto:elvin1949@wmconnect.com)) on Sun Nov 16th, 2003 at 10:11:16 AM MST  
([User Info](#))

good morning  
been there done that  
those were the day's  
later elvin

[ [Parent](#) ]

elvin49? ([none / 0](#)) ([#5](#))  
by Norm on Sun Nov 16th, 2003 at 10:55:55 AM MST  
([User Info](#))

good morning  
Elvin....1949  
what significance?  
class of '49 for me!  
(:>) Norm.

[ [Parent](#) ]

Re: elvin49? ([none / 0](#)) ([#14](#))  
by elvin1949  
([elvin1949@wmconnect.com](mailto:elvin1949@wmconnect.com)) on Mon Nov 17th, 2003 at 01:34:38 PM MST  
([User Info](#))

hi norm  
1949 year i was born  
was tearing things up to see what made  
them  
tick by 1955 like that kind of stuff  
later  
elvin

[ [Parent](#) ]

Re: elvin49? ([none / 0](#)) ([#16](#))  
by Norm on Tue Nov 18th, 2003  
at 09:20:24 AM MST  
([User Info](#))

Yeah I like tearing stuff up to  
see what makes it tick  
also....Then later if things work  
out trying to put it back together.  
Like a cap pistol one screw held it  
all together when I took the  
screw out pieces went flying  
everywhere! some real learning  
experiences out there. Have fun!  
Later...Norm.

[ [Parent](#) ]

Re: Mechanical DC - AC convertor experiment ([none / 0](#)) ([#6](#))  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Sun Nov 16th, 2003 at  
11:46:01 AM MST  
([User Info](#)) <http://www.internetfred.com>

Ah, ok that is one way of doing it... Another would be to hook a  
transistor to where the solenoid/switch is now and you would have  
no noise or interference and no arcs... But it's a good starting point  
and shows how to convert that DC to AC easily.  
I wish you good luck and keep up the experimentin...

Re: Mechanical DC - AC convertor experiment ([none / 0](#))  
([#7](#))  
by Junkie ([madschemist@blownup.com](mailto:madschemist@blownup.com)) on Sun Nov 16th,  
2003 at 11:58:24 AM MST  
([User Info](#)) <http://www.akuma.dsl.pipex.com/chris>

iFred wrote : "Another would be to hook a transistor to where the solenoid/switch is now and you would have no noise or interference and no arcs"

I'm not sure its possible to make an oscillator with a single transistor.

Anyway I built that just to see if its possible to build a cheapo inverter without transistors, oh and I like sparks too :)

-Chris

[ [Parent](#) ]

Re: Mechanical DC - AC convertor experiment  
([none / 0](#)) ([#8](#))  
by drdongle on Sun Nov 16th, 2003 at 12:53:05 PM  
MST  
([User Info](#))

Sure you can, just apply a little feedback from the secondary ( with appropriate resistance to reduce the voltage) and you'll have a fine 1 transistor oscillator/upverter.

Dr.D

[ [Parent](#) ]

Re: Mechanical DC - AC convertor experiment  
([none / 0](#)) ([#9](#))  
by Junkie ([madscientist@blownup.com](mailto:madscientist@blownup.com)) on Sun  
Nov 16th, 2003 at 02:14:15 PM MST  
([User Info](#)) <http://www.akuma.dsl.pipex.com/chris>



Is this what you mean ?

Thanks.

[ [Parent](#) ]

Re: Mechanical DC - AC convertor  
experiment ([none / 0](#)) ([#11](#))  
by drdongle on Sun Nov 16th, 2003 at  
09:04:21 PM MST  
([User Info](#))

Very close though I would add an additional resistor between the base and ground then ground the top lead on the transformer secondary. Your current resistor should be fairly large and the grounded one fairly small ( so as to form a voltage divider) something on the order of 100K ohms and 1K ohms so as to give a 100:1 ratio. You may also have to try reversing polarity of one winding and fiddle with the resistor values. too much voltage on the transistor will destroy it. Also keep in mind that the transformer primary will determine how much current the circuit passes so chose a transistor with the appropriate power handling capabilities.  
IE:  $I = E/R$  and  $E \times I = P$  ( watts)

Dr.D

[ [Parent](#) ]

Re: Mechanical DC - AC convertor experiment ([none / 0](#)) ([#12](#))  
by Junkie  
([mads scientist@blownup.com](mailto:mads scientist@blownup.com)) on Mon Nov 17th, 2003 at 02:31:29 AM MST  
([User Info](#)) <http://www.akuma.dsl.pipex.com/chris>

That looks simple enough :) . I will have to try that ASAP.

Thanks !

-Chris

[ [Parent](#) ]

Re: Mechanical DC - AC convertor experiment ([none / 0](#)) ([#15](#))  
by elvin1949  
([elvin1949@wmconnect.com](mailto:elvin1949@wmconnect.com)) on Mon Nov 17th, 2003 at 01:40:16 PM MST  
([User Info](#))

use transistors from ham amps  
have seen them 2kw and up  
later  
elvin

[ [Parent](#) ]

Re: Mechanical DC - AC convertor experiment ([none / 0](#)) ([#10](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Sun Nov 16th, 2003 at 05:25:46 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>



I'm certainly no expert in the field of electronics but it seems to me I remember playing with something in that form using a capacitor, resistor and a center tapped transformer. I'd have to dig out some papers to find it but I was driving flourescents with it. One of those fun things to do...

Have Fun  
Ed

[ [Parent](#) ]

Re: Mechanical DC - AC convertor experiment ([none / 0](#)) ([#13](#))  
by RobD on Mon Nov 17th, 2003 at 06:23:44 AM MST  
([User Info](#))

The limitation is that the transformer saturates with a low frequency square wave but it's a good start. Go to MOSFETs or IGBTs next and then use different core material. E77 from Amidon is good.  
RobD

[Mechanical DC - AC convertor experiment](#) | 16 comments (16 topical, 0 editorial)

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## [Sine wave inverter](#)

By [RayW](#), Section [Homebrewed Electricity](#)

Posted on Sun Nov 2nd, 2003 at 07:53:11 PM MST

[Inverters](#)

sine wave inverter circuit

Does anyone know of a sine-wave inverter circuit that could be home-brewed???

RayW

[Sine wave inverter](#) | 16 comments (16 topical, 0 editorial)

Re: Sine wave inverter ([none / 0](#)) (#1)  
by [RobD](#) on Sun Nov 2nd, 2003 at 09:53:24 PM MST  
([User Info](#))

I personally haven't found any easy ones Ray. I was going to design one myself but now the prices seem to be falling so I'll wait on it. The technology is out there and getting better everyday. If you can program AVR microcontrollers go to the Atmel web site. You'll see it's quite extensive and costly. For what it's worth I think you can build a 'stepped' inverter with about 8 steps in each half wave that will work close to the pure sine ones with a lot less electronics. I may do one of those and post the circuits.  
RobD

Re: Sine wave inverter ([none / 0](#)) (#4)  
by [jubalearly](#) on Mon Nov 3rd, 2003 at 08:03:06 AM MST  
([User Info](#))

Rob D said: For what it's worth I think you can build a 'stepped' inverter with about 8 steps in each half wave that will work close to the pure sine ones with a lot less electronics. I may do one of those and post the circuits.

I wondered if 'magic sine waves' as promoted by Don Lancaster @ <http://tinaja.com/magsn01.asp> might be an easier approach. They are supposed to be microprocessor friendly and suitable for inverters.

Here's a brief description taken from Don's psge: "Magic sinewaves" are repeating long sequences of ones and zeros. They can get created from ordinary but extremely carefully chosen digitally switched pulses.

Digital sinewaves with precisely controlled amplitudes and amazingly low distortions. Compared to traditional PWM, magic sinewaves can offer far higher efficiencies and lower distortions. With circuitry that is elegantly simple and microcontroller friendly.

[ [Parent](#) ]

Re: Sine wave inverter ([none / 0](#)) (#5)  
by [RobD](#) on Mon Nov 3rd, 2003 at 03:54:52 PM MST  
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I forgot about this one. I looked at it a few years ago and it seemed good. I have a couple of Don's books and they are quite good. Is he giving out the algorithm for his magic waves?  
RobD

[ [Parent](#) ]

Re: Sine wave inverter ([none / 0](#)) (#6)  
by kmitchel on Mon Nov 3rd, 2003 at 04:51:35 PM MST  
([User Info](#))

I've been thinking that this approach--Magic Sine Waves--would be awesome for inverters, but have never seen it implemented. The I2K inverter I previously posted is the closest, but all he is really doing is lengthening the pulses to do power factor compensation. Wish someone would develop one.

[ [Parent](#) ]

Re: Sine wave inverter ([none / 0](#)) (#2)  
by kmitchel on Mon Nov 3rd, 2003 at 12:08:56 AM MST  
([User Info](#))

maybe <http://www.technology.niagarac.on.ca/people/mcsele/i2k.htm>

not a true sine-wave inverter

Re: Sine wave inverter ([none / 0](#)) (#3)  
by RobD on Mon Nov 3rd, 2003 at 06:06:52 AM MST  
([User Info](#))

Thanks Kmitchel,  
I have just looked at this page and the inverter. It is basically a low frequency square wave inverter. The two transformers are driven at 60 Hz in much the same manner as a class AB audio amplifier. There is nothing wrong with this approach excepting that AB amps have relatively low efficiency (75% at best). The low internal resistance of the MOSFETS (rds(on)) save the inverter from some real heat problems. Obtaining the transformers might also be a problem and I imagine they are quite expensive.

RobD

[ [Parent](#) ]

Re: Sine wave inverter ([none / 0](#)) (#7)  
by kmitchel on Mon Nov 3rd, 2003 at 05:02:31 PM MST  
([User Info](#))

I believe it's more like a class D amp. The MOSFET's are either on or off. It would be nice to see this inverter further developed, but I am grateful the author posted the work he did do. As far as the transformers, maybe...<http://members.tripod.com/~schematics/xform/xformer4.htm>  
I was kind of surprised he used two in parallel. I think in any homemade high VA inverter transformers would be a problem. I kind of question how cost effective a homebrewed inverter is, and whether it's better in the long run to buy a commercial inverter. Maybe multiple small (cheap) inverters tasked to specific applications. And get a smaller true sine wave inverter just for the stuff that really needs it.

[ [Parent](#) ]

Re: Sine wave inverter ([none / 0](#)) (#8)  
by laskey on Mon Nov 3rd, 2003 at 06:33:35 PM MST  
([User Info](#))

I was thinking of doing some modifications to commercial inverter. You know smooth the steps out before they are amplified in a everyday old cheap inverter. Honestly, How hard could it be?

Cya,  
Chris

[ [Parent](#) ]

Re: Sine wave inverter ([none / 0](#)) (#9)  
by Budgreen on Tue Nov 4th, 2003 at 10:57:35 AM MST  
([User Info](#))

it could be fairly hard and not worth the time.. most inverter ups systems that have non-square wave outputs normally use a microprocessor to create the waveforms and do the rest of the inverter control. if you could read the software off it and recode it would be very possible but quite time consuming :)

on another note you could start and make a dc-dc converter first say 24vin 170v out.. pwm controlled, take a rectified 170v out and run it to an H-bridge, control the H bridge with a 10-25khz pwm signal modulated by a 60hz stable sine wave, then filter the output of the H-bridge to remove the 10-25khz pwm frequency and your left with a nice sine wave output at a high efficiency.

I have been trying to come up with a good dc-dc converter information to try and design a 24v-170v converter (that in itself is easy, just getting it to put out 10-20A is the hard part) so if anyone could help in this arena I may have schematics available by the end of the year :)

[ [Parent](#) ]

Didn't see this option mentioned: ([none / 0](#)) (#10)  
by TomW on Tue Nov 4th, 2003 at 12:10:01 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Folks;

This is not new at all but have any of you considered just driving an induction motor at its generating speed [with caps added] by using a dc motor from your batteries perhaps with some form of speed regulation?

The output from an induction motor would be the purest of sinewaves.

Just another way although mechanical it would work.

Cheers.

TomW

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Re: Didn't see this option mentioned: ([none / 0](#)) ([#11](#))  
by Budgreen on Tue Nov 4th, 2003 at 12:47:05 PM MST  
([User Info](#))

that is indeed a feasible idea..

but the concern would be how efficient would (say a 5hp) dc motor be? plus the current draw of the motor unloaded to spin the induction motor with relatively little load?

using 250W of power to spin a motor to run a 50W ac load might not be reasonable

(wattages just guesimated as I have no source to back it up)

[ [Parent](#) ]

Re: Didn't see this option mentioned: ([none / 0](#)) ([#12](#))  
by boB on Tue Nov 4th, 2003 at 12:55:55 PM MST  
([User Info](#))

There is a construction article in the latest Electronics World (Wireless World)

magazine from the UK. You can find this one at Barnes and Noble.

It's the front

page picture and main article. 500 Watts and sine wave inverter.

It's not bad !

boB

[ [Parent](#) ]

Re: Didn't see this option mentioned: ([none / 0](#)) ([#13](#))  
by drdongle on Tue Nov 4th, 2003 at 04:14:45 PM MST  
([User Info](#))

This is called a MG set or motor-generator and the idea has been used for many years by the military and commercially for every thing from radio equipment to elevators.

There not particularly efficient.

Dr.D

[ [Parent](#) ]

Re: Sine wave inverter ([none / 0](#)) (#14)  
by ibedonc on Tue Nov 4th, 2003 at 10:21:23 PM MST  
([User Info](#))

National makes a CLASS D amp chipset that I am going to base my Sinewave Inverter off of ,and I have a chip to make the 60hz sine , this will drive the CLASS D amp which will drive H-Bridge modules that will handle 5k watt each, need another 5k just add another module and mine will put out 220v just like the power co , when I am done I want to be able to do 40k watt also the controller will turn on output modules based on need, only need one running , then only one will be on , turn on something that needs 2 then it will enable 2

I could also make them on 1k modules

Re: Sine wave inverter ([none / 0](#)) (#15)  
by Budgreen on Wed Nov 5th, 2003 at 07:02:46 AM MST  
([User Info](#))

what voltage will you switch? low voltage and then step up with transformer? or just chop a 310v signal?

[ [Parent](#) ]

Re: Sine wave inverter ([none / 0](#)) (#16)  
by ibedonc on Wed Nov 5th, 2003 at 08:45:12 PM MST  
([User Info](#))

DC 48v to 310v with lot of capacitors for surge this is the supply power for the h bridge

using toroids for the stepup supply , 25khz switching freq

my first electronic Job was for ELPAC , electronic switching power supplies

I will monitor the current though each module with a current sense

[ [Parent](#) ]

[Sine wave inverter](#) | 16 comments (16 topical, 0 editorial)

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[inverter](#)

By [clankhankel](#), Section [Homebrewed Electricity](#)  
Posted on Sat Nov 1st, 2003 at 02:04:32 PM MST  
inverter location question.

[Inverters](#)

Where is the best place to install an inverter in the house or next to wind mill & solar panel. Ben

[inverter](#) | 6 comments (6 topical, 0 editorial)

Re: inverter ([none / 0](#)) (#1)  
by [jimu](#) on Sat Nov 1st, 2003 at 02:26:17 PM MST  
([User Info](#))

As close as possible to your battery bank.  
JimU

Re: inverter ([none / 0](#)) (#2)  
by [clankhankel](#) on Sat Nov 1st, 2003 at 02:52:13 PM MST  
([User Info](#))

Jim Thank you for the info I'm new at this wind & solar system. I'm going to use 8 ga wire to the battery bank, it will about 30 ft from the battery bank

[ [Parent](#) ]

Re: inverter ([none / 0](#)) (#3)  
by [jimu](#) on Sat Nov 1st, 2003 at 04:20:27 PM MST  
([User Info](#))

Ok..Now I have a bit more to work with..

Since we have no idea of the size of your inverter, and the capacity of your bank, I will go with what I have set up..

I use a Trace DR1512 inverter, which is 1500 watts at 12 volts, and the inverter is mounted directly above my battery bank , which consists of 6 Trojan T-105's.

I use two 3.5 foot lengths of 00 guage cable to connect to the bank from the inverter..

Unless your inverter is going to be under, say 600 watts, I wouldnt use 8 ga. and definely not 30 feet from the bank..your losses would be tremendous..

You want the absouletly shortest length from the inverter to the batts, and the largest

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guage wire you can afford or work with.

Now, there is an exception to this rule, and that is some people use small inverters for each room, running large guage DC runs from a central battery bank to each inverter

in the house..I have done this some years ago with some small inported inverters, one in the bedroom, and one in my living room, and work fine for the small loads.

There is quite a bit of info out there on the net, and a google search of "inverter wiring" yielded over 400 hits, some of which will answer your questions in more depth.

Hope this helps,

JimU

[ [Parent](#) ]

Re: inverter ([none / 0](#)) (#4)  
by clankhankel on Sat Nov 1st, 2003 at  
05:13:30 PM MST  
([User Info](#))

Jim I have two inverter vegtor 3000 watt each 4 trojan l 16, 4 155 w panels plus 2 wind mill hornets,xantrex c60 multifunction dc controller. do I put all this hardware close my panels & windmill or put by the house. Which would be best. the panels & windmill will aboue 30 ft away from the house. the house roof does not face south.Thanks ben

[ [Parent](#) ]

Re: inverter ([none / 0](#)) (#5)  
by DanB on Mon Nov 3rd, 2003 at  
01:06:28 PM MST  
([User Info](#))

30' of AWG 8 wire is not good for a 3000 watt inverter.... not good at all!  
You need lots less distance and very heavy wire! Keep in mind, your inverter could draw over 200 amps from the batteries!  
What you have there now is good for about 1/10 that..  
Your inverter will almost surely shut down if you put a significant load on it, and that wire might get dangerously warm.

[ [Parent](#) ]

Amen to that! ([none / 0](#)) ([#6](#))  
by TomW on Tue Nov 4th, 2003 at  
08:41:04 AM MST  
([User Info](#))  
<http://oneota.net/~earthsourcepowr/>

Dan is absolutely correct. Inverter to battery wiring needs to be relatively massive wire to be safe and efficient or even work at all in some cases and certainly if more than a few feet between the batteries and the inverter.

Cheers.

TomW

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[inverter](#) | 6 comments (6 topical, 0 editorial)

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### [Question about dc to ac inverters](#)

By [camp185](#), Section [Homebrewed Electricity](#)  
Posted on Thu Oct 30th, 2003 at 12:33:14 AM MST [Inverters](#)  
[Question about dc to ac inverters](#)

Howdy,

I have a question about DC to AC inverters...When I finally connected my inverter to my battery I came across something that I never calculated. That when my inverter is on it uses energy whether something is plugged into it or not. My question is this. Is this the case with most small inverters, say under 1000 watts? I have a 400 watt with 800 watt max, and according to the directions it uses .6 amps while it is on. Seems kind of like a lot to me...it has a fan. Are there some that use 0 amps while left on?

The reason I ask is because I have a bunch of itmes that run on timers that I would love to plug into an inverter. Sucking up over 14 amps a day just to leave it on doesn't sound to practical. Any help?

Rob

[Question about dc to ac inverters](#) | 10 comments (10 topical, 0 editorial)

Re: Question about dc to ac inverters ([none / 0](#)) ([#1](#))  
by [kurt](#) on Thu Oct 30th, 2003 at 02:41:08 AM MST  
([User Info](#))

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there are inverters that have no load amp draws lower than .6A some also have a "sleep mode" which reduces the amount of power the inverter requires when nothing is running ever further.  
<http://www.xantrex.com/products/supercat.asp>



Re: Question about dc to ac inverters ([none / 0](#)) (#2)  
by veewee77 on Thu Oct 30th, 2003 at 05:26:31 AM MST  
([User Info](#))

what items do you have on timers?

Re: Question about dc to ac inverters ([none / 0](#))  
(#6)  
by camp185 on Thu Oct 30th, 2003 at 11:16:34 AM  
MST  
([User Info](#)) <http://www.bestwebimage.com>

I have a water softener, and my sprinkler system. I also would like to hook up my garage door when I get another panel. The door isn't on a timer, but same idea...no or little power until that one minute I need it.

[ [Parent](#) ]

Re: Question about dc to ac inverters ([none / 0](#)) (#3)  
by Adrian L on Thu Oct 30th, 2003 at 05:35:07 AM MST  
([User Info](#))

Just to let you know, The no load current draw on inverters varies a lot, some cheap chinese inverters can use 2 amps at 12 volts when not powering anything...

Normally the bigger the inverter capacity the higher the no load current will be, I believe this is due to more higher powered components needing to be 'powered' ready to go all the time, and stray inductance in the higher powered transformers.

The more expensive ones have automatic shut down, and automatic restart when a larger load is detected, but this will not suit your situation with the timers because the timers will stop timing!

Inverters I've owned for reference:

a 1200 watt modified sinewave inverter, it had high load triggered fans, so it only used 0.3amps while on and not powering anything....

a 250 watt pure sinewave inverter, it was a 24 volt model, and also had load triggered fans(heavy load triggered), uses 0.16 amps when not powering anything (I used to leave this on day and night)

a 330 watt 12 volt modified sinewave inverter, this one ran it's fan constantly and used about 0.35 amps

Cheers,

Adrian L

Re: Question about dc to ac inverters ([none / 0](#)) (#4)  
by veewee77 on Thu Oct 30th, 2003 at 05:46:53 AM MST  
([User Info](#))

You could make a small circuit that puts the fan on a temperature switch that nly turns the fan on if the heatsink gets above a certain temp. That would lower the "dead" current. Or you could add a current level sensor on the output line and make the fan come on only with a certain amount or more of output current. The inverter won't get hot unless it is driving a load above a certain amount. With trial and error, you could figure out the level where the fan needs to come on.

just my \$.02 and worth every penny!

DS

Re: Question about dc to ac inverters ([none / 0](#))  
(#7)  
by camp185 on Thu Oct 30th, 2003 at 02:16:27 PM  
MST  
([User Info](#)) <http://www.bestwebimage.com>

Worth a lot more than 2 cents to me....

Knowing my wonderful ability to take things apart and DESTROY I thought twice about your idea. Then it gave me a great idea, or at least I think, it's one I can handle anyhow. Simply install a toggle switch for the fan. I am sure the inverter can keep cool enough while cranking out the power for a digital timer, and when the timer goes off the units only need high power for a few seconds (sprinkler system). Then when I want to crank on the lights or computer I just flip the switch and the fan kicks on keeping it nice and cool.

Thanks!

Anyone out their...let me know if this is a bad idea...

Rob

[ [Parent](#) ]

Re: Question about dc to ac inverters ([none / 0](#)) (#5)  
by Norm on Thu Oct 30th, 2003 at 07:11:04 AM MST  
([User Info](#))



Aren't the timers using 110 volt electricity anyway, (unless it's a quartz battery operated timer) or if you had a mechanical wind up timer that would turn on the inverter and whatever at the same time.....  
Ever notice how much a 'wall wart' uses times 4-8 ?(:>)  
Norm.

(Just a glance back.)At one time they had spring-wound clocks for cars whereupon every few minutes a 6-volt solenoid would rewind the clock. ('38 Chevy Special Deluxe)  
Wonder how much of an amp. that used in 24 hrs.?

Re: Question about dc to ac inverters ([none / 0](#)) (#8)  
by RobD on Thu Oct 30th, 2003 at 03:27:53 PM MST  
([User Info](#))

What you're talking about is idle current and inverter manufacturers usually state this in their specs. .6 amps idle current is about normal and when you think that a 12 volt 1500 watt inverter is drawing 125 amps at full load that's not bad.  
RobD

Re: Question about dc to ac inverters ([none / 0](#)) (#9)  
by Adrian L on Thu Oct 30th, 2003 at 07:56:19 PM MST  
([User Info](#))

Yeah i've added a switch inline with the wires to the fans on my 330 watt unit, worked just fine with it switched off, and would not even get warm without the fan up to about a 100 watt load!

Cheers,

Adrian L

DC Timer? ([none / 0](#)) (#10)  
by wdyasq on Fri Oct 31st, 2003 at 04:45:26 AM MST  
([User Info](#))

One of my -future projects- is a stand-alone Solar powered freezer. The -brain- of the system will be the low-voltage thermostat. This thermostat will turn the inverter on until the freezer reaches a particular temperature. It will then shut-off and wait for a time interval. If the freezer needs to be turned on - the upper limit switch, it will turn the inverter back on. If not, it will go back to -sleep-.

There could be more instructions to the system, such as add more intermittent machines and cycle them so only one large one or several smaller ones would run at the same time. System conditions could be monitored so non-essential items would only be run when the reserves were available.

I know one of the new small low power chips could do all of this on a few milliamps. I guess I'll have to learn how to make them work.

Ron

[Question about dc to ac inverters](#) | 10 comments (10 topical, 0 editorial)

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### [Cobra Power Inverters for sale](#)

By [onyx](#), Section [Classifieds](#)

Posted on Sun Oct 26th, 2003 at 07:02:49 PM MST [Inverters](#)

For Sale: Cobra Power Inverters, 1500 watt, and 2500 watt Continuous

I have the following Cobra Power Inverters for sale, Brand new, in box, factory sealed, never used:

CPI 2500: 2500 watt continuous, 5000 watt peak. New improved model. For more details go to product website, [CPI 2500 at Cobra.com](#). Selling for \$220, plus \$15 shipping to anywhere in the continental US.



CPI 1500: 1500 watt continuous, 3000 watt peak. This is also a new model that has been improved. Again, for more details go to product website, [CPI 1500 at Cobra.com](#). Selling for \$130, plus \$10 shipping to anywhere in the continental US.

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If you have any questions, please feel free to e-mail me at [sellit697@hotmail.com](mailto:sellit697@hotmail.com). Thanks! :-)

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[?s about converting dc to ac](#)

By [44toy](#), Section [Homebrewed Electricity](#)  
 Posted on Fri Oct 17th, 2003 at 03:56:35 PM MST [Inverters](#)  
 Posted this on the wrong board so I posted here to ( will try delete copy in magnets section)

O.k. I am trying to get my first system going, and no body around here can tell me if I am figuring my load correctly. Lets say these are the specs on an item. .72 amps (read with amp clamp,) 120 volts ac (read with my meter.)

I was using the following formula-

$$\frac{P}{I \mid V} \text{ ----- } A \times v = P$$

.72 X 120= 86.4 watts

then to covert this to a 12 volt dc amp draw --  $P / V = A$

$$86.4 W / 12 v$$

dc = 7.2 amps dc

I am using The total of the (basic items) dc amp loads + a 50% cushion for additions etc, to figure the amps my hydro powered generator will need to put out.

This may be confussing the electronic teachers at my college look at me funny and will not stand firm. My questions are--

1. Will this work to figure the amount of power I will need? I know I could simplify the process and any better conversion formulas would be nice
2. Will there be any drop other than the loss to the inverter? the main thing I am unsure of is using the formula to convert from dc to ac.
3. If you guys look at this and just have a funny look on your face, You can get the idea of what I am trying to figure and please HELP.

[?s about converting dc to ac](#) | 8 comments (8 topical, 0 editorial)

Re: ?s about converting dc to ac ([none / 0](#)) ([#1](#))  
 by [RobD](#) on Fri Oct 17th, 2003 at 04:28:11 PM MST  
[\(User Info\)](#)

The first problem I see is that you are mixing AC power from your meter that is not RMS and then figuring DC from it.

RMS power is the amount of AC that will heat a resistor to the equivalent DC power.

The formula  $P = E I$  gives the power and this is correct. You might want to measure the resistance of your load IF the load doesn't vary excessively when it is under a dynamic load. Once you know the resistance you can get the current by  $I = E/R$  and  $P = E I$  or  $P = I^2 R$  to get your power for your working voltage.

Your method will get you in the ball park though.

RobD

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Re: ?s about converting dc to ac ([none / 0](#)) (#2)  
by 44toy on Fri Oct 17th, 2003 at 05:24:16 PM MST  
([User Info](#))

I believe I am with you on the statement (Once you know the resistance you can get the current by  $I=E/R$  and  $P=E I$  or  $P=I^2 R$  to get your power for your working voltage.)

But alot of the loads I measured are computer, television, vcr and other dumb stuff. And I dont think I can measure resistance on them? So all I have to go on is the amp clamp, and my measured voltage of the supply 120 volts ac.

All I need is a Ballpark since I am Trying to figure a 40% buffer and have no help local. -----thanks for all advice.

Duplicate Post ([none / 0](#)) (#3)  
by TomW on Fri Oct 17th, 2003 at 05:54:51 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

44toy;

If I had caught this before it had comments on both copies I would have deleted one of them but since they both have comments I left them both up. No big deal either way.

Cheers.

TomW

[Stuff I have Online](#)  
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Re: ?s about converting dc to ac ([none / 0](#)) (#4)  
by electronbaby ([electronbaby@hotmail.com](mailto:electronbaby@hotmail.com)) on Sat Oct 18th, 2003 at 10:16:58 PM MST  
([User Info](#))

why not use an AC ammeter to determine your current draw? Or if you only wanted to be 'in the ballpark' you could just read the wattage on the back of the appliance that is in question. It is usually listed. RoyR

Re: ?s about converting dc to ac ([none / 0](#)) (#6)  
by 44toy on Sun Oct 19th, 2003 at 07:51:30 AM MST  
([User Info](#))



I am using a fieldpiece sc76 voltmeter with ampclamp to check the current draw of the loads i will be pulling (clamped on one wire of my test cord). I measured the volts by inserting the probes into the house outlet.

Readings for one load were .72 amps at 120 volts

I am trying to figure how many dc amps I will need power the loads. I am not sure The above formula is right because I have a limited undrsanding of power.

[ [Parent](#) ]

Re: ?s about converting dc to ac ([none / 0](#)) (#5)  
by wdyasq on Sun Oct 19th, 2003 at 07:45:11 AM MST  
([User Info](#))

I have found a few meters that might help. The Kill a WATT ; Watts and Watts up PRO and AC cost control all measure watts of 120 volt AC current. The Watts up and Watts up PRO record the surges. The Watts Up PRO has a computer interface so one can play with a spreadsheet and figure out just how much energy the tool or toy uses and how much it is going to cost to build a system to handle it.

The lesser meters run in the ~ \$30-\$40 range while the Watts Up is ~\$100 and the Watts up PRO is ~\$150.

For you mountain guys, the unit is only rated -Altitude up to 2000 meters - I guess one would need to drag the tools off the mountain to test them or - heaven forbid, risk breaking -UL listing-!

Ron

Re: ?s about converting dc to ac ([none / 0](#)) (#7)  
by jubalearly on Mon Oct 20th, 2003 at 09:02:44 AM MST  
([User Info](#))

The kill-a-watt meter works up to 15 amps and as long as you are close to 60Hz. Otherwise, your meter (DMM?) and clamp ammeter should be measuring RMS as long as you are close to 60Hz. It depends on the meter design and original calibration to give you RMS @60Hz & your meter may not be accurate.

I really like my kill-o-watt meter. I had to replace one that was used on a generator, tho. I think I can repair it. But, my point is that they increased the size of the input resistor (that burned up) from 5 watt to 10 ohm, 10 watt.

Re: ?s about converting dc to ac ([none / 0](#)) (#8)  
by charged on Thu Nov 13th, 2003 at 11:50:09 AM MST  
([User Info](#))

Call me crazy. But, why not just do the following..

1. power up your inverter with no load and measure it's "idle" power drawn from a battery.
2. Plug in each appliance and measure the increase in power drawn on the battery side.
3. Add up all the appliance power measurements and you'll have better-than-ballpark measurements.

All D.C. all the time.

Enjoy!

[?s about converting dc to ac](#) | 8 comments (8 topical, 0 editorial)

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## [Inverters](#)

By [Flyeribe](#), Section [Classifieds](#)

Posted on Tue Oct 14th, 2003 at 08:24:21 AM MST

[Inverters](#)

For sale inverters

Hi I have three prosine inverters 1800/24v new with manuals. Located in Ontairo  
You can contact me at Luke.Cardinal@nrc.ca for more info

[Inverters](#) | 0 comments (0 topical, 0 editorial)

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[use for ups's](#)

By [Budgreen](#), Section [Homebrewed Electricity](#)  
 Posted on Fri Sep 26th, 2003 at 09:03:57 AM MST [Inverters](#)  
 what can be done here....

Before to long I will be getting some old ups's (660va and 720va) and either the charging section or scr controller in these units is bad and basically unrepairible but the actual inverter section is good, what good use could I put these units to work doing? I do have a large battery bank but that is reserved for future use at the moment. within the next month I will have up a small windmill to provide power for them, just loking for an interesting use.

[use for ups's](#) | 3 comments (3 topical, 0 editorial)

I use[d] one as an inverter for a long time.. ([none / 0](#)) (#1)  
 by TomW on Fri Sep 26th, 2003 at 10:57:44 PM MST  
[\(User Info\)](#) <http://oneota.net/~earthsourcepowr/>

Budgreen;

I used an APC brand 650 UPS very successfully for several hours a day for about a year as an inverter. It worked beautifully but finally died a couple weeks ago.

One note that i will make is that it got awfully hot when drawing 20 to 25 amps continuously which more than likely contributed to its failure and also is wasted power.

They are not designed for anything but intermittent short term use. You will want heavier cable from the batteries to the internal cable than they use from the factory to connect to the batteries also.

Add a cooling fan if at all possible such as a computer fan.

I had to trick out the buzzer and you need to press the "test" button to get it to fire up without grid. Considering it was a dumpster find I felt it did well as an inverter. I have used them for years when camping in the RV where there was no juice bush, too.

Cheers.

TomW

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Dead UPS and a post mortem... ([none / 0](#)) (#3)  
 by TomW on Tue Sep 30th, 2003 at 08:55:59 AM MST  
[\(User Info\)](#) <http://oneota.net/~earthsourcepowr/>

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Folks;

That comment reminded me to dig that UPS out and look into the problem.

What I found is a first for me that I can remember in 30+ years of electronic work.

2 of the power resistors had gotten so hot [no cooling fan] that they became unsoldered and were lying in the bottom of the case. Pretty darned weird. If i can get to it I will be soldering them back in and adding a cooling fan to get rid of that heat. The PC board in there is at the top of the case with all the components hanging down and the traces up with about 3/8th inch clearance to the cover.

Considering they are only designed for intermittent short term use it is amazing it lasted this long running about 5 hours regularly at pretty much full load plus.

Again it was a dumpster find so no loss if I can't get it working again plus its a goldmine of parts too.

Just passing on the experience. If you intend to use one as an inverter I highly recommend a fan that kicks on when its running. You could modify the battery door to hold a fan easily without even pulling the cover. I will modify the top of the case for a fan because its off already.

Cheers.

TomW

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Re: use for ups's ([none / 0](#)) ([#2](#))  
by dconn on Tue Sep 30th, 2003 at 05:11:59 AM MST  
([User Info](#))

Hi Budgreen,

I have two APC ups'es here and I did a bit of playing around to see what I could do with them. They are rated at 650VA and 800VA. I was hoping to dedicate one to running a fridge.

I had no problem at all connecting directly to the UPS battery wires from a big battery bank and then switching on. They made a little beep every now and then but I didn't mind that (it was in the battery shed). It was also great that I was able to connect a serial cable to the UPS'es and read battery voltage (and lots of other not-so-useful stuff) - (I used apcupsd to read the UPS details).

I gave up though because when I switched on the fridge the ups would switch with over-current protection. Ok - I know that an induction motor draws a lot of current starting up but I think the computer UPS units are, perhaps, over-protected. Another thing to note is that VA does NOT equal watts in APC UPS land (maybe the VA is battery draw/charging and watts is AC output? I dont know) so a 800VA UPS only gives around 600 watts.

As usual I've found that the answer is to somehow get the cash and buy a new Inverter.

All the best,

Derek

[use for ups's](#) | 3 comments (3 topical, 0 editorial)

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## [12v-240v](#)

By [morgs](#), Section [Remote Living](#)

Posted on Sun Sep 21st, 2003 at 05:17:41 PM MST

[Inverters](#)

Current draw.

Hi all

I need to know what current draw I will have through a 12v-240v inverter. e.g 240v 100w light through a 800w 12v-240v inverter. Am I better off using 12v or 240v lights with energy efficient globes. I am building a remote home using solar and wind for power. I will have about a 600 amphr battery bank when I first start out. Will 240v lights, fridge, microwave oven,TV/video/DVD work properly off a modified sign wave inverter.

Thanks

[12v-240v](#) | 5 comments (5 topical, 0 editorial)

Re: 12v-240v ([none / 0](#)) ([#1](#))

by [laskey](#) on Sun Sep 21st, 2003 at 06:04:32 PM MST

[\(User Info\)](#)

Well, you're always better off going through as few electronics as possible. Everything has losses associated with it. You're better off using DC devices, and only using an inverter when you have no other choice.

Of course, things change if you have high draw rates and long distances to run. In that case you're better off inverting near the battery and running the 240 to the high consumption device. For example, say your fridge consumes 1500 watts (it won't be that high, but say it is) at 12 Volts that 125 amps. You`d need some really expensive (and BIG) wire to deliver that to your kitchen.

Not practical. At 240 Volts AC the same 1500 watts is only 6.25 amps which will run on the same wire your house is already wired with. (for 240VAC I`m assuming you`re somewhere in the UK) Cheap, and easy. BUT, with an inverter you only get up to 95% effcient, so to deliver your 1500 watts you actually need to generate in excess of 1575 Watts.

As for the actual lights you asked about. Use the energy effcent ones whether you go AC or DC they use about a quarter of the power for the same light as the incandecent type.

Hope that helps some.

Cya,  
Chris

Re: 12v-240v ([none / 0](#)) ([#2](#))

by [drdongle](#) on Sun Sep 21st, 2003 at 06:21:05 PM MST

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Good advice in the previous post, use as few "conversion" steps as you can between the batteries and the loads, It helps to place the batteries and load as close as possible to one another. Consider automotive florescent lighting, and 12VDC entertainment equipment, ( TV, VCR, Radio, etc). Consider a car stereo for you sound system ( already set up for 12VDC), Consider doing with out energy hogs like a microwave, and look into gas powered refige ( propane/ butane or natural gas)and and a gas cooker (stove) . As you talking about 240 V appliances I take it that your in the UK.

Dr.D

Re: 12v-240v ([none / 0](#)) ([#3](#))  
by morgs on Sun Sep 21st, 2003 at 07:13:23 PM MST  
([User Info](#))

Thanks for the info. I'm actually from Australia and I haven't been able to find many energy efficient 12v globes here. The ones I have found have been quite expensive compared to the 240v ones. I'll keep an eye out for them though. I'd like to keep using an 240v electric fridge so I'll have to work out my power supply to suit.  
thanks again.

Re: 12v-240v ([none / 0](#)) ([#4](#))  
by mgormley on Mon Sep 22nd, 2003 at 06:47:23 AM MST  
([User Info](#))

Australa (ears prick up!) where are you?

[ [Parent](#) ]

Re: 12v-240v ([none / 0](#)) ([#5](#))  
by jubalearly on Mon Sep 22nd, 2003 at 08:45:39 AM MST  
([User Info](#))

I don't think anyone makes any good 12v appliances. So I prefer the 120v ones. I usually multiply the amps by 11 (120/12= 10, & add 10% for losses). If you have a device that does not list the amps, it will at least have watts. Divide watts by volts to get amps & then calculate. Watts are the same for either voltage. For 240 volts, you would want to figure 21-22 times the 240v amps to get what you would have at 12v. So your 1 amp, 240v appliance will need 10 gauge wire (until you get to the inverter) on 12v (24 + amps!). Gee, why does my coffee maker run my battery down so fast? It only draws 10 amps....

[12v-240v](#) | 5 comments (5 topical, 0 editorial)

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## [Lightning strikes again](#)

By [reecko](#), Section [Homebrewed Electricity](#)

Posted on Fri Sep 19th, 2003 at 08:22:25 AM MST

[Inverters](#)

[inverter help](#)

My inverter, a Trace SW 4048 just took its third ground hit from lightning and I'm at wits end. We have lightning protection on both the ac and dc sides but those aren't being disturbed. I can't keep calling my insurance company everytime I hear thunder. Does anyone have any suggestions.

Need help,  
Reecko

[Lightning strikes again](#) | 8 comments (8 topical, 0 editorial)

Re: Lightning strikes again ([none / 0](#)) ([#1](#))  
by [jubalearly](#) on Fri Sep 19th, 2003 at 09:21:43 AM MST  
([User Info](#))

What kind of lightning protection do you have? Whatever it is you can probably improve your protection considerably. Do you have a lightning rod on the roof? I'll have to dig around but I had a couple of good references for lightning protection companies that had a great deal of information on the internet. Try a search on google. You may need several properly installed lightning rods.

Re: Lightning strikes again ([none / 0](#)) ([#3](#))  
by [reecko](#) on Fri Sep 19th, 2003 at 11:38:21 AM MST  
([User Info](#))

But will installing a lightning rod on the roof keep me from getting strikes that are coming up my ground line? If we get a strike close by it is coming up the ground from what we can tell.  
Reecko

[ [Parent](#) ]

Re: Lightning strikes again ([none / 0](#)) ([#8](#))  
by [jubalearly](#) on Mon Sep 22nd, 2003 at 01:25:31 PM MST  
([User Info](#))

All lightning comes from the ground up - that's the source of the electrons. Actually there is an initial flow from the cloud that establishes the channel. I think most lightning gets into the equipment from the AC lines so unplugging it should help. Unless you need to use it during a storm.

Take a look here:

<http://www.lightning.org/protect.htm>

<http://www.harger.com/>

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- [More on Inverters](#)
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Re: Lightning strikes again ([none / 0](#)) (#2)  
by bob golding ([yubba at clara dot net](#)) on Fri Sep 19th, 2003 at 11:37:42 AM MST  
([User Info](#))

could try winding a coil of thickish wire around the leads about 5 turns and grounding one end. this will take out the HF spikes and still appear transparant to the inverter. dont know if it will work with inverters works fine for H.F antennas.

keep having fun

bob

Re: Lightning strikes again ([none / 0](#)) (#4)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Fri Sep 19th, 2003 at 12:22:53 PM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

I use Varisters.

A varister is something like a Zener diode except it works on AC current as well. When the voltage goes up to the rated voltage of the varister it becomes almost a dead short and loads down the overvoltage. The normal 120vac line is a sine wave with the peaks at about 170 volts so you will need a varister rated at 175 or 180 volts, very common at RadioShack. While the peaks are 170 volts, the RMS average is 120 volts. If you wanna use one on the phone line you need a varister rated at 90 volts to accommodate the ring voltage which is much higher than the talking voltage.

I have them all over the place: Circuit breaker box, Extension cords, box on house where phone wire comes in, computer power distribution. When properly done you will use 3 varisters for each AC Line. One will go between the 3 wires of the line...

Hot - Neutral

Neutral - Ground

Ground - Hot

This forms a little circle of varisters which will short out the voltage spikes, no matter which lead of the AC line that they come in on. I have read where, if you parallel 2 or more together, that the protection goes up by a factor bigger than the total number of varisters that were used.

-- W o o f

Re: Lightning strikes again ([none / 0](#)) (#5)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Fri Sep 19th, 2003 at 01:16:55 PM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

Heres more information than you wanted about Surge protection using Metal Oxide Varistors or MOVs...

[http://www.powerdesigners.com/InfoWeb/design\\_center/Appnotes\\_Archive/an9204.pdf](http://www.powerdesigners.com/InfoWeb/design_center/Appnotes_Archive/an9204.pdf)

[http://powerelectronics.com/ar/power\\_varistors\\_ideal\\_solution/](http://powerelectronics.com/ar/power_varistors_ideal_solution/)

[http://www.fujisemiconductor.com/test\\_web/mov/](http://www.fujisemiconductor.com/test_web/mov/)

<http://www.murata.com/emc/knowhow/pdfs/te04ea-1/31to32e.pdf>

<http://www.djsociety.org/MOV.HTM>

and some cool pictures of MOVs that have blown up or caught fire

[http://www.djsociety.org/Surge\\_1.htm](http://www.djsociety.org/Surge_1.htm)

.

-- W o o f

[ [Parent](#) ]

Re: Lightning strikes again ([none / 0](#)) (#6)  
by DanB on Sat Sep 20th, 2003 at 09:29:56 AM MST  
([User Info](#))

Rough...

There have been 3 inverters killed here and a few more in the neighborhood.

This sounds tedious, but now days... when I suspect lightning when Im gone, or if it gets near - I simply unhook the inverter. The most important part to unhook I think is the AC side.

Most inverters that have died up here are killed not by a direct strike - it could be some distance! But most of the fried inverters had long AC lines plugged into them, like... 2 story houses, or places with outside shops and lines running to those. The long AC line I think is dangerous... a near strike will induce a voltage in in the line - enough to fry the inveter!

Especially dangerous are lines in the air - the first one that died here was hooked up to an outbuilding via a powerline running through the air on insulators. Better is to bury the line. - at least, thats my "theory"!

Knock on wood... but I've had no problems since I started unhooking the AC side of my inverter in storms. Perhaps time will tell!

Re: Lightning strikes again ([none / 0](#)) (#7)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Sun Sep 21st, 2003 at 08:52:40 PM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

Have you ever tried MOV lightning protection?  
The things will soak 10,000 amps before exploding  
still cheaper than an inverter...

-- W o o f  
[ [Parent](#) ]

[Lightning strikes again](#) | 8 comments (8 topical, 0 editorial)

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need help

By shane, Section Homebrewed Electricity  
Posted on Sun Sep 14th, 2003 at 09:16:24 PM MST  
about inverters

[Inverters](#)

Now I finally think I have it I need one of these  
<http://cgi.ebay.com/ws/eBayISAPI.dll?ViewItem&item=3046353843&category=294&rd=1>  
and then I can hook up my waterwheel generator to it and I can have plug in power. But I was wondering because I have a 40vdc generator and I wanted to know how I can keep it into the 9-15vdc range. can it be done using a battery dead or alive?

[need help](#) | 2 comments (2 topical, 0 editorial)

Re: need help (none / 0) (#1)  
by DanB on Mon Sep 15th, 2003 at 08:23:08 AM MST  
([User Info](#))

That sort of inverter would offer your 120 AC nicely (only 400 watts but...)... you couldnt hook it directly to the generator though. You'd need a battery in there - a good, "alive" battery.

Re: need help (none / 0) (#2)  
by shane on Mon Sep 15th, 2003 at 08:27:45 PM MST  
([User Info](#))

man that sucks, so what I need a diode or a bridge rectifier?

[need help](#) | 2 comments (2 topical, 0 editorial)

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- [Also by shane](#)



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## [Portable power](#)

By [Old F](#), Section [Homebrewed Electricity](#)

Posted on Thu Sep 4th, 2003 at 06:44:28 PM MST

[Inverters](#)

just throwing this out here for any one fresh out of projects:)

### Portable power

just throwing this out here for any one fresh out of projects : )

Ok here it is take an old push mower remove the engine . On the mower deck bolt a box to hold two deep cycle 12V batteries.

Bolt a piece of plywood across the lower part of the push handle and mount a battery charger Inverter and reel type extension cord.

In the summer this could be used to power electric hedge trimmer or weed eater or other lawn care items. Or where ever you need a bit of ac power but don't want fire up a generator or run long cords.

Using it regularly means that it will be better maintained. And if the grid goes down it will keep some things going for you.

And if the engine that came off the mower runs use it with a car alternator to charge the batteries during longer power outages. I have had mowers given to me that took only a little TLC to get them running again .

Old F

So many projects so much fun : )

[Portable power](#) | 1 comment (1 topical, 0 editorial)

Re: Portable power ([none / 0](#)) ([#1](#))  
by [ThomasK](#) on Mon Sep 8th, 2003 at 03:09:27 PM MST  
([User Info](#))

Hello Old F,  
Nice idea, my self was thinking of such a thing too but still not have the time to do so. But as I'm say " time will come ".  
Thanks for giving me a kick in this direction.  
Greez Thomas

[Portable power](#) | 1 comment (1 topical, 0 editorial)

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[Canadians where/which inverters](#)

By [Reno](#), Section [Homebrewed Electricity](#)

Posted on Wed Sep 3rd, 2003 at 06:25:01 AM MST

[Inverters](#)

none

After blowing up a Canadian Tire 700 series inverter by placing the rated 500 watt cont. load on it and lasting 3 minutes it went back.

Since I live in a small city I will have to order or travel to get one.

I was looking at the Power Bright Inverters,

[http://www.dcacpowerinverters.com/12\\_volt\\_power\\_inverters.html](http://www.dcacpowerinverters.com/12_volt_power_inverters.html)

but they ship out of the US and charge GST and PST. They state prices are in US funds and all orders from US I was always billed afterward by rev Can for the Taxes.

This this makes no sense to me.

I also considered the Vector inverter

[http://www.donrowe.com/inverters/vector\\_1200.html](http://www.donrowe.com/inverters/vector_1200.html)

but they use a broker and the fee is 30.00 US even though the price even with exchange is good all the service charges cost almost as much as the inverter.

Any suggestion

thanks

[Canadians where/which inverters](#) | 18 comments (18 topical, 0 editorial)

Re: Canadians where/which inverters ([none / 0](#)) (#1)

by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Wed Sep 3rd, 2003 at 06:49:26 AM MST

([User Info](#)) <http://www.internetfred.com>

I purchased a "uberex" standard 600 watt inverter from costco. Seems to work well.

As far as tax's go. All merchandise made in Canada is charged PST and GST. both imported and exported if it is new, if not new then it is under a product catagory and gets charged differently... Don't ask. Our tax system is screwy at best and everyone knows it.

300< 1000watt Schematic Here ([none / 0](#)) (#2)

by LowTechWreck on Wed Sep 3rd, 2003 at 07:04:43 AM MST

([User Info](#))

<http://www.aaroncake.net/circuits/inverter.htm>

[ [Parent](#) ]

Re: 300< 1000watt Schematic Here ([none / 0](#)) (#3)

by JW on Wed Sep 3rd, 2003 at 11:26:33 AM MST

([User Info](#))

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Related Links

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- [http://www.donrowe.com/inverters/vector\\_1200.html](http://www.donrowe.com/inverters/vector_1200.html)
- [More on Inverters](#)
- [Also by Reno](#)

Hi Reno,

Try [www.vectormfg.com](http://www.vectormfg.com) then go to the remanufactured web-sales section of there website. They do sell the 3000w model (VEC051) there for \$435.00 us plus shipping. Bear in mind this is a remanufactured unit. but it still carrys the full two year warranty. I just bought one there myself, it works just as good as a new unit. I was able to compare a new one against a reman, they both seem to work equally well.  
-JW

[ [Parent](#) ]

Re: 300&lt;1000watt Schematic Here ([none / 0](#)) ([#4](#))  
by JW on Wed Sep 3rd, 2003 at 12:21:30 PM MST  
([User Info](#))

I just visited the vector site and could not find the vec051. It seems they took it off the page, there's a bunch of other inverters there, but no vec051. I had been watching that thing on there for like six months finally decided to do it, it went well and as soon as I mentioned it its gone. sorry guys maybe I bought the last one they had.  
-JW

[ [Parent](#) ]

Re: 300&lt;1000watt Schematic Here ([none / 0](#)) ([#6](#))  
by Reno on Wed Sep 3rd, 2003 at 03:41:47 PM MST  
([User Info](#))

I am looking for a Canadian site  
I did write Vector and asked them for  
a list of Canadian retailers but nothing yet.

[ [Parent](#) ]

Re: 300&lt;1000watt Schematic Here ([none / 0](#)) ([#5](#))  
by TomW on Wed Sep 3rd, 2003 at 03:22:27 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>



LTW;

I have to point a couple things out with regard to that inverter.

I can't imagine it has much frequency stability. What I mean by that is while it will certainly put out AC the output hertz [frequency] will vary wildly with the load it has on it.

Pretty much the same thing goes for output voltage and current. I would never attach that to anything i cared much about. However, for lights or heaters or something like a wall wart it would probably be OK.

Just felt that should be said before someone thinks they can build one to run their house off of. Modern inverters incorporate several layers of control on frequency, current and voltage in order to stay within rated specs over varying loading and supply conditions.

By all means experiment, learn and try one out but be aware of its limitations before you plug in your new Widescreen HDTV.

I tend to see things from the angle of "Whats wrong with this picture" viewpoint which comes from years of troubleshooting. I never believed anyone else much so I experimented and you should too. I have seen some spectacular failures over time trying circuits i found in some obscure place including a tesla coil that nearly fried me because i doubled the windings for some windage.

I am certainly not an expert in electronics circuit design just a guy who has worked with electronics and computers for a longer time than he cares to admit.

Cheers.

TomW

[Stuff I have Online](#)

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300 to 1000watt Schematic Here: > Another one  
([none / 0](#)) ([#8](#))  
by LowTechWreck on Wed Sep 3rd, 2003 at 04:43:24 PM  
MST  
([User Info](#))

Hi Tom

As Johny Carson's side kick used to say

"Yes Sir, You Are Correct Sir"

But so many people are begging for Plans

I've been looking, because mine "Aint Gona CutIt Either"

Heres another one:

<http://www.uoguelph.ca/~antoon/circ/archive/inverter.htm>

[ [Parent](#) ]

300 to 1000 watt Schematic Here: Another one  
([none / 0](#)) ([#9](#))  
by LowTechWreck on Wed Sep 3rd, 2003 at  
05:00:52 PM MST  
([User Info](#))

Silicon Power Transistor 2n3055

<http://www.ushasemi.com/pdf/MJE/2N3055%20.pdf>

[ [Parent](#) ]

Re: 300 to 1000 watt Schematic Here:  
Another one ([none / 0](#)) ([#10](#))  
by LowTechWreck on Wed Sep 3rd, 2003 at 06:16:43 PM MST  
([User Info](#))

This Schematic is starting to be really  
consistant.  
Another Refference...Even:

<http://www.i4at.org/lib2/inverter.htm>

[ [Parent](#) ]

Re: Canadians where/which inverters ([none / 0](#)) ([#7](#))  
by Reno on Wed Sep 3rd, 2003 at 03:43:14 PM MST  
([User Info](#))

We have a Costco a few cities over  
next time I am in that town i will  
check it out  
Thanks

[ [Parent](#) ]

Re: Canadians where/which inverters ([none / 0](#)) ([#12](#))  
by jubalearly on Thu Sep 4th, 2003 at 01:50:00 PM MST  
([User Info](#))

I bought an inverter here:

<http://www.store4power.com>

I believe they are in Canada.

[ [Parent](#) ]

Re: Canadians where/which inverters ([none / 0](#)) ([#13](#))  
by LowTechWreck on Thu Sep 4th, 2003 at 02:44:49 PM MST  
([User Info](#))

Looks like some great Prices.  
Which one did you get?

[ [Parent](#) ]

Re: Canadians where/which inverters ([none / 0](#)) ([#11](#))  
by RobC on Wed Sep 3rd, 2003 at 09:30:07 PM MST  
([User Info](#))

I bought mine a HighGear brand 2000 watt 4000 surge for 319.00 US. They are made by the Cobra CB radio people 3 year warranty and if I remember right 24 hour telephone tech support. Bet you can't beat that deal anywhere. I would bet they are sold in Canada but don't know for sure.  
RobC

Re: Canadians where/which inverters ([none / 0](#)) ([#14](#))  
by thebbqguy on Fri Sep 5th, 2003 at 08:09:22 AM MST  
([User Info](#))

Hi Reno ( original poster of this topic )

Are you saying the Canadian Tire model was rated at 700 but you were able to blow it out at 500 ?

If so, did you get your money back from them ? .... I'm curious. I find Canadian Tire are not so quick to refund money.

I have always wondered about the quality of their inverters. I thought they may not be of the highest quality, and your story seems to back this up.

Anyway from what you say you were well within the specs of the product and it blew anyway, - that's pretty scary and depressing.

Mark

Re: Canadians where/which inverters ([none / 0](#)) ([#15](#))  
by thebbqguy on Fri Sep 5th, 2003 at 02:44:52 PM MST  
([User Info](#))

Hi Reno,

By the way, I see many of the people who responded to your original post, posting prices of power converters that are MUCH higher priced than the \$99 model you bought, - I'm wondering if the low price of \$99 for a 700 watt power inverter tells the tale - that indeed it's a piece of crap ? ... not sure, but from what I see here, it must be. I'm glad of your post because I will steer clear of that brand, that's for darned sure. If in the States you buy a 700 watt inverter for \$400, ( about \$500 Canadian) then it's for sure that they are much better quality than the piece of junk our local Canadian Tire store sells.

Is this by chance the model you bought ? it sells for \$99.99 at CanadianTire ... <http://www.canadiantire.ca>

The bottom line, if the thing was rated at 700 watts which it is, and their website even states it has a 1000 watt surge, then it should never had blown with what you were using ... - this product is indeed a POC.



[ [Parent](#) ]

Re: Canadians where/which inverters ([none / 0](#)) ([#16](#))  
by Reno on Fri Sep 5th, 2003 at 04:34:44 PM MST  
([User Info](#))

yeah thats the one  
But not my problem Canadian Tire owns it again.  
Actually was thinking of blowing up another  
just for fun  
It does come with a 2 year warranty.  
Why is that Canadian companies list prices  
in US Dollars and did you know that provinces  
do not collect each others sales taxes  
PowerBright ships out of quebec and wants to  
charge me PST. I told them Que doesn't collect PST for Ontario  
and Quebec doesn't have a PST anymore.  
The price you quoted for a 700 watt inverter is a little high  
though  
PowerBright - 159.00  
Vector - 129.00 on sale normally 189.00

[ [Parent](#) ]

Re: Canadians where/which inverters ([none / 0](#)) ([#17](#))  
by Reno on Fri Sep 5th, 2003 at 04:38:40 PM MST  
([User Info](#))

It went back  
Canadian Tire is great for taking thing back  
A buddies bought one of those Mosquito Magnets  
back in June he is returning now with no box and  
no questions asked (Told them it didn't work)  
Actually it was rated fot 500 watts continuous  
so that is what I put on it.

[ [Parent](#) ]

Re: Canadians where/which inverters ([none / 0](#)) ([#18](#))  
by thebbqguy on Sun Sep 7th, 2003 at 01:13:49 PM MST  
([User Info](#))

Reno,

I have to ask something, can you tell us what you were running on the inverter that was sucking 500watts of continuous power ?

I'm really wondering what it was.....

thanks if you can let us know, sorry I'm just curious :-)

Mark

[ [Parent](#) ]

[Canadians where/which inverters](#) | 18 comments (18 topical, 0 editorial)

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### [What would happen if.....?](#)

By [waldo](#), Section [Homebrewed Electricity](#)  
Posted on Thu Aug 21st, 2003 at 02:31:13 PM MST [Inverters](#)

**What would happen if you plugged a normal inverter into your house wiring?**

What would happen if you plugged a normal inverter (not grid tie) into your house wiring. Would it feed power back into the grid/ your house. Would it be out of phase with the house current? Or would it just blow up.

I don't plan on trying this. I try to stay away from electricity, but I am just curious.

[What would happen if.....?](#) | 12 comments (12 topical, 0 editorial)

Re: What would happen if.....? ([none / 0](#)) ([#1](#))  
by [ThomasK](#) on Thu Aug 21st, 2003 at 02:43:06 PM MST  
([User Info](#))

Hello waldo,  
- very simple - it goes Baaang!!!!  
Greez Thomas

Re: What would happen if.....? ([none / 0](#)) ([#2](#))  
by [troy](#) on Thu Aug 21st, 2003 at 03:44:59 PM MST  
([User Info](#))

It would be out of phase AND it would blow up. If you're really lucky, you might get a fire out of the deal too.

Good luck and have fun!

troy

Re: What would happen if.....? ([none / 0](#)) ([#3](#))  
by [TomW](#) on Thu Aug 21st, 2003 at 04:02:02 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

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In a word:



Cheers.

TomW

[Stuff I have Online](#)

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Re: What would happen if.....? ([none / 0](#)) (#4)  
by waldo on Thu Aug 21st, 2003 at 04:23:30 PM MST  
([User Info](#))

That's pretty much what I thought. I had overheard some guy saying, "why not just hook it up..." I thought to myself that it might be a recipe for disaster, but not being the expert, I thought I would find out.

Maybe I should find where this guy lives, so I can watch the fireworks.

Re: What would happen if.....? ([none / 0](#)) (#5)  
by boB on Thu Aug 21st, 2003 at 04:33:47 PM MST  
([User Info](#))

Actually, there is a ~very slight~ chance that the inverter would be in phase in which case it might not blow up right away IF the voltages were the same and the frequency and phase did not drift. This is a very remote possibility though... Most likely it would go:

```
##### # # # ##### ###
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##### # # # # ##### ###
```

Or at least... POP !

Re: What would happen if.....? ([none / 0](#)) (#6)  
by laskey on Thu Aug 21st, 2003 at 05:15:40 PM MST  
([User Info](#))

Yeah maybe, but your average inverter isn't a true sinewave , and the frequency isn't controlled dead on.... so I'd opt for boom myself. But mostly because the grid forces the inverter to run at it's voltage, frequency and wave shape, and I doubt highly that the inverter would like that at all.

cya,  
Chris

[ [Parent](#) ]

Re: What would happen if.....? ([none / 0](#))  
([#7](#))  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on  
Thu Aug 21st, 2003 at 10:41:35 PM MST  
([User Info](#))

Guy's don't be ridiculous.  
The inverter would spark when you plug it in,  
and heat up a lot. No booms about it. (Might  
hear some fets poppin) Might see some smoke.  
It would be more depressing then impressive.

-Andrew

[ [Parent](#) ]

Re: What would happen if.....? ([none](#)  
[/ 0](#)) ([#11](#))  
by boB on Sun Aug 24th, 2003 at  
01:55:19 PM MST  
([User Info](#))

OF course, the Trace SW series grid tie  
inverter is just an inverter plugged  
into the grid, with special control  
software of course... And a voltage  
source inverter at that !  
Also, generators are connected to the  
grid too.

It ~can~ be done..., but in general,  
sparks and bangs are most likely  
to occur.

[ [Parent](#) ]

Re: What would happen if.....? ([none / 0](#)) ([#8](#))  
by E man on Fri Aug 22nd, 2003 at 04:17:34 PM MST  
([User Info](#))

Let's set up a money pool to buy one of those cheap inverters at Val-Mart. Then we can plug it in and see if it blows...post pics. I'd pay \$5 bucks for that! Hey, this could be a regularly featured segment: "What Would Happen If"... We could even vote on what wacky thing to destroy next. Hhhmmmm, as I rub my chin thoughtfully in mock concentration.

E-man

Re: What would happen if.....? ([none / 0](#)) ([#9](#))  
by elvin1949 ([elvin1949@wmconnect.com](mailto:elvin1949@wmconnect.com)) on Fri  
Aug 22nd, 2003 at 05:52:02 PM MST  
([User Info](#))

saw that tried with a small wal-mart thing  
SPARK-FLASH-SMOKE  
it don't like it  
later  
elvin

[ [Parent](#) ]

Re: What would happen if.....? ([none / 0](#))  
([#10](#))  
by laskey on Sat Aug 23rd, 2003 at 03:34:58  
PM MST  
([User Info](#))

See... Told ya. :)

Cya,  
Chris

[ [Parent](#) ]

Re: What would happen if.....? Generators? ([none / 0](#)) ([#12](#))  
by waldo on Mon Aug 25th, 2003 at 12:36:45 PM MST  
([User Info](#))

OK,

I new a guy who had a generator driven from the PTO on a tractor, and he would just plug it into his electrical box when the grid went down.

I imagine while the grid was down there ouldn't be a problem, but when the power came back on, shouldn't there have been a bang, pop, sizzle or something else?

As far as I know he didn't have an automatic transfer switch, but he could have had a manual one, and I guess that could explain it.

[What would happen if.....?](#) | 12 comments (12 topical, 0 editorial)

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## [Multiple Inverters](#)

By [LowTechWreck](#), Section [Homebrewed Electricity](#)

Posted on Thu Aug 14th, 2003 at 05:41:18 AM MST

[Inverters](#)

More Amps?

This may be an absurd question.

I guess the only dumb question is the one you don't ask, But..

Can you parrallel the output of two or more 12v-DC to 115v-AC

inverters for more amperage?

[Multiple Inverters](#) | 7 comments (7 topical, 0 editorial)

Re: Multiple Inverters ([none / 0](#)) ([#1](#))  
by [wpowokal](#) on Thu Aug 14th, 2003 at 06:14:08 AM MST  
([User Info](#))

Generally no, unless they are designed for paralelling. Reason is the time base 60 hz needs to be in sync, that is zero crossing point ie the point between positive and negative so to speek must be the same for both inverters.

regars Allan

Re: Multiple Inverters ([none / 0](#)) ([#2](#))  
by [jubalearly](#) on Thu Aug 14th, 2003 at 08:11:48 AM MST  
([User Info](#))

Allan has it right, it's complicated trying to get these to synchronize. In addition to matching the frequency exactly, the waveforms would have to be identical. It's much simpler just to keep the circuits seperate.

This is a good reason to buy a bigger inverter than you actually need. But 15 amps @ 120v is only 1800w. So, unless you have a dedicated circuit (usually for motors) or other uncommon application, 1800w is all you need for any circuit. Actually, you'll be hard pressed to find a 120v appliance that requires more than 1380w, so a 1500w inverter will cover almost anything you are likely to need.

A few of the more expensive sine wave inverters have built in electronics to allow them to be synchronized. It's generally available only on the largest (highest KW output) at each input voltage level so you can get more amps if necessary. A 3HP well pump is the type of application that might require this. But a more common requirement is if you want to get 240v from two 120v inverters.

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Re: Multiple Inverters ([none / 0](#)) (#3)  
by boB on Thu Aug 14th, 2003 at 11:29:40 AM MST  
([User Info](#))

OutBack Power inverters can stack multiple inverters and Trace SW inverters have some provisions for this.

Line Tie inverters for selling back to the grid also will inherently parallel. The grid is their reference signal of course.

boB

Re: Multiple Inverters ([none / 0](#)) (#4)  
by LowTechWreck on Thu Aug 14th, 2003 at 03:38:46 PM MST  
([User Info](#))

These things are pretty expensive.  
They have LARGE heat sinks, the whole out side of the case is an aluminum heat sink isn't it. I know that can't be cheap.  
What would stop someone from getting schematic and ordering the parts from Digikey or a local parts company. Unless it is highly technical involving oscilloscopes and other equipment that someone might not have.

Re: Multiple Inverters ([none / 0](#)) (#5)  
by zubby on Thu Aug 14th, 2003 at 06:53:44 PM MST  
([User Info](#))

many electronics manufacturers today use ( in-house ) part numbers on their components, meaning that the value of the component is not what is written on it. it is just a part number. a super dude electronics wizzard can often estimate what the value is based on the rest of the system. hope this helps---zubby

[ [Parent](#) ]

Re: Multiple Inverters ([none / 0](#)) (#6)  
by zubby on Thu Aug 14th, 2003 at 06:54:52 PM MST  
([User Info](#))

many electronics manufacturers today use ( in-house ) part numbers on their components, meaning that the value of the component is not what is written on it. it is just a part number. a super dude electronics wizzard can often estimate what the value is based on the rest of the system. hope this helps---zubby

[ [Parent](#) ]



Re: Multiple Inverters ([none / 0](#)) ([#7](#))  
by LowTechWreck on Fri Aug 15th, 2003 at 05:36:16 AM  
MST  
([User Info](#))

Yes sir thats a nice trick. About the only thing for shure is reading the resistors.

[Multiple Inverters](#) | 7 comments (7 topical, 0 editorial)

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[DC to AC power inversion](#)

By [pete](#), Section [Homebrewed Electricity](#)

Posted on Tue Aug 5th, 2003 at 02:32:14 PM MST

[Inverters](#)

Selecting an inverter, continuous runtime question

I have a small beginner system that I am putting together and have a couple elementary questions. Question 1, what can I expect to run from a 97 amphour battery. If power is calculated as watts = volts \* amps, then an AC device that pulls 5 amps requires 600 watts (120v\*5a). Assuming that the inverter were 100% efficient, does this mean that the AC device would actually draw 50 amps from the 12V battery (600 watts= 12v\*50a)? And I could therefore expect slightly less than 2 hours of runtime, before I fully discharged them....bad idea I know, just trying to understand some basic concepts.

2nd question: some of the cheaper 800 watt inverters claim to run for 5 hours, does this mean that there are some inverters that can not be run for long periods of time, for instance 30 minutes?

I searched the baJesus out of the old and new boards and couldn't find these answers, sorry if they have been answered before.  
bye, -Pete

[DC to AC power inversion](#) | 20 comments (20 topical, 0 editorial)

Re: DC to AC power inversion ([none / 0](#)) (#1)  
by Seth on Tue Aug 5th, 2003 at 02:36:38 PM MST  
([User Info](#))

thats about the sum of it.. if you ignore the losses... like only get 75% of input power into bats,.... inverters are never 100% effecient... ect

Re: DC to AC power inversion ([none / 0](#)) (#2)  
by troy on Tue Aug 5th, 2003 at 04:59:05 PM MST  
([User Info](#))

Yes, you have the general idea down pat. Golf cart batteries are an inexpensive way to add lots of amp hours to your storage.

I think some of the less expensive inverters may be a bit generous on their output capacity. Yeah maybe it'll do 14000 watts but only for six milliseconds and then the fire starts.

No seriously, most of them are reasonably close to rated capacity, but I just prefer not to push their limits.

Best regards,

troy

Re: DC to AC power inversion ([none / 0](#)) (#3)  
by DanB on Wed Aug 6th, 2003 at 08:15:31 AM MST  
([User Info](#))

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I used to use a Wagan (inexpensive Taiwan inverter) 2500 watt inverter and it worked well... it was reasonably efficient. I changed to a Trace 2500 watt sine wave inverter, which is actually a bit less efficient especially at lower outputs, but it is interesting how much stronger the trace is when it comes to starting motors and running large loads! I was barely able to weld off the Wagan with my small 120V mig welder. The trace does a better job of running my welder than my 6500 watt Honda generator!

[ [Parent](#) ]

Re: DC to AC power inversion ([none / 0](#)) (#4)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Wed Aug 6th, 2003 at 09:18:02 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

I also have a trace 12/2500 and it works very well. I think it surges to around 5500 watts. I used to have a Vector which seemed to work well but as you said it didn't handle the surges very well... thank goodness for a reset button. I wish now that I had purchased a 24V trace... live and learn.  
Have Fun  
Ed

[ [Parent](#) ]

Re: DC to AC power inversion ([none / 0](#)) (#5)  
by DanB on Wed Aug 6th, 2003 at 09:23:56 AM MST  
([User Info](#))

Yep... I'd have gone 24, except for me... the cost of the batteries, the fact that I got this inverter used for a real good price, and the fact that all the lights in our house are 12 V made it a no-brainer to stick w/12 volts for now. Even though the wire costs more and the inverter is only 2500 watts, I think the 24V version of the same inverter is 4500W which would be nice... (I could kill my batteries a LOT faster!)

So Im stuck at 12 volts for a while....

[ [Parent](#) ]

Re: DC to AC power inversion ([none / 0](#)) (#6)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Wed Aug 6th, 2003 at 11:08:15 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

I like the inverter and the 12V stuff really isn't a big problem. One of the problems I have is my well pump is 220VAC. I thought of adding a second 12/2500 and tie them together.. I think that option is open on mine.. there is a link between the two that matches the hz. But the expence is rather high. Right now all my 220 stuff is from the grid ( stove, water heater and 4" well pump) and about 70% of the main house is on batteries... still not good enough.

We really don't have super winds around here in the summer and there are times when there is no wind for several days in a row which puts me back on the grid charging batteries.

I guess partial dependency is still better than total dependency... especially when the grid goes down.

Havin' fun as usual  
Ed

[ [Parent](#) ]

Re: DC to AC power inversion ([none / 0](#)) (#7)  
by hvirtane on Wed Aug 6th, 2003 at 12:38:31 PM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

"We really don't have super winds  
around here in the summer  
and there are times when there is no wind for several days in a  
row..."

I've seen that you've built some working small stirlings.

Do you think that it would be possible to build  
a stirling (a combination of several small ones)  
to make 50 W constant power, when the sun is shining?

To make it using less than 200 \$ for the parts?

What about making a solar chimney of 50 W power?

What about a producer gas generator using just  
firewood to power a Brigg & Stratton?

- Hannu

[ [Parent](#) ]

Re: DC to AC power inversion ([none / 0](#)) (#8)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Wed Aug  
6th, 2003 at 01:24:50 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

The stirlings are fascinating machines but to get any real  
power from them they become quite complex. Unless of  
course you build them very large. All the idea's are do-able  
depending on how involved you want to get. I'm currently  
working on a prototype engine to do just that. Its basically  
a linear diesel engine to power the alternator. The stirling  
system had crossed my mind with this one but would  
become more involved than I wanted. The model is a small  
300 watt unit and its almost operational, there are a few  
details that have to be finished up. My goal with this one is  
to be able to run it for 50 hours on 1 gal of diesel fuel. The  
linear diesel isn't new nor is the alternator but the torque  
drive is the kicker. This was a spin off of a torque  
enhancement system that I designed for a magnetic rotary  
engine I built several years back. It really didn't sink in until  
recently that it could be used by itself for other applications.  
I should really write a book on all the odd gageets I've built  
while experimenting with different things. Alot of them were  
only good for conversation or junk art when done but  
interesting just the same.

More fun stuff...

Ed

[ [Parent](#) ]

Re: DC to AC power inversion ([none / 0](#)) (#9)  
by RobD on Thu Aug 7th, 2003 at 08:04:10 AM MST  
([User Info](#))

Hi Ed,  
I'm not familiar with the linear diesel. What's it about?  
RobD

[ [Parent](#) ]

Re: DC to AC power inversion ([none / 0](#))  
([#10](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on  
Thu Aug 7th, 2003 at 09:07:17 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Hi Rob...

The linear diesel is basically 2 pistons inline connected by a rod with no crankshaft. I believe its considered a "Free piston" engine. Not a new concept but quite interesting. Basically trying to regain the inherent 25% automatic loss going through the crankshaft. Once the buggs are worked out should make a great little engine for powering Hybrid set ups. Here is a site that is working on generator and compressor versions of the unit.

[http://www.innas.com/Chiron\\_wp.html](http://www.innas.com/Chiron_wp.html)

There are a bunch of sites describing them.

I needed 40 pounds of linear thrust to drive the torque system which delivers 32 ft lbs output on the rotary drive. In order to achieve 40 lbs thrust you only need a piston that is 5/16" in diameter. I'm working through some problems of controlling it at this point as well as the injection system. A few other bugs need to be worked out also. I believe it could run longer than the 50 hours on a gallon once the inefficiency's are worked out. There is 147000 BTU in a gallon of diesel. At 50% efficiency it should run for around 70 hours with a 300 watt load.

Its another one of those strange Ideas I always have cluttering up my brain... If nothing else its definately fun and challenging...

Have Fun  
Ed

[ [Parent](#) ]

Re: DC to AC power inversion ([none / 0](#)) ([#11](#))  
by RobD on Thu Aug 7th, 2003 at  
01:34:31 PM MST  
([User Info](#))

Now I remember I did this once before! To many things in the old brain. I guess you put magnets on the rod and let them run the alternator. A 5/16" piston? What do you do for rings? I like this idea, I definitely need one!  
Rob

[ [Parent](#) ]

Re: DC to AC power inversion  
([none / 0](#)) ([#12](#))  
by windstuffnow  
([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Thu  
Aug 7th, 2003 at 04:06:40 PM MST  
([User Info](#))  
<http://www.windstuffnow.com/main>

I'm hoping to get away from the rings unless absolutely necessary. I figure with a 1.5" stroke plus the extra length of the cylinder and close tolerances the blowby will be minimul. Once it's at running temp it shouldn't leak or at least the leaking will be insignificant. If all else fails its not that difficult to make the rings

Having fun...

Ed

[ [Parent](#) ]

Re: DC to AC power inversion  
([none / 0](#)) ([#13](#))  
by RobD on Thu Aug 7th,  
2003 at 06:01:58 PM MST  
([User Info](#))

Great Ed!  
I'd love to see the final pics.  
Best, Rob

[ [Parent](#) ]

Re: DC to AC power inversion ([none / 0](#)) ([#14](#))  
by BT Humble ([za2bb@optusnet.com.au](mailto:za2bb@optusnet.com.au)) on Thu Aug 7th, 2003  
at 11:14:54 PM MST  
([User Info](#)) <http://www.geocities.com/za2bb/>

Why not just buy one of these?

<http://tinyurl.com/jdqi>

With the pathetic value of the Australian peso against the USS it'd probably cost you all of \$500 (including shipping).

BTH

[ [Parent](#) ]

Re: DC to AC power inversion ([none / 0](#)) ([#15](#))  
by Gordy on Sat Aug 9th, 2003 at 05:24:50 PM MST  
([User Info](#))



Hi BTH,

Could you check that web address and re post it , I tried a google search with the one you posted and could not find it.

Hi ED,

I just started working on a pile driving crew this week , and was thinking along a similar line (for a deisel powered linier alternater) while watching the deisel power head slam up and down. This one apears to have about a 36 inch stroke and fires 48 times per minute, they tell me that it will drive 120 tons.

Thanks and good luck,  
Gordy

[ [Parent](#) ]

Re: DC to AC power inversion ([none / 0](#)) ([#16](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Sat  
Aug 9th, 2003 at 09:10:35 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Sounds cool gordy! All we need to do is match an alternator to that baby and power a city!!! What exactly is it? and what is it used for?

Have Fun

Ed

[ [Parent](#) ]

Re: DC to AC power inversion ([none / 0](#))  
([#19](#))  
by Gordy on Sun Aug 10th, 2003 at 12:01:10  
PM MST  
([User Info](#))

ED,

This is a pile driver, we are currently driving 12in. dia. x.250 pipe with a 3/4 inch plate welded across the bottom (to plug the pipe). Using a 220,000 lb crane a 60 foot frame is hoisted up, the frame holds the power head and pipe. The crane uses two cables, one to support the frame and one to control the power head. Once set in place the power head cable is lowered and a catch hooks the bottom of the piston, then the cable is raised when the piston reaches the top of its stroke the catch releases and the piston falls. As it reaches the bottom of its stroke it fires throwing the piston back to the top of its stroke and at the same time pushing the pipe down into the ground. Using splices when nessesary we are driving these pipe down 50 to 90 feet. The pipe are the cut off 2.5 feet above ground and filled with concrete, then forms are built around them and filled with concrete to make footings for a bridge.

The power head has not been on the ground where I can make measurements. But the cylinder is open at the top so I can see the piston stroking about 36 inch. into the air. And looks about 10 inch in dia. To deliver the force it does the piston has to be solid steel. The power head works on the 2 cycle princeple and fires 48 times per minute.

It is a trip to watch the pipe hit mush 10 feet down and suddenly go into freefall for another 10 or 20 feet down into the ground.

I will try and get a few pics. But we are on 12 hour days (plus 2.5 hours drive time) so it will be next week end before I can try to send them.

Regards,

Gordy

[ [Parent](#) ]

Re: DC to AC power inversion ([none / 0](#)) (#20)  
by BT Humble ([za2bb@optusnet.com.au](mailto:za2bb@optusnet.com.au)) on Wed Aug 20th, 2003 at 04:18:35 PM MST  
([User Info](#)) <http://www.geocities.com/za2bb/>

Sorry about that, I only just noticed. The company is Altronics, and their website is <http://www.altronics.com.au>

Bear in mind (this only just occurred to me) that these inverters will be set up for 240VAC/50Hz.

BTH

[ [Parent](#) ]

linear? ([none / 0](#)) (#17)  
by hvirtane on Sun Aug 10th, 2003 at 03:37:38 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

1)  
The discussion about linear engines reminds me of Beale free piston Stirling engines.

Anybody has tried any of them?

<http://www.sunpower.com/products/index.html>

2)  
And then:

anybody has tried to make a free piston steam engine?

A cylinder very hot, a small hole lets water coming in, when the piston is in a suitable position... flashing steam pushes quickly the piston to move... a coil around the magnet connected to the piston produces current when the piston moves, another magnet opposite that pushes the piston back when it is far enough, and the steam is coming out from another hole, which the piston opens inside the cylinder wall, when the piston is far enough... the cycle repeats.

- Hannu

Re: linear? ([none / 0](#)) (#18)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Sun Aug 10th, 2003 at 08:33:38 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

I've never attempted to build a free piston stirling although the idea is quite interesting. The idea for the free piston steam also sounds interesting, but instead of a magnet use another flash steam piston to push it back into position for the next flash. I think this would utilize the power more efficiently. Using a magnet, a portion of the power would be used in compressing the field and power would be lost. Similar to a spring.

I chose diesel fuel because of the amount of energy stored in the fuel. I've been tossing other ideas around but the main objective is reducing the amount conversions to get the end result. Diesel fuel contains 43,108 watts of stored energy, obviously we won't get 100% conversion factor, but if we could convert it at 50% or better (preferably better) our energy problems would be reduced considerably ( or at least by 1/2). The standard 4 stroke engine is only around 20% efficient ( 2 strokes are even worse because we are cooling the piston with wasted fuel). The biggest inefficiency is the design of the crankshaft which contributes to 25% of all losses.

If its there use it to its best possible potential, why waste it?

Enough of my pet peeves...  
Have Fun  
Ed

[ [Parent](#) ]

[DC to AC power inversion](#) | 20 comments (20 topical, 0 editorial)

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[Looking for 12vdc to 240vac simple inverter configuration](#)

By [Simon](#), Section [Homebrewed Electricity](#) [Inverters](#)  
Posted on Mon Jul 28th, 2003 at 01:46:31 AM MST  
Looking for 12vdc to 240vac simple inverter configuration

Hi guys,

I am planning to build a simple inverter to run lights. Any ideas for the primary and secondary windings for a 12VDC input to 240VAC output one? If anyone has a MOSFET circuit diagram please... Thanks Simo

[Looking for 12vdc to 240vac simple inverter configuration](#) | 7 comments (7 topical, 0 editorial)

Re: Looking for 12vdc to 240vac... ([none / 0](#)) ([#1](#))  
by [dconn](#) on Mon Jul 28th, 2003 at 03:53:20 AM MST  
([User Info](#))

Hi,

I did once think about trying to build an inverter but quickly realised that 1) much cheaper and easier to buy one and 2) the waveform from poorly designed inverters is very far from sinewave (normally only squarewave) - not good for running CFL bulbs.

If you are really interested in building an inverter there is a guy named madhav\_chowdhary ([madhav\\_chowdhary@yahoo.co.in](mailto:madhav_chowdhary@yahoo.co.in)) who has details of a board he sells to make a 800W or 1500W pure sine wave inverter. The details are viewable in the files section of the AWEA-Wind-Home yahoo group (I think - otherwise you could email him).

I'd still recommend that you just buy an Inverter off-the-shelf - if you use CLF bulbs you would probably get away with a lower wattage requirement and a smaller and cheaper inverter.

Best regards,

Derek Conniffe

Re: Looking for 12vdc to 240vac... ([none / 0](#)) ([#2](#))  
by [Simon](#) ([simon@guyo-inc.com](mailto:simon@guyo-inc.com)) on Mon Jul 28th, 2003 at 05:06:53 AM MST  
([User Info](#))  
<http://www.guyo-inc.com/engineering.htm>

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Thankx Derek for the help. I had actually heard about this guy briefly in the old board. He came up with the idea then said he had the circuits for sell but i could not get to him. Thanks again Simon

[ [Parent](#) ]

inverter link ([none / 0](#)) (#3)  
by wpowokal on Mon Jul 28th, 2003 at 10:29:31 PM MST  
([User Info](#))

Simon, here is a link to a simple inverter which uses transistors not mosfets.

<http://www.uoguelph.ca/~antoon/circ/555dcac.html>

Have you thought about DC lighting or is this a project for the experience of building it.

I have found one using MOSFETS and when I re-find it I will post the link, in all probabily the transistors could be replaced with MOSFETs,with maybe some driver mods.

regards Allan

Re: inverter link ([none / 0](#)) (#4)  
by Simon ([simon@guyo-inc.com](mailto:simon@guyo-inc.com)) on Mon Jul 28th, 2003 at 11:59:37 PM MST  
([User Info](#))  
<http://www.guyo-inc.com/engineering.htm>

Thanks for the link.

[ [Parent](#) ]

another link ([none / 0](#)) (#5)  
by wpowokal on Tue Jul 29th, 2003 at 07:05:35 AM MST  
([User Info](#))

Simon, also see this link regards Allan. PS interesting site you have .

[http://www.interq.or.jp/japan/se-inoue/e\\_ckt30.htm](http://www.interq.or.jp/japan/se-inoue/e_ckt30.htm)

Re: Looking for 12vdc to 240vac simple inverter ..  
([none / 0](#)) (#6)  
by ThomasK on Tue Jul 29th, 2003 at 03:50:57 PM MST  
([User Info](#))

Hello to All,  
Myself also has a new link,  
<http://home.t-online.de/home/Wolf-GuenterG/>  
see under " construction guide for Powerinverter"  
It is lots of info and it helps to understand the  
matter.  
Greez Thomas

scematic ([none / 0](#)) (#7)  
by wpowokal on Mon Aug 4th, 2003 at 08:51:04 AM MST  
([User Info](#))

Another simple inverter.  
<http://www.uoguelph.ca/~antoon/circ/archive/inverter.htm>

regards Allan

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### [Got my new inverter !](#)

By [Old F](#), Section [Homebrewed Electricity](#)  
Posted on Sat Jul 26th, 2003 at 06:17:17 PM MST [Inverters](#)

I am like a proud daddy. Fedx delivered it today : )

It's a Statpower portawattz 3000, 2400 watts continuous 3000 surge.

I took it out to the shop to try it out all I had to run it was a old 12 volt RV battery better than 50% discharged and light jumper cables but it started and ran the 1/3 hp cap start motor on my ban saw no problem it was cutting a 3inch by 1/2 inch steel bar stock for a load .

I will be using it for stand by power for some things in the house using a transfer switch. The AC out put can be hard wired no cords to mess with. It will have a 900 amp hour battery bank with grid powered for now 3 stage charger.

Having so much fun it should be illegal : )

Old F

[Got my new inverter !](#) | 2 comments (2 topical, 0 editorial)

Re: Got my new inverter ! ([none / 0](#)) ([#1](#))  
by [RobC](#) on Sat Jul 26th, 2003 at 09:28:19 PM MST  
([User Info](#))

I know how you feel I just bought a Highgear brand inverter Its made by the Cobra CB radio people. I bought it at a Flying J Truck Stop for 319.00\$ 2000 watt continous 4000 watt surge

Re: Where do I get One? ([none / 0](#)) ([#2](#))  
by [Motorhead](#) on Fri Aug 8th, 2003 at 08:16:28 PM MST  
([User Info](#))

Hey this sounds great where can I buy it?

Motorhead

[Got my new inverter !](#) | 2 comments (2 topical, 0 editorial)

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## [Portawattz 3000 inverter any one have one?](#)

By [Old F](#), Section [Homebrewed Electricity](#)

[Inverters](#)

Posted on Sun Jul 20th, 2003 at 09:05:01 AM MST

Are they worth the money ?

---

Portawattz 3000 inverter any one have one?

I am putting together a UPS for my furnace blower an water pump on my wood stove.

And want to know if there worth the money and how well they hold up.

I know that some of you out there have done some thing similar , inverter battery bank and transfer switch. Any hints or tips or things you would do different looking back on it now?

Many thanks

Old F

[Portawattz 3000 inverter any one have one?](#) | 6 comments (6 topical, 0 editorial)

Re: Portawattz 3000 inverter any one have one?

[\(none / 0\)](#) ([#1](#))

by [Jimbo](#) on Sun Jul 20th, 2003 at 11:59:05 AM MST

[\(User Info\)](#)

Not directly answering your question, I am using a 1-hp 24 vdc motor for my well pump as an alternate to the inverter/AC motor package. Besides the inexpensive replacement of brushes every few years, I like the immunity to nearby lightning strike surges. Being cheap in general, I am going to buy 10 2kw computer UPS units for my other 120vac needs. I heat with wood & have a backup hot water system. It uses a small 1/6hp circulation pump.

UPS units [\(none / 0\)](#) ([#2](#))

by [TomW](#) on Sun Jul 20th, 2003 at 01:26:41 PM MST

[\(User Info\)](#) <http://oneota.net/~earthsourcepowr/>

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Jimbob;

Just want to mention that while I have used consumer grade computer UPSs as inverters you can expect short life and the occasional shutdown from high surge like turning on a TV or motor starts or thermal problems. They are not intended for continuous duty at all.

Having said that I will also note that you really don't need to buy them. They get tossed in dumpsters daily for failed batteries. I have used up 3 free ones over the past couple years and they were all discards with fried SLA batteries. I just hook them to my bank of batteries and use them as is. They also have somewhat horrible efficiency too with a high standby current while idling. There is a trick to getting them to start without ac on the plug too which is easy on older ones but on newer ones i have not figured out how to do it without modifications to the UPS.

Just my real world experience with them.

Cheers.

TomW

[Stuff I have Online](#)

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[ [Parent](#) ]

Re: UPS units ([none / 0](#)) ([#3](#))  
by Jimbob on Sun Jul 20th, 2003 at 01:52:03 PM MST  
([User Info](#))

You are correct on the cheap UPS units. I derate to 50% and had success without a problem. I also know not all UPS units are built equal in durability.

[ [Parent](#) ]

Re: Portawattz 3000 inverter any one have one?  
([none / 0](#)) ([#4](#))  
by Jimbob on Sun Jul 20th, 2003 at 02:04:28 PM MST  
([User Info](#))

I forgot to add, a computer UPS is not for starting an electric motor. I would limit use to simple lighting, and small inductive loads such as a window fan. I have operated a toaster, iron, skillet & other high wattage resistive loads without incident on a part time (ICAS) basis. I have not experienced a problem running a TV, however the UPS I played with was industrial quality. I do not recommend for everyone, but I am comfortable with the better designed UPS units.

Cheap inverters ([none / 0](#)) (#5)

by DanB on Mon Jul 21st, 2003 at 07:24:47 AM MST  
([User Info](#))

I cannot speak for portawatt, but often times you'll find the same inexpensive inverter with lots of different brand names on it as I'm sure you know!

There are lots of very inexpensive inverters getting used up here and there have been no problems. The very small ones, in my experience - where the fan runs all the time, have "fan" problems... they wear out because I do not think they were ever intended for continuous use, but the larger ones (over 1500 watts) have all worked out fine so far!

I used an inexpensive 2500 watt "Wagan" (which may be the same thing) for 2 years w/no problems, it did well starting 1 hp motors, it ran our washing machine etc... with no problems. I took it out of service recently only because a neighbor gave me a good deal on his used Trace SW2512, which does seem a bit more powerful and makes a little less hum in amplifiers. One gripe I have with the Trace inverters (and the thing I like about the more inexpensive ones) is the trace is always "buzzing" - which is a bit annoying if it's inside the house like ours is! The more inexpensive ones are quieter, at least in my experience.

Re: Cheap inverters ([none / 0](#)) (#6)

by Old F on Mon Jul 21st, 2003 at 06:18:00 PM MST  
([User Info](#)) <http://www.oldf.homestead.com>

I know what you mean Dan.

One assembly line 3 colors of paint and 26 different name labels : )

The one I am looking at is 3000 watt continues and 5000 surge.

I will be using it with a manual transfer switch to keep some things running in the house when the power goes off .

Old F

[ [Parent](#) ]

[Portawattz 3000 inverter any one have one?](#) | 6 comments (6 topical, 0 editorial)

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[Thanks for the Info People.](#)

By [Windnutone](#), Section [Homebrewed Electricity](#)  
Posted on Tue Jul 15th, 2003 at 11:04:26 PM MST [Inverters](#)  
Thanks for the Feedback. ( Huge UPS INVERTER)

After printing out the responses to my questions about this extremely large UPS , Inverter .... i was able to get a 24 Hr. 800 No.and the person I spoke with was very helpfull especially with the Info .... and Ideas I received from the site... Seems this Company is still around and the reason this Machine was retired after only 10 years .... a New one with the same specs is less than 1/3 the weight and 1/4 the size ....and does more. The UPS I have tips the scales at about 1800 Lbs. stands 5 Ft tall ... 36 In. deep and 36 In. Wide. When asked what I was useing it for I told him to power my home from stored wind energy ... Guess he is interested in such things and asked to stop by . 2 Hr. Drive from Seattle.He is going to show me exactly how to convert this . I will in turn show him several Machines and tell him what I can about starting out . This UPS has a 5000 Watt True Sine Wave Inverter. Oh Joy! I will Post all I've learned from him for those who may have one of these or might be thinking about picking one up. I gave 30.00 for this.. Yahoooo.

[Thanks for the Info People.](#) | 1 comment (1 topical, 0 editorial)

Re: Thanks for the Info People. ([none / 0](#)) ([#1](#))  
by JW on Wed Jul 16th, 2003 at 10:53:16 AM MST  
([User Info](#))

Good job Windnutone,

I always try to contact the OEM first. And if that does not work then try other alteratives. I hope you have lots of fun. Just remember to be careful because that inverter is like messing with an open breaker panel.

JW-

[Thanks for the Info People.](#) | 1 comment (1 topical, 0 editorial)

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## [Grid Tie](#)

By [wdyasq](#), Section [Homebrewed Electricity](#)  
 Posted on Thu Jul 10th, 2003 at 09:04:12 PM MST [Inverters](#)  
 Wouldn't post on Myke thresd - too long?

Myke,

An old friend of mine decided to switch from one of the "Baby Bells" to the old parent company here in Texas. He knew one of the higher up in the old parent company and was assured it could be done painlessly.

After 6 months of wrangling, the fellow's credit rating had been ruined due to the "Baby Bell" continuing to charge him for a phone service he wasn't getting. He also could not get them to release this phone number as required by state law.

The short story is it was a mess and he is having more trouble than one could think. I personally believe dealing with an electrical company will result in more trouble than it will be worth.

Here, the "buy back" price is \$.06 kWh. If a man had 4 - 100 Watt panels cooking 10 hours a day, it still hasn't netted a quarter. A fight over "this ain't right, get an electrical engineer to approve it" and "you'll have to have somebody here" and "We're sorry, we couldn't make it the day we scheduled, can you make it ...", "the inverter you just paid \$2500 for is no loner acceptable". I could go on for weeks.

Of course, while you are steaming over the lack of cooperation, you will read in the Sunday paper (your electricity has been cut off for weeks so you can't read it on your monitor and your system requires the inner-tie to work), about how folks are able to sell surplus power back to the local utility and how the local utility encourages home owners to.....

Ron

[Grid Tie](#) | 1 comment (1 topical, 0 editorial)

Re: Grid Tie ([none / 0](#)) ([#1](#))  
 by [elvin1949](#) ([elvin1949@wmconnect.com](mailto:elvin1949@wmconnect.com)) on Fri Jul 11th, 2003 at 08:54:10 PM MST  
[\(User Info\)](#)

AND then you wake up and learn you ain't dreaming

[Grid Tie](#) | 1 comment (1 topical, 0 editorial)

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## [Cheap photovoltaic system DC TO 120 V AC inverter](#)

By [myke](#), Section [Homebrewed Electricity](#) [Inverters](#)

Posted on Thu Jul 10th, 2003 at 12:00:25 AM MST

How do I cheaply hook up a quad of PV panels to my house 120V AC system?

I need some help. I've acquired 4 PV panels (85 W 17V) at a great price, and want to hook them up through an inverter into my house system - which is on grid - at a good price. Sunny Boy et al inverters are VERY expensive, and I want to put this quad to work safely and cheaply.

Any ideas? MYKE

[Cheap photovoltaic system DC TO 120 V AC inverter](#) | 6 comments  
(6 topical, 0 editorial)

DC TO 120 V AC inverter ([none / 0](#)) ([#1](#))  
by [Adrian L](#) on Thu Jul 10th, 2003 at 12:40:51 AM MST  
([User Info](#))

As Far as I am aware, the previously Trace branded OK4 inverters are the only grid tie ones available in a small size, but these can only handle 100watts and need 24 volts input, someone else might know of something else though!

Adrian L

Re: DC TO 120 V AC inverter ([none / 0](#)) ([#3](#))  
by [Gordy](#) on Thu Jul 10th, 2003 at 09:25:47 AM MST  
([User Info](#))

Myke,

Check out Home Power mag [CLICK HERE](#) . Check out their classified ads they list a seller for the small inverters. Also check out their Guerilla Solar section, these people are doing what you want to. But with out the power company's OK.

this helps,

Hope

Gordy

[ [Parent](#) ]

Re: Cheap photovoltaic system DC TO 120 V AC ([none / 0](#)) ([#2](#))  
by [jubalearly](#) on Thu Jul 10th, 2003 at 09:18:27 AM MST  
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What, exactly do you want to do? The National Electrical Code has a number of requirements for adding power sources, outside the utilities, to your home. You can't just hook such power sources (generators, solar panels with inverter, etc.) up and go. That's one reason why grid tie inverters are expensive.

But, 4 panels is not likely enough to run your entire house, so I assume one circuit (15amp?) is all you currently require. The cheapest approach is to use an extension cord & plug in the appliances you need (floor lamp for light). Also, you make no mention of batteries. It seems unlikely that you only want to use this on sunny days. Do you have the rest of the system figured out?  
Russ

Re: Cheap photovoltaic system DC TO 120 V AC  
([none / 0](#)) ([#4](#))  
by myke on Thu Jul 10th, 2003 at 11:28:24 AM MST  
([User Info](#))

Thank you all for your replies/input. Russ, my goal is simply to lower my monthly electric utility bill and learn more about solar power in an economic fashion.

I have always been fascinated by all things science. I am a novice in this area, and hoping to learn more. I may have, in the future, access to a few more out of the box PV panels at a very good price (local municipality gave up on PV bus stop project mid-way). What I want to do is safely apply the electricity generated by these panels to my in house wiring with an eye on saving some money - realizing that it will take months or years for the system to pay for itself. My house is in the suburbs, and the panels would not be visible from the street, and in a location for 8hrs/day average sun exposure. I am not interested in breaking any utility codes, and am not selfish such that "anything goes as long as I benefit" - that mentality is self defeating. I welcome your advice, and if you need any more info to give solid direction to my fledgling enterprise, please let me know. As of this moment, the ONLY components I have are the 4 panels. MYKE

[ [Parent](#) ]

Re: Cheap photovoltaic system DC TO 120 V AC  
([none / 0](#)) ([#5](#))  
by wdyasq on Fri Jul 11th, 2003 at 05:37:49 PM MST  
([User Info](#))



Myke,

An old friend of mine decided to switch from one of the "Baby Bells" to the old parent company here in Texas. He knew one of the higher up in the old parent company and was assured it could be done painlessly.

After 6 months of wrangling, the fellow's credit rating had been ruined due to the "Baby Bell" continuing to charge him for a phone service he wasn't getting. He also could not get them to release this phone number as required by state law.

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Here, the "buy back" price is \$.06 kWh. If a man had 4 - 100 Watt panels cooking 10 hours a day, it still hasn't netted a quarter. A fight over "this ain't right, get an electrical engineer to approve it" and "you'll have to have somebody here" and "We're sorry, we couldn't make it the day we scheduled, can you make it ...", "the inverter you just paid \$2500 for is no loner acceptable". I could go on for weeks. Of course, while you are steaming over the lack of cooperation, you will read in the Sunday paper (your electricity has been cut off for weeks so you can't read it on your monitor and your system requires the inner-tie to work), about how folks are able to sell surplus power back to the local utility and how the local utility encourages home owners to.....

Ron

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Re: Cheap photovoltaic system DC TO 120 V AC ([none / 0](#)) (#6)  
by troy on Sat Jul 12th, 2003 at 10:57:45 AM MST  
([User Info](#))

Dear Myke,

Here's a brief overview:

The big advantage of a pure intertie system is that you don't need batteries. The grid IS your battery. There are several drawbacks to this system. 1. Your inverter MUST be an intertie inverter to match the wave form and phase of the grid electricity, or things will blow up and/or catch on fire. 2. So far as I know, there are no cheap intertie inverters. 3. When the grid goes down, you automatically go down also. 4. Most utilities don't make it easy or cheap to set up intertie. Many require a special accessible disconnect and a second meter, with two sets of monthly "reading fees".

If you add a bank of batteries, then you can run a circuit from your mini system and be completely independent from the grid. The big advantage here is that when the grid goes down, you still have (limited) power. Plus, the

utility has no control over your system then.  
You can also start out with any little cheapie square wave inverter which will run most things within their wattage rating. Not as efficiently as full sine wave inverter, but not terrible.

By all means, go to [www.homepower.com](http://www.homepower.com) and download the most recent issue. It's the best home brew power periodical on the planet and it's FREE.

Good luck and have fun!

troy

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[Cheap photovoltaic system DC TO 120 V AC inverter](#) | 6 comments  
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## [Monster UPS ... Inverter ...](#)

By [Windnutone](#), Section [Homebrewed Electricity](#)

Posted on Tue Jul 8th, 2003 at 07:21:06 PM MST

[Inverters](#)

Hello everyone ,,, new to board. Have aquired a UPS ..  
Input Voltage is 480 .... can this be changed to 120 AC ?

I bought a Huge UPS from the Local Hospital .... 10 Years old . Its weight alone is about 1800 Lbs.Wanting to know if this input voltage of 480 could be changed by a Pro.

Or how could I get a 480 line out of my house? I only need to start it up a while.

Just long enough so it than shuts down and thinks there is an outage.Than will kick over to Batts.Any Ideas will be most welcome.Thank-You

[Monster UPS ... Inverter ...](#) | 6 comments (6 topical, 0 editorial)

Re: Monster UPS ... Inverter ... ([none / 0](#)) ([#1](#))  
by JW on Wed Jul 9th, 2003 at 12:03:09 AM MST  
([User Info](#))

Well well,

I ran across such a thing once before. This company I work for, bought this building and it had a uninterruptible power supply. Which sounds very similar to what you describe. This thing was built into the building's 460v three phase service. And had a switching capability of less than a second. I guess this system was designed to accommodate the "fire up time " for the 500kw diesel gen-set. It wasn't designed to run the maximum output for anytime more than an half-an-hour, from what I understand about the nature of the UPS system.

From what I remember about the system it has some kind of 386 controlling it. It had a classic "green screen" from the 80's.

If you can isolate the charging system, I'm sure you can charge it with what you want "ie" 120vac. You charging circuit may require more charging time to fill the batt bank, but you can have theoretically the full rated output for the "monster inverter" for the given time of output. Possibly less output for a longer period of time.

I just want to remark here that I wasn't allowed to play with such a thing, so consider yourself lucky.

JW

Re: Monster UPS ... Inverter ... ([none / 0](#)) ([#2](#))  
by JW on Wed Jul 9th, 2003 at 10:44:00 AM MST  
([User Info](#))

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I feel that it is rare to acquire one of these UPS systems. That's why I remarked that your lucky.

I think that you could run several houses off one of these units. The first thing I would do is contact the OEM for the unit. Then try to get the factory schematics for it. After looking at that for a while, you will figure out what your up against technically. Since you probably don't need three phase for your home, unless you have some machine tools that have three phase motors. You might be able to reconfigure it a little and make a nice 220 service, then have an extra 120 line. It seems to me the computer that controls the whole thing switch's the inverter on. The first thing I would do is try to get that computer back up. Then see what it has to say and go from there.

JW

[ [Parent](#) ]

Re: Monster UPS ... Inverter ... ([none / 0](#)) (#3)  
by zubbly on Wed Jul 9th, 2003 at 05:34:10 PM MST  
([User Info](#))

one thing you could try is to activate unit with control transformer. it is very possible that 3phase 480 volt is not required. you could try using 50-100va control transformer-480v primary-120v secondary. connect 120vac to the secondary and you will have 480 volt on the primary. attach the primary transformer leads to any of the 3 3phase input leads and see what happens. if it does not work, interchange in put with the other remaining lead. you have 3 possibilities here. phases ab,ac, or bc. i am hoping that your unit only has to see the voltage on two of the three phases to trigger. also, please make sure that you use a fuse ( not more than 1 amp ) between control transformer and your ups unit. if none of that works, attach your control transformer to your ups unit, connect from one of the 480v transformer leads to a 5mfd capacitor and from the other side of the capacitor to the remaining input lead of the ups unit. the capacitor will create a third leg so to speak, a little out of phase, but maybe just enough to activate ups unit. **DON'T FORGET THAT YOU RUN A GOOD CHANCE OF BLOWING UP YOUR UNIT OR YOUR SELF. WEAR SAFTEY GLASSES. PLEASE WAIT FOR OTHER COMMENTS AS SOMEONE ELSE MAY HAVE A BETTER IDEA-I HOPE.**  
have fun. Zubbly

[ [Parent](#) ]

Re: Monster UPS ... Inverter ... ([none / 0](#))  
(#4)  
by JW on Wed Jul 9th, 2003 at 08:58:02 PM  
MST  
([User Info](#))

Hey Zubbly,

Personally, I never thought of that. It sounds good, give the input source what it wants. The controller shouldn't need more power than you describe supplying. Unless it has an old CRT. Ten years ago sounds pretty new to me, maybe display output won't require more power than that. Excellent suggestion with the fuse. Instead of the capacitor you could use a small phase converter. That uses 220 two phase and a three phase motor to make the third leg. I've seen "phase converters" use 220 to run three phase motors, with some efficiency loss of-course. Not quite sure how you would step up to 460 from 240, but I run some small PLC's off 460 three phase through a small delta wound transformer, and just pick up the 120v I need to run the PLC from a leg of the transformer and neutral. Actually If the UPS uses such a step down transformer configuration to pick up power to run the controller. You could tap into that with 120v and not need to energize the "main phases input/output's.

JW

[ [Parent](#) ]

Re: Monster UPS ... Inverter ... ([none / 0](#)) ([#5](#))  
by wdyasq on Sat Jul 12th, 2003 at 09:43:02 AM MST  
([User Info](#))

JW,

Somewhere, I read an article or post about using a three-phase 230/460 Volt motor to get 460 3 Phase. I always wondered if that one motor could be used as a "phase converter" at the same time.

While we are at it, power a small device off it too and get some return.....

Ron

[ [Parent](#) ]

Re: Monster UPS ... Inverter ... ([none / 0](#)) ([#6](#))  
by JW on Wed Jul 16th, 2003 at 11:34:49 AM MST  
([User Info](#))

Hi Ron,

I first heard that it was possible to make a three phase service from two phase from my uncle. He had a small warehouse with only a two phase service. He acquired a big air compressor from a friend. And that needed three phase to operate. Anyway there was an old ten horse three phase motor laying around the shop, and you guessed it he had a brain storm. So he connected 220 to the motor, and left one of the legs "open". Low and behold the motor ran. Then he tested the open leg of the circuit and there was a good enough reading there. So he decided to parallel the two motors and try to run the air compressor. and as long as he let the first motor freewheel the air compressor ran ok. I remarked too him they got phase converters you know. He said ya I know, but all this is free. Then I asked him how long did you run it that way, and how much more was the electric bill. He said I ran it for about two months till I couldn't afford the electric bill anymore. I asked how much more was it? he said about twice the usual.

As far as getting extra power back, I think it worked the other way around, at least in this example. But I have heard story's about people getting some mystery extra power from VARIACS which are variable transformers. I'm not sure if they were rectifying the output or what. But it has been reported a couple of times that way.

JW-

[ [Parent](#) ]

[Monster UPS ... Inverter ...](#) | 6 comments (6 topical, 0 editorial)

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## [Inverter Question](#)

By [Larry755](#), Section [Classifieds](#)

Posted on Mon Jul 7th, 2003 at 06:57:24 AM MST

[Inverters](#)

230v inverter to 120v

Hi to all, new to posting on this board and I lost the first post so will try again. I have a 24vdc in 230v 60hz out inverter at 1700 watt. Can I use a transformer to drop it down to 120 volts and if so how do I wire this up to work. The inverter has no ground on the three prong plugs. I removed the cover and there is no wires connected to the ground terminal. Thanks for any help.

[Inverter Question](#) | 6 comments (6 topical, 0 editorial)

Re: Inverter Question ([none / 0](#)) (#1)  
by Seth on Mon Jul 7th, 2003 at 09:56:10 AM MST  
([User Info](#))

Yes.. i do believe that trace(now Xantrex) sells a 240 to 120V transformer.... or some body does....

Re: Inverter Question ([none / 0](#)) (#2)  
by RobD on Mon Jul 7th, 2003 at 10:00:24 AM MST  
([User Info](#))

Hi Larry, There are problems doing this if your inverter is a modified sine. At 60Hz most AC sine wave transformers will saturate. This leads to over heating. Also unless your converting very low power (under say, 100 watts) you will need a very substantial transformer. I'm not sure how your inverter is set up but it is possible, on some inverters to tap off two legs and this will be your 120 volts. Check it with a meter to be sure. If this works you should also see 120 across the other leg. (You should have one common leg) When you use your inverter remember you can't pull all the inverter power off just one leg. you'll have to share between the two to balance your power as each leg will only give you half the inverter power. RobD

Re: Inverter Question ([none / 0](#)) (#3)  
by Larry755 on Tue Jul 8th, 2003 at 01:38:25 PM MST  
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RobD: The problem is I have no common wire. The Fluke says 230v between the two output prongs but the neutral or common has no connection inside of the inverter. I can get 115v from each of the two legs to case ground, but have been afraid to try a load that way. It looks as there has never been a wire connected to the neutral inside the unit. Thanks  
Larry755

[ [Parent](#) ]

Re: Inverter Question ([none / 0](#)) (#5)  
by RobD on Tue Jul 8th, 2003 at 05:45:51 PM  
MST  
([User Info](#))

Hi Larry, It sounds like your going to be ok if you tap from one side to ground on the case. Ungrounding a supply is usually not done if the engineer wants to pass UL. From what your saying it looks like the mod. sine wave is being developed from a zero center point. This is why you see 120 on each leg. Of course the best thing to do is look at it with a scope but if you don't have one open the case and find the ground leg on the circuit board with your meter going between the case and what you think is ground on the board. When you get ground you should see zero ohms or close to it. When you find the trace see if it is very wide indicating that it can take current ( you can compare it to the output traces in diameter which you can find by going from one of the output pins to the trace on the PC board you think is output). I would say if its wide that your ground is left floating and the company has a 120 inverter where they run the ground to the 120 socket. If this is ok it should work for you. You can try hooking a low wattage (say 25 or 40 watt) bulb across your circuit from the new ground to one leg. Se if the bulb looks about right in brightness and check the voltage across it with your meter. Good luck, RobD

[ [Parent](#) ]

Re: Inverter Question ([none / 0](#)) (#4)  
by Seth on Tue Jul 8th, 2003 at 03:16:15 PM MST  
([User Info](#))

Why not just use a cheap incandecent light bulb.... if it blows because it is a 240V inverter.... welp yyou know for sure.. not sure if u said its labled as a 240V invrter... just ramblioing

Re: Inverter Question ([none / 0](#)) (#6)  
by Larry755 on Sat Jul 12th, 2003 at 04:37:08 AM MST  
([User Info](#))

Thanks to all for the help. Larry755

[Inverter Question](#) | 6 comments (6 topical, 0 editorial)

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## [48 volts](#)

By [Andrew](#), Section [Homebrewed Electricity](#)

Posted on Fri Jul 4th, 2003 at 06:32:36 PM MST

[Inverters](#)

48 volts? New industry standard?

Hi,

Any of you ponder what the future of automotive operating and off-grid power equipment?

I heard from a friend that he is absolutly convinced that the new systems for inverters and others is 48 volts. He claims it is the easiest by far to step up to usable "grid" voltages. I tend to agree with him, because I have seen it in many backup and ups systems. Also since the automotive companies are switching their systems to 48 volts, it is sure to have an impact on the inverter market. Just wondering what your 2 cents worth is about this. Agree? Disagree? This could be interesting on what actually will happen.

-Andrew

[48 volts](#) | 6 comments (6 topical, 0 editorial)

Re: 48 volts ([none / 0](#)) ([#1](#))

by [wdyasq](#) on Fri Jul 4th, 2003 at 07:13:16 PM MST

[\(User Info\)](#)

Odd there Andrew,

I thought all I read was "42 Volt" automotive systems. SAE, Dupont, Sanyo and others are using 42 Volts and there is a pdf on "42 Volt Automotive Electrical System Standards".

There are some real innovations in the 43 volt systems, PM alternator/starters in the flywheel, all electric A/C systems, electric brakes and power steering and even electric valve trains.

<http://www.sae.org/42volt/bookstore.htm>

It will be nice when one can purchase "off the shelf" products for the alternative energy uses we dream up....

Ron

Re: 48 volts ([none / 0](#)) ([#2](#))

by [Seth](#) on Fri Jul 4th, 2003 at 08:02:00 PM MST

[\(User Info\)](#)

I do agree.... at 12V the currnet is large for the amount of power compared to 42V, Wire is expensive..... 24V is what im looking for right now..... Id like to know if you can compose a list of UPS's that operarte on 24V and 48V .....

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Re: 48 volts ([none / 0](#)) (#3)  
by 5kw on Sat Jul 5th, 2003 at 08:24:53 AM MST  
([User Info](#))

A note on the 42 volt auto systems. They are actually 36 volt nominal systems ie 18 lead acid cells and run at 42 volts when the car is running, like saying present autos are 14 volt systems.

Re: 48 volts ([none / 0](#)) (#4)  
by wdyasq on Sat Jul 5th, 2003 at 06:00:20 PM MST  
([User Info](#))

Good Point on the "42 = 36" 5kw. Also, the "new and improved" batteries may be Lithium based to reduce weight. Pre-packaged "heat-pumps" in the new car AC units will be a scrounger's delight.

Ron

Re: 48 volts ([none / 0](#)) (#5)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Sat Jul 5th, 2003 at 08:30:52 PM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

Here is a very detailed article from Car Audio Magazine that describes the change to 42 volt systems and the Advantages . . .  
[http://www.caraudiomag.com/features/0307cae\\_42volt/index.html](http://www.caraudiomag.com/features/0307cae_42volt/index.html)

T i m

}=- W o o f -= {

Re: 48 volts ([none / 0](#)) (#6)  
by sensei on Fri Dec 5th, 2003 at 03:09:20 PM MST  
([User Info](#))

A few years ago we were able to get our grubby little hands on a 120vdc/120vac inverter from beneath a railroad coach car. It was great on the current demand side but the idle current was too much for for for only 10 auto batts. We solved the problem by parrelling two more banks. Haven't talked to the fellow in years but he didn't have any problems for the 18 months I was around..

[48 volts](#) | 6 comments (6 topical, 0 editorial)

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## [Ups inverters](#)

By [Andrew](#), Section [Homebrewed Electricity](#)

Posted on Wed Jul 2nd, 2003 at 02:31:00 AM MST

[Inverters](#)

How long they last, etc....

Hi,  
I was just wondering if people were using ups inverters as their main source? It wouldn't seem like they would handle well to continuous duty.

Also,  
I have a junked ups here, but there is something horribly wrong with it. I would put in the 30v and what it would do was when I turned it on it would make a loud click (sounds like a big relay) Also, I plugged it in the wall, and it was only putting out about 3v AC from the battery leads. STRANGE! Sounds like the circuit opened up myself. Or a fuse popped. It is one of those huge 4000watt type ones. It has a huge transformer in it too. I've seen smaller ones on welders. What do you think is going on?

-Andrew

[Ups inverters](#) | 3 comments (3 topical, 0 editorial)

Re: Ups inverters ([none / 0](#)) ([#1](#))  
by [wpowokal](#) on Wed Jul 2nd, 2003 at 06:35:03 AM MST  
([User Info](#))

Andrew, While I do not use an UPS myself, they are frequently in continuous service in commercial installations. The quality will have a bearing, so can you post details on your unit?

The 3v AC sound like mutual inductance to me, so I agree the circuit is not complete. There was a posting on the old board some time back (months) someone posted how to trick them into believing the power had failed.

regards allan

Re: Ups inverters ([none / 0](#)) ([#2](#))  
by [Seth](#) on Fri Jul 4th, 2003 at 09:33:13 AM MST  
([User Info](#))

3V ac on the battery terminals.... with batteries conected.. or not... , then your measuring the wrong electric mode... batteries are DC, feel silly dont u. My 300VA UPS does that too... actually it has 3 sererate clicks.... on mine i get it to go by holding the push on/off button ---- when i dont have it coneted to the mains..... U have a 4KW modle.... cool.. what vantage is the battery bank on it.. im looking for a 24V banked UPS in that power range....

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Re: Ups inverters ([none / 0](#)) (#3)  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Fri Jul  
4th, 2003 at 01:06:30 PM MST  
([User Info](#))

I'm not THAT ignorant. Just because I'm 15 doesn't mean I know nothing about electronics. I know batteries are dc. The batteries were disconnected. I was just getting some strange inductance from the transformer. That's what I was saying was wrong with it. I think that either the transformer blew a winding or I transistor opened up on me. (probably the drive circuit fet) Its gonna be tough trying to track down which particular one it is. I think the relay thing is happening because of the transformer not being hit with a frequency thus making it practically a small resistor. I'm almost POSITIVE its a transistor problem. It has it written all over it. If the circuit opened up the relay wouldn't fire at all would it. The relay fires even when the ups is plugged into 120vac. This ups might not be recoverable. (On a lighter note the ups manufacturer must deal with xilinx because I found a programmable xilinx chip wired on for the interface between the ups and the computer. It was cool! There were little thermistors and other goodies wired up to it. It sounds like it would be a pretty sophisticated ups when it was working.)

-Andrew

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[Ups inverters](#) | 3 comments (3 topical, 0 editorial)

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## [Levitation](#)

By [maxmwiz](#), Section [Magnets & Magnetism](#)

Posted on Sun May 18th, 2003 at 10:00:31 AM MST

Steel washer levitating in magnetic field

---

does anyone have any ideas of how this works? It is a steel washer that floats above the magnetic field and when inverted it doesn't fall away!

[Levitation](#)

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[Levitation](#) | 2 comments (2 topical, 0 editorial)

Re: Levitation ([none / 0](#)) ([#1](#))  
by Anonymous Hero on Fri Jun 6th, 2003 at 01:49:25 PM MST

**SIR: all matter has a positive field aboutt it's surface and in the matter itself when a force is applied to it will not change it's positive attitude and proporsion to the force applied. Such as the moon keeps it's distance and etc: jdolci@ij.net**

Re: Levitation ([none / 0](#)) ([#2](#))  
by Anonymous Hero on Fri Jun 6th, 2003 at 01:56:20 PM MST

**SIR: all matter has a positive field about it's surface and in the matter itself when a force is applied to it will not change it's positive attitude and proporsion to the force applied. Such as the moon keeps it's distance and etc: jdolci@ij.net**

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2. [Diamagnetic Levitation](#) ([Weird Science](#), [Levitation](#))  
posted by ADMIN on 03/29/2003 07:06:12 AM MST  
7 comments

3. [Bismuth discs for levitation are on the way](#)  
([Magnets & Magnetism](#), [Levitation](#))  
posted by scadmin0 on 03/28/2003 04:16:09 PM MST  
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## [Diamagnetic Levitation](#)

By [ADMIN](#), Section [Weird Science](#)

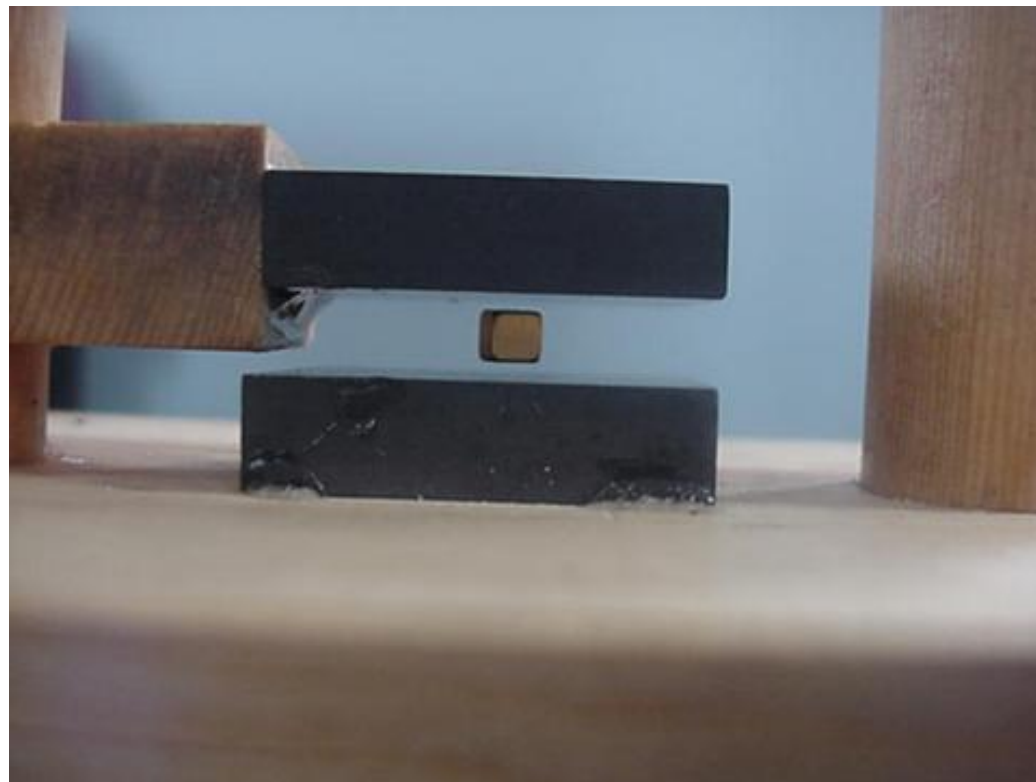
Posted on Sat Mar 29th, 2003 at 07:06:12 AM MST

[Levitation](#)

Some of the Otherpower.com board folks may not have seen our levitation experiments yet -- Read on, cool PICS!

In 1842 Earnshaw determined that a permanent magnet could levitate, but would only be stable in one axis. An external force is needed to stabilize in the other axis. In these experiments of ours, the external force is provided by the levitating magnet's reaction to a diamagnetic material, like carbon-graphite or Bismuth.

[You can check out our diamagnetic levitation pages HERE.](#)



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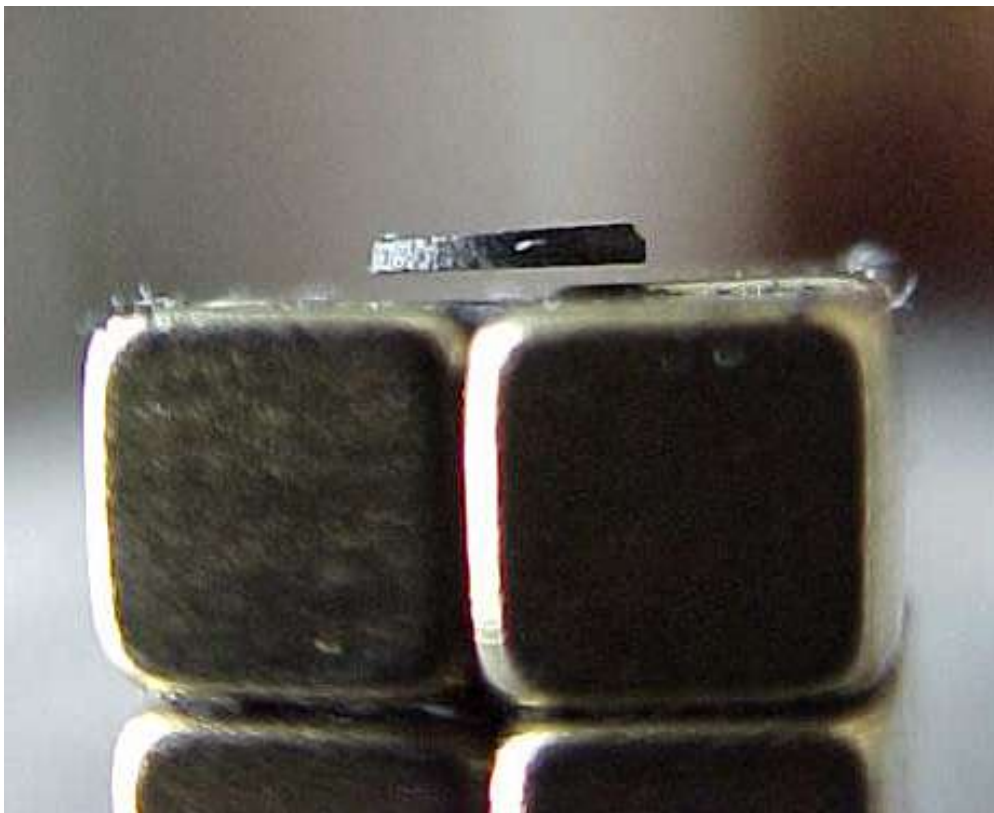
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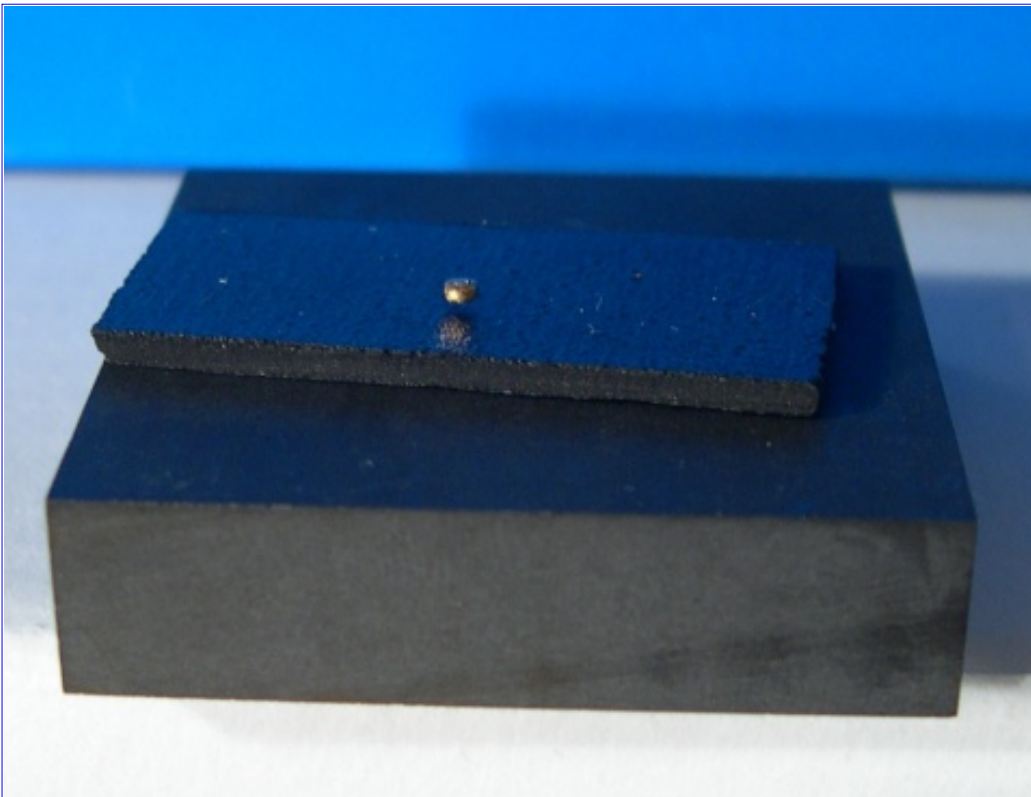
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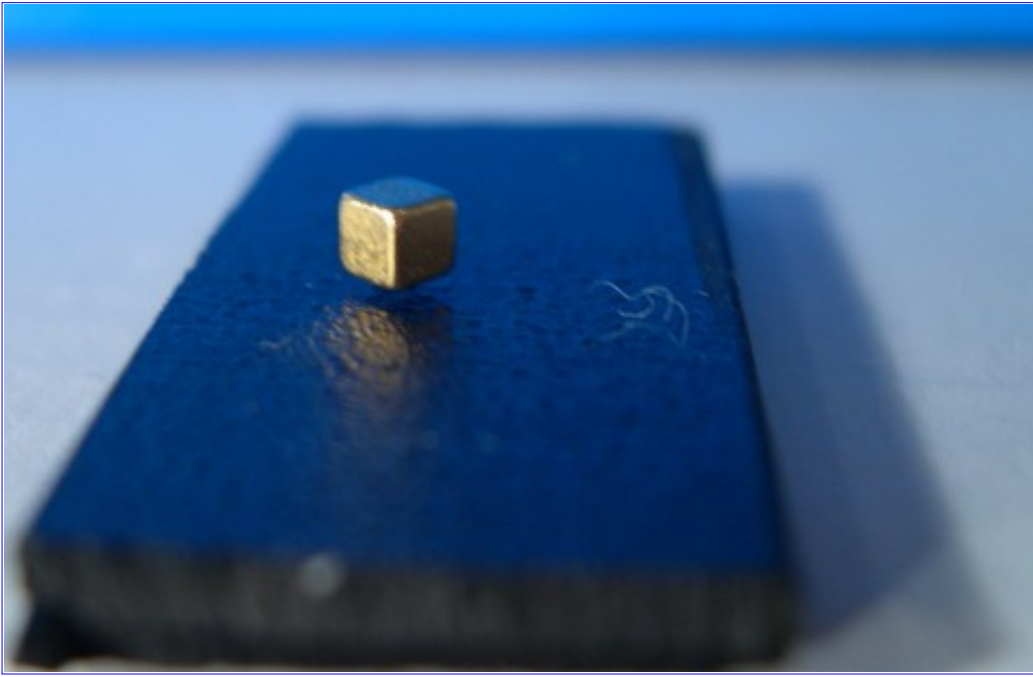


[Diamagnetic Levitation](#) | 7 comments (7 topical, 0 editorial)

More Levitating Magnets ([none / 0](#)) ([#1](#))  
by [iansmith](#) on Sun Apr 13th, 2003 at 10:51:34 AM MST  
([User Info](#))

I have some of ForceField's graphite blocks as well as some other materials I have played around with. Here are some images (click for larger versions) of some small magnets I was levitating without an upper plate.





levitation ([none / 0](#)) (#2)

by maxmwiz on Sat May 17th, 2003 at 11:52:04 AM MST

([User Info](#))

I have a picture of a steel washer levitating above magnets and a magnetic viewing device on the website [www.theverylastpageoftheinternet.com](http://www.theverylastpageoftheinternet.com) If anyone can help explain the phenomena I would appreciate it. Thanks, Jerry

Reelling forces ([none / 0](#)) (#3)

by Anonymous Hero on Mon May 26th, 2003 at 02:17:20 PM MST

All matter is charged with a natural ositive charge. What you did was charged the bottom plate which also field charged the items and created force internally to equal the items mass that forced the smaller portion of the same mass to equal it's adjacent mass causing a more magnetic force externally causing a repelling action. As for it's positioning on the plate is another matter and the best reference is many Ancient systems have prodused anti-gravity: See two Water Work jdolci: Ed Leed and Flower Show, James Dyson/Wrong Garden water flowing up hill. If you can find on a drawing the pyramid angles of the great pyramid: The angles which have been surveyed are in error and have not been constructed properly. Take it from two people who know of course Ed Leed is dead and old old man me!!!!!! jdolci@ij.net

[ [Parent](#) ]

AXSIS ([none / 0](#)) (#4)

by Anonymous Hero on Mon May 26th, 2003 at 02:47:39 PM MST

For it to anti-gravitate naturally the shape of your items are very important which is the missing axis. see Ed Leedsalnini as to how important shapes are with proper demensions. jdolci@ij.net

[ [Parent](#) ]

Present Diameter ([none / 0](#)) (#5)

by Anonymous Hero on Wed May 28th, 2003 at 02:09:10 PM MST

Some more Ancient talk. If you draw a one inch diameter you canot truely find the hypotenuse of a square tanjent to the drawn diameter. Yes I know you can calculate the triangle to the corner of the square9 (45\*), but who is to say that one is rite although we are presently useing it. All engineer have been climbing for many centuries all over the Great Pyramid's allusive Pyramid cubit's inch. When sombody many years ago thought of the present inch the erson came to the conclusion that he can cheat when manufacturing and filling the vases he can cheat with the ONE INCH which is a short count. To the thinking many just a crack pot!!!!!! jdolci@ij.net

Present Diameter ([none / 0](#)) (#6)

by Anonymous Hero on Wed May 28th, 2003 at 02:18:27 PM MST

Some more Ancient talk. If you draw a one inch diameter you canot truely find the hypotenuse of a square tanjent to the drawn diameter. Yes I know you can calculate the triangle to the corner of the square9 (45\*), but who is to say that one is rite although we are presently useing it. All engineer have been climbing for many centuries all over the Great Pyramid's allusive Pyramid cubit's inch. When sombody many years ago thought of the present inch the person came to the conclusion that he can cheat when manufacturing and filling the vases he can cheat with the ONE INCH which is a short count. To the thinking many just a crack pot!!!!!! jdolci@ij.net

Re: Diamagnetic Levitation ([none / 0](#)) (#7)

by Motorhead on Tue Aug 5th, 2003 at 09:26:52 PM MST

([User Info](#))

Is it posible to levitate large diameters using this science?  
if so I have an application for it.

[Diamagnetic Levitation](#) | 7 comments (7 topical, 0 editorial)

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## [Bismuth discs for levitation are on the way](#)

By [scadmin0](#), Section [Magnets & Magnetism](#) [Levitation](#)

Posted on Fri Mar 28th, 2003 at 04:16:09 PM MST

**We should have them in stock and for sale on our shopping cart within 2-3 weeks.**

[Bismuth discs for levitation are on the way](#) | 0 comments (0 topical, 0 editorial)

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## [Good news for Mother Earth News fans](#)

By [Old F](#), Section [Remote Living](#)

[Reviews](#)

Posted on Sat Dec 6th, 2003 at 03:45:55 PM MST  
issues 1 thru 60 on CD 1970- 1980

Good news for Mother Earth News fans

issues 1 thru 60 on CD 1970- 1980

Go to <http://www.motherearthnews.com>

There is a lot of good info to be had for \$19.95  
The issue that has the plans for the waste oil heater  
can be found on the CD.

I have been looking over my copy and it been a real  
blast from the past : )

Old F

Have so much fun it should be illegal

[Good news for Mother Earth News fans](#) | 3 comments (3  
topical, 0 editorial)

Re: Good news for Mother Earth News fans  
([none / 0](#)) (#1)  
by RobD on Sun Dec 7th, 2003 at 09:55:25 AM MST  
([User Info](#))

Those old Mother Earth News were the best!

Re: Good news for Mother Earth News fans  
([none / 0](#)) (#2)  
by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Mon Dec 8th,  
2003 at 10:49:24 AM MST  
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I saw that too in the latest issue, and will be ordering it.

Quite a few years back, Mother Earth News was turned into a rich yuppie outdoor magazine, with articles about helicopter salmon fishing in New Zealand and such; I cancelled my subscription then. They lost thousands of subscribers from this, and many staffers. Some of the ex-staffers and readers went on to start Back Home Magazine, to which I have been a contributing author twice now. That's actually my house on the cover of the latest issue of Back Home, with the remote communications article ;~) I do highly recommend Back Home....lots of organic gardening, home cooking, home business success stories, livestock tips, renewable energy, homesteading info....

Then someone at TMEN realized that, hmmm, maybe this was a bad idea. The new TMEN magazine is more back to the roots of the original. My only complaint is they don't run much about renewable energy systems anymore.

In fact, there's not even much about homebrew RE systems anywhere anymore, not even in Home Power.....they seem to focus on mostly big, expensive commercial systems now. It's a void we are considering trying to fill. Just a thought for now, but who knows?

Cheers!  
DANF

Re: Good news for Mother Earth News fans  
([none / 0](#)) (#3)  
by elvin1949 ([elvin1949@wmconnect.com](mailto:elvin1949@wmconnect.com)) on Tue  
Dec 9th, 2003 at 02:56:14 AM MST  
([User Info](#))

oldf  
thanks i needed that  
just ordered it  
later  
elvin

[Good news for Mother Earth News fans](#) | 3 comments (3  
topical, 0 editorial)

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1. [Good news for Mother Earth News fans](#) ([Remote Living](#), [Reviews](#))

posted by Old F on 12/06/2003 03:45:55 PM MST  
3 comments

2. [Efficient living](#) ([Remote Living](#), [Reviews](#))

posted by wdyasq on 11/14/2003 07:23:01 PM MST  
0 comments

3. [Vortex Anemometer Review](#) ([Homebrewed Electricity](#), [Reviews](#))

posted by ADMIN on 11/03/2003 12:24:54 PM MST  
4 comments

4. [Home Power Magazine good buy !](#) ([Homebrewed Electricity](#), [Reviews](#))

posted by RobC on 10/31/2003 12:59:43 PM MST  
2 comments

5. [Good comments](#) ([Homebrewed Electricity](#), [Reviews](#))

posted by Mike Wolak on 10/24/2003 12:21:03 PM MST  
1 comment

6. [motor/generator review](#) ([Homebrewed Electricity](#), [Reviews](#))

posted by Chuck on 10/13/2003 03:50:10 PM MST  
5 comments

7. [Added Topic -- Reviews](#) ([Site News](#), [Reviews](#))

posted by ADMIN on 10/08/2003 01:50:29 PM MST  
11 comments

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### [Efficient living](#)

By [wdyasg](#), Section [Remote Living](#)

Posted on Fri Nov 14th, 2003 at 07:23:01 PM MST

[Reviews](#)

maybe not

[http://story.news.yahoo.com/news?tmpl=story&cid=573&ncid=573&e=9&u=/nm/20031114/od\\_nm/environment\\_redford\\_dc](http://story.news.yahoo.com/news?tmpl=story&cid=573&ncid=573&e=9&u=/nm/20031114/od_nm/environment_redford_dc)

The building's exterior appears to be wood but is made of a fiber and cement material. Much of the interior is lit with skylights and solar cells that provide about a fifth of its energy. Cool sea breezes augment the air conditioning and special towers draw off heat.

The structure uses about 60 percent less water than most buildings because it captures rainwater from the roof, showers and sinks and uses it to water the plants and flush the low-flow toilets. The urinals use a special cartridge to funnel away wastewater.

[Efficient living](#) | 0 comments (0 topical, 0 editorial)

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## [Vortex Anemometer Review](#)

By [ADMIN](#), Section [Homebrewed Electricity](#)

Posted on Mon Nov 3rd, 2003 at 12:24:54 PM MST

[Reviews](#)

It's a slick and inexpensive unit based on a bicycle speedometer.

[InSpeed](#) was kind enough to send us one of their Vortex anemometers to fly and test. It's a nice, well-made unit, and costs only US\$65.00.



The cup assembly comes assembled and is a solid plastic piece. The hub uses a bushing and the company suggests lubricating with graphite, not oil. It spins very freely and starts up at walking speed. The magnet and sensor are contained inside the hub. You can disassemble the hub unit for cleaning and lubrication. We got the pole-mount version, with an aluminum bracket for mounting. It came with 20

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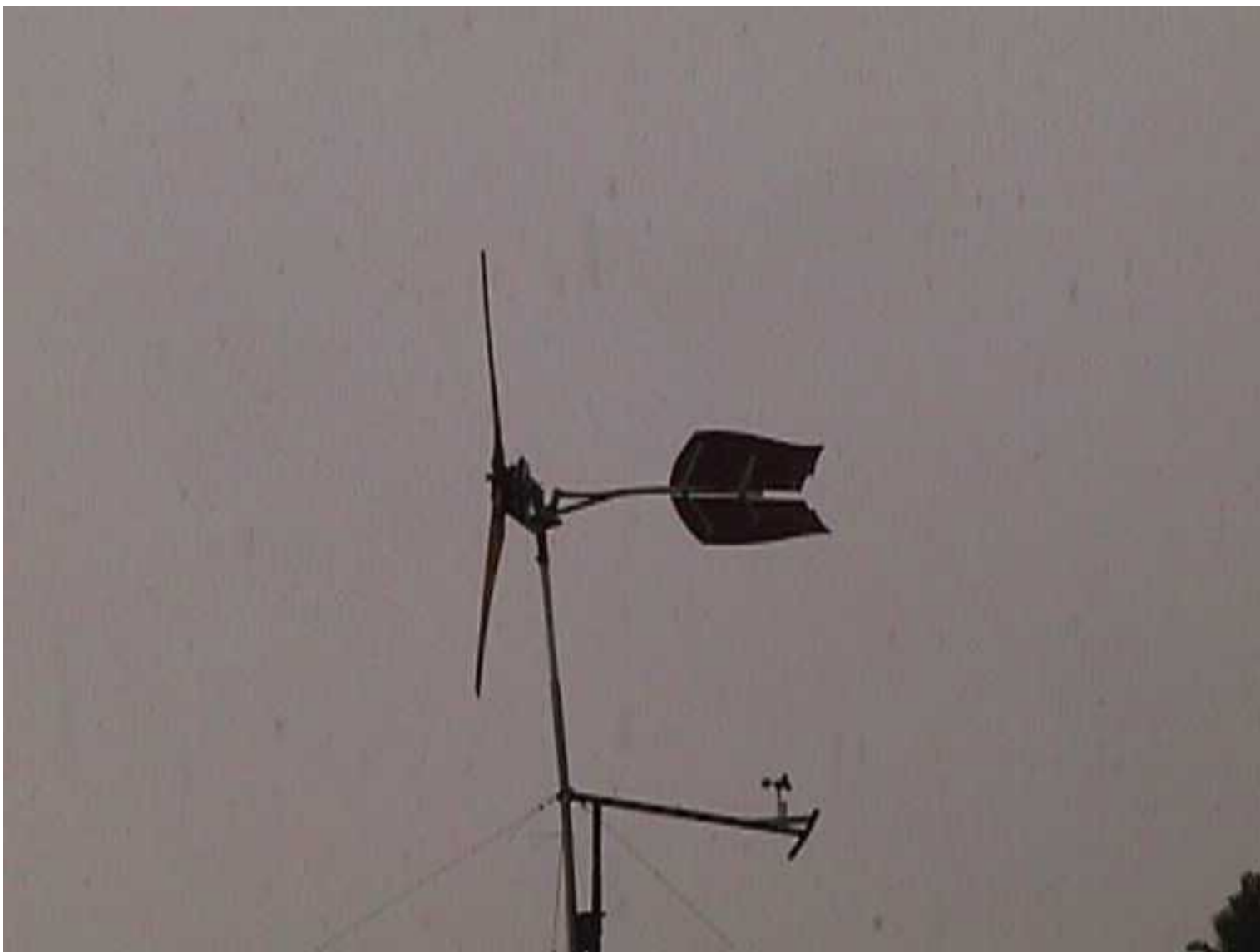
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feet of wire; we have to run it over 100 hundred feet and just spliced in more 2-conductor wire. You can special order the Vortex preassembled with longer wire.

The digital bicycle speedometer computer shows instantaneous windspeed, and also tracks maximum windspeed, and totalizes (plus other features I haven't tried yet -- averaging, etc.). The builder rates it accurate within 4%. We did not test the accuracy -- we don't have an expensive reference anemometer up here for comparison, and it's been windy here for weeks, which prevents truck testing. The display updates about once a second.

We have it flying on DanB's windmill mast. This is probably one of the harshest locations we could fly it at -- there's high winds and lots of turbulence. It's hard to tell in the picture below, but the anemometer is flying a couple feet below the blade, on a "foot" that sticks out toward the direction our prevailing winds come from -- most of the time, there won't be a wind "shadow" from the pole on the anemometer. Our anemometer will get slammed hard all winter. We'll report back on how it holds up..



If you are looking for an inexpensive anemometer and don't want to build one, this is a slick, well-made unit from a very friendly company.

[Vortex Anemometer Review](#) | 4 comments (4 topical, 0 editorial)

Re: Vortex Anemometer Review (1.00 / 1) (#1)  
by Chuck on Mon Nov 3rd, 2003 at 04:17:23 PM MST  
([User Info](#)) <http://www.greeleynet.com/~cmorrison>



It looks nice and the price can't be much better from what I can see.

However, the disclaimer they have on the web site is important. It doesn't calculate in times with 0 wind speed, so this won't be good for averaging wind speed (and lack thereof) over time. Should be fine for instantaneous measurements though.

Chuck

Re: Vortex Anemometer Review ([none / 0](#)) ([#2](#))  
by DanB on Mon Nov 3rd, 2003 at 05:51:41 PM MST  
([User Info](#))

yes, that's always the case it seems with these bike speedo anemometers. It does a good job of "average" on a windy day though... many times on windy days itll never stop- so in those cases the average is accurate.

Wind miles is an interesting one though.. for long term data aquisition.

[ [Parent](#) ]

Re: Vortex Anemometer Review ([none / 0](#)) ([#3](#))  
by 5kw on Mon Nov 3rd, 2003 at 09:03:29 PM MST  
([User Info](#))

Hi Dan,

If it totalizes miles of wind run you can simply divide the wind run by the number of hours since the last reading. Por ejemplo if the odometer neted 1680 miles in one week divided by 168 hours = 10 mph ave.

I have always heard that reed switch type anamometers, I'm assuming this one uses a reed switch as most bicycle speedometers do, fail rather quickly . Even though the reed switch is rated for millions of cycles the cups chalk up millions of revs in a matter of months. Time will tell!

Make the wind fun!

Victor

[ [Parent](#) ]

Re: Vortex Anemometer Review ([none / 0](#)) ([#4](#))  
by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Thu Nov 20th, 2003 at 09:35:33 AM MST  
([User Info](#))

If the reed switch does wear out, at least it'll be a 50 cent replacement and easy fix....as you said, time will tell.  
DANF

[ [Parent](#) ]

[Vortex Anemometer Review](#) | 4 comments (4 topical, 0 editorial)

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### [Home Power Magazine good buy !](#)

By [RobC](#), Section [Homebrewed Electricity](#)

Posted on Fri Oct 31st, 2003 at 12:59:43 PM MST

[Reviews](#)

Home Power Magazine

I just got a subscription to Home Power magazine and I can tell you its great everybody ought to have one. I never realized that there were so many good RE products out there. Pumps windmills inverters solar panels batterys you name it.

[Home Power Magazine good buy !](#) | 2 comments (2 topical, 0 editorial)

Re: Home Power Magazine good buy ! ([none / 0](#)) ([#1](#))  
by [windstuffnow](#) ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Fri Oct 31st, 2003 at 01:19:10 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Isn't that something!!! The world really doesn't revolve around power and oil companies, although they want to keep that image alive.

Great magazine! Your absolutely correct! Need one specifically for DIY'ers too! Hey there's an idea for those inclined

Have Fun  
Ed

Re: Home Power Magazine good buy ! ([none / 0](#)) ([#2](#))  
by [troy](#) on Fri Oct 31st, 2003 at 03:20:35 PM MST  
([User Info](#))

I purchased all their back issues on CD, very reasonable and a gold mine of information. I'm just a poor doctor though, so I download the current issue for free from [www.homepower.com](http://www.homepower.com). Very nice people.

Best regards,

troy

[Home Power Magazine good buy !](#) | 2 comments (2 topical, 0 editorial)

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### [Good comments](#)

By [Mike Wolak](#), Section [Homebrewed Electricity](#)  
Posted on Fri Oct 24th, 2003 at 12:21:03 PM MST

[Reviews](#)

#### Good comments

Love to do this. I've been treated good.

[www.plastecs.com](#) processed my order quickly, responded to my e-mails and sent quality products. We should let our brothers know when someone or place is good....

[Good comments](#) | 1 comment (1 topical, 0 editorial)

Re: Good comments ([none / 0](#)) ([#1](#))  
by Tom in NH on Fri Oct 24th, 2003 at 08:31:22 PM MST  
([User Info](#))

Ditto for me. Jim Bazinet at Plastecs goes out of his way to make sure you're treated right and you can count on him to be honest with you. Decent prices too.  
Tom

[Good comments](#) | 1 comment (1 topical, 0 editorial)

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## [motor/generator review](#)

By [Chuck](#), Section [Homebrewed Electricity](#)

Posted on Mon Oct 13th, 2003 at 03:50:10 PM MST

[Reviews](#)

After a few months testing

This is a brief look at a low speed DC motor I've been testing as a generator for the last few months. It is available used at Surplus Center in Nebraska for about \$50(US) plus shipping.

This motor has a face plate rating of 24 volts at 194 rpm and 13 amps. It is rated as a 1/4hp motor. It comes in 3/4" and 5/8" shaft sizes. The shell is formed from 1/8" sheet steel and contains four large ceramic magnets. There are four small brushes contacting the commutator, although not at 90 degree angles as one might suspect. The coils appear to be awg 14 wire. without pulling things apart I can't tell what the winding pattern is.

I purchased a few of these and have been working on finding the issues one might encounter attempting to use these in wind applications. In the tests referred to below, I used the motors as they arrived, without refurbishing or replacing parts. I expected (correctly it turns out) that I would destroy some of these in tests.



Matching a rotor to your generator is important in getting satisfactory results. I tested this motor as a generator in a 24v system with two different sets of blades; a 3 blade, 7.5' diameter rotor of carved wood, and a 2 blade 8' diameter cast nylon rotor. In both cases I observed voltage and current during low (under 20mph) winds and high (over 35mph) wind events. In both cases I used high capacity batteries as the load.

For 12 volt systems the 3 blade rotor is a good fit in low winds, charging as soon as the rotor spun up. Start up speeds seemed a little high, but motors of this type (dynamos) tend to have a fairly high resistance to moving due to heavy armatures and pressure from brushes. A four blade rotor may be a better 12 volt fit as the cut-in speed is a low 100rpm and four blades should provide more low end torque.

For 24 volt systems the 3 blade rotor is disappointing in lower wind regimes. I watched for quite a while as the output voltage bounced between 15 and 20 volts. In a similar wind the output of the 2 blade rotor was much more satisfying, charging up to 5 amps in the same conditions. Startup with 2 blades is lousy for all the reasons given above. Even in a 20mph wind startup is slow.

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In stronger winds both rotors provided good results, although the 2 blade rotor gave consistantly higher amperage as long as it was already spinning.

Not knowing the actual limitations of the motor (as generator) I set the furl very stiff with the 2 blade rotor and watched to see how high I could get the current before things got nasty. As happens in Colorado in the fall, nature was eager to grant my desire for high winds. In winds over 40 mph I watched this motor put out over 500 watts before the fiery end.

The weakest link appears to be the brushes, which burned up within a few hours at 20 amps (500 + watts). The brush pigtails, a strong smell and black dust were all that remained. There was evidence of high heat and melted wire insulation.

Higher current replacement brushes might help boost the durability of these units somewhat. But that may not take care of overheating issues. These motors, like most, are totally sealed. They have a removeable band for accessing and servicing the brush connections. Leaving off the service band or allowing airflow through the generator in some creative way that keeps water out could help aleviate heat issues and gain a few amps.

Conclusion:

For 24 volt systems these motors can be used to produce 300 watts and for 12 volt systems, 150 watts. If you decide to use one of these motors in a wind generating application, adjust the tail to furl at the rated 13 amps. Remember that this is a cheap and quick way to get a few watts out of the wind. Design to account for it's limitations and you can get good use of your investment.

If you want more, you'll need to address the heat issue. Don't skimp on replacing the bearings if you intend on leaving it up for a while.

Chuck

[motor/generator review](#) | 5 comments (5 topical, 0 editorial)

Re: motor/generator review ([none / 0](#)) ([#1](#))  
by drdongle on Mon Oct 13th, 2003 at 07:05:58 PM MST  
([User Info](#))

Great report, in paragraph 6 you described one unit in terms of volts output and the other in terms of amps output, could you clarify by applying the same standard to both?  
again a great report.

Dr.D

Re: motor/generator review ([none / 0](#)) ([#2](#))  
by Chuck on Tue Oct 14th, 2003 at 08:39:24 AM MST  
([User Info](#)) <http://www.greeleynet.com/~cmorrison>

Hi Dr.D,

Thanks for the kind words.

Regarding paragraph 6, for the 24v system there were no amps with the 3 blade rotor because it didn't reach cut-in speed. Voltage is all that could be measured. With the 2 Blade rotor cut-in was reached and amps (up to 5) were being produced. Voltage for the 2 blade test was battery voltage, roughly 26 volts.

Chuck

[ [Parent](#) ]

Re: motor/generator review ([none / 0](#)) ([#3](#))  
by drdongle on Tue Oct 14th, 2003 at 05:16:24 PM MST  
([User Info](#))

Thanks for the clarification, again a great report and I hope more successes.

Dr.D

Re: motor/generator review ([none / 0](#)) ([#4](#))  
by ssdd on Thu Nov 13th, 2003 at 05:13:19 AM MST  
([User Info](#))

Dear sir  
im looking for permanent magnet dc motor with~ 100rpm  
and ~ 5n.m  
please introduce a copmany that i buy it

Re: motor/generator review ([none / 0](#)) ([#5](#))  
by ssdd on Thu Nov 13th, 2003 at 05:35:56 AM MST  
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my mail sir\_tak11@yahoo.com

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[motor/generator review](#) | 5 comments (5 topical, 0 editorial)

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[Added Topic -- Reviews](#)

By [ADMIN](#), Section [Site News](#)  
Posted on Wed Oct 8th, 2003 at 01:50:29 PM MST [Reviews](#)  
For reviewing equipment, parts, components, anything related to this board.

Chuck M wanted to post some equipment reviews so here's the place for them! Everyone, let us know if you want more topics added. They are easy to do and aid greatly in searching.

ADMIN

[Added Topic -- Reviews](#) | 11 comments (11 topical, 0 editorial)

Re: Added Topic -- Reviews ([none / 0](#)) ([#1](#))  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Wed Oct 8th, 2003 at 10:30:18 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

How about a topic for Heat or Thermal

I have tried to place posts for Home heating, Pool Heating and Thermocouple Power, but there isn't a proper topic area for these Subjects . . .

-- W o o f

Re: Added Topic -- Reviews ([none / 0](#)) ([#2](#))  
by JW on Thu Oct 9th, 2003 at 08:59:48 AM MST  
([User Info](#))

Hi ADMIN,

first off Id like to say I'm very impressed with this board. I have learnd so much by reading it. You guys are doing a fantastic job!!! the only suggestion that I have to improve it is this// As the new postings or new post threads are added, all the posts move down the line of the list, and can quite easily move many pages back where no one can esily detect new posts to old postings/or topics. Then if someone might have thought about a suggestion for a preivious posting, that was not apperant to them at the time, that the posting remained on the "front page" of the posts. As a result most will miss late activity on a posting. unless of course your are a savvy user, and go back a couple of pages, to look for activity in a posting that you were interested in , but even doing this you are bound to miss allot, especially if you previously werent interested in all the postings back there, but then someone else might have added something, that made you interested. most of the time, like I said you just miss that oportunity.

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Alot of potentially new users are finding some of these "old" postings and are actually adding to them with new posts. these people are finding these old posts thru a search engine. But most of us miss this "new" activity since the main posting stays 5 to 10 pages back on the list of postings. A fer example: some guy named Julius, cant rememer the last name, posted some very well articulated explanations to one of JCP'S perpetual motion posts, while it was in The quarentine zone. this happened acouple of months after the time of his rant. But the guy made an honset effort, and it was intersting to read.

It would be very cool if there was topic for recent additions to all preivious postings.

Keep up the exellent work guys OTHERPOWER IS #1

-JW

[ [Parent](#) ]

Re: Added Topic -- Reviews ([none / 0](#)) ([#3](#))  
by TomW on Thu Oct 9th, 2003 at 10:06:26 AM MST  
([User Info](#))  
<http://oneota.net/~earthsorcepowr/>

JW;

I have often thought a special page with everything "new" on it starting with the latest would be very useful. Kind of like how the old board did postings.

I have seen the same issues you mentioned. You can go into your display preferences for the site and get up to 50 stories per page but I find I still miss stuff and I read almost everything that goes through the site but do not go beyond the 50 that display on my "front page".

So there you go, Dan, a feature request.

Cheers.

TomW

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Re: Added Topic -- Reviews ([none / 0](#)) ([#4](#))  
by Wolfie1 on Thu Oct 9th, 2003 at 12:22:23 PM MST  
([User Info](#))

Actually, and possible more 'do-able' in scoop would be an option to list the stories (not sure if that is the right word for it) in order of the story with the most current posting in it and going backwards in time.

Then, 'stories' that can get a quick answer drop from the first page while old favorites that never seem to die, such as laminate materials and coil turns/size/thickness will remain until they die a natural death (if they ever will).

I think most of the people that read and post most days will probably read everything new for fear of missing something valuable.

Martin.

[ [Parent](#) ]

Re: Added Topic -- Reviews  
([none / 0](#)) ([#5](#))  
by John on Thu Oct 9th, 2003 at  
01:26:24 PM MST  
([User Info](#))

Reversed chronological listing.  
That's an option that we had with the old board. Admin. said that they are working on it but I haven't seen it yet. I hope it will be done soon!

John  
[Toxin absorber/Pain reliever](#)  
[ [Parent](#) ]

Re: Added Topic -- Reviews  
([none / 0](#)) ([#6](#))  
by kurt on Thu Oct 9th, 2003 at  
01:38:24 PM MST  
([User Info](#))

Actually most message boards are set up so that if a new comment is added to a post it moves to the top of the list indicating that there has been new activity. That way ongoing threads don't get buried. I always thought the way this board was set up was kind of strange but it gets the job done so I was not going to howl to loud especially since there was already enough problems for the admins to worry about



[ [Parent](#) ]

Re: Added Topic --  
Reviews ([none / 0](#)) ([#7](#))  
by JW on Fri Oct 10th, 2003  
at 10:02:21 AM MST  
([User Info](#))

ADMIN;

I did a litte looking for something, that I remember from looking at various disscusion forums, a while back. check this out <http://shouldexist.org>

most of these board software programs (meaning all, or at least execept for one) are mostly a generic program that everyone uses. Personally I think the way this one is set up is pretty dam good. Also these same programs have several customiziable features. for example the way the main page includes all new postings from all "catagorys" is working quite well. also if someone posts to one of the postings it does not change its location "ie" bring it up to the top of the list. this part of the system (board) "works fine".

heres my sugestion///

we dont really need the DIARY section. if that small portion "the diary" of the from the main page was replaced with "newest postings from all sections" the arcive capability of this



site would be greatly enhanced, this would allow new users to interact when they find an old post, these guys (potential new users) are being directed to these old posts by a search engine. unfortunately the posts these guys are finding and posting to, are so far back on the list ,or archive, nobody know's they were there, and posted a comment or question.

If someone is really that interested in your diary, then they can already "easily" link to it from your 'handle'(mine is JW) located at the bottom of your posts. so IN MY OPINION THE DIRARY SECTION IS REDUNDANT. in my mind this should be easily configured with the "existing software" that is up and running here, but I could be wrong, but creating a "whole new" page to do this is probably not practical. anyway if you change only that -repace the dirary display box, with most recent postings from all sections- for me, as a user of this board i see it as a plus. but i feel its important to "note" the board works fine, and is really good, even without this suggested minor change.

-JW

[ [Parent](#) ]

Re: Added Topic --  
Reviews ([none / 0](#))  
([#8](#))  
by JW on Fri Oct 10th,  
2003 at 10:09:29 AM  
MST  
([User Info](#))

"correction"

above I quote  
//personally I think the  
way this one is est up is  
pretty dam good" I am  
referring to  
OTHERPOWER. Not the  
link i provided there...  
-JW

[ [Parent](#) ]

Re: Added Topic -- Reviews ([none / 0](#)) ([#9](#))  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Mon Oct  
13th, 2003 at 05:15:37 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

I ran a BBS system here in Huntsville, AL for over 10 years. The software was VBBS Virtual Bulletin Board System. It had a feature in the message section called new message search which would bring up any unread messages for the users. The folks using this feature could define the topics that the New Message Reader worked with. I miss this type of feature on internet boards . . .

. >=- W o o f -=<

Re: Added Topic -- Reviews ([none / 0](#)) ([#10](#))  
by zubbly on Sun Nov 2nd, 2003 at 03:50:31 PM MST  
([User Info](#))

a topic in the area of induction motor conversion i think would be good as much of the research i do is in this area. i think that induction conversion has an extremely good potential with a little more devotion to this area.

thanks---zubbly

Re: Hornet HT2 blade noise (12 vdc windmill) ([none / 0](#)) ([#11](#))  
by desertratjack on Sat Nov 8th, 2003 at 05:54:33 PM MST  
([User Info](#))

I have a noise problem at about 35 mph with the 6 blade prop but other wise am happy with this mill and have also purchased the 6 vdc version (using the same prop). I might just put the noisy mill further up the hill and smile when I hear it's yowl, knowing it is putting out 20 plus amps :-)

[Added Topic -- Reviews](#) | 11 comments (11 topical, 0 editorial)

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### [The 88 cent counter](#)

By [Norm](#), Section [Homebrewed Electricity](#)

[Science Fair](#)

Posted on Sun Dec 21st, 2003 at 05:07:10 PM MST

This is for those that aren't aware that you can use a calculator to count or an obvious use for it.

I don't wish to offend anyone that knows this... (I can hear them now.... "Of course I knew that! Waddah ya think I am... Stupid?) Well without further babblings here it is....

<http://www.fortunecity.com/marina/titanic/664/id6.htm>

Havin' Fun! ( :>) Norm

[The 88 cent counter](#) | 13 comments (13 topical, 0 editorial)

Re: The 88 cent counter ([none / 0](#)) (#1)  
by Norm on Sun Dec 21st, 2003 at 05:14:10 PM MST  
([User Info](#))

Looks like I should have previewed my web page..among other things...(too many 'bullets')messy...oh well

Re: The 88 cent counter ([none / 0](#)) (#2)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Sun Dec 21st, 2003 at 05:34:52 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Thats a slick idea Norm!!! My brain goes numb if I have to take my socks off to count past 10 so winding those 30 turn coils really messes me up.

Have Fun!

Ed

[ [Parent](#) ]

Re: The 88 cent counter ([none / 0](#)) (#5)  
by TomW on Sun Dec 21st, 2003 at 05:52:27 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

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- <http://www.fortunecity.com/marina/titanic/664/id6.htm>
- [More on Science Fair](#)
- [Also by Norm](#)

Ed;

actually you can get to 110 using toes.

for every 10 on fingers curl one toe when all toes are curled its 100 then you still got the 10 fingers .

Cheers.

TomW

[Stuff I have Online](#)

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[ [Parent](#) ]

Re: The 88 cent counter ([none / 0](#))  
(#9)  
by windstuffnow  
([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon  
Dec 22nd, 2003 at 06:35:41 AM MST  
([User Info](#))  
<http://www.windstuffnow.com/main>

Ok Tom, your going to have my ears smokin' if I have to count that high ;o)... I think I'll stick to Norms idea with the number device.

Have Fun!  
Ed

[ [Parent](#) ]

Re: The 88 cent counter  
([none / 0](#)) (#10)  
by Norm on Mon Dec 22nd,  
2003 at 06:52:55 AM MST  
([User Info](#))

A little fun game between you and one of your younger relatives see how fast you can click this 'counter' in a minute ...about 360 in a minute for me... (but then 'Granpa' was always slow!) ( :>) Norm.

[ [Parent](#) ]

Re: The 88 cent counter ([none / 0](#)) (#3)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Sun  
Dec 21st, 2003 at 05:42:24 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

Wow , Too Cool

My immediate reaction, is to disassemble the calculator and solder a coupla wires onto the "Equals" button, and mount the calculator where you can easy see the readout.

}=- W o o f -= {

Re: The 88 cent counter ([none / 0](#)) (#4)  
by Norm on Sun Dec 21st, 2003 at 05:49:41 PM  
MST  
([User Info](#))

Yeah even a couple of (OOPS!) with the soldering iron would be affordable! Not quite like brain surgery...LOL! Norm.

[ [Parent](#) ]

Re: The 88 cent counter ([none / 0](#)) (#6)  
by bob golding ([yubba at clara dot net](#)) on Sun Dec 21st, 2003 at 06:41:23 PM MST  
([User Info](#))

thx for the reminder norm. i still have a couple of calculators with wires coming out of them from doing this years ago. knew i did it for something other than powering them.

bob

reminder ([none / 0](#)) (#8)  
by Norm on Sun Dec 21st, 2003 at 09:17:50 PM  
MST  
([User Info](#))

Yeah they were a lot more expensive then too...battery-draining LEDs ...Norm.

[ [Parent](#) ]

Re: The 88 cent counter ([none / 0](#)) (#7)  
by cevonk ([cevonk\(at\)signhere\)aol.com](#)) on Sun Dec 21st, 2003 at 06:51:51 PM MST  
([User Info](#))

Very clever! The pushrod on the coil winder would be an ADC (Analog to Digital Converter)!

Re: The 88 cent counter ([none / 0](#)) (#11)  
by witapple on Mon Dec 22nd, 2003 at 02:22:24 PM  
MST  
([User Info](#))

I have used an old calculator in the past for similar purposes but instead of using a cam to push the button I put a magnet on the shaft and set a reed relay close to the shaft so it would be triggered once for every revolution, and then ran wires from the reed relay to the button contacts on the calculator.  
You do have to reset the calculator after a while cuz they only count so far but works fine for short periods of time.

Re: The 88 cent counter ([none / 0](#)) (#12)  
by Norm on Mon Dec 22nd, 2003 at 07:11:32 PM  
MST  
([User Info](#))

Like I said when I first posted this it was mainly for those that didn't know this could be done, I figured a large percentage of us probably already knew that you could use it for a counter, but it was just recently that I accidentally discovered that you could reset it. This feature makes it twice as nifty. Plus they're so inexpensive anymore. Norm.

[ [Parent](#) ]

Re: The 88 cent counter ([none / 0](#)) (#13)  
by Bach On on Tue Dec 23rd, 2003 at 05:08:38 AM  
MST  
([User Info](#)) [change AT: bach\\_on AT hotmail.com](#)

Seems like somebody did this on the other board. He wired the switch with a jack coming out. He made two plugs for it. One went to his device to "count" revolutions. He made another that was shorted out. That meant the shorted one could be placed in the calculator so it would work like normal. The other was used when he wanted to use it as a counter. Of course for \$.88 a pop, you could probably forego the extra plug.

Or did I dream that?

Bach On

- I'm just as happy as if I had good sense! -

[The 88 cent counter](#) | 13 comments (13 topical, 0 editorial)

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posted by Guerreiro on 12/03/2003 05:21:16 AM MST  
9 comments
3. [Welding Conduit](#) ([Weird Science](#), [Science Fair](#))  
posted by J Steele on 12/02/2003 10:34:00 AM MST  
2 comments
4. [Testing a Wind Generator](#) ([Homebrewed Electricity](#), [Science Fair](#))  
posted by KnightOfEpsilon on 11/10/2003 06:03:52 PM MST  
2 comments
5. [My Tiny Savonius NiCad Battery Charger \(Pics\)](#) ([Homebrewed Electricity](#), [Science Fair](#))  
posted by xeroid on 09/09/2003 02:49:52 PM MST  
5 comments
6. [Nuked my Zener Diode - Oops!](#) ([Homebrewed Electricity](#), [Science Fair](#))  
posted by xeroid on 08/29/2003 12:20:48 PM MST  
5 comments
7. [Size Relationships](#) ([Magnets & Magnetism](#), [Science Fair](#))  
posted by wooperhound on 08/28/2003 06:48:27 AM MST  
4 comments
8. [Freon Ferris wheel](#) ([Weird Science](#), [Science Fair](#))  
posted by guitarzan on 08/16/2003 11:43:19 AM MST  
4 comments
9. [Oil Heater/Foundry/and Stirling](#) ([Quarantine Zone](#), [Science Fair](#))  
posted by Johnny Cool Pants on 06/23/2003 09:07:09 AM MST  
1 comment
10. [First Electric Car?](#) ([Quarantine Zone](#), [Science Fair](#))  
posted by Johnny Cool Pants on 06/22/2003 07:33:58 AM MST

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11. [I just think this is soooo cool!!!](#) ([Weird Science](#), [Science Fair](#))

posted by Bach On on 06/19/2003 03:20:07 PM MST  
8 comments

12. [Combined Power](#) ([Magnets & Magnetism](#), [Science Fair](#))

posted by zork on 05/21/2003 09:49:54 PM MST  
10 comments

13. [new board keep it simple please](#) ([Rants & Opinion](#), [Science Fair](#))

posted by Anonymous Hero on 05/20/2003 01:36:59 PM MST  
4 comments

14. [Let it fly!](#) ([Weird Science](#), [Science Fair](#))

posted by Norm on 04/27/2003 07:15:29 AM MST  
3 comments

15. [anyone heard of this?](#) ([Rants & Opinion](#), [Science Fair](#))

posted by Jamie on 04/09/2003 02:40:49 PM MST  
2 comments



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### [threshing machine plans](#)

By [Guerreiro](#), Section [Remote Living](#)

Posted on Wed Dec 3rd, 2003 at 05:21:16 AM MST

[Science Fair](#)

[www.fieldlines.com](http://www.fieldlines.com)

I'm trying to find the building plans, or working mechanism plans of an ancient threshing machine. Can anyone help me with that. If not of an old one at least the plans of an easy to build one. Thanks and sorry to post this question in this place; I do 't know if is the best one to do so.  
Guerreiro

[threshing machine plans](#) | 9 comments (9 topical, 0 editorial)

threshing machine plans ([none / 0](#)) ([#1](#))  
by [cevonk \(atsignhere\)aol.com](#) on Wed Dec 3rd, 2003 at 07:42:09 AM MST  
([User Info](#))

Here you go! :-)



Re: threshing machine plans ([none / 0](#)) ([#2](#))  
by [Guerreiro](#) on Wed Dec 3rd, 2003 at 08:36:33 AM MST  
([User Info](#))

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- [More on Science Fair](#)
- [Also by Guerreiro](#)

AH!AH!AH! Very funny,thanks anyway.  
I should know it was a long shot.  
Guerreiro

[ [Parent](#) ]

Re: threshing machine plans ([none / 0](#)) (#6)  
by elvin1949 ([elvin1949@wmconnect.com](mailto:elvin1949@wmconnect.com)) on Wed Dec 3rd,  
2003 at 01:55:39 PM MST  
([User Info](#))

look up eli whitney [speling ]  
he invented it i think  
later  
elvin

[ [Parent](#) ]

Re: threshing machine plans ([none / 0](#)) (#3)  
by TomW on Wed Dec 3rd, 2003 at 09:25:32 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

cevonk;

Hey, except for the piece of chain I think that truely qualifies as  
ancient tech. And it was exactly my first thought, too except i  
thought of a piece of rawhide as the link between sticks.

Cheers.

TomW

[Stuff I have Online](#)

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[ [Parent](#) ]

Re: threshing machine plans ([none / 0](#)) (#4)  
by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Wed Dec 3rd, 2003 at 09:44:46  
AM MST  
([User Info](#))

"remote living" here IS an appropriate place for this kind of question. And  
home grain production is still done by the very most remote and/or  
hardcore homesteaders.

I think I've seen info on home-built threshing machines in older issues of  
The Mother Earth News, and possibly an issue of Back Home. The latest  
issue of TMEN has a photo of a homesteader threshing by hand, and she  
is not looking particularly pleased about the whole process. I can see why  
you want to build a machine!

ADMIN

Re: threshing machine plans ([none / 0](#)) (#5)  
by TomW on Wed Dec 3rd, 2003 at 01:35:58 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Guerreiro;

We got to discussing this over on IRC and since the threshing machine was first invented in the early 1800's we can't figure out where you got the idea there was such a thing as an ancient machine?

Prior to that it was all done by hand near as we can tell. If you have other information please share it with us.

Cheers.

TomW

[Stuff I have Online](#)

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Re: threshing machine plans ([none / 0](#)) (#8)  
by cevonk ([cevonk\(at\)signhere\(aol.com\)](mailto:cevonk(at)signhere(aol.com))) on Wed Dec 3rd, 2003 at 02:06:35 PM MST  
([User Info](#))

I hope no one will be upset if I quote scripture in the historical context of ancient threshing machines:

Deuteronomy 25:4 Thou dost not muzzle an ox in its threshing.

Until the early industrial revolution, AFAIK, all threshing was done by hand, or by having oxen (or other draft animals) tread on the straw (wheat, rice, whatever) while attached to a large, spoked wheel mounted on the threshing floor.

Winnowing was done by tossing the grain into a breeze. Placer miners (gold mining) in the desert use winnowing machines consisting of a big fan, in front of which they toss dirt from which they want to separate gold dust and nuggets.

[ [Parent](#) ]

Re: threshing machine plans ([none / 0](#)) (#9)  
by kurt on Wed Dec 3rd, 2003 at 02:27:04 PM MST  
([User Info](#))



<http://www.geocities.com/RainForest/Vines/4095/resources/thresher.html>



Re: threshing machine plans ([none / 0](#)) ([#10](#))  
by slimjim on Fri Dec 5th, 2003 at 10:00:29 AM MST  
([User Info](#))

Hi, new here.

Having worked on a LOT of old combines and thrashing machines, I would say that the chain flail would workk great for grain, and would be a snap to build. Suggestion: don't weld the chain flails to the shaft, bolt them. They WILL eventually wear out. Wheat and other grains are surprisingly abrasive.

The article mentions a sieve to separate the wheat from the chaff. I would suggest building it with two layers of screen. Even better would be two layers of sheet metal perforated with 1/2" holes. To adjust the size, you just slide one screen so the hole size is larger or smaller. If you are getting too much chaff through the sieve, close the holes a LITTLE bit (like a 1/16"). Also, it's not going to work too well without a fan blowing air up underneath it. Think of building a large box, with a blower pushing air up through the sieve set over the top. You can shake the sieve yourself or you can rig up some sort of shaking device with a motor and linkage. The air blows the lighter chaff up and into your face :( while the heavier grain falls down into the box. When it's getting full, stop and empty it.

The bad news: I would be very surprised if this home-brew device was capable of cleaning grain well enough for human consumption. Unless you like chaff in your bread, you will have to get it cleaned anyway. Try buying a "fanning mill" from a farm auction. It is what farmers used to use to clean and treat seed wheat and would clean wheat as fine as you want it.

[threshing machine plans](#) | 9 comments (9 topical, 0 editorial)

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## [Welding Conduit](#)

By [J Steele](#), Section [Weird Science](#)

Posted on Tue Dec 2nd, 2003 at 10:34:00 AM MST [Science Fair](#)

How to safely weld electrical conduit

---

Hello All,

Remember in high school shop class how we were warned not to weld galvanized electrical conduit because the Zinc fumes are poisonous? Well, I've spent the last 20 years carefully grinding the galvanized away before I weld or braze. (The grinding probably produced as much Zinc fumes as welding would have.) So yesterday I was reading about electro-polishing and I occured to me that I should be able to electro-etch the zinc away from the steel. An hour later I had a fast and clean method for removing the Zinc. I took a plastic bucket and put a ring of lead around the bottom. The lead came from a stained glass supply store. They call it lead cane. The end of the lead bent up the side of the bucket and hooked over the rim. I put about 4" of water in the bucket and mixed in a 1/4 cup of lye. Next, I attached the negative clip of my battery charger to the lead cane and the positive clip went on the conduit. With the conduit in the water / lye mix, bubbles formed and the water turned black as the Zinc was eroded away in about 30 minutes. If you want it to go faster, add more lye. If your battery charger overheats, add more water. I intend to let the Zinc settle in the bucket and re-use the mix. Do this outside because the bubbles are at least Hydrogen and Oxygen and wear safety glasses and gloves. Lye in a open cut hurts terribly.

Have a good day

John

[Welding Conduit](#) | 2 comments (2 topical, 0 editorial)

Re: Welding Conduit ([none / 0](#)) ([#1](#))  
by [ibedonc](#) on Tue Dec 2nd, 2003 at 11:47:39 AM MST  
([User Info](#))

( Lye ) it also kills nerves

Re: Welding Conduit ([none / 0](#)) ([#2](#))  
by [jubalearly](#) on Wed Dec 3rd, 2003 at 05:21:46 PM MST  
([User Info](#))

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- [Also by J Steele](#)

I don't know what's best for zinc, but you can probably use something else than lye for the electrolyte. I have some friends who use electrolysis to remove rust and corrosion from Civil War artifacts. They use salt (table salt-sodium chloride) for the electrolyte & about 6v. They adjust the amount of salt to keep the amps low enough for the battery charger.

Talk to someone who really knows their chemistry. Note that usually an acid is used to make the electrolyte, you are using a base. If a basic electrolyte is required, you may still be able to use something milder than lye. But I don't see what difference it makes as long as the solution will conduct electricity - just keep the conduit more positive than where you want the zinc to be drawn to. Different electrolytes will work at different rates, probably all slower than the lye solution unless you try some strong acids.....

[Welding Conduit](#) | 2 comments (2 topical, 0 editorial)

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### [Testing a Wind Generator](#)

By [KnightOfEpsilon](#), Section [Homebrewed Electricity](#) [Science Fair](#)

Posted on Mon Nov 10th, 2003 at 06:03:52 PM MST

I need help with testing this wind generator I'm planning on building.

I'm doing a science project involving different types of wire for a small wind generator similar to this one I found on otherpower.com:

<http://www.otherpower.com/woodmill.html>

I was wondering how I could test this generator. The web site said that it was attached to a car and tested at 25 mph, but they didn't say how they kept it attached to the vehicle. Could anyone tell me how I could do that, or suggest any other methods of testing the generator? Thanks.

[Testing a Wind Generator](#) | 2 comments (2 topical, 0 editorial)

Re: [Testing a Wind Generator](#) ([none / 0](#)) ([#1](#))  
by [DanB](#) on Mon Nov 10th, 2003 at 06:15:36 PM MST  
([User Info](#))

It was a small wind turbine... I made a bracket that tied it down to the front bumper and then had a brace that went over the back of the car and I tied the back brace down to the roof, and the spare tire which mounted on the back of the car.

(that was a model A ford with a bad paint job... and they are tall, some cars might be harder!)

You can certainly test a small alternator like that with a drill... it will give you some idea of alternator performance anyhow! When I used the car, we pretty much had a battery on the floor, and a volt meter and an ammeter so we could record output vs a rough approximation of windspeed. I would not say that sort of testing is either accurate, safe, or legal though... so - do so at your own risk!

The wooden windmill was a fun experiment, I'd seriously consider building an axial field alternator though... it's easier, and you'll most likely get better results with fewer magnets.

This one: <http://www.otherpower.com/woodax.html> works better and is overall a bit easier to build I think. The alternator is simpler...

To do it over again there are a few things I'd change however. Like.. next time Id use smaller shaft and bearings, that one was a bit hard starting due to stiffness in the ball bearings. And.. if you were serious about using the machine and having it last, I'd probably avoid using wood. But that page should offer

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- <http://www.otherpower.com/woodmill.html>
- [More on Science Fair](#)
- [Also by KnightOfEpsilon](#)

an idea how simple an axial field machine can be.

Search this forum too, for lots and lots of ideas and other experiments! Have fun!

Re: Testing a Wind Generator ([none / 0](#)) ([#2](#))  
by KnightOfEpsilon on Mon Nov 10th, 2003 at  
09:42:05 PM MST  
([User Info](#))

Thanks, I appreciate the help. By the way, where would you suggest I look for parts to build the AX? I've never really built anything before, so this is a little overwhelming. What I want to do is experiment with the same alternator using 18, 20, 22, and 24 gauge wire.

What kind of magnets should I use? Would ferric magnets do the trick, or should I go with the neodymium boron kind?

Also, for the rotor blades on the AX, how much do you think the diameter of the swept area can be decreased without sacrificing too much power?

Sorry if these questions seem a bit novice, but I'd appreciate any help I can get.

[Testing a Wind Generator](#) | 2 comments (2 topical, 0 editorial)

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## [My Tiny Savonius NiCad Battery Charger \(Pics\)](#)

By [xeroid](#), Section [Homebrewed Electricity](#)

[Science Fair](#)

Posted on Tue Sep 9th, 2003 at 02:49:52 PM MST

[My Tiny Savonius NiCad Battery Charger\(Pics\)](#)

Hi Guys.

At LONG last, a couple of friendly shutter bugs came to visit with their digital cameras, so I am including the pictures of my teeny tiny Nickel Cadmium "C" cell charger.

This first one is a simple head on shot showing the general assembly. I just used a simple 2X4 frame, and held it up with sections of "borrowed" clothesline from an extra kit my wife had...



This one shows the alternator close up. You can see the little black ceramic magnets that are hot glued into place. Little note here: Don't use hot glue on ceramic magnets. It seems to weaken them.



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- [Also by xeroid](#)

Here's a blur while it spins. You can also see the thin metal ring that I put in behind the coils to pull a little more magnetic field through. I'm not too worried about eddy currents or heat build up with the tiny amount of power this mill creates (about 4V and 800mA in a good stiff wind).



And here's the oversized eye screws I used to secure the clothesline "guy wires" to the frame...



Thanks to Lucie and Steve for the pics. Very nice.

Now... On to the next one... BIGGER...MORE POWER!!  
(Insert appropriate gorilla grunting noises here.)

Regards,

Xeroid.

[My Tiny Savonius NiCad Battery Charger \(Pics\)](#) | 5 comments (5 topical, 0 editorial)

Re: My Tiny Savonius NiCad Battery Charger (Pics)  
([none / 0](#)) ([#1](#))  
by Alex on Wed Sep 10th, 2003 at 05:38:18 AM MST  
([User Info](#))

Good Work!  
But I think that it will generate more power if you place it more highly - on roof...

Re: My Tiny Savonius NiCad Battery Charger (Pics)  
([none / 0](#)) ([#2](#))  
by jubalearly on Wed Sep 10th, 2003 at 08:19:16 AM MST  
([User Info](#))

How about some more construction details - particularly the windings. And did you use any kind of regulation for charging the ni-cads? I've still got a 250w Picoturbine kit to build one of these days so I'm particularly interested in how you constructed the rotor. TIA,  
Russ

Re: My Tiny Savonius NiCad Battery Charger (Pics) ([none / 0](#)) ([#4](#))  
by xeroid ([centurion27@lycos.com](mailto:centurion27@lycos.com)) on Wed Sep 10th, 2003 at 02:47:27 PM MST  
([User Info](#))

Whoa! Hang on there! This is just one of the tiny little rechargeable flashlight battery chargers. I only used 16 1.25"X 0.5" X 0.25" ceramic magnets on a round 12" or so diameter of light gauge steel.

I modified the version from picoturbine (I believe called the "beta" plans) that charges 2 "AA" cells to try and get more juice in order to charge 3 to 6 size "C" nicad cells. The plans call for 60 wraps of 20 guage wire, I used 80, since I needed higher voltage.

I used a zener diode to act as a "safety valve". The zener will only be by-passed once the battery pack reaches 3.6V (3 cells in series) and then the excess power can flow past the blocking zener into an LED and a couple of 10ohm resistors in series (so 20ohms). I paralleled in some capacitors after the rectifier diode bridge I built in order to get a smoother DC flow. The only thing is, I should have used varying sizes, as it seems to spike the voltage when all three of the same kind hit their capacity and unload all at once (or seem to).

Regards, XEROID.

[ [Parent](#) ]

Re: My Tiny Savonius NiCad Battery Charger (Pics)  
([none / 0](#)) ([#3](#))  
by troy on Wed Sep 10th, 2003 at 08:52:14 AM MST  
([User Info](#))

Excellent job. Free electricity is good electricity. I wouldn't worry about the hot melt glue damaging the ceramic mags, they're just naturally weak. Seriously, once you experience the power of neodymium magnets, you'll never go back to ceramic. They're just not even in the same league. The ceramics are fine for a small project because they're inexpensive, but for major volts/amps/watts, there is no substitute for neos.

Best regards,

troy

Re: My Tiny Savonius NiCad Battery Charger (Pics) ([none / 0](#)) (#5)  
by xeroid ([centurion27@lycos.com](mailto:centurion27@lycos.com)) on Wed Sep 10th, 2003 at 02:51:53 PM MST  
([User Info](#))

Thanks Troy.

I actually started this little project so long ago, I don't think I had as yet discovered the sheer power of neos yet. The instructions said to use ceramics, so I bought them, and I just built it with what I had.

Actually, I am thinking of gluing some 1 1/4" X 1/2" X 1/8" neos ON TOP of the ceramics just for fun to see what kind of crazy efficiency boost I can get.

That and it's bound to start charging in much lower winds...

Regards, XEROID.

[ [Parent](#) ]

[My Tiny Savonius NiCad Battery Charger \(Pics\)](#) | 5 comments (5 topical, 0 editorial)

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### [Nuked my Zener Diode - Oops!](#)

By [xeroid](#), Section [Homebrewed Electricity](#)  
Posted on Fri Aug 29th, 2003 at 12:20:48 PM MST [Science Fair](#)  
[Nuked my Zener Diode - Oops!](#)

Hi Folks.

I built a little Picoturbine.com based savonius for charging nicads. I built the little overcharge protection circuit which uses a zener diode to shunt excess power through a resistor to burn it off.

The only problem was that the original design was intended to charge 2 size "AA" nicads, and I wanted to charge 3 size "C" nicads. I think I "NUKED" my single little 3.6V zener diode with the higher amp output of the 3 "C" cells.

Okay, I have essentially NO electronics training or knowledge, so could someone with greater wisdom than me please help me build a reasonable overcharge protection for these cells? I have a couple of 10W 10ohm resistors to burn the excess power off.

The output of the alternator is about 4.1 - 4.5V at top speed (sorry, no tachometer yet, but this is as fast as I've ever seen it go in a fairly strong wind) and about 0.8 - 1 amp.

I'll try and get pictures soon. A friend of mine who owns a digital camera is coming over for dinner in a little over a week, so we'll see.

Thanx in advance.

[Nuked my Zener Diode - Oops!](#) | 5 comments (5 topical, 0 editorial)

Been burning up zeners myself ([none / 0](#)) ([#1](#))  
by TomW on Fri Aug 29th, 2003 at 12:34:46 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Xeroid;

Thats kinda funny since I have been killing zeners and regulators myself just lately.

I gotta ask just how is this circuit wired? is the zener in series with the batts or what?

Usually, but not always, a zener is used across a voltage source to clamp it to a specific level. If that is the case it seems like the batteries you charge with it should not really affect current through the zener. I could be wrong it has been awhile since I did much electronics at the circuit level.

Anyway add some info and I am sure one of the real experts on circuits will chime in with solid information.

Cheers.

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TomW

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Re: Been burning up zeners myself ([none / 0](#))  
([#2](#))  
by JW on Fri Aug 29th, 2003 at 01:30:33 PM MST  
([User Info](#))

Zeners huh,

These are a strange breed of diodes I think. they will act like a regular run of the mill rectifier diode. then at their "turn on" voltage they will internally short, and conduct in both directions. Until the voltage drops and then they go back to regular "check valve"(rectifier) type operation.

Basically in my mind what I see happening here is that you have the Zdiode in series with your resitors, and all that in parallel with the batt's and charger leads. If so then you may just have to increase the load capacity of your Zdiode. And you may be correct, that your new batteries are popping the Zdiode. Something you could also try is using the Zdiode to activate a small relay to open the charging circuit, instead of a dump load. Hopefully this wont cause any over speed problems for you. And since the impedance in the relay coil is quite high, you could use the same Zdiode(after replaced). basically while the zdiode is conducting, it is in a series circuit with the relay coil and batteries. while the relay is energized, it uses battery voltage and disconnects the positive lead of the charger circuit. Allowing the "relay to remain on" until the battery voltage decreases to a point that the Zdiode stops conducting. then the cycle repeats endlessly if necessary.

If over speed was a factor you could use the relay to route the dummy load, if it is double position double throw. I'm pretty sure you will be okay if the charging circuit is open for such a small set up. I just recently bought some Zdiodes that could carry 40amps while conducting both ways. And of coarse there are many different breakdown voltages avilable. The charts for selecting Zdiode's usually include many "turn on" or "break down" voltages. I happened to be lucky that there was a really good electronics store nearby and they helped me find the right chart to select mine. But the mail order companies usually are willing to help if you basically know what you are looking for.

-JW

[ [Parent](#) ]



Re: Been burning up zeners myself ([none / 0](#)) (#3)  
by laskey on Fri Aug 29th, 2003 at 05:00:51 PM MST  
([User Info](#))

As far as I see it you really don't have a problem. You're just not using the right zener diode. You need one that can handle the current you're feeding through it. 4.5Volts X 1Amp = 4.5 Watts. You need a 5 Watt zener to handle what you put through it. Which I'm pretty sure are available.

Cya,

Chris

[ [Parent](#) ]

Re: Nuked my Zener Diode - Oops! ([none / 0](#)) (#4)  
by RobD on Fri Aug 29th, 2003 at 05:40:00 PM MST  
([User Info](#))

Zener diodes are, in most cases, not designed for high current applications. They work wonderfully well in circuits where bias or reference is required and noise is not a problem (Zener's are inherently noisy buggers). You might want to look into three terminal regulators. Easy to hook up and can take a lot more current than zeners. In fact I think Radio Shack has a little blurb on the back of some of there regulators telling how to hook them up.  
RobD

Re: Nuked my Zener Diode - Oops! ([none / 0](#)) (#5)  
by charged on Sat Oct 4th, 2003 at 02:36:12 PM MST  
([User Info](#))

Use your zener to control the base lead of a power transistor that's been properly heat-sinked.

Use a 2N3055 with the collector connected to your positive "overshoot" power point, the same place you had the positive going into the zener previously. The emmitter goes to your overshoot load.

The zener is connected between the collector (+) and the base lead through a variable resistor. When the zener senses the overcharge, it turns on the base lead through the current control resistor and allows the excess charge to bleed off.

The transistor can handle MUCH more power than the zener, which is only intended to be a circuit voltage control mechanism. A zener is NOT intended to be a high power charge control device by itself.

[Nuked my Zener Diode - Oops!](#) | 5 comments (5 topical, 0 editorial)

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## Size Relationships

By [wooferhound](#), Section [Magnets & Magnetism](#)  
 Posted on Thu Aug 28th, 2003 at 06:48:27 AM MST [Science Fair](#)  
 Coil and Magnet Size Relationships

I asked this question last week and nobody touched it, so I'm asking again and rephrasing the question. What size should the coils be in relationship to the magnets?

If I have a 2 inch square magnet, How big should the coil be?

If I have a 1/4 inch diameter magnet. How big should the coil be?

.

[Size Relationships](#) | 4 comments (4 topical, 0 editorial)

Re: Size Relationships ([none / 0](#)) ([#1](#))  
 by [DanB](#) on Thu Aug 28th, 2003 at 10:38:52 AM MST  
[\(User Info\)](#)

it depends a bit on the spacing between the magnets, and somewhat on how many phases the machine will be.

For single phase... its a hard call in my opinion. Ideally, the coil should occupy the space of 2 magnets so that one leg (by leg we mean one "half" or "side" of the coil) is always seeing the opposite pole of the other. If both legs of the coil see the same pole, no power is generated during that moment. But in my own tests, it seems like I get a little bit more power in the single phase setup having the same number of coils as magnets, even though in theory that's not ideal.

In theory the hole in the coil should be about the size of the magnet. In practice I think a bit of a compromise might be ideal, so that the inner diameter of the coil is a bit smaller than the magnet.

For multiple phases, the coils will probably be larger than 1 magnet, unless you stack coils.

Best is to build your magnet rotor - and Id space the magnets evenly or put them maybe a bit closer together, but dont put more space between the magnets than the magnets are wide. Once the rotor is built.... figure a way to spin it and test some different coil shapes/configurations etc... then you'll know!

A search on this board for magnets, coils... possibly "coil shape" will definitely yield some results!

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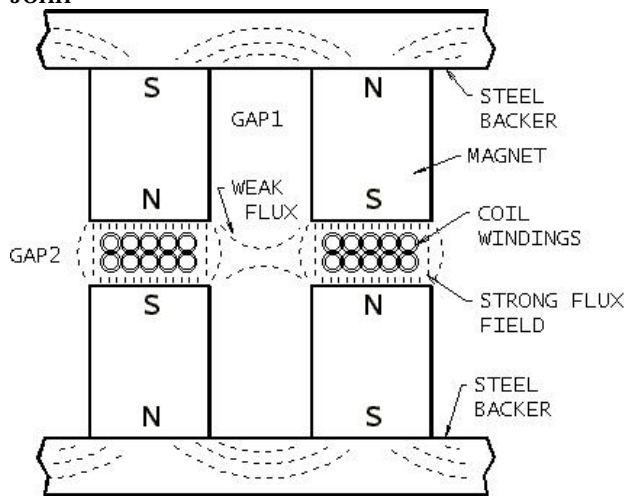
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Re: Size Relationships ([none / 0](#)) (#2)  
 by J Steele ([Jvsinthal@yahoo.com](mailto:Jvsinthal@yahoo.com)) on Thu Aug 28th, 2003  
 at 01:23:11 PM MST  
[\(User Info\)](#)

Here is a drawing that shows a permanent magnet alternator. The coil windings stay still and the magnets and steel backers move. The drawing attempts to show how the flux lines move thru the magnets, across GAP2, into the next magnet, thru the steel backer, to the next magnet, and so on. You can see from the drawing why you want GAP2 to be as small as practical, so that the field is strongest. As Dan described, to design a coil you need to know the size of the magnets and the size of GAP1. GAP1 can be made very small but it will allow the flux to "short circuit" the intended path for the flux. I show this short circuit in the area labeled "weak flux." For my guess, I would make GAP1 at least as large as GAP2 but smaller than the width of the magnet. Also notice from the drawings that the width of the coil windings should be less than the magnet width. I would guess that the windings should be about 90% of the magnet width. If you make the winding wider than the magnet you'll get a flattened sine wave. I would also attempt to make the windings wider than thicker so that GAP2 can be reduced. (My drawing did not convert to jpg well, the circles labeled "coil windings" are intended to show individual wires passing through the plane of the screen.)

I hope this makes sense.

John



Re: Size Relationships ([none / 0](#)) (#3)  
 by hvirtane on Sat Aug 30th, 2003 at 11:59:02 AM MST  
[\(User Info\)](#) <http://www.cc.jyu.fi/~hvirtane/cooker/>

"For my guess, I would make GAP1 at least as large as GAP2 but smaller than the width of the magnet. Also notice from the drawings that the width of the coil windings should be less than the magnet width. I would guess that the windings should be about 90% of the magnet width. If you make the winding wider than the magnet you'll get a flattened sine wave. I would also attempt to make the windings wider than thicker so that GAP2 can be reduced."

These are among the fundamental questions.

When strong magnets like neodymium ones are now widely available I think that the knowledge will grow how to design permanent magnet alternators very effective.

It is clear that if you widen the gap between the magnets you will loose power (because in the empty area there is no flux at all), even if you as well gain something by getting them far apart from each other, because then there is less 'leakage' from a magnet to the next one in the line. Somewhere between the extremes there is the optimum, how to get the best power at suitable RPM.

So these factors influence each other.

The magnetic power of the magnets as well influences the best design probably...

There are several different theories concerning the best design.

Some people say that the dual disk design is the best, some deny that proposition.

One quite good method is to copy a quite successful design, you can find several of them by studying 'Otherpower' website, Hugh Piggott's web-site, Ed's website (<http://www.windstuffnow.com>) and others.

- Hannu

Re: Size Relationships ([none / 0](#)) (#4)  
by DanB on Sat Aug 30th, 2003 at 01:20:28 PM  
MST  
([User Info](#))

I would tend to agree (intuitively) with your guess about gap sizes there...  
except I think that it depends very much also on the magnet shape. Rectangular, or wedge shaped magnets have their edges overall running parallel, so leakage will be more if the magnets are close. Disk magnets would only be touching at one point if they were in direct contact - so leakage is bad only at that one point. I think you can safely pack disk magnets a bit closer to each other than rectangular,, or wedge shaped magnets... even if you have a big airgap. In cases like with some of Eds machines, with slotted Laminates and very very small airgaps, perhaps leakage between the magnets is probably not such an issue at all.

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[Size Relationships](#) | 4 comments (4 topical, 0 editorial)

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### [Freon Ferris wheel](#)

By [guitarzan](#), Section [Weird Science](#)  
Posted on Sat Aug 16th, 2003 at 11:43:19 AM MST  
will it work?

[Science Fair](#)

when I was 15 and doing time in reform school, one of my teachers told me about an idea he had to make energy. He then drew me a picture and explained how he would make a miniature ferris wheel and hang 8 freon bottles on it. Four full and four empty and run hoses from the full one to the empty one on the opposite side. then stick the whole thing in a water trough. as long as the water was hotter than air temp, he said as the full bottle dipped into it, it would turn to gas and go thru the tube to the top bottle and turn back to liquid, thus constantly turning the wheel perpetually. Would this work? and if not, why not? and has anyone built one of these?

[Freon Ferris wheel](#) | 4 comments (4 topical, 0 editorial)

Re: Freon Ferris wheel ([none / 0](#)) (#1)  
by [wdyasq](#) on Sat Aug 16th, 2003 at 11:57:33 AM MST  
([User Info](#))

<http://www.google.com/search?q=mentos+wonder+wheel&sourceid=opera&num=0&ie=utf-8&oe=utf-8>

Re: Freon Ferris wheel ([none / 0](#)) (#2)  
by [wdyasq](#) on Sat Aug 16th, 2003 at 12:02:36 PM MST  
([User Info](#))

<http://www.amasci.com/freenrg/minto.html>

the drawing

Re: Freon Ferris wheel ([none / 0](#)) (#3)  
by [guitarzan](#) ([dt@redskinvalley.com](mailto:dt@redskinvalley.com)) on Sat Aug 16th, 2003 at 12:12:53 PM MST  
([User Info](#)) <http://www.redskinvalley.com>

thats it alright, that was done in 1976 it said, and my teacher told me about it in 1984. From the article, it sounds like it would have to be huge to generate enough electricity  
[guitarzan](#)  
[ [Parent](#) ]

Re: Freon Ferris wheel ([none / 0](#)) (#4)  
by [wdyasq](#) on Sat Aug 16th, 2003 at 07:47:44 PM MST  
([User Info](#))

still requires the input of energy

[Freon Ferris wheel](#) | 4 comments (4 topical, 0 editorial)

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#### Poll

how many mit-mits are in a skeetaskram?  
a.) a good half a dozen  
b.) I'd say at least three or four  
c.) it's never been scientifically measurable  
d.) what's the question again

Votes: 2

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## [Oil Heater/Foundry/and Stirling](#)

By [Johnny Cool Pants](#), Section [Quarantine Zone](#)

Posted on Mon Jun 23rd, 2003 at 09:07:09 AM MST

[Science Fair](#)

### Tips & Links

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Oil Heater/Foundry/and Stirling  
Staring Johnny Cool Pants

Heating your home/shop, making your own parts, and other places you can use your custom larger Stirling Engines.

Waste Oil Heater & Back Yard Foundry



If you live in the woods like many of us here in the Great Northwest, it is not practical to have a windmill. Going taller than the trees is not easy and cutting them down is not cool. There are many streams and creeks here but not on every property, so water wheels are not always an option and they are already a known science.

It rains alot in the forest and people heat their homes alot. So my focus is on using that heat, or heat recovery and I will get into ideas for using rain some other time on this board.



Pouring your own metal in a back yard foundry is a growing hobby.  
Pic source and info: <http://www.backyardmetalcasting.com/>

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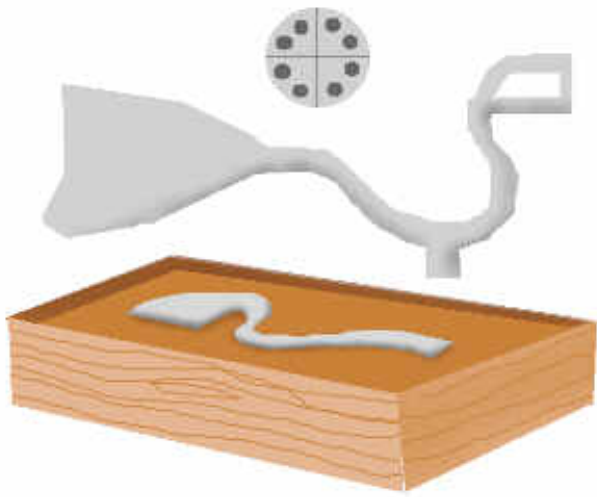
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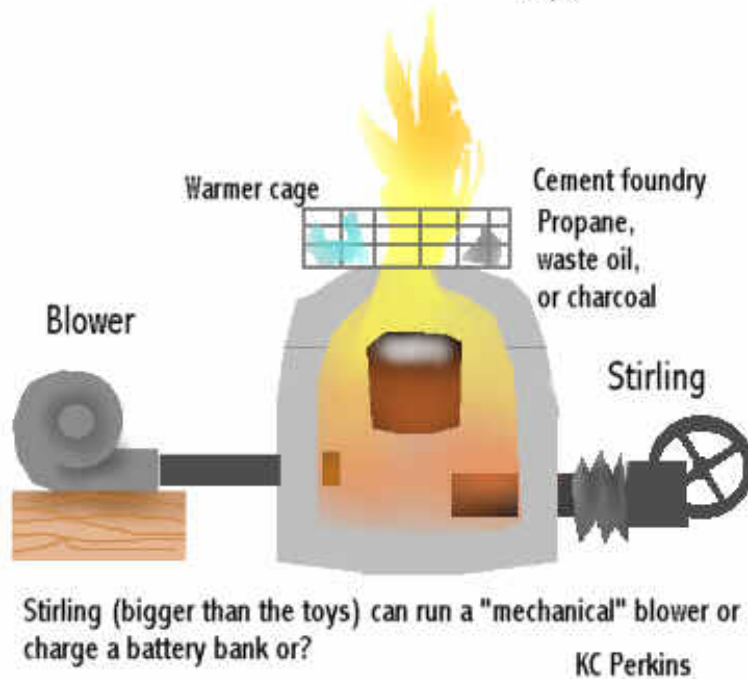
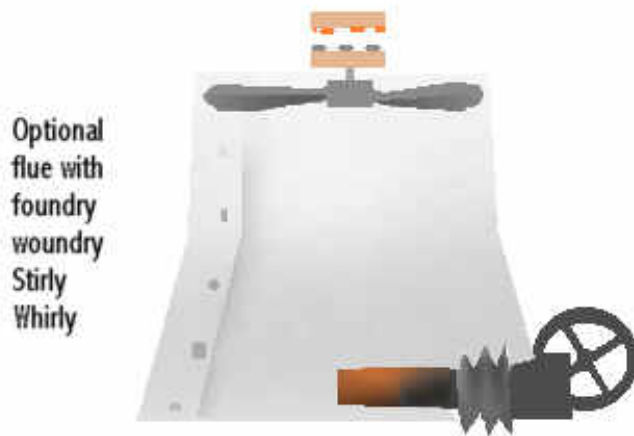
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You can sand cast your own custom windmill / water wheel parts. Then grind, buff, polish, or leave rough. Now, where to stick that Stirling? I know some of you may reply telling me where to stick it, but that is the beauty of free flow info and opinion, however I remind you this is Q-zone and in here flame wars can get intense enough to run a Stirling.



The Flue part is comical but actually could function as further heat recovery (both Stirling and heat wind blades) if you used your foundry a lot. I don't expect most people would use their foundry often enough,

unless you were building Larger Stirlings to sell, then your foundry would be very busy

This is for the most part assuming you will use it on occasion to build custom parts they don't make, for your other projects. Stirlings are very simple motors, you have to have a blower, might as well make a Stirling to run a mechanical blower, instead of electric, make you look real cool.

So basically focus on the bottom half of that illustration for now. There is a possibility a large Stirling under that intense heat could produce enough electricity to run an electric blower, even steam power possibilities here.

Running an electric blower is in no way, running it's self or providing it's own heat. It is not a claim of overunity.

#### Waste oil heaters

Waste oil heaters offer an excellent way to heat your home or shop for "near free" and also offer good place to put a custom larger Stirling hot air motor/electric generator, running for "near free"



<http://www.ecologixsystems.com>

Sells burners and bunch of waste oil "treatment" machinery for what looks more like commercial use. Not really necessary for most home use, in my opinion. These links can give you ideas though, for size and operation methods.

Reznor oil heater

[http://www.reznoronline.com/mpd/pub/wo/us\\_brochure/features.htm](http://www.reznoronline.com/mpd/pub/wo/us_brochure/features.htm)

Torrid

<http://www.torrid200.com/>

Let's say you have a shop and you want to do your part to help the environment. If you have oodles of money you just buy one of these things, but if you are like a lot of us, you are also trying to save money in the first place. So just make your own waste Oil heater. You don't need that fancy fan in the back either.

If you need a fan at all, that fan can be run free using a stirling powered fan, as well.

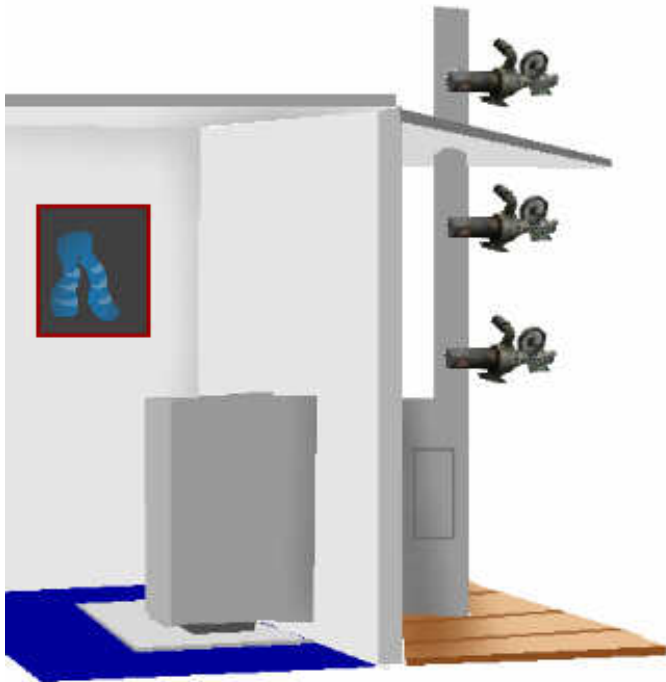
Not sure of their prices but these "Smart Ash" portable incinerators can be converted to heaters pretty easy, but this link is more to show you if they can convert an oil drum into an incinerator, you can convert an oil drum into a waste oil heater.

<http://www.elastec.com/smartash2.html>

Here's Mother Earth's Waste Oil Heater with instructions on how to build one for under \$40 though I don't know when that was written, could have been way back, I have many of the original magazines, a gold mine if you move away from Internet access.

[http://journeytoforever.org/biofuel\\_library/ethanol\\_motherearth/me4.html](http://journeytoforever.org/biofuel_library/ethanol_motherearth/me4.html)

You can heat your shop using the vegetable oil you cooked with the week before, you can use old motor oil, etc. If you are worried about smell, these burn much cleaner than you may think for recycling used oil, however you can construct your waste oil heater so it is through the wall, with only the heat box on the inside of your shack, if you don't mind having to go outside to light it. You can screen in that porch, or frame it in if you have bears.



Then you can talk your neighbors, maybe even your local auto service station into giving you used oil. Some fry food restaurants may give you lots too. Heating your home, shop, whatever, can be near free all winter long.

"Links" to some of these pages of mine can be posted elsewhere on the board if desired.

Why do I post here in Quarantine? It's a form of protest, I don't think any science with the desire to improve situations should be Quarantine, even if it is the kookiest idea, there may be one part of it giving someone else an idea. So I crank up a flying circus to get people to at least peak in here, now I find out not much gets sent here since it started, so I pretty much get my own page to go with my own show, tee hee.



[Oil Heater/Foundry/and Stirling](#) | 1 comment (1 topical, 0 editorial)



PS ([none / 0](#)) (#1)

by Johnny Cool Pants on Mon Jun 23rd, 2003 at 09:46:57 AM MST

[\(User Info\)](#)

PS

Plus some of my stuff was sent here to Q-zone anyway. Casualties of flame war.

This is another good page on back yard foundry

[http://www.artmetal.com/project/TOC/proces/cast/ag\\_cast.html](http://www.artmetal.com/project/TOC/proces/cast/ag_cast.html)

Here is a guy using microwave ovens to melt metal

<http://home.c2i.net/metaphor/mvpage.html>

Note:

If using a Stirling hot air engine with your foundry, depending on what your Stirling is made of, ha, you should have a length of buffer pipe from the foundry to the Stirling engine so you don't melt down your Stirling engine.

Most people will be melting common metals in their foundry so order a piece of pipe that melts at a higher temperature than the stuff you will normally work with.

This is where I get my metal because I can drive there and pick it up, but they have a good selection.

<http://www.onlinemetals.com/>

Here is a Melt Temp Chart

Material	Product	(deg. F)	(deg. C)	Ref.
<b>Cobalt-chromium</b>				
alloys	Genesis II	2415-2550	1325-1400	9
	Master Tec	2215-2380	1215-1300	222
	Novarex	2425-2475	1330-1337	223
<b>Gold Alloys</b>				
Type I	Ney-Oro A	1825-1900	996-1038	7
Type II	Ney-Oro A-1	1650-1775	899- 968	7
Type III	Ney-Oro B-2	1650-1775	899- 968	7
Type IV	Ney-Oro G-3	1630-1740	888- 949	7
40% Au-Ag-Cu	Forticast	1555-1665	846- 907	9
10-15% Au-Ag-Pd	Paliney No.4	1670-1810	910- 988	7
Au-Pd	Olympia	2213-2380	1210-1304	9
Au-Pt-Pd	TPW	2012-2282	1100-1250	196
Porcelain-fused-to-metal	Jelenko O	2034-2206	1112-1208	9
Mercury		-37	-38	130
<b>Nickel-chromium</b>				
alloy	Unimetal	2098-2282	1148-1250	196
<b>Palladium-based</b>				
dental alloys	Athenium	2120-2330	1160-1277	197
	Legacy	2020-2360	1104-1293	197
	Liberty	2020-2280	1104-1249	197
	Microstar	2156-2336	1180-1280	9
	PTM-88	2120-2340	1160-1282	197
	Protocol	2320-2390	1271-1310	197
	Spartan	2040-2120	1116-1160	197
	W1	2165-2320	1185-1270	222
<b>Pure metals</b>				
Chromium		3407	1875	130
Copper		1981	1083	130
Gold		1945	1063	130
Nickel		2647	1453	130
Palladium		2826	1552	130
Platinum		3217	1769	130
Silver		1761	961	130
Titanium		3035	1668	130
Zinc		787	420	130

**Silver-palladium alloys**

Crown-and-bridge Albacast 1870-2010 1021-1099 9

Porcelain-fused-  
to-metal Jel-5 2116-2341 1158-1283 9

Titanium-6Al-4V alloy 3002 1650 196

**Waxe**

Beeswax Ross Co. 93- 158 34- 70 68

Carnauba Ross Co. 27- 189 53- 87 68

Inlay casting Kerr blue hard 122- 176 50- 80 68

Paraffin Ross Co. 111- 140 44- 60 68

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JCP

[Oil Heater/Foundry/and Stirling](#) | 1 comment (1 topical, 0 editorial)

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## [First Electric Car?](#)

By [Johnny Cool Pants](#), Section [Quarantine Zone](#)

Posted on Sun Jun 22nd, 2003 at 07:33:58 AM MST

[Science Fair](#)

First Electric Car?

First electric Car circa 1900

Had magnet and coil motor right in each front wheel. Each front wheel (was) the motor, that car, a Porsche.

"In the year 1898 when a new century was ready to begin and nobody had heard about the Y2K effect, Jakob Lohner a coachbuilder who owned the " k.u.k.-Hofwagenfabrik Jakob Lohner & Co ", with manufacturing facilities in Florisdorf, Vienna, decided that it was the right time to build and sell a modern " horseless carriages " to bring such vehicles up to date, offering the latest technical developments to his distinguished customers among them the House of the Hasburgs .

Lohner disliked " the new horseless carriages " powered by explosion engines that were beginning to run around the roads because he considered that they were too rude, dirty and noisy for his aristocratic customers.

In order for the project to come through safely, he hired as chief engineer a 25 years old, engineer, named Ferdinand Porsche, who as a student of the Imperial Technical School of Reichenberg, had learned and experienced with youthful enthusiasm with electricity as a propulsive energy.

The brilliant ideas usually are the simplest and the more beautiful ones, and this was the case of the propulsion system devised by Porsche for the new Lohner electrical vehicle."

Full sotry:

[http://leo.worldonline.es/jaumepor/angles/porsches/loh\\_porsche.htm](http://leo.worldonline.es/jaumepor/angles/porsches/loh_porsche.htm)



[First Electric Car?](#) | 1 comment (1 topical, 0 editorial)

Re: First Electric Car? ([none / 0](#)) ([#1](#))

by Anonymous Hero on Sat Jul 5th, 2003 at 03:36:10 AM MST

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Tesla had a car.

In the late 1880's, Dr. Nikola Tesla accidentally discovered an electrostatic "super-charging" effect while trying to verify Hertz' discovery of electromagnetic waves. After hundreds of experiments, he learned how to control and maximize this phenomenon. This led him to the discovery that electricity is made up of different components that can be separated from each other, and that a pure, gaseous, etheric energy can be fractionated away from the flow of electrons in a circuit designed to produce short duration, unidirectional impulses.

When all of the conditions were right, this etheric energy would manifest itself as a spatially distributed voltage that would radiate away from the electrical circuit as a "light-like ray" that could charge other surfaces within the field. Tesla found that this effect was greatly magnified when these impulse currents were produced by the discharge of a capacitor.

This huge explosion of electrostatic energy, that radiates away at right angles from the capacitor discharge pathway, is the primary operating principle of his Magnifying Transmitter. With amazing device, Tesla planned to broadcast energy to the whole world from his facility at Wardencllyffe, New York, for dirt cheap.

After Tesla was prevented from bringing his World Broadcast System into full manifestation, he worked for years to develop a smaller version of the device that harnessed the same principles. By the 1920's he had succeeded. This specialized electronic circuit is what powered his infamous Pierce-Arrow automobile.

He had removed the motor and ran the car using a mysterious little black box. The car ran for three days in the demonstration until people got tired of watching and Tesla's assistants drove it back to the lab.

The Bay Area recently joined Sacramento, Los Angeles, San Diego, and Phoenix and Tucson, Ariz. as the only areas where consumers can lease (not purchase) the first electric car in mass-market production, General Motors' (GM) EV1, which is being distributed by Saturn retailers.

The enduring appeal of electric vehicles stems from their motors: clean, quiet, reliable, low-maintenance, energy-efficient and, in themselves, non-polluting. While dramatic improvements have been made in electric vehicle motors, the battery is still the Achilles' heel. The long sought solution to storing electric energy on board has yet to be realized.

source

<http://www.mtc.ca.gov/publications/transactions/ta1098bat.htm>

more electric cars

<http://www.avt.uk.com/page3.html>

that page's electric conversion page

<http://www.avt.uk.com/page3.html>

[First Electric Car?](#) | 1 comment (1 topical, 0 editorial)

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### [I just think this is soooo cool!!!](#)

By [Bach On](#), Section [Weird Science](#)

Posted on Thu Jun 19th, 2003 at 03:20:07 PM [Science Fair](#)  
MST

A fun video...

This is just the crowd that could really appreciate this video. This must have been done by a group of creative people with a lot of time on their hands.

<http://home.attbi.com/~bernhard36/honda-ad.html>

Bach On

[I just think this is soooo cool!!!](#) | 8 comments (8 topical, 0 editorial)

Re: I just think this is soooo cool!!! ([none / 0](#)) ([#1](#))  
by Brian on Thu Jun 19th, 2003 at 04:30:20 PM MST  
([User Info](#))

Yeah, I saw that a while back. It is definitely cool to watch. Isn't it computer generated?? The wheels rolling up hill doesn't look quite right to me!!

Too bad it's a Honda commercial..... ;-)

Re: I just think this is soooo cool!!! ([none / 0](#)) ([#2](#))  
by Bach On on Thu Jun 19th, 2003 at 04:40:57 PM MST  
([User Info](#)) [change AT: bach\\_on AT hotmail.com](#)

No. It wasn't computer generated. It was done live as a commercial. There were a series of articles written about it. I'd bet they had to do many, many takes before it all worked correctly.

It may be old, but I hadn't seen it before. Somehow, I think Rube Goldberg would approve.

Bach On

- I'm just as happy as if I had good sense! -

Re: I just think this is soooo cool!!! ([none / 0](#)) ([#4](#))  
by Old F on Thu Jun 19th, 2003 at 05:30:31 PM MST  
([User Info](#)) <http://www.oldf.homestead.com>

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- <http://home.attbi.com/~bernhard36/honda-ad.html>
- [More on Science Fair](#)
- [Also by Bach On](#)

I like it!

And Rube would have been proud : )

[ [Parent](#) ]

Re: I just think this is soooo cool!!! ([none / 0](#)) ([#6](#))  
by Brian on Thu Jun 19th, 2003 at 08:42:52 PM MST  
([User Info](#))

Ok, so how do the 3 tires roll up hill on the ramp after being hit by the other tire that rolls along the floor??? That's the only part that looks set up to me. Take a look!!

[ [Parent](#) ]

Re: I just think this is soooo cool!!!  
([none / 0](#)) ([#7](#))  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on  
Thu Jun 19th, 2003 at 09:25:17 PM MST  
([User Info](#))

Actually if you look real close, you can see that part of the wheels are weighted, so that's why they could roll up hill for a bit. (The wheels were balanced so that when something would hit them, the weighted end would fall forward, and hit the others)  
-Andrew

[ [Parent](#) ]

Re: I just think this is soooo cool!!! ([none / 0](#)) ([#8](#))  
by Brian on Thu Jun 19th, 2003 at 09:51:54 PM MST  
([User Info](#))

Makes sense to me! My resolution must be too low or something as I can't see the weights.... :-)

[ [Parent](#) ]

Re: I just think this is soooo cool!!! ([none / 0](#)) ([#3](#))  
by troy on Thu Jun 19th, 2003 at 05:10:08 PM MST  
([User Info](#))



No question, these guys know how to fool around with corporate funding.

troy

Re: I just think this is soooo cool!!! ([none / 0](#)) ([#5](#))  
by Demetri ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Thu Jun  
19th, 2003 at 08:09:55 PM MST  
([User Info](#))

Well damn, I think I'm in the wrong occupation, hehehe.

Demetri  
Always be the lead dog.

[I just think this is soooo cool!!!](#) | 8 comments (8 topical, 0 editorial)

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## Combined Power

By [zork](#), Section [Magnets & Magnetism](#)

Posted on Wed May 21st, 2003 at 09:49:54 PM MST

[Science Fair](#)

I know that if you attach 2 or more magnets together, the power of the field increases.

---

I know that if you attach 2 or more magnets together, the power of the field increases.

My question is, is some of the power lost or is it the exact power of both magnets combined? I would think that they would loose a bit of power, but I'm not sure.

[Combined Power](#) | 10 comments (10 topical, 0 editorial)

Stacking magnets... ([none / 0](#)) ([#1](#))

by [xeroid](#) ([centurion27@lycos.com](mailto:centurion27@lycos.com)) on Thu May 22nd, 2003 at 01:38:56 PM MST

[\(User Info\)](#)

I will need some back up from more qualified colleagues here on the board (Dan B?) but I am pretty sure that stacking magnets only increases the magnetic flux. I don't think there would be any losses, and if there are any, I would think they would be negligible. Stacking magnets is an effective way to force more magnetic flux through your coils. The only thing to consider is the added weight, but with small neos, that's not usually a problem.

Mess around with it. I'm sure you'll find it will give you some more bang for your buck.

Regards,

Xeroid.

Thanks ([none / 0](#)) ([#2](#))

by [zork](#) on Thu May 22nd, 2003 at 07:03:53 PM MST

[\(User Info\)](#)

Thanks, that'll help.

I've considered the weight issue, but you've got to compromise somewhere.

[ [Parent](#) ]

Well.. ([none / 0](#)) ([#3](#))

by [TomW](#) on Thu May 22nd, 2003 at 08:59:38 PM MST

[\(User Info\)](#) <http://oneota.net/~earthsourcepowr/>

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Zork;

Be advised my gauss meter is my hand and is uncalibrated and the scale is not marked.

I kinda fooled around with one neo and then a pair stacked. The how hard is it to pull off the steel door test revealed to me that while 2 is definitely harder to pull off it does not seem to be even near 2X the force to remove 1.

Cheers.

TomW

[Stuff I have Online](#)

[Contact Me](#)

Stacking magnets ([none / 0](#)) (#4)  
by RayW on Thu May 22nd, 2003 at 09:27:51 PM MST  
([User Info](#))

I remember reading a somewhere that when two identical magnets are stacked that the field strength is increased by about 70%. But if this not correct maybe someone can correct me on this. RayW.

alllright... ([none / 0](#)) (#5)  
by zork on Thu May 22nd, 2003 at 11:27:46 PM  
MST  
([User Info](#))

70%?

I'm hearing some conflicting responses...anyone has a definite answer?

[ [Parent](#) ]

Conflicting opinions ([none / 0](#)) (#6)  
by TomW on Fri May 23rd, 2003 at 09:09:46  
AM MST  
([User Info](#))  
<http://oneota.net/~earthsourcepowr/>

Conflicting opinions are pretty normal here.

DanB has a gaussmeter and thats one person we could bug until he gives us some numbers.

But the tests i did on the steel door suggest somewhere in the 125 to 150% increase over 1 magnet when using 2. This suggest to me that dual opposed magnets be better than stacked with all else being equal. I say that because pulling 2 magnets apart is definitely more than 2X what it takes to pull one off steel. Again just observations.

Cheers.

TomW

[Stuff I have Online](#)

[Contact Me](#)

[ [Parent](#) ]

hmm ([none / 0](#)) ([#7](#))  
by zork on Fri May 23rd, 2003 at  
05:18:50 PM MST  
([User Info](#))

Ok, so I'm hearing anywhere from 25% to about 90%...ya.... looks like I'll just have to see for myself.

[ [Parent](#) ]

Distance issue ([none / 0](#)) ([#8](#))  
by Anonymous Hero on Sun May  
25th, 2003 at 12:24:08 AM MST

I don't think it decreases in power, but you have to take into consideration the fact that both of the magnets are not an equal distance from the object.

[ [Parent](#) ]

stacking magnets ([none / 0](#)) ([#9](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Sun  
May 25th, 2003 at 07:20:09 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

I just did a test using Dan's item #27 magnets and the reading from one alone is around 3000 gauss, adding one more brings it up to 4000 gauss, adding another one it goes to 4600 and a 4th one up to 4700. It appears the most significant gain would be by doubling and the rest is too small to make a cost effective difference. So that's about a 33% increase. It doesn't seem like you're making the magnet stronger I think you're simply expanding the field a bit more so this would increase your output...

Have Fun  
Ed

[ [Parent](#) ]

XLNT ([none / 0](#)) (#10)  
by TomW on Mon May 26th, 2003 at 10:59:04 AM MST  
([User Info](#))  
<http://oneota.net/~earthsourcepowr/>

Ed;

Thanks for corroborating my hand gauss test with actual numbers. This magnetism stuff is such an odd phenomenon it doesn't always work the way you would expect.

Cheers.

TomW

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[Combined Power](#) | 10 comments (10 topical, 0 editorial)

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[new board keep it simple please](#)

By [Anonymous Hero](#), Section [Rants & Opinion](#)  
Posted on Tue May 20th, 2003 at 01:36:59 PM MST [Science Fair](#)  
keep it simple.

this new board is lousy get rid of that intoduction box anyway I always got to write it over again it always says too many words my 2 cents

[new board keep it simple please](#) | 4 comments (4 topical, 0 editorial)

Anonymous Heroes... ([none / 0](#)) ([#1](#))  
by xeroid ([centurion27@lycos.com](mailto:centurion27@lycos.com)) on Tue May 20th, 2003 at 02:28:37 PM MST  
([User Info](#))

Hey, I have an idea... Why not get rid of anonymous heroes... That way people can't hide behind anonymity to take cheap pot shots at the board or other people.

... Ever heard of "cut" and "paste"? These two magical commands can save you a lot of re-typing.

If you truly think the new board is "lousy", feel free to not use it.  
Regards, XEROID.

no argument there ([none / 0](#)) ([#2](#))  
by TomW on Tue May 20th, 2003 at 02:52:16 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Subject says it all.

Well when the "old board" goes read only it will be pretty quiet over there.

Not sure why people bitch so much about how a free resource works after its upgraded to 21st century software.

Plus I have confidence that soon this board will look and feel a lot like the old board but actually be useable as an archive of awesome data.

I figure we will lose a few long term members but thats just how it goes.

Cheers.

TomW

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the heros ([none / 0](#)) (#3)  
by Anonymous Hero on Tue May 20th, 2003 at  
04:45:49 PM MST

XEROID we can even give them a little poker chip in  
their poker hand so they can't wear their poker face  
when when calling your bluff.

[ [Parent](#) ]

hostility ([none / 0](#)) (#4)  
by Johnny Cool Pants on Tue Jun 3rd, 2003 at 03:38:18  
AM MST  
([User Info](#))

RUDE!

I wasn't even here! Fighting and nit picking and I saw the  
word "Bitch" from administration.

Damn I feel good,  
cause you can't blame this page on me.

toota-loo

JCP

[new board keep it simple please](#) | 4 comments (4 topical, 0  
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[Let it fly!](#)

By [Norm](#), Section [Weird Science](#)  
 Posted on Sun Apr 27th, 2003 at 07:15:29 AM MST [Science Fair](#)  
 I'm sure someone has already thought of this but...

I'm sure someone has already thought of this and one of us has already ran across it on the internet, how about hoisting a small wind genny up where the wind is really blowing with a gyrocopter type kite? Does anybody on the board know how to make the blades for an autogyro? (Remember I'm talking about a Small science fair type of outfit here!) Norm.

[Let it fly!](#) | 3 comments (3 topical, 0 editorial)

Those bleedin Aussies ([none / 0](#)) (#1)  
 by [Techstuf](#) on Sun Apr 27th, 2003 at 08:41:47 PM MST  
[\(User Info\)](#)

Those Aussies are doin it, I believe. Heard somethin bout a grant given to an aussie to build the thing.....think they are plannin the largest wind tower too, maybe. Peace, TS out

Flying Blade ([none / 0](#)) (#2)  
 by [Johnny Cool Pants](#) on Sun May 11th, 2003 at 08:46:33 PM MST  
[\(User Info\)](#)

Flying Blade  
 They can be designed so they land perfectly when the wind dies out and then lift back up again when the wind picks up.

Besides the main line it can have lines on the wings leading backwards behind the kite plane and grounded to reels with low resistance. These would help stablize it and reel it back down level as the winds die.

Wing is always angled upward for instant lift when the wind starts up again. Line the wing with genny props. Give it light weight wire frame shock absorbing mosquito leg landing gear.

Re: Let it fly! ([none / 0](#)) (#3)  
 by [charged](#) on Fri Nov 14th, 2003 at 04:53:43 PM MST  
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I used to fly these really ugly "paper bag" kites that were hexagon shaped and about 5' in diameter.

When you get them up high enough, they can literally fly for days and days since there are various layers to the atmospheric currents.

Anyway, the best way to send your power back down from a flying turbine would be to make it high voltage electrostatic impulses at about 20kv. You only need a single, super-thin wire going up the rope to the turbine. One electrode from the HV output goes to a little cluster of needles that all point straight up into the sky. The other electrode is attached to the wire coming down to you.

Your end of the wire goes to one side of a high voltage capacitor and the other side of the capacitor goes to a metal rod that's stuck in the ground.

Hook up the HV terminal of a car ignition coil to one side of a spark plug and the other side of the spark plug goes to the sky-wire side of the capacitor. The - terminal on the ignition coil goes to the ground rod.

Now just connect your battery between the low voltage terminal on the coil and the ground rod.

Every time the capacitor get's full enough it arcs through the spark plug and into the coil's hv side. This makes the low voltage side put out a high current, low voltage pulse to the batteries.

You'll also be collecting excess electrostatic charge just from the wire being in the air. So, efficiency should be better than normally expected.

Tesla did this in the 1890's. It's in his patents.

[Let it fly!](#) | 3 comments (3 topical, 0 editorial)

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posted by Quigs on 10/24/2003 12:08:39 AM MST  
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posted by camp185 on 10/21/2003 12:06:11 AM MST  
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posted by Andrew on 10/06/2003 12:17:42 PM MST



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posted by bretco on 09/11/2003 06:07:35 PM MST  
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posted by Tom in NH on 09/02/2003 11:12:01 PM MST  
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30. [Solar Heating Panel Question](#) ([Homebrewed Electricity](#), [Solar](#))

posted by pexring on 08/23/2003 10:26:28 AM MST  
14 comments



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### Solargizer Components

By [sle Cain](#), Section [Homebrewed Electricity](#)

Posted on Sun Dec 14th, 2003 at 05:06:00 PM MST

[Solar](#)

#### Solargizer Components

Hello All,  
I've purchased A Solargizer PN i735x150-241.  
I have no manual and Plustechs sit offers nothing.  
Its not what I expected but it may be useful.  
The questin I have is what the moodule between th Solar panel and the battery connection is. The Solar Panel say 12v-24v. and not much on the module. IS this a transformer, regulator??. It seems very small.  
Thanks in advance.  
Steve

[Solargizer Components](#) | 3 comments (3 topical, 0 editorial)

Re: Solargizer Components ([none / 0](#)) (#1)  
by [dburt](#) on Mon Dec 15th, 2003 at 10:24:43 AM MST  
([User Info](#))

Don't know, but it might be a blocking diode.

Re: Solargizer Components ([none / 0](#)) (#2)  
by [sle Cain](#) on Mon Dec 15th, 2003 at 04:26:16 PM MST  
([User Info](#))

To big,  
I'm pretty sure I see a blocking diode on the panel itself.  
Nice guess, and you may actually be correct because I don't know how old it is.  
Steve

[ [Parent](#) ]

Re: Solargizer Components ([none / 0](#)) (#3)  
by [Geo K](#) on Tue Dec 16th, 2003 at 10:32:46 PM MST  
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Steve the Solargizer you have is for desulphating 6to24 volt batteries .The black box is the electronics for converting the 4.5 volts coming from the panel and pulsing it into the battery at 40 volts. If you connect it to a battery in low light the led should start flashing and in high sunlight should be on continually.You can test it By Placing a radio close to the Battery and tuning it to the frequency of the Solargizer.

George K.

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[Interesting solar power use I ran across](#)

By [chuckh](#), Section [Homebrewed Electricity](#)

Posted on Wed Dec 10th, 2003 at 11:41:11 AM MST

[Solar](#)

Thought this was creative solar use.

On a sailing forum I ran across what I thought was a pretty creative idea. Thought people here might be interested.

A fellow has a large trailerable sailboat. Uses solar panels for charging battery bank during boating trips. Plus can use the boat as a camper when trailering to boating area. When the boat is at home, plug it into house system.

Got me to thinking about other possibilities.

Motor home or camping trailer with solar panels and large battery bank for travel. Can stay at cheaper and/or secluded camp sites with no power. Plug it into the house system when at home. Plus have a guest room.

People with a remote cabin. Mount solar panels and battery bank on a trailer. Take it to the cabin. Plug it into house system when at home.

Anyway, I'd never seen anybody mention this type of thing and thought it worth sharing.

Chuck H.

[Interesting solar power use I ran across](#) | 7 comments (7 topical, 0 editorial)

Re: Interesting solar power use I ran across ([none / 0](#)) (#1)  
by marv ([windtamer@hotmail.com](mailto:windtamer@hotmail.com)) on Wed Dec 10th, 2003 at 05:02:00 PM MST  
([User Info](#))

I met a guy who runs his whole house in downtown toronto on a huge battery bank he keeps in his one ton van. He drives it to work and plugs in. He owns this buisness (rebuilding batterys etc.)and also enjoys 100% tax write off from this power I imagine.

Aparently had a discrepancy with hydro and told them to hit the road.

Marv.

Re: Interesting solar power use I ran across ([none / 0](#)) (#2)  
by Jerry on Wed Dec 10th, 2003 at 09:49:39 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

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This is what I did this summer with the old Mini Wini. I put the genny up only when camped. It works great. We've got 14 12 volt batteries onboard. No generator.

A 2500 watt inverter to power, small electric heater, tv vcr combo, iron, microwave oven, hair dryer, other electric hair things (wifes stuff), mixer, drill, sawsall and some other things but not all at once. We've been out 5 days at a time with plenty of power. The genny is a tape drive motor and



3 Jerry blades. JK TAS Jerry

[Airheads Page](#)

Re: Interesting solar power use I ran across  
([none / 0](#)) ([#3](#))  
by kww on Thu Dec 11th, 2003 at 07:21:07 AM MST  
([User Info](#))

And if you ever did run out of power you could always go for a drive. :-) Maybe I'll mount one of my turbines to an old Rx-7 I've got sitting out here so if the wind doesn't blow I can just take it for some spins around the pasture. LOL Hmmmmm, I wonder if some of DanB's tests were really tests. ;-) Seems like a good idea though, if you're off the grid, maybe put the batteries and turbine on a trailer...blah blah blah  
Kevin

[ [Parent](#) ]

Re: Interesting solar power use I ran across  
([none / 0](#)) ([#4](#))  
by desertratjack on Thu Dec 11th, 2003 at 08:08:28 AM MST  
([User Info](#))

Yeah!

Get a ham ticket and talk to me! Jack NL7SX  
(Ridgecrest, CA)

[ [Parent](#) ]

Re: Interesting solar power use I ran across ([none / 0](#)) (#5)  
by Budgreen on Thu Dec 11th, 2003 at 08:41:55 AM MST  
([User Info](#))

maybe an otherpower HF net? de kb8kvi

[ [Parent](#) ]

Re: Interesting solar power use I ran across ([none / 0](#)) (#6)  
by Old F on Thu Dec 11th, 2003 at 09:49:55 AM MST  
([User Info](#))  
<http://www.oldf.homestead.com>

Could be fun

de N8QJU

Old F

[ [Parent](#) ]

Re: Interesting solar power use I ran across ([none / 0](#)) (#7)  
by kww on Fri Dec 12th, 2003 at 07:02:21 AM MST  
([User Info](#))

Assuming you're replying to me, sorry, don't have a ham radio.  
Kevin

[ [Parent](#) ]

[Interesting solar power use I ran across](#) | 7 comments (7 topical, 0 editorial)

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[spheral solar](#)

By [Dameion](#), Section [Homebrewed Electricity](#)  
Posted on Sat Dec 6th, 2003 at 11:12:33 AM MST  
[solar roofing](#)

[Solar](#)

Just wondering if anyone has checked out this site and any of it's claims. I've long thought that if solar and roofing were combined it would become a viable alternative. This company seems to be making headway. Unlike many other sites that "claim" to have the answers; i've visited this place and it does exist. I know i'll be keeping a close watch on developments from this company in the near future.

<http://www.spheralsolar.com/>

[spheral solar](#) | 1 comment (1 topical, 0 editorial)

Re: spheral solar ([none / 0](#)) ([#1](#))  
by [Shoofly](#) on Sat Dec 6th, 2003 at 12:19:45 PM MST  
([User Info](#))

Here is a link to a similar company that came out of U-Mass/Lowell.

<http://www.konarkatech.com>

A little sidenote, I was on the U-MassLowell campus last week and they have at least three wind gennies whirring on the roof of the engineering building, all commercial units. They were somewhat noisy when the wind was up. Shoo

[spheral solar](#) | 1 comment (1 topical, 0 editorial)

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[PV w/d stretched out beyond understanding](#)

By [converseur](#), Section [Classifieds](#)

[Solar](#)

Posted on Wed Dec 3rd, 2003 at 10:31:32 PM MST

I welcome unavoidable most valuable principles for my system

Hi guys,

I'm a newbe and I love this discussion group. I posted a request for solar cel WB-27 distributor and the discussion went on and ended how PV w/d can be stretched beyond my upmost understanding .Altenergystore introduces this PV as having odd voltage 23.2V. Does this mean off spec? Partonsale claims that they don't sell off spec panels! Ed illustrated that 6.82 amp X 14.6V comes to 95W. Where did the 6.82amps come from as PV are advertised by watt ouput. This illustrates that we must investigate beyond watt rating posted. Chuck illustrated further that his own panels rated at 630W come out to an upmost 500 watts even with a MPPT. I'm baffled. I welcome a few unavoidable principles for purchasing PV and MPPT which would be the most valuable for my system powered by 2 Trace DR2412, 2400 amps battery bank and an Onan diesel generator for a remote cabin under construction. -- Richard

[PV w/d stretched out beyond understanding](#) | 5 comments (5 topical, 0 editorial)

Re: [PV w/d stretched out beyond understanding](#) ([none / 0](#)) ([#1](#))  
by Tom in NH on Wed Dec 3rd, 2003 at 11:24:25 PM MST ([User Info](#))

Maybe you already know this, but the discrepancy between ratings and actual measured output comes from the fact that most manufactures rate the output of their cells using a standard amount of sunlight falling on them: 1000 watts per square meter. When the cells' output is measured in the real world many factors come into play that degrade the theoretical rating. The angle of the sun in the sky, the time of day, the angle at which the cells are pointing, atmospheric effects, temperature, the material covering the cells, quality of solder joints, resistance due to wire size (and length), and the fact that some cells just turn out to be 'duds' all affect output. The manufacturer's rating might best be viewed as a theoretical maximum from which you start deducting all the little real-world inefficiencies. For instance, I have a home-built panel with cells rated at 110 watts. I've never gotten more than 85 watts out of it and usually it's more like 70 watts, chiefly due to to the fact that my panel may not be facing the sun squarely.

Your panel that puts out 23.2 volts... How many cells are in it? With 36 cells, typical for a 12v array, you should expect 18-25 volts in sun with no load.

--Tom

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Re: PV w/d stretched out beyond understanding  
([none / 0](#)) (#2)  
by TomW on Thu Dec 4th, 2003 at 05:57:21 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

converseur;

I believe most manufacturers rate their panels as open volts times short circuit amps in full sunlite with a 90 degree angle of incidence. "Open volts" can vary anywhere from 17 volts to 21 volts but as soon as you connect the panels to a battery the voltage becomes battery voltage which itself is dynamic.

Anyone with any common sense on electricity knows that watts is amps times volts and with a short circuit you have 0 [zero] volts and 0 times anything is still zero.

In my real world experience my 300 watts of solar in dead on full sun into my batteries will put out approximately 18 amps or somewhere around 70% of "rated". If I was charging @ 16.6 volts this would be about right for a true 300 watts but I am charging at anywhere from 11.5 to 14.4 volts depending on battery state of charge.

Frankly, I just write it off as sales hype by the manufacturer much like those ads that make me think if I buy "this car" I will be the envy of all the other men as they see me with the ladies in my car.

To make it even worse different companies use different open voltage numbers which further confuses the rating game 17 to 21 volts is a broad range I have seen quoted.

Your angle of incidence makes a really big difference and a tracker and proper seasonal altitude adjustments can add to your incoming substantially. And I have seen cloud edge effect boost the amps up above 25 for short periods so the panels can achieve or exceed rated output in certain conditions.

Just my real world experience over the past couple years with good quality manufactured panels.

Cheers.

TomW

[Stuff I have Online](#)  
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Re: PV w/d stretched out beyond understanding  
([none / 0](#)) (#3)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Thu Dec 4th, 2003 at 07:05:23 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

I only brought that up because you don't get what the advertizers are selling you. I was figuring out the amount of panels I would need to power my office and made a realization during the process. I had calculated I needed about 400 watts to keep things going while the wind was slow in the summer. At the time I was looking at some 100 watt panels. Going through their ratings I realized they listed maximum charging amps and open voltage as the final output. So I took their max amps and combined it with my average battery voltage ( actual charging ) and found they couldn't possibly perform to their rated output.

If I had purchased on 4 of these panels with the expectation of getting 100 watts per panel to meet my 400 watt need I would have been greatly disappointed only getting 340 watts or less. If each panel makes 6 amps charging and your battery bank is running at around 12 volts then the actual watts being put into the batteries is about 72 watts so  $4 \times 72 = 288$  watts not including any line or other losses along the way. So I assume its a buyer beware or catch 22 advertizing scheme. I'm still looking for some panels but with a different perspective... I would need 6 100 watt panels to deliver my 400 watt charging that I want. This makes cost a major determining factor...

Have Fun  
Ed

Re: PV w/d stretched out beyond understanding  
([none / 0](#)) (#4)  
by Homebrewed12vdc on Thu Dec 4th, 2003 at 09:51:25 AM MST  
([User Info](#))

Ed, Just a thought, you mentioned you have a wind generator, and by the way you talk it sounds like it does the job all winter when the wind is higher, then it would seem to me that maybe another small windmill would be the answer to your summer time problem. Hope that helps.  
From Mike

Re: PV w/d stretched out beyond understanding  
([none / 0](#)) (#5)  
by bob golding ([yubba at clara dot net](#)) on Thu Dec 4th, 2003 at 11:43:45 AM MST  
([User Info](#))

this might help

[http://www.anotherurl.com/therm/solar\\_eval.htm](http://www.anotherurl.com/therm/solar_eval.htm)

bob

[PV w/d stretched out beyond understanding](#) | 5 comments (5 topical, 0 editorial)

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## [Home Made Solar](#)

By [Mike Wolak](#), Section [Homebrewed Electricity](#)

Posted on Wed Dec 3rd, 2003 at 05:55:51 AM MST

[Solar](#)

Home Made Solar

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I ordered the cells from Plastecs Co. WB-28 cells\*\*\*----100mm round ( 4" round )----single crystal---2.0-2.25A @ 0.57-0.60V-----efficiency 12-12.9%----easily solderable----weighs 0.28 oz. each ( 8 gms )-----\$3.55 each plus S&H. Plastecs treated me very well. I soldered the cells in series using the included foil wire that plastecs included. At first I thought the foil was packing material, then realized it was foil used on the solar cells! I had to use a solder GUN 140 watt to solder these cells. The back of the cells are positive and completely covered in solder. This acts as a heat sink and makes soldering difficult. I advise to pre-tin the foil or wire and then apply heat as short as possible. After attaching each cell please test for cell to be working. Solder, test, solder, test till all 36 cells in series are attached. The housing of the cells were a little crude. This is just the pre-testing stage. I used 2 sheet of lexan, laid out the soldered cells on the lexan, put another sheet over them. Flipped the sheets over to view the back of the cells. Put a dab of silicon on the back positive side of the cells, laid the lexan on the cells. This way the cell won't slide and short each other out. I had some aluminum mirror channel that I used for a frame, U channel. Before sealing the frame I drilled 2 holes for screws to go thru from leads of cell positive and negative foil wrapped around screws. Test again for full panel voltage then ran silicon thick around edge of lexan and squished together and applied U channel frame around lexan, like a picture frame. Had some 4X4 laying around had the kids dig a hole 46 inches in the ground and placed 4X4 in hole. Mounted half inch 45 degree pipe fitting treated to top of post. Mounted a 40"X20" plywood to top of fitting and mounted solar panel to plywood. Drilled out two large holes for the panels power posts, positive and negative. Mounted out door inclosure boxes over the power posts. In the inclosure boxes are the diodes. Then ran water tight electrical pipe to "test box" with battery and small inverter. It worked, took about half of day light to charge the battery that I ran down. Here are some pictures, with cheep cam sorry. Later will run heavy gage wire to garage to battery bank. The panel is using 12 guage wire for now. Full sun 21VDC almost 2 amps were flowing thru meter when first attached to drained battery.

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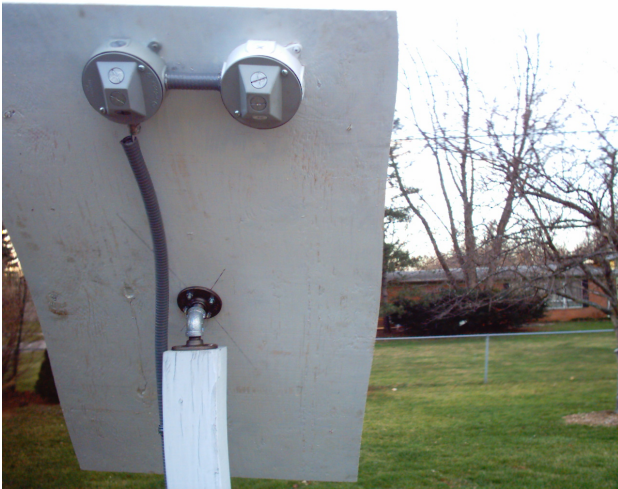
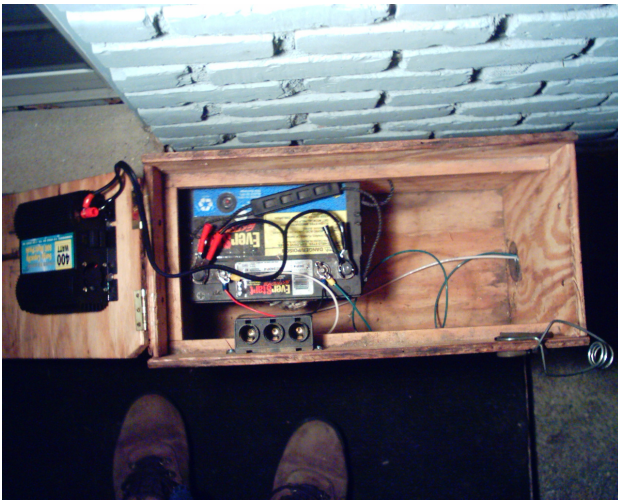
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[Home Made Solar](#) | 5 comments (5 topical, 0 editorial)

Re: Home Made Solar ([none / 0](#)) ([#1](#))  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Wed Dec  
3rd, 2003 at 02:22:31 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

Good job Mike

I have a different panel than you, otherwise I have the same setup as you as you. My panel was surplus from a local electronics store. This panel puts out less than 1 amp. My small fan and 12vdc flourescents pull my systems volts down too much every night in the summer.

I have been looking at those Plastecs Co. WB-28 cells too. .

}=- W o o f -= {

Re: Home Made Solar ([none / 0](#)) (#2)  
by Mike Wolak on Wed Dec 3rd, 2003 at 02:31:29  
PM MST  
([User Info](#))

WB-28 are impressive. But the cold weather is here. My test box outside is cold, yesterday instead of 4 hours of inverter use I got 2 hours. The battery was at full capacity. Tested with a battery load tester. Will the freezing 26F degree effect the time of use on my battery?

[ [Parent](#) ]

Re: Home Made Solar ([none / 0](#)) (#5)  
by troy on Thu Dec 4th, 2003 at 10:25:08 AM  
MST  
([User Info](#))

Yes, the cold will very much affect battery capacity. Flooded lead acid cells want to be at the same temp you do, about 70F.

Good luck and have fun!

troy

[ [Parent](#) ]

Re: Home Made Solar ([none / 0](#)) (#3)  
by Tom in NH on Wed Dec 3rd, 2003 at 10:19:00 PM MST  
([User Info](#))

Awesome looking panel! And you're getting great voltage output from it too. How does your current output respond to sun angle? My panel, made with 108 WB-29's and a glass covering, puts out better than 85 watts when it's pointed straight at the midday sun, but drops off to 60 watts or so if it's tipped a few degrees. I wonder if maybe lexan is more tolerant of sun angle than glass. --Tom

Re: Home Made Solar ([none / 0](#)) (#4)  
by Adrian L on Thu Dec 4th, 2003 at 06:38:09 AM MST  
([User Info](#))

I like your battery box/inverter setup, reminds me of an earlier setup of mine.

Just a tip, do yourself a favour and replace the stock leads on that inverter, or at least put proper terminal ends on, they die really quick from the acid eating away at them on the terminals and it looks like the acid are eatings yours up already?

Solar power is really great to setup a nice little functioning self contained remote power supply, and its just so easy and fun I can't see why more people don't do it!

Once you have the RE bug there is no going back, you will keep spending more and more on new equipment, but what a great hobby.

Have Fun,

Adrian L

[Home Made Solar](#) | 5 comments (5 topical, 0 editorial)

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### [how to get off spec solar panel to adequate voltage?](#)

By [converseur](#), Section [Homebrewed Electricity](#)

[Solar](#)

Posted on Tue Dec 2nd, 2003 at 04:25:49 PM MST

#### How to get off spec solar panel to adequate voltage?

Hello,

I saw that sun electric has 75 watts 23V panel at \$115.00. Any suggestion wether to lower it to 18V or to raise to 32V. -- Richard

[how to get off spec solar panel to adequate voltage?](#) | 3 comments  
(3 topical, 0 editorial)

get off spec solar panel to adequate voltage? ([none / 0](#)) (#1)

by [drdongle](#) on Tue Dec 2nd, 2003 at 07:50:56 PM MST  
([User Info](#))

To get 18 Volts use a "buck" DC to DC converter, though 5 volts isn't a lot to drop. to get 32 Volts you will need a "boost" DC to Dc converter.

Dr.D

Re: how to get off spec solar panel to adequate vo ([none / 0](#)) (#2)

by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Wed Dec 3rd, 2003 at 09:51:59 AM MST  
([User Info](#))

If that 23V rating is for open-circuit voltage, it's already just fine for charging a 12v battery.

ADMIN

off spec panel to adequate voltage? ([none / 0](#)) (#3)

by Seth on Wed Dec 3rd, 2003 at 10:20:40 AM MST  
([User Info](#))

Or get a MPPT and just run all the SAME power pannels in series.....

[how to get off spec solar panel to adequate voltage?](#) | 3 comments  
(3 topical, 0 editorial)

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### [solar cell WB- 27](#)

By [converseur](#), Section [Homebrewed Electricity](#)  
Posted on Mon Dec 1st, 2003 at 12:35:54 PM MST  
Looking for solar cells at fair price

[Solar](#)

Hi guys,

I had plans to build solar panels. I checked at plastec. They asked \$177.00 for 50 cells, or \$3.25 each for 1000 cells. I find this price extremely abusive. Anyone would know a better place to buy cells? I can get brand photowatt 155 watts for \$499.00 ( \$3.16 a watt) at partonsale.com or brand sharp 165 watts for \$519.00 (\$3.20 a watt) at Sunelectronic sunelec.com. Sunelectronic has slightly blemished Photowatt 155 at \$400.00 BR-250 50 watts at \$184.00 posted on Ebay.

Anyone needs a sine Wave inverter at a good price Sunelectronic has Trace PS2512 or PS2524 at \$1,200.00 on Ebay

Richard

[solar cell WB- 27](#) | 10 comments (10 topical, 0 editorial)

Re: solar cell WB- 27 ([none / 0](#)) ([#1](#))  
by [windstuffnow](#) ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon Dec 1st, 2003 at 02:06:18 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

There are some sun panels on ebay right now for 299 per panel. They are 120 watt panels. I've been mulling over getting 4 of them for myself... any one have any experience with these panels?

Sounds like a reasonable deal..

Have Fun  
Ed

Re: solar cell WB- 27 ([none / 0](#)) ([#6](#))  
by [converseur](#) on Tue Dec 2nd, 2003 at 03:42:46 PM MST  
([User Info](#))

Hi Guys,

Cheapest Solar has BP 380 v 12VDC at \$270.00.  
Richard

[ [Parent](#) ]

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- [Also by converseur](#)



Re: solar cell WB- 27 ([none / 0](#)) (#2)  
by RobD on Mon Dec 1st, 2003 at 07:26:35 PM MST  
([User Info](#))

That's a good price for the Traces Ed. Whish I had the bucks now I'd get the 24 volt one.  
If I remember when I bought my individual cells they cost me about\$1.50 each or so. It's still expensive when you figure the price of building the panels with the glass and backing. what are you using for the plates behind the cells?  
RobD

Re: solar cell WB- 27 ([none / 0](#)) (#3)  
by converseur on Mon Dec 1st, 2003 at 07:49:49 PM MST  
([User Info](#))

Hi guys, I made a mistake for the Trace PS2512 or PS2524 for auction on Ebay, they are \$1020.00 and not \$1200.00

Richard

Re: solar cell WB- 27 ([none / 0](#)) (#4)  
by Tom in NH on Mon Dec 1st, 2003 at 09:05:11 PM MST  
([User Info](#))

It has been my experience that you do not build your own panels to save money over commercial units. I build my own panels so I understand more about them, I have more flexibility in designing arrays, and I know what they're made of. I've bought from Plastec and have been very happy with the service compared to several other companies I've tried, and their prices are competitive. Still, you'd think the price for raw cells, no matter where they come from, would be low enough to give you some savings if you elect to go the do-it-yourself route. --Tom

Re: solar cell WB- 27 ([none / 0](#)) (#5)  
by converseur on Tue Dec 2nd, 2003 at 03:37:01 PM MST  
([User Info](#))

Thans tom. Silicon Solar has ``build your own kit``.  
I will give a try.

[ [Parent](#) ]

Re: solar cell WB- 27 ([none / 0](#)) (#7)  
by Tom in NH on Tue Dec 2nd, 2003 at 05:15:00 PM MST  
([User Info](#))

You can get quality stuff from Silicon Solar, but you will be disappointed if you want your order to arrive quickly. Don't be surprised if delivery takes a couple months. --Tom

[ [Parent](#) ]

Re: solar cell WB- 27 ([none / 0](#)) (#8)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Tue Dec 2nd, 2003 at 11:00:42 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

I have been looking at these 2 places . . .

<http://sales.goldmine-elec.com/prodinfo.asp?prodid=8159>

<http://www.partsonsale.com/>

}-- W o o f --{

Re: solar cell WB- 27 ([none / 0](#)) (#9)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Wed Dec 3rd, 2003 at 02:40:24 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

That really gets me... parts on sale list the Kyrocera 158 watt panels for 499 and state that its only 3.19 per watt. Thats actually not true... They are really about 5.15 per watt, unless your running an 23V system. I don't know of any person charging their 12V batteries to 23Volts. Maximum current is 6.82 amps into a fully charged battery of 14.6V comes out to a 99.5 watt solar panel in my book....

Makes you wonder who set the rule (lie) for solar panel sales....

Just my opinion

Ed

[ [Parent](#) ]

Re: solar cell WB- 27 ([none / 0](#)) (#10)  
by Chuck on Wed Dec 3rd, 2003 at 05:24:47 PM MST  
([User Info](#))  
<http://www.greeleynet.com/~cmorrison>

My guess is that an mppt charger is required to get close to rated output. Even then it doesn't really make it.

I have 630 watts (rated) of panels. Even with a good mppt charger, the most I've seen go into the battery is 18.x amps @28 volts, just over 500 watts (dead of winter at noon). This would make each 105 watt panel actually 83.3 watts. Better than the example you give, but still \$4.81/watt instead of \$3.81/watt.

oh well...

Chuck

[ [Parent](#) ]

[solar cell WB- 27](#) | 10 comments (10 topical, 0 editorial)

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## [Home Made Solar Questions](#)

By [Mike Wolak](#), Section [Homebrewed Electricity](#)

Posted on Mon Dec 1st, 2003 at 11:11:29 AM MST

[Solar](#)

### Home Made Solar Questions

I have build a solar panel using 36 solar cells tied together in series. In bright light this panel produces 21 volts DC.

I purchased a 40 watt diode from Radio Shack and hook up to solar cells so not to have the batteries discharge into panel when darkness appears. As a test I took voltage measurements direct off panel with no load, 21 volts DC.

I tested a battery that was low in charge 11.9 VDC. This battery is a boat deep cycle 12 volt battery. When I attached to solar panel to the battery then read the battery it was still 11.9 VDC. I was hoping to see a higher voltage like when you read the battery voltage on a car with the alternator running. Check futher using an AMP meter the battery was sucking almost 2 AMPS. About an hour later the battery voltage rised to 12.4 VDC. So I take it my monster is working?

1. Why when charging the battery off the solar panel I'm not reading the solar panel 21 volts when not connected to battery.
2. Just 2 amps of draw off the panel? Should'nt it be more?
3. By using 40 amp bridge rectifiers from Radio Shack and only using the single diode on the bridge, note I attach a diode to each leg of the panel. Will this cause the panel to be less efficient?
4. The battery I'm using has a led indicator to state the charge condition, green is charged, black is low and red is recharging. Funny it is in the red always when I ran down the battery for the test. With or without the panel attached.

I am doing this project for therpy, keeps mind off of things. The objective is to just make the family room solar powered for starts. I will take pictures later this week and give you an idea of what I made. Any thoughts would be welcome.

Thank You

[Home Made Solar Questions](#) | 5 comments (5 topical, 0 editorial)

Re: Home Made Solar Questions ([none / 0](#)) ([#1](#))  
by [veewee77](#) on Mon Dec 1st, 2003 at 01:53:27 PM MST  
([User Info](#))

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The solar panels will produce open voltages as you said at or near 21V. But when you connect them to your batteries, the batteries draw more current than the panels can produce and maintain the 21V. So the voltage drops to the level of the batteries, 11.9 low and 12.4 (charging).

If you watch, your batteries will continue to rise in volts until they are charged, at which time the panels will start to dump more voltage into the batteries (but not much more than a volt or so) because the batteries will always let a little current flow through them. You could watch your ammeter and chart the amps being drawn as it is being charged and soon you will see the amps level out. At that time, your batteries will be fully charged. The amps at which they level out will be the 'float' charge your panels will be able to provide. This is OK as long as the 'float' charge is not out of specs for your battery.

Have fun!

Doug

Re: Home Made Solar Questions ([none / 0](#)) (#2)  
by Demetri ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Mon Dec 1st,  
2003 at 03:24:20 PM MST  
([User Info](#))

Mike-

I'm curious, what solar cells did you use? Where did you get them and how much did they cost? I myself am looking into cheap solar, as my neighbors complain loudly about windmills and the like, and I think your route will be the most cost effective. Diodes won't lessen the efficiency of the panel itself, but do burn some power themselves. Most have a .5 to .7 volt drop. That means that when you are drawing 2 amps through them, you are losing 1 - 1.4 watts of power. You might hook up your solar panel through your ammeter without the diodes, and cover the panel to see if the diode is really needed. Good luck, and have fun. I sure am.

Demetri  
Always be the lead dog.

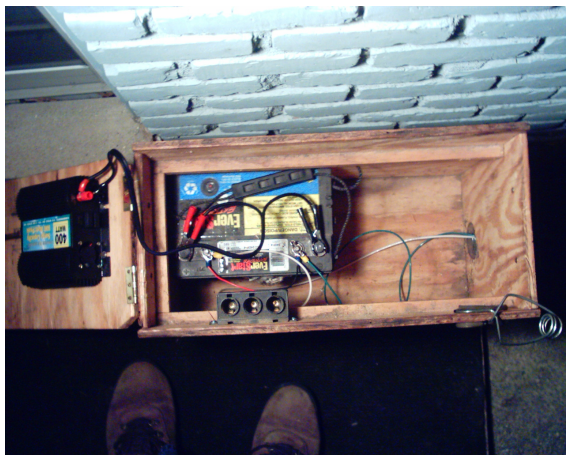
Re: Home Made Solar Questions ([none / 0](#)) (#5)  
by Mike Wolak on Tue Dec 2nd, 2003 at 10:10:59  
AM MST  
([User Info](#))

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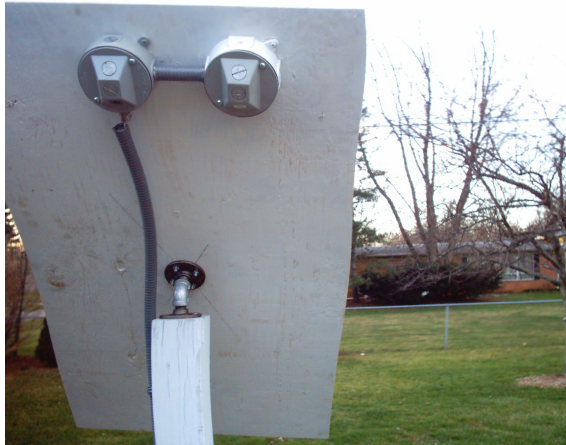
The back of the cells are positive and completely covered in soilder. This acts as a heat sink and makes soildering difficult. I advise to pre-tin the foil or wire and then apply heat as short as possible.

After attaching each cell please test for cell to be working. Soilder, test, soilder,test till all 36 cells in series are attached. The housing of the cells were a little crude. This is just the pre-testing stage. I used 2 sheet of lexan, laid out the soildered cells on the lexan, put another sheet over them. Flipped the sheets over to view the back of the cells. Put a dap of silicon on the back positive side of the cells, laid the lexan on the cells. This way the cell won't slide and short each other out. I had some aluminum mirror channel that I used for a frame, U channel.

Bofore sealing the frame I drilled 2 holes for screws to go thru from leads of cell positive and negative foil wrapped around screws. Test again for full panel voltage then ran silicon thick around edge of lexan and squished together and applied U channel frame around lexan, like a picture frame. Had some 4X4 laying around had the kids dig a hole 46 inches in the ground and placed 4X4 in hole. Mounted half inch 45 degree pipe fitting treated to top of post. Mounted a 40"X20" plywood to top of fitting and mounted solar panel to plywood. Drilled out two large holes for the panels power posts, positive and negative. Mounted out door inclosure boxes over the power posts. In the inclosure boxes are the diodes. Then ran water tight electrical pipe to "test box" with battery and small inverter. It worked, took about half of day light to charge the battery that I ran down. Here are some pictures, with cheep cam sorry. Later will run heavy gage wire to garage to battery bank. The panel is using 12 guage wire for now. Full sun 21VDC almost 2 amps were flowing thru meter when first attached to drained battery.







[ [Parent](#) ]

Re: Home Made Solar Questions ([none / 0](#)) ([#3](#))  
by [pexring](#) on Mon Dec 1st, 2003 at 10:55:59 PM MST  
([User Info](#))

Drawing 2 amps is doing pretty good on a 21 volt panel.  
Remember, watts/volts = amps. I have a 30 watt solar panel that powers the fans in my solar heating panels. I paid around \$90 new for the pvc panel off ebay, and it's worked wonderfully.

Anyway, when I'm operating 12 volt fans, my 30 watt panel only has about 2.5 amps available. 30 watts / by 12 volts = 2.5 amps. Each of my fans draw .45 amps. I probably won't hook a third fan to it, as it kicks out less amps on overcast days.

Of course, most appliances take way more amps. Which means way more solar panels!

Mark

Re: Home Made Solar Questions ([none / 0](#)) ([#4](#))  
by [pexring](#) on Mon Dec 1st, 2003 at 11:02:03 PM MST  
([User Info](#))

Oops, I gotta quit answering posts at midnight! I only have a 20 watt panel that I paid around \$90 for on ebay. Which means I only get about 1.5 amps to work with on a full sunny day. So I only power the two fans which together draw less than an amp. Works pretty good that way. Gees.

Mark

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### [Solar panel help](#)

By [Todd](#), Section [Homebrewed Electricity](#)

Posted on Sun Nov 23rd, 2003 at 12:18:37 PM MST

[Solar](#)

Solar panel

Well today was the first day I could test my little Solar panel and charge controler out this is what I found . I tested at 12 noon full sun DCV 10.45 DCA .95 ??? then I tested it on ACV and got 21.9 V don't know the amps on ac . All the tests with no load . The panel is a Hoxan HSP 10-6 and I have no info on it ... got it off of E-BAY , What do you guys think ... did I do something wrong ?? Need help

[Solar panel help](#) | 6 comments (6 topical, 0 editorial)

AC? ([none / 0](#)) (#1)

by [wdyasq](#) on Sun Nov 23rd, 2003 at 03:46:36 PM MST  
([User Info](#))

I didn't know solar cells put out AC.

Ron

Re: Solar panel help ([none / 0](#)) (#2)

by [wooferhound](#) ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Sun Nov 23rd, 2003 at 05:46:44 PM MST  
([User Info](#))

<http://timmythy.home.mindspring.com/timmy.htm>

your Solar Panel puts out DC voltage. If you measure that output with an AC voltmeter your reading will incorrect. For solar panels, measure them with the meter set to DC volts.

However, 10.45 vdc is not enough to charge your batteries. A Solar panel should put out more than 15 volts in full Sun  
...

}=- W o o f -= {

Re: Solar panel help ([none / 0](#)) (#3)

by [Tom in NH](#) on Sun Nov 23rd, 2003 at 05:50:39 PM MST  
([User Info](#))

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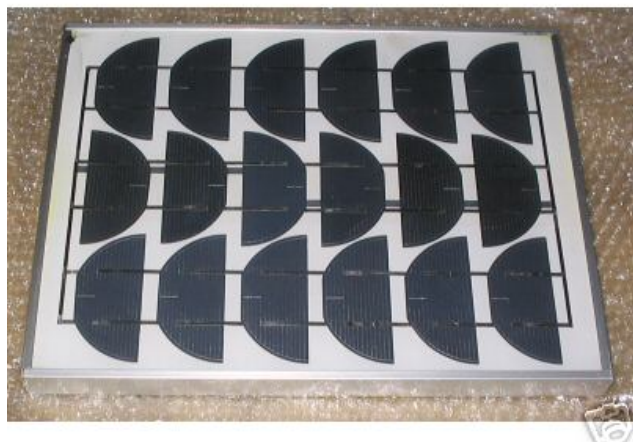
Try disconnecting everything and measuring the volts and amps of just the solar panel. This should only be DC. How big is the panel? How many individual cells does it have?

Tom

Re: Solar panel help ([none / 0](#)) (#4)  
by Todd on Sun Nov 23rd, 2003 at 07:39:13 PM MST  
([User Info](#))

The readings were just the panel here is a pic of the panel

Re: Solar panel help ([none / 0](#)) (#6)  
by Todd on Sun Nov 23rd, 2003 at 07:46:03 PM MST  
([User Info](#))



Re: Solar panel help ([none / 0](#)) (#7)  
by Adrian L on Mon Nov 24th, 2003 at 06:27:17 AM  
MST  
([User Info](#))

The reason you are only getting 10.5 volts is because that particular panel is obviously made to charge a 6 volt battery, thats what the numbers would mean 10-6 = 10 watt 6 volt panel.

Usually a 12 volt panel has 36 solar cells inside it, yours only has 18, what you could do is buy another panel the same and hook it up in series to get 21 volts at 1 amp (21 volts is about what a normal 12 volt panel will output open circuit) and you would have the equivaent of a 20 watt 12 volt panel.

Sorry to break the bad news,

Adrian L

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### [Hey Admin could it be possible](#)

By [Reno](#), Section [Rants & Opinion](#)

Posted on Fri Nov 21st, 2003 at 09:37:03 PM MST

[Solar](#)

none

Could it be possible to have threads with recent posts bumped to the top that way there is a better chance that current conversations

stay where they are easily located.

I have been on other boards where this is done and it seems to work well

[Hey Admin could it be possible](#) | 5 comments (5 topical, 0 editorial)

Re: Hey Admin could it be possible ([none / 0](#)) (#1)  
by [Demetri](#) ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Fri Nov 21st, 2003 at 11:47:28 PM MST  
([User Info](#))

I think such a feature would come in handy as well.

Demetri

Always be the lead dog.

Re: Hey Admin could it be possible ([none / 0](#)) (#2)  
by [gameman](#) on Sat Nov 22nd, 2003 at 06:43:19 AM MST  
([User Info](#))

i was thinking the same thing ..that would be great gameman

[ [Parent](#) ]

Re: Hey Admin could it be possible ([none / 0](#)) (#3)  
by [pexring](#) on Sat Nov 22nd, 2003 at 10:56:56 AM MST  
([User Info](#))

Ditto for me.

Mark

[ [Parent](#) ]

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Re: Hey Admin could it be possible ([none / 0](#)) (#4)  
by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Sun Nov 23rd,  
2003 at 10:24:58 AM MST  
([User Info](#))

We ruled out bumping up the posts with new comments to the top-- there would be too many older posts on the front page many mornings.

Instead, we are working on an op that displays only new stuff wherever you deploy it. The programmer we use for all this is real busy, so we'll have to wait for a bit. We'll also have him alphabetize the FAQs by topic and within topics.

It'll happen, please be patient!

ADMIN

Re: Hey Admin could it be possible ([none / 0](#))  
(#5)  
by Reno on Sun Nov 23rd, 2003 at 11:01:27 AM  
MST  
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thanks, keep up the great work

[ [Parent](#) ]

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## [Wiring 2 solar panels](#)

By [pexring](#), Section [Homebrewed Electricity](#)

Posted on Wed Nov 19th, 2003 at 11:45:04 PM MST

[Solar](#)

Why doesn't this work?

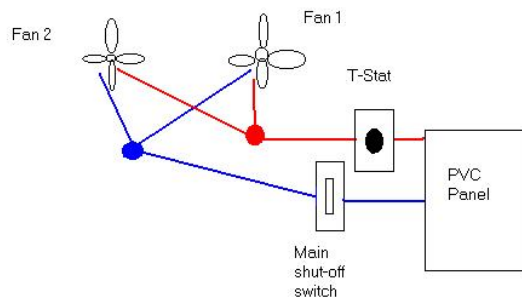
Hi,

I just finished building my second solar heating panel. Each panel has its own fan that draws .45 amps. The fans are powered by a 20 watt pvc solar panel (1.5 amps). I'd like to hook both fans up to one t-stat.

When I hook both fans directly to the pvc panel, they both run great guns. The problem occurs when I add the t-stat. Fan 2 runs perfect. It turns on when the t-stat reaches the desired temp, and shuts off when the t-stat falls below the set temperature. Fan 1 runs the exact opposite -- it runs when the t-stat is off and stops when the t-stat clicks on.

I'm baffled. It's probably something stupid, but I'm not seeing it. Here's a wiring diagram of how I got things wired. Appreciate any thoughts.

Mark



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[Wiring 2 solar panels](#) | 5 comments (5 topical, 0 editorial)

Re: Wiring 2 solar panels ([none / 0](#)) ([#1](#))  
 by TomW on Thu Nov 20th, 2003 at 12:33:12 AM MST  
 (User Info) <http://oneota.net/~earthsourcepowr/>

pexring;

My very first guess is that you actually have the fan that runs at exactly the wrong time wired across the switch rather than in series with it that would explain why it runs with the thermostat [switch] is off. I suggest you wire the fan leads together first then wire that to the thermostat. That way both will be energized at the same time.

Cheers.

TomW

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Re: Wiring 2 solar panels ([none / 0](#)) ([#2](#))  
by jubalearly on Thu Nov 20th, 2003 at 07:53:43 AM MST  
([User Info](#))

Tom's right, it's got to be wired wrong. Your drawing is correct, tho, as it shows them wired in parallel. I like his solution - it will help keep the wiring straight in future, also. I would normally put both switches on the same line, also. I find it best to be consistent. So I always put switches or anything else in the positive lead. I started out with automobiles where you often have no other choice.....HTH,  
-RussH

Re: Wiring 2 solar panels ([none / 0](#)) ([#3](#))  
by Homebrewed12vdc on Thu Nov 20th, 2003 at 09:42:18 AM MST  
([User Info](#))

Well i agree with everybody else your diagram looks good, but it must be wired wrong. I want to know what did you use for a t-stat, I am trying to due a similar setup to blow heat in the house from the woodstove, but I only want the fans to work when the other rooms need the heat. Thanks and good luck. From Mike

Re: Wiring 2 solar panels ([none / 0](#)) ([#4](#))  
by pexring on Thu Nov 20th, 2003 at 11:23:53 AM MST  
([User Info](#))

I just used a typical Honeywell round heat/cool thermostat.

I put it directly inside the panel and set it to 'cool'. So when the panel heats up to about 72, it comes on, and runs until it cools down to below 72 and shuts off.

I'll start over on the wiring. I was also thinking of putting both switches on one line. I've looked at my wiring a 100 times and it doesn't look wrong to me, but it has to be wrong. There's always 101!

Mark

Re: Wiring 2 solar panels ([none / 0](#)) ([#5](#))  
by Electric Ed on Fri Nov 21st, 2003 at 05:31:12 AM  
MST  
([User Info](#)) <http://www.electric-ed.com>

The heat/cool thermostat has two "sets of contacts" in the mercury switch, in other words, it's a double throw switch. When one closes, the other opens. You likely have one fan controlled by the heat contacts, and one controlled by the cooling contacts.

Keep in mind these thermostats are designed to operate with a relay. The mercury switch contacts won't handle much load.

Electric Ed

[ [Parent](#) ]

[Wiring 2 solar panels](#) | 5 comments (5 topical, 0 editorial)

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[Need help](#)

By [Todd](#), Section [Homebrewed Electricity](#)  
Posted on Fri Nov 14th, 2003 at 09:14:43 PM MST [Solar](#)  
Solar panel

Hi all ... I'm a Newbee , I've been a lurker to this site for some time now , so I finally joined . I got some Questions , I bought my first Solar cell and charge controller off of E-bay ... they are small but they got to start somewhere . Well the guy I got it off of doesn't know anything about them , so maybe you guys do . well this is what I got ... The Charge regulator is a TT1B Photovoltaic regulator from Integrated Power corporation and the Solar panel is a Hoxan HSP10-6 it's like 15 1/2 by 13 1/2 inches . Any info on them would be great . Thanks Oh ya by the way I made a little gen out of a lawnmower and a GM Alternator a boat Battery and an a 300 watt inverter .

[Need help](#) | 1 comment (1 topical, 0 editorial)

Re: Need help ([none / 0](#)) ([#1](#))  
by [Seth](#) on Sat Nov 15th, 2003 at 01:25:14 AM MST  
([User Info](#))

Well i see that u already found the information on that charge controller.....

as for the cell.... ill guess it's about a 20-15W cell.... your controller can handle a lot more than that.

[Need help](#) | 1 comment (1 topical, 0 editorial)

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## [Thermostats for solar heating panels](#)

By [pexring](#), Section [Homebrewed Electricity](#)

Posted on Thu Nov 13th, 2003 at 09:51:41 PM MST

[Solar](#)

Where do I find them?

Does anyone have a source of where I can buy thermostats for my solar heating panels? Right now I'm operating them on a switch, which my wife never seems to remember to turn on. So I turn them on before I leave for work, and they tend to run cold until around 9am when the frost finally melts off the glass. Be nice to just have them turn on automatically. They do need to be 12 volt.

Mark

[Thermostats for solar heating panels](#) | 11 comments (11 topical, 0 editorial)

Re: Thermostats for solar heating panels ([none / 0](#)) (#1)

by Norm on Thu Nov 13th, 2003 at 10:10:34 PM MST ([User Info](#))

almost all thermostats run from low voltage to a relay that turns on a 110 volt blower motor if your fan/blower motor is 12 volt all you need is a 12 volt relay like from a riding mower starter relay. Norm.

Re: Thermostats for solar heating panels ([none / 0](#)) (#2)

by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Thu Nov 13th, 2003 at 10:16:10 PM MST

([User Info](#))

<http://timmythy.home.mindspring.com/timmy.htm>

You will need 2 thermostats  
One inside of the room you are trying to heat  
and  
one inside of the outlet of the heating panel

Wire them in series, so your heater fan will only turn on when the room needs heat AND the panel is warm enough to provide heat.

} = - W o o f - = {

Differential ([none / 0](#)) (#3)

by wdyasq on Fri Nov 14th, 2003 at 04:15:32 AM MST

([User Info](#))

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A couple of years ago a friend built me a device using two thermistors and an Op-Amp to turn off and on my attic fan.

He said he got the circuit from a website that had a solar heat panel that did the same thing. The device needed a temperature differential and a certain temperature to energize and would shut off when these weren't met.

Ron

Re: Differential ([none / 0](#)) (#4)  
by gameman on Fri Nov 14th, 2003 at 07:04:22 AM MST  
([User Info](#))

are you good at building Electronic Circuits?? if so you can make a thermostat . ( i am almost finished making one for my system )it runs on DC from 7 to 18 volts . you can use a AC adapter or you can hook it to your solar panel that runs your fan ...graet idea about using a relay from a riding lawn mower  
gameman

[ [Parent](#) ]

More sources of relays... ([none / 0](#)) (#5)  
by TomW on Fri Nov 14th, 2003 at 07:22:02 AM MST  
([User Info](#))  
<http://oneota.net/~earthsourcepowr/>

Microwave ovens typically have several relays in the 12 to 24 volt class in them. only good for smallish current like under 10 amps or something but small low power to activate and salvage.

Cheers.

TomW

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Re: Thermostats for solar heating panels ([none / 0](#)) (#6)  
by Larsanderss ([larsanderss@brevet.nu](mailto:larsanderss@brevet.nu)) on Fri Nov 14th, 2003 at 07:23:38 AM MST  
([User Info](#))

Maybe You could try this one... ( <http://www.fieldlines.com/story/2003/9/23/92535/4705> ) i have not built it myself. I know there is another circuit (LM35) wich gives a output proportional to °C for those who likes it better than °F.

One other describtion is available on the Homepower download page (in a article about solar hot air).

Lars A

Re: Thermostats for solar heating panels ([none / 0](#)) (#7)  
by jubalearly on Fri Nov 14th, 2003 at 08:17:16 AM MST ([User Info](#))

The easiest thing to do is buy the thermostat for an electric automobile fan. I think Auto Zone has them for less than \$15. They are normally open until the thermocouple gets above the set temperature, which is adjustable. I used one at the cabin to automatically operate the circulation pump for the water heater.

I don't recall the amperage capacity (20a?) of these. You may want to use a relay anyway since it will simplify setting up longer wire runs to the pump. About the only drawback is that the thermocouple is only about 20" from the control, so you have to mount it near the panel (or whatever you put the thermocouple on). HTH, -RussH

Re: Thermostats for solar heating panels ([none / 0](#)) (#8)  
by laskey on Fri Nov 14th, 2003 at 08:29:17 AM MST ([User Info](#))

A guy did an article for homepower magazine a little while ago, and it contains the schematics for the exact thing you want.

<http://www.homepower.com/files/hotairhp72.pdf>

Cya,  
Chris

Re: Thermostats for solar heating panels ([none / 0](#)) (#9)  
by pexring on Fri Nov 14th, 2003 at 12:08:05 PM MST ([User Info](#))

Great link. I can build, wire and plumb a house without even looking at a book. Yet my knowledge of this type of electronics is minimal. This website should sell this type of thermostat where I could simply run a wire inside the solar panel and adjust the dial on the wall.

Today I had another thought. Why not just buy an ordinary mercury-type thermostat and put it inside the panel. Set the t-stat on a/c so it kicks on when the temp reaches about 80. Then it would never shut off until it got cold again. With my solar panel on the wall, I could reach in through the intake vent and adjust the dial if necessary. Crude, but it may just work!

Otherwise, I'd possibly pay someone to build and send me one that worked.

Mark

[ [Parent](#) ]

Re: Thermostats for solar heating panels ([none / 0](#))  
([#10](#))  
by hydrosun on Fri Nov 14th, 2003 at 07:55:40 PM MST  
([User Info](#))

I've been running my homemade solar heating panel for years with a simple mercury thermostat that I picked up at a used store. I had to mount it backward (I had to take off the spring holding the mercury and mount it inside the heater. I drilled a hole in the side of the panel and push the shaft holding the spring into the hole) to make it turn on at the higher temp instead of off that it would do for a heater. A solar air heater only needs a single thermostat to turn on when the temperature in the heater goes above the preset temp ( maybe 90) I doubt you'd have enough panels to overheat a house. And you can just shut it off in the summer. A solar water heater would need the slightly more complex differential thermostat to allow the unit to start at a lower temp if the water is cold and shut off if the water is too hot.

Re: Thermostats for solar heating panels ([none / 0](#)) ([#11](#))  
by pexring on Fri Nov 14th, 2003 at 08:53:42 PM MST  
([User Info](#))

You're right, overheating the house is not a concern. Today I did pick up a Honeywell round heat/cool thermostat. I think it will work perfect without any modifications. I'll put the thermostat in the panel I'm finishing this weekend and set it to 'cool' when the temp hits 75 degrees. It will operate the fans in both panels. So then the fan starts and doesn't stop until the temp drops below 75. Was a spendy thermostat (\$38), so it'll have to serve both panels.

With the mercury in these t-stats, is there any concern of getting it too hot?

Mark

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[Thermostats for solar heating panels](#) | 11 comments (11 topical, 0 editorial)

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### [Help with solar module wire](#)

By [Larry755](#), Section [Homebrewed Electricity](#)  
Posted on Sun Nov 9th, 2003 at 01:14:48 PM MST  
solar module wire

[Solar](#)

I have 3-75 watt solar modules and going to upgrade to 5-75 watt modules. They are 35 ft. from the shack so I will need 50 ft of wire and I need to stay with 12 volt to run the ham gear. What size wire should I run in from the pannels to the house? I am thinking of ordering a c40 Xantrex controller as my Morningstar will not work with the extra amps. Can someone tell me the size of wire this controller will take. Wish I had the wind in TN. for a wind genny. Thanks Larry

[Help with solar module wire](#) | 5 comments (5 topical, 0 editorial)

Re: Help with solar module wire ([none / 0](#)) ([#1](#))  
by [TomW](#) on Sun Nov 9th, 2003 at 02:10:53 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Larry;

I run 4 75 watt panels at 12 volts and 50 feet of wire to the batteries. When I sized that run of wire I decided I needed #1/0 for the 20 amp load i calculated to get an acceptable loss. Well I had #4 on hand so while it calls for #1/0 i used the #4 and lose some I suppose.

Check this chart

<http://oneota.com/~earthsourcepowr/dropchart.html>

You can also parallel more than one cable to share the load if you have it on hand.

Cheers.

TomW

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Re: Help with solar module wire ([none / 0](#)) ([#2](#))  
by [DaveR](#) on Sun Nov 9th, 2003 at 05:38:33 PM MST  
([User Info](#))

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Another option that will work but may be a bit more for the controller is to go with 4 or 6 modules, and an MPPT controller. Then you could run the panels at 24 volts and control it down to 12 volts at the batteries or load. That's what I did when I had to place my solar panels 100 feet from my batteries. I used the Solar boost 50.

Dave

Re: Help with solar module wire ([none / 0](#)) ([#3](#))  
by desertratjack on Sun Nov 9th, 2003 at 06:23:38 PM  
MST  
([User Info](#))

Even though we have wind here in the pass, solar carries the load. So go solar and then wind. Wind powerplants are improving all the time.

I use 1/0 wire and it would carry 100 amps at 12 vdc and this keeps the losses low. But smaller wires can be used. For a long time I used solid #12 wire and it worked ok.

Re: Help with solar module wire ([none / 0](#)) ([#4](#))  
by drdongle on Sun Nov 9th, 2003 at 07:35:05 PM MST  
([User Info](#))

Where in Tn are you? I'm in Sevier Co, near Gatlinburg.

Dr.D

Re: Help with solar module wire ([none / 0](#)) ([#5](#))  
by Larry755 on Tue Nov 11th, 2003 at 01:43:54 AM  
MST  
([User Info](#))

Dr.D I live in Western Tn. in Henderson Co. Thanks to all for the help.  
Larry

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[Help with solar module wire](#) | 5 comments (5 topical, 0 editorial)

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## Solar Heating Panel Update

By [pexring](#), Section [Homebrewed Electricity](#)

Posted on Thu Nov 6th, 2003 at 12:00:33 PM MST

[Solar](#)

Here's an update on the heater I built.

A couple times over the summer I asked questions and posted info on the solar heating panel I was building. I thought you'd all like an update of how it turned out. Now that we've had a couple sunny but cold days of temps not over 30, I can say that this panel does work. This is just a measly 4'x6' panel, and I'm blowing out heat in temperatures of 115-125 degrees farenheit. I live in a 1900 square foot doublewide, and over the last 2 days I haven't had to turn the furnace on during the day. I'm also taking advantage of the sun shining in my south windows and skylight. I wrote an article outlining the details I did to build this panel. The article can be found in my quarterly newsletter, or at this URL:

<http://www.mobilehomerepair.com/article17solar.htm> We also talk a lot about alternative ways to heat mobile homes in the FORUM section of my website, <http://www.mobilehomerepair.com>  
Mark

[Solar Heating Panel Update](#) | 27 comments (27 topical, 0 editorial)

Re: Solar Heating Panel Update ([none / 0](#)) (#1)  
by [pexring](#) on Thu Nov 6th, 2003 at 12:12:23 PM MST  
([User Info](#))

This will teach me to preview my messages before posting! LOL Here's the message again, in more of a readable format. Sorry. Wish I knew how to delete the first one. Maybe the site admin could clean this up for me.

-----

A couple times over the summer I asked questions and posted info on the solar heating panel I was building. I thought you'd all like an update of how it turned out. Now that we've had a couple sunny but cold days of temps not over 30, I can say that this panel does work.

This is just a measly 4'x6' panel, and I'm blowing out heat in temperatures of 115-125 degrees farenheit. I live in a 1900 square foot doublewide, and over the last 2 days I haven't had to turn the furnace on during the day. I'm also taking advantage of the sun shining in my south windows and skylight.

I wrote an article outlining the details I did to build this panel. The article can be found in my quarterly newsletter, or at this URL: <http://www.mobilehomerepair.com/article17solar.htm> We also talk a lot about alternative ways to heat mobile homes in the FORUM section of my website, <http://www.mobilehomerepair.com>

Mark

Re: Solar Heating Panel Update ([none / 0](#)) (#2)  
by [Reno](#) on Thu Nov 6th, 2003 at 03:26:49 PM MST  
([User Info](#))

Why silver

I thought black was the best absorber of solar and silver/white the least. I think if you went with black backing you would improve your results also another trick is to increase your surface area. This is done by bending (corrugating) the backing so you do not have to increase the size of your box.

[ [Parent](#) ]

Re: Solar Heating Panel Update ([none / 0](#)) (#3)  
by [pexring](#) on Thu Nov 6th, 2003 at 03:53:51 PM MST  
([User Info](#))

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Silver? Nothing is silver on my panel. All black. Originally I had tried corrugation, but it took so long to heat-up the corrugated panels, I took them out. Plus, corrugation throws a shadow. I got better results with flat painted-black aluminum.

Mark

[ [Parent](#) ]

Re: Solar Heating Panel Update ([none / 0](#)) (#4)  
by Norm on Thu Nov 6th, 2003 at 04:52:08 PM MST  
([User Info](#))

I noticed that you used insulation and aluminum flashing seperately how about insulation that comes with aluminum on both sides? (the insulation is, I believe what TomW mentioned at one time, yellow, doesn't melt, and is fireproof? Norm.

[ [Parent](#) ]

Re: Solar Heating Panel Update ([none / 0](#)) (#5)  
by pexring on Thu Nov 6th, 2003 at 04:58:04 PM MST  
([User Info](#))

I saw some insulation with a paper-thin aluminum coating. I thought perhaps thicker aluminum would be better, so I didn't use it. But maybe what you are thinking of is a bit different.

Mark

[ [Parent](#) ]

Re: Solar Heating Panel Update ([none / 0](#)) (#9)  
by gameman on Thu Nov 6th, 2003 at 08:28:06 PM MST  
([User Info](#))

about how many cfm's will your fan move ? and what is your indoor themp?  
gameman

[ [Parent](#) ]

Re: Solar Heating Panel Update ([none / 0](#)) (#12)  
by pexring on Thu Nov 6th, 2003 at 10:27:17 PM MST  
([User Info](#))

I'll have to try and find what the CFM's are. I knew it when I bought the fan. The temp in the house holds steady at 67-72 degrees. Of course, the rooms on the north side are on the colder end.

[ [Parent](#) ]

Re: Solar Heating Panel Update ([none / 0](#)) (#6)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Thu Nov 6th, 2003 at 05:20:14 PM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

If you put the fan on the bottom inlet, and blow the cold air in, you will get better air flow than sucking the hot air out at the top.

don't know if you need more airflow ?

Cold air is more dense and the fan will work with that better. And you mention that the air is 115-125 degrees fahrenheit, your fan will not be heated up to this point. In the summer your fan will be sitting in 200 degree or more heat. It won't be so high a temperature at the bottom . . .

} - W o o f - = {

Re: Solar Heating Panel Update ([none / 0](#)) ([#10](#))  
by Norm on Thu Nov 6th, 2003 at 09:36:00 PM MST  
([User Info](#))

Blowing the air in is good...sucking air into a house is bad...of course a small fan like this probably wouldn't have that much of an effect on your flue for your gas water heater or gas furnace if you have them...still it's better not to take the chance? Seems like there was a link about this somewhere on the board. Norm.

[ [Parent](#) ]

Re: Solar Heating Panel Update ([none / 0](#)) ([#7](#))  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Thu Nov 6th, 2003 at 05:44:10 PM MST  
([User Info](#)) <http://www.internetfred.com>

That is HOOOTTT! I like that idea! I have seen it before, but didn't really think about it. I think it's going to be a weekend project comming up! Seems simple enough to build and fast. THANKS! That was a good job you did in explaining it and the Rules of thumb! I alfo figure a small wind turbine to power the fan would be cool!

Re: Solar Heating Panel Update ([none / 0](#)) ([#8](#))  
by pexring on Thu Nov 6th, 2003 at 07:50:46 PM MST  
([User Info](#))

Today I picked up materials to build another solar heating panel. This one I intend to blow heat underneath my mobile home to help keep the floors warmer. Getting free heat is the only way I'd ever heat underneath my home! LOL. Good thought about switching the fans to the inlet.

On a side note . . .

I was able to keep the furnace off for 12 hours today! Temp is 18 degrees outside right now and it never got above 30. Last night I was doing some calculations, and I figured for every hour my natural gas furnace ran, it cost me over \$1/hour at the current rates. So if the furnace runs 6 hours a day, that's \$180 a month. Be more than that in the real cold months tho.

So last night a friend of mine mentioned to me about seeing a halogen heater on the internet. They run on less watts and kick out a lot of heat. Except we were having real trouble finding someone who sells them in the United States. But low and behold, I discovered that K-Mart carries them. So I bought their last one today. The halogen heater is also listed on KMart.com.

The halogen heater's maximum setting is 800 watts and it kept my entire living/dining/kitchen-room area comfortable. Heck, a 2500 watt heater can hardly keep one of those rooms comfortable! So now I'm toying with the idea of buying one for each of the three bedrooms. The heater set on 800 watts cost me about 8 cents an hour to run. On the 400 watt setting (which would probably be perfect for the bedrooms), it would be half that. Of course I'd only need the halogen heaters in the evenings and on days the sun didn't shine. So maybe I'm getting close to throwing that expensive gas furnace out on the front lawn! LOL

Mark

[ [Parent](#) ]

Re: Solar Heating Panel Update ([none / 0](#)) ([#15](#))  
by gameman on Fri Nov 7th, 2003 at 07:45:36 AM MST  
([User Info](#))

do you know how many btu's this halogen heater puts out??  
it sounds like a great heater  
gameman

[ [Parent](#) ]

Re: Solar Heating Panel Update ([none / 0](#)) ([#18](#))  
by pexring on Fri Nov 7th, 2003 at 11:48:54 AM MST  
([User Info](#))

I'd like to know how many BTU's it kicks out too, but I don't see it anywhere.  
May look on the web for more info.

Last night once the sun went down, I pulled my thermo curtains to hold the heat in the house. Then turned on this halogen heater to keep things from cooling down too fast. We made it until about 8:15pm before having to kick the furnace on. Basically I went 12 hours without running the furnace. Normally my heat bill is \$200-\$300 a month. If I can get it down to under \$100/month, I'll be one happy camper.

Mark

[ [Parent](#) ]

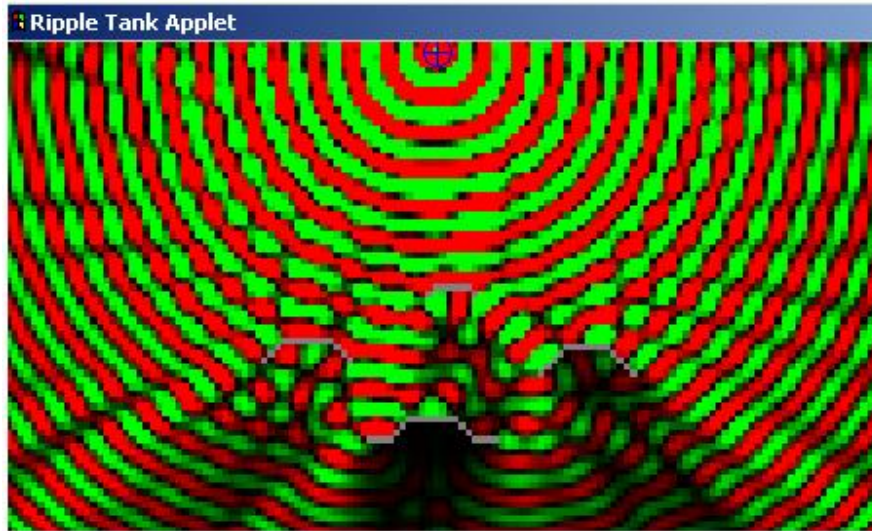
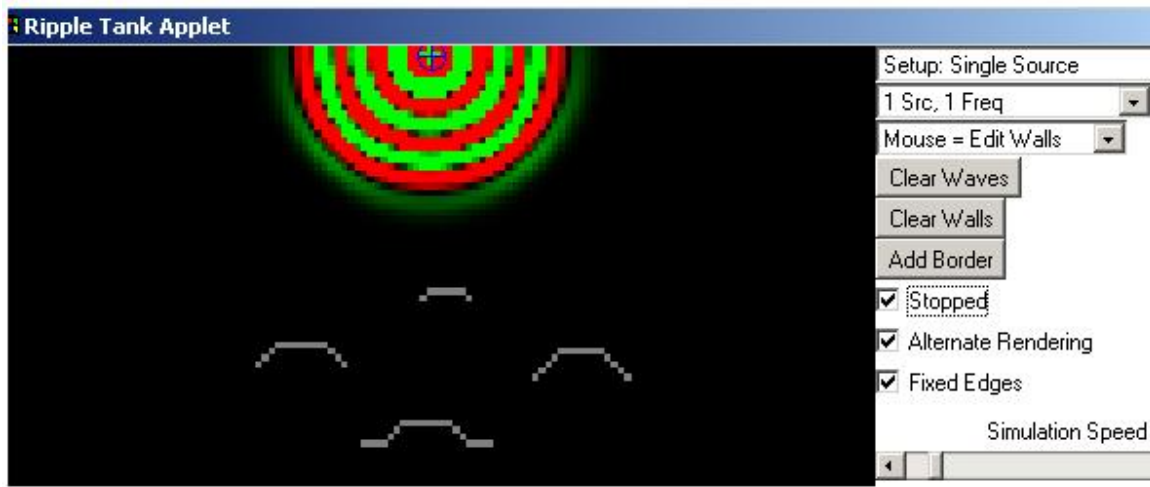
Re: Solar Heating Panel Update ([none / 0](#)) ([#11](#))  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Thu Nov 6th, 2003 at 09:44:23 PM MST  
([User Info](#)) <http://www.internetfred.com>

Hey Guys! I just did some simulations for airflow moving through the solar collector, I love sims... Anyway I was playing with this ripple tank and putting Baffles in the ripples (viewing the ripples as "air flow"), I noticed that by shaping these baffles, that I got localized regions of hot spots. And it also slows down the airflow. Which makes the air hotter I believe, well that's the way I interpreted it. Any way here is the simulation and the link to go play with.. Tell me what you think.. Is placing baffles that are a specific shape going to increase the heat and slow down the flow?? (Resistance creates heat too, would this?)  
Opinions????

<http://www.falstad.com/ripple/>

REALLY COOL SITE!!

<http://www.falstad.com/mathphysics.html>



Re: Solar Heating Panel Update ([none / 0](#)) (#13)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Fri Nov 7th, 2003 at 06:01:58 AM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

works great when it's cold !  
Well , What are you going to do with the monster heat your going to get in the Summer ?

}=- W o o f -={

Re: Solar Heating Panel Update ([none / 0](#)) (#14)  
by pexring on Fri Nov 7th, 2003 at 06:46:35 AM MST  
([User Info](#))

Just cover the glass during the summer. Problem solved.

Mark

[ [Parent](#) ]

Re: Solar Heating Panel Update ([none / 0](#)) (#27)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Sat Nov 8th, 2003 at 07:35:23 PM  
MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

Can't you heat your water or your pool with it in the summer ?

}=- W o o f -=  
[ [Parent](#) ]

Re: Solar Heating Panel Update ([none / 0](#)) (#16)  
by kww on Fri Nov 7th, 2003 at 08:42:58 AM MST  
([User Info](#))

Hi pexring,  
Nice project. I've got a question for you. If you added a 4'x 6' window where your 4'x 6' solar collector is would it give as much heat as the collector? Seems like it would to me but... I've been wanting to do something like the solar collector thing, but if a window would do the same I'd have a much easier time convincing the wife to add a window instead of the collector. :-)  
Btw, I put in some big windows in my garage and work shop, all face the sun in the winter, but no full sun in the summer. On a sunny winter day my very uninsulated garage (you can feel the wind blow at times) and work shop will be around 8 degrees warmer than outside.  
Kevin

Re: Solar Heating Panel Update ([none / 0](#)) (#17)  
by pexring on Fri Nov 7th, 2003 at 11:40:27 AM MST  
([User Info](#))

Hi,

Cold sunny day #3 without the furnace running. 20 degrees outside. At noon my solar heater is blowing temps of 112 degrees. That along with the sun from the south windows does a good job of keeping the house comfortable without using the furnace. I do need to set up some fans to have move the heat better tho. The solar panel is right next to my sliding glass doors in the dining room, and that room really gets warm, so need to move that air further into the home.

As far as converting a window into a solar heating panel, a friend and I are also experimenting with that. On one of my windows I do have an insulated aluminum box up against the window with a hole in the bottom left corner, and another in the upper right. I have a round solar-powered marine fan in the bottom hole that pulls air in and pushes it out the hole at the top. The air does not go through any pathways. I'm finding that I'd probably be able to heat the room just as well without the box over the window. But maybe this weekend, I'll pull off the box and add pathways and hopefully that'll get me more heat. If I do, I'll post pictures then.

Mark

[ [Parent](#) ]

Re: Solar Heating Panel Update ([none / 0](#)) (#19)  
by kww on Fri Nov 7th, 2003 at 04:58:20 PM MST  
([User Info](#))

I got to thinking about what I'd said and realized your collector thing will work better than a window because it doesn't suffer the loses a window does, which is a lot, especially at night. You need some foam insulation window covers for night time. ;-)  
Thanks for showing your work.  
Kevin

[ [Parent](#) ]



Re: Solar Heating Panel Update ([none / 0](#)) (#20)  
by kww on Fri Nov 7th, 2003 at 05:14:52 PM MST  
([User Info](#))

One other thing I was going to tell you about, something I've learned through the experience of heating my house with only a wood stove insert at one end for 12 years. Put a box fan on the floor about half way between the coldest and hottest room and blow (low speed should work fine) the cold air into hot room, works much better than trying to blow the hot into the cold, someone explained it above. Basically the cold air has more momentum and the fan can "throw" it farther.  
Kevin

[ [Parent](#) ]

Re: Solar Heating Panel Update ([none / 0](#)) (#21)  
by monte350c on Fri Nov 7th, 2003 at 10:12:44 PM MST  
([User Info](#))

Hi All,

I'm trying a really low-buck experiment that was inspired by the last round of solar heating panel stuff I read on the board.

We have several windows that get really good afternoon sun. I went to Home Depot and bought an aluminum slat mini-blind. They were nice enough to trim it to fit the window for free! I also bought a can of flat black paint.

Once I got home I deposited the contents of the flat black paint all over the mini-blind. Next the blind went into the window, adjusted so the lower part of each slat faces the window, and the upper part faces the room. I figure it would set up a convective flow this way.

So far (it's only been a week or so) I've noticed the blind heats up to about 120 - 130 F in the sun. I blew out a match, and held the smoking end near the blind. There's a definite upwards flow off the slats. Plus just by putting your hand near it you can feel heat from about 6" away or so.

If this continues to look good, I'll replace the blinds or curtains on all the windows that get sun in the house. It probably will make a difference, and it's pretty easy and cheap to do too.

Ted.

[ [Parent](#) ]

Re: Solar Heating Panel Update ([none / 0](#)) (#22)  
by pexring on Fri Nov 7th, 2003 at 11:45:10 PM MST  
([User Info](#))

Ted,

Last year I had bought a solar window heater based on the concept you described, but it sure didn't give out the kind of heat you describe. You've definitely peaked my interest.

The trick is to figure out if the heat gain you are getting is more than thge sun simply shining unblocked and heating a larger area. If you had 2 rooms about the same size facing south, the experiment could be done -- 1 room with the black blinds, the other with just a naked window. Then watch the room temp over several hours. Be interesting to know.

Do keep us informed.

Mark

[ [Parent](#) ]

Re: Solar Heating Panel Update ([none / 0](#)) (#24)  
by monte350c on Sat Nov 8th, 2003 at 07:48:12 AM MST  
([User Info](#))

Hi Mark,

When I was hanging this converted (painted) blind, I used a fairly unscientific method to position it. It seems that all windows even good double glazed pass quite a bit of cold through them. I held my hand near the window and noticed the first 1 - 2" were noticeably colder than the room temp. So I hung the blind about 2.5" away from the glass.

I'll try the comparison between the blinded window in one room and open windows for another for a week or so and post the results.

You'd have to think every bit helps!

Ted.

[ [Parent](#) ]

Re: Solar Heating Panel Update ([none / 0](#)) (#26)  
by pexring on Sat Nov 8th, 2003 at 07:59:06 AM MST  
([User Info](#))

Ted,

Thanks for doing the experiment. Even just doing the experiment on one sunny day should be able to tell us. I'd do the experiment myself, but all my even-sized bedrooms are on the north side of my home.

Well, this morning its cloudy. Could be an expensive day running that furnace. I went 11 hours yesterday without running it. Wish I could put up a big ole wind jenny, but that's not possible here. Too bad, its always blowing.

Mark

[ [Parent](#) ]

Re: Solar Heating Panel Update ([none / 0](#)) (#23)  
by kww on Sat Nov 8th, 2003 at 06:14:20 AM MST  
([User Info](#))

You really shouldn't be getting any more heat than if you'd just left the window unblocked and let the floor, etc. in the room absorb the heat. However, when comparing two windows, both with closed blinds, the one with the black facing the window will certainly do more for heating the room as it won't reflect as much UV out the window. I do sort of the opposite during the summer, I keep all the white blinds closed during the day which keeps the house several degrees cooler.

Kevin

[ [Parent](#) ]

Re: Solar Heating Panel Update ([none / 0](#)) (#25)  
by Reno on Sat Nov 8th, 2003 at 07:50:14 AM MST  
([User Info](#))

When covering a window in the winter you should always remember about condensation which can lead to water damage and worse mold. Good air flow over glass should always be maintained.

[ [Parent](#) ]

[Solar Heating Panel Update](#) | 27 comments (27 topical, 0 editorial)

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### [Canadian Solar Panels](#)

By [laskey](#), Section [Classifieds](#)

Posted on Sun Nov 2nd, 2003 at 12:41:11 PM MST

[Solar](#)

Anybody know a Canadian source for solar panels

Hey does anyone have a good Canadian supplier for Solar panels. I haven't been able to find a good price any where in my own country.

Cya,  
Chris

[Canadian Solar Panels](#) | 3 comments (3 topical, 0 editorial)

Re: Canadian Solar Panels ([none / 0](#)) ([#1](#))  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Mon Nov 3rd, 2003 at 01:43:39 PM MST  
([User Info](#)) <http://www.internetfred.com>

Good Luck! I have been trying for 6 months trying to find a solar panel company in Canada, it ain't happen. After repeated emails to several companys and no replys I have given up all hope. I just don't understand why these companys in Canada do not want business or even to reply to your email.... My suggestion is to buy from ebay under the term - solar panels or solar cells. - I wish you good luck!  
Fred.  
[www.internetfred.com](http://www.internetfred.com)

Re: Canadian Solar Panels ([none / 0](#)) ([#2](#))  
by GeeWiz on Mon Nov 3rd, 2003 at 09:00:54 PM MST  
([User Info](#))

You can try SPS Energy, I dealt with them when they were Powersource. See URL  
<http://www.spsenergy.com/pages/about/index.htm>

[ [Parent](#) ]

Re: Canadian Solar Panels ([none / 0](#)) ([#3](#))  
by converseur on Mon Nov 24th, 2003 at 03:20:51 PM MST  
([User Info](#))

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Chris,

Solar Panel are not affordable in Canada. They cost about 3 times of what it cost in the USA. There is no renewable energy market in Canada. I'm looking for solar panel also. They are some on Ebay. Some are used, other are off spec, and other are perfect. I have found a few webbsite. Altenergystore.com, they do business in the Atlantic. They have several discussion panels, articles and forums very good prices. There is also Partonsale.com in California. They have competitive prices. They have live 1-800 technical support. I found a new website Sunelec.com located in Miami. They sell refurbished inverters, off spec solar panels (auction on Ebay), their website seems like a hay wire business.

Beat regards, richard

[Canadian Solar Panels](#) | 3 comments (3 topical, 0 editorial)

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[connecting solar panels without solder](#)

By [Peterthinks](#), Section [Homebrewed Electricity](#)

Posted on Fri Oct 31st, 2003 at 08:57:11 PM MST

[Solar](#)

thought you'd like to know....

I had to connect a solar cell to some wires and didn't want to solder it.

it was a small cell from a calculator.

The lcd display from the calculator had a small strip of rubber with black lines in it used to conduct to different parts of the display from the circuit board.

So I cut two pieces off the strip and pushed them against the cell with the ends of the wires

A blob of epoxy on them to secure them and a few hours later two solderless connections were done.

Another coat of epoxy on the back of the cell secured them even better.

I don't know what you call that strip or where you can get it (other than in calculators) but it's something to think about.

Peter

[connecting solar panels without solder](#) | 3 comments (3 topical, 0 editorial)

Re: connecting solar panels without solder ([none / 0](#)) (#1)

by RobD on Sat Nov 1st, 2003 at 07:37:08 AM MST ([User Info](#))

I think those strips are a rubber based carbon impregnated material. They often oxidize and create resistances. Even though you sealed it I wonder if you will still have problems in time. The displays they drive are very low current in the order of microamps not amps.

Just my two cents.

RobD

Re: connecting solar panels without solder ([none / 0](#)) (#3)

by Peterthinks on Sat Nov 1st, 2003 at 11:15:12 AM MST ([User Info](#))

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actually I just dug the cell out of a drawer...I put the thing together around 5 years ago for a beam robot.

still gives out loads of power....sorry no measurements on resistance from 5 years ago to compare to today.

[ [Parent](#) ]

Re: connecting solar panels without solder ([none / 0](#))  
([#2](#))  
by signweld on Sat Nov 1st, 2003 at 07:41:51 AM MST  
([User Info](#))

SORT OF RELATED, I had to repair a broken connection on the glass on the rear window defogger on my van and got some electrically conductive glue from NAPA. Seems to work fine. I would think it should work to connect to solar cells as well.

signweld

[connecting solar panels without solder](#) | 3 comments (3 topical, 0 editorial)

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## [Building a Solar Panel](#)

By [Mike Wolak](#), Section [Homebrewed Electricity](#)

Posted on Fri Oct 24th, 2003 at 12:10:23 PM MST

[Solar](#)

### Building a Solar Panel

Hello everone,

I have purchases 38 WB-28 solar cells from [www.plastecs.com](#). These cells are 100mm round 4 inches. Single crystal 2.0-2.25A @ 0.57-0.60V efficiency 12-12.9%. I am looking for suggestions on wiring, housing for out doors or any other comments for this project. The primary reason for this 37W panel is well, charging a 12V battery bank. This bank of quantity 10 batteries in parallel, Dynasty VRLA valve regulated lead acid freebe 12V batteries, would they run a inverter 400W for starts and supply power for one room in my house to start? In addition this would be a back up for those days of no power, eg: blackout 2003, weather, coronal mass ejections, ect. So I am looking for great housing ideas, cheep of course, weather resistant. Wiring, wire guages, inner solar cell wiring ways, web sites. I have follow this web page for some time. I needed to have a winter project so this is it. I live in Michigan. So gang what you say?

Michael  
N8JGU

[Building a Solar Panel](#) | 4 comments (4 topical, 0 editorial)

Re: Building a Solar Panel ([none / 0](#)) ([#1](#))  
by Tom in NH on Fri Oct 24th, 2003 at 09:04:08 PM MST  
([User Info](#))

I recently assembled a panel of 108 cells from Plastec. 32 x 42 inches. Low wattage soldering irons don't work well. Make sure the cells in your array are spaced so they don't touch each other and short out. You won't burn anything up, but output will be reduced. Also, check the output of each cell after you solder the tabs on. If you put a "dud" in the array, it will affect your output. I mounted mine on 1/4 inch clear luan plywood. Ran screw-type connectors out the back side and I can wire groups of 36 cells either in parallel or series. Used double strength glass, with spacers, to cover the cells without placing excessive pressure on them. I used 1 x 1 x 1/16 aluminum channel stock formed the frame.

On my next panel which I'll be starting soon, I'm thinking of putting a dab of silicone caulk on the back of each cell to hold them in place on the plywood before soldering the top faces. I'll use a closed cell foam tape as a gasket and spacer between the glass and plywood.

This was my first panel and I have a lot to learn. One big lesson was order a few extra cells to cover for breakage. Also, the ratings used in the cell descriptions are the theoretical maximums. They're the max from which you deduct power due to everything: a glass covering, two cells

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touching each other, the panel not being aimed perfectly at the sun, etc. My 100 watt panel was actually running around 87 watts at in the midday sun in September. It's probably less now that the sun is a little lower in the sky.

My goal is to use the electricity to produce hydrogen, which works well even on cloudy days. Keep us posted on your progress.

--Tom

Re: Building a Solar Panel ([none / 0](#)) (#3)  
by converseur on Mon Nov 24th, 2003 at 05:14:01 PM MST  
([User Info](#))

hi,

I'm quite excited to read about your project. I dream to built my own renewable power system. I have 2 refurbished Trace 5548 and I have another 2 coming. I have a 2400 amps battery bank. I'm to the point to investgate renewable charging system. Solar energy is quite interesting, but it is totally unknown in Canada. I know that solar panel can be built. Can I aks you how long did it take to built you panel? Can I ask you how much cost the solar cells.

Best regards,

Richard

[ [Parent](#) ]

Re: Building a Solar Panel ([none / 0](#)) (#2)  
by ChrisW on Wed Oct 29th, 2003 at 10:55:21 AM MST  
([User Info](#))

The picture of the blue solar panels built with WB-28s on the plastecs web site is mine! I built four panels using those cells and I must say the output is pretty impressive, especially when you get the panels aimed DIRECTLY at the sun. I've seen 13 amps with all four panels hooked up on a bright, sunny day.

I have a few thoughts and suggestions:

1. Use a FAT wire for interconnecting the cells. I discovered that using the recommended "foil tape" with cells of such a high current capacity severely limited their output. When I switched over to 10 AWG bare copper, I was amazed at how much more current I was able to get out of them. Be sure to use an equally beefy wire from the panel to the charge controller.
2. CRITICAL: Be EXTREMELY careful about soldering -- \*DO NOT\* keep the soldering iron on the cell any longer than absolutely necessary; if you leave it on there for too long, the cell will short-circuit itself internally and die. Result: wasted money and disappointment.
3. If you don't have a DVM (digital volt meter), GET

ONE that's capable of reading 10 amps or more, then before you start wiring the cells together, test each one in full, bright sunlight. Check both the voltage and the current; each cell should put out upwards of 0.5 volts at 1.8 amps or more. After you solder a pair of cells together, check them again, both individually and in series. The current should be approximately the same and the voltage should be roughly doubled, i.e., 1.0 to 1.6 (or more) volts. Once you have a string of cells wired together, test the whole string. The point of all this is to ensure you don't end up with a dead cell due to overheating with the soldering iron. No matter how careful you are, there's always a chance that you'll blow a cell or two along the way.

4. I built four wooden frames and used tempered glass to cover them. I used ordinary window glazing compound to seal the glass against the frame; if you ever need to get to the cells in the future, the glazing compound will release the glass without too much effort. Be sure to provide a couple of holes in the back so the whole thing can "breathe", otherwise you'll be surprised how quickly condensation will form on the glass.
5. Speaking of condensation, I'd love to hear some comments on this phenomenon. I had one my panels positioned near a guard rail on my deck which cast a shadow over several cells. After 20 minutes or so, I noticed condensation building up on the glass, directly over the shadowed cells! I could only assume that those particular cells were heating up and sinking more current than they were putting out, though I didn't notice any appreciable decline in the panel's output. Strange! I now avoid shadows like the plague and my panels seem to be happy about it.
6. The WB-28 cells are VERY delicate so handle them carefully, and once they're mounted in a frame, be careful with them outdoors particularly on windy days. I had one panel perched rather precariously on the deck when a gust of wind came along and knocked it down. I cringed and said several prayers for its survival, but the sound of broken glass rang clear as I picked up the panel. The tempered glass survived the fall, but most of the cells shattered into a million pieces. Having lost a quarter of my power generation capability, I decided to build a wind turbine rather than replace the panel.

Hope that helps!  
ChrisW

Re: Building a Solar Panel ([none / 0](#)) (#4)  
by converseur on Mon Nov 24th, 2003 at 07:02:59  
PM MST  
([User Info](#))

hello Chris,

I have an excellent power system of 4 Trace SW5548 that I have rebuilt and I raised my battery bank to 2400 amps. I would like to run it wholly from renewable energy. Solar energy represents the best choice but it is totally unknown here in Canada. I have thought building my own solar panels. If possible I do not want to begin from scratch. I saw on sunelectronics website ``sunelec.com that they have off spec multicontact connector 75 watts panel 23V at 1.53D/W or \$115.00 that need to be framed. Could you confirm that at 23v there is nothing can done? And what about the price, that's only half price? too expensive? Any suggestions for plan over 20 panels?

[ [Parent](#) ]

[Building a Solar Panel](#) | 4 comments (4 topical, 0 editorial)

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## [Carrizo super gold spec sheet and wiring information](#)

By [ADMIN](#), Section [Homebrewed Electricity](#) [Solar](#)

Posted on Fri Oct 24th, 2003 at 10:37:22 AM MST

We had an email requesting information on old Carrizo panels, and I was able to dig the info up out of my files.

These panels were removed from service at the Carrizo power plant in California about 10 years ago, so as such they had no manual with them. I was actually able to dig up the original literature that came from the surplus distributor; I still run a pair of 4-panel Carrizo sets.

The biggest thing to be alert for---most of these panels were low voltage, and made to be used in "quadlams" or "trilams"---sets of 4 or 3 panels wired in series to get 12v. So if you have only one panel, your first step is to take a voltmeter and measure the output voltage in full sun. If the panel is intended to stand on its own for 12vdc, you should see 17-22v from it--this would be one of the carrizo 12v conversion panels, which were uncommon and more expensive. If you see 4-6v, then it's intended to be part of a multi-panel set....probably 4 panels.

Since I thought this info might be useful to others too, I put the scans of the literature I got with my Carrizos years ago up on our website...hope it helps. Also, my panels came with no frame; I acutally had to build a wooden frame to hold the glass laminate sheets.

One of the scans is pretty marginal, but the durn thing was printed on gold-colored paper!

Spec sheet:  
<http://otherpower.com/images/supergold.jpg>

Wiring / installation info:  
<http://otherpower.com/images/carrizo.jpg>

Cheers -- thought this might be useful to folks out there.

DANF

[Carrizo super gold spec sheet and wiring information](#) | 0 comments (0 topical, 0 editorial)

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### [Mixing solar panel types](#)

By [Quigs](#), Section [Homebrewed Electricity](#)

Posted on Fri Oct 24th, 2003 at 12:08:39 AM MST

[Solar](#)

I currently have an array of six BP Solar 75 watt panels.

Now I have the opportunity to obtain several 60 watt panels of another type, not free but very cheap. Is there any inherent difficulty in mixing the array? The new panels claim a similar open voltage, but they are of a different crystalline type, judging from their appearance. Any comments appreciated.

Quigs

[Mixing solar panel types](#) | 3 comments (3 topical, 0 editorial)

Re: Mixing solar panel types ([none / 0](#)) ([#1](#))  
by [wpowokal](#) on Fri Oct 24th, 2003 at 04:22:23 AM MST  
([User Info](#))

Quigs, from one who does it, mix and match till your hearts content.

If you are putting panels in series then keep the same wattage in each series (or the lowest rating will prevail), but beyond that go for it.

regards Allan

Re: Mixing solar panel types ([none / 0](#)) ([#2](#))  
by [TomW](#) on Fri Oct 24th, 2003 at 06:18:25 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

I agree 100% with Allan on this. You should have no problems whatsoever. If you mix wattage units in a series string you will only get the current out equal to the lowest rated panel and even that would do no harm just lose output amps.

Hope you get a great deal because solar is so reliable here I would glom onto all I could find cheap. Retail is just so expensive on panels.

Well, off to get some more of that "free" firewood thats my real AE / RE here.

Always feel better when there are a few billion BTUs in the woodshed awaiting the combustor. And, as anyone who burns wood for heat know, its free. Of course thats after you own the saw, the woodstove and retrieval equipment.

Cheers.

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TomW

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Re: Mixing solar panel types ([none / 0](#)) ([#3](#))  
by Seth on Fri Oct 24th, 2003 at 10:42:57 AM MST  
([User Info](#))

Im mixing 2 75W(Photowatt) and 1 100W(seimens) pannels, they are in parrellel.. so no problems at all so far... been three months.... and now i have a mppt on the way from outback power systems MX-60. =-)

[Mixing solar panel types](#) | 3 comments (3 topical, 0 editorial)

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## [Solar Garage!](#)

By [camp185](#), Section [Homebrewed Electricity](#)  
 Posted on Tue Oct 21st, 2003 at 12:06:11 AM MST

[Solar](#)

Quest For The Solar Garage!

Quest For The Solar Garage!

Starting to love the RE stuff. I have been doing a ton of reading, a ton of playing, and a ton of smiling while my wife rolls her eyes at me when I start a new project. I have been playing around with the wind turbines, but San Jose Ca. just isn't the greatest place. Especially when you live in the middle of suburbia. So I wanted to do something to produce electricity.....

Timing being everything, it was my birthday a couple of weeks ago. I hinted for Radio Shack gift certificates, and little links for what I may need. I got a 15 watt 1 amp solar panel with 7 amp charger. Radio Shack is probably not the best place to buy a solar panel, but it's easy for friends to get gift certificates there:). Anyhow, my total cost: \$0.

Battery...I own my own business. I sell safety products, and one of my customers sells RV batteries. A little barter, and I walked out with a 175 amp battery. Just a little more than I expected...nice guy. Price: Not what it would usually cost.

Inverter...Walgreens special, 400 watt continuous, 800 watt max...\$39.95. It uses .6 amps while it on. Is that good?...bad? I don't know.

Anyhow, I simply connected my garage lights to the inverter, making the switch on the inverter as the light switch. I have two 37 watt flourescents and one 15 watt. I also have my computer monitor hooked up to it as well. A while back I hooked up an old computer in my garage networking it. It turns out to be one of the greatest things. I got tired of running back and forth from my office in the house to the garage all of the time looking up directions on how to build something.

In the future I plan on adding another panel but something with a lot more bang for the buck. I want to have my whole garage powered. I would love to have the garage door, the water softner, and sprinklers all running off RE.

Having fun with Renewable Energy, and Love OtherPower.com.

Mr. Rob

[Solar Garage!](#) | 5 comments (5 topical, 0 editorial)

Re: Solar Garage! ([none / 0](#)) ([#1](#))  
 by JW on Tue Oct 21st, 2003 at 08:13:12 AM MST  
[\(User Info\)](#)

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camp185,

nice little write up there, priceless. It feels good to make your own power and give's you a sense self of security. I survived Hurricane Andrew, even though my erges to produce AE started before then. currently I am managing a 3000-watt 12v input 120vac output inverter. We had to run our refrigerators with gasoline powered AC generators, following the moring after, the entire grid system was destroy'd, it took a full three full months for the local utility to get power back to our house. from hind-sight, it would have been nice to be as hurricane prepared as the family is today.

-JW

Re: Solar Garage! ([none / 0](#)) (#2)  
by TomW on Tue Oct 21st, 2003 at 08:51:57 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Mr. Rob;

Hey, you stole my idea! [just kidding].

I don't live in hurricane country but I do live in tornado and ice storm country. Equally as devastating at times to the power distribution infrastructure.

I have converted about 80% of my office / shop area to solar. It does not run freezers, refrigerators, etc. It does, however, run most of my personal entertainment, tools, communications and computer gear. Far from off grid in this all electric home we have but a step in the right direction, I believe. It makes you feel you are a part of the solution rather than a part of the problem. My link below has info on my system if you are interested. It includes 5kw of inverters, 1300 Amp Hours of battery storage and 300 watts of solar.

I think converting one "area" at a time is a fine way to get started without a lot of cash.

One point I would like to raise is that it is a whole lot easier to conserve a kilowatt hour of power than it is to produce it. By eliminating those incandescent light bulbs that should actually be marketed as heaters that produce a bit of light you have saved lots of energy that goes up in heat you usually don't need.

I simply wired certain circuits of my office / shop area to plugs which I plug into either my inverter[s] or the grid connected socket near the inverters depending on battery state of charge, etc. This makes it very easy to run certain parts of my area on either RE or grid power without expensive systems and devices. So far so good.

Another point i must make:

Beware! This stuff is highly addictive and as far as I know there is no intervention system in place for the RE addicted.

Cheers.

TomW

[Stuff I have Online](#)

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Re: Solar Garage! ([none / 0](#)) ([#3](#))  
by JW on Tue Oct 21st, 2003 at 09:15:59 AM MST  
([User Info](#))

Tom W,

LOL, That's AE. This reminds me of that movie MR. MOM, especially the part where the guys wife's boss visits the house, and says to the husband oh I see your doing some rewiring here on this wall. And the husband replie's as he pulls up his pants. ya, doing some home improvement here between this room and that one there, the wife's boss chimes in, oh, ya, gonna re-wire with 220, and the husband reply's YAaaa, 220 221 "whatever it takes"

AE , RE blaa bla blaa...

-JW

[ [Parent](#) ]

Re: Solar Garage! ([none / 0](#)) ([#4](#))  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Tue Oct 21st, 2003 at 01:22:03 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

> two 37 watt flourescents and one 15 watt. I also have  
> my computer monitor hooked up to it as well.

Sounds like about 120watts of stuff running off of the inverter. that would be more than 12 amps draw off of your battery (all on same time), with only a 1 amp solar panel charging the battery for 7 hours in a day.

Nice battery but it would be wise to add more solar panels. I have exactly the same setup here with a 12vdc 7watt flourescent and a 7 watt 12 vdc fan as the only loads (1.2 amps all on same time), and I run outta power frequently.

. >=- W o o f -=<

Re: Solar Garage! ([none / 0](#)) ([#5](#))  
by camp185 on Wed Oct 22nd, 2003 at 08:44:39 PM MST  
([User Info](#)) <http://www.bestwebimage.com>

I would love more power...I would also love more money. The way I have it set up right now actually seems to work out. I don't work in the shop every night so it looks like it's going to balance out ok the way I have it set up. Maybe for Christmas I'll put in a request for a 75-100 watt panel. It's the gift that keeps on giving!. I would love to open that garage door opener with solar.

[ [Parent](#) ]

[Solar Garage!](#) | 5 comments (5 topical, 0 editorial)

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[Any plans for junction boxes](#)

By [jtb701](#), Section [Homebrewed Electricity](#)  
 Posted on Sun Oct 19th, 2003 at 06:32:49 PM MST [Solar](#)  
 I've got solar panels but no junction boxes

Has anyone got plans for junction boxes and frames for solar panels? I thought I remember reading about using heavy duty speaker terminals reclaimed from higher end stereo components and dismantling and resizing aluminum storm window frames. The panels are approx 51x13inch Seimens 50 watters that I plan use for power. They have 2 tin strips apiece on either end and I would like to possibly set the junction boxes up so as I add panels the junction boxes parallel together. While ultimately the panels will remain outside, initially they will be removable for use in remote locations. Thanks in advance for any help. I have learned a lot since I found this site.

[Any plans for junction boxes](#) | 2 comments (2 topical, 0 editorial)

Re: Any plans for junction boxes ([none / 0](#)) (#1)  
 by [josephcrawley](#) on Mon Oct 20th, 2003 at 08:17:04 AM MST  
[\(User Info\)](#)

I used those metal studs they use in home construction and I glued the panels to them with some liquid nails like glue. They've been together for about 6 months which isn't that long for a solar panel so not to sure how they'll do in the long run.

Joseph

Re: Any plans for junction boxes ([none / 0](#)) (#2)  
 by [jubalearly](#) on Tue Oct 21st, 2003 at 01:27:20 PM MST  
[\(User Info\)](#)

jtb, I would simply look on the panal manufacturers web sites. Surely some of the solar panel manufacturer's have a drawing of the JB's they are using. Also, Homepower magazine undoubtedly has pictures of a number of these. I would simply use a waterproof box the size of a receptacle box with whatever terminals are convenient in it. Two screw terminals are all you really need.

[Any plans for junction boxes](#) | 2 comments (2 topical, 0 editorial)

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## [Making solar cell and inverter](#)

By [robp](#), Section [Homebrewed Electricity](#)

Posted on Sat Oct 11th, 2003 at 01:05:32 PM MST

[Solar](#)

Making solar cell and inverter

<http://cgi.ebay.com/ws/eBayISAPI.dll?ViewItem&category=3240&item=2351985714>

Anyone try this ? Any comments ?

I have not connection to the seller.

Thanks, Rob

[Making solar cell and inverter](#) | 13 comments (13 topical, 0 editorial)

Re: Making solar cell and inverter ([none / 0](#)) ([#1](#))  
by [ThomasK](#) on Sat Oct 11th, 2003 at 03:51:37 PM MST  
([User Info](#))

Hi Rob,  
My opinion to this is:  
Don't give a Damn to it.  
Because I've tried to find Inverter Info (DIY...a.s.o.) in the net but found most such things like...aaroncake... not really a solution. I've want to have really good solutions. 'Bout the solarpanels it is the same. All sh.. !  
Greez Thomas

Re: Making solar cell and inverter ([none / 0](#)) ([#2](#))  
by [Tom in NH](#) on Sat Oct 11th, 2003 at 07:47:19 PM MST  
([User Info](#))

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- [More on Solar](#)
- [Also by robp](#)

I don't know much about inverters, and less about that CD on ebay, but have you seen the inverter plans that appear at:

<http://www.theverylastpageoftheinternet.com/forsale/plans/inverter/inverter.htm>

Often you see reports of make-your-own solar cells that are based on the copper oxide method where you basically heat a piece of copper until it starts to oxidize. I haven't actually tried making these kinds of cells, but I understand their low efficiency would pose problems for people who want to power their house with them. You would need acres of them to do it.

-Tom

Re: Making solar cell and inverter ([none / 0](#)) ([#3](#))  
by Budgreen on Sat Oct 11th, 2003 at 09:33:25 PM MST  
([User Info](#))

those linked plans (theverylastpageoftheinternet) should work fairly well for diy power  
only drawback is the lack of efficiency and output waveform. I currently have a project going and using bits of the final output section schematic to make a sinewave inverter

[ [Parent](#) ]

Re: Making solar cell and inverter ([none / 0](#)) ([#6](#))  
by RobD on Sun Oct 12th, 2003 at 08:56:27 AM MST  
([User Info](#))

Quickly looking at these plans I see some problems.  
Because of the low frequency the transformers will get very hot due to saturation and secondly the transformers would be expensive. More expensive then buying a cheapo 700 watt inverter for \$75.00 that would work better.

[ [Parent](#) ]

Re: Making solar cell and inverter ([none / 0](#)) (#7)  
by ThomasK on Sun Oct 12th, 2003 at 12:44:03 PM MST  
([User Info](#))

Hello Tom in NH,  
Thank you for the link with the inverter.  
This seems a bit underdesigned for 1000 VA but it is an Idea to follow on.  
I´m in a Project for myself which is about to compare some Designs and put  
the best together for a Inverter.  
I hope by the end of the Year i´m come to some results.  
By the way, does anybody of you know some DIY plans for a sinewaveinverter?  
Greez Thomas

[ [Parent](#) ]

Re: Making solar cell and inverter ([none / 0](#)) (#8)  
by LowTechWreck on Mon Oct 13th, 2003 at 07:03:14 AM MST  
([User Info](#))

I built this one.

[http://zephyrgennys.tripod.com/tony\\_van\\_roon\\_inverter.doc](http://zephyrgennys.tripod.com/tony_van_roon_inverter.doc)

It doesn't work.  
Hardly any way to screw it up.  
\*\*\*\*\*

I have ordered the parts for this one:

<http://www.uoguelph.ca/~antoon/circ/555dcac.html>

Looks more promising.

[ [Parent](#) ]

Re: Making solar cell and inverter ([none / 0](#)) (#9)  
by ThomasK on Mon Oct 13th, 2003 at 12:31:52 PM MST  
([User Info](#))

Hello LowTechWreck,  
Thanks for Your reply, the first link is what i´m call No solution,  
the second is also not so sophisticated except for the part which  
forms  
the sinewave - I´ve got to try it.  
Thankyou and Greez  
Thomas

[ [Parent](#) ]

PARTS ([none / 0](#)) (#10)  
by LowTechWreck on Wed Oct 15th, 2003 at 07:01:36 AM  
MST  
([User Info](#))

<https://www.alliedelec.com>  
862. -6040 381LX272M063J032 \$4.530 2700uf cap  
236. -0308 NE555N \$0.180  
935. -1235 NTE196 \$2.590  
935. -6072 NTE197 \$2.500  
619. -0505 600502F00000 \$61.540 heat sink from HELL  
\*\*\*\*\*  
[www.coilws.com](http://www.coilws.com)  
1uh 1-25 amp coil \$6.00

[ [Parent](#) ]

Re: Making solar cell and inverter ([none / 0](#)) (#4)  
by Norm on Sun Oct 12th, 2003 at 07:32:13 AM MST  
([User Info](#))

My opinion, based on what I've read here on the board is to buy a bunch of solar cells fairly cheap and stick em in an oven with solder and connect them all together. Seems like someone posted about this about a month or so ago with larrge pics...seemed like he was quite sucessful with it. Maybe the author can step right in and clue us in again? (:>) Norm.



Re: Making solar cell and inverter ([none / 0](#)) ([#5](#))  
by Norm on Sun Oct 12th, 2003 at 08:05:59 AM MST  
([User Info](#))

I guess it was you Andrew....

<http://www.fieldlines.com/story/2003/8/21/24644/7612> ....and there it is that large pic again that was the only thing...it slowed this old computer of mine to a crawl but I don't mind the content is all that really matters and it would be nice to go into very detailed explanation on how you do this...Thanks (:>) Norm.

[ [Parent](#) ]

Re: Making solar cell and inverter ([none / 0](#)) ([#11](#))  
by ThomasK on Fri Oct 17th, 2003 at 12:14:08 PM MST  
([User Info](#))

Hello LowTechWreck,  
Thanks for the partslist.  
But i´m dont need it because where i´m at work i´m have access to some Material for cheap.  
Greez Thomas

Major INVERT ([none / 0](#)) ([#12](#))  
by LowTechWreck on Sat Oct 18th, 2003 at 03:40:13 AM MST  
([User Info](#))

WOW!

[http://www.schmitzhouse.com/Johns\\_Electronics\\_02.htm](http://www.schmitzhouse.com/Johns_Electronics_02.htm)

Re: Major INVERT ([none / 0](#)) (#13)  
by ThomasK on Sat Nov 15th, 2003 at 05:27:12 PM MST  
([User Info](#))

Hello LowTechWreck,  
Thank You Very Much,  
Thats really WOW!!!!!!!!!!!!!!!!!!!!!!  
I`ve been some time off  
Now I`m on again.  
Thanks  
Thomas

[ [Parent](#) ]

[Making solar cell and inverter](#) | 13 comments (13 topical, 0 editorial)

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[10 watts of Joy](#)

By [Andrew](#), Section [Homebrewed Electricity](#)

Posted on Mon Oct 6th, 2003 at 12:17:42 PM MST

[Solar](#)

First Panel Up!!! Homemade!!!

HI!!!

10 watts doesn't seem like much, but when one builds it from a chunk of aluminum, some fiberglass and a handful of solar cells, it really means a lot!!!

Those Silicon Solar cells I posted about a while ago finally got put to use! After a day's worth of machining, etching copperclad fiberglass, and a whole lot of soldering, the panel is complete. It is sitting in the sun right now, charging my batteries, and running a small portable tv.

I used the technique I explained a couple of posts back about copperclad pcb solar panels. It turned out to work very well! I made little 1 volt 2 cell boards, and then epoxyed them on the the machined aluminum, and soldered them all together without putting any stress at all on the cells. Not one cracked, and all are performing flawlessly! I will have pictures shortly.

Hopefully more of these to come!!!

Already have over \$400 in the solar panel budget. By this time next year, my whole house will be off grid!

-Andrew

[10 watts of Joy](#) | 6 comments (6 topical, 0 editorial)

Re: 10 watts of Joy ([none / 0](#)) ([#1](#))  
by troy on Mon Oct 6th, 2003 at 03:10:26 PM MST  
([User Info](#))

Wooo hooo, go Andrew!

I don't care if they're commercial or homebrew, electricity from the sun is just fundamentally better than electricity from dinosaurs.

I have two 110 watt panels now and plan to add six more next year.

Best regards,

troy

Re: 10 watts of Joy ([none / 0](#)) ([#2](#))  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Mon Oct 6th, 2003 at 04:22:22 PM MST  
([User Info](#))

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Well, after almost a day worth of charging, I decided I need two more cells to get in the peak power range... The panel voltage is just a shy low, so I am not getting full current. I was having fun lighting up small halogens, and florescents. It was kinda weird running the inverter directly off the solar panel, as it would just shut off if the current was to high, because the panel went under voltage. Luckily it was a nice sunny day, so I got a lot of use already.

When I find the usb cord to my digital camera, I'll upload the pictures.

You should look at the fiberglass mounting idea... It really works out great!

-Andrew

[ [Parent](#) ]

Re: 10 watts of Joy ([none / 0](#)) (#3)  
by sean on Mon Oct 6th, 2003 at 04:59:22 PM MST  
([User Info](#))  
<http://homepage.ntlworld.com/s.amesbury/homepage.htm>

Hey 10 watts is 10 watts!!! And im only using a 15w panel but when the suns out its a superb battery charger. Where did you get your cells from? And how much cheaper did it work out building it yourself? And how big is the panel? Sorry for all the questions but im into solar if it can be made cheap enough. Well done though andrew and getting off the grid is something i just dream off but im so limited with space and solar is so expensive in the uk i just keep dreaming.....one day it may come true.....sean

Re: 10 watts of Joy ([none / 0](#)) (#4)  
by Tom in NH on Mon Oct 6th, 2003 at 10:58:03 PM MST  
([User Info](#))

Way to go! I'm eager to see the photos. What do you think one might draw from your technique that would be applicable to larger installations of hundreds or thousands of watts?

I'm looking for ways to streamline building of 100 watt panels which actually are only 87 watts in full sun, less if they're not aimed right, but you probably already know how that goes.

Tom

Re: 10 watts of Joy ([none / 0](#)) (#5)  
by johnjach on Tue Oct 7th, 2003 at 07:54:16 AM MST  
([User Info](#))

I appreciate the photos of your fine work. Are you or anyone else out there familiar with a website called [www.knowledgepublications.com](http://www.knowledgepublications.com) ? This author claims there are many sources for getting used solar cells for free. He said some of these sources would include local governmental agencies such as public works departments, county and state highway departments and the like. Any truth to all of his claims?  
I would buy his book if I knew his claims were true.

Re: 10 watts of Joy ([none / 0](#)) (#6)  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Tue Oct 7th, 2003 at 10:01:01 AM MST  
([User Info](#))

Well, I left my usb cable in wisconsin somewhere, so I am heading to the computer store to get another one... Photos will be posted today.

As for getting solar cells and panels for free, I doubt it. You can get old highway sign panels for cheap, but not free. Gov. auctions rarely have that stuff here. (Mostly old cars, and furniture)

Also, I just bought 36 cells from silicon solar. I think they are 0.5v @4.5A peak power  
5A short circuit. It was pricy, but the total for a 120 watt panel with shipping, and materials is only \$220. Thats about %40 less than the cheapest panel I could find. (Astropower 120, at \$410)

The link for the cells is: <http://www.siliconsolar.com>

Now to answer the other questions...

For mounting the cells on fiberglass, I did have much success. It seemed quick, and less stress on the cell the bare soldering. (I use the analogy of soldering to a potato chip) I would etch the boards, apply solder paste, and lay the cells on. Cook in a (toaster over :) ) and let the solder paste flow. This would pull all the cells in alignment because of the surface tension, and it didn't require any manual handling of the cells. Once the cells were mounted on the fiberglass, I would then solder to the surface contacts, since they are now a lot more rigid. You can see this on the pictures.

As for trying to mass produce this, I haven't tried big cells yet, but it seems that everytime I use bigger cells with this method, it gets harder to lay them correctly, etc. You could give it a try, as I had nothing but success so far.

If that doesn't work, I know solar companys use this method sometimes: Lay the cells on a sheet of teflon, solder all top contacts, lay teflon sheet on top, and flip, solder all bottom contacts, flip again, cover entire set with epoxy, (like a mold) and then mount in aluminum case, and add more epoxy.

-Andrew

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### [New and cheaper Solar Cells](#)

By [wdyasq](#), Section [Homebrewed Electricity](#)

Posted on Thu Oct 2nd, 2003 at 06:44:24 PM MST

[Solar](#)

\$0.20 a Watt?

<http://www.st.com/stonline/press/news/year2003/t1355h.htm>

STMicroelectronics, Europe's largest semiconductor maker, said that, by the end of next year, it expected to have made the first stable prototypes of the new cells, which could then be put into production.

~~~~~

Following that, ST and others would need to develop production technologies to make solar cells and panels in large quantities to achieve the \$0.20 per watt target, he said.

"Our target is fixed at \$0.20," said Coffa, who expects no major technological difficulties in going from prototypes to mass-produced commercial products.

~~~~~

Let the fun begin....

Ron

[New and cheaper Solar Cells](#) | 8 comments (8 topical, 0 editorial)

Re: New and cheaper Solar Cells ([none / 0](#)) ([#1](#))  
by Tom in NH on Thu Oct 2nd, 2003 at 11:07:39 PM MST  
([User Info](#))

This will be interesting to follow. I heard, but don't know if it's true, that there is only one manufacturer in the country (AstroPower) that is not owned by oil companies. Thinking about this plus the high price for photovoltaics, it kinda makes you wonder doesn't it. 20 cents a watt, if it comes to pass, will certainly shake things up. --Tom

Re: New and cheaper Solar Cells ([none / 0](#)) ([#6](#))  
by Bach On on Fri Oct 3rd, 2003 at 05:32:28 PM MST  
([User Info](#)) [change AT: bach\\_on AT hotmail.com](#)

Remember gas wars? The oil/gas companies hated those. Think what will happen when/IF a manufacturer finally breaks through the price barrier with a low cost panel. We might have watt war. That would do my heart good!

Bach On

- I'm just as happy as if I had good sense! -  
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Re: New and cheaper Solar Cells ([none / 0](#)) (#2)  
by sean on Fri Oct 3rd, 2003 at 01:42:04 AM MST  
([User Info](#))  
<http://homepage.ntlworld.com/s.amesbury/homepage.htm>

Theres been the promise of cheaper solar cells for the past couple of years at least but i havent heard of 20 cents per watt.Im sure its possible to make cheaper pv's now after all there seems to be enough folks researching it, maybe it will happen in the near future its been long awaited.....sean

Re: New and cheaper Solar Cells ([none / 0](#)) (#3)  
by bob golding ([yubba at clara dot net](#)) on Fri Oct 3rd, 2003  
at 03:31:18 AM MST  
([User Info](#))

there was a very good article in new scientist magazine sometime this summer about the technology used to make solar cells. cant find it a the moment but the jist of it was to try and reduce the cost of heating the silicon which is far and away the most expensive part of the process. if anyone is really intersted you can subscribe to thier archive for a week and look it up.

bob

Re: New and cheaper Solar Cells ([none / 0](#)) (#8)  
by troy on Sat Oct 4th, 2003 at 04:16:20 PM MST  
([User Info](#))

Yes, I did some reading on Evergreen (the continuous draw process, not ingots) and tracked down prices. At the time they cost more than the premium Shell solar panel. Maybe someday cheaper, maybe not. If you look back over the literature, there have been many promises of drastic price drops as the technology advances.

Unfortunately, there haven't been any dramatic breakthroughs yet. But I am still hopeful, as humans are endelessly inventive.

On the bright side, panels in large quantity have stayed around \$4.00 a watt for almost a decade, while modest inflation has made those dollars cheaper, effectively reducing the cost per watt by a third in one decade. So I'll take progress at whatever speed I can get it, incremental or breakthrough.

Best regards,

troy

[ [Parent](#) ]

Re: New and cheaper Solar Cells ([none / 0](#)) (#4)  
by RogerAS ([rogeras@cei.net](mailto:rogeras@cei.net)) on Fri Oct 3rd, 2003 at  
09:22:55 AM MST  
([User Info](#))

Hi All,

There was also an article in Homepower magazine about some company using a new technique to continuously draw out the silicone so that production was several orders of magnitude quicker. I don't remember which issue, but I'll look into it and see if I can find it.

RogerAS  
"Put the bunny back in the box!"

Re: New and cheaper Solar Cells ([none / 0](#)) (#5)  
by yossarian on Fri Oct 3rd, 2003 at 05:04:03 PM MST  
([User Info](#))

I heard, but don't know if it's true, that there is only one manufacturer in the country (AstroPower) that is not owned by oil companies

Evergreen solar is independent (they're the ones with the continuous process), but it seems like they are more interested in licensing their technology than producing panels. Kyocera and Sharp make panels and they aren't controlled by oil interests.

I really don't think that Shell and BP are interested in holding their own prices higher or stifling the industry, anyway. I saw a BP executive on tv a while back. He said the days of oil were limited and BP is transitioning into an energy company. Solar panels, hydrogen, biodiesel, whatever, they'd sell whatever can make a profit.

Re: New and cheaper Solar Cells ([none / 0](#)) (#7)  
by Demetri ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Fri Oct 3rd, 2003  
at 10:06:40 PM MST  
([User Info](#))

I would also wonder, is that \$.20 a watt the end product going to consumers, or to manufacture?

Demetri  
Always be the lead dog.

[New and cheaper Solar Cells](#) | 8 comments (8 topical, 0 editorial)

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## Solar Panel

By [Frank Lussier](#), Section [Remote Living](#)

Posted on Mon Sep 29th, 2003 at 11:30:52 AM MST

None

[Solar](#)

Hi

I just finished building a warm air solar panel for my house.

I used 2x6 treated lumber for the box with 2- 2" holes on the bottom and the top, 1/4" plywood for the back, 2" Styrofoam insulation, 230 pop cans cut off the top and the bottom, 4'x7' thermal glass (patio door), I have 11 of them in my barn and a computer fan 5 inch square.

My first test was on a cloudy day, the temperature outside was 66°F and the temperature of the panel was 158°F not bad, this afternoon the temperature outside is 68°F and sunny and the temperature of the panel is 254°F. The panel is so hot the insulation is melting.

What can I put on the isolation to prevent melting?

Here are some pix



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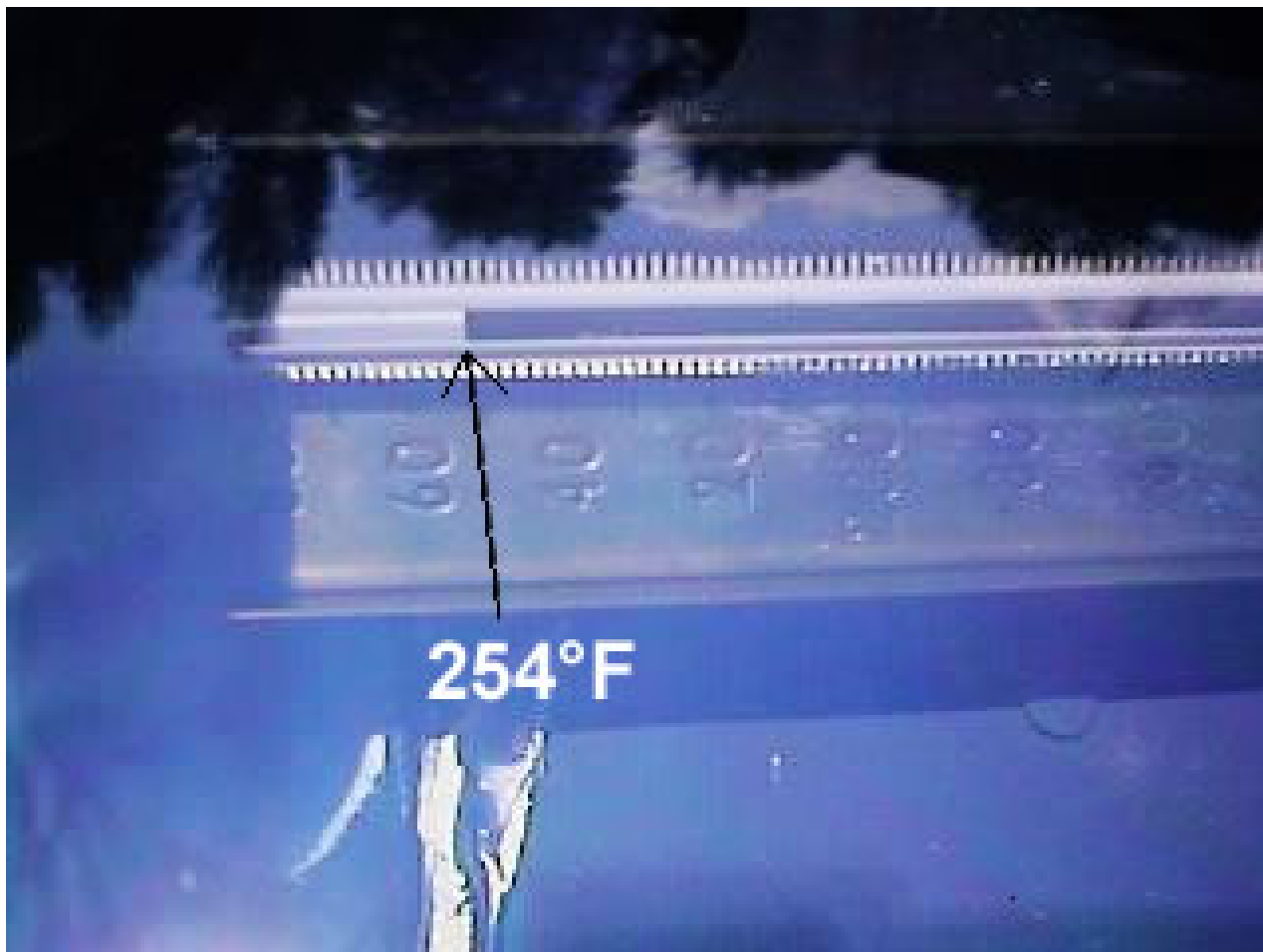












This website is amazing a lot of info a lot to learn.

Thanks  
Frank

[Solar Panel](#) | 28 comments (28 topical, 0 editorial)

Re: Solar Panel ([none / 0](#)) (#1)  
by Budgreen on Mon Sep 29th, 2003 at 11:59:42 AM MST  
([User Info](#))

have you tried a more powerfull fan to circulate out the hot air faster? sounds like a safe bet to me. maybe also some larger holes > 2.5"

Re: Solar Panel ([none / 0](#)) (#3)  
by Mike Wolak on Mon Sep 29th, 2003 at 12:50:28 PM MST  
([User Info](#))

Just wondering, the cans ends are removed and lined up to be a tube? The cans are mounted how? The bottom and top of the unit have a gap a can length this is where the in out holes are? The fan is sucking out or pressurizing in? Please more details on construction.

[ [Parent](#) ]

Re: Solar Panel ([none / 0](#)) (#5)  
by Frank Lussier on Mon Sep 29th, 2003 at 01:20:40 PM MST  
([User Info](#)) <http://www.fludan.com>

Just wondering, the cans ends are removed and lined up to be a tube?  
yes

-The cans are mounted how?  
the cans are mounted in place with 1 inch shingle nails - pushed by hand-it's quite easy

The bottom and top of the unit have a gap a can length this is where the in out holes are?

-approx 1 1/2 can length and yes that is where the inlet and outlet are.

The fan is sucking out or pressurizing in?  
-it is pressurizing in

Please more details on construction.

first i made a 3 sided rectangular box out of 2 x 6 lumber. i added a 1/4 plywood as the backing. i then added two inch styrofoam insulation on the top, bottom and two sides ( i nailed them in place)

I caulked all joints

I then added my cans - 260 of them! lol

for the gap i added a piece of aluminium to cover the insulation.

i then painted everything black with high temperature matt paint.

then i added my thermal window - which was already in an aluminium frame. I screwed it on top of the 2 x 6

I drilled two holes of 2" side by side on the top and bottom (next time i will cut out one rectangular hole instead)

This is my first test panel.  
Thanks  
Frank

[ [Parent](#) ]

Re: Solar Panel ([none / 0](#)) (#2)  
by Frank Lussier on Mon Sep 29th, 2003 at 12:24:39 PM MST  
([User Info](#)) <http://www.fludan.com>

have you tried a more powerful fan to circulate out the hot air faster? sounds like a safe bet to me. maybe also some larger holes > 2.5"

yes I just installed a 300 cfm fan and it brought down the temperature to 100 °F  
but now i have to replace all the styrofoam because it's all melted lol!  
boohoo. I was expecting a moderate to good temperature not 254 °F i got..i could bake a cake in it.

Thanks for your suggestion - it works

Re: Solar Panel ([none / 0](#)) (#4)  
by troy on Mon Sep 29th, 2003 at 12:57:41 PM MST  
([User Info](#))

Styrofoam can't take the heat, as you know first hand. There is another kind of foam that is widely available and can stand heat in the 250+ range. One brand is Thermax. You can recognize it at the lumber yard because it is a dirty brown or yellow foam with a much finer "grain" than beaded styrofoam. It also typically has some kind of foil on both faces. I want to say it is isocyanurate foam, but I'm not totally sure on that.

I used it on a solar oven that routinely hits 300F no problem and the foam's still fine.

Don't depend on high air flow alone to solve the foam problem, because invariably, the fan will get unplugged or you'll have a brief power outage at just the wrong time and poof, melted foam.

Good luck and have fun!

troy

[ [Parent](#) ]

Re: Solar Panel ([none / 0](#)) (#6)  
by Frank Lussier on Mon Sep 29th, 2003 at 01:23:38 PM MST  
([User Info](#)) <http://www.fludan.com>



Thanks for the info...i will be looking for that stryfoam. I tried first with all the scraps i had around the house and now i know the household styrofoam doesn't work lol.

Frank

[ [Parent](#) ]

Re: Solar Panel ([none / 0](#)) (#11)  
by Norm on Mon Sep 29th, 2003 at 06:24:17 PM MST  
([User Info](#))

Why any kind of plastic foam at all? why not crumbled up newspapers? Thats what I've seen them use on solar cookers that boil water, funny isn't it we're so used to associating boiling water with fire or red hot heating elements and that the paper would catch on fire. Norm.

[ [Parent](#) ]

Re: Solar Panel ([none / 0](#)) (#14)  
by troy on Mon Sep 29th, 2003 at 09:40:05 PM MST  
([User Info](#))

I would be cautious about the use of paper as an insulator that is used in a solar collector hooked to your house. As paper is exposed to routine high temperatures, a process of pyrolysis changes the structure of the paper so that the spontaneous ignition temperature drops to 200-300 degrees F.

We do want to make heat, but not by burning the collector, or worse still, the house. Some claim that even wood can develop dangerously low ignition temperatures upon prolonged exposure to solar collector heat. I think that is why you never see a commercial collector made from wood. I did see a recommendation to bake a sample of your wood at 300 for a week and see if there are any significant changes, smells, color, etc just to be safe.

Food for thought anyway.

Best regards,

troy

[ [Parent](#) ]

Re: Solar Panel ([none / 0](#)) (#15)  
by Norm on Tue Sep 30th, 2003 at 07:05:13 AM MST  
([User Info](#))

Hey Troy: Thanks for the information I never realized something like that could possibly happen...once again I went typin' away and forgot to fully engage my brain...but even so someone might have tried it...now they'll know better, but I guess newspaper does work okay in an outdoor solar cooker. Sure do learn a lot from this board....don't we! Do you happen to have any good links about solar heating in this regard? Might be beneficial to all of us. (:>) Norm.

[ [Parent](#) ]

Re: Solar Panel ([none / 0](#)) (#20)  
by troy on Tue Sep 30th, 2003 at 05:58:03 PM MST  
([User Info](#))

Hey Norm!

I built a flat plate aluminum collector with pretty good results. My dad built one that used recycled aluminum beer cans with just the top cut off, with the opening facing the sun. His idea was more surface area = more heat. I was not overly impressed with Dad's design. And I ran across this design, which is intriguing because it uses furnace filter for the absorber:

<http://ww2.green-trust.org:8383/2000/solar/Homebuilt%20Collector%20Instructions.pdf>

"The collector design was tested using the ASHRAE 93-77 procedure, at Western Michigan University's Energy Learning Center (no longer operating). The result: greater than 72% maximum efficiency. This was the highest efficiency air collector they ever tested. It bettered all liquid collectors but one, which it virtually equaled. I know of no non-concentrating air collector, Conserval's SolarWall included, with higher efficiency."

Best regards,

troy

[ [Parent](#) ]

Re: Solar Panel ([none / 0](#)) (#26)  
by Gordy on Sat Oct 4th, 2003 at 07:44:39 AM MST  
([User Info](#))

For a good article on the furnace filter idea click on "more diaries" and go back to #52 Black paint on solar hot air experiment.

Speaking of filters don't forget to use one on the inlet side of your collector. Otherwise dust will start collecting on the black paint and start blocking the sun from your collector.

Gordy

[ [Parent](#) ]

Re: Solar Panel ([none / 0](#)) (#7)  
by JackS on Mon Sep 29th, 2003 at 02:05:06 PM MST  
([User Info](#)) <http://home.bresnan.net/~j3s/index.html>

I would be most interested in seeing how this is built, a drawing or a pic of how its put together would be of help.

I have spent most of the summer experimenting with solar heat and have 2 panels installed, but neither have developed such great results

JackS

Re: Solar Panel ([none / 0](#)) (#8)  
by Frank Lussier on Mon Sep 29th, 2003 at 04:50:34 PM MST  
([User Info](#)) <http://www.fludan.com>

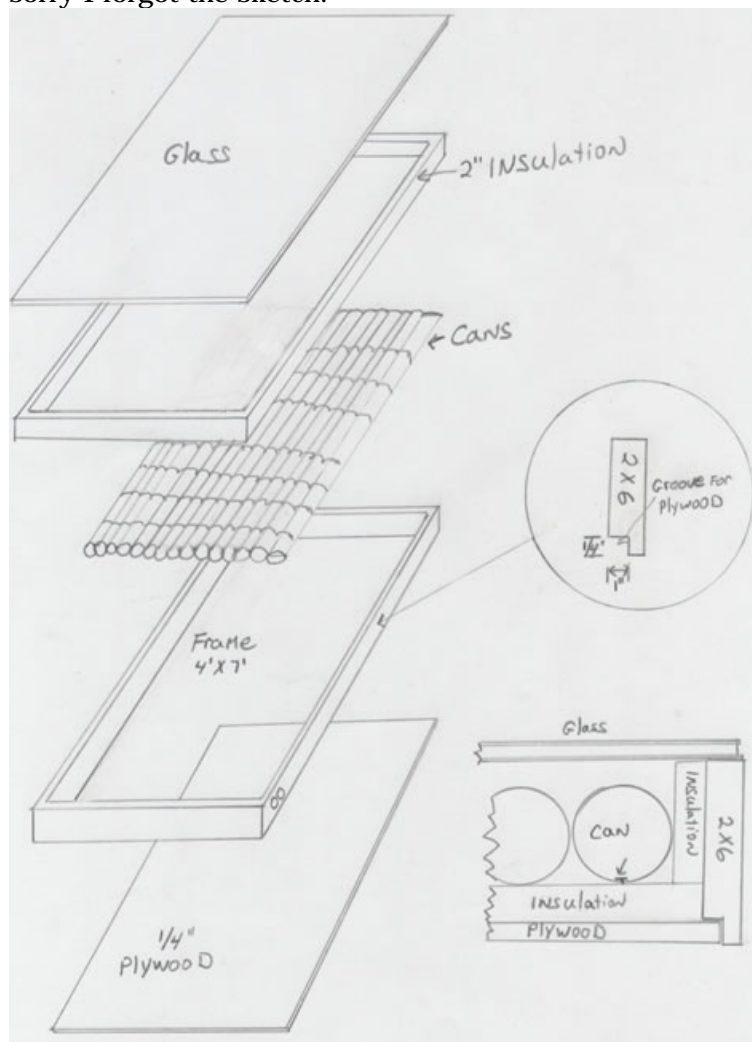
This ia a sketch of the solar panel .  
I hope this will be useful.

Frank

[ [Parent](#) ]

Re: Solar Panel ([none / 0](#)) (#9)  
by Frank Lussier on Mon Sep 29th, 2003 at 04:54:19 PM MST  
([User Info](#)) <http://www.fludan.com>

sorry I forgot the sketch.



[ [Parent](#) ]

Re: Solar Panel ([none / 0](#)) ([#12](#))  
by [pexring](#) on Mon Sep 29th, 2003 at 07:58:55 PM MST  
([User Info](#))

Frank,

I too have made a solar panel this summer, although not as big as yours. Mine is 4'x5'. I'm getting temps in the mid to lower 100's on 50 degree days. Instead of aluminum cans, I simply lined the back of the panel with aluminum sheeting and painted it black with the high-heat paint. A couple questions for you:

I assume the air simply blows over the cans? Or can it blow through them too? I then assume the air comes in contact with the glass? Did you use a single or double glass?

At first I built mine with single glass, then made it double. Got much better results with double glass. Plus I would think double glass would be crucial to help shield against the cold in the winter. I'm about ready to make another panel or two as I know where I can get some big double-glass doors.

I'm basically wondering if tin cans are really better than aluminum sheets? Except for when the sun is straight on, you'd throw a lot of shadows too, which I avoided with the flat aluminum sheeting. Maybe I should try pressurizing mine and see if I can also get the temps to build-up. That would prove whether or not cans are worth all the work.

Thanks for posting. Always great to hear other ideas.

Mark

[ [Parent](#) ]

Re: Solar Panel ([none / 0](#)) ([#13](#))  
by Reno on Mon Sep 29th, 2003 at 08:26:30 PM MST  
([User Info](#))

Can I suggest bending the sheet in a zig zag pattern  
45 degrees at the bends. This will dramatically increase  
the surface area of the collector face while not increasing  
the size of the apparatus.

[ [Parent](#) ]

Re: Solar Panel ([none / 0](#)) ([#17](#))  
by pexring on Tue Sep 30th, 2003 at 07:43:32 AM MST  
([User Info](#))

In my original design I tried a corrugated sheet of metal. The shadows became a problem, and it seemed to take forever to heat-up. Once it heated, it worked OK. I'm trying to create a solar heating panel that starts heating with the first morning sun! So far the flat black aluminum seems to work best for that.

Mark

[ [Parent](#) ]

Re: Solar Panel ([none / 0](#)) (#16)  
by Frank Lussier on Tue Sep 30th, 2003 at 07:39:06 AM MST  
([User Info](#)) <http://www.fludan.com>

Hi

Yes the air go through and over them, you can get those double glass door at any windows manufacturer, usually the are \$45 - \$75 with small defect.

[ [Parent](#) ]

Re: Solar Panel ([none / 0](#)) (#10)  
by Budgreen on Mon Sep 29th, 2003 at 05:41:46 PM MST  
([User Info](#))

quite impressive!

I was thinking of making a solar water heater to use for my garage but a design similar to this would save the trouble of making a pump and heat exchanger setup

Re: Solar Panel ([none / 0](#)) (#18)  
by Frank Lussier on Tue Sep 30th, 2003 at 07:57:28 AM MST  
([User Info](#)) <http://www.fludan.com>

I was concerned with the wood when I made this solar panel but I am going to try finding some 2x6 aluminium tracks, I bought some 2x4 aluminium studs and track for my office I hope they make the in 2x6.

Frank

Re: Solar Panel ([none / 0](#)) (#19)  
by troy on Tue Sep 30th, 2003 at 05:15:22 PM MST  
([User Info](#))



If the wooden framing members were well insulated from the hot part of the collector and none of the wood was exposed, I would take the chance on my house. I'm just not sure I would take that chance for someone else if I were a manufacturer.

Good luck and have fun!

troy

[ [Parent](#) ]

Re: Solar Panel ([none / 0](#)) (#21)  
by John D on Tue Sep 30th, 2003 at 09:54:03 PM MST  
([User Info](#))

You mentioned you were using treated 2x6. I think if you do some checking you will find there are extremely deadly chemicals used in the preservation process. When the wood is heated these chemicals can easily vaporize, mix with the air and I won't go there. Just some food for thought.

Re: Solar Panel ([none / 0](#)) (#22)  
by Frank Lussier on Wed Oct 1st, 2003 at 03:36:47 PM MST  
([User Info](#)) <http://www.fludan.com>

Hi guys

I just bought some 2x6 channels for steel stud framing and the only insulation I found was from ROXUL - it is made from nonflammable material, the max temperature is 1200°F.

I am putting the new solar panel together today, when I'm finished I will post the new pictures. They are announcing rain for the next few days. I can't wait to see how high a temperature I will get with this new panel. As soon as I get the data, I will post it.

Frank

Re: Solar Panel ([none / 0](#)) (#23)  
by JackS on Wed Oct 1st, 2003 at 04:13:50 PM MST  
([User Info](#)) <http://home.bresnan.net/~j3s/index.html>

Hi Frank

i have been busy testing solar heat too, today

i put up my old satellite dish after modifyng it and saw 370 degrees out of it, i am trying to figure out how much heat it will make while not tracking the sun and will begin testing tomorrow,

i saw 120 degees off of it while it was on the ground not pointed directly at the sun, but a couple of these position just right will provide some hot water



JackS

[ [Parent](#) ]

Re: Solar Panel ([none / 0](#)) (#25)  
by richard on Thu Oct 2nd, 2003 at 04:06:25 PM MST  
([User Info](#))

Try a ( C ) band dish. 6 or 8 ft. size.

[ [Parent](#) ]

Re: Solar Panel ([none / 0](#)) ([#27](#))  
by veewee77 on Mon Oct 6th, 2003 at 08:47:05 PM MST  
([User Info](#))

I have a c-band, 6ft spun aluminum dish that I an going to try to use like this.

How would be the best way to shine the aluminum?

DS

[ [Parent](#) ]

Re: Solar Panel ([none / 0](#)) ([#24](#))  
by Frank Lussier on Wed Oct 1st, 2003 at 04:26:28 PM MST  
([User Info](#)) <http://www.fludan.com>

cool, keep me posted.  
Frank

Re: Solar Panel ([none / 0](#)) ([#28](#))  
by Homebrewed12vdc on Thu Oct 9th, 2003 at 11:36:27 AM MST  
([User Info](#))

I have 4 of these that heat a 700 square foot building, they work well but i well give you a few pointers on better constuction. First of all I found that 2 inch copper tubes instead of cans works better, I also made my frame out of aluunim. The computer case fans work well, I have a 8 inch by 2 in slot in the bottome and top of mine, with four fans in it, this way if one fails it still has three to run on. Another thing I did which works good was a set the exterior of the top at a 70degree angle and mounted a VW solar panel wired to the fans, this way the brighter the sun, and the hotter the heater gets the more speed the fans turn on. This setup took me from 5 cords of wood 2 years ago to heat my building down to little over a cord of wood last winter. Hope this helps youout and everybody else out there who is trying to use the natural resources.

[Solar Panel](#) | 28 comments (28 topical, 0 editorial)

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[First time on new board, test PIC](#)

By [bretco](#), Section [Rants & Opinion](#)

Posted on Thu Sep 11th, 2003 at 06:07:35 PM MST

[Solar](#)

test of new user

Hi all, just trying to post a pic of my solar hot H2O panel as a test to learn how to post PICs.



[First time on new board, test PIC](#) | 7 comments (7 topical, 0 editorial)

Re: First time on new board, test PIC ([none / 0](#)) ([#1](#))  
by [WetinOR](#) on Thu Sep 11th, 2003 at 06:22:31 PM MST  
([User Info](#))

Very nice homebrew panel. Is that copper pipe or PVC?  
George

Re: First time on new board, test PIC ([none / 0](#)) ([#2](#))  
by [bretco](#) on Thu Sep 11th, 2003 at 06:26:30 PM MST  
([User Info](#))

It's PVC, painted flat black, with a celotex backing. Wish it was copper!

[ [Parent](#) ]

Re: First time on new board, test PIC ([none / 0](#)) ([#3](#))  
by [wooferhound](#) ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Thu Sep 11th, 2003 at 07:27:43 PM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

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Looks like 1 1/4inch PVC Pipe, the 90degree fittings for that pipe are a lot like squares and present a lot of resistance to liquids. If you used 1 1/2inch fittings the 90degree fittings are a lot more like circles and will give you a lot less head pressure to the pump. How are you getting any flow through that many tight 90degree corners?

Plus if this was a picture test, you should size your pictures to an internet friendly size of less than 640pixels in any direction.

-

. T i m

Re: First time on new board, test PIC ([none / 0](#)) (#4)  
by bretco on Thu Sep 11th, 2003 at 08:32:21 PM MST  
([User Info](#))

Sorry about the pic size. Hope to climb the learning curve on pic posting enough before the next one.  
I actually used a small 110vac "utility" pump and a 5 gallon pail and got about 3 gallons/minute of flow. Basically didn't think a high flow rate would be necessary, but I imagine the elbows do give a lot of flow drag. I just wanted to fabricate a quick and cheap test unit using a sliding glass door (free in the newspaper) as the glazing, 2x6 sides, and a plywood back with insulation. I got approx a 2-3 temp rise across this thing (high noon in Vermont, June), which I think is around 3000 btu's/hr. Just curious what a "baseline" output has been seen on other units. Just starting to really research homebrew collectors, so any advice would be welcome.

[ [Parent](#) ]

Re: First time on new board, test PIC ([none / 0](#)) (#6)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Fri Sep 12th, 2003 at 03:32:17 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

I built a smaller pool heater with 80 feet of 1 1/2inch black pipe, The pump I have is 20 gallons a minute and I get a 2 degree rise through the pipe on the hottest days.  
you can see it here...

<http://www.fieldlines.com/story/2003/7/8/19177/93125>

Also some of the best information on Pool and water heating that I have ever found is on this page...

[http://www.jc-solarhomes.com/how\\_to.htm](http://www.jc-solarhomes.com/how_to.htm)

that page has some very good graphics and figures on water dynamics.

. T i m  
[ [Parent](#) ]



Re: First time on new board, test PIC ([none / 0](#)) ([#5](#))  
by Seth on Thu Sep 11th, 2003 at 09:19:15 PM MST  
([User Info](#))

U know.. sliding galss doors are meant to block heat transfers????

Better to use that plastic celifane insulation for windows i bet....  
the stuff with double sidded tape and u use a hair dryr to make it  
shrink to a flat/non-rippled surface....

Re: First time on new board, test PIC ([none / 0](#)) ([#7](#))  
by bretco on Sat Sep 13th, 2003 at 10:20:32 AM MST  
([User Info](#))

Hi,

The insulation I used was Celotex, which is that foil backed styrofoam type of stuff, not the heat shrink plastic film you're thinking of. Hopefully sliding glass door glass does block heat, but not light, which is what I want to hit the pipes. Do you think a single pane of plain glass would work better? I just tried this glass 'cause it was free.

Take care

[ [Parent](#) ]

[First time on new board, test PIC](#) | 7 comments (7 topical, 0 editorial)

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## [Panel Design Question](#)

By [Tom in NH](#), Section [Homebrewed Electricity](#)

Posted on Tue Sep 2nd, 2003 at 11:12:01 PM MST

[Solar](#)

Which is better, glass or plexiglas?

Hi. I'm new on this forum. Looking forward to learning lots. I'm about to get started building my first PV panel. What opinions are there about choosing glass or plexiglas or some other material for protection from the elements?

Thanks,

Tom

[Panel Design Question](#) | 4 comments (4 topical, 0 editorial)

Re: Panel Design Question ([none / 0](#)) ([#1](#))  
by [drdongle](#) on Wed Sep 3rd, 2003 at 05:49:57 AM MST  
([User Info](#))

Personaly Lexan stands up the best.

Dr.D

Re: Panel Design Question ([none / 0](#)) ([#2](#))  
by [troy](#) on Wed Sep 3rd, 2003 at 09:49:40 AM MST  
([User Info](#))

Most plastics, including Lexan, will eventually degrade in the sun. Glass is heavier and far more brittle, but no long term degradation in the sun. It will still be working fine in 30 years, which the lexan will not. Depends on how long you want it to last.

Transmission characteristics also play a role here. As an example, polycarbonate is a very good UV absorber. Some PV cells utilize some UV photons to make electricity, so polycarb may actually reduce output. Normal window glass uses some iron as an additive (glass looks green on the edge), which costs you 6-8% light transmission. Commercial PV panels use special low iron glass for improved transmission, but it costs more.

They will all work reasonably well, so use what you want, some materials just work slightly better than others, or last better.

Good luck and have fun!

troy

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Re: Panel Design Question ([none / 0](#)) (#3)  
by Tom in NH on Thu Sep 4th, 2003 at 08:43:20 PM MST  
([User Info](#))

Thanks for your comments, drdongle and troy. I thought I had decided on tempered low iron glass... until I got the price quote from my local glass place. I'm looking at a glass price of \$100 per 32" x 42" panel! And Lexan is even more. Now, plain old window glass is looking better and better. Do you know of a reasonably priced source of these materials?

Tom

Re: Panel Design Question ([none / 0](#)) (#4)  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Sun Sep 7th, 2003 at 12:20:57 AM MST  
([User Info](#))

That's a lot!!!!  
Wow!

I would suggest looking it up on google or calling a local glass blower. They usually will have something you might need. Also, they can order direct from factory, so it saves you a lot.

-Andrew

6 to 8 percent isn't bad considering the epoxy the companies encapsulate them drops about 15-20 percent light transmission.

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[Panel Design Question](#) | 4 comments (4 topical, 0 editorial)

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## [Solar Heating Panel Question](#)

By [pexring](#), Section [Homebrewed Electricity](#)

Posted on Sat Aug 23rd, 2003 at 10:26:28 AM MST

[Solar](#)

Question about the absorption plate

I just finished building a solar heating panel. I followed the instructions to a tee with this website being one of my main sources:

<http://ww2.green-trust.org:8383/2000/solar/solair.htm>

My question is how far should the glass (glazing) be from the absorption plate? Mine is about 2" because my neighbor thought maybe if the absorption plate was too close to the glass, it would cool off. I originally had about a half inch gap between the glass and absorption plate.

Also, would double glazing be a whole lot better than single glazing?

For an absorption plate, I just painted corrugated metal flat black. Right now the panel is warming 80 degree air to 95 or so -- and that's during the summer!

Mark

[Solar Heating Panel Question](#) | 14 comments (14 topical, 0 editorial)

Re: Solar Heating Panel Question ([none / 0](#)) (#1)  
by [Bach On](#) on Sat Aug 23rd, 2003 at 09:04:59 PM MST  
([User Info](#)) [change AT: bach\\_on AT hotmail.com](#)

I take it that this uses solar energy to heat air, not some form of liquid collector.

I'm not sure of your location or the placement of your unit, but reaching an internal temperature of only 80 degrees in Summer seems a bit low to me. Was this facing the sun directly, or was the corrugated collector at an angle to the Sun? The Sun will appear lower in the Winter. Do you have a means of mounting the box so the Sun rays are nearly perpendicular to the black collector? That will provide a much higher gain.

Did you insulate and seal the interior walls and the surface beneath the collector? I'd think that any leaks here would negate the solar gain.

Two panes of glass should provide better insulation provided there is an air-tight gap between them. Without two panes, the glass will serve as a radiator to cool the interior. Air changes temperatures pretty quickly, as compared to a liquid.

I saw projects like this back during the energy crisis in the late 70's. One guy had mounted these on his windows. They blew air through a gap created by raising the window.

Still, it's an interesting project. Please keep us posted.

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Bach On

- I'm just as happy as if I had good sense! -

Re: Solar Heating Panel Question ([none / 0](#))

(#2)

by pexring on Sat Aug 23rd, 2003 at 10:13:03 PM  
MST

([User Info](#))

Hi,

Thanks so much for the response. I was thinking maybe nobody had built one of these. Yep, the panel was in full direct sun for much of the day. It is designed to heat air. During the hottest part of the day, it did get to 115 or so. But that's a far cry from the 140+ that others are getting. Today the outdoor temp got to 110, so that heater should have been easily kicking out temps of over 200.

Yep, everything is insulated. Someone had suggested to me to paint everything black underneath the absorption plate. The absorption plate is black, but nothing underneath is. So maybe tomorrow I'll do that and see about adding a second sheet of glass or plastic. With what I've done so far, I've gone overboard to see that everything is good and sealed.

My absorption plate is corrugated metal. Maybe I should change it to aluminum. I can't find corrugated aluminum, but can get flat aluminum. Would then have to put something in the pathways to create turbulence so the air mixes and heats.

I welcome any other thoughts. Thanks for your response. Will keep in touch.

Mark

[ [Parent](#) ]

Re: Solar Heating Panel Question ([none / 0](#)) (#3)

by CntrlAltDel on Sun Aug 24th, 2003 at 03:43:00 AM  
MST

([User Info](#))

Try cutting Aluminum soda, beer cans in half.  
Then cut them with a scissors lengthways (make 3/8 slices) downwards, fold them over.  
(you are making little stars out of them), use sheet metal screws to mount them to the front. paint them with stove paint. (Aluminum dissipates heat much better than steel.  
If you want to get fancy, run a 4 inch air duct from the bottom and one up top.  
Run a puter fan from the bottom with a cheezy solar panel to push air through.  
(use a furnace filter so as to keep the dust off your glass!)

GOOD LUCK

Having prob's with my cam or i would send pix.

I am using soda cans (uncut) 1/2 holes drilled through the bottom and top mounted on top of each other (using

caulking), a peice of 1/2 copper tube to cualk and hold them together till it dries. (in the process myself)

The STARS WILL WORK! I have made panels that kicked out the heat.

try [www.canssolair.com](http://www.canssolair.com)

(could be a bad link)but from memory. (a weak one at that!)

Re: Solar Heating Panel Question ([none / 0](#))

([#4](#))

by CntrlAltDel on Sun Aug 24th, 2003 at 04:05:38 AM MST

([User Info](#))

I gave you a bad link! (sorry) close though.  
A might late here in Colo and need to get some shut eye. (I WILL LINK IT TO YOU); and all.

[ [Parent](#) ]

Re: Solar Heating Panel Question ([none /](#)

[0](#)) ([#8](#))

by CntrlAltDel on Mon Aug 25th, 2003 at 08:59:24 PM MST

([User Info](#))

The correct link <http://www.cansolair.com/>

[ [Parent](#) ]

Re: Solar Heating Panel Question ([none / 0](#)) ([#5](#))

by John D on Sun Aug 24th, 2003 at 10:58:44 AM MST

([User Info](#))

I would make the frames from 2x6. Cut rigid 2" blue insulation board for the back. Silicon the inserted board both sides for an air seal. Cover insulation board with aluminum foil shiny side up. Use silicon glue to hold in place until corrugated collector sheet installed over top. Use double glazed sealed window units and mount flush to top edge of 2x6. You can make these units any length say 8 feet attach to a south facing shop wall. If you cut 2 or 3 holes in the bottom and top you will get natural convection flow. The cold air near the floor is sucked out into the collector, heated and forced back into the shop. A down draft fan inside will keep the hot air from pooling at the ceiling. This works quite well north of the 50th where winter temps frequently hit -40 C.



Re: Solar Heating Panel Question ([none / 0](#))  
(#6)  
by TomW on Sun Aug 24th, 2003 at 11:20:54 AM  
MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

John;

Good idea but may I add a point?

If you do it this way at nite air will flow in reverse robbing you of that precious heat as air in the heater cools, falls out the bottom all nite.

The one I built long long ago to assist in heating a mobile home I lived in had a "trap" to let cold air settle into and stop the reverse circulation at nite. Very much like a "P" trap in A waste water line. Same principle anyway.

Cheers.

TomW

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Re: Solar Heating Panel Question ([none / 0](#)) (#7)  
by wdyasq on Sun Aug 24th, 2003 at 07:17:09 PM MST  
([User Info](#))

Steven Baer worte a book called "Sunspots", I think, a few years back. It went through a lot of solar heating projects and such - GOOD information. I would see if I could find a copy to look through.

Ron

Re: Solar Heating Panel Question ([none / 0](#))  
(#9)  
by pexring on Tue Aug 26th, 2003 at 11:13:01 AM  
MST  
([User Info](#))

Just for kicks, I moved my glass closer to the black corrugated absorption plate. Instead of the glass being 2.5" from the absorption plate, it is now 1 inch. It made very little difference in heat. Someone suggested maybe my corrugated metal absorption plate is too hard to heat. So next I'll either try a different absorption panel, or replace it with a second glass and heat the aluminum inside the panel.

My neighbor once made a solar panel shaped like a triangle. Holes in the bottom let air in, and he had a fan at the top which pulled it out. He claimed he got heat of 140-160F. I can't get above 115 on a 100 degree day!

I like the p-trap idea, although a bit to late for the design of this panel. So instead I may use a trap door.

Thanks for the input. Keep it coming. Fuel prices will be extra high this year, so need alternative ways to heat.

Mark

[ [Parent](#) ]

Re: Solar Heating Panel Question ([none / 0](#)) (#10)  
by Larsanderss ([larsanderss@brevet.nu](mailto:larsanderss@brevet.nu)) on Tue Aug 26th, 2003 at 02:13:15 PM MST  
([User Info](#))

Hmmmmmm... I think i will have to make some measurements of air flow through my collector and add a measurement of outdoor temperature (my collector gets its air from the outdoors and a fan transports it into my house..... I will give You some figures in m3/h and °C as soon as i have them..... Nice with people making use of sunshine like this..

The cheapest supplier of solar cells i have found around here is about 6700\$ for a installed effect of 1kW.... I think it is too much when grid electricity cost me about 0,1\$.. How are Your prices..??

Good evening Lars A

Re: Solar Heating Panel Question ([none / 0](#)) (#11)  
by Larsanderss ([larsanderss@brevet.nu](mailto:larsanderss@brevet.nu)) on Tue Aug 26th, 2003 at 02:14:16 PM MST  
([User Info](#))

That is (wich everyone surely guessed) 0,1\$ per kWh.

Lars A

[ [Parent](#) ]

Re: Solar Heating Panel Question ([none / 0](#)) ([#12](#))  
by VTPhil on Sat Oct 11th, 2003 at 09:18:01 PM MST  
([User Info](#))

I've been tinkering with a very similar project recently. I've used aluminum cans, glued end on end, with holes drilled between them... so they make something of a pipe. But wonder if this is any better than one big flat collector plate of aluminum, or perhaps corrugated aluminum.

Anyone have thoughts/experience?

Re: Solar Heating Panel Question ([none / 0](#)) ([#13](#))  
by Larsanderss ([larsanderss@brevet.nu](mailto:larsanderss@brevet.nu)) on Tue Oct 14th, 2003 at 06:37:56 AM MST  
([User Info](#))

I built mine like a flat box in a glass covered box, it takes outdoor air through the inner box and into my basement. The inner box is made of a frame from 2"\*1" wood covered on the back side (except for air transport holes) with "masonite" and on the sun facing side with thin aluminium sheet metal (painted black). Inside the inner box is one "inner wall that makes the air pass like a up side down "U" and the inner side of the alu sheet has "fins" on it to increase the heat transfer area. I works quite well and was built with a minimum effort.....

[ [Parent](#) ]

Re: Solar Heating Panel Question ([none / 0](#)) ([#14](#))  
by Homebrewed12vdc on Sat Oct 18th, 2003 at 12:21:44 PM MST  
([User Info](#))

I used 2inch copper pipes in my solar heaters, works good, and was cheap from the local scrap dealer. Just a thought, considering everbodys can idea.

[Solar Heating Panel Question](#) | 14 comments (14 topical, 0 editorial)

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### [Interesting stuff from NASA](#)

By [cevonk](#), Section [Homebrewed Electricity](#)

Posted on Thu Dec 25th, 2003 at 11:07:39 PM MST

[Solar Thermal](#)

Neo, PMA and Stirling info

I found this while looking up information about Stirling engines (still trying to figure those out):

<http://gltrs.grc.nasa.gov/reports/2001/CR-2001-210952.pdf>

It's about the degradation of Neo magnets under high temperatures and with a de-magnetizing field being exerted on them. Not sure it's strictly applicable to Neo magnets in terrestrial applications, but it might be useful to someone.

There's a similar discussion of Samarium-Cobalt magnets here:

<http://gltrs.grc.nasa.gov/citations/all/e-7144.html>

VERY interesting looking reports abstracted here:

<http://gltrs.grc.nasa.gov/citations/all/e-7929.html>

<http://gltrs.grc.nasa.gov/citations/all/e-7017.html>

but they want spending cabbage for the whole reports.

This one, describing a linear alternator (really the demagnetization occurring within a linear alternator) is pretty interesting, too. Be careful trying to open this. It locked my Adobe reader up for some reason (may just need to reboot), but I managed to download the file and then open it up okay.

<http://gltrs.grc.nasa.gov/reports/2001/TM-2001-211084.pdf>

Unfortunately this one is not available in .pdf:

<http://gltrs.grc.nasa.gov/cgi-bin/GLTRS/browse.pl?2001/TM-2001-211084.html>

#### ABSTRACT:

Permanent magnet excited linear alternators rated tens of kW and coupled to free-piston Stirling engines are presently viewed as promising candidates for long term generation of electric power in both space and terrestrial applications. Series capacitive cancellation of the internal inductive reactance of such alternators has been considered a viable way to both increase power extraction and to suppress unstable modes of the thermodynamic oscillation. Idealized toroidal and cylindrical alternator geometries are used here for a comparative study of the issues of specific mass and capacitive tuning, subject to stability criteria. The analysis shows that the stator mass of an alternator designed to be capacitively tuned is always greater than the minimum achievable stator mass of an alternator designed with no capacitors, assuming equal utilization of materials ratings and the same frequency and power to a resistive load. This conclusion is not substantially altered when the usually lesser masses of the magnets and of any capacitors are added. Within the reported stability requirements and under circumstances of normal materials ratings, this study finds no clear advantage to capacitive tuning. Comparative plots of the various constituent masses are presented versus the internal power factor taken as a design degree of freedom. The explicit formulas developed for stator core, coil, capacitor and magnet masses and for the degree of magnet utilization provide useful estimates of scaling effects.

Lots of interesting stuff on the NASA Technical Reports Server:

<http://gltrs.grc.nasa.gov/ask.htm>

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[Insulation techniques for passive solar earth-bermed home](#)

[Solar Thermal](#)

By [joe4324](#), Section [Remote Living](#)  
Posted on Tue Dec 23rd, 2003 at 12:31:31 PM MST

what is the most optimal insulation style for maximum thermal mass and temperture consistency?

Here is a link to a post in my own forums I would like your input on. Feel free to post there if you like, I check this board and that one quite often.

<http://www.ecoforums.com/forum/viewtopic.php?t=17>

[Insulation techniques for passive solar earth-bermed home](#) | 1 comment (1 topical, 0 editorial)

Re: Insulation techniques for passive solar earth- ([none / 0](#)) ([#1](#))  
by [hvirtane](#) on Tue Dec 23rd, 2003 at 03:00:47 PM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

I think that your idea to build partly inside the earth is a sound one. I know here two people who have built partly underground.

About the best materials I don't know.

- Hannu

[Insulation techniques for passive solar earth-bermed home](#) | 1 comment (1 topical, 0 editorial)

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### [SolarFrost.com](#)

By [acenergydfw](#), Section [Weird Science](#)  
Posted on Mon Dec 8th, 2003 at 09:22:12 PM MST [Solar Thermal](#)  
Anybody seen this site

Anybody seen this site. They appear to be trying to sell the technology they theoretically have developed, Servel referigeration that can be used with waste or solar heat. Should be doable, I'm thinking, but since I don't have a degree in thermal dynamics or HVAC, I'm posting here. I'm new to this group but have been interested in alt-energy for many years and have a degree in electronics with 20+ yrs expetience with UPS, 3 phase, ect.  
TIA,  
mel

[SolarFrost.com](#) | 0 comments (0 topical, 0 editorial)

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## [Passive Solar Windows, Multi-pane low-e right?](#)

By [joe4324](#), Section [Remote Living](#) [Solar Thermal](#)

Posted on Fri Nov 28th, 2003 at 12:21:54 AM MST

Cant figure out wich ones I need!

Ok, I'll make this quick. I'm working on a floor plan and materials list for my earth bermed passive solar home I will be building hopefully next year. I know this is a dumb question but I want to verify before I assume I know what I'm looking for the type of windows best suited for my purpose.

I live in indiana, and I'm on a mission, I dont EVER want to pay another utility bill again, I'm going to attempt to construct a home that will require NO heating or cooling, at least not conventional expensive methods.

So basically, I want the suns energy to come INTO my thermal envelope. Wich windows am I looking for. I want the best available. I'm currently trying to settle on an exact square footage so I can work on my formula for the 'amount' of glazing I need. soon as thats ready its time to call window manufactures to price them. Am I looking for better then double-pane Low-E? or is there something better?

[Passive Solar Windows, Multi-pane low-e right?](#) | 5 comments (5 topical, 0 editorial)

More information? ([none / 0](#)) ([#1](#))  
by [wdyasq](#) on Fri Nov 28th, 2003 at 07:55:09 AM MST  
([User Info](#))

Joe,

First I recommend a book, Sunspots: An Exploration of Solar Energy Through Fact and Fiction by: Steve Baer. He has a lot of thoughts and experiments about solar energy that actually make sense. And, he built and lived in solar homes over 20 years ago.

By now you realize windows work two ways - they let energy in and, in a home, they are usually the largest energy leaking device in a well-built home. In Indiana, you are probably worried about heat loss and want to maximize heat gain. For those in warmer climates, there may be different concerns.

I am attaching a rendering I did trying to explain some features I will put in any dwelling I plan on owning and living in. Here are some of the simple explanations. There is a Sunroom/greenhouse on the south end. A reflective bi-fold panel is on the south face and a reflective panel covers the roof. Both are insulated. In the daytime, the panels can be opened to let the sun shine in. At night, they may be closed to conserve heat. Pipes collect the heat and distribute it under the house. small fans circulate the air. In warmer climates, one might reverse the procedure to rid themselves of heat when needed.

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The dwelling itself is near a cube. The reason is to get as much volume as possible with the smallest wall and roof area. The flat roofs are for "drawing purposes only". I don't think any building deserves flat roof problems and will avoid them whenever possible.

Not shown is the "batch style" water heater, the small generator, and the heating system that, by thermosyphon, heats the home and domestic hot water when needed.

There will also be solar stills to assure water used for drinking, cooking and making coffee. A catchment system will provide rain water for clothes washing and solar cells will provide for "priority" devices such as a freezer.

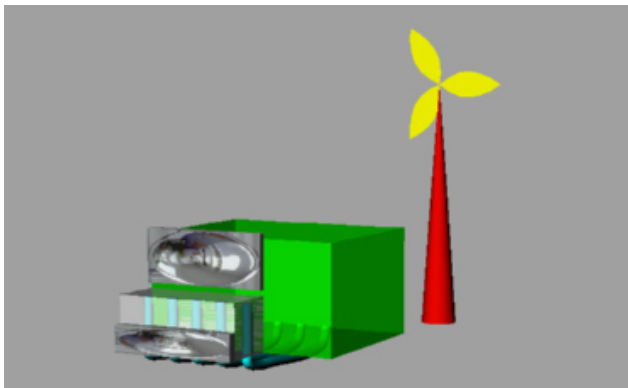
So no, I'm not going to answer if you want single, double or triple pane glass and specify the iron content and surface treatment. But then again, I don't know if these windows are to be vertical or at an angle, shaded or in full sun, how much window area you plan. AND, there is a saying where I come from - Go ahead, it's your cow.

Here is a home built in Iowa a few years back:

[http://www.public.iastate.edu/~envr\\_stu\\_324/house.htm](http://www.public.iastate.edu/~envr_stu_324/house.htm)

Ron

Diplomacy is the art of saying 'Nice doggie' until you can find a rock. - Will Rogers



Re: Passive Solar Windows, ([none / 0](#)) ([#2](#))  
by troy on Fri Nov 28th, 2003 at 10:07:53 AM MST  
([User Info](#))

I built a passive solar superinsulated house in Ontario that was very successful. As you have discovered, windows get complicated in a hurry. Here's my short answer: Double pane low-E, be cautious about over glazing (too many windows). Don't put any windows on the north, unless it's strictly for view--they lose energy period. Limited glass on the east and west, most glass on the south.

The medium answer: If you're willing to insulate your windows at night, you'll have much better results Nov-Feb.

Indiana doesn't get a lot of hours of sunlight in those months, and quad glazing with low-emmissivity coatings won't fix that. That makes even super duper windows net energy losers every day for those four months, except the rare cloudless day. Even triple glazed low-E windows have poor R-values compared to any decent wall.

So you can stick with modest glazing that will help some in the spring and fall, but not hurt you too much in the dark winter months. Or you can devise a scheme for insulating the windows at night and on cloudy days and make a go of it with a little more window area. This may cause some overheating on bright days unless you try something more complex than just passively heating the cement floor of the house for storage.

If you're interested, I'll send you a longer analysis with some easy heat loss math. It outlines a hybrid active/passive method that should work in Indiana, is low tech using readily available materials, and is affordable.

Best regards,

troy

Re: Passive Solar Windows, ([none / 0](#)) (#4)  
by joe4324 on Sun Nov 30th, 2003 at 12:05:11 AM  
MST  
([User Info](#)) [www.ecoforums.com](http://www.ecoforums.com)

I would love to recieve more info!

You could either send it to my email  
joe4324@hotmail.com

Or even better post it on my website  
www.ecoforums.com

the site isnt nearly complete, but there is a working forum there and in the future I plan on using this site to gather information and share all my latest exploits and adventures AND disasters with he world :) My home will be one of them.

One thing I want to impress on everyone is that I'm after the least expensive way POSSIBLE to get this done otherwise it 'wont' be happening, I'm only 23 years of age and I dont make much money, I view every day I pay rent and every utility bill as money lost for my home AND my savings account. I live very basically now and there isnt many more corners I can cut.

Providing I can aquire the land I want for \$20k, I will be wanting the home itelf to be 'liveable' when I hit the \$20k mark on building it. (not including well/septic, wich I have to have to get a mortgage..grrr) SO thats 20k for JUST the house. I know thats hardly anything!

But what I want is very, VERY simple. 20ft deep, 50ft wide. Earth-bermed on east/west/north, Only exposed side will be facing south, All glazing vertical. Southernwall will be conventionally built and 'SUPER' insulated. All concret will be Super insulated as well (including footer)

No trim-work or anything fancy on the inside, I want bare concrete walls (I can always hang things or paint them later!) so I'm going to save a big wad of cash there. The floors will be bare as well untill I asses what areas would be nice to have some padding.



I'm looking at a Steel roof (not sure if it will be angled south OR north, I need to pick out a peice of land first) SO all and all doing the majority of the work myself or will friends/family I believe there will be virtually nothing that needs contracted out. So I've done some 'test' calculations and it just might be possible to bring a structure in for 20k... I'm damn sure going to try :)

So if anyone has any input for ANY stage of this type of project please let me know!

Soon as I have more time I should be updating www.ecoforums.com with more detailed outlines of my plans and intentions. and hopefully I'll be able to generate some really good feedback.

[ [Parent](#) ]

Re: Passive Solar Windows, ([none / 0](#))  
([#5](#))  
by troy on Mon Dec 1st, 2003 at 11:25:57 AM  
MST  
([User Info](#))

Give me a week or two, I have discovered that I don't have an electronic copy of the document that I wanted to give you. I have a hard copy, but I'll have to put that back into Word and revise it a bit before I can send it to you. But it WILL come.

Good luck on the project,

Best regards,

troy

[ [Parent](#) ]

Re: Passive Solar Windows, ([none / 0](#)) ([#3](#))  
by JW on Fri Nov 28th, 2003 at 12:09:59 PM MST  
([User Info](#))

joe4324,

Hmmm, passive solar windows. Double pane Low-E. Uknow I did some digging on this one, considering your designing your own floor plan, this may or not be of help to you... "Ecolodge" this company was featured in popular science "best of whats new 10th annual" for december 1997.

Also the design ecolodge uses appears in a book published by ARCO in 1978. in the small artical I found(in the book) there are some very interesting concepts disscussed about this topic. Im going to quote from the artical perhaps this will help.

//the average thermal efficiency- the ratio of heat falling on them to useful heat extracted- of these collectors is generally in the region of 45 to 65%. the main heat losses occur from the front surface of the collector itself, provided

all other parts of the system are well lagged. The glass cover assists in minimizing these losses, since glass is transparent to visible radiation but opaque to infra-red. Thus, solar radiation passes through it but the long wave thermal radiation from the warm collector plate cannot pass out-ward through the glass. the system can be made more efficient by means of a vacuum between the glass and the metal plate and by using suitable spectrally selective surfaces on the metal. These are surfaces with properties opposite those of the glass. they absorb visible radiation efficiently, so they are black to sunlight, but they do not appreciably absorb longer wavelength infra-red radiation. Consequently they do not emit the latter wavelengths either and so cannot radiate heat, and therefore a spectrally selective superblack body reaches a higher temperature in sunlight than does a normal uniformly black body. Solar water heaters incorporating an absorbing surface of super-black anodized galvanized steel are commercially available. They absorb 93% of visible light but emit only 10% of there infra-red, and this produces an improvement in average performance of several percent.--

Also intersting-

/Solar radiation(both direct and diffuse) passes through the glass cover plate and warms the metal surface, which in turn warms water frowing through the pipes. The water is circulated from the hot water storage tank,either by convection or by a small pump. With appropriate thermostat control to switch the system off when the insolation is to weak to make a useful contribution, solar water heaters can readily provide a reliable supply of domestic supply of hot water in consistently sunny areas of the world. A conventional booster heater is, however, generally fitted in the tank to provide heat during cloudy spells. -

Summary-

It appears that solar heaters, mounted on the roof may also be used in a simular fashion as a heat pump, allowing excess heat to be released at night. But the heaters built into an interior wall facing said glass windows cannot be seen through because the heaters themselves are opaque.

Have fun!  
-JW

[Passive Solar Windows, Multi-pane low-e right?](#) | 5 comments (5 topical, 0 editorial)

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## Solar Chimney

By [Dameion](#), Section [Homebrewed Electricity](#)  
 Posted on Sun Nov 23rd, 2003 at 01:53:31 PM MST

[Solar Thermal](#)

hello ... this is my first time posting to this very interesting group. I've been following many different ways to make electricity in the last couple of years and one of the more interesting that i've come across is the idea of a solar chimney. Just wondering if anyone has tried this on a smaller scale.

[http://www.globalwarmingsolutions.co.uk/the\\_solar\\_chimney.htm](http://www.globalwarmingsolutions.co.uk/the_solar_chimney.htm)

any and all comments would be appreciated

Dameion

[Solar Chimney](#) | 2 comments (2 topical, 0 editorial)

Re: Solar Chimney ([none / 0](#)) (#1)  
 by [pexring](#) on Tue Nov 25th, 2003 at 12:32:20 AM MST  
[\(User Info\)](#)

Interesting idea for sure. But I wonder just how big it has to be to produce any useful energy from the turbine. Building one on a small scale may not be enough to turn a turbine. Still might be worth tinkering with tho.

Mark

Re: Solar Chimney ([none / 0](#)) (#2)  
 by [troy](#) on Wed Nov 26th, 2003 at 12:27:06 PM MST  
[\(User Info\)](#)

I don't recall the link right off hand, but Australia is contemplating an enormous thermally driven chimney with a wind turbine at the top. Acres of glass collector on the ground, etc. If I remember correctly, the power generated was related to the overall height as the square or cube of the height, so their conclusion was that anything shorter than hundreds of meters was a waste of time.

Good luck and have fun!

troy

[ [Parent](#) ]

[Solar Chimney](#) | 2 comments (2 topical, 0 editorial)

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### [Added new topic: Solar Thermal](#)

By [ADMIN](#), Section [Site News](#)

Posted on Fri Oct 24th, 2003 at 01:16:10 PM MST [Solar Thermal](#)

As per user request last week! Cheers ADMIN

[Added new topic: Solar Thermal](#) | 3 comments (3 topical, 0 editorial)

Re: Added new topic: Solar Thermal ([none / 0](#)) (#1) by [windracer](#) on Sat Oct 25th, 2003 at 08:03:49 PM MST ([User Info](#))

Thanks guys for this new topic. This type of energy production can be as easy as painting the back of your building with flat black paint. Since heating is the largest user of energy, there should be a lot of neat ideas out there.

Windracer

heating is the largest user of energy? ([none / 0](#)) (#2) by [wdyasq](#) on Sun Oct 26th, 2003 at 06:11:27 AM MST ([User Info](#))

It is obvious you haven't lived in the tropics - or Texas.

I will agree it is stupid to generate electricity to heat water, use electricity in refrigeration cycles and throw that heat out with one's air-conditioner and have a refrigerator throwing heat out and buy more electricity for the air-conditioner to get rid of THAT heat - with your "Energy Star", government approved devices.

Ron

Save the oil well! It will be easier to grow a tree than finding a dinosaur egg to hatch.

Re: heating is the largest user of energy? ([none / 0](#)) (#3) by [desertratjack](#) on Sat Nov 8th, 2003 at 05:44:10 PM MST ([User Info](#))

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When will there be a solar panel that is cooled by water for higher efficiency and the hot water used also?

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[Added new topic: Solar Thermal](#) | 3 comments (3 topical, 0 editorial)

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### Something odd

By [Demetri](#), Section [Weird Science](#)

Posted on Sun Jun 29th, 2003 at 06:56:24 PM [Superconductors](#)  
MST

Led flashed without any apparent power source.

Anyone ever drop a single led onto the floor and have it flash? I knocked a bright red one off a table onto the floor in a dark room and it blinked on for just a fraction of a second, illuminating the far wall. Only thing I can figure is static. Linoleum floor, wearing thick rubber soled steel toed work boots, hot and kinda humid outside. Led worked fine afterwards. The table it was knocked off of has my stereo on it, lots of power and EM radiation floating around there, I'm sure. Any ideas?

Demetri

[Something odd](#) | 4 comments (4 topical, 0 editorial)

Re: Something odd ([none / 0](#)) ([#1](#))  
by RayW on Sun Jun 29th, 2003 at 08:30:00 PM MST  
([User Info](#))

Interesting,sounds like the led had a static charge on it and it discharged when the led came in contact with the floor.  
Rayw

Re: Something odd ([none / 0](#)) ([#2](#))  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Tue Jul 1st, 2003 at 12:11:58 PM MST  
([User Info](#))

Do leds have a piezo electric effect?

This could possibly explain this.

-Andrew

[ [Parent](#) ]

Re: Something odd ([none / 0](#)) ([#3](#))  
by nasher on Mon Jul 28th, 2003 at 01:33:24 PM MST  
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That dose sound odd... phizoelectric effect or static or mabey it got an induced volage in it by passing a magnitic field (were the ends touching eachother?) is only things i can think of also.. would be real hard to measure it and im sure its insignificant

personaly i think it sounds neet but dont think it would develop into a powersource :(

Nasher

Re: Something odd ([none / 0](#)) ([#4](#))  
by Demetri ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Wed Aug 13th, 2003 at 11:03:48 AM MST  
([User Info](#))

Heh, I'm envisioning a waterfall arrangement with led's lighting up as they hit the bottom of a basin, and a bunch of buckets on a belt to lift them up and dump them out again. No, the leads weren't touching. This is probably a once in a lifetime thing. I'm sure such charges build up and discharge all the time, but the chances of it happening across the leads of an led, at a voltage useable by the led, and at the correct polarity, are astronomical.

Demetri  
Always be the lead dog.

[Something odd](#) | 4 comments (4 topical, 0 editorial)

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## Moisture and Humidity problem?

By [halfcrazy](#), Section [Remote Living](#)

Posted on Sun Dec 14th, 2003 at 05:35:21 PM MST

[Survival](#)

I am building a small home in Maine.

Not sure what category this should be in but here it is. I am building a small home in Maine it is 32 by 24 on a slab with conventional insulation. I am currently heating it during construction with a unvented propane heater. and it is all sheetrocked and painted. The problem i am having is that if i shut the windows the humidity level runs right up to like 65-70% and the windows and doors get soaking wet as well as most of the outlets on the outside wall. I have radiant heat in the slab i just havent got it up and running yet. I have been told the unvented propane heater is the cause of all the humidity? does this sound right or do i need to do something different?

[Moisture and Humidity problem?](#) | 4 comments (4 topical, 0 editorial)

by-products ([none / 0](#)) ([#1](#))

by [wdyasq](#) on Sun Dec 14th, 2003 at 06:58:46 PM MST  
([User Info](#))

The by-products of combustion of hydrocarbons is CO2 and H2O. If insufficient oxygen is present you can get CO - Carbon Monoxide - but you won't need to worry about that after it has killed you.

If you care about the beneficiaries of your insurance policies more than you care about yourself or your life, keep running the propane heater in an enclosed space. If you would like to enjoy the house you are building..... well, make some changes.

Ron

Re: Moisture and Humidity problem? ([none / 0](#)) ([#2](#))  
by [cevonk\(atsignhere\)aol.com](#) on Sun Dec 14th, 2003 at 10:52:46 PM MST  
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For fuels such as kerosene, white gas, and oil, each unit of fuel burned releases roughly an equivalent unit of water into the atmosphere. If that atmosphere is a tightly sealed home humidity will be a serious problem if much fuel is burned. You are loading the interior atmosphere of the home with a lot of water vapor, and it is condensing on the parts of the home that are below the dewpoint of the interior atmosphere. Check those outside wall outlets...the condensation says that they are a source of cold coming into the home (heat leaving, actually.)

I don't know if it would be worthwhile, but you could try to make a heat exchanger for the heater. It might just be a fire hazard. If you are using one of those jet engine looking heaters, you could have it exhaust the heated air into a long section of metal chimney flue that ran across the house and exited at a window. There would be some sacrifice of efficiency, but some of the heat would radiate through the metal chimney flue into the house, while the rest would blow out the window.

You do have to watch out for carbon monoxide poisoning with any kind of device that consumes oxygen from an enclosed space. You can probably get a cheap CO monitor at the hardware store. They work like smoke alarms.

Better to be out a few \$\$ than be found lying on the concrete all stiff and blue.

Re: Moisture and Humidity problem? ([none / 0](#))  
([#3](#))  
by halfcrazy on Mon Dec 15th, 2003 at 03:52:37 AM  
MST  
([User Info](#))

Thanks everyone for the comments this heater is a decorative woodstove looking heater it will never be our source of heat we just hooked it up for a week or two till i can get my radiant heat going so i guess i will get on the ball and there is 2 co detectors going in before we move in to. thanks for the advice

[ [Parent](#) ]

Re: Moisture and Humidity problem?  
([none / 0](#)) ([#4](#))  
by Norm on Mon Dec 15th, 2003 at 06:33:54  
AM MST  
([User Info](#))

There are times when a person can afford to procrastinate, but this isn't one of those times. Please get those co detectors and install them now! Even after you have them installed and as long as you are running this heater be overly cautious and open some windows. Better to be a little cold than....

[ [Parent](#) ]

[Moisture and Humidity problem?](#) | 4 comments (4 topical, 0 editorial)

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 posted by RobC on 08/20/2003 11:21:30 PM MST  
 3 comments
5. [Black Out 2003](#) ([Homebrewed Electricity](#), [Survival](#))  
 posted by Mike Wolak on 08/19/2003 09:42:55 AM MST  
 16 comments
6. [Air Wells, Dew Ponds & Fog Fences](#) ([Weird Science](#), [Survival](#))  
 posted by hvirtane on 08/11/2003 10:37:01 AM MST  
 0 comments
7. [COOL HEAT Stirling Johnny & The Silver Spurs](#) ([Quarantine Zone](#), [Survival](#))  
 posted by Johnny Cool Pants on 06/22/2003 12:41:50 PM MST  
 0 comments
8. [Jungle Bill](#) ([Remote Living](#), [Survival](#))  
 posted by Johnny Cool Pants on 05/30/2003 06:46:45 AM MST  
 6 comments
9. [refridgeration ideas... what do you guys do or think?](#) ([Remote Living](#), [Survival](#))  
 posted by bob g on 04/15/2003 12:25:13 AM MST  
 7 comments
10. [Other Utilities](#) ([Remote Living](#), [Survival](#))  
 posted by RonD on 04/01/2003 11:09:07 AM MST  
 13 comments
11. [Old Dog new trick](#) ([Rants & Opinion](#), [Survival](#))

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posted by Old F on 03/30/2003 07:02:58 AM MST  
0 comments

12. [Egglew \(testing\)](#) ([Remote Living](#), [Survival](#))  
posted by DanB on 03/29/2003 08:08:55 PM MST  
0 comments



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### My website

By [Homebrewed12vdc](#), Section [Remote Living](#)  
Posted on Tue Oct 14th, 2003 at 02:21:48 PM MST [Survival](#)  
this is my old website, way over due for a update, but maybe it will help somebody

Hey check this out, its one way of getting started.  
<http://www.freewebs.com/bearsalternativeenergy/index.htm>

[My website](#) | 1 comment (1 topical, 0 editorial)

Re: My website ([none / 0](#)) ([#1](#))  
by Demetri ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Tue Oct 14th, 2003 at 04:32:29 PM MST  
([User Info](#))

Neato.

Demetri  
Always be the lead dog.

[My website](#) | 1 comment (1 topical, 0 editorial)

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## [Country Living](#)

By [browning358](#), Section [Remote Living](#)

Posted on Fri Oct 10th, 2003 at 03:25:08 PM MST

[Survival](#)

Hi folks new to this board and need a bit of help

Hi Folks. I am new to the board. I used to drop by the old board once and awhile and have found a wealth of info on it. I live here in St. Catharines Ontario Canada. I have farmed for a good portion of my life and the latter part owned and operated my own woodworking business and landscaping business. We currently have our home up for sale and are moving back north to the country. Hoping our home sells fast so we can get things back to basic. We have tried to do this for years but something always seems to come up. But this time we are going to do it. The reason I am telling you all this is so you know where I am coming from. We have been looking at a piece of property that has 35 acres of land mostly bush. The home is real niceley set up insulated. Septic and a drilled well. The only thing there isn't any hydro. What I was wondering was what a fellow would have to do or buy to set his self up with solar and wind or??? This is all new to me and not to sure if or what to do. I don't have a great deal of money to spend on solar maybe \$5000 or so to start and not sure if this would be enough to get us up and running with things in the house. I suppose the other thing would be for us to buy a place with hydro and start from there. Any help would be appreciated. Taker easy. George

[Country Living](#) | 6 comments (6 topical, 0 editorial)

Re: Country Living ([none / 0](#)) ([#1](#))  
by [Homebrewed12vdc](#) on Fri Oct 10th, 2003 at 03:53:51 PM MST  
([User Info](#))

Just food for thought, check out [www.ebay.com](http://www.ebay.com) and look up these search words (solar panels), (solar panel), they have some pretty coplete systems on the in your price range.

Re: Country Living ([none / 0](#)) ([#2](#))  
by [kurt](#) on Fri Oct 10th, 2003 at 04:22:14 PM MST  
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how many watt hours a week are you going to need? how many sun hours do you get per week at that location? what are the wind conditions at the location?



Re: Country Living ([none / 0](#)) (#3)  
by Wolfie1 on Mon Oct 13th, 2003 at 05:43:26 AM  
MST  
([User Info](#))

Kurt has it right but since you are not yet there, no don't know those numbers.

Try to get hold of the kWh numbers from the previous owner and that should give you some idea of the amount of power that you may need. I say 'may need' because you should also look at the conservation side of things. Does the new place have all incandescent lighting - converting to flourescent will save power. If they were running an old refridgerator, a newer one will save power.

Martin.

[ [Parent](#) ]

Re: Country Living ([none / 0](#)) (#4)  
by 12volt dan ([dan12v@hotmail.com](mailto:dan12v@hotmail.com)) on Mon Oct 13th,  
2003 at 06:18:45 AM MST  
([User Info](#))

Hello Browning358

I think I can help. I live in Muskoka off the grid. Whereabouts are you (general area)

Nice to see another alternative energy person  
7 years off the grid and counting

Re: Country Living ([none / 0](#)) (#5)  
by browning358 on Mon Oct 13th, 2003 at 10:41:05  
AM MST  
([User Info](#))

Hi Folks Thanks for the replys. The home I am looking at is in Mattawa Ontario. Actually there is two. All depends on if they will still be available when my house sells. We got an offer in on ours yesterday so we are hoping. The other home is in West Nippising. We are going up to go through them both this coming Thursday. I might be an old feller but I am still getting kind of excited. Well thanks again. I will let you folks know exactly what I am getting hopefully by next weekend. George

[ [Parent](#) ]

Re: Country Living ([none / 0](#)) (#6)  
by troy on Mon Oct 13th, 2003 at 11:41:12  
AM MST  
([User Info](#))

Just to get a little feel for the scale of things, if you have anything like "normal" electrical consumption, a US \$40,000 setup might not be enough. If you're careful with conservation and you get rid of all electric heat devices (stove, furnace, water heater, incandescent light bulbs, blow dryers) then you stand a chance of getting a workable system for \$5-10,000. Many sources note that every dollar spent on efficient appliances (eg fridge) will save you 4-5 dollars of solar/wind/battery expenses. Wind and solar often complement each other, as you won't get much sun dec/jan/feb, but the wind often blows then. I used to live just east of Cobourg five miles north of the lake.

Good luck and keep us posted,

troy

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[Country Living](#) | 6 comments (6 topical, 0 editorial)

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## Renewable energy

By [RobC](#), Section [Rants & Opinion](#)

Posted on Wed Aug 20th, 2003 at 11:21:30 PM MST [Survival](#)

### Disappointment

I just got back from the Idaho state fair and you know what? Not one lousy exhibit on renewable energy. If you wanted your palm read, or your back realigned or your chrome polished, or a new spa you came to the right place!!!

[Renewable energy](#) | 3 comments (3 topical, 0 editorial)

Re: Renewable energy ([none / 0](#)) (#1)  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Thu Aug 21st, 2003 at 03:13:48 AM MST  
([User Info](#))

Talk about disappointing, Colorado is like number 2 out of the 50 states for the most renewable energy resources. Lots of hydro, wind, and most of all, solar. But hey, were like number 49 when it comes to using them. It's kinda unnerving to be talking about renewable energy when my view of pikes peak becomes every more cloudier with smog. I see the big old coal fire spewing out smoke downtown. It takes two trainloads of coal a day to power Colorado Springs (150-200 cars). Pop. 400,000

Even more disgusting! I live in a neighborhood with "covenances". They won't let me put up a wind genny because it's unsightly. But worst of all, they absolutely refuse to let me put up any solar on my roof! ARRRGH!!!! Don't you think they have gone too far when you have to sneak up little panels at a time on your roof? And hide them from the neighbors. (and do it at night so noone sees you.)

It's sad really.

In my adventures in Holland, I gained a new respect for the rest of the world and their action to switch over to renewable resources. Makes us American's look selfish. I hope we gain a perspective of thinking outside the small borders of our country, and deal with issues that effect the world and not just us. Let's just hope we don't learn the hard way, and get caught with our pants down.

-Andrew

Re: Renewable energy ([none / 0](#)) (#2)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Thu Aug 21st, 2003 at 08:37:04 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

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I agree that is absolutely discusting!!! And as far as what you do on your own property shouldn't be governed by what other's think! They would think quite differently when you were the only one with power and all others were sitting in the dark during an outage... you would find you have a bunch of new friends. Sometimes it takes a good shake to get people to see things differently ( or correctly).

Have Fun  
Ed

Re: Renewable energy ([none / 0](#)) (#3)  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Thu Aug 21st, 2003 at 10:17:29 AM MST  
([User Info](#))

I wish it was that simple. They claim they can take "legal action" and force me to take down any "unsightly objects". Get this, I said if it was ok to put up a darrius or savinous turbine, but they claimed it would make "too much noise"! Yet they let the neighbor keep their noisy as hell rat dog out night barking until the sun comes up!  
Frankly if I controlled the covenances, I would encourage people to put up any renewable energy they could. It might lower the property values in the short term, but when the oil gets expensive, the solar powered neighborhood will look mighty lucrative.  
Sigh.

-Andrew

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## [Black Out 2003](#)

By [Mike Wolak](#), Section [Homebrewed Electricity](#)

Posted on Tue Aug 19th, 2003 at 09:42:55 AM MST

[Survival](#)

### Black Out 2003

Cought with my pants down. I live in north suburbs of Detroit. Black out of 2003 occured, no power, cell phone eventully died, beepers soon died, Detroit water supply stop pumping, after 20 hours no central office no dial tone on the phone. Were we ready? Did we have cash? No ATM machines, no gas stations pumping. Did we have a full tank? Was the generator full? Did we have gas cans full? Did we store water? Was any stores open? NO NO NO NO. Are you ready? I will keep more in touch with this web site. I have a goal to be ready the next time.

Simple things like your car is in a paking lot chained in and the electric gates will not open. Yes I now carry bolt cutters in my car. Yes I will always have a full tank. Yes I will always have cash on hand. I realized my generators vary between 90-130v ac under load conditions. Freezers and fridges run at about 80% under generators. The big hall way fan never spins up to full RPM. Lights and TV was fine, keep in mind to have a antenna for broadcast reception when the cable goes out. Many radio stations were off the air. Batteries in flash lights go fast after 48 hours of no power. A good collection of glow sticks should be at hand. It was a comfort feeling having HAM radio as a source of communication for 911 emergencies with no dial tone anywhere. This was a perfect test how we depend on power and how we were not prepared. I just had to wite this note, make your power so you have power.

Mike  
n8jgu

[Black Out 2003](#) | 16 comments (16 topical, 0 editorial)

Re: Black Out 2003 ([none / 0](#)) ([#1](#))

by [billyjim](#) on Tue Aug 19th, 2003 at 10:25:08 AM MST  
([User Info](#))

we all got caught with our pants down!! WE run a small variety store/gas station and gave away a morning-delivered order of \$600 worth of icecream novelties that night..

it helped stave off a near panic buying spree...we closed the doors, when it became too dangerous to navigate the aisles in the store in the dark...

Re: Black Out 2003 ([none / 0](#)) ([#2](#))

by [xeroid](#) ([centurion27@lycos.com](#)) on Tue Aug 19th, 2003 at 11:45:10 AM MST  
([User Info](#))

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Oh yeah, us too. We like to have candles around for nice romantic movie-night-in dates when we can't find a sitter for the baby. It's a good thing, because we needed them that night!

One thing that did help us - I heard about a trick to make your deep freezer run a little more efficiently - fill bags with water and freeze them in the deep freeze when you don't have much in it. When they freeze, they help to keep the temperature down in there. I had a few large zip lock bags full of water in there, so I took one out and put it in a plastic bowl in our fridge to help keep the temperature down in there too.

The power for us wasn't out too long (about 12 or 14 hours) compared to some, but I think the freezey bag thing helped. Just a thought.  
Regards, XEROID.

Re: Black Out 2003 ([none / 0](#)) ([#3](#))  
by TomW on Tue Aug 19th, 2003 at 11:56:42 AM  
MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Xeroid;

Been doing that for years and it does seem to work.

In a pinch you can line a cardboard box with a plastic garbage bag or sheeting and fill it. I think it helps the fridge run less overall and definitely keep frozen longer should there be a power failure.

Too much wasted effort on the big things when the little things are what count.

Cheers.

TomW

[Stuff I have Online](#)

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Re: Black Out 2003 ([none / 0](#)) ([#6](#))  
by xeroid ([centurion27@lycos.com](mailto:centurion27@lycos.com)) on Tue  
Aug 19th, 2003 at 12:55:49 PM MST  
([User Info](#))

Hey, good tip about the box, Tom. That way the frozen block will have a more definite shape. The bags I used were just zip locked shut with the water inside and took on random shape depending on what they leaned against in the freezer. A nice rectangular block would be easier to work with, geometrically speaking.  
Regards, XEROID.

[ [Parent](#) ]

Re: Black Out 2003 ([none / 0](#)) ([#7](#))  
by Norm on Tue Aug 19th, 2003 at 02:41:05  
PM MST  
([User Info](#))

About freezing blocks of ice to keep the fridge cold...We used to do that back in the 40's a guy we called the iceman delivered ice we put a card in the window that said 50 on one side and 100 on the other 20 cents for 100 pounds (sometimes you gave him a quarter and told him to keep the change and he thanked you for the tip! and not a trace of sarcasm! Whatever happened to Serval gas refrigerators? or solid state camper 12volt reffridgerators? Norm.

[ [Parent](#) ]

Re: Black Out 2003 ([none / 0](#)) ([#9](#))  
by unclebuck68 on Tue Aug 19th, 2003  
at 05:37:06 PM MST  
([User Info](#))

Norm, Have you ever seen a servel refrigerator that ran on kerosene? Years ago I seen one use kerosene, the lite wick warmed up the gas. I guess the propane burner came latter.

[ [Parent](#) ]

Re: Black Out 2003 ([none / 0](#))  
([#14](#))  
by Norm on Wed Aug 20th, 2003  
at 06:06:05 AM MST  
([User Info](#))

No unclebuck68 I never seen a kerosene one but we had a second-hand one when we first got married, they were a little bit heavier than electric my cousin helped me bring it up to a second floor apartment (he was like an ox back then)and we had quite a time of it, anyway, I adjusted the flame a little higher and it got too cold...froze everything in the fridge...just like a deep-freeze!  
Norm

[ [Parent](#) ]

Re: Black Out 2003 ([none / 0](#)) ([#4](#))  
by Seth on Tue Aug 19th, 2003 at 12:20:08 PM MST  
([User Info](#))

Im almost ready to go..... 1100Ah of capacity, 250W solar, DC genset, in the construction mode for a VAWT and ham all the way....

KC7NOA

Re: Black Out 2003 ([none / 0](#)) (#5)  
by Inquiring Mind ([aaawelder@dungyadoo.com](mailto:aaawelder@dungyadoo.com)....[remove poop to reply](#)) on Tue Aug 19th, 2003 at 12:24:54 PM MST  
([User Info](#)) <http://www.gomedia.ca/aaawelder/>

The message that is shockingly clear, in yours, is that we are captives to our technology, without which, the majority would be devastated. The general concensus is that it will always be there. The reality of a blackout says: What If?, the consequences horrific. Those of us who are prepared know, it had better be anonymous.

Sorry about the gloom people, it was just a thought running through my..

Inquiring Mind  
Inquiring Mind <'>< Chance favors the prepared mind whose hands do the work!

Re: Black Out 2003 ([none / 0](#)) (#8)  
by RogerAS ([rogeras@cei.net](mailto:rogeras@cei.net)) on Tue Aug 19th, 2003 at 03:42:15 PM MST  
([User Info](#))

Hi,

Yep that black out for the northeast was a royal pain. Try living in the mid south(Arkansas Ozarks). Every winter we have ice storms. Not only does the power go away but the roads are almost, if not, impassable even with chains.

My wife and I have lived over 3 years off-grid, and every winter we are the only lights visable for miles. We had a game warden come down our prvate road 'cause he thought "something" was up. After an hour of education he left, saying he was going to have to set up his home for just this sortta thing.

More power lines, more generation stations, more more more. We Americans never seem to learn. SAD aint it?

RogerAS  
"Put the bunny back in the box!"

Re: Black Out 2003 ([none / 0](#)) (#10)  
by nasher on Wed Aug 20th, 2003 at 12:44:58 AM MST  
([User Info](#))



Well i know out here in hawaii alot of people bought stuff in case of powerfailures also.. one of the big things were those shake flashlights that sharper immage sells... you shake it and it runs for 20-30 min and then every now and then you shake it for 30 or so more seconds to keep it going.. nice alternative energy solution for a flashlight... no more worrying about are there fresh batteries in the car's flashlight...

[ [Parent](#) ]

Re: Black Out 2003 ([none / 0](#)) ([#12](#))  
by elvin1949 ([elvin1949@wmconnect.com](mailto:elvin1949@wmconnect.com)) on Wed Aug 20th, 2003 at 02:32:28 AM MST  
([User Info](#))

less is more  
learned that when i was a child  
later  
elvin

[ [Parent](#) ]

Re: Black Out 2003 ([none / 0](#)) ([#11](#))  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Wed Aug 20th, 2003 at 01:15:50 AM MST  
([User Info](#))

Woa!

Man, I was on a ship headed for Boston when this happened. I had no idea, on the ship there was only a dinky sattelite tv that didn't work half the time. When we docked in Boston, everybody was pissed/worried, but I was ignorant as usual. When I flew to denver to pick up my car (oh yea, the president of the US was in the same hotel I was parked at, and the jerk towed it! apparently there wasn't enuff room for his 5 limos.)

Drove home to find more pissed/worried people, and just learned about the blackouts from a previous post here on this board. Maybe I was caught with my pants down, but I was too ignorant to realize.

I saw a Nuclear plant near the detroit area when flying home, did that kick the bucket too?

-Andrew

Wonder if my 50 watt solar, and 100ah battery will save my ass next time?

Re: Black Out 2003 ([none / 0](#)) ([#13](#))  
by Wolfie1 on Wed Aug 20th, 2003 at 05:24:07 AM MST  
([User Info](#))

Yes, the nuclear plants around Detroit were shutdown. Can't generate power when the power has nowhere to go. I guess nuclear plants are like windmills in that sense!

Martin.

[ [Parent](#) ]

Re: Black Out 2003 ([none / 0](#)) ([#15](#))  
by nasher on Wed Aug 20th, 2003 at  
09:26:12 PM MST  
([User Info](#))

nuclear plants are well... designed to run at 80+ % load... when load drops to less than 10% they are really hard to keep running ... also when the load goes away 80% to zero... well the plant has safety equipment that will probably shut it down...

course the Nuclear plant needs some power (to run its pumps and such) to start it up.. so once it dropped off line it could easily take hrs just to safely restart it

[ [Parent](#) ]

Re: Black Out 2003 ([none / 0](#)) ([#16](#))  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com))  
on Thu Aug 21st, 2003 at 03:17:21 AM  
MST  
([User Info](#))

Probably days.  
Diesel plants take hours.

-Andrew

[ [Parent](#) ]

[Black Out 2003](#) | 16 comments (16 topical, 0 editorial)

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## [Air Wells, Dew Ponds & Fog Fences](#)

By [hvirtane](#), Section [Weird Science](#)

Posted on Mon Aug 11th, 2003 at 10:37:01 AM MST [Survival](#)

There Is Water in the Air

---

Some weeks ago 'Rexresearch' has published a new version of their article 'Air Wells, Dew Ponds & Fog Fences'.

There is really a lot of water above us, even there, where under our feet the desert is dry.

Anybody has seen any of these systems in use?

<http://www.rexresearch.com/airwells/airwells.htm>

- Hannu

[Air Wells, Dew Ponds & Fog Fences](#) | 0 comments (0 topical, 0 editorial)

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## [COOL HEAT Stirling Johnny & The Silver Spurs](#)

By [Johnny Cool Pants](#), Section [Quarantine Zone](#)

Posted on Sun Jun 22nd, 2003 at 12:41:50 PM MST

**COLD HEAT**

---

Heeeeeeeeeere's Johnny!

What we call in Seattle "Cold Heat" or "turning water into wine."

Build yourself a custom Stirling for a better fit. Stick the Stirling out the wall, so the one part is left out there in the cold like a snow flake.

[Survival](#)

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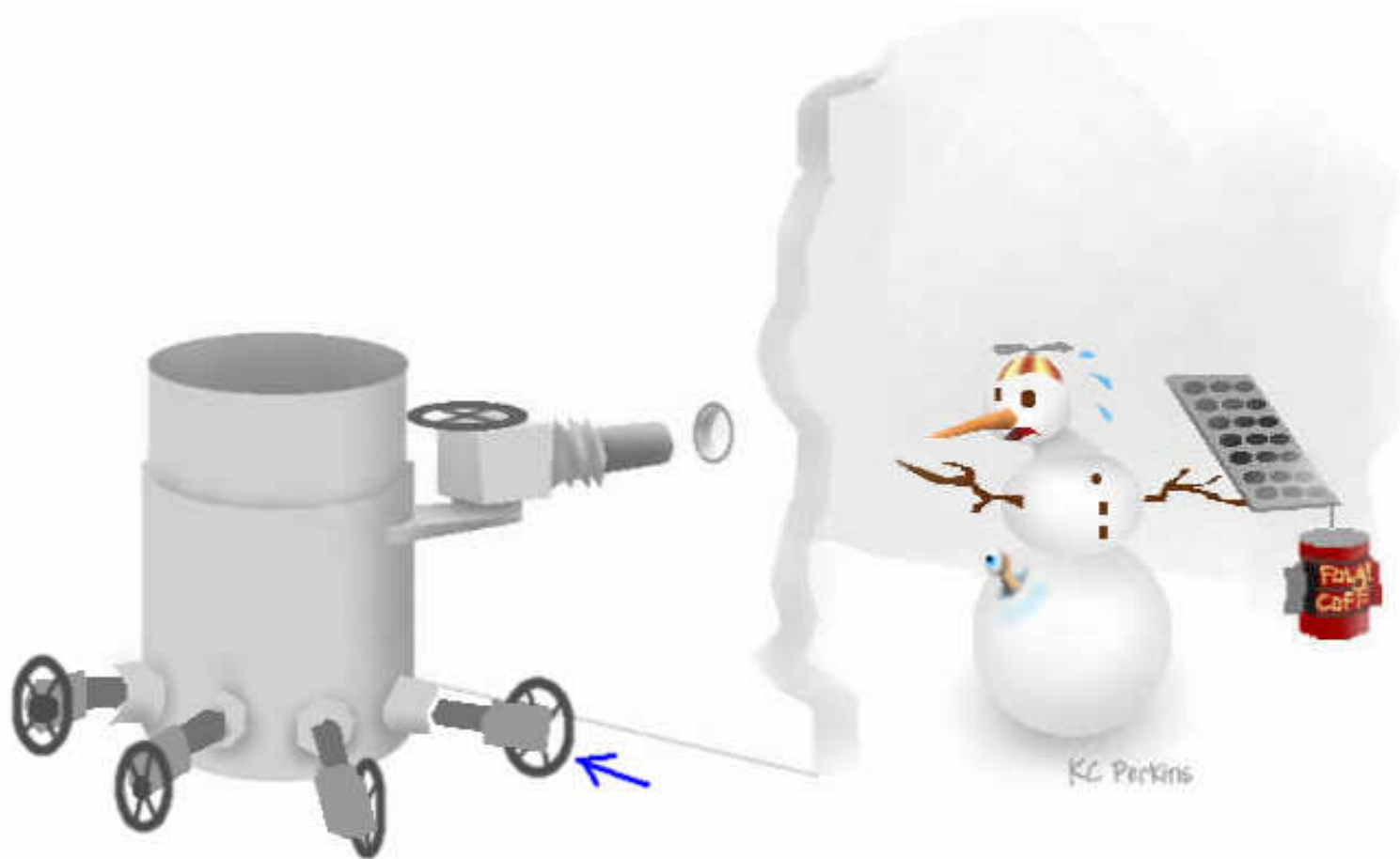
A Stirling will run off of cold air just like it will off of warm air.

Hook up my kinfolk's friction heater (one cylinder inside another with about an 1/8 inch space in between them, having oil or water in that space, so the one cylinder will slide real easy and you have something float on a little.

One cylinder turns and the other is stationary.)

Then have the wheel of the 3 foot Stirling just barley rubbing the cylinder so it can turn even if the cylinder doesn't.

The cylinder will start to turn soon enough, give it a push. When it does start to turn it will pick up speed and the slip sliding oil friction party between the two cylinders will get hot. Real hot, enough to heat your house.



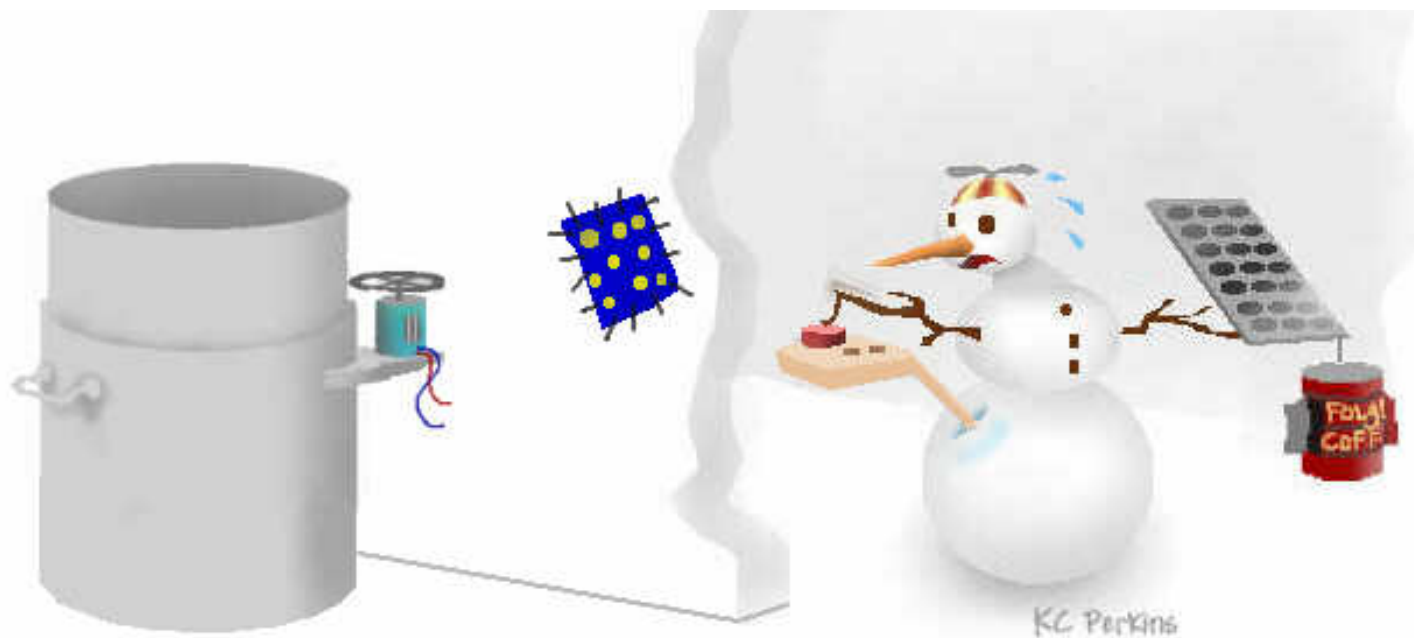
Here's the groovy part, what we call "The Stirling Stroll" up here in Washington State just north of the state of confusion.

It will get hot enough to run other Stirlings from their hot end, like plugging a male plug into a female to transfer the energy down the line, it's a great way to stay warm in the winter time.

Here's where you really get your groove on, most of you don't have a 3 foot Stirling laying around, if you do it's up there on your Chimney paying for itself. Not to worry.

You don't need a stirling kids, patch that hole in the wall and just run it with a teeny weenie continuous duty PM electric motor small as a tea cup.





You can use old Restaurant supply soup pots for your first heater project, you'll probably need to find two different brands, because the same maker doesn't often make two pots with such slight size differences but if I know my kids, you'll find a way.

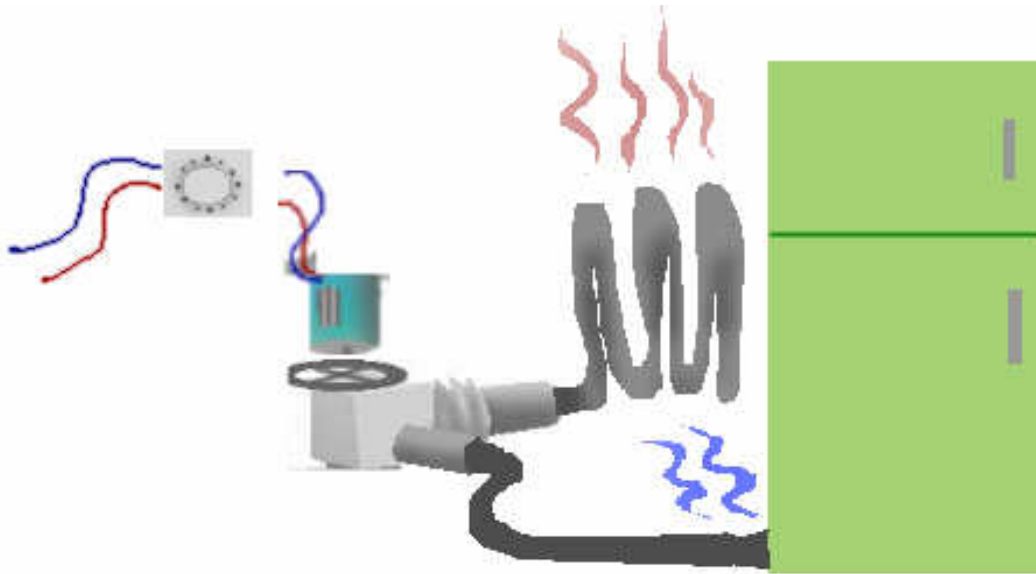
Little Johnny got some death threats and it had me on edge a little, this kind of fear and worry made me treat a good friend bad, cussing him out and telling him to go away. I'm ashamed of myself and now I'm mad.

And no one should be punished for their opinion even if that opinion is in agreement with someone out of favor with someone in power. Now that person can't even sign their name when they leave a Q or A, on some board because it get's removed right away.

That's going to stop, or someone will feel the full force of my wrath. Or maybe just a thousand long haired leaping leprechauns in custom tie dye hemp shoes all taking a sudden interest in Alternative Energy and everyone of them fans of your favorite foggy mountain dispatch, Johnny Cool Pants.

So that other board better take an example from the good nature of the one and only original otherpower dot com board, huh kids? Or they'll have an infestation of the little green drunken fellers caliming the place needs an original hero and Johnny Cool Pants will start giving away all the secrets of the universe,

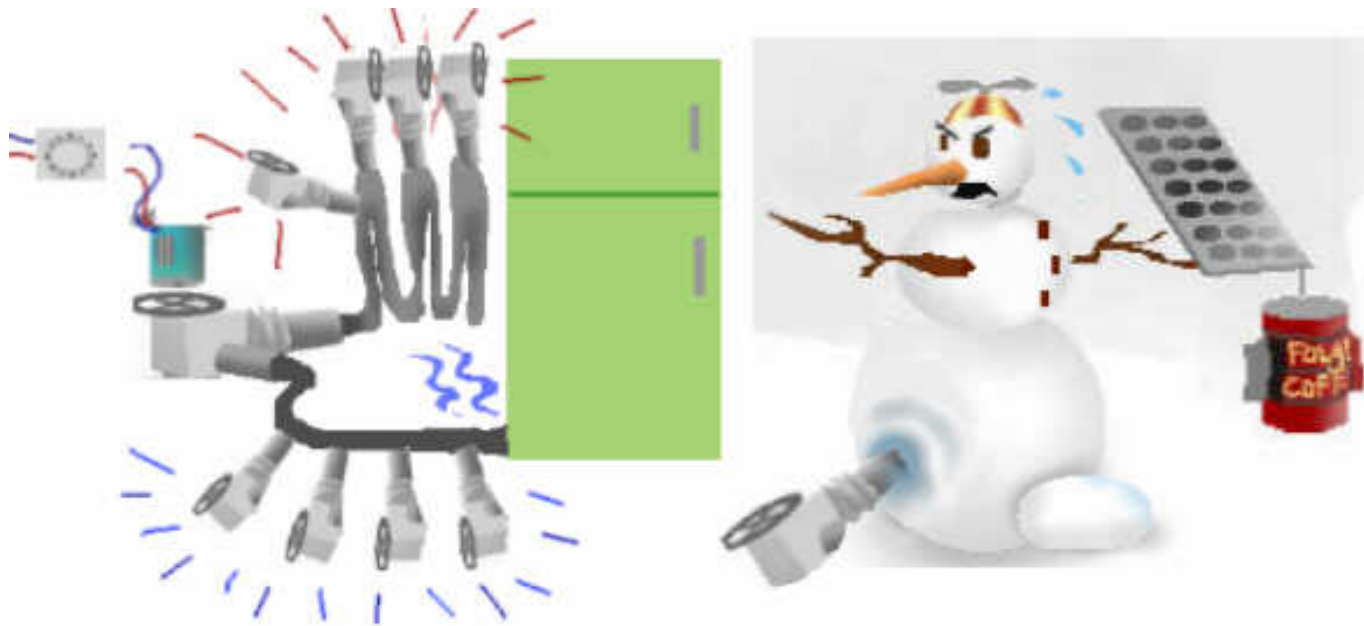
like this,



A sterling can be run backwards if you just find something to turn the wheel. The piston inside will run and the heat chamber become hot, hotter than a Brittany Spears wanna-be convinced you're the lead roady for the Back Street Boys. And the cool air chamber becoming cool, very cool, like Johnny's pants.

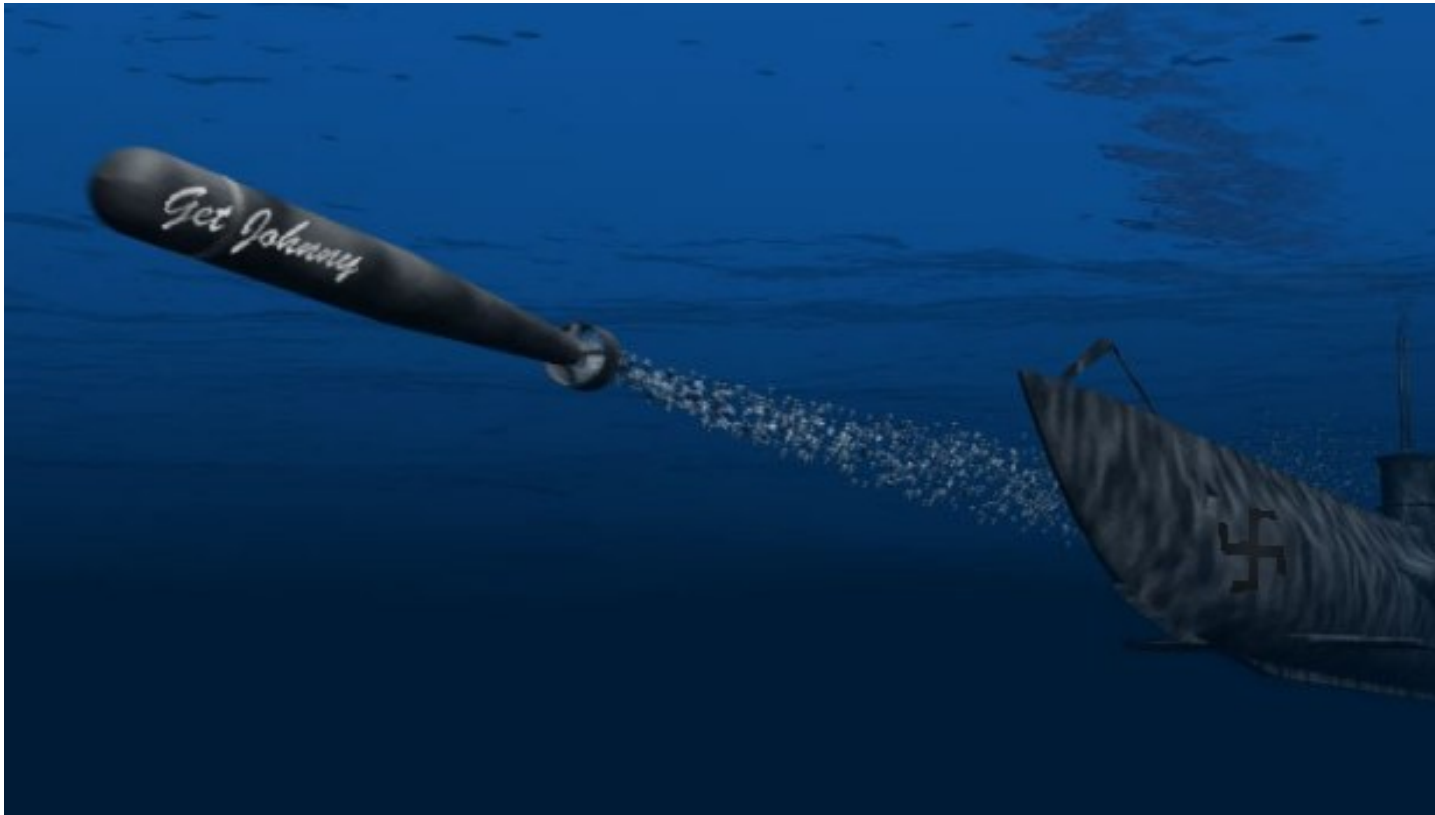
You can run your heater and your refrigerator from one Stirling hooked up to an electric PM motor, and a timer so it can take breaks through out the day and so it can take the whole night off and stay up watching re-runs of Dr. Who with you.

They use all sizes of Stirlings on the submarines, running off the heat of other engines, to running off the cooler sea temperature.



Then whacha do is plug in some Stirlings to those lines feeding the heater and the fridge and get some of that power back. Where ever you can find hot or cold.

Who loves you kids?



[COOL HEAT Stirling Johnny & The Silver Spurs](#) | 0 comments (0 topical, 0 editorial)

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## Jungle Bill

By [Johnny Cool Pants](#), Section [Remote Living](#)

Posted on Fri May 30th, 2003 at 06:46:45 AM MST

[Survival](#)

jungle

Bill I was snooping around the old board and I had a response question for you there, but not sure when you will ever go back and review that stuff again. It's on this string...

[http://www.otherpower.com/cgi-bin/webbbs/webbbs\\_config.pl?read=16688](http://www.otherpower.com/cgi-bin/webbbs/webbbs_config.pl?read=16688)

If it's true I want to hear all about it. I want to run away to Brazil. I started to once but I got hungry and came home.

JCP

[Jungle Bill](#) | 6 comments (6 topical, 0 editorial)

Juan Valdez ([none / 0](#)) (#1)

by [Johnny Cool Pants](#) on Fri May 30th, 2003 at 06:53:48 AM MST

[\(User Info\)](#)

Wait, you once mentioned you grow coffee too! I think you're on the level. Far out in the true sence, Columbia? What's your main power source where you are set up? Wind? Do you have a monkey?

Not joking ([none / 0](#)) (#2)

by [Johnny Cool Pants](#) on Fri May 30th, 2003 at 05:42:10 PM MST

[\(User Info\)](#)

Bill you there?

I'm seriously interested in the jungle, especially botanical medicine.

As you know all or almost all medicine comes from plants anyway. They just grind it up, put it in a capsul and bill you with a brick enema.

I know it's off topic but if anyone finds interest in this, here is a site listing many plant medicine sites and links.

<http://www.puk.ac.za/library/subjects/pharm/alternative.html>

And this is a site listing what some of your basic kitchen spices can do for your health.

<http://www.thebearbyte.com/Herbal/Herbalogy.html>

Johnny Cool Pants

[ [Parent](#) ]

BILL ?????????????? ([none / 0](#)) (#3)

by [Johnny Cool Pants](#) on Sun Jun 1st, 2003 at 04:00:10 AM MST

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Bill where are you?

Did a Python get you?

Anyway I was thinking about all the heat in the jungle. Has to be a way to tap into that. I mean with the tree canopy blocking the sun "light" and hindering windmills.

There is a breeze in the top of the trees. Someone posted a comment about a man who charged his batteries during the depression by running an insulated wire up a tree.

The effect might be even stronger in the jungle keeping one end warm and the other end cooler (maybe down a well)

Got squirrels there Bill? Some kind of jungle squirrel? Monkeys? Well we have squirrels all over the Northwest here and I'm cutting off the limbs that allow them to cross to the next tree, (tree limbs, not squirrel limbs) and installing fatty roap bridges from some old discarded marine line.

I'm going to connect them with really springy springs and then suspend more springy springs hanging down to lines leading to hanging magnets inside tube coils (the way the "forever flashlight" works) the magnet just slides back and forth through the coil when you shake it.



Photo source: <http://www.thinkgeek.com/gadgets/lights/5a9f/zoom/>

I know it will not be a lot of voltage but it will be consistant all day long, those squirrels are busy little guys and the magnets will be bobbing up and down through the coils (about 20 of them) Then the voltage starts adding up.

Likewise a few anchored floaters upstream from my pond waterfall will jiggle a magnet in a coil all day long Jungle Java,  
No Troy I didn't make the freakin current or the squirrels! Sucessfully put one back together though, when I decided it was best to go with cutting the tree limbs.

\$#!+ Bill, I wanna live  
in the jungle too! Get me  
out of here. I'll increase  
your coffee production by 25%  
and limit my coffee consumption  
to 50% if you introduce me to a  
girl who looks like the actress  
in the movie "Salvador"

Johnny Cool Pants

Oh my goodness ([none / 0](#)) (#4)  
by Anonymous Hero on Tue Jun 3rd, 2003 at 07:23:28 AM MST



JCP, easy now. I have been off working in the field, building stuff and basically avoiding idiots. If you want to change your position in life, you must learn Law. Somehow I believe you are capable of that. What I like best about this site , is there are many intelligent people sharing ideas of real ways to reduce our dependency on the alchemists who have stolen our minds and reduced us to Lawless animals in Orwell's barn. The people on this site offer brilliant suggestions to solving one tiny piece. And that is a good thing. Before you come out of Babylon, you must get Babylon out of you. Maybe you are already close. I don't know. Jungle Bill

far away land ([none / 0](#)) (#5)

by Johnny Cool Pants on Tue Jun 3rd, 2003 at 11:18:05 PM MST  
([User Info](#))

I didn't just fall off the pyramid Bill, but ah? do me a favor and wait till I am out of Babylon before you send me anti-babylon stuff like that, know what I mean jelly bean?

Nevermind Tarzan, unless these copperheads come up with a space ship, it's all the same boat.

Down the Nile, crocodile,  
damn the torpedos,  
Aquaman

[ [Parent](#) ]

Babylon ([none / 0](#)) (#6)

by Anonymous Hero on Wed Jun 4th, 2003 at 02:42:50 PM MST

JCP, Your wish is my command. Jungle Bill

[Jungle Bill](#) | 6 comments (6 topical, 0 editorial)

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[refridgeration ideas... what do you guys do or think?](#)

By [bob g](#), Section [Remote Living](#)

[Survival](#)

Posted on Tue Apr 15th, 2003 at 12:25:13 AM MST

**i have been researching and planning**

for the last several years my trek to the simpler life. i have the lights figured out with compact florecent (sp) and i have the washer and dryer figured out, but i am down to re Fridgeration. because of the winter temps in kansas having some periods of time in the winter where freezing water is no problem, i figure to build an ice house that is connected to the kitchen by means of a refrigerator door and the inner shell for the shelving. and by putting up several thousand pounds of ice in a very well insulated ice house i figure i should be able to get my basic re Fridgeration needs met... assuming of course that the ice house will not be cold enough for frozen storage then a small efficient chest type freezer could be used to store frozed goods and make ice cubes for consumption. anyone doing anything like this? i figure an 8 by 8 styrofoam lined room can hold up to 40 or 50 thousand pounds of ice if stacked to the ceiling. what do you guys think? i figure if our fore fathers did it that way then it is good enough for me. bob g

[refridgeration ideas... what do you guys do or think?](#) | 7 comments (7 topical, 0 editorial)

Propane fridges .. a step further? ([none / 0](#)) ([#1](#))  
by TomW on Tue Apr 15th, 2003 at 06:50:47 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

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Bob;

Welcome back, again.

Over the years I have used quite a few propane refrigerators. And as I fondly recall, several of these units had a tendency to freeze the contents if you were not careful with the settings. They accomplish this with little more than a "pilot light"

My point, you wonder?

My point is that Kansas, like Iowa, has a lot of heat available most of the summer. Summer is when you need cooling.

I'm no refrigeration tech but it sure seems like an absorbtion cooler could be rigged to work with some form of solar collector to run at "max" to freeze water or even cool a room if sized properly. Around here the Amish still harvest ice and while visiting ordering furniture in late July on a 100 degree day have had lemonade with ice in it. Considering the Amish here do not use electricity or propane I'm fairly certain it comes from the icehouse. It is amazing how long a few tons of ice will last even buried in straw so your super insulated opened to a frige icehouse idea seems sound.

Cheers.

TomW

[Stuff I have Online](#)

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Old Fashioned Refrigeration... ([none / 0](#)) (#2)  
by xeroid ([centurion27@lycos.com](mailto:centurion27@lycos.com)) on Wed Apr 16th,  
2003 at 09:21:10 AM MST  
([User Info](#))

I know absolutely nothing about refrigeration, but I just wanted to commend you on your lifestyle choice. If the industrialized world would adopt some of the philosophies and thinking of people like you and others on this board, pollution and energy crisis problems would soon cease to exist.

Bravo!

Regards, XEROID.

commended ?? who me? nah.... ([none / 0](#)) (#3)  
by bob g on Wed Apr 16th, 2003 at 10:36:44 PM  
MST  
([User Info](#))

not sure commendations are in order here at least where i am concerned. Don't get me wrong i don't plan on burning old tires in a fireplace for heat, but i am not planning this as saving mother nature from me, but rather learning to live with what mother nature provides. As i have stated as well as countless others it is far easier to conserve power, than it is to produce it. So i figure if i can trim my basic need for shelter, namely in square feet, and make it as thermally efficienct as i can, then my goal of using nature to provide for me is more attainable. Should i decide to build a multi thousand square foot lodge, i will either have to put up a few dozen wind generators ,, hundreds of solar cells, and burn a forest of trees every year just to survive. i dont see this as surviving but useing up nature and my back just to get by.... i figure keep it small,, tread lightly,, and maybe nature will provide my basic needs.. and if in the end result i get what i need, and dont kill my ecosystem, then i have not only succeeded but done a good thing. Perhaps others will either follow by example or at least take pause to think.. not a bad side effect in my estimation. i guess it is hard to read Thoreau's "Walden" and not do some serious rethinking of ones life, and followed by "five acres to independance" i end up with a big... "  
hmmmmmmmmmm, i wonder, could I? just maybe!!! bob gayle

[ [Parent](#) ]

Air Conditioning ([none / 0](#)) (#4)

by Dan M on Mon Apr 21st, 2003 at 02:45:49 PM MST  
([User Info](#))

As far as refrigeration (or air-conditioning) goes, I think there's a big difference between keeping ice frozen and using it for cooling. Here are a couple of numbers that could help: Melting one lb of ice requires about 150KJ of energy (or takes 150KJ of energy from its surroundings). Doing this every hour gives about 42 watts of cooling. 42 watts for an hour equals about 140 BTU/hour. Therefore, a 10,000 BTU air conditioner (when air conditioners are rated in BTU they mean BTU/hour) could be duplicated using ice but it would take about 71 lbs of ice per hour, or somewhere around 1/2 ton per day. These numbers are only based on the heat of fusion for water. You would get another 25% or so depending how close you got the water to room temperature before discarding it. As an alternative, bury as much flexible tubing as you can find as deep as you can get it (at least several feet) and recirculate water through it. If you have a coil of this in the house and blow a fan through it you have air conditioning. This doesn't help much with refrigeration though. Also, your 8x8x8 room hold just over 30,000 lbs of water (slightly less ice).

ice storage #'s ([none / 0](#)) (#5)

by bob g on Mon Apr 21st, 2003 at 11:42:22 PM MST  
([User Info](#))

thanks for the input, it was never my intention to get room air conditioning from the ice house, as for my est of how much the room would hold it was from memory of numbers i crunched 4 or 5 years ago, and i cant remember just how large a room i did the math on. could have been a 10 by 10 who knows. the idea here is for reffridgeration only, and for only myself and possibly one other, according to other sources 12,000 lbs a year for a family with a milk cow was the average 60 or so years ago. The point being that i think that it is worth the effort to get my refrigeration from an ice house if possible. as for air conditioning, i think i will stay with a room air unit, and use it in a smaller well insulated area, and try to limit its use. bob gayle

[ [Parent](#) ]

Underground dwelling ([none / 0](#)) (#6)

by Wolfles ([wolfles-@-netzero.net](#)) on Tue Apr 22nd, 2003 at 01:43:39 AM MST  
([User Info](#))

Bob, Have you thought of a berm or undergroud home?? I have studied it and the earts temp staysnear or at 62 deg. F My Aunt had a storm shelter for tornadoes and she kept her canning goods cool during the Texas heat. When I was a kid, I would go and cool off when playing and swip a jar of pickled peaches. It wasn't much more than a dug-out with railroad ties for the roof and four foot of earth on top of the ties. It wasn't much to look at, but it was cool and a safe place to be in a storm. MyWattsWorth

Re: re Fridgeration ideas... what do you ([none / 0](#)) (#7)

by cryonucleator on Fri Jun 27th, 2003 at 05:54:32 AM MST

([User Info](#)) <http://www.makehydrogen.com>

Bob g, can't add much to what everybody['s said, but I recall that about 20 years ago a guy got a big international cash award for his design of a huge underground ice block that he formed over the winter and used for cooling in summer. Kind of similar to ideas already mentioned.

For \*small\* and \*well insulated\* freezer unit, how about a large reservoir of extremely cold non-freezing liquid?? The res would have to be well insulated too, of course. Heat exchange (heat sink) array would need a sensor-valve-switch to shut off flow when winter temps rise above your desired max, say at -10 F. Then open again when temps drops to -10 F or lower. Sounds like a couple of the other writers here could calculate the res:freezer volume ratio. Might turn out to be kinda expensive, in terms of antifreeze medium. Luck to you! ---Dennis  
<http://www.makehydrogen.com>

[refridgeration ideas... what do you guys do or think?](#) | 7 comments  
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[Other Utilities](#)

By [RonD](#), Section [Remote Living](#)

Posted on Tue Apr 1st, 2003 at 11:09:07 AM MST

[Survival](#)

Okay so we can make electricity and heat now,,

How about beating the high cost of Phone bills, cable TV, and Internet access??

Any ideas would be appreciated.

I do kinda want to know but, I didn't want to post a test message on the new board.

[Other Utilities](#) | 13 comments (13 topical, 0 editorial)

re:Okay so we can make electricity and heat now ([none / 0](#)) ([#1](#))

by [JackS](#) on Tue Apr 1st, 2003 at 11:52:22 AM MST

([User Info](#)) <http://home.bresnan.net/~j3s/index.html>

only options i can think of are smoke signals, carrier pigeon and 2 way radio. Ham radio they use repeaters. Maybe Dennis Lee can help, i am sure that will be his new scam.

re: Okay so we can make electricity and heat now ([none / 0](#)) ([#3](#))

by [Crippy](#) on Wed Apr 2nd, 2003 at 02:51:52 PM MST

([User Info](#)) <http://windpower.jkcc.com>

One of the cool ways, I started looking into, is packet radio. Doubtless the ham radio ops already know about this. Basically, you plug your ham radio into your computer, and the computer uses the radio to broadcast data through the antenna. Bandwidth is pretty low atm, >9,600bps I think, and the first version needed someone to physically rebroadcast the data to the next RRB (radio re-broadcast) site. I think the max range was around 120 miles. The newest version of this (forget what it's called) sets each ham site up as an automatic RRB so that data is passed unattended. Both of these methods use some custom adapter cards that you can buy off the net as well as some driver software. The newest version I heard about uses nothing more than a computer sound card that is directly plugged into the mic socket and the PC sends the sound signal straight to the ham radio. I think specific software is required for that setup. Please correct anything that is out to lunch :) No with that in mind, once you have no requirement for a hard/land-line network, the sky is the limit just so long as there are ham RRBs close enough to you and they are set up for packet radio too. There is ample software for live voice communication over the internet and as the packet radio technology matures, no doubt the bandwidth and/or data compression will greatly improve too. Just do a web search for "packet radio".

[Windpower - first attempt](#)

[ [Parent](#) ]

Packet radio sounds like fun. ([none / 0](#)) ([#11](#))

by [RonD](#) on Mon Apr 7th, 2003 at 01:33:30 PM MST

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Now that I'm learning about electricity and using OHMS law, I might look into Ham Radio. I got a radio, but I can't use it until I get some kind of licence. 30 years ago my Dad got a letter that said we're coming to get your rig! and its been hiddin under my bed ever since. I asked why they were mad and I guess 5kw is too much without a licence. He's gone now, but my room is exactly how I left it 20 years ago when I left to get married. Nobody thought I'd be gone that long, and them big ole boxes of tubes are still there.

There's a ham shack setup where I work, I'll check it out. I have put up antennas but the com expert just needed a coconut tree climber.

[ [Parent](#) ]

Internet Access ([none / 0](#)) (#12)  
by Anonymous Hero on Tue Apr 8th, 2003 at 06:14:58 PM MST

Don't know where you're located, but if you can get an email package only from your server (cheaper), then check out this site.  
ftp://rtfm.mit.edu-pub-usenet-news.answers/internet-services/access-via-email.  
This will enable you to access the internet through your email and not only the surface web, but the deep web about 100 times bigger. That's the only money saver that I know of. Cheers

[ [Parent](#) ]

Some ideas ([none / 0](#)) (#2)  
by Adrian L on Tue Apr 1st, 2003 at 07:55:07 PM MST  
([User Info](#))

Yeah good question RonD,

I have thought about this question a lot, at this stage there isn't really a way to beat a standard phone line as yet. Maybe once mobiles start offering high speed internet access at affordable rates(and cheaper calls for that matter) their would be no need to have a 'on grid' telephone line for most places and that would lower your charges by not needing to pay the 'network' charge monthly.

But it's a user pays world, their should be an ammendment made to that quote 'death and taxes'... to 'death taxes and monthly payments of some kind to telecommunications companies'

It's getting harder and harder to live a cheap uncomplicated life thats for sure. I can only see it getting worse in the next 30 years as well. I think the people in their 40s-50s now are the lucky ones, back then you could live a simpler life. I'm in my twenties and i can tell you Stress and high paced living these days is already taking it's toll and most likely will be the death of me. Give me a solar/wind powered farm anyday over the 'burbs'.

Cheers,

Adrian L

easer living ([none / 0](#)) (#7)  
by deerslayer660 on Sat Apr 5th, 2003 at 04:58:45 PM MST  
([User Info](#))

hey ron boy i know how you feel my big gripe is if i have to pay a monthley fee to a tvstation tbs tnn exc i donot feel i schould have to watch commericals and it should be law they cant get money from bolth me and a advertieser untill people in this country get some ba##s and challenge are government maybe also take controll of it there is no way out like double taxation tax when you make it tax you when you spend it tax everithing not nailed down gas road tags new cable tv tax ohio exc next new tax will be air you breath ok enough bit%&^ing george

[ [Parent](#) ]

Reply to Other Utilities... ([none / 0](#)) ([#4](#))

by xeroid ([centurion27@lycos.com](mailto:centurion27@lycos.com)) on Thu Apr 3rd, 2003 at 02:20:07 PM MST

([User Info](#))

...Of course you could just DUMP the cell phone (unless you don't have a land line) and the Cable T.V... Hey let's face it, Cable TV is a great way to encourage people to pay money to waste their valuable time. I would recommend a good old fashioned antenna. Pay one price and ditch the Cable guys. A little news and the occasional sit com is about all I can be bothered with as far as TV goes these days, especially with how SILLY most TV programming seems to be getting. Just an opinion. I still like to "Veg" when I am too tired to do anything else.

Regards, XEROID.

My only cable comes from the antenna ([none / 0](#)) ([#6](#))

by troy on Sat Apr 5th, 2003 at 09:11:46 AM MST

([User Info](#))

Dear Xeroid,

I did exactly as you describe and have never been happier. If we want something fancy, we rent a movie for two bucks. I paid for my antenna once and now I'm done forever. We get five channels without a rotator. A hundred more will just make me waste more time. I'd rather go down in the basement and make chips on the lathe.

Best Regards,

troy

[ [Parent](#) ]

Its funny how things changed ([none / 0](#)) ([#10](#))

by RonD on Mon Apr 7th, 2003 at 10:38:23 AM MST

([User Info](#))

Used to be phones were hard wired and tv's were wireless.

The Site I'm building at isn't exactly remote.

There is a utility pole, with telephone, cable and grid power right in the front yard (garden).

I hit it with the tractor everytime I mow. :)

I think its around \$26. for the phone.  
\$35 for cable \$60.00 includes high speed Internet.

So I guess its only \$86.00 a month. and about \$9 to have grid power backup.

[ [Parent](#) ]

Just Dump it? ([none / 0](#)) (#9)  
by RonD on Mon Apr 7th, 2003 at 10:27:19 AM MST  
([User Info](#))

Its not for me. Its for the others I live with.

Those are things I must provide.

The swimming pool and hot tub, I don't have to provide, they can get jobs and buy that themselves.

[ [Parent](#) ]

Internet connections? ([none / 0](#)) (#5)  
by hvirtane on Sat Apr 5th, 2003 at 06:21:18 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

Here, where I'm living  
(in Central Finland, near Jyväskylä)  
by far the cheapest Internet access  
is with a gprs mobile phone connection!  
There is one operator, dna, which is charging  
only 20 euro (the same in \$) for a month.  
The phone can be on all the time for that price.  
The connection is not fast, but it works.

What are your possibilities for Internet connections?

For ham radios Debian GNU/linux operating system  
is told to be very good and it is free!  
(I'm using Debian, but a gprs connection.)

Where is your place, actually?

Hannu Virtanen  
hvirtane@cc.jyu.fi

Ohio, USA ([none / 0](#)) (#8)  
by RonD on Mon Apr 7th, 2003 at 10:24:40 AM MST  
([User Info](#))

[ [Parent](#) ]

Re: Other Utilities ([none / 0](#)) ([#13](#))  
by Anonymous Hero on Fri Jun 20th, 2003 at 04:00:33 AM MST

Get that free internet service while keeping cookie crushers but no personal info on your computer.

Use and put up with the delay in cheap Internet phone calls

TV sucks.

[Other Utilities](#) | 13 comments (13 topical, 0 editorial)

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### [Old Dog new trick](#)

By [Old F](#), Section [Rants & Opinion](#)

Posted on Sun Mar 30th, 2003 at 07:02:58 AM MST

[Survival](#)

Looks like an old dog can learn a new trick after all : )

[Old Dog new trick](#) | 0 comments (0 topical, 0 editorial)

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## [Egglew \(testing\)](#)

By [DanB](#), Section [Remote Living](#)

Posted on Sat Mar 29th, 2003 at 08:08:55 PM MST

Maya's Egg-lew

[Survival](#)

---

This is the "Egglew" that Maya, Matt, and I built last Sat.

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[Egglew \(testing\)](#) | 0 comments (0 topical, 0 editorial)

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### [Guitar string](#)

By [Norm](#), Section [Classifieds](#)

Posted on Tue Dec 30th, 2003 at 05:37:07 AM MST [Wanted](#)

I've got all the material I need to make a 'Hot wire cutter' except the wire....

.....so I thought well I'll just get a guitar string...then I saw into Walmart they had guitar strings whoops too much!

....I don't need a new string anyway a broken string will work. Not sure what size I'll need, but anybody got a broken guitar string they'd care to donate? ( :>) Norm

[Guitar string](#) | 11 comments (11 topical, 0 editorial)

Re: Guitar string ([none / 0](#)) ([#1](#))  
by Old F on Tue Dec 30th, 2003 at 06:12:02 AM MST  
([User Info](#)) <http://www.olf.homestead.com>

Norm

Leave the guitar string on the guitar.  
Unless you play like I do than take them all off : )

The wire I use for the hot wire cutter I have on my web site  
Is steel wire any thing from .02 to .035 dia works just fine.  
I get mine at Ace hardware in the little handy pacs dirt cheap.  
Whats your transformer voltage? And what kind of controller are you using?

Old F

Re: Guitar string ([none / 0](#)) ([#7](#))  
by Norm on Tue Dec 30th, 2003 at 06:36:12 PM MST  
([User Info](#))

Old F, Using a 12-6 volt -10 amp.battery charger and a lighting dimmer switch about like you have on your web site. BTW..Heads turn...(away) when I try to play an accordian, an organ, or a saxaphone but I sure enjoy the sound of REAL Country Music and Polkas! Thanks for the suggestions! All good! LOL ( :>) Norm.

[ [Parent](#) ]

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Re: Guitar string ([none / 0](#)) (#2)  
by wind pirate on Tue Dec 30th, 2003 at 06:55:41 AM  
MST  
([User Info](#))

I'll send you a broken guitar string, or how about .035 Mig welding wire? Let me know what you need and I'll send it out.

Steve

Re: Guitar string ([none / 0](#)) (#8)  
by Norm on Tue Dec 30th, 2003 at 07:24:04 PM  
MST  
([User Info](#))

Steve thanks for the offer...E-Mail me  
peppysue@suite224.net and I'll give you my mailing  
address some .035 Mig welding wire probably.... ( :>) Norm.

[ [Parent](#) ]

Re: Guitar string ([none / 0](#)) (#3)  
by RobD on Tue Dec 30th, 2003 at 07:29:04 AM MST  
([User Info](#))

Nichrome wire is the best. Antique Electronic supply sells it for 19 cents a foot. ([www.tubesandmore.com](http://www.tubesandmore.com))

Re: Guitar string ([none / 0](#)) (#5)  
by Chagrin on Tue Dec 30th, 2003 at 09:02:32 AM  
MST  
([User Info](#))

The dingy gray braided "picture hanging wire" is also nichrome and available at just about any department store. From my experiments with electrically ignited ... uh ... well, it's the best. Gets very hot but doesn't degrade like steel or melt like copper.

[ [Parent](#) ]

Re: Guitar string ([none / 0](#)) (#4)  
by monte350c on Tue Dec 30th, 2003 at 07:38:57 AM  
MST  
([User Info](#))

Hi Norm,

I spent "some" time in the past couple of months fiddling around with hot wire cutters and now I've got a good reliable unit that really works well.

I started with plans from the net that used a Rad Shack xformer and a regular light dimmer which lasted about 1 hour, then the transformer smoked.

So I got another heavier transformer, and kept on truckin' but went through about 6 fuses.

My final configuration that really works well is as follows:

Hammond PH100JG transformer - 100 VA, 120 volt primary, 24 volt secondary (about \$35 from a local electronic supply place)

I use a Leviton fan speed control on the 120 volt side of the transformer. This looks just like a light dimmer but seems to hold up for this use. (less than \$10 Home Depot)

Then on the hot wire side of the transformer, I use 2 of those old ceramic ballast resistors they used to use in a lot of Chrysler cars in series with the wire.

For the wire I use 20 guage stainless wire which is available at Home Depot in 20 foot rolls for about \$3

I turn the unit on and set the fan speed controller to its lowest setting. Then slowly increase the setting until the wire is warm enough to melt the foam. I found a lot better results by just heating the wire barely enough to melt the foam. If the wire gets red-hot it will lose its tension and sag a lot in the middle.

The bow I made up out of 3 / 4 " copper pipe with a pair of 90 degree elbows. I use a couple of pieces of wood dowel in the ends of the pipe legs to insulate the wire from the bow. And a couple of small turnbuckles attached to the dowels to hold and tension the wire.

I found nicer cuts when the temperature of the wire is just hot enough to cut the foam, with a lot of tension on the wire. This way if the bow jerks a bit during the cut, it won't leave bumps in the cut.

If you need some pics of this setup let me know and I'll come back and post them!

Having fun!

Ted.

Re: Guitar string ([none / 0](#)) (#10)  
by RobD on Tue Dec 30th, 2003 at 09:58:40 PM  
MST  
([User Info](#))

Ted,  
I put a heavy spring on one end of my wire to keep it tense even if it got to hot.  
RobD

[ [Parent](#) ]

Re: Guitar string ([none / 0](#)) ([#6](#))  
by Gordy on Tue Dec 30th, 2003 at 11:48:03 AM MST  
([User Info](#))

Hi All,

I built one of these years ago from plans in a modle air plain mag. It consisted of a power cord going into a triplet gang box wired to standard house lite switch (to act as a main), then wired to a dimmer switch then wired to a standard house outlet. Now install a cover plate.

The bow was made from 1/2" steel electrical conduit, with two 90 degree bends (using a conduit bender from the hardware store/rental center where I bought the conduit, sence I made the bends at the store they did'nt charge me for the use of the bender.) Then I went home and cut the ends off so the bow was 6" deep. Then drill a hole in each end (facing each other) about 1/8" from the end. In each of these holes I placed a spring, then insulators made from high density nylon, then I attached .035 stainless welding wire to the insulators, making sure the springs where each stretched out 3/4" or so. The electrical conections were made by each insulater with crimp conectors. I ran the one wire up through the conduit to the other side to make it neater and easier to handle.

The plans called for the use of a 10 amp battery charger, plugged into the above control box and hooked up to the bow. The dimmmer is used to vary the output of the battery charger. As mentioned in earlier posts you dont want the wire red hot but you do want it hot enough to melt the foam away from the wire or it will leave a stringy resedue, and if too cold the foam will glue itself back to gether after the wire passes through.

This worked for me on a 2' bow but NOT on my 5'er even with a 40 amp chager set to 200 amp boost. So I tried plugging the bow directly in to the control box... IT WORKED. The only problem I ran into was that I used the cheaper 600 watt dimmer switch and burnt it out after 40 or 50 hours of use while cutting recycled foam to insulate a friends 30 x 40 pole shed. The switch was replaced with the more expensive 1000 or 1100 watt dimmer switch, and is still working fine with more hours on it than the first one.

Good luck and play

SAFE,

Gordy

Re: Guitar string ([none / 0](#)) ([#11](#))  
by Gordy on Wed Dec 31st, 2003 at 09:19:56 AM  
MST  
([User Info](#))

PS.

forgot to mention, once you get the dimmer switch set for the proper heat on your wire. Use a permanent marker to mark the switch's knob setting , and check it each time before you turn the main on. Got this idea after someone bumped mine and melted the cuttig wire when the main was turned on.

Gordy

[ [Parent](#) ]



Re: Guitar string ([none / 0](#)) ([#9](#))  
by Norm on Tue Dec 30th, 2003 at 07:34:08 PM MST  
([User Info](#))

Thanks for all the helpful and interesting ideas and suggestions guys. I'm simply amazed at the diversity and talents of all of you people on the board! Havin' fun in NE Ohio! (:>) Norm.

[Guitar string](#) | 11 comments (11 topical, 0 editorial)

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 posted by klu on 12/05/2003 06:33:06 AM MST  
 3 comments
3. [Question ?](#) ([Remote Living](#), [Wanted](#))  
 posted by RobC on 11/30/2003 12:46:38 PM MST  
 7 comments
4. [Amp Hour Meter for Wind Generator?](#) ([Homebrewed Electricity](#), [Wanted](#))  
 posted by AKWindandSun on 11/27/2003 11:43:59 AM MST  
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 posted by kell on 11/25/2003 08:14:59 PM MST  
 5 comments
6. [Could you help me?](#) ([Homebrewed Electricity](#), [Wanted](#))  
 posted by Virgis on 11/21/2003 07:56:49 AM MST  
 2 comments
7. [Radiant light from gas flame for solar power?](#) ([Weird Science](#), [Wanted](#))  
 posted by hiho1 on 11/14/2003 08:06:42 AM MST  
 3 comments
8. [suggestions on resin choices...](#) ([Weird Science](#), [Wanted](#))  
 posted by headhunter on 10/22/2003 10:36:23 PM MST  
 3 comments
9. [Batteries](#) ([Classifieds](#), [Wanted](#))  
 posted by Homebrewed12vdc on 10/22/2003 03:07:53 PM MST  
 1 comment
10. [obtaining magnets for generator](#) ([Magnets & Magnetism](#), [Wanted](#))  
 posted by kell on 10/13/2003 10:26:38 AM MST  
 14 comments

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11. [WANTED STERLING WALKING BEAM ENGINE](#)  
([Classifieds](#), [Wanted](#))

posted by Homebrewed12vdc on 10/11/2003 09:24:01 AM  
MST  
1 comment

12. [seeking ionized carbon cylinders](#) ([Classifieds](#),  
[Wanted](#))

posted by magnetokinetic on 10/07/2003 08:56:42 PM  
MST  
0 comments

13. [Wanted ; 1500 lb,or better magnets](#) ([Magnets &](#)  
[Magnetism](#), [Wanted](#))

posted by magnetokinetic on 09/18/2003 06:15:00 PM  
MST  
1 comment

14. [Solar Ventilator](#) ([Classifieds](#), [Wanted](#))

posted by pexring on 08/23/2003 01:26:49 AM MST  
3 comments

15. [Question for a Genius! \(Can you answer?\)](#)  
([Homebrewed Electricity](#), [Wanted](#))

posted by Insane on 07/02/2003 11:00:19 PM MST  
12 comments

16. [Propellor Hub Wanted](#) ([Classifieds](#), [Wanted](#))

posted by winchargerman on 05/11/2003 12:23:04 AM  
MST  
1 comment

17. [Degaussing ideas](#) ([Homebrewed Electricity](#), [Wanted](#))

posted by Anonymous Hero on 05/06/2003 08:40:18 PM  
MST  
6 comments

18. [another distraction](#) ([Rants & Opinion](#), [Wanted](#))

posted by Bruce Downunder on 04/08/2003 04:07:43 PM  
MST  
1 comment

19. [About the new board . .](#) ([Rants & Opinion](#), [Wanted](#))

posted by Crippy on 03/30/2003 04:31:57 PM MST  
0 comments

20. [testing pic up load](#) ([Classifieds](#), [Wanted](#))

posted by Old F on 03/30/2003 06:47:18 AM MST  
0 comments



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[looking for non-electirc fan for wood stove](#)

By [klu](#), Section [Remote Living](#)

[Wanted](#)

Posted on Fri Dec 5th, 2003 at 06:33:06 AM MST

[looking for non-electirc fan for wood stove](#)

I am looking for non-electirc fan for wood stove. I have a remote home with no electricity and want to put a thermocouple powered fan on the wood stove to improve heating. Alternate ideas are welcome.

[looking for non-electirc fan for wood stove](#) | 3 comments (3 topical, 0 editorial)

Re: [looking for non-electirc fan for wood stove](#) ([none / 0](#)) ([#1](#))  
by [jim](#) on Fri Dec 5th, 2003 at 06:53:23 AM MST ([User Info](#))

Once again, google is your friend ;-)

Stirling fans have been in use for many years, and are still manufactured today.

Take a look at this one:

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here is a link

<http://www.orc.ca/~gerry/freebreeze.html>

JimU

Re: looking for non-electirc fan for wood stove ([none](#) / [0](#)) ([#2](#))  
by TomW on Fri Dec 5th, 2003 at 08:02:06 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Google search for calframo fan they are a bit more sophisticated than a thermocouple and use a peltier device to run it. Ours has been spinning on our stove for 3 years or more.

Cheers.

TomW

[Stuff I have Online](#)

[Contact Me](#)

Re: looking for non-electirc fan for wood stove ([none](#) / [0](#)) ([#3](#))  
by [charged](#) on Fri Dec 5th, 2003 at 08:20:44 AM MST  
([User Info](#))

[www.keelynet.com/bedmot/bedmot.htm](http://www.keelynet.com/bedmot/bedmot.htm)

The design at the bottom of the page will work nicely as a small fan motor. Just reverse the batteries periodically.

[looking for non-electirc fan for wood stove](#) | 3 comments (3 topical, 0 editorial)

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### [Question ?](#)

By [RobC](#), Section [Remote Living](#)

Posted on Sun Nov 30th, 2003 at 12:46:38 PM MST

[Wanted](#)

Sawmill Plans

Anybody know of a good site with info on bandsaw mills for cutting lumber. A build it yourself type of site? Thanks RobC

[Question ?](#) | 7 comments (7 topical, 0 editorial)

Re: Question ? ([none / 0](#)) ([#1](#))

by [DaveR](#) on Sun Nov 30th, 2003 at 01:55:36 PM MST  
([User Info](#))

[http://www.woodweb.com/knowledge\\_base/Home\\_built\\_bandsaw\\_mill.html](http://www.woodweb.com/knowledge_base/Home_built_bandsaw_mill.html)

This shows pictures, but is not a how to. He also says it is DANGEROUS.

Dave

Re: Question ? ([none / 0](#)) ([#2](#))

by [kww](#) on Sun Nov 30th, 2003 at 04:33:19 PM MST  
([User Info](#))

Dangerous, sounds like fun, and I've been wanting one of those anyway. :-)

[ [Parent](#) ]

Re: Question ? ([none / 0](#)) ([#3](#))

by [RobC](#) on Sun Nov 30th, 2003 at 05:10:08 PM MST  
([User Info](#))

Thanks for your help. RobC

[ [Parent](#) ]

Re: Question ? ([none / 0](#)) ([#4](#))

by [zubby](#) on Sun Nov 30th, 2003 at 06:52:53 PM MST  
([User Info](#))

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hello Robc. i don't have any sites for you to visit, but maybe this will help. my brother bought a portable band saw mill about 15 yrs ago. called a "wood miser" i think. made in ontario, canada. he has never had a problem and has cut an awful lot of lumber for himself and others. try finding on google or another search engine. you may see pics that will explain a lot for you.

good luck----zubbly

Re: Question ? ([none / 0](#)) ([#5](#))  
by RobC on Mon Dec 1st, 2003 at 02:34:27 AM MST  
([User Info](#))

I found it thanks.

RobC <http://www.woodmizer.com/welcome.html>

[ [Parent](#) ]

Re: Question ? ([none / 0](#)) ([#6](#))  
by elvin1949 ([elvin1949@wmconnect.com](mailto:elvin1949@wmconnect.com)) on Mon Dec 1st, 2003 at 01:29:03 PM MST  
([User Info](#))

the woodmiser is very easy to operate  
my sister-in-law ran one alone for 5 yr's  
later  
elvin

[ [Parent](#) ]

Re: Question ? ([none / 0](#)) ([#7](#))  
by marv ([windtamer@hotmail.com](mailto:windtamer@hotmail.com)) on Mon Dec 1st, 2003 at 05:42:01 PM MST  
([User Info](#))

[www.sawmillmag.com](http://www.sawmillmag.com)

here's a good sawmill mag for mostly portable mills.  
I have one here in ontario. (luv it)

Marv

[ [Parent](#) ]

[Question ?](#) | 7 comments (7 topical, 0 editorial)

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### [Amp Hour Meter for Wind Generator?](#)

By [AKWindandSun](#), Section [Homebrewed Electricity](#)  
Posted on Thu Nov 27th, 2003 at 11:43:59 AM MST

[Wanted](#)

#### Amp Hour Meter for Wind Generator?

Hi,

Looking for a 48V wind generator amp hour meter.

Thanks,  
Kevin

[Amp Hour Meter for Wind Generator?](#) | 1 comment (1 topical, 0 editorial)

Re: Amp Hour Meter for Wind Generator? ([none / 0](#))  
([#1](#))  
by [hydrosun](#) on Fri Nov 28th, 2003 at 06:44:20 PM MST  
([User Info](#))

You can use the 48 volt adapter to use a standard Triametric Meter. Of course an amp hour meter doesn't have to be powered by the circuit it's monitoring. I've got an old model amp-meter running off 12 volts monitoring the running total of my 24 volt Air 403.  
Chris

[Amp Hour Meter for Wind Generator?](#) | 1 comment (1 topical, 0 editorial)

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## [Magnets for Lithuanian Schoolkids](#)

By [kell](#), Section [Magnets & Magnetism](#)

Posted on Tue Nov 25th, 2003 at 08:14:59 PM MST

[Wanted](#)

Lithuanian school wind power project

I sent some neos to the Lithuanian teacher that asked for help on this board recently. To do their project they may need different magnets from the ones I sent them. They might need magnets that are flat. So I'm reminding the people on the board that saw that posting from the Lithuanian teacher, and letting those who didn't see it know that those kids may be needing magnets. If we can take up a collection we could have a supplier send the magnets directly instead of having several people all paying \$20 each just for the shipping costs for a few magnets to go overseas. To do it this way I would first e-mail the teacher and ask what magnets he needs. I would be happy to act as coordinator/treasurer in that case. Any ideas? Maybe the admin here will have something to say too.

[Magnets for Lithuanian Schoolkids](#) | 5 comments (5 topical, 0 editorial)

Re: Magnets for Lithuanian Schoolkids ([none / 0](#)) (#1)

by [JW](#) on Wed Nov 26th, 2003 at 07:44:20 AM MST ([User Info](#))

Kell,

I was thinking about this, and Id like to donate, my Mom's Mom is of direct Lithuanian descent. I think the idea is a great one, count me in for at least 20 bucks, my e-mail is [techdata@flashsteam.com](mailto:techdata@flashsteam.com) ,if you put something together and need a litte more thats ok too,

-JW

Re: Magnets for Lithuanian Schoolkids ([none / 0](#)) (#2)

by [DanB](#) on Wed Nov 26th, 2003 at 08:47:02 AM MST ([User Info](#))

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- [Also by kell](#)

It sounds like they have quite a neat project there and it's great that folks have offered to chip in!  
We like to donate to this sort of thing, and it's really not necessary for you all to chip in like this, though the offer is very kind. It's actually the support of customers and folks who participate on this board which help to make the magnet side of our business work out well enough so that we can help out in situations like this.

We've sent him enough magnets to build a good machine I think. On the way to Lithuania are 24 of the 1" X 2" X 1/2" blocks + a set of Hughs plans. Hopefully we'll all get to hear a bit about the project! Im not sure if they'll build Hughs machine or experiment, but the plans should help out a bunch either way.

Re: Magnets for Lithuanian Schoolkids ([none / 0](#)) (#3)  
by wind pirate on Wed Nov 26th, 2003 at 09:58:25 AM MST  
([User Info](#))

Dan B and the rest of you a Wondermagnet - you folks are a real class act. Thanks for your generosity to these folks. Count on my continued support of your business.

SB

[ [Parent](#) ]

Re: Magnets for Lithuanian Schoolkids ([none / 0](#)) (#4)  
by Norm on Wed Nov 26th, 2003 at 04:53:13 PM MST  
([User Info](#))

Ah....all of you guys are the greatest makes me proud to know all of you! Norm

[ [Parent](#) ]

Re: Magnets for Lithuanian Schoolkids ([none / 0](#)) (#5)  
by kell on Wed Nov 26th, 2003 at 07:14:39 PM MST  
([User Info](#))

Yo, props to my man DanB!

[Magnets for Lithuanian Schoolkids](#) | 5 comments (5 topical, 0 editorial)



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### [Could you help me?](#)

By [Virgis](#), Section [Homebrewed Electricity](#)  
Posted on Fri Nov 21st, 2003 at 07:56:49 AM MST [Wanted](#)

Maybe somebody have unnecessary Neos and could make donation for pupil's club?

Dear Sirs, it's my the first posting and maybe i'll be funny. I am social tutor of pupil's technical creation club "Vejavaikiai" (Wind's kids) from small Lithuania town Naujoji Akmene. My pupils are interested in homebrewed electricity too. We have made some wind mills using car AC alternators. Now we are going to make a new alternator using Permanent magnets.

Maybe someone has unnecessary Neos and you could make a donation for our club? It would be a great X-mas present for my pupils and they would be thankful very much for your help. Any proposal we are looking forward to hear from you.

Thank you in advance.

Virgis

[Could you help me?](#) | 2 comments (2 topical, 0 editorial)

Re: Could you help me? ([none / 0](#)) ([#1](#))  
by [kell](#) on Sat Nov 22nd, 2003 at 09:55:55 AM MST  
([User Info](#))

I have some neodymium magnets left over from a project. They are not flat; the poles are located on curved surfaces. I think I have three of each polarity (north in south out, and south in north out). Most people use flat magnets, but I will send these magnets to you if you e-mail me. My e-mail address is [kellrobinson@yahoo.com](mailto:kellrobinson@yahoo.com)  
Good luck and best wishes for the kids.

Re: Could you help me? ([none / 0](#)) ([#2](#))  
by [Virgis](#) on Mon Nov 24th, 2003 at 05:35:03 AM MST  
([User Info](#))

Thank you for your understanding of my problem. My pupils were jumping up to roof when i have received your mail. My E-mail <[petronis@cementas.lt](mailto:petronis@cementas.lt)>.

Virgis

Address: LITHUANIA  
5464, Naujoji Akmene  
Zemaites 8 str.  
Virginijus Petronis

[ [Parent](#) ]

[Could you help me?](#) | 2 comments (2 topical, 0 editorial)

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## [Radiant light from gas flame for solar power?](#)

By [hiho1](#), Section [Weird Science](#)

[Wanted](#)

Posted on Fri Nov 14th, 2003 at 08:06:42 AM MST

Ahh, Question.

Can someone please tell me if the light from a natural gas flame can be used as power source for a small solar cell? And if not, is there something that can capture the non-direct radiant heat from a natural gas flame to generate a small source of energy? Anyone? Bueller?

[Radiant light from gas flame for solar power?](#) | 3 comments (3 topical, 0 editorial)

Re: Radiant light from gas flame for solar power?

[\(none / 0\)](#) (#1)

by JW on Fri Nov 14th, 2003 at 08:42:43 AM MST

[\(User Info\)](#)

LOL,

I think the square root of pie is going to be relative to Candlepower... (j/k)

I believe CDS cells will absorb in the IR spectrim, but efficiency is poor.

-Never surrender- Ferris Bueller'

-JW

Re: Radiant light from gas flame for solar power?

[\(none / 0\)](#) (#2)

by veewee77 on Fri Nov 14th, 2003 at 06:11:22 PM MST

[\(User Info\)](#)

Actually, you might e better served to get a peltier junction and place it closer to the flame (not in the flame) with a heat sink on the other side.

DS

Re: Radiant light from gas flame for solar power?

[\(none / 0\)](#) (#3)

by hydrosun on Fri Nov 14th, 2003 at 07:41:29 PM MST

[\(User Info\)](#)

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There is a device called the Midnight Sun sold by Alternative Energy Engineering that runs on propane and produces electricity. It was developed by Western Washington University and JX Cristals. It has a central white hot flame surrounded by special photovoltaic cells that work on the infrared frequency. I don't have the specs in front of me, but I think it put out 120 watts. the idea was it would work as a room heater and create electricity at the same time. Not as much electricity as a fuel cell but still a quiet nonmechanical way to convert some of the energy into electricity. The price I remember seeing was \$2300. Though high, it does replace a propane heater and a generator, so might be worthwhile in some situations.

I don't know what a regular solar panel would do , but I know it's voltage goes down with higher temps, so probably not much.

[Radiant light from gas flame for solar power?](#) | 3 comments (3 topical, 0 editorial)

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[suggestions on resin choices...](#)

By [headhunter](#), Section [Weird Science](#)

Posted on Wed Oct 22nd, 2003 at 10:36:23 PM MST

[Wanted](#)

[suggestions on resin choices...](#)

Well, I've tried this hobby store resin for my machine... the cool thing is its clear, ya know the same resin thats used in those paper weights that have coins floatin in em.

The problem is its brittle, and can crack easily. Just curious as to the other types of resins that are available.

Was hoping for the clear see through look, but much stronger.

Any suggestions, and possible places to find such and item?

Ivan.

[suggestions on resin choices...](#) | 3 comments (3 topical, 0 editorial)

Re: suggestions on resin choices... ([none / 0](#)) (#1)  
by [johnjach](#) on Thu Oct 23rd, 2003 at 06:52:56 AM MST  
([User Info](#))

Two sources. There are many plastics, resins, mold making supplies, etc. at [www.smoothon.com](#). There may be something at that web site which can be of use to you. Also try [www.fiberglasssupply.com](#). Is it possible you could reinforce the plastic part (I assume you're making a prop) with carbon-fiber rods?

Re: suggestions on resin choices... ([none / 0](#)) (#2)  
by [monte350c](#) on Thu Oct 23rd, 2003 at 08:50:07 AM MST  
([User Info](#))

Hi!

In my early wind machine experience I've used 2 types of resin so far.

The first is plain old fiberglass (styrene-based) resin. It's:

1. The type you add a few drops of hardener to a lot of resin.
2. Very stinky!
3. Dries semi-clear with a greenish or purplish hue.
4. Seems quite good for casting stators.
5. Is quite cheap.
6. It's fairly brittle when it dries.

The second type is epoxy resin. It's:

1. The mix is 5 parts resin to one part hardener.

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2. There's hardly any smell at all.
3. Dries clear.
4. Works well with styrofoam, ie. doesn't melt it.
5. Is more expensive (one quart of resin & hardener = about \$45)
6. It's got a small amount of give to it when dry.

I have found the epoxy based stuff from West Systems (<http://www.westsystem.com>) is nice to use. They supply a set of pumps with their product for about \$10. The resin pump is 5x the delivery per stroke as the hardener pump, so you can very easily make just the amount of epoxy as you go along in the job. 1 pump of resin, then 1 pump of resin. It does take longer to set up than the styrene based stuff, my wing profiles took about 8 hours to fully harden up.

I found the styrene based stuff at a local auto parts supplier, and the epoxy I got came from a local marine/boating supply shop. The epoxy won't stick to polyethylene plastic, so you can use 4 or 6 mil plastic film to line a mold. It just pops off when hard. Leaves a nice shiny surface too.

As a final note you can predict whether or not something will stick to epoxy or styrene resin by testing it with a bit of acetone. Generally if the acetone doesn't melt the thing you're testing, then the resin won't stick to it either.

Good luck and have fun! (styrene resin especially - outdoors or wear a mask!)

Ted.

Re: suggestions on resin choices... (none / 0) (#3)  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Thu Oct 23rd,  
2003 at 10:51:10 PM MST  
([User Info](#)) <http://www.internetfred.com>

I use general boat or car repair resins. Any car parts and general stores have them. stuff is cheap, available everywhere. Can not see through it, but it's strong, does smell, mask is highly suggested. Fibers are suggested for strenght.

[suggestions on resin choices...](#) | 3 comments (3 topical, 0 editorial)

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## [Batteries](#)

By [Homebrewed12vdc](#), Section [Classifieds](#)

Posted on Wed Oct 22nd, 2003 at 03:07:53 PM MST

[Wanted](#)

12v or 6 volt

Does anybody who lives in the area of Colebrook, NH 03576 have any batteries cheap or for free for the hualing. I have 10 year old gell cells now, and they have issues. Thanks you can contact me at [bearfalconer@hotmail.com](mailto:bearfalconer@hotmail.com)

[Batteries](#) | 1 comment (1 topical, 0 editorial)

Re: Batteries ([none / 0](#)) ([#1](#))

by Seth on Thu Oct 23rd, 2003 at 12:39:03 PM MST  
([User Info](#))

Have u tried a desulfator on them??? to help with the issues the Gell cells have..

[Batteries](#) | 1 comment (1 topical, 0 editorial)

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- [bearfalconer@hotmail.com](mailto:bearfalconer@hotmail.com)
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## [obtaining magnets for generator](#)

By [kell](#), Section [Magnets & Magnetism](#)

Posted on Mon Oct 13th, 2003 at 10:26:38 AM MST

[Wanted](#)

magnet shipper will not pick for polarity

I have a plan to convert an old generator (from a motorcycle) from field coils to use with permanent magnets. The motivation: enabling the bike, an old kick start, to start up and run without a battery. I was lucky enough to find neodymium magnets that are just the right size and curvature to fit inside the generator case, which is cylindrical, in place of the field coils. Unfortunately the supplier, All Electronics in L.A., California, refuses to sort magnets for polarity. Basically, it's "We ship and you take what you get." So I ordered extra magnets hoping I would get some with opposing polarity, but they were all the same. The supplier's web site is [allelectronics.com](#) and the catalog number for the neodymium magnets is [MAG-23](#).

Does anybody here have any suggestions? The magnets I got from them have the north pole on the outside (convex) face and the south pole points in toward the center of curvature. I only need one magnet with the polarity the other way around and I can build my project.

I have gone on motorcycle and car discussion boards looking to see if they have members in L.A. that would go to one of the All Electronics retail stores (with a pocket compass) to find a magnet for me, but got nowhere. So maybe I would fare better by finding another outlet that carries the same magnet -- seems like the manufacturer would sell them to more than one place. Anyway, I am looking for substantive help, and suggestions are welcome, but I don't want to get into a debate about the feasibility or merits of this project, or any technical issues -- I went through that already in the other bbs.

[obtaining magnets for generator](#) | 14 comments (14 topical, 0 editorial)

Re: obtaining magnets for generator ([none / 0](#)) ([#1](#))  
by [signweld](#) on Mon Oct 13th, 2003 at 12:08:32 PM MST  
([User Info](#))

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- [MAG-23](#)
- [More on Wanted](#)
- [Also by kell](#)

Another source, depending on your diameter needed, would be a starter motor from a lawnmower, or snowblower ect, or Ive even found them in small agricultural 12. spray pumps from agway or northern hyd. Might be a chalange to find right size. If the id was ok you could always shim the od to make work. Thinner magnets might reduce current, but it sounds like you only need to power a few lights.

Good luck!  
signweld

Re: obtaining magnets for generator ([none / 0](#)) (#2)  
by JW on Mon Oct 13th, 2003 at 12:18:57 PM MST  
([User Info](#))

I have a suggestion/

use <http://www.wondermagnet.com>

Dan B is a magnet expert, you probably could get some very good advice from him, especilly pertaining to the type used for these dual rotor design. Actually if you look at the top of the page "here" you will see a link to "our products" and thats a good way to get there.

as far allelectronics goes they specialize in used surplus stuff, this is not a source of "new" magnets and most likely what you get, will become out of stock, never to be available again.

The actual bonus to wondermagnet is you will get "free" tech support here, my hat goe's of to you Dan.

-JW

Re: obtaining magnets for generator ([none / 0](#)) (#3)  
by DanB on Mon Oct 13th, 2003 at 12:24:08 PM MST  
([User Info](#))

We used to have those very same magnets and could offer them in pairs but sold out last winter. Im not sure All Electronics has them both ways, and several other folks have told me that they were unable to get even numbers of magnets which are magnetized half and half.

We looked into having this size (or something very similar) manufactured, and due to the shape - they cost about three - four times what a similar sized bar magnet (flat) would cost. With that in mind, for most applications, I think perhaps it's wise to simply use a bar magnet which is thicker.

Re: obtaining magnets for generator ([none / 0](#)) ([#4](#))  
by JW on Mon Oct 13th, 2003 at 12:34:58 PM MST  
([User Info](#))

signweld,

I think you misundersood kell's posting. I believe he's trying to fix a magneto (for ignition spark) for his motorcycle engine or something like that. if Im correct the motorcycle engine has a kick start, and no battery or generating electrical system.

-JW

[ [Parent](#) ]

Re: obtaining magnets for generator ([none / 0](#)) ([#7](#))  
by signweld on Mon Oct 13th, 2003 at 03:24:55 PM MST  
([User Info](#))

JW, I did understand Kells question as he wants to remove the field coils from a generator and replace them with pm's. He didnt state weather its use was for lights or ignition. either wayI I surmised that the generator was probabaly not of a automotive size, but more of the 2-3/4 to 3-1/4" dia size, for which I sugested the replacments, which are already in pairs. Maybe he will post size specs and wether or not he wants to make a 6 or 12v pm generator or a magneto.  
signweld

[ [Parent](#) ]

Re: obtaining magnets for generator ([none / 0](#)) (#8)  
by kell on Mon Oct 13th, 2003 at 04:34:03 PM MST  
([User Info](#))

DanB:

I talked on the phone to a worker in their store on South Vermont Avenue in L.A. He put me on hold while he went to check the magnets, and came back and said they have them in pairs. They haven't discontinued them either -- they are still getting them from the manufacturer. So the magnets are there. With both polar orientations.

Since these magnets are still being made, maybe you should consider getting some more and selling them. I for one would sure appreciate it.

[ [Parent](#) ]

Re: obtaining magnets for generator ([none / 0](#)) (#5)  
by JB on Mon Oct 13th, 2003 at 12:56:05 PM MST  
([User Info](#))

try [www.mpja.com](http://www.mpja.com) I dont know if the separate them or not.Good Luck. JB

Re: obtaining magnets for generator ([none / 0](#)) (#6)  
by John on Mon Oct 13th, 2003 at 02:27:55 PM MST  
([User Info](#))

[mpja.com](http://www.mpja.com) also has these magnets, but they do the same thing as All Electronics. Out of 20 that I ordered only one had north on the inside(concave side).

John

[Toxin absorber/Pain reliever](#)

Re: obtaining magnets for generator ([none / 0](#)) (#9)  
by JW on Tue Oct 14th, 2003 at 07:53:15 AM MST  
([User Info](#))



signweld,

My apoligize's , after I read the post more thourogly I agree with you, that could be the case. But the kick start thing thru me off, and in my my mind I automatically defaulted to magneto, for spark. And that remark he made at the bottom of the post about "I just need thses magnet's dont ask why" gave me a susspion that he was'nt trying to make a genny or alt.

sorry about that, I know from my reasearch that wondermagent has a very diverse selection of magnets 'not just the kind made for dual rotor genny's. As a mechanic, if i was looking for a weird magnet set, for repairing a magneto system ,that are commonly used on motercycle engines, that have no battery. or possibly try to installal magneto system, on a motercycle that used a coil and a battery. Thats where id look for them. especially if the motorcycle engine had no magneto system in the first place.

Again sorry about disagree'ing with you, I just wanted to bring the possibility to light. Besides if you have engine power, its a hell of alot easyier to just bolt on a small PM DC motor and use that as a genny, perhaps this is why kell said dont ask why.

-JW

[ [Parent](#) ]

Re: obtaining magnets for generator ([none / 0](#)) ([#10](#))  
by kell on Tue Oct 14th, 2003 at 10:15:42 AM MST  
([User Info](#))

It's not a mag, the bike has a conventional points-and-coil (Kettering) igintion system that requires a power source. By taking out the electromagnets ("field coils") in the stock generator and replacing them with permanent magnets I can get power at much lower revolutions. Maybe even enough that at kick the gen will power the ignition enough to put out a spark. No battery involved.

[ [Parent](#) ]

Re: obtaining magnets for generator ([none / 0](#)) ([#11](#))  
by JW on Tue Oct 14th, 2003 at 12:26:35 PM MST  
([User Info](#))

Kell,

Cool! what a great idea. see I knew there was a magneto involved some way, just kidding, LOL.

Sounds like a really "neato" project. I'm sure your endeavor will meet with success.

-JW

[ [Parent](#) ]

Re: obtaining magnets for generator ([none / 0](#)) ([#13](#))  
by signweld on Wed Oct 15th, 2003 at 12:16:31 PM MST  
([User Info](#))

I heard this somewhere, but dont know personally, that you could change the value of the condenser to help the spark suffering from low voltage, at the expense of faster pitting of the points. Might be worth playing with if it starts hard. You might need a condenser / capacitor checker as I dont remember automotive condensers having a value printed on them. good luck.  
signweld

[ [Parent](#) ]

Re: obtaining magnets for generator ([none / 0](#)) ([#12](#))  
by kurt on Tue Oct 14th, 2003 at 11:31:25 PM MST  
([User Info](#))

<http://www.rare-earth-magnets.com/SearchResult.aspx?CategoryID=21&Keywords=Segment&All=True>



Re: obtaining magnets for generator ([none / 0](#)) (#14)  
by [ibedonc](#) on Sat Nov 8th, 2003 at 08:51:36 PM MST  
([User Info](#))

thank you , this is a great site , and these magnets are what I have been lookin for

[ [Parent](#) ]

[obtaining magnets for generator](#) | 14 comments (14 topical, 0 editorial)

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## [WANTED STERLING WALKING BEAM ENGINE](#)

By [Homebrewed12vdc](#), Section [Classifieds](#) [Wanted](#)  
 Posted on Sat Oct 11th, 2003 at 09:24:01 AM MST  
 I desperatley are looking for a WANTED STERLING WALKING BEAM ENGINE

If anybody has a STERLING WALKING BEAM ENGINE that works for sale please contact me at [bearfalconer@hotmail.com](mailto:bearfalconer@hotmail.com). Thankyou.

[WANTED STERLING WALKING BEAM ENGINE](#) | 1 comment (1 topical, 0 editorial)

Re: WANTED STERLING WALKING BEAM ENGINE  
[\(none / 0\) \(#1\)](#)  
 by [windstuffnow \(elenz@windstuffnow.com\)](mailto:elenz@windstuffnow.com) on Sat Oct 11th, 2003 at 11:26:11 AM MST  
[\(User Info\)](#) <http://www.windstuffnow.com/main>

The stirling beam engine is probably about the simplest to construct. I have plans for a "Tin Can" version of it on my site. If your looking for something that will actually make some power it will have to be fairly large depending on the amount of power your looking for. Still not a real efficient way to convert energy.

Some sites that sell plans or models...

- <http://www.jerry-howell.com/Beamer.html>
- <http://www.baileycraft.com/page1.htm>
- <http://www.jerry-howell.com/>
- <http://www.bekkoame.ne.jp/~khirata/indexe.htm>
- <http://members.aol.com/tstirlingo/>

Have fun  
Ed

[WANTED STERLING WALKING BEAM ENGINE](#) | 1 comment (1 topical, 0 editorial)

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### [seeking ionized carbon cylinders](#)

By [magnetokinetic](#), Section [Classifieds](#)

Posted on Tue Oct 7th, 2003 at 08:56:42 PM MST

[Wanted](#)

must be reasonably priced

seeking ionized carbon cylinders approximately 8" thick and have a length of twelve inches or better, any info, or quote welcome. contact me at tetrxiomega@hotmail.com thanks

[seeking ionized carbon cylinders](#) | 0 comments (0 topical, 0 editorial)

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### [Wanted ; 1500 lb,or better magnets](#)

By [magnetokinetic](#), Section [Magnets & Magnetism](#)

Posted on Thu Sep 18th, 2003 at 06:15:00 PM MST

[Wanted](#)

seeking ,magnets of 1500lb or better ,specific shapesdesired!

I am seeking magnets of 1500lb,or better in these specifications,x10,1"round x 6" long bar magnets ,x 1 block magnet 6" x 6" x 6" at a reasonable deal please contact me at [tetrixomega@hotmail.com](mailto:tetrixomega@hotmail.com) thank you for your time!

[Wanted ; 1500 lb,or better magnets](#) | 1 comment (1 topical, 0 editorial)

Re: Wanted ; 1500 lb,or better magnets ([none / 0](#)) ([#1](#))  
by [wooferhound](#) ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Thu Sep 18th, 2003 at 07:47:24 PM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

I think that you are talking about a 6" x 6" x 6" magnet that will pick up 1500lbs.  
well try e-mailing the guy that does these auctions on Ebay.

Here is a 1.5 inch square magnet that looks pretty mean and dangerous, and a decent price too. . .

<http://cgi.ebay.com/ws/eBayISAPI.dll?ViewItem&item=2558966570>

-- W o o f

[Wanted ; 1500 lb,or better magnets](#) | 1 comment (1 topical, 0 editorial)

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## [Solar Ventilator](#)

By [pexring](#), Section [Classifieds](#)

Posted on Sat Aug 23rd, 2003 at 01:26:49 AM MST

[Wanted](#)

Wanted wholesaler for solar ventilator

I recently bought a solar ventilator on ebay and am impressed with it. The solar ventilator is about 8" in diameter. Basically, you put the contraption in a wall, and a built-in solar cell runs a fan which draws air out of the room. Does anyone know where I can find a wholesaler for these? Thanks a zillion, Mark

[Solar Ventilator](#) | 3 comments (3 topical, 0 editorial)

Re: Solar Ventilator ([none / 0](#)) ([#1](#))  
by Alex on Sat Aug 23rd, 2003 at 06:25:32 AM MST  
([User Info](#))

You can make such fan using a solar cells and computer fan without any problem...

Re: Solar Ventilator ([none / 0](#)) ([#2](#))  
by pexring on Sat Aug 23rd, 2003 at 10:28:19 AM MST  
([User Info](#))

The fans need to be able to take moisture. These fans are designed to handle moisture. Not sure if that's the case if I use a computer fan. Mark

[ [Parent](#) ]

Re: Solar Ventilator ([none / 0](#)) ([#3](#))  
by dualsporter on Sat Aug 23rd, 2003 at 11:11:07 AM MST  
([User Info](#))

Solar ventilators are commonly found at shops selling sailing / boating equipment.

You mount one through the fore hatch and the interior of your boat stays dry and does not get musty when closed up for extended periods.

Dualsporter

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[Question for a Genius! \(Can you answer?\)](#)

By [Insane](#), Section [Homebrewed Electricity](#)  
Posted on Wed Jul 2nd, 2003 at 11:00:19 PM MST  
[Question for a Genius! \(Can you answer?\)](#)

[Wanted](#)

Ok, Here are the tools.

Twenty 12 volt 4 watt light bulbs.  
One GM Alternator with Built in Governor.  
One Regular Old 12 volt car battery.  
One Water turbine.  
One pump. (pumps 3000 gallons per hour) And has 4.5 meters of head pressure.

Now with these tools would you have enough energy to run the 20 light bulbs?  
How much energy would you be producing? (Roughly)  
What would be the max rpm you would get?  
With the tools above what is the best setup?  
How long could you run the 20 lights off of a fully charged 12v car battery?

Anyone know the answers?

[Question for a Genius! \(Can you answer?\)](#) | 12 comments (12 topical, 0 editorial)

Re: Question for a Genius! (Can you answer?) ([none](#) / 0) ([#1](#))  
by Anonymous Hero on Wed Jul 2nd, 2003 at 11:10:32 PM MST

Ok I'll bite. Lets see ... If you lit up the lights to there optimum rating you'd be producing 80 watts ,, but..... That would depend on the flow in volume. Max rpm...depends on the flow and nozzle size. With the above listed tools , it would depend on the flow. The lights will run on a curve based upon the amp hours listed on the battery and the condition of that battery. If you want more help, you need to give us more info. Sorry.. Not a genius , but trying real hard, Jungle Bill

Re: Question for a Genius! (Can you answer?) ([none](#) / 0) ([#2](#))  
by dagnew on Thu Jul 3rd, 2003 at 07:33:48 AM MST ([User Info](#))

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In general the power produced by a water turbine can be found by  $HP = \text{Flow}(\text{ft}^3/\text{sec}) \times \text{HEAD}(\text{ft}) / 8.8$ . So... Convert 3000 gal/hour to cubic feet per second... I calculate about .1  $\text{ft}^3/\text{sec}$ . Multiply by head about 14 ft. divide by 8.8 then multiply by eff factor of about .8 is about .13 hp. This can be converted to about 70-80 watts electricity. Now, you have twenty 4 watt bulbs = 80 watt usage. Seems like it could work, but the problem is that all the water pumped to 4.5 meters MUST be used to drive the turbine, which means that it must be channeled through a pipe or similar enclosure to build the head pressure, which means you don't have any water left for your decorative waterfall. Dick Agnew

Re: Question for a Genius! (Can you answer?) ([none](#) / [0](#)) ([#3](#))  
by wdyasq on Thu Jul 3rd, 2003 at 08:50:31 AM MST  
([User Info](#))

You don't need a genius, you need a clairvoyant to know what items are in the "mystery system".

If you plan on running the turbine with water from the pump, you will need divine intervention to produce surplus power.

Re: Question for a Genius! (Can you answer?) ([none](#) / [0](#)) ([#4](#))  
by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Thu Jul 3rd, 2003 at 09:14:28 AM MST  
([User Info](#))

And -- remember that the inrush current when turning on the lightbulbs would be 3-4 times their running current, if they are incandescent. If they are fluorescent, it works the opposite way -- very low inrush current.

Cheers

ADMIN

Re: Question for a Genius! (Can you answer?) ([none](#) / [0](#)) ([#5](#))  
by Insane on Thu Jul 3rd, 2003 at 02:30:37 PM MST  
([User Info](#))

Well, considering you would only need the lights in the evening when it gets dark. That may help a whole lot. :)  
The rest of the day, the battery is being charged.

flow rate is roughly 3000 gph or 10300 liters per hour.  
(times the head by the flow and times that by 10 will give you the rough power. = 133 watts

so with this flow and a small size turbine what kind of rpm could you get if it is turning the generator? How long could you run the 80 lightbulbs off the battery and alternator? And what kind of a setup would you use?  
Would you connect directly to the battery from the generator and connect the light directly to the battery?  
Would a gearing system to the generator be better?

Re: Question for a Genius! (Can you answer?)  
([none / 0](#)) ([#6](#))  
by Anonymous Hero on Thu Jul 3rd, 2003 at 05:53:46 PM MST

Sounds like my gazebo project, I want to get something back from my Koi pond waterfall which runs on a pump. But what do you need 80 lights for? Enchanted look, or a greenhouse? Anyway I wanted to skip the battery all together but I was told using a couple of batteries wouldn't be that much hassle or maintenance if you set it all up correctly. My advice is to just start making the system and see how much you get from it. learning by doing.

[ [Parent](#) ]

Re: Question for a Genius! (Can you answer?) ([none / 0](#)) ([#7](#))  
by JW on Thu Jul 3rd, 2003 at 07:24:18 PM MST  
([User Info](#))

You dont need a Genius, you need an optical heat-exchanger.

[ [Parent](#) ]

Re: Question for a Genius! (Can you answer?) ([none / 0](#)) ([#8](#))  
by pexring on Thu Jul 3rd, 2003 at 10:44:43 PM MST  
([User Info](#))

Definitely not a genius here. What's an optical heat exchanger? Thanks, Mark

[ [Parent](#) ]

Re: Question for a Genius! (Can you answer?) ([none / 0](#)) ([#9](#))

by Insane on Thu Jul 3rd, 2003 at 11:19:45 PM MST

([User Info](#))

lol, No I need a genius. No one has told me how to do it or if it can be done. :) How do I wire it?

[ [Parent](#) ]

Re: Question for a Genius! (Can you answer?) ([none / 0](#)) ([#10](#))

by wdyasq on Fri Jul 4th, 2003 at 06:46:09 AM MST

([User Info](#))

Insane,

You have given insufficient information.

To answer your "questions":

Now with these tools would you have enough energy to run the 20 light bulbs?

How much energy would you be producing? (Roughly)

What would be the max rpm you would get?

With the tools above what is the best setup?

How long could you run the 20 lights off of a fully charged 12v car battery?

And:

so with this flow and a small size turbine what kind of rpm could you get if it is turning the generator?

How long could you run the 80 lightbulbs off the battery and alternator?

And what kind of a setup would you use?

Would you connect directly to the battery from the generator and connect the light directly to the battery?

Would a gearing system to the generator be better?

\*\*\*\*\*

The answer of the energy to run the bulbs has been answered, by yourself and dagnew. There is an ~100% difference between your figures and dagnew's but, WTH.

The rest of the answer gets down to personal preference, knowledge and skills. If one has a constant



supply of energy, such as water gives, a battery is not always necessary. But, we don't know the style of water turbine you might select so none can venture to guess what speed it would run or, if you will need "gearing". Nor, do we have an indication of the condition of your car battery OR, what you need to pump.

I have been reading the archives on subjects of interest to me. The folks here are VERY free with their knowledge and information. I'm sure if you will do a LOT of "homework", you will be able to formulate a question these kind, knowledgeable and experienced folks can answer to your satisfaction.

[ [Parent](#) ]

Re: Question for a Genius! (Can you answer?) ([none / 0](#)) ([#11](#))  
by Insane on Fri Jul 4th, 2003 at 10:48:25 PM MST  
([User Info](#))

thanks for the comments, I realize there are variables missing. I just wanted to know for sure if it could be done and how to do it. (From what I found, it can be done.) Someone with a similar setup but with a 6000 gph flow is making 160 watts. So, In reality I should maybe be able to get 80 Watts. The turbine will be hand made. for such a small project. I am looking into the gm alternator, I may have to make one from scratch as well, but we will see. All a great learning experience. With this charging and no load during the main part of the day, will this hurt the battery?

Re: Question for a Genius! (Can you answer?) ([none / 0](#)) ([#12](#))  
by Anonymous Hero on Sat Jul 5th, 2003 at 03:26:26 PM MST

Dear Insane, Ok I see now,,, you are going to pump water to use the same water flowing down a pipe to create energy ,( not to pump the same water right, cause then you'll need to talk to experts like Dennis Lee, we on this board deal in the limitations of reality and math) . You are going to light up some cute lights and make a scientific water project? OK great. 3000 pgm pump up 4.5 meters. Very well thats 50 GPM X 10lbs X ~ 15 feet head = 7500 ft /lbs per min or about .22 HP or about 170 watts. 'Lets expect not more than 35 % efficiency = 60 watts available to you will home built turbine. I think it is always worth the time to build anything , so don;t let my 60 out of 80 bum you out, go for it. GM alternators will require a step up in speed. I would not use one , I would use a pma. Basically the sweet little homemade gennys

these propeller heads use on their wind machines. You can build exactly to your requirement. Also AC is really nice to play with if you genny is remote. You can easily modify voltage . Real nice. I farted around with car alternators enough, and the best one I came up with was a VW single wire , self exciting one and I used a DC/DC converter to bump up the voltage to 15 VDC. It ate about 10% in the process. Totally inefficient with Sears vaccum cleaner turbine, I was ABLE TO extract 25 % of the true nozzle torque. Bloody good fun though. AND ,, I had power in my barn for a friend who lived in there and only need a couple lights and a radio. The VW generator ran like silk for years. Jungle Bill

[ [Parent](#) ]

[Question for a Genius! \(Can you answer?\)](#) | 12 comments (12 topical, 0 editorial)

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### [Propellor Hub Wanted](#)

By [wincherman](#), Section [Classifieds](#)  
Posted on Sun May 11th, 2003 at 12:23:04 AM MST [Wanted](#)  
I need a Wincharger 4 bolt prop hub in good condition. It can either be a 1500 (long bolt) or 1200(short bolt) style. [bryantwind@sbcglobal.net](mailto:bryantwind@sbcglobal.net) Thanks.

[Propellor Hub Wanted](#) | 1 comment (1 topical, 0 editorial)

ADMIN note: Winchargers ([none / 0](#)) ([#1](#))  
by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Tue May 13th, 2003 at 11:08:30 AM MST  
([User Info](#))

This person is DEDICATED to restoring old Winchargers into serviceable condition, and has much information, advice, replacement parts, etc. on the subject.

Highly recommended!

ADMIN

[Propellor Hub Wanted](#) | 1 comment (1 topical, 0 editorial)

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### [Degaussing ideas](#)

By [Anonymous Hero](#), Section [Homebrewed Electricity](#)  
Posted on Tue May 6th, 2003 at 08:40:18 PM MST [Wanted](#)

I need some information or ideas an a home-made degaussing device.

I need to show that I can nuetralize several different sized magnets using some sort of device made from common materials. Please help me out

[Degaussing ideas](#) | 6 comments (6 topical, 0 editorial)

Degaussing... ([none / 0](#)) (#1)  
by xeroid ([centurion27@lycos.com](#)) on Wed May 7th, 2003 at 12:58:58 PM MST  
([User Info](#))

Have you tried a hammer?

(sorry, I just couldn't resist!)

I think there must be a way to to this with a coil of wire and a high voltage DC source...

Maybe one of the guru's on this board could elaborate...?  
Regards, XEROID.

Long ago.. ([none / 0](#)) (#2)  
by TomW on Wed May 7th, 2003 at 01:26:10 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

In a time when I did TV repairs we had degaussing coils to remove residual magnetism from picture tubes. These wre simply a large coil of fine wire you plugged into the wall and passed across the picture tube to neutralize residual magnetism.

I think demagnetizing permanent magnets would seem unlikely with "common materials" but its not an area i can claim to be knowledgeable in.

I will note that I think it would require a huge field of the opposite poplarity or alternating polarity to demagnetize anything of consequence. Bulk erasers exist for magnetic media but the difference between zeroing a video tapes magnetic data and zeroing a magnets field are orders of magnitude apart.

Cheers.

TomW

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Re- Degaussing ideas ([none / 0](#)) (#3)  
by Electric Ed on Wed May 7th, 2003 at 03:52:42 PM MST  
([User Info](#)) <http://www.electric-ed.com>

You will need a coil with Alternating Current. An old dual-voltage AC motor stator, connected for 230 v, (run winding only) and operated on 115 volts, is what we used to use for de-magnetizing tools. etc. I don't know if it would be strong enough for what you want to do or not. Ed

Currie..... ([none / 0](#)) (#4)  
by Demetri ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Wed May 7th, 2003 at 10:50:17 PM MST  
([User Info](#))

Could you just heat the magnet to it's Currie temperature?  
Or do they remagnetize when they cool? Demetri  
Always be the lead dog.

degaussing ([none / 0](#)) (#5)  
by troy on Thu May 8th, 2003 at 10:53:48 AM MST  
([User Info](#))

Once you cook them, at least the neos, they're cooked forever. Best Regards, troy

[ [Parent](#) ]

Currie Tempature ([none / 0](#)) (#6)  
by Anonymous Hero on Sat May 10th, 2003 at 12:17:03 AM MST

Once a magnet reaches it's Currie point it loses it's magnetic field. Cooling it down doesn't restore it.

Magnets are always losing their power as smaller magnetic domains are eaten by larger ones. Even super powerfull NIB magnets will demagnetize over a few hundred years. Less powerfull magnets leak flux much faster and can die in months. Entropy in action. :-)

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
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[another distraction](#)

By [Bruce Downunder](#), Section [Rants & Opinion](#)  
 Posted on Tue Apr 8th, 2003 at 04:07:43 PM MST [Wanted](#)  
 This is a request for help.

 Does anybody know of a good book that is easy to follow in setting up and machining with a vertical mill. Say, including using an indexing head Etc. Oh, be cery careful of the quill feed on these. someone locked it off -and then tried to wind the handle , result , stripped quill feed gear housing -they are only made of el-cheapo gun metal . also when I scored this , there was no instruction book , anyone help in downloading one to me ,please.-I'll buy you a fosters!. Thanks Bruce

[another distraction](#) | 1 comment (1 topical, 0 editorial)

Re: Another distraction ([none / 0](#)) ([#1](#))  
 by Crippy on Thu Apr 10th, 2003 at 07:44:32 PM MST  
[\(User Info\)](#) <http://windpower.jkcc.com>

Nice :) I've used a few different models of these mill/drills. Emphasis should be on the "drill" part as the pedestals are nowhere near robust enough for serious milling operations. It is very easy to over-stretch the capacity of these things and get some MAJOR chatter out of them. The best advice for these is to keep the exposed portion of the spindle as small as possible, and lower the head as far down the pedestal as possible. This helps a lot in reducing chatter. Also, using small, 4 flute cutters and using them to make multiple passes, instead of using bigger cutters and fewer passes takes the stress off the pedestal too.

Looks like you have a nice little carbide cutter on it too :) A mill/drill is an excellent little piece of kit for light work. Just be patient with it and it'll do a pretty good job for you. I'd like to get one for at home too. Either that, or a Shopsmith, as I've heard pretty good things about some of them too.

[Windpower - first attempt](#)

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[About the new board . .](#)

By [Crippy](#), Section [Rants & Opinion](#)

Posted on Sun Mar 30th, 2003 at 04:31:57 PM MST

[Wanted](#)

Too busy. WAY too busy.

Too many buttons, options and clutter. Too bad you couldn't hit the main page and it shows you all the main forums listed vertically. Click on the forum you want (Wind, Hydro, Solar, etc) and you now have a list of message threads pertaining to the forum topic. Personally, I like expanded threaded displays so I can hit the newest one in the thread, but that's just me. The different message threads are arranged by the last message posted, this way, new messages to an old thread automatically bump it to the top of the thread list. A good example of this is at [bmistress.hyperboards.com](#) While I understand the board is new, it's one of the most cluttered forum apps I've seen. To me, even though the old board had great threads that get pushed out of sight too fast, it was clean, simple and you could get to the messages with little fuss. This has too many buttons an features, not all of which might be necessary. Additionally, there's no topicx for "TEST" or just a "RANT" so things like this get posted all over the place.

[About the new board . .](#) | 0 comments (0 topical, 0 editorial)

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## [testing pic up load](#)

By [Old F](#), Section [Classifieds](#)

Posted on Sun Mar 30th, 2003 at 06:47:18 AM MST

[Wanted](#)

hope this works

The Dans at work on new site

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[waste water heat recovery](#)

By [marv](#), Section [Remote Living](#)  
Posted on Fri Dec 26th, 2003 at 05:07:24 PM MST [Water Heating](#)  
shower water system

This is a unit I built 3 years ago. It warms up the cold water going to the shower from the shower waste water.

Even if it heats the water a few degrees thats a little less comming from the hot water tank. It costs nothing to run, no maintenance and the savings add up year after year.

Thought you guys might want a look.



MARV.

[waste water heat recovery](#) | 6 comments (6 topical, 0 editorial)

Re: waste water heat recovery ([none / 0](#)) ([#1](#))  
by [joe4324](#) on Sat Dec 27th, 2003 at 03:09:58 AM MST  
([User Info](#)) [www.ecoforums.com](http://www.ecoforums.com)

I love stuff like this, If your warming up the cold water a little bit before it goes into the hot water heater you could be saving yourself a couple dollars a month, maybe a little more!

My only problem with systems like this is its hard for me to choose wich ones to use because you cant have them all. eventually you'll have a plumbing nightmare! :)

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Re: waste water heat recovery ([none / 0](#)) (#4)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on  
Sat Dec 27th, 2003 at 08:11:02 AM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

Yes , I can see the water going through the shower  
water  
then up to tha attic to warm up some more  
then down to thw hot water heater to finish  
warming up the water  
Then to the shower and drained to start heating  
up the new water comming in. . .

} = - W o o f - = {  
[ [Parent](#) ]

Re: waste water heat recovery ([none / 0](#)) (#2)  
by Old F on Sat Dec 27th, 2003 at 07:10:21 AM MST  
([User Info](#)) <http://www.oldf.homestead.com>

Marv

Here is a tube an shell heat exchanger I built for the  
exhaust of a 5 HP Briggs.  
The water inlet an outlet are ½ inch. Its all stainless steel.

Were I work we use waste heat from are air compressors  
to preheat water.  
They save \$ 10000 a year this way .

Oh by the way love that beast of a tower you built.

Old F



Re: waste water heat recovery ([none / 0](#)) (#3)  
by marv ([windtamer@hotmail.com](mailto:windtamer@hotmail.com)) on Sat Dec  
27th, 2003 at 07:44:18 AM MST  
([User Info](#))

Thanks Old F.  
What do you heat with the briggs?  
And how does the compressor rig work?

MARV.

[ [Parent](#) ]

Re: waste water heat recovery ([none / 0](#))  
(#5)  
by Old F on Sat Dec 27th, 2003 at 12:07:59  
PM MST  
([User Info](#)) <http://www.oldf.homestead.com>

Marv

The compressors are 125 HP screw type and the oil is air cooled they run 24/7 . And they really crank out a lot of heat 140of to 160of air temp .

We had to install a 500 gal tank and a boost pump to raise the hot water pressure we had on the fourth floor of the building. Were we set it up it was only 20 feet from the compressors. And ties in to a 1500 gal steam heated water heater.

We placed a air to water heat exchanger over the hot air being exhausted by the compressor.

The water from the pumps bypass was plumed to the heat exchanger and back to the tank. We are only raising the water temp to about 90o F but this gave us one heck of a savings. It was only an after thought as we all ready planing to put in boost pump and tank in any way.

The best part for me was getting payed for something I like playing with : )

Now the Briggs tube and shell will be a test to see how much and how fast can I heat water with engin exhaust. Its one of many irons I have in the fire right now.

Right now I have been working on a tower design of my own.  
So much fun so little time : )

Old F

[ [Parent](#) ]

Re: waste water heat recovery ([none / 0](#)) (#6)  
by jt72 on Sun Dec 28th, 2003 at 01:46:55 PM MST  
([User Info](#))



Looks like a great idea. My problem is that my costs to replace the drywall I would have to tear out to get to my drainage would be far more than I would ever recover. This Spring I will be installing a "desuperheater" to my heat pump. The waste heat that is blown to the outside air at the compressor will be used to heat water that is recirculated to the hot water heater. As such, in North Carolina where we cool 9 months out of the year, my hot water costs during the Summer should be little or nothing.

Since the old tank hot water heaters are the biggest energy hog in the house, I expect to recover the cost of installing this thing in less than two years.

Jim

[ [Parent](#) ]

[waste water heat recovery](#) | 6 comments (6 topical, 0 editorial)

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posted by marv on 12/20/2003 11:18:03 PM MST  
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3. [Recycled engine heat as you drive](#) ([Rants & Opinion](#), [Water Heating](#))

posted by bretco on 11/25/2003 06:07:04 PM MST  
15 comments

4. [Figuring BTU's](#) ([Homebrewed Electricity](#), [Water Heating](#))

posted by pexring on 11/06/2003 11:32:00 PM MST  
6 comments

5. [Pool Heating, Only when the Sun is shining](#) ([Remote Living](#), [Water Heating](#))

posted by woofhound on 10/12/2003 09:18:16 PM MST  
1 comment

6. [How to keep water from freezing](#) ([Homebrewed Electricity](#), [Water Heating](#))

posted by shane on 09/21/2003 07:46:19 PM MST  
8 comments

7. [homebrew water heat changer](#) ([Remote Living](#), [Water Heating](#))

posted by bewotec on 08/28/2003 04:21:18 AM MST  
5 comments

8. [New solar system \( professional \) - I'm impressed.](#) ([Homebrewed Electricity](#), [Water Heating](#))

posted by thebbqguy on 08/22/2003 07:04:02 PM MST  
4 comments

9. [homebrew vs brand solar heaters](#) ([Rants & Opinion](#), [Water Heating](#))

posted by bewotec on 08/21/2003 04:38:27 AM MST  
8 comments

10. [New enclosed solar heater using black pipe - this is my first enclosure !](#) ([Homebrewed Electricity](#), [Water Heating](#))

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posted by thebbqguy on 08/19/2003 01:06:48 PM MST  
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11. [glassed in black tube = higher heat yield](#)  
([Homebrewed Electricity](#), [Water Heating](#))

posted by thebbqguy on 08/18/2003 08:40:25 AM MST  
15 comments

12. [Homemade solar pool heating system with black pipe](#) ([Homebrewed Electricity](#), [Water Heating](#))

posted by thebbqguy on 08/10/2003 08:51:50 AM MST  
10 comments

13. [Splicing PEX tubing](#) ([Remote Living](#), [Water Heating](#))

posted by Wyomingbob on 07/04/2003 08:51:06 PM MST  
7 comments

14. [Hot water heating element temp. ?](#) ([Homebrewed Electricity](#), [Water Heating](#))

posted by Dave B on 05/13/2003 05:17:34 PM MST  
6 comments

15. [Frenette heater](#) ([Remote Living](#), [Water Heating](#))

posted by Techstuf on 04/21/2003 05:16:33 PM MST  
1 comment

16. [Novan solar hot water](#) ([Remote Living](#), [Water Heating](#))

posted by Wyomingbob on 04/19/2003 09:27:30 PM MST  
1 comment

17. [testing](#) ([Rants & Opinion](#), [Water Heating](#))

posted by JackS on 03/31/2003 11:48:43 PM MST  
1 comment

18. [just testing](#) ([Remote Living](#), [Water Heating](#))

posted by Ramblyr on 03/31/2003 07:53:52 PM MST  
0 comments

19. [looking for h2o heat](#) ([Homebrewed Electricity](#), [Water Heating](#))

posted by outback on 03/30/2003 04:25:09 AM MST  
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[water heating](#)

By [marv](#), Section [Remote Living](#)

Posted on Sat Dec 20th, 2003 at 11:18:03 PM MST [Water Heating](#)

home brew water heater

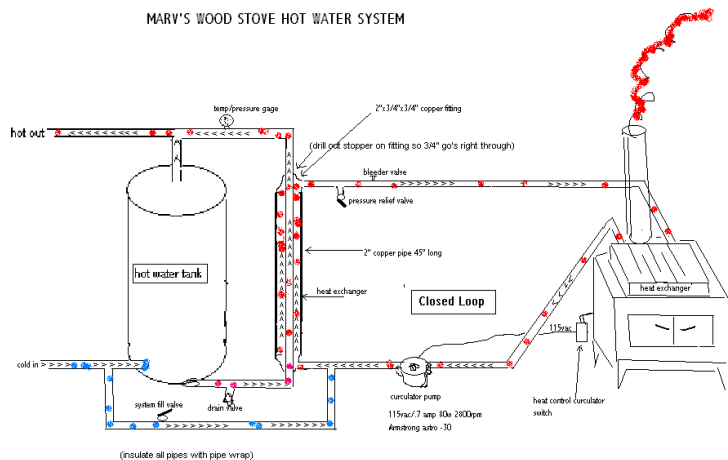
This is my water heating system thats hooked to the wood stove. I flipped off the breaker on the electric water heater 4 weeks ago and this has supplied all our hot water needs since! (2 adults & 2 teens)

All the parts can be bought from a good plumbing supply shop exsept for the wood stove exchanger which I built.

The key to the system is the two fittings on the top & bottom of the water tank heat exchanger, they are 2"x 3/4"x 3/4" copper. There is a lip on the inside that has to be drilled threwh so the 3/4" copper pipe can go from the top right threw to the bottom.

I'm very happy with how it works. check it out!

MARV.



[water heating](#) | 7 comments (7 topical, 0 editorial)

Re: water heating ([none / 0](#)) ([#1](#))  
 by [halfcrazy](#) on Sun Dec 21st, 2003 at 07:10:05 AM MST  
[\(User Info\)](#)

Very neat i am planning a similar system to heat water for my radiant heat and domestic heat. i plan on wood heat and also would like to tie in some solar panels also. keep us posted.

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Re: water heating ([none / 0](#)) (#2)  
by 12volt dan ([dan12v@hotmail.com](mailto:dan12v@hotmail.com)) on Sun Dec 21st,  
2003 at 07:25:00 AM MST  
([User Info](#))

Yes verely cool. I plan on heating my house the same way.  
I'm trying /building a setup to get heat into the back room  
without the pump. We'll see how it works  
7 years off the grid and counting

Re: water heating ([none / 0](#)) (#3)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Sun Dec  
21st, 2003 at 06:01:50 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

You need another circulator pump at the same location as  
the Drain Valve. This will help to store some extra hotwater  
heat in your waterheater. Otherwise your system is just  
working "On Demand".

Cool system though . . .

}=- W o o f -= {

Re: water heating ([none / 0](#)) (#4)  
by marv ([windtamer@hotmail.com](mailto:windtamer@hotmail.com)) on Sun Dec  
21st, 2003 at 08:21:35 PM MST  
([User Info](#))

Woof The hot water circulates through the water  
tank on its own and the tank fills with hot water  
automaticly. We can have two-three showers in a row  
no problem. The water temp. in the tank stays at  
around 130'to 140'.

MARV.

[ [Parent](#) ]

Re: water heating ([none / 0](#)) (#5)  
by troy on Mon Dec 22nd, 2003 at 02:32:17  
PM MST  
([User Info](#))

Depending on where the heat exchanger sits in relationship to the water storage tank, you can get good thermosyphon action to keep the tank water hot.

The ideal location would be a high water storage tank and a low vertical heat exchanger, but even if they are side by side, there is often enough temperature stratification to make the thermosyphon work.

Best regards,

troy

[ [Parent](#) ]

Re: water heating ([none / 0](#)) ([#6](#))  
by brock ([nevermab at uwgb dot edu](mailto:nevermab@uwgb.edu))  
on Mon Dec 22nd, 2003 at 04:21:43 PM  
MST  
([User Info](#))

So did you make the heat exchanger or use parts from ??? I was thinking of using and old transmission oil cooler.

I was just about to build a very similar system. What are you running on the stove side? Something that doesn't boil I assume?

Brock

[ [Parent](#) ]

Re: water heating ([none / 0](#))  
([#7](#))  
by marv  
([windtamer@hotmail.com](mailto:windtamer@hotmail.com)) on Tue  
Dec 23rd, 2003 at 06:47:54 PM  
MST  
([User Info](#))

Hi brock;

I made the exchanger from 3/16" stainless . It's basicly a box with baffles to direct the water. I'm running just water on the stove side. The water circulates all the time so it stays at 130\*-150\* not near boiling point.

You can buy heat exchangers that go right in the stove but this is what I did and it seems to work good.

Thanks for the intrest.  
MARV.

[ [Parent](#) ]



[water heating](#) | 7 comments (7 topical, 0 editorial)

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[Recycled engine heat as you drive](#)

By [bretco](#), Section [Rants & Opinion](#)  
 Posted on Tue Nov 25th, 2003 at 06:07:04 PM [Water Heating](#)  
 MST  
 Recycled engine heat as you drive

Hi,  
 Just wondering if anyone has tried putting an insulated tank (maybe about 100 gallons) in the back of their pickup truck and bypassing the radiator to allow the engine to heat the tank full of water. It could be valved to turn the radiator back on if the tank gets too hot. A friend & I were discussing the feasibility of salvaging this heat and using an internal tank heat exchanger to claim it back as domestic hot water. Maybe some type of quick connect system to the house water supply. I'm already doing a similar process with my woodstove boiler with heat exchanger. Thinking of the wasted heat an internal combustion engine wastes, this would have to be better than dumping the heat to the atmosphere without first using it. Just thought I'd throw this out to the forum for feedback.  
 Bretco

[Recycled engine heat as you drive](#) | 15 comments (15 topical, 0 editorial)

Re: Recycled engine heat as you drive ([none / 0](#)) (#1)  
 by [kell](#) on Tue Nov 25th, 2003 at 07:49:54 PM MST  
[\(User Info\)](#)

Sounds great in principle. The devil is often in the details. You may need baffles to keep the water from sloshing and destabilizing the vehicle. You'll be hauling hundreds of pounds of water (and using up more gasoline). You'll have to pump that water into the house somehow every time you get back from a car trip... and when you go somewhere and park overnight while the water cools off all the extra gas you burned will have gone to waste, along with the wear on your suspension. That, or you leave with an empty water tank and have to find somewhere to fill it up for the trip back... but once the water is warmed up the extra gas expended to haul the added weight of the hot water will have been wasted.  
 An appealing concept perhaps, but I have to say I can't think of a way to make it work in the real world.

Re: Recycled engine heat as you drive ([none / 0](#)) (#12)  
 by [Old F](#) on Thu Nov 27th, 2003 at 06:49:42 AM MST  
[\(User Info\)](#) <http://www.oldf.homestead.com>

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Bretco

Here is something that I use with my wood boiler that could all so be used with engin exhaust.

For a heat exchanger for domestic hot water I used a old propane water heater with the burner that had gone bad removed.

I welded 3/4 inch fittings to the flu and pumped water from the stove thru it works like a charm.

Seeing how they are designed for high temp combustion gases in the first place they should be a good fit for engin exhaust.

And they can be had free for the hauling.

Old F



[ [Parent](#) ]

Re: Recycled engine heat as you drive ([none / 0](#)) ([#2](#))  
by zmoz on Tue Nov 25th, 2003 at 08:01:16 PM MST  
([User Info](#))

Also, it would probably take quite a drive to warm up all that water. Before that happens, your engine is going to be running much cooler than usual, which is NOT good for it in the least and causes even less gas mileage. (in addition to the extra weight you are carrying) Your engine is designed to run with ~200 degree water circulating in it, not cold water.

Re: Recycled engine heat as you drive ([none / 0](#)) (#3)  
by bretco on Wed Nov 26th, 2003 at 05:31:10 AM MST  
([User Info](#))

I was thinking of retaining the thermostat to maintain engine temp so it still runs normally and 100 gallons of water (800 lbs) would definitely drop the mileage somewhat, but with an engine that is probably already only 20% efficient, with the rest wasted heat, capturing that heat has to have potential benefit. I think I'll try an experiment with my F150 and an old oil tank in the back and see if there's possibly any value to this idea. I'll post results if anyone is interested.

Bretco

[ [Parent](#) ]

Re: Recycled engine heat as you drive ([none / 0](#)) (#4)  
by Adrian L on Wed Nov 26th, 2003 at 06:59:38 AM MST  
([User Info](#))

What would be better would be a heat exchanger around the motor coupled to some sort of steam turbine to run a generator, which charges a couple of deep cycle batteries in the back, batteries are heavy, but a couple of 30kg batteries wouldn't effect the milaeage much and store a good 2-4kw max.....

With all these hybrid cars around im surprised they haven't bothered to make a prototype that does this, we all know how much a car engine wastes energy in heat!

Adrian L

[ [Parent](#) ]

Re: Recycled engine heat as you drive ([none / 0](#)) (#6)  
by zmoz on Wed Nov 26th, 2003 at 03:01:01 PM MST  
([User Info](#))

Thermostat isn't really going to help you. As soon as it opens a flood of cold water will come through and make it cold again...then the thermostat will close again, heat up the water, open, get cold, close, ect. Sounds pretty bad for the engine to me....

[ [Parent](#) ]

Re: Recycled engine heat as you drive ([none / 0](#)) ([#9](#))  
by bretco on Wed Nov 26th, 2003 at 10:49:05 PM MST  
([User Info](#))

Hi Zmoz,  
But isn't that what really happens anyway when the thermostat opens, a flood of cold water (from the radiator, instead of the tank) constantly makes the thermostat cycle from closed to sort of open until equilibrium sort of lets the thermostat "modulate" the water to the engine core.  
I'm thinking that the engine won't really see the difference if I use a tank in conjunction with the radiator and the original engine thermostat.  
By the way, I'm still working on my PMG wind generator that I've been gathering info from the otherpower board for some time. I just need to move myself where the zoning rules for my town don't go so far as to look in your underwear drawer to see if you can put up a winmdill! :)  
Bretco

[ [Parent](#) ]

Re: Recycled engine heat as you drive ([none / 0](#)) ([#11](#))  
by zmoz on Wed Nov 26th, 2003 at 11:52:03 PM MST  
([User Info](#))

The problem is the small amount of coolant in your engine heats up in just a few minutes. With 100 or more gallons of water...you would have to go on a REALLY long drive just to get it to heat up, and all along the way you'd be running cold water through your engine. Did I mention that was bad for it yet? ;)

[ [Parent](#) ]

Re: Recycled engine heat as you drive ([none / 0](#)) (#14)  
by monte350c on Thu Nov 27th, 2003 at 10:34:15 AM MST  
([User Info](#))

Hi All,

An automotive thermostat will open basically as needed - it doesn't have to be all the way open or shut. It will open only as much as the temperature of the water passing over the expansion capsule. A good example of this is an automotive engine installed in a marine application (Mercruiser stern drives for example) where lake or sea water is used directly for cooling. If you have a 190 stat in it, it will run at 190, taking in only enough cold water to maintain that temp.

Ted.

[ [Parent](#) ]

Re: Recycled engine heat as you drive ([none / 0](#)) (#5)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Wed Nov 26th, 2003 at 08:26:27 AM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

It's been pointed out several times here, that it is better to reclaim the heat from the exhaust system, than from the water system.

}=- W o o f -= {

Re: Recycled engine heat as you drive ([none / 0](#)) (#7)  
by Demetri ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Wed Nov 26th, 2003 at 03:51:02 PM MST  
([User Info](#))



If I was going to build such a system, I would leave the original cooling system essentially intact. Run the engine coolant through a heat exchanger to heat extra water, do not let the two systems come into contact. I absolutely would not drink or bath in water that has run through the cooling system of a car, propylene glycol(antifreeze) is a fairly nasty poison. If the engine's thermostat controlled when coolant flowed through the heat exchanger, there would be no more temperature swings than there are when the coolant flows through the radiator. Valves could be used to select whether coolant goes to the heat exchanger or the radiator. Hth.

Demetri  
Always be the lead dog.

Re: Recycled engine heat as you drive ([none / 0](#)) ([#10](#))  
by bretco on Wed Nov 26th, 2003 at 11:06:16 PM MST  
([User Info](#))

Hey Demetri,  
I would'nt dream of interchanging the glycol coolant from my truck to the house domestic water system. I'm already running an isolated system from my wood boiler that heats my domestic water via homemade heat exchangers ( my last gas bill showed about \$2.00 usage for Oct-Nov in Vermont.) I totally isolate the "dirty" woodsove water from the "clean" city water with lots of copper tubing heat exchangers. Anyhow, I think maybe the experiment in itself might be worthwhile in establishing how much "waste" heat can be reclaimed from a vehicle, and I think it won't be all that difficult to rig up a way to "suck" the heat from my truck tank to the house tank, after all, my wood boiler is sort of doing the same thing, but now I will have to "download" the hot water to my house system, quick release valves etc.

[ [Parent](#) ]

Re: Recycled engine heat as you drive ([none / 0](#)) ([#8](#))  
by dualsporter on Wed Nov 26th, 2003 at 03:51:53 PM MST  
([User Info](#))

Sounds very interesting. Definitely want to hear about your results. Major downer, as I'm thinking, is related to where you are located. If you are in a cold climate where freezing temp.s must be delt with, and you use... say a 250 gallon oil tank... with a 50/50 mix of antifreeze, you're looking at investing in 125 gallons of antifreeze at \$4.00 / gallon (wholesale), you've got a \$500 experiment going. Maybe put a copper heat exchanger loop inside the tank and only fill the tank about 2/3 full of plain water. Reduces your cooling system volume (as compared to other method) and will probably survive being frozen. You'd just have to drive a little (ahem) farther to melt it before good heat rise could occur. Keep us updated.

Dualsporter

Re: Recycled engine heat as you drive ([none / 0](#)) (#13)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Thu Nov 27th, 2003 at 09:40:59 AM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

The question about engine heat has been asked here before, with 17 comments...

<http://www.fieldlines.com/story/2003/10/10/111948/27>

}=- W o o f -= {

Re: Recycled engine heat as you drive ([none / 0](#)) (#15)  
by bretco on Thu Nov 27th, 2003 at 01:12:55 PM MST  
([User Info](#))

Thanks for pointing me to the other postings about recycling engine heat. The exhaust heat exchanger really has me thinking! I can hear my pickup out in the driveway getting nervous!!

Thanks all  
Bretco

[ [Parent](#) ]

[Recycled engine heat as you drive](#) | 15 comments (15 topical, 0 editorial)

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### [Figuring BTU's](#)

By [pexring](#), Section [Homebrewed Electricity](#)  
Posted on Thu Nov 6th, 2003 at 11:32:00 PM MST

[Water Heating](#)

How to figure BTU's to boil water

I know this formula has been posted here before, but for the life of me I can't find it. If you build an experiment to heat water, how do you figure the BTU's?

Many thanks,  
Mark

[Figuring BTU's](#) | 6 comments (6 topical, 0 editorial)

Re: Figuring BTU's ([none / 0](#)) (#1)  
by [dburt](#) on Fri Nov 7th, 2003 at 05:57:58 AM MST  
([User Info](#))

1 Btu is the energy required to heat 1 pound of water by 1 degree F  
Dave from PA

Re: Figuring BTU's ([none / 0](#)) (#2)  
by [JW](#) on Fri Nov 7th, 2003 at 07:22:12 AM MST  
([User Info](#))

I agree with dburt.

BTU= which is the quantity of heat or thermal energy required to raise the temperature of one pound of pure water one degree F.

SI system of units, the unit for thermal energy is the joule(J) One kilojoule (kJ) 0.9478 Btu. the watt(W), equal to joule per second (J/s), is used for power, where one watt 3.412 Btu per hour.

takes 970 btu to evaporate (convert to steam) one pound of water.

-JW

[ [Parent](#) ]

Re: Figuring BTU's ([none / 0](#)) (#3)  
by [windstuffnow](#) ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Fri Nov 7th, 2003 at 01:46:23 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

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- [More on Water Heating](#)
- [Also by pexring](#)

JW, do you have any formula's on the volumn of steam produced for a given amount of boiling water? Such as CFM at a given pressure/area?

Have Fun  
Ed

[ [Parent](#) ]

Re: Figuring BTU's ([none / 0](#)) (#4)  
by JW on Fri Nov 7th, 2003 at 02:00:30 PM MST  
([User Info](#))

Hi Windstuffnow,

Yes the ratio, or coefficient of expansion for water is 1600 to 1. you could use volume of water x 1600, then convert as necessary to cubic feet, the per minuite part gets tricky, as well as btu input requirements. I recomend steam tables for this...

Another examble that might be helpful is Liquid Nitogen, its coefficient for expansion is between 600 and 700 to 1. as you can see water is a supieror working fluid.

-JW

[ [Parent](#) ]

Re: Figuring BTU's ([none / 0](#)) (#5)  
by monte350c on Fri Nov 7th, 2003 at 03:10:59 PM MST  
([User Info](#))

Hi Ed,

I found this set of online thermal problem calculators a while back:

<http://kahuna.sdsu.edu/testcenter/testhome/index.html>

specifically look at the "States" link for a calculator that will solve CFM/pressure type problems. Keep having fun!

Ted.

[ [Parent](#) ]

Re: Figuring BTU's ([none / 0](#)) (#6)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on  
Fri Nov 7th, 2003 at 03:39:41 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Thanks JW and Monte, this is a good start for what I wanted...

Having fun as usual!  
Ed

[ [Parent](#) ]

[Figuring BTU's](#) | 6 comments (6 topical, 0 editorial)

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## [Pool Heating, Only when the Sun is shining](#)

By [wooferhound](#), Section [Remote Living](#) [Water Heating](#)

Posted on Sun Oct 12th, 2003 at 09:18:16 PM MST

Run the pool heater only when there is heat to get

I ran across this site while searching the "Kill a WATT" device (cool thing) from an earlier post. They have a Solar Cell system that directly runs the pool pump only when the Sun is out.

<http://www.etaengineering.com/poolkits.html>

I thought it was a Hot idea. I should have a system that only runs the pump when there is heat to recover. The timer idea is great , but if I ran the system from a solar cell triggered pump system, I would save power and get more heat.

right ?

[Pool Heating, Only when the Sun is shining](#) | 1 comment (1 topical, 0 editorial)

Re: Pool Heating, Only when the Sun is shining ([none / 0](#)) (#1)  
by [Homebrewed12vdc](#) on Fri Oct 17th, 2003 at 04:18:38 PM MST ([User Info](#))

Well I well tell you my experience with solar heat, I have a solar panel connected to 12v computer fans that push air through my solar air heater. I would think the saem principle would work for you, obivoiusly the brighter the sun the faster the fans run, same thing should happen with a pump, so it should be a very efficent set up for you. Hope this helps.

[Pool Heating, Only when the Sun is shining](#) | 1 comment (1 topical, 0 editorial)

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### [How to keep water from freezing](#)

By [shane](#), Section [Homebrewed Electricity](#)  
Posted on Sun Sep 21st, 2003 at 07:46:19 PM [Water Heating](#)

I need advice

I need to know what type of things I can use to heat water in front of a waterwheel so i get 365day power. I was thinking of puttin 2 stove-type elements into a pipe and closing if off and making that warm up the water, what other things could I use that I can build my self?

[How to keep water from freezing](#) | 8 comments (8 topical, 0 editorial)

Re: How to keep water from freezing ([none / 0](#)) ([#1](#))  
by Electric Ed on Sun Sep 21st, 2003 at 07:57:54 PM MST  
([User Info](#)) <http://www.electric-ed.com>

That could use more energy than the installation could generate.

If you restrict the flow so that it is moving really fast, it will take a lower temperature to freeze it.

Electric Ed

Re: How to keep water from freezing ([none / 0](#)) ([#2](#))  
by Norm on Sun Sep 21st, 2003 at 08:46:21 PM MST  
([User Info](#))

I would think if the water is restricted where it has to flow entirely thru the waterwheel and there is enough water flowing that it will never freeze especially if it is an overshot waterwheel? Have you had experience with this waterwheel or will this be a first time? It would probably help if you could describe it a little more...even a small stream dammed so you have a three or four foot head would be quite effective...just my thoughts. (:>) Norm.

Re: How to keep water from freezing ([none / 0](#)) ([#3](#))  
by shane on Sun Sep 21st, 2003 at 10:49:53 PM MST  
([User Info](#))

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- [Also by shane](#)

well its an overshoot but the flow is restricted. The creek will freeze normally so im trying to keep it running. I can make the flow more intense by blowing up a damn farther up stream. Someone told me to put a tube with holes underneath the water and blow air into it. It sounds like a good idea. Also wouldn't an overshoot be more likely to freeze? It is my first time and the damn is about 4 feet high. Im living in an area where it can reach -20 degrees celsuis but usually -10 or so.

[ [Parent](#) ]

Re: How to keep water from freezing  
([none / 0](#)) ([#4](#))  
by Norm on Mon Sep 22nd, 2003 at 06:25:23  
AM MST  
([User Info](#))

Sean: To my way of thinking an overshoot is almost completely immersed in the flowing water, An undershot has a large percentage of its blades exposed to the air. Norm.

[ [Parent](#) ]

Re: How to keep water from freezing  
([none / 0](#)) ([#6](#))  
by Barnac ([barnac@videotron.ca](mailto:barnac@videotron.ca)) on Mon Sep 22nd, 2003 at 09:26:00 AM MST  
([User Info](#))

Air bubbles can be used to prevent water to freeze.

Here is a link to see what air bubbles can do to prevent water from freezing. This application is for a pond, but I guess sanme pricinple could be used if the flow of water is not strong enough to prevent water from freezing.

<http://pondwindmills.com/>

Anyway it could, at least, give you some ideas.

[ [Parent](#) ]

Re: How to keep water from freezing ([none / 0](#)) ([#5](#))  
by jubalearly on Mon Sep 22nd, 2003 at 08:13:46 AM  
MST  
([User Info](#))

Heating it would waste too much power. Why don't you build a still & dump alcohol in front of it. That's non-toxic antifreeze. And if it doesn't work you will still have some use for the product.....

Re: How to keep water from freezing ([none / 0](#))  
(#7)  
by laskey on Mon Sep 22nd, 2003 at 08:14:59 PM  
MST  
([User Info](#))

Alcohol non-toxic? Why don't you just dump big bricks of salt in there?

Just because it's non-toxic, doesn't stop it from being a total environmental disaster.

The air bubble thing might work. It's been known to keep harbours ice free and things like that, but it's only going to work if the stream is fast enough not to freeze solid.

Cya,  
Chris

[ [Parent](#) ]

Re: How to keep water from freezing ([none / 0](#)) (#8)  
by shane on Mon Sep 22nd, 2003 at 11:17:40 PM MST  
([User Info](#))

my name is not sean, anyways im not pumping hot air into it just air. If not ill make some device of somesort. Now I have to blow up a damn with some termite, if you know wha that is.

[How to keep water from freezing](#) | 8 comments (8 topical, 0 editorial)

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[homebrew water heat changer](#)

By [bewotec](#), Section [Remote Living](#)  
Posted on Thu Aug 28th, 2003 at 04:21:18 AM [Water Heating](#)  
MST  
nothin

Hello,  
if you check a commercial site about solar water heating, there is one element, the boiler with the pipes inside, which is a very expensive unit.

This heat changer is to transfer the heat of the solar-heated antifreeze liquid to the water. And of course it is quite good insulated.

Is there anybody who have made one like this at home? What materials do you use for this?

The factory made boilers are usually covered steel, what i think cannot be hurt for modification...

thanks for any info,

viktor

[homebrew water heat changer](#) | 5 comments (5 topical, 0 editorial)

Re: homebrew water heat changer ([none / 0](#)) (#1)  
by [Kilroy2k1](#) on Thu Aug 28th, 2003 at 07:37:51 AM MST  
([User Info](#)) <http://home.cogeco.ca/~woproject>

Hello,  
I have built a homebrew boiler, but its definately not for use inside a residential home and cannot be run unattended (yet). feel free to check out my site <http://home.cogeco.ca/~woproject>

Tom S.

Re: homebrew water heat changer ([none / 0](#)) (#2)  
by [Old F](#) on Thu Aug 28th, 2003 at 08:23:30 AM MST  
([User Info](#)) <http://www.oldf.homestead.com>

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Here is what I am using for a heat exchanger its and old gas fired hot water heater with the burner removed and the flue that runs though the middle of the water tank is welded shut with fitting



to match your plumbing.

The hot food grade antifreeze is pumped through the flue and heats the water in the tank.

This gives me a heat exchanger and hot water storage all in one. The pics show the water heater with out burner and outer skin and fittings welded in.

I am using mine with an out door wood fired boiler that heats my home.

Works great and the best thing is that water heater was free for the hauling

Hope this helps

Old F

Re: homebrew water heat changer ([none / 0](#))  
([#3](#))  
by Old F on Thu Aug 28th, 2003 at 08:46:11 AM  
MST  
([User Info](#)) <http://www.oldf.homestead.com>

One more thing I built a box that fit the tank after I insulated it.

Old F

[ [Parent](#) ]

Re: homebrew water heat changer ([none / 0](#))  
([#4](#))  
by bewotec on Mon Sep 1st, 2003 at 05:24:29 AM  
MST  
([User Info](#))

Hi,

thanks, your one is the one i look for.

is its material stainless steel or simple painted steel inside?

if painted then what did you use for the paint? or if the paint is original, how did it survive the welding? how is about corrosion inside? what is the heat changer pipes made of? if copper then how did you prevent corrosion between copper and steel?

thanks!

viktor

[ [Parent](#) ]

Re: homebrew water heat changer ([none / 0](#)) ([#5](#))  
by Old F on Mon Sep 1st, 2003 at 10:36:36  
AM MST  
([User Info](#)) <http://www.oldf.homestead.com>

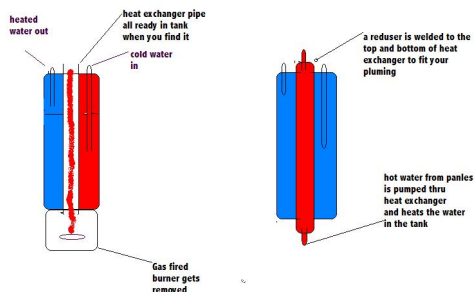
Viktor

What I started with was a house hold hot water heater or as you say boiler it used a natural gas burner to heat the water. The burner went bad an that is why I got it for free. The tank has all ready has one 3 inch pipe that runs thru the tank this is the heat exchanger it just steel and welds easily.

Hope this help

Old F

Have fun



[ [Parent](#) ]

[homebrew water heat changer](#) | 5 comments (5 topical, 0 editorial)

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## [New solar system \( professional \) - I'm impressed.](#)

By [thebbguy](#), Section [Homebrewed Electricity](#)

Posted on Fri Aug 22nd, 2003 at 07:04:02 PM MST

[Water Heating](#)

New pool Heater

---

Hi all,

Well, I took the plunge last week and bought a single solar panel from a company to see what the difference was between my nice homemade system and a professional one. Well, I'm impressed, and depressed. I guess I am glad I'm impressed because the professional solar panel was expensive. Anyway the thing puts out tons of water, and from what i have read, it's not just heat you need it's heat AND flow. You can burn your finger with a match, but you can't heat a pool - meaning my little 1/2" tube homemade solar system is nice, but it's not going to do a great deal to heat an 18 foot above ground pool which is 5 feet high, - that's a LOT of water in there.

Once I got the professional system running today with the very large 1-1/2" tube, I quickly realized my that my system although cute was not anywhere near as strong as this one panel.

In any event, I am glad i tried using black hosing to heat my pool, and indeed it DOES work, no matter what any salesman will tell you, - you just need enough flow to get a pool warm.

I now want to buy another 4 panels from this company, - each kit or "panel" is 40 sq.feet, and with 5 panels, that makes 200 sq. feet, which should be enough to do my pool... - most places suggest 60% of your total area of pool.

In my case the pool is an 18foot, round above ground pool, so that's 256 sq. feet approx, so I'm well over the 60% needed to heat that pool quickly.

Anyway here are some images to check out.

Mark.

Does this mean my HOMEMADE solar system failed ? - by all means NO... and that's a very positive NO !, if I had the room - say I was living out in the country or had a lot of propery, I could use more black hosing and would have very good sucess with my homemade system.

What you see in the images is ONE panel - eventhough you see 4 pieces, it is actually only one panel or "kit" ... which equals 40sq feet.

Install was easy, and I'm more than impressed. Now to find somebody who doesn't scare easily and install this and other panels on my roof.... I have a 2 story house, and it's just impossible for me to even put my life

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- [Also by thebbguy](#)

on the line to put a solar panel system on the roof.

How I envy people who have a single story house .... they have it so easy :-)

Mark.



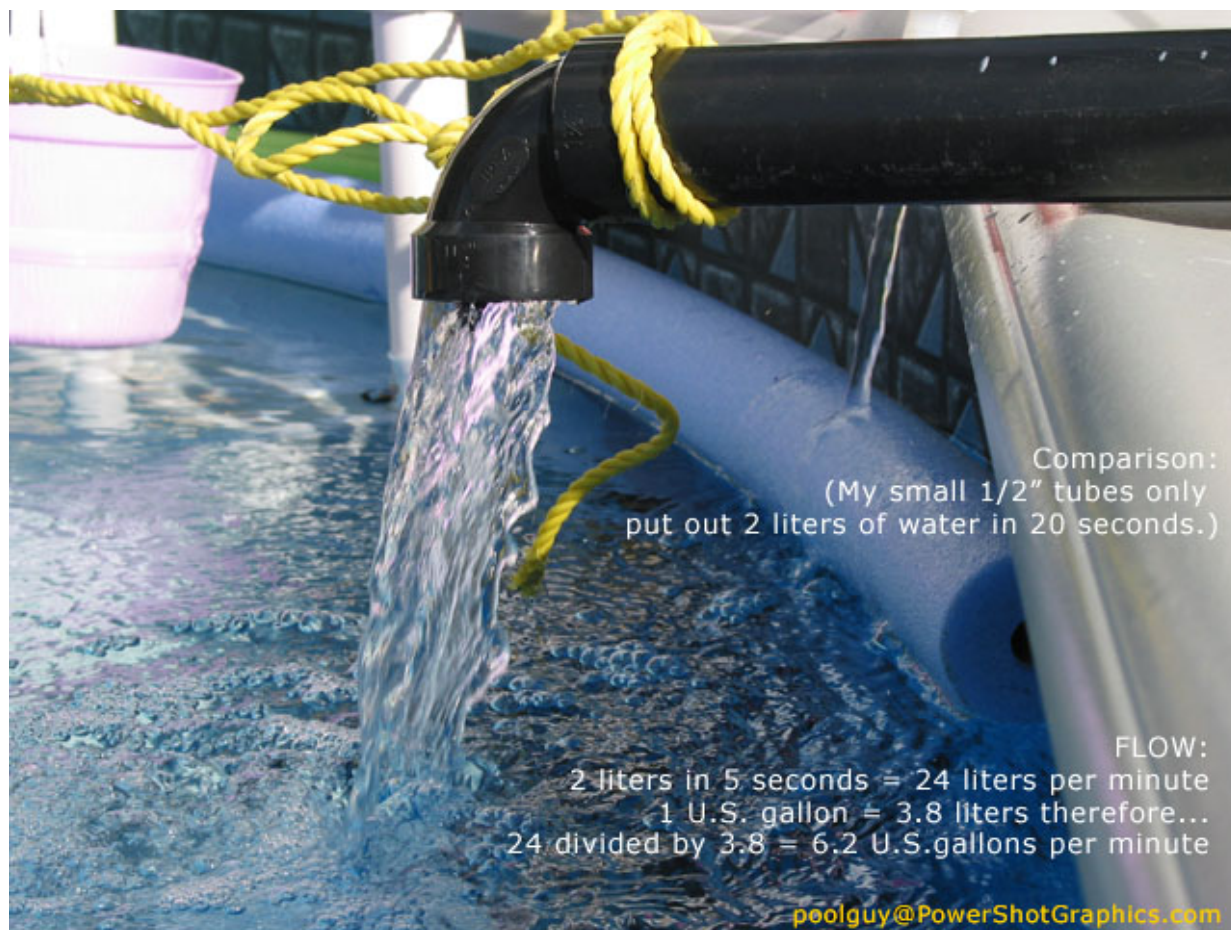












Editors Note: I fixed it so those huge photos show on a reasonable screen width. Hopefully DanF can get that fixed soon.  
TomW

[New solar system \( professional \) - I'm impressed.](#) | 4 comments (4 topical, 0 editorial)

Re: New solar system ( professional ) - I'm impres ([none / 0](#)) ([#1](#))  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Sat Aug 23rd, 2003 at 01:55:26 AM MST  
([User Info](#))

I have a small question.

Would't you get hot(ter) water if you "recycled" it? Simply have a small output flow, and simply run the water in the system a bunch of times, while just a little bit gets out. Then the water inputted would be warmed quicker by the already hot water.

-Andrew

Re: New solar system ( professional ) - I'm impres ([none / 0](#)) (#2)  
by thebbqguy on Mon Aug 25th, 2003 at 08:12:13 AM MST  
([User Info](#))

Hi Andrew,

The professional panels are very effecient, that there's no need to recycle the water again into them, - they put out pretty hot water the first time, and the more panels the hotter the water.

I got an email from my brother this morning saying he was talking to his friend this weekend and the guy was saying that the 4 panels he has hooked up on his roof ( they are professional ones ) as you see in my images, - anyway the water is so hot that he can make coffee with it. That's pretty darn good.

My brother also knows the guy "aint" fibbing, as he was in the guy's pool a few weeks ago and it was 94 degrees ! - his wife had forgotten to turn the darn solar system off !

I wish I had that kind of problem. Anyway I've just ordered another 2 panels this morning, and will hopefully get them this Thurday, and that will make a total of 3 for me.

I also found out that solar panels on a roof can cause major damage to your shingles, - because of shifting due to the constant movement of water in the panels and tubes. I have therefore decided to build a structure on my lawn for my solar panels. My home is only 4 years old, and the roof is under warranty for 15 years, -if I place the solar system on the roof, and in 5 years the shingles are worn through the company that did the job will NOT honor the warranty. - Too much of a risk for me, so I'm keeping them on the ground.

I'll build a "deck" of sorts made out of pressure treated lumber, cover it with shingles, and then attached the solar panels on there. Much cheaper than replacing a roof at \$5,000.

anyway that's it for now.

Mark.

Here are some new pics I took of the solar panel.











[ [Parent](#) ]

Pump? ([none / 0](#)) ([#3](#))

by Demetri ([corvettemach1@yahoo.com](#)) on Mon Aug 25th, 2003 at 11:48:51 AM MST

([User Info](#))



Does the professional heater have it's own pump?

Demetri

Always be the lead dog.

Re: Pump? ([none / 0](#)) ([#4](#))  
by thebbqguy on Mon Aug 25th, 2003 at 11:55:47 AM MST  
([User Info](#))

Hi Demetri,

Nope, none needed, it just uses your existing pool pump, which is strong enough to power it. 3/4 to 1hp is what they ask for. I have a 1.5 hp, so I have the valve that goes to the panel closed down about 80%, and still I am getting a big water flow.

I just also ordered 3 more of these panels today, so they should be here by Thursday, and by Friday I'll have 'em hooked up, so I'll post a few more pix of the 4 panels hooked together.

Mark

[ [Parent](#) ]

[New solar system \( professional \) - I'm impressed.](#) | 4 comments (4 topical, 0 editorial)

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[homebrew vs brand solar heaters](#)

By [bewotec](#), Section [Rants & Opinion](#)

Posted on Thu Aug 21st, 2003 at 04:38:27 AM MST

[Water Heating](#)

nothing

Hi,

I would like to ask you for opinion only. If there is someone who has experience with brand solar heater and homebrewed ones also.

Is there noticeable efficiency difference between these? I mean in cold winter days how much higher is the brand solar heater temperature than a homebrewed (copper pipe, black painted, glass covered)? The price is about 4:1 so thats why i am interested in it...

thanks for any comment,  
viktor

[homebrew vs brand solar heaters](#) | 8 comments (8 topical, 0 editorial)

Re: homebrew vs brand solar heaters ([none / 0](#)) ([#1](#))  
by [thebbqguy](#) on Thu Aug 21st, 2003 at 06:41:42 AM MST  
([User Info](#))

Hi Vic,

Well, good question ! ,

I just bought a professional solar system made by Enersol last week, and it's expected here at my house today !

I bought one panel - a 4x10 size - so that's 40 sq feet.

I'll see what kind of heat I get out of it today. I was going to buy a few of them, but thought maybe I should try one first, and see how better it is than my homemade systems.

Anyway I'll be posting images of the professional one maybe today or tomorrow.

you can see my homemade systems here:

<http://www.powershotgraphics.com/pool>  
<http://www.powershotgrahpics.com/pool2>

in the second one, - I have now redone the tubing and have coiled it properly

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in the box you see there ( the enclosed box that has plexiglass )

Mark.

Re: homebrew vs brand solar heaters ([none / 0](#)) (#2)  
by thebbqguy on Thu Aug 21st, 2003 at 07:02:20 AM MST  
([User Info](#))

Hi Viktor, sorry for the mis-spelling on your name.

You asked for an opinion, and i didn't quite do that in my first post.

I have spoken to several people on websites that sell professional systems, and they all say that you cannot even begin to compete with a professional system.

I do tend to agree.

Why ?

Because they make use of the sq. footage of an area, 100%, a 4x10 sheet = just that, 40 sq.feet

I have a 4'x8' sheet of plywood - in theory that's 32 sq. feet, but...  
much of my 4x8 sheet is not usable, the corners, and also the middle where I was not able to bend the pipe,  
and had to stop my coil there, - so in reality,  
that 4x8 sheet of plywood with blackpipe has a LOT of wasted space.  
Look at the image below.

Also, let's remember that most black pipe homemade systems are 1/2" pipe....  
the professional ones are 1-1/2" pipe ! .... the gallons per hour these things push out is unbelievable, so  
there's just no comparison. I like tinkering, and don't have tons of money so I made 3 homemade systems,  
but scraped up money to buy one professional panel to test, and keep. I have put in all the tubing this week,  
in anticipation of my professional solar panel's arrival. I have it running from my pool's pump, under the deck  
and into a part of the backyard where I'll put the solar panel on the ground and test it.



[ [Parent](#) ]

Re: homebrew vs brand solar heaters ([none / 0](#)) (#3)  
by wdyasq on Thu Aug 21st, 2003 at 05:10:26 PM MST  
([User Info](#))

I think the real product missing is the Dollar per Unit of energy acheived. A more personal unit might \$ per unit ENJOYED.

While the folks with the high efficiency hot water heaters can claim X Btu/sf/hr they can't match the pleasure of a warm shower from a dark colored hose simply warmed by the sun.

Ron

Re: homebrew vs brand solar heaters ([none / 0](#)) (#4)  
by Norm on Fri Aug 22nd, 2003 at 12:36:47 PM MST  
([User Info](#))

Has anyone ever just pumped water onto the top of a roof...let it run off into the eaves and into an open container like a horse trough...cistern, or whatever? About the cheapest way I can think of to get hot water ...also your attic wouldn't get so hot! Norm.

[ [Parent](#) ]

Re: homebrew vs brand solar heaters ([none / 0](#)) (#5)  
by thebbqguy on Fri Aug 22nd, 2003 at 03:39:32 PM MST  
([User Info](#))

HI Viktor,

As promised here is a pic(s) of my new solar panel.

I AM impressed with it, and it blows away my homemade one, that's the sad part, but I am glad, as I paid good money for this one :-)

In one image I talk about the flow rate... the professional panel is 1-1/2" so no wonder it put so much water out - now we're cooking with gas, I mean solar :-)

Considering this is only one panel, I can't even fathom what 5 of these would do on my roof, - I do now believe my brother when he said a guy's pool was at 94, and that the guy has to turn the solar system off and can't keep it running all day, - the water flow when 4 panels are hooked up together is amazing, considering that each panel can handle a lot of water. ( 10 gallons MAX per minute per 4 sections) - which I have here..... but I don't have it running at 10 gpm.

To seriously heat my pool I need at least 4 of these panels, which are 4'x10'.

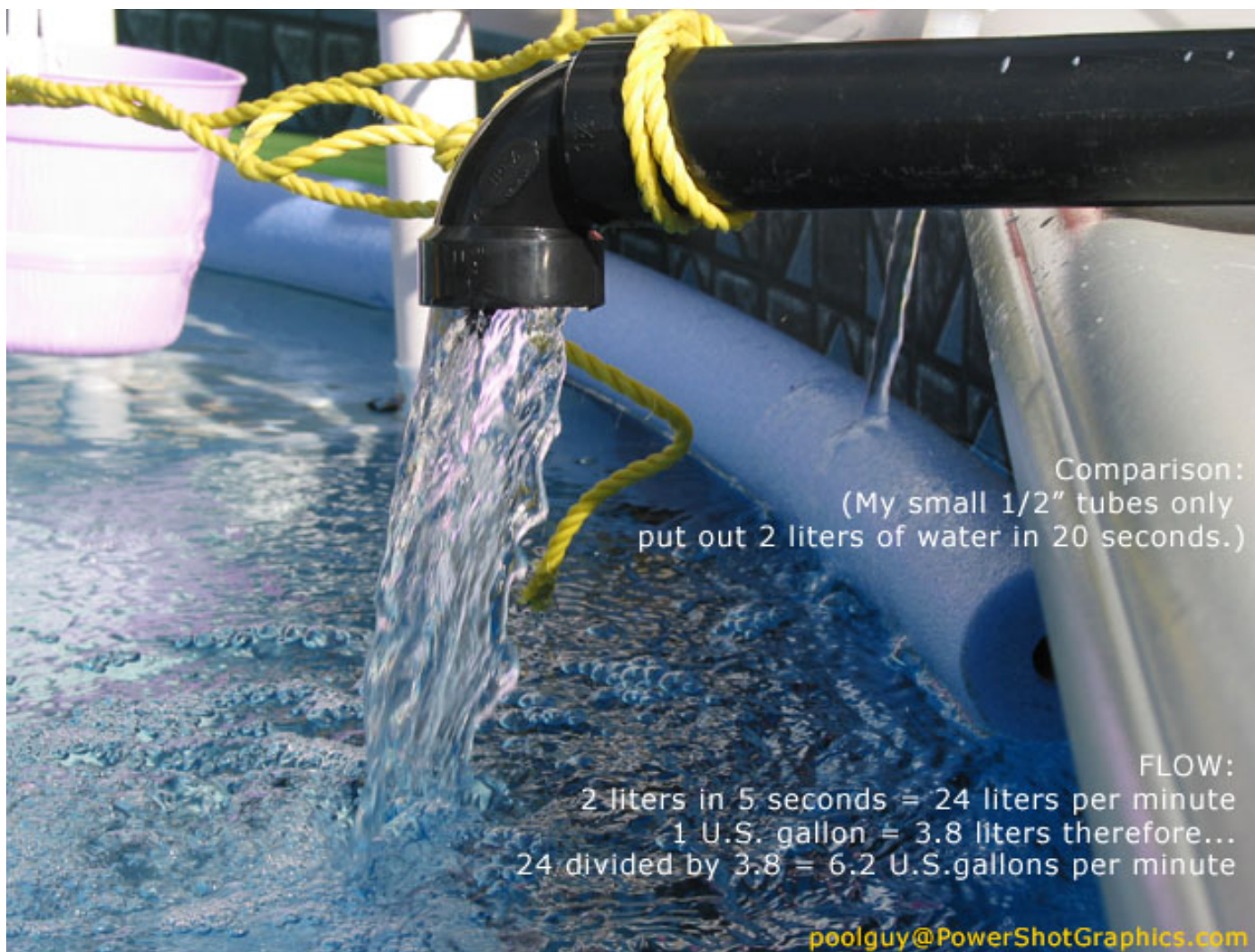
poolguy@PowerShotGraphics.com











[ [Parent](#) ]

Re: homebrew vs brand solar heaters ([none / 0](#)) ([#6](#))  
by bewotec on Sat Aug 23rd, 2003 at 01:35:56 AM MST  
([User Info](#))

Hello,

is this DIY kit also a non-glassed one?

so only because of the good engineering and the satisfying material, it has 4 times better efficiency than the homebrewed one.

i am impressed and sad also.

thanks!

viktor

[ [Parent](#) ]

Re: homebrew vs brand solar heaters ([none / 0](#)) ([#7](#))  
by troy on Sat Aug 23rd, 2003 at 08:39:57 AM MST  
([User Info](#))

The key difference between the commercial unit and the homebrew unit is the average length of run. It looks like the commercial unit has many pipes of short length in parallel, while yours is one long pipe. Might be interesting to do those temp measurements on your unit to see what the temp is as you go further down the pipe. If you stop gaining significant heat at 40 feet, you could just make yours a lot of shorter parallel pipes like the commercial unit.

Best regards.

troy

[ [Parent](#) ]

Re: homebrew vs brand solar heaters ([none / 0](#)) ([#8](#))  
by thebbqguy on Sat Aug 23rd, 2003 at 11:26:57 AM MST  
([User Info](#))

Hi Troy,

Interesting, yes I would love to measure that.

I will tell you though, for the homemade systems, the longer the tube the better.

I know just from experience.... I made a smaller solar system, - incased in a box, and I have now given up on it, - even with the plexiglass, the amount of tubing I used, about 120 feet, is just not long enough to do any real heating.

My local pool places sells "homemade" systems just like this using the exact same black tubing ( which is available at all hardware stores ) and they recommend a minimum length of 500 feet.

When I bought my own tubing it came in a 400 feet length. I remember testing the water, and water temp was so-so.... so I bought another 200 feet and added that to the 400 .... guess what .... water temp was MUCH higher !

but yes, you are right on the money, there IS a a point where the tubing stops being effecient in terms of heat vs the length, but what that length is, I just don't really know exactly.

Mark.  
poolguy@powershotgraphics.com

[ [Parent](#) ]

[homebrew vs brand solar heaters](#) | 8 comments (8 topical, 0 editorial)

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[New enclosed solar heater using black pipe - this is my first enclosure](#)

[Water Heating](#)

! By [thebbgguy](#), Section [Homebrewed Electricity](#)  
Posted on Tue Aug 19th, 2003 at 01:06:48 PM MST  
Pool Heater

Hi all,

Just wanted to let you know that I have now posted images that show my progression through my first homemade solar enclosure.

<http://www.powershotgraphics.com/pool>

I bought the 3foot x 5foot piece of plexiglass for \$18.xx at my local hardware store, and the rest I had hanging around.

At this point I have not arranged the pipe properly, - meaning I haven't attached it down, and coiled it in the box properly but that will come, and I'll add images this week when it's done.

Anyway I hope that this helps anyone out a bit if they are trying to build one.

The temp inside that box today is off the scale on my tiny digital thermometer, it went so high and then just went crazy giving "EEE" for error, so it's darn hot in that box.

I want to get as much black hose as I can coiled in there, - as it stand that's 100 feet of 1/2 tubing you see in there right now.

anyway thanks for reading :-)  
Mark.

main site: <http://www.powershotgraphics.com/pool>  
new pix of solar enclosure :  
<http://www.powershotgraphics.com/pool2>



[New enclosed solar heater using black pipe - this is my first enclosure !](#) |  
10 comments (10 topical, 0 editorial)

Re: New enclosed solar heater ([none / 0](#)) ([#1](#))  
by Electric Ed on Tue Aug 19th, 2003 at 05:22:28 PM MST  
([User Info](#)) <http://www.electric-ed.com>

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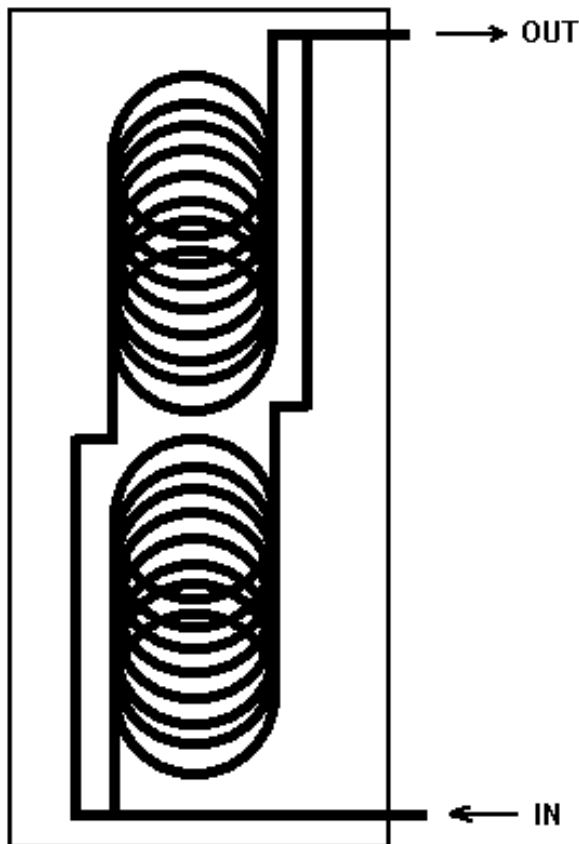
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- <http://www.powershotgraphics.com/pool>
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- [More on Water Heating](#)
- [Also by thebbgguy](#)

[quote - "I want to get as much black hose as I can coiled in there, - as it stand that's 100 feet of 1/2 tubing you see in there right now."]

A longer length of pipe will not result in an increase in the temperature of the water, unless the rate of flow is very fast. The water is very likely up to it's maximum temperature after it has flowed through the first 25 or 30 ft. of tubing.

For pool heating, a larger volume of water is better and I believe you would get better results if you put any additional tubing in parallel with the existing.



Electric Ed

Re: New enclosed solar heater using black pipe ([none / 0](#)) (#2)  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Tue Aug 19th, 2003  
at 09:38:35 PM MST  
([User Info](#)) <http://www.internetfred.com>

Nice. Where did you buy the tubing and what is it called.. What size is it? Thanks!

Re: New enclosed solar heater using black pipe  
([none / 0](#)) (#3)  
by zmoz on Tue Aug 19th, 2003 at 10:19:49 PM MST  
([User Info](#))

Looks to me like plastic sprinkler tubing. Should be able to find it at most any hardware store...very cheap.

[ [Parent](#) ]

Re: New enclosed solar ..... ([none / 0](#)) (#4)  
by dconn on Wed Aug 20th, 2003 at 12:28:00 AM MST  
([User Info](#))

Do you think a house central heating radiator painted black in a glass enclosure would work as well as the black pipe? I was thinging about doing this.

Derek

Re: New enclosed solar heater using black pipe - t ([none / 0](#)) (#5)  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Wed Aug 20th, 2003 at 01:22:25 AM MST  
([User Info](#))

The best results I had so far with water heating is that first, no tubing overlaps. Second, the more in "parallel" the better. Third, maximize surface area. My best result was 10 tubes zig-zaging next to each other. All with common start, ends. On sunny days it was getting so hot it was spitting steam and scalding hot water out. Although, the best of the best, I heard it parabolic. The closer the focal point to the actual mirror, the less adjusting. These can get well above boiling, as much as 400-700 degrees!

-Andrew

Your heater is pretty nice for a first.

Re: New enclosed solar heater using black pipe - t  
([none / 0](#)) (#6)  
by thebbqguy on Wed Aug 20th, 2003 at 08:25:52 AM MST  
([User Info](#))



Hi Guys,

thanks for the comments :-)

- That tubing is 1/2" ..... it's regular black utility or "drainage" tubing that they use in grocery stores in the meat section, from what i have heard, it is a food grade pipe, so I guess it's good for human consumption if you have it hooked up at a cottage for water hook up.

That tube cost me \$9.98 for 100 feet - very inexpensive I thought.

400 feet cost me \$39.99 - no savings but a longer length to work with.

If it is say \$10 for 100 feet here in Canada, that stuff has to be about \$7 maximum for 100 feet in the United States.

Go to your local hardware store and check around - I found mine in the back of the store with all the sump pumps, etc.

I first bought 100 psi rated tubing which was a bit more expensive, \$3 more for 100 feet, but when they ran out, I bought 75psi rated tube ( 100 feet \$9.98 ) and it works fine.

If anyone wants a close up image of the writing on the actual tube let me know.

anyway thanks again for all the help and comments.

Ed, I really want to get a little test going with your theory about parallel tubes, but darn, the other day I had 100 feet of tube hooked up and the water was flowing at a good rate, and it was COLD :- ( .... when I added another 100 feet to it, at the same rate ( in series ) - meaning I just made the tube longer, the water from it at the same flow was MUCH higher.

I also noticed that when I had 400 feet of black tube, and added another 200 feet to it, to make 600 it made the water much warmer.

The only way to get hotter water from a small length of tube is to really slow down the flow - this is what I have found from actual experience, so I'm just not sold on the idea as of yet :- (

From my experience - the longer the tube is, - say 500 or 600 feet, - the longer that water is inside the black tube, and in essence is sucking up heat from the sun.... if the pipe is super short, - it has no time to grab solar heat from the tube, because before the water has time to heat up, it's already pouring out of the end of the hose..... I don't know, am I just not getting the point ? I don't know :- (

Mark

[ [Parent](#) ]

Re: New enclosed solar heater using black pipe - t ([none / 0](#)) (#7)  
by troy on Wed Aug 20th, 2003 at 09:29:43 AM MST  
([User Info](#))

You're always looking for the best compromise. Longer dwell times (very low gallons per minute through the pipe) gives hotter output, but less of it. Furthermore, the hotter your pipe gets, the more you lose to the air, lowering the number of BTU's that actually make it into the pool. So, for a given 4x8 panel, high flow will give cooler output, but more BTU's into the pool. 500 gallons of 78F water is better than ten gallons of boiling water.

Optimal pipe length can be determined by measuring the temperature at regular intervals along the pipe. Then graph those numbers and when the temperature curve stops going up, or goes up very slowly, you've just passed optimal pipe length. This graph will only be valid for a particular flow rate and a particular input temperature and a given collector design (glazed, unglazed, insulated, whatever, each collector type will be unique in it's optimized pipe length.)

At some point someone made a comparison to the enclosed solar oven they built, which is thermodynamically a much different animal, in that there is no active heat transfer out of the oven. Of course, the oven will get much hotter, and then it has to be insulated and glazed to prevent losing that. But your solar pool heater panel is actively "cooled" by the pool water, so you'll never get very high temps, which actually improves efficiency.

The lower pipe temperature is why glazing doesn't make such a big difference, some difference, but not triple or more like a stagnant solar oven. What WILL make a big difference, is collector size (more pipe, more panels). You only get so many BTU's per square foot of sunlight.

Good luck, have fun, keep experimenting!

troy

[ [Parent](#) ]

Re: New enclosed solar heater using black pipe - t ([none / 0](#)) (#9)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Wed Aug 20th, 2003 at 02:04:19 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

The Pipe I used for my pool heater was much larger diameter than the pipe that the pump was designed for. This did 3 things: it reduced the Head backpressure that the pump sees ; it slowed the water down a great deal so it dwelled inside the heater pipes for a longer period ; and it increased the surface area of the pipe to the Sun.

One thing that I thought was interesting was that millions of super tiny bubbles were constantly coming from the return line in the full Sun. At first I thought the system had an air leak, but later checks convinced me that it was sealed up fine.

}=- W o o f -= {

[ [Parent](#) ]

Re: New enclosed solar heater using black pipe ([none / 0](#)) (#8)  
by Inquiring Mind ([aaawelder@dungyadoo.com](mailto:aaawelder@dungyadoo.com)....[remove poop to reply](#)) on Wed Aug 20th, 2003 at 10:09:45 AM MST  
([User Info](#)) <http://www.gomedia.ca/aaawelder/>

This may be a hair off the beaten path but, food for thought I hope. Years ago, when solar was the craze, we built numerous solar homes. The common factor of all was the solarium. This space started in the basement, up to the ridge pole and down to the basement on the opposite side. Air currents could flow completely around the inner shell. The floor of the solarium was about 6" of white rock. On this strata, black plastic barrels filled with water were lined up against the inner wall, also painted black. Sunlight filtering through the solarium glass would be reflected from the white rock onto the barrels and wall. The air currents produced were amazing. Getting to the point: Instead of using air as the heat transfer medium in the heater, why not use a non freezing liquid. The heat transfer would be greater and lasting.

Just a thought.

Inquiring Mind <'>< Chance favors the prepared mind whose hands do the work!

Re: New enclosed solar heater using black pipe ([none / 0](#)) (#10)  
by thebbqguy on Mon Sep 8th, 2003 at 08:14:58 PM MST  
([User Info](#))

Just a quick update here,

Since the 21st of August, I started slowly buying professional solar panels, and today my 3 shipment arrived, so now I have a total of 6 panels.

Each panel is 4x10 feet ( 40 sq feet )

Let me just say something, I really enjoyed fiddling around with my homemade black hose system, but after buying my first professional panel that uses a 1-1/2" tube, I was sold on them.

Here's an example - today my pool was at a cool 68.2 degrees in the morning, - about 11 am.

I got my shipment of 2 panels ( I had 4 at this point ) anyway I installed the 2 I just received, got the whole thing together and had it up and running about 1:05 pm, well, by 5pm - when I shut the system off, I had the water up to 75.9 degrees.

That would have been IMPOSSIBLE with my homemade solar tubes, - they are 1/2" pipes, and even with 3 of them running, it doesn't even compare to the professional system. Water comes out of the professional panels so quickly that the water is being turned over at such a high rate, I was getting a 1.2 degree temp increase in only 30 minutes ! my pool at one point during the day. As the day went on, that decreased slowly but still that's just amazing !

I use my little stopwatch, a piece of paper and I write everything down, - I took temps each 30 minutes by the way. Anyway you also have to consider where I live, - I live in Ontario Canada - Ottawa - and it's cold here at night, - getting down to about 6 degrees above zero now during the nights, and only about 21 degrees during the day ( that's about 69 degrees F ).... today for example I had a high of 21.5 degrees on my outdoor thermomter, - that's not very warm, but still the panels pushed a heck of a lot of water.... anyway sorry for the long story, here's a picture taken today.

P.S. - you can see my homemade 4x8sheet of plywood with my tubing, a long time to wind and attach that, and in theory that total sheet of plywood would yield 32 sq.feet of area, but.. but look at the huge area in the middle.... very depressing, but i couldn't do anything about it, so in reality, that 32 sq feet is probabally more like 25 sq feet of area.... it's a lot of space for nothing :- ( I did have fun though.

Btw, I forgot to mention, that pool is an 18foot above ground, ( you can see it there ) and it is a new model for this year, - it is 52" high instead of the normal 48" high that was the standard last year.... there's a lot of water in that pool.

anyway those 6 panels yield a total of 240 sq feet of area ! - my pool equals 256 sq feet. Most companies suggest you buy a good 60% of the area of your pool, but in my case those 6 panels equal 93.75% coverage - so I'm doing well, - I just wish I had a large yard. I'd love to have a good 10 panels, - yes I'm a nut for fast free heat :-)



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[New enclosed solar heater using black pipe - this is my first enclosure !](#) |

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[glassed in black tube = higher heat yield](#)

By [thebbguy](#), Section [Homebrewed Electricity](#)

Posted on Mon Aug 18th, 2003 at 08:40:25 AM MST

Pool Heater ??

[Water Heating](#)

Hi all,

As you may know or maybe not, I have made a homemade solar heater for my 18 foot above ground pool. ( Surface area is approx 256 sq feet )

Images and info about my setup are here: <http://www.powershotgraphics.com/pool>

Now, - I wonder if anyone can shed some light on this for me,

I currently have a piece of 4'x8' plywood.... I took regular black tarpaper ( roofing paper) and stapled it down on this sheet of plywood.

image of plywood and tubing:

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On top of it, I laid down and attached 500 feet of black tubing ( 1/2 " )

Now, I want to know, if I took this sheet of plywood and tubing, and built a frame around it, say out of 2x4 wood, so I have a frame completely around the plywood, now I would take a sheet of plexiglass from my local hardware store, and scew that down on top of the 2x4s that are on the 4'x8' sheet of plywood..... do you think that this would yield any real improvement in the heat being generated from that black tubing ?? .... plexiglass is about \$80 a sheet of 4'x8' so I would love to have any comments, on if this is worth the extra time and money.

Any help would greatly be appreciated, and if you do post something, please send me an email at : mark@powershotgraphics.com .... for some reason I am checking off the "alert me if there are responses to my post" but for some reason I'm not getting any alert in my email box that somebody has posted to my questions ( others I have posted in the past )

anyway thanks much in advance :-)

Mark

---

Editors Note: Mark; I made it so the picture is included in the story rather than a link.

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[glassed in black tube = higher heat yield](#) | 15 comments (15 topical, 0 editorial)

Re: glassed in black tube = higher heat yield ([none / 0](#)) ([#1](#))  
by electronbaby ([electronbaby@hotmail.com](mailto:electronbaby@hotmail.com)) on Mon Aug 18th, 2003 at 08:53:06 AM MST  
([User Info](#))

I would assume it would make a big difference. I have not made any of these solar heaters you talk about but if you think of it like this... you probably have this solar heater mounted outside where it can get plenty of sun. It is subjected to breezes blowing around it. This will start to cool the tubing and disperse the heat. If you make it a sealed enclosure, the temp will rise quicker and give you a more consistant output so to speak. This is how a green house works. Plexi might be easier to handle, but I would go for glass although it might be more expensive, it might work a little better than plexi because of its ability to pass sun light easily (plexi might become cloudy after a couple of years) and its ability to retain heat (insulate). Have fun!! RoyR

Can't see how it wouldn't help.. ([none / 0](#)) ([#2](#))  
by TomW on Mon Aug 18th, 2003 at 09:16:14 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

I have to agree with Roy here.

The air temperature inside a glazed area will be much higher than outside ambient air temperature. Your coils can't help but absorb that. They will lose less heat to the night air too I think.

Cheers.

TomW

[Stuff I have Online](#)  
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Re: Can't see how it wouldn't help.. ([none / 0](#)) ([#3](#))  
by thebbqguy on Mon Aug 18th, 2003 at 11:32:42 AM MST  
([User Info](#))

Hi guys,

Thanks much for the responses.

One question, can somebody explained that word " glazed" for me.... does this mean the area that is inclosed in with glass ?

I've seen this term several times, but have not really known what it means.

Thanks also to the owner of this website, I didn't know you could show an image in the actual post, boy that really makes it easier for the reader, so thank you for that :-)

anyway wow, so I guess this is something I need to try out in the near future :-)

I was kind of hoping that plexiglass would be as good as glass for the rays of sun to penetrate, glass is so easy to break :-)

anyway thanks again :-)

Mark.

mailto:mark@powershotgraphics.com

[ [Parent](#) ]

glazing ([none / 0](#)) (#4)  
by TomW on Mon Aug 18th, 2003 at 11:53:00 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Mark;

"glazed" simply means [to me] "covered with glass".

And on another note:

I would stay away from plexiglass for several reasons.

Expensive.

Clouds with time and scratches easily.

I think it would sag in that size in a horizontal position.

For an ultra cheap way to test it try clear plastic "visqueen" it won't last long but its dead cheap in rolls.

Cheers.

TomW

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Re: glassed in black tube = higher heat yield ([none / 0](#)) (#5)  
by troy on Mon Aug 18th, 2003 at 01:13:54 PM MST  
([User Info](#))

The answer to your question all depends on how hot the tubing on the plywood sheet gets. In a typical pool heater, there's a lot of water going through the tubing so they never get very hot, less than 100F typically. IF that is true, adding a layer of glazing will likely REDUCE performance because even glass absorbs about ten percent of the light unless you get special low iron glass.

On the other hand, if the tubing is considerably hotter than ambient air temp, say 150 or more, then you might gain some performance, but not a lot, since the ambient air temperature is fairly warm in the summer when your getting real heat gain.

Here's an almost free way to find out. Put a 1x4" frame around your plywood sheet, cover it with saran wrap, wait 30 min, measure output temp, then remove saran wrap, wait 30 min, measure output temp.

The other clue about wether or not this is cost effective, is commercial solar pool heaters. The vast majority of them have no glazing unless you're heating your pool in the early spring/late fall, when you will lose a lot of heat from the naked solar panel.

Best regards,

troy

Re: glassed in black tube = higher heat yield ([none / 0](#)) (#6)  
by sean on Mon Aug 18th, 2003 at 03:39:55 PM MST  
([User Info](#)) <http://homepage.ntlworld.com/s.amesbury/homepage.htm>

Get it under glass its going to make a difference for sure, i have just been given some old alluminium framed windows and im going to have a play with in making solar heaters and water heaters. If you check my site i made a simple solar oven in december and although i couldnt cook with it a small matt black baking tray warmed up nicley in about 15mins and that was only GLAZED with cling film. It was tested indoors in a south facing window but it still worked and ive baked potatoes in it this summer. Try getting in touch with a window company who replace old windows you might drop lucky and get something for nothing and at the right size.....sean

[ [Parent](#) ]

Re: glassed in black tube = higher heat yield ([none / 0](#)) (#7)  
by sean on Mon Aug 18th, 2003 at 03:40:45 PM MST  
([User Info](#)) <http://homepage.ntlworld.com/s.amesbury/homepage.htm>

Get it under glass its going to make a difference for sure, i have just been given some old alluminium framed windows and im going to have a play with in making solar heaters and water heaters. If you check my site i made a simple solar oven in december and although i couldnt cook with it a small matt black baking tray warmed up nicley in about 15mins and that was only GLAZED with cling film. It was tested indoors in a south facing window but it still worked and ive baked potatoes in it this summer. Try getting in touch with a window company who replace old windows you might drop lucky and get something for nothing and at the right size.....sean

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Re: glassed in black tube = higher heat yield ([none / 0](#)) ([#8](#))  
by Bach On on Mon Aug 18th, 2003 at 04:04:02 PM MST  
([User Info](#)) [change AT: bach\\_on AT hotmail.com](#)

A sealed area will hold in more of the heat. Trapping the heat near the hose should provide a higher solar gain.

But I have to agree that Plexiglass may not be the best candidate for this task. If at all possible, I'd try to use glass. Maybe you can make several sections to use smaller pieces, rather than a large sheet. Clean it well. Seal the box well so bugs and vermin don't get inside.

You could be swimming in December, or even later.

Bach On

- I'm just as happy as if I had good sense! -

Re: glassed in black tube = higher heat yield ([none / 0](#)) ([#9](#))  
by thebbqguy on Mon Aug 18th, 2003 at 05:14:00 PM MST  
([User Info](#))

Hi Guys :-)

I thank you for all your input on my question.

Well, I haven't been on all day, due to the fact I was out in the backyard building my little solar box.

I used wood that I had hanging around under my deck, and went over to the hardware store this afternoon also, and bought a piece of plexiglass - size is 3feet x 5 feet.

Anyway I built the thing today, and for today just threw the tube in there, and will do some serious testing on it tomorrow, when I mount it properly on the black tar paper I have put in there.

I have a few places where the wood is not perfect so there are pockets where air can get in and out.

I took about 20 high resolution digital images and will post those later tonight and give you a link, but for now, I'll give you a sneak peek at what I did.

There is only 100 feet of tube in there, and that really is not enough to make a

good solar heater from what I know, so I hope I didn't do all that work for nothing and only able to get say 200 feet of tubing into that small area. ( darn)

The 500 feet I have on the 4'x8' sheet of plywood really puts off some nice heat on a sunny day, so I kind of wish that was the one encased in a box.

Anyway here's an image :

[http://pages.infinit.net/logopro/IMG\\_5005scaled.jpg](http://pages.infinit.net/logopro/IMG_5005scaled.jpg)



Mark.

[ [Parent](#) ]



Re: glassed in black tube = higher heat yield ([none / 0](#)) ([#10](#))  
by BT Humble ([za2bb@optusnet.com.au](mailto:za2bb@optusnet.com.au)) on Mon Aug 18th, 2003 at 06:42:21 PM MST  
([User Info](#)) <http://www.geocities.com/za2bb/>

From what I've read about solar pool heaters it's generally much more cost effective to scale up the basic design that you're already using. As you've already said, plexiglass is \$80 per sheet and you'll buy a \*lot\* of 1/2" poly pipe for that. ;-)

Putting the collector in a glass box will give you higher temperatures, but there's only so much energy to be collected per square foot. Have you got a nice big sun-facing rooftop to put it on?

BTH

Re: glassed in black tube = higher heat yield ([none / 0](#)) ([#11](#))  
by drdongle on Mon Aug 18th, 2003 at 07:35:55 PM MST  
([User Info](#))

I would defenitly use regular glass than plexy or Lexan. Glass has the property of allowing visable light to pass through ad degrade to IR ( heat). thats why the inside of you car get so freaking hot in the summer with the windows closed. It's also why 2 or 3 layers of glass are used in those "super insulated windows, the glass is real good at retaining heat.  
Dr.d

Re: glassed in black tube = higher heat yield ([none / 0](#)) ([#12](#))  
by billyjim on Tue Aug 19th, 2003 at 10:46:17 AM MST  
([User Info](#))

Try using a piece of clear "Coroplast" 4x8 sheet... it will give a degree of insulation from the air currents wiping away the heat fromm your board and pipe, and... only costs about \$4 a sheet... it does real well in the sun...I have a sheet at my business with a printed sign thats been out in all weather for 11 years...

Re: glassed in black tube = higher heat yield ([none / 0](#)) ([#13](#))  
by thebbqguy on Tue Aug 19th, 2003 at 01:19:24 PM MST  
([User Info](#))

Hi guys, thanks for all the help, I really appreciate !

I just wanted to let you all know that my images are posted now,

try : <http://www.powershotgraphics.com/pool2>

you'll see all the images that show my progress on the solar enclosure.

Mark.

[ [Parent](#) ]

Re: glassed in black tube = higher heat yield ([none / 0](#)) (#14)  
by thebbqguy on Thu Aug 21st, 2003 at 06:46:01 AM MST  
([User Info](#))

For anyone looking for other solar panel stuff ( homemade )

check my other topic on this website forum:

<http://www.fieldlines.com/story/2003/8/19/13648/4496>

I've got other good info there for anyone who is interested.

This forum by the way is great, and I really appreciate all the help I have received.

Mark

[ [Parent](#) ]

Re: glassed in black tube = higher heat yield ([none / 0](#)) (#15)  
by thebbqguy on Mon Sep 8th, 2003 at 08:05:48 PM MST  
([User Info](#))

Just a quick update here,

Since the 21st of August, I started slowly buying professional solar panels, and today my 3 shipment arrived, so now I have a total of 6 panels.

Each panel is 4x10 feet ( 40 sq feet )

Let me just say something, I really enjoyed fiddling around with my homemade black hose system, but after buying my first professional panel that uses a 1-1/2" tube, I was sold on them.

Here's an example - today my pool was at a cool 68.2 degrees in the morning, - about 11 am.

I got my shipment of 2 panels ( I had 4 at this point ) anyway I installed the 2 I just received, got the whole thing together and had it up and running about 1:05 pm, well, by 5pm - when I shut the system off, I had the water up to 75.9 degrees.

That would have been IMPOSSIBLE with my homemade solar tubes, - they are 1/2" pipes, and even with 3 of them running, it doesn't even compare to the professional system. Water comes out of the professional panels so quickly that the water is being turned over at such a high rate, I was getting a 1.2 degree temp increase in only 30 minutes ! my pool at one point during the day. As the day went on, that decreased slowly but still that's just amazing !

I use my little stopwatch, a piece of paper and I write everything down, - I took temps each 30 minutes by the way. Anyway you also have to consider where I live, - I live in Ontario Canada - Ottawa - and it's cold here at night, - getting down to about 6 degrees above zero now during the nights, and only about 21 degrees during the day ( that's about 69 degrees F ).... today for example I had a high of 21.5 degrees on my outdoor thermomter, - that's not very warm, but still the panels pushed a heck of a lot of water.... anyway sorry for the long story, here's a picture taken today.



[ [Parent](#) ]

[glassed in black tube = higher heat yield](#) | 15 comments (15 topical, 0 editorial)

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## [Homemade solar pool heating system with black pipe](#)

By [thebbqguy](#), Section [Homebrewed Electricity](#)

[Water Heating](#)

Posted on Sun Aug 10th, 2003 at 08:51:50 AM MST

Just thought I would post info about my solar system in case anyone is interested.

---

Hi all,

Just thought I would post info about my solar system in case anyone is interested.

<http://www.powershotgraphics.com/pool>

I currently have 3 separate systems running for my 18 foot above ground pool. The pool is 52" high and is has a lot of water, - don't know, but somebody told me it holds 28,000 liters ( I live in Canada )

I know that 1 U.S. gallon = 3.8 liters.

anyway I have 3 systems, .... started out with one, but realized it would never work ..... as there's just too much water to heat up.

The first system I used black utility hose, - 1/2 " and have 500 feet of it. That worked so well, that I made another system and put that on the roof of my child's play structure outside .... that one has 400 feet.

Then this past week I bought another 600 feet of black hose and now have that running as my 3rd solar system.

All system are 100 % independant of each other, and all are running off the 1.5 hp motor that came with my pool, there's no strain on the motor by the way, which is great.

I push 8 liters of water every minute from each little 1/2 hose - and water is about 88-89 degrees, once the water has been running about a good 15 minutes.... when it first starts water is about 127 degrees F.

anyway let me do some math here:

8 liters of water from each hose per minute.

That's 24 liters total from the 3 black hoses per minute.

there are 3.8 liters in 1 U.S. gallon.... so.....

24 divided by 3.8 = 6.3 gallons per minute.

so, 6.3 gallons x 60 minutes = a total of : 378 gallons per hour .

That's enough to fight the battle..... the first 500 feet of tube I had installed - only one pipe - was beautiful, but I quickly realized that this was just not enough to fight the pool, - when you have that much water in a pool it's just not doing much if not anything.

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From what i have read, - if a solar heater is big enough for your pool, you should be getting about a 2 degree per hour rise - from the solar heater alone, and another 1 degree per hour from the sun with its passive heating, -so that's 3 degrees per hour increase which is amazing.

anyway you can check out my images at :

<http://www.powershotgraphics.com/pool>

[Homemade solar pool heating system with black pipe](#) | 10 comments (10 topical, 0 editorial)

Re: Homemade solar pool heating system with black ([none / 0](#)) ([#1](#))

by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Sun Aug 10th, 2003 at 09:33:16 AM MST

([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

The temprature rise of 2 degrees an HOUR seems a bit too high. I'm pretty sure that if you are getting a 2 degree rise in a DAY that you would be fine. My Solar pool heater was getting a 1 degree rise per day which I thought was perfect.

Where are you getting your Black Tubing and what type of stuff is it (flexable / stiff).

}=- W o o f -= {

Re: Homemade solar pool heating system ([none / 0](#)) ([#2](#))

by drdongle on Sun Aug 10th, 2003 at 10:41:27 AM MST

([User Info](#))

System looks great!

Dr.D

Re: Homemade solar pool heating system ([none / 0](#)) ([#3](#))

by sean on Sun Aug 10th, 2003 at 04:54:27 PM MST

([User Info](#))

<http://homepage.ntlworld.com/s.amesbury/homepage.htm>

looks great but if it was under glass it should work even better and for more months of the year.....sean

[ [Parent](#) ]

Re: Homemade solar pool heating system ([none / 0](#)) ([#4](#))

by thebbqguy on Mon Aug 11th, 2003 at 07:06:46 AM MST

([User Info](#))



Hi Sean,

Thanks for the info about the glass. I will go price plexiglass for fun, but a sheet of 4x8 sheet is over a \$100 here in Canada.... I bought a small section about 2 years ago for a coffee table - about 3 feet x 2 feet and it was \$55.xx if memory serves me correctly.

Morning Tim,

With the professional solar collectors, you should be getting way higher temps than with homemade systems, I have read numerous posts that a system can lift your pool temp by a good 6 - 8 degrees in a day. -- This is totally normal, \* if \* your solar system is 100% that of the area of your pool.

My 18 foot above ground pool has 254 sq feet of area. In order for me to have 100% of that area, can you image how many 4x8 sheets of piping I would need to equal that area ? - my lawn would be full of sheets ( yikes ) !

My 4x8 sheet is not even totally full of pipe..... the middle of the sheet is empty because the black piping is not that pliable and started to kink when I got too tight of a circle in the inner part.....

Anyway in theory that 4x8 sheet of plywood = 32 sq feet ONLY !

My brother has a math "template" to figure out from the size of tube and the length of tube to tell you pretty bang on how much sq footage total you have in a certain length of pipe.

I originally started off my solar system with only one pipe running into the pool, I had 500 feet of pipe ( 1/2" ) running on this system.

Anyway eventhough the temp was coming out rather nicely - about 89 degrees, - I quickly realized that there was just not enough flow for the temp to rise that much.

I then added another solar piping system, - installing it on my children's play structure roof... this one has 400 feet of pipe on it.

I then thought, ok if 1 is borderline, 2 must be better, so how about adding in another ? ... so I went out and bought another 600 feet of black pipe and have that just spread out over black roofing paper on the patio right now.

- heat coming off this 600 feet of pipe, eventhough not tacked down and evenly spread out so sun hits 100% of it, is quite amazing, temps coming out of it are really nice - about around that 88-89 degree mark - running at 2 liters per 15 seconds.... - that's 8 liters per minute.... ( 1 U.S. gallon = 3.8 liters )

anyway when I turn on those systems at the beginning the water coming out is naturally very hot - so hot you can almost scald yourself.

I know that even with 3 solar water tubes running into my pool, the sq footage that is coming out of my 3 systems is just not anywhere near what should be... in order for my pool to get a 3-4 degree temp increase per hour, I would need 20 of those tubes

running into the pool - each running on an independant system... ( all my systems are NOT connected to the other systems) each is 100% independant of the other.

I did try running 2 solar systems together as one - meaning I connected the 500 feet of tubing on the 4x8 sheet, and the 400 feet on the children's play structure roof.... just connecting the tubes together.....

I noticed that the water temp was indeed higher, but the flow was not..... and from what i read, it's temp, but ALSO flow that makes a good system..... if flow is too low, then you don't achieve much..... so I broke them into 2, and get a much better heating system from that... - a guy from one of the professional solar collector companies actually told me to do this, but I won't mention names.

Tim, that hose - it was \$9.99 for 100 feet.... they also sell it in 400 foot lengths, - that was #39.99 ..... I bought it at my local hardware store.... the guy told me they use it for drainage at cottages and is a standard tubing that is found all over the place. - they use it in grocery stores also for certain parts of the plumbing.

Anyway the first 400 feet of it I bought , I bought 100psi rated tube, which was \$10 more for the roll... so that was \$49.99 .... but when I went back to get more, they only have the piping at 75psi, so I bought that, - it was cheaper, and I just don't see the need for the extra 25psi... - if they had it, I would have bought it, but none was in stock.

The pipe is pretty pliable, but NOT as pliable as garden hose, but it is indeed pliable enough to work with totally fine.

anyway sorry if I went on like a broken record.

If you look at the professional solar collectors, you will see that they use huge piping that goes to and from the actual solar collector ( panel ) that sits on your roof for example.... each collector can push out a good 2-4 gallons per minute ! - so imagine when you have 8 of those collectors on your roof !

\* good example \*

My brother lives in Vancouver - they get a lot of rain there, and weather is nowhere near what it is like here in Ottawa ( we get much hotter summers) he went to a friend's house about 2 weeks ago..... my brother said the guy's pool was 94 degrees !!!

How was this possible ? ... well when the guy bought the house, it came with the pool and a professional solar collector system - the roof is full of collectors, and the piping going to the pool pump motor is the standard 1-1/2 or 1-1/4 inch size..... anyway the guy told my brother that he has to turn the solar system off all the time because the pool gets too hot ! - anyway that day his wife had left the system on, and so the water was way too hot to be refreshing.

\* I wish I had those problems :-) \*

Anyway that goes to show you the power of solar collectors, if they equal the sq footage of your pool - you can get amazing water temps. - I've read some

of the really high quality collectors available boast a temp increase in your pool of 10 degrees - provided you have 100% coverage in sq footage on your collector.

Right now I guess I have what... about 1/6th coverage in sq.footage, so I am nowhere near what i should be.

If I lived further out in town, had a large property, I would buy 10 sheets of 4x8 plywood, and coil 400 feet of black tubing on each one .... now imagine the solar energy that would come off something like that - wowie !

Mark.

<http://www.powershotgraphics.com/pool>

I'll take some new pictures today of the connections to my pump, as the website at this moment doesn't reflect the 3 seperate connections for each of my existing solar systems.... - I have installed "y" tubes onto the pool filter system, right near the pool, and each of the "y" connectors attaches to a black 1/2 tube ( the solar tubes) ... and each "Y" has a valve to turn off each and any of the tubes at any time.

[ [Parent](#) ]

Re: Homemade solar pool heating system with black ([none / 0](#)) ([#5](#))  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Mon Aug 11th, 2003 at 08:01:27 AM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

The pipe is so small and it is so long. Pipe has resistance to water flow. This resistance is called `Head' and is measured in feet, as if the water were being pumped uphill for that number of feet which loads the pump down. Here is a link to a chart showing the friction Head for all pipe sizes and flow rates.

<http://pump.net/frictiondata/fricofwater.htm>

they don't list PVC pipe so scroll down the page and select 1/2 copper pipe then find your flow rate on the chart and you'll see the resistance to the water in feet. Also any fittings in the system (like 90 degree elboes) has head resistance. The chart for pipe fitting head resistance is at the top of the page linked to above.

.....

The pool heater I built was raising the temperature of the water by about 1.7 degrees as I measured the difference between the pool water and the return water from the heater. Plus the temprature of my 2500 gallon pool was rising by about 1 degree per day. unfortunatly my pool developed a leak and drained itself, but before that happened we were swimming in 88 degree water, up from 76 degrees on the day I got it operational. We are planning to try and return the pool to Wal-Mart for replacement.

-

}=- W o o f -= {

Hmmm ([none / 0](#)) (#6)

by Demetri ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Mon Aug 11th, 2003 at 11:28:52 AM MST  
([User Info](#))

I know this would be an absolutely HUGE pain in the butt, you'd never drain your pool specifically for this(Geez, what would you do with all that water? And your water bill from refilling it? Assuming you don't have a well.), but if you ever have your pool drained sometime, you might consider painting the bottom of it black. Or maybe a cool picture in predominantly dark shades.

Demetri  
Always be the lead dog.

Re: Hmmm ([none / 0](#)) (#8)

by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Mon Aug 11th, 2003 at 03:34:56 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

The problem with a pool painted a dark color for heat is that you can't turn it off if it gets too hot . . .

} = - W o o f -= {

[ [Parent](#) ]

Re: ([none / 0](#)) (#7)

by thebbqguy on Mon Aug 11th, 2003 at 11:45:32 AM MST  
([User Info](#))

Hi Demitri,

I'm super lucky, where I live in Canada, - we have no water meter, so you use as much water as you wish, and that's the end of story.

Lucky we live where there's never a shortage. We have so much water we sell it to many of the upper States in the U.S.A.

As for draining, it's as easy as pie, you just run your drain hose, which is a flexible baby blue hose out to the street and let it go, there are sewers in front of every house, so that's quite convenient.

Mark  
<http://www.powershotgraphics.com/pool>

Re: Homemade solar pool heating ([none / 0](#)) (#9)

by Electric Ed on Mon Aug 11th, 2003 at 08:08:53 PM MST  
([User Info](#)) <http://www.electric-ed.com>

It is nice to see people making use of all that "free" solar energy.

However, I believe that for heating a large volume of water to a relatively low temperature, such as for pool heating, a collector with more parallel branches would be more efficient.

You described three "branches" of 400 ft, 500 ft, and 600 ft, using a total of 1500 ft of pipe.

I would recommend, say, fifteen branches of 100 ft each instead. Of course, the down side is that this involves more plumbing, and you would also need a higher volume pump.

There is a maximum water temperature that can be achieved with the pipe exposed to the air. The problem with the longer run is, if the water gets up to that maximum temperature in the first 100 ft of the run, the remainder of the pipe in that run is wasted.

Electric Ed

Re: Homemade solar pool heating ([none / 0](#)) ([#10](#))  
by thebbqguy on Tue Aug 12th, 2003 at 07:51:01 AM MST  
([User Info](#))

Hi Ed,

Wow, well you bring up a good point.

I'm going to do a test today and try using a 100 foot piece of tubing and take the temp of water flowing from it, once it has been flowing for about 10 mins.

The other day, I had a 400 piece of tubing running at 8 liters per minute, the water was warm.

I stopped the flow, added on 2 other lengths of 100 foot tube, so I now had 600 feet of tubing.

I turned the flow back on, and let it go for a good 5 minutes, and then checked the water temp - .... it was MUCH warmer than it was with the 400 feet.

This told me the longer the length the better ..... but you are right, there must be a happy medium.

I'm thinking of doing this, if your thoughts are correct about the tubes

I'll take a 1-1/2" black pipe ( used for bathrooms) ... the same size my pool filter is running on.....

I'll take that tub, and cap one end of it, - the other end will be hooked up to the pool filter.

Ok now I want to drill holes all the way along the pipe and slide my existing 1/2" pipe into those holes and have each length of pipe say a length of 100 feet like you suggest.

I don't know, would it be more effecient ? ... I don't know how to attach the small 1/2" pipe into the larger pipe, maybe just PVC glue would do it.

Anyway, don't know if this would be more effecient, but

would be a fun project.

Mark.

<http://www.powershotgraphics.com>

[ [Parent](#) ]

[Homemade solar pool heating system with black pipe](#) | **10** comments (10 topical, 0 editorial)

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### [Splicing PEX tubing](#)

By [Wyomingbob](#), Section [Remote Living](#)

Posted on Fri Jul 4th, 2003 at 08:51:06 PM MST

[Water Heating](#)

must never ever leak

What's the absolute surest and proper method for splicing a run of 1/2" Heat PEX that will be entombed in concrete as part of a hydronic heating system? I know, I know -- don't splice at all. We really tried to avoid it, honest. I need a method that will last 300 years, in concrete, running very hot propylene glycol, and never ever leak even after a million heating & cooling cycles. Help?

[Splicing PEX tubing](#) | 7 comments (7 topical, 0 editorial)

Re: Splicing PEX tubing ([none / 0](#)) ([#1](#))  
by [wdyasq](#) on Fri Jul 4th, 2003 at 09:09:18 PM MST  
([User Info](#))

Mr Wyoming,

<http://www.pexconnection.com/heating/oxygaurd.htm#heatpex>

Has 1000' lengths of 1/2" PEX.....

You must be building a big building or have some cheap PEX you are using....

Or, just plan on making the splices wher you can get to and fix them.

Ron

Re: Splicing PEX tubing ([none / 0](#)) ([#2](#))  
by [Wyomingbob](#) on Fri Jul 4th, 2003 at 09:21:20 PM MST  
([User Info](#))

I had a 1000' roll of PEX. It is top-grade stuff, and the building isn't that big. A mid-course change in the heating system design left me short of the manifold. The splice will be under concrete and inaccessible. This cannot be that hard.

[ [Parent](#) ]

Re: Splicing PEX tubing ([none / 0](#)) ([#3](#))  
by [Anonymous Hero](#) on Fri Jul 4th, 2003 at 10:58:57 PM MST

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As well as I can remember you can use one of the pex union fittings that use double O ring seals and protect it by covering it over with large shrink tubing before covering it with concrete. For additional peace of mind you can replace the O rings with neoprene or silicone types that will have a much longer lifespan. I imagine you will be pressure testing the system before doing the concrete pour. Good Luck Tom S.

Re: Splicing PEX tubing ([none / 0](#)) ([#4](#))  
by troy on Sat Jul 5th, 2003 at 12:15:07 PM MST  
([User Info](#))

You could always put the splice in a box with an accessible cover that looks nice in the floor. I'm a belt and suspenders kind of guy myself. Isn't there some variant of Murphy's law that states that the likelihood of a plumbing joint leaking is inversely proportional to its accessibility?

I know you're busy like crazy, but I am fascinated by radiant heat so if you could give us a little description of your project some time that would be great. Is your pump/control system off the shelf or did you come up with a less expensive home-brew solution?

Good luck and have fun!

troy

[ [Parent](#) ]

Re: Splicing PEX tubing ([none / 0](#)) ([#5](#))  
by Wyomingbob on Sat Jul 5th, 2003 at 03:31:08 PM MST  
([User Info](#))

Hi, Troy. Think I've found the standard method: barbed brass insert coupling, crimped w/ O-rings (prolly two each side), then sealed w/ heat-shrink or that waterproof vulcanized electrician's tape.

The system isn't under any real pressure, just a couple of pounds from the slowpump. I knew there had to be a common fix, because at \$550 per 1000' roll, installers couldn't afford to no-splice every loop & wind up with a bunch of useless short rolls in the warehouse. And damage can happen during installation. (Some job orders do specify "no splices", tho.)

Local ACE Hardware actually had all the goodies, including plugs & schraeder valve fittings for pressure testing. Even lent me the crimping pliers gratis.

The reason I ran short is cuz I changed the system design a bit on the fly, which is quite typical of me.

The entire slab sits on 2" of styrofoam, called Insulworks: these are 4'x4' pieces w/ grooves milled so the PEX just snaps in & is secured by plastic staples. Two zones of the hydronic system are purely distribution: (1) back bedroom, office, and part of living room; (2) bathroom, mudroom

hall, and master bedroom. Third zone is the troublemaker. It leaves the manifold, warms the bulk of the living room, then does many tight turns in the solarium, where dark concrete and sloped glazing should mean a net temp gain on cold sunny days. So it's a mix of distribution and collection.

Then I was going to return to the storage tank, but figured heck, may as well use this reheated glycol to warm the kitchen. That's when I ran short.

Choices became: overextending loop (2) to carry the kitchen; adding a fourth zone; or splicing more PEX to loop (3) and putting that reheated fluid to good use.

The bathroom floor, BTW, is a product called Warmboard: basically 1-3/8" thick OSB with an aluminum sheet surface and tracks for the PEX.

Haven't quite sorted out the controls yet: it's going to be pretty basic, with maybe one floor temp sensor in the LR and I'll balance the other zones by tweaking manifold valves manually. Not putting thermostats or electronic valves on each loop.

That's an expensive pain, and uses parasitic power.

The solar HW collector will have its own pump and differential thermostat. Or I might just slap a 12VDC slow pump and 50 watt solar panel right on the collector and call it good. Glycol in both the collector and hydronic systems; domestic hot water is in a 60 gal tank with dual stainless heat-exchanger coils inside. After six months of futile searching, I finally found a reliable supplier of solar tanks at a decent price: Tam Jass tanks from SPNW in Oregon. Thermomax wanted about 2.5 times as much for a lesser tank. And SPNW will cut in bulkheads for water heater elements for only \$60 per, so my wind turbine dump loads are taken care of. The the DHW leaves the tank and goes to a demand LP gas water heater which modulates to zero BTUs if the water is hot enuf.

Sound like a nightmare plumbing job? Fraid so. I love electrical, but plumbing just sux. Icky.

[ [Parent](#) ]

Re: Splicing PEX tubing ([none / 0](#)) ([#7](#))  
by troy on Mon Jul 7th, 2003 at 02:35:19 PM  
MST  
([User Info](#))

Hey thanks Bob,

That's what I'm thinking, a combination of low tech with some informed tweaking. More simple, more reliable, more affordable, more serviceable, with a reasonable amount of control.

Best regards,

troy

[ [Parent](#) ]

Re: Splicing PEX tubing ([none / 0](#)) ([#6](#))  
by Anonymous Hero on Sun Jul 6th, 2003 at 02:33:45 PM MST

Wyoming, I built a hydronic system back in Canada. I had a special tool that stretched the PEX and allowed a shrink fit . It worked well and maybe you could use 1/2 "copper as a union. I described my system on remote living a couple months ago. Check it out. Jungle Bill

[Splicing PEX tubing](#) | 7 comments (7 topical, 0 editorial)

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### [Hot water heating element temp. ?](#)

By [Dave B](#), Section [Homebrewed Electricity](#)  
Posted on Tue May 13th, 2003 at 05:17:34 PM MST  
Does anyone know ...

[Water Heating](#)

the surface operating temperature of hot water heating elements, specifically a 120 VAC 1500 watt element at full power ? I will be testing these with the variable AC from my alternator, I know they should be submerged to avoid burning them up and need to see if I'm in the ballpark with the temp. range etc. I know I can measure current, voltage etc. but wondered if anyone knew the surface temp, might be easier for me to test if things will work for me as planned. Thanks, Dave B.

[Hot water heating element temp. ?](#) | 6 comments (6 topical, 0 editorial)

heater element surface temperature ([none / 0](#)) ([#1](#))  
by [mkseps](#) on Tue May 13th, 2003 at 06:35:49 PM MST  
([User Info](#))

The heater element is no different than the surface element of an electric stove. If energized in open air, the element will get red hot indicating a temperature of over 1200 degrees F. If left in this mode, the element will burn itself out.

Heating element ([none / 0](#)) ([#2](#))  
by [windstuffnow](#) ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Tue May 13th, 2003 at 07:19:52 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Dave, simply pull out one of the elements from an electric stove and use this as a test unit. Measure ohms on the unit and calculate the wattage it will handle... If you get it to glow your in the ballpark.

Why is it that the stove coil doesn't short out when you place a pan on it? Ok we won't worry about that at this point...

Have Fun!  
Ed

[ [Parent](#) ]

Element temp. thanks ([none / 0](#)) ([#3](#))  
by [Dave B](#) on Tue May 13th, 2003 at 10:48:03 PM MST  
([User Info](#)) <http://www.madbbs.com/users/bruggelog>

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Thanks guys, I actually did pull one of my stove elements out and checked it out. Shows 38 ohms for the small element. I can get one hot water element quite hot spinning the alternator by hand but at 10 ohms I'm doing alot of work just keeping it at approx. 100 RPM. I've got alot of experimenting to do and when I get my coils and magnets epoxied down I'll run up some real tests with a 2 HP electric motor I've got access to. Adding elements, series/parallel coils also along with adjusting the air gap to try to get where I'm going. It's a give and take but looks like a large blade set with alot of torque and not so much speed will be the way to go. I can spin up my alternator to 90 VAC no load by hand at 300 RPM. I'm hoping to pre-heat water and have the room for 100' tilt tower. Any thoughts on the size blade set and profile with as much torque as possible but still capable of 300-400 RPM ? I'm having a great time thanks to all of you out there. I'll post test results as I go.  
Dave B.

[ [Parent](#) ]

A little more info. ([none / 0](#)) (#4)  
by Dave B on Tue May 13th, 2003 at 11:37:28 PM  
MST  
([User Info](#)) <http://www.madbbs.com/users/bruggelog>

The stove heating element is rated for 240 VAC and @ 38 ohms. Doing the math this is approx. a 1500 watt element. The hot water elements I have purchased for testing are 120 VAC and at 10 ohms rate at approx. 1500 watts also. Is there an easy way to determine the torque needed to start and sustain an RPM of say 300-400 ? Will start up always require the most torque assuming I will be loading this with the low resistance of the heating element(s) ? I'm trying to keep this simple without variable pitch mechanisms etc. but switching or varying the load electronically depending on the RPM will be very beneficial for start up and efficiency at speed. I welcome any ideas or thoughts on a working circuit, I have very little time to bread board too. Just not enough time to play. Thanks, Dave B.

[ [Parent](#) ]

HP and Torque ([none / 0](#)) (#5)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on  
Wed May 14th, 2003 at 07:37:49 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>



Horsepower and torque:

$HP = \text{Torque} \times \text{Rpm} / 5252$   
example: 2hp = 35 ftlbs x 300 rpm / 5252

$\text{Torque} = \text{HP} / (\text{Rpm}/5252)$   
example: 2hp / ( 300 rpm / 5252) = 35 ftlbs

$\text{Rpm} = \text{HP} (\text{Torque}/5252)$   
example: 2hp / ( 35 / 5252) = 300 rpm

Have Fun!  
Ed

[ [Parent](#) ]

Thanks Ed ([none / 0](#)) (#6)  
by Dave B on Wed May 14th, 2003 at  
09:11:45 AM MST  
([User Info](#))  
<http://www.madbbs.com/users/bruggelog>

I'll be looking over all this good stuff and will be having alot more fun testing things out very soon. Any thoughts on a switching circuit to vary the load at different RPM or voltage ? I think you see what I'm wanting to do. I'd pay you if you wanted (another) little project. Sure sounds like you have the means but like most of us maybe not the time. Thanks again. Dave B.

[ [Parent](#) ]

[Hot water heating element temp. ?](#) | 6 comments (6 topical, 0 editorial)

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### [Frenette heater](#)

By [Techstuf](#), Section [Remote Living](#)  
Posted on Mon Apr 21st, 2003 at 05:16:33 PM [Water Heating](#)  
MST

Molecular friction heater

Say, does anyone know of anyone who has built this simple heater and achieved results?

<http://www.fortunecity.com/greenfield/bp/16/rotary.htm>

Peace,

TS out

[Frenette heater](#) | 1 comment (1 topical, 0 editorial)

Frenette ([none / 0](#)) ([#1](#))  
by [windstuffnow](#) ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon Apr 21st, 2003 at 06:55:36 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

I built one several years back. It made a temperature of 130 degrees. As far as heating a whole house for \$30.00 a month... won't happen. You can take a copper, brass or aluminum plate and make a steel disc with magnets installed just like an alternator. Once the magnets are spinning close to the plates you'll get tons of heat. Much easier to build also. Submerge the entire system in a liquid and circulate the liquid through the house. But there is no free ride in either case... you put a half horse or more into it and you'll get less out...

Fun projects though...  
Have Fun as always...  
Ed

[Frenette heater](#) | 1 comment (1 topical, 0 editorial)

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## [Novan solar hot water](#)

By [Wyomingbob](#), Section [Remote Living](#)  
 Posted on Sat Apr 19th, 2003 at 09:27:30 PM MST [Water Heating](#)  
 From Reagan's first term...

...comes an orphaned solar hot water system that needs a home. I am in market for same. But having a devil of a time finding information on this system. Perhap's y'all can help.

The bulk of it is called the Novan Optimizer -- allegedly the Lexus of SHW in the early '80s. Manufactured in Boulder, CO. System consists of: four 4x8 fin-type collectors, with the pebbled glass (which I've NEVER understood). A counterflow-type heat exchanger (probably double-walled), pipe-inside-pipe variety. Grundfos circulating pumps (2) and zone valves. Fluid reservoir, approx 30" long x 12" diameter, which was said to contain an "oily substance." Now empty.

Questions:

Know anything about this system?

Have any of you heard of 'Bray oil,' apparently used in lieu of Glycol on some old systems -- especially Novans? Could I flush the system somehow & switch to Propylene Glycol? Reckon the whole system, including two old Bradford White solar storage tanks (80 and 120 gallons) is worth \$3000? Or should I go w/ a smaller, new system? (I have a hankering for the Thermomax Mazdon system w/ dual-heat-exchanger tank, but that's gonna hurt to the tune of \$7000. Owwwch.)

[Novan solar hot water](#) | 1 comment (1 topical, 0 editorial)

Re: Novan solar hot water ([none / 0](#)) ([#1](#))  
 by Anonymous Hero on Mon Jun 30th, 2003 at 05:29:26 PM MST

I also inherited a Novan solar hot water system about which I know nothing. Can anyone supply any info on this system or manufacturer. I don't think mine is installed (or maybe adjusted) correctly because even on hot (100 degree) clear sunny days, the bottom half of the storage tank (80 gal) does not even get up to 60 degree even with no hot water usage.

[Novan solar hot water](#) | 1 comment (1 topical, 0 editorial)

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[testing](#)

By [JackS](#), Section [Rants & Opinion](#)

Posted on Mon Mar 31st, 2003 at 11:48:43 PM  
MST

[Water Heating](#)

[testing](#) 1 2 3

[testing](#) | 1 comment (1 topical, 0 editorial)

Let me try post an image. ([none / 0](#)) ([#1](#))  
by Junkie ([madscientist@blownup.com](mailto:madscientist@blownup.com)) on Tue Apr 1st, 2003 at 12:46:24 AM MST  
([User Info](#)) <http://www.akuma.dsl.pipex.com/chris>

There's already lots of testing comments so Ill (try)post under this....



And another blurry one from my cheap camera :)



These are photos of my first attempt at an induction motor conversion, without a lathe. I found a smaller rotor which fits inside this re-wound core. It still isnt finished!

-Chris

[testing](#) | 1 comment (1 topical, 0 editorial)

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[just testing](#)

By [Ramblyr](#), Section [Remote Living](#)

Posted on Mon Mar 31st, 2003 at 07:53:52 PM MST

[Water Heating](#)

Testing



[just testing](#) | 0 comments (0 topical, 0 editorial)

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### [looking for h2o heat](#)

By [outback](#), Section [Homebrewed Electricity](#)

Posted on Sun Mar 30th, 2003 at 04:25:09 AM MST

[Water Heating](#)

hey all,i was just wondering if someone could point me to some sight using water for heat.

[looking for h2o heat](#) | 5 comments (5 topical, 0 editorial)

floor heat ([none / 0](#)) ([#1](#))

by [Ramblyr](#) on Sun Mar 30th, 2003 at 08:40:50 AM MST

([User Info](#)) <http://www.windgeny.com>

Here is a link to a pdf file which might help.

<http://www.hotwaterproducts.com/HTP/Pdfs/925%20controlled%20munchkin.pdf>  
I am doing hot water heat in a garage at present which iam using a gas hot water heater an expansion tank,temp sensor,a bleed valve to remove air,and a grundfose pump,a line voltage thermostad,and about 300 hundred foot of pex tubing which is tied to the wire in the concrete.You should use about one foot of tubing per one square foot of floor space.You would probably be better off buying product from a heating and plumbing supplier tha on the web!I have tried to find good info before but couldnt. Cant figure out how to post a pic!

radiant floor heat ([none / 0](#)) ([#2](#))

by [Anonymous Hero](#) on Wed Apr 2nd, 2003 at 10:01:12 AM MST

My next house will use radiant floor heating, so I've been doing the research on the proper tubing, pumps, solar assist, etc. Nice to know someone got the job done. Any specs on your pump? The tubing itself is cheap enough, it's all the commercial control circuitry that costs a fortune. thanks, troy

base board heaters ([none / 0](#)) ([#3](#))

by [Anonymous Hero](#) on Fri Apr 4th, 2003 at 04:44:09 AM MST

thanks for the comeback fellows.i didfn't make my self clear as usesall.what i'm trying to find is water baseboard heaters.does anyone know of a sight that sells these.or better yet has plans to build them. thanks outback

Hot Water Heat ([none / 0](#)) ([#5](#))

by [Ramblyr](#) on Sun Apr 20th, 2003 at 07:45:35 AM MST

([User Info](#)) <http://www.windgeny.com>

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Here is a site with some nice units which you could put on your outside walls, <http://www.aimradiantheating.com/store/slimline.html> or you could epoxy tubing to allunium strips or solder copper pipes to copper strips,you could make a press for alluminum or copper by notching a piece of wood say half an inch then for experiment sake try a strip cut out of a beer can laying it over the wood and pressing it with a dowel rod down into the groove that way making a snap on fin system, you can also buy these for under floor heat! Good luck

[ [Parent](#) ]

problem ([none / 0](#)) (#4)  
by Anonymous Hero on Fri Apr 4th, 2003 at 04:49:03 AM MST

am i doing something wrong posting i have an account [outback]but when i post it shows up as Anonymous Hero.help

[looking for h2o heat](#) | 5 comments (5 topical, 0 editorial)

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## [Need circuit to switch between pump/gen turbines](#)

By [visionarynz](#), Section [Remote Living](#)

[Water Pumping](#)

Posted on Mon Dec 22nd, 2003 at 02:01:27 AM  
MST

something with two momentary inputs that will latch each way

I'm after a circuit that will switch a water source between two different turbines. One turbine is pumping water mechanically (a long way up) to fill a water tank, and the other is for power generation. Switching the water supply between these two turbines will probably be done with some sort of solenoid, but the circuit only needs to switch a relay, which will control it. I can solder it together, all I need is a schematic.

Now I'm guessing that a circuit to do this job will use logic gates, and it should be fairly simple, but I don't know enough to design it from scratch.

There will be a water tank with a magnetic float, and two reed switches. One reed switch will be at the top of the tank, and one will be at a lower level, probably about half way. What it needs to do is switch the relay one way when the float comes within proximity of the top reed switch, and then switch it back the other way when the float gets down near the lower reed switch. The input of the reed switches will be momentary, so it needs to latch one way, until the float gets back to the other reed switch. This also means I can have a momentary push button wired in parallel with each reed switch to click the relay one way or another when the water level is somewhere in the middle.

All going to plan, this setup should keep the tank between the upper and lower levels, and divert the water supply to another turbine for generating power whenever the tank reaches full. But not be switching back and forth every time a little bit of water is used from the tank, only when the tank gets down to the lower level, which will be about 1metre (3feet) lower. Also changing the mechanical pump to an electric one is not an option at the moment, and I think this setup could work just as efficiently and be much cheaper anyway. I've looked through a lot of schematics on the net, but I haven't been able to find one that does exactly this. Any links/help would be appreciated.

[Need circuit to switch between pump/gen turbines](#) | 4 comments (4 topical, 0 editorial)

Re: Need circuit ([none / 0](#)) ([#1](#))  
by [wpowokal](#) on Mon Dec 22nd, 2003 at 07:21:00 AM MST  
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Visionarynz,

I would use a latching relay, say 12v, this will have normally open and normally closed contacts.

Each alternate pulse will latch then unlatch the relay, simple and faily foolproof, that said there are others on this board much less electronic challenged than me so hang on till one helps out.

regards Allan

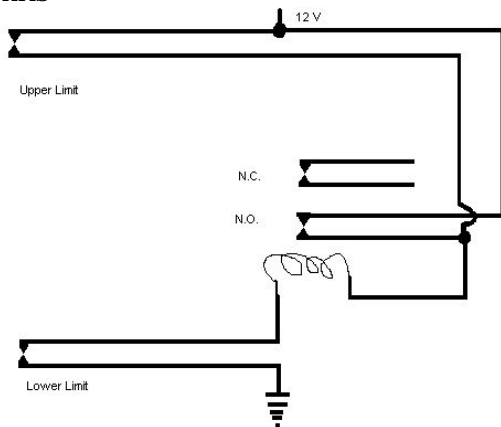
Re: Need circuit ([none / 0](#)) (#2)  
by laskey on Mon Dec 22nd, 2003 at 10:07:41 AM  
MST  
([User Info](#))

Despite my crude drawing. You probably could do this....

The N.C. contact would be you state changer.

The lower limit switch would unlatch the whole deal.

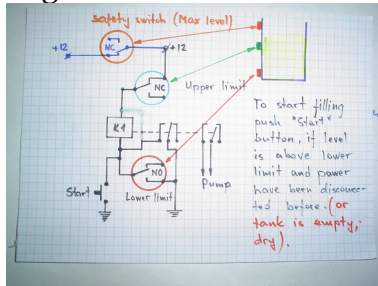
Cya,  
Chris



[ [Parent](#) ]

Re: Need circuit ([none / 0](#)) (#4)  
by Virgis on Tue Dec 23rd, 2003 at 11:55:52  
PM MST  
([User Info](#))

Hi, please try this. It works perfectly.  
Virgis



[ [Parent](#) ]

Re: Need circuit to switch between pump/gen turbin  
([none / 0](#)) (#3)  
by hvirtane on Mon Dec 22nd, 2003 at 01:26:30 PM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

You might use a pressure switch from a water automatic system. Basically you only have to measure two different water pressures and switch the electric current on and off?

- Hannu

[Need circuit to switch between pump/gen turbines](#) | 4 comments (4 topical, 0 editorial)

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2. [membrane pumps](#) ([Homebrewed Electricity](#), [Water Pumping](#))  
posted by bewotec on 12/18/2003 07:07:23 AM MST  
2 comments
3. [HomeBuilt Float Switch - What about low level cutoff?](#) ([Remote Living](#), [Water Pumping](#))  
posted by oirlandos on 12/12/2003 05:31:18 AM MST  
3 comments
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posted by halfcrazy on 10/30/2003 05:34:25 PM MST  
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5. [Another Well Question](#) ([Remote Living](#), [Water Pumping](#))  
posted by dconn on 10/21/2003 02:09:39 PM MST  
5 comments
6. [Pump Info](#) ([Remote Living](#), [Water Pumping](#))  
posted by browning358 on 10/20/2003 04:10:27 PM MST  
6 comments
7. [Bend Aluminum Tubing](#) ([Quarantine Zone](#), [Water Pumping](#))  
posted by Alex on 09/20/2003 07:48:21 AM MST  
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posted by woodsman on 09/01/2003 05:46:52 AM MST  
10 comments
9. [Bike Pump for pumping water](#) ([Remote Living](#), [Water Pumping](#))  
posted by Junkie on 07/22/2003 05:35:35 AM MST  
1 comment
10. [Car water pump?](#) ([Remote Living](#), [Water Pumping](#))  
posted by Anonymous Hero on 06/17/2003 10:07:48 PM MST  
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11. [Stirling Water pump Idea #2](#) ([Weird Science](#), [Water Pumping](#))

posted by Junkie on 05/16/2003 12:06:29 PM MST  
5 comments

12. [Septic system depth](#) ([Remote Living](#), [Water Pumping](#))

posted by Wyomingbob on 05/03/2003 07:18:33 PM MST  
3 comments

13. [Stirling Water Pump](#) ([Remote Living](#), [Water Pumping](#))

posted by Junkie on 04/23/2003 02:19:44 AM MST  
3 comments

14. [play ball.....GET BIG](#) ([Homebrewed Electricity](#), [Water Pumping](#))

posted by Techstuf on 04/21/2003 05:33:16 PM MST  
2 comments

15. [Centrifugal pump](#) ([Homebrewed Electricity](#), [Water Pumping](#))

posted by Techstuf on 04/18/2003 01:32:52 PM MST  
0 comments

16. [Air wells](#) ([Remote Living](#), [Water Pumping](#))

posted by Techstuf on 04/15/2003 12:22:22 AM MST  
5 comments

17. [I'll have a double Schauberger to go](#) ([Homebrewed Electricity](#), [Water Pumping](#))

posted by Techstuf on 04/15/2003 12:14:56 AM MST  
0 comments

18. [Water well advice needed](#) ([Remote Living](#), [Water Pumping](#))

posted by Wyomingbob on 04/12/2003 10:31:16 AM MST  
3 comments



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[membrane pumps](#)

By [bewotec](#), Section [Homebrewed Electricity](#)  
 Posted on Thu Dec 18th, 2003 at 07:07:23 AM [Water Pumping](#)  
 MST

Hello there.

Here one guy is making windpumps with homemade membrane pumps. These are 30-40 cm diameter, 10 cm high cylinders, which tops are from flexible plastic (gum). Its axle is moving up and down, like in a piston pump. But because it has no moving surface, it is better to maintain. (surprisingly high lifetime for the flexible top)

Anybody has a clue about plans of a membrane pumps, which can be made at home? (the guy of course keeps everything secret)

or do you have any opinion about it?

thx,  
viktor

[membrane pumps](#) | 2 comments (2 topical, 0 editorial)

Trash Pump ([none / 0](#)) (#1)  
 by [wdyasq](#) on Thu Dec 18th, 2003 at 07:53:29 AM MST  
[\(User Info\)](#)

There is a common type of membrane pump known as a -Trash Pump- in hte construction industry. Each pump chamber consists of and inlet flapper valve, an outlet flapper valve and the pump diaphram.

I have replaced diaphragms in these pumps, but never because of wear. They have all rotted due to old age.

Each type of device has its' own properties that may or may not make it superior in a particular use. Diaphragm pumps can have high suction and high head but are usually limited in the volume they can produce. In addition, large inlet and outlet valves can allow the passing of solids larger than centrifical or piston type pumps might allow.

ROn

Re: membrane pumps ([none / 0](#)) (#2)  
 by [bewotec](#) on Mon Jan 5th, 2004 at 05:58:34 AM MST  
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- [Also by bewotec](#)

I think it is easier to build at home as a piston pump, so i will try to make one.

(the thing is, that here there is no piston or thrash pump for reasonable price, at least i found no piston pump at all...)

Have a cylinder and two valves and a gum membrane and will see it.

viktor

[membrane pumps](#) | 2 comments (2 topical, 0 editorial)

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## [HomeBuilt Float Switch - What about low level cutoff?](#)

By [oirlandos](#), Section [Remote Living](#) [Water Pumping](#)

Posted on Fri Dec 12th, 2003 at 05:31:18 AM MST

Hi folks, first of all let me apologize if this is off-topic.<br>

It has to do with the handy-looking (and cheap!) floatswitch made by the guys and described on [http://www.otherpower.com/float\\_switch.html](http://www.otherpower.com/float_switch.html) .

Here's my question: I can see this float switch working well to prevent overflow in a cistern - but what about turning off the pump when the water level at the spring got low?

Wouldn't this mean having the reed switch sticking to the film at some point? I'm thinking along these lines - the switch has to operate at a low level so it's mounted low down in the PVC tube. At some point the water level rises, the film rises with it until it touches the reed switch - then it sticks.

How did you get around this? Or am I totally wrong?

[HomeBuilt Float Switch - What about low level cutoff?](#) | 3 comments (3 topical, 0 editorial)

Re: HomeBuilt Float Switch - What about low level ([none / 0](#)) (#1)  
by RogerAS ([rogeras@cei.net](mailto:rogeras@cei.net)) on Fri Dec 12th, 2003 at 08:54:20 AM MST  
([User Info](#))

Hi,

What about using Hall Effect transistors and some small neos magnets at the positions you want off or on? A simple flip flop driving a MOSFET or other to activate or stop the pump. Put the magents in the end of a plastic dowel on a hunk of all thread brass, fine tune as needed for different water levels. Either thread the plastic dowel or double nut with brass nuts.

RogerAS  
"Put the bunny back in the box!"

Re: HomeBuilt Float Switch - What about low level ([none / 0](#)) (#3)  
by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Sat Dec 13th, 2003 at 11:50:21 AM MST  
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- [http://www.otherpower.com/float\\_switch.html](http://www.otherpower.com/float_switch.html)
- [More on Water Pumping](#)
- [Also by oirlandos](#)

The hall effect sensor and flipflop are a great idea - BUT in my location I've had outdoor electronics fail so many different times from lightning that I hesitate to use them for a critical application like a float switch....if it failed and I didn't notice, the pump could burn out. I also worry about the extremely harsh, condensing environment -- tho I suppose the entire thing could be potted in epoxy.

However, I think my next electronics project is going to be a water system status panel. The challenge is that the house is 480 feet from the spring. I think I have enough wire in place to make a system monitor that will show -- pump running or not, status of both float switches, and a sensor at the cistern to show that water is actually flowing.

DAN

[ [Parent](#) ]

Re: HomeBuilt Float Switch - What about low level ([none / 0](#)) ([#2](#))  
by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Sat Dec 13th, 2003 at 11:24:37 AM MST  
([User Info](#))

Perfectly appropriate posting for here.

I did have a prototype of this low-level switch working at one time. I didn't want to have the reed switch submerged, OR the magnet (some concerns about possible contamination of the water by epoxy, or Neodymium if the magnet coating failed). So I used a rod with a magnet on it that extended above the water level inside a PVC tube, and a reed switch on the side of the tube. When the water level dropped, the magnet lowered to next to the reed switch and closed it, and both were still above the water line. There was an extension of the bottom of the rod, too -- long enough that the magnet could not travel down past the reed switch and accidentally turn the pump back on again, and so that it could not stick to the switch.

In any case, my problem was ice....the upper level of my well rings is still an icy environment and the water vapor condensed in the tube and froze, causing failure--clogged the whole tube with hoarfrost. I did not find a way around this, other than the possibility of re-building my whole spring house with more space and more insulation. So the project was never written up for our web pages.

In any case -- SJE Rhombus sent us new replacement float switches, one for low level and one for high. That's my next project -- installing them. Time will tell how well they work.

Hope that answers your question.

Cheers  
DANF



[HomeBuilt Float Switch - What about low level cutoff?](#) | **3**  
comments (3 topical, 0 editorial)

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### [Deep Well pump's](#)

By [halfcrazy](#), Section [Remote Living](#)

Posted on Thu Oct 30th, 2003 at 05:34:25 PM [Water Pumping](#)  
MST

I have a deep well 220 ft water is at 40 ft my question is

I have a deep well 220 ft water is at 40 ft my question is i am completely off grid and run a trace swplus 2524 inverter that has 4x starting amps. i probably need to run a ac pump as i dont have much room for a bulk tank at the house to store from a slow pumping dc pump will this inverter run a 120 vac submersible pump or should i get the step up transformer trace offers and run a 240vac submersible? or is it really worth my time to try and set up a bulk tank and slow pump to it then pressurize the house with a dc pump? thanks for any help

[Deep Well pump's](#) | 7 comments (7 topical, 0 editorial)

Re: Deep Well pump's ([none / 0](#)) (#1)  
by [drdongle](#) on Thu Oct 30th, 2003 at 06:08:01 PM MST  
([User Info](#))

I have a holding tank on the hill side above my house and when the pump comes on it pumps up to the tank which then gravity feeds back to the house.

Dr.D

Re: Deep Well pump's ([none / 0](#)) (#2)  
by [halfcrazy](#) on Thu Oct 30th, 2003 at 06:25:44 PM MST  
([User Info](#))

i forgot to mention i live in maine so i get a lot of really cold weather

Re: Deep Well pump's ([none / 0](#)) (#3)  
by [RobC](#) on Fri Oct 31st, 2003 at 07:29:19 AM MST  
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I think the most important thing is actual watt/amp output of your inverter

verses the starting amps of the submersible pump you want to run.

The pump motor can pull 6 to 8 times more amps starting than it takes to run it.

As for switching to 240 it might be better for your pump motor but

won't reduce the watt load on your inverter.

RobC

Re: Deep Well pump's ([none / 0](#)) (#7)  
by desertratjack on Thu Nov 6th, 2003 at 08:06:45 AM MST  
([User Info](#))

and running through the additional step-up transformer probably loses an additional 20% of the power used.

[ [Parent](#) ]

Re: Deep Well pump's ([none / 0](#)) (#4)  
by hydrosun on Fri Oct 31st, 2003 at 10:15:34 AM MST  
([User Info](#))

You might want to look into using the no surge, slow start ac pumps from Grundfos. They are as efficient and lower cost than a Shurflo dc pump. They come in many models for 120 volt and 240 volt and different depths and pressures. I used to use a small dc nemo submersible pump to pump to a holding tank and then a pressure pump (shurflo dc). Now I pump with a 1/2 hp Grundfos from 145 feet to a pressure tank. One pump that should last for 20 years versus two pumps that I had to replace every few years. I've also gotten a few for customers tired of replacing dc pumps and having well drillers getting too large and inefficient pumps for their solar systems. These pumps have been available for the last 3-4 years and are a lot less expensive than anything else I've seen for being this efficient. Apparently they have been used in Europe for awhile.

On your system you have to see how deep the pump is and add 92 feet for a 40 psi pressure tank to get the total lift that the pump would have to be rated. Check out the pumps at Backwoods Solar. They have a few models in their catalog but more are available. I think you can run a similar system to mine (120 volt 1/2 hp) if you don't draw the well down too far. If you draw it down to 240 feet you may need to have a bigger pump or accept a slower rate of flow. If you are far from the inverter or need a bigger pump then you can go with the transformer after the pressure switch so it doesn't become a phantom load. By the way the pressure switch can be anywhere in the plumbing so it can be close to the inverter system and then the power is run at 240 the distance out to the pump and down the well.

Re: Deep Well pump's ([none / 0](#)) (#5)  
by Chuck on Fri Oct 31st, 2003 at 06:27:32 PM MST  
([User Info](#)) <http://www.greeleynet.com/~cmorrison>

I have a similar well, 200 ft with static level at 50 ft. We use a dankoff etapump with 240 watts of solar and a 1400 gallon storage tank. On a decent sunny day we can fill the tank from empty, but we don't usually have to. I would rather pull from a water tank than from the batteries.

The dankoff setup is a 60 cycle ac pump with 48v solar panel input. The controller does quite a job. There is no huge starting surge like on most AC pumps. The etapump will push from about 400 feet down and performance is related to how many panels (watts) you let it use. I get 3 gallons per minute at the hydrant, a bit more at the tank where the pipe is larger.

I did an unintentional test one week when I set the float wrong in the tank. The pump sprayed water out of the tank seals for 3 days without apparent harm to itself. Caused a bit of erosion (and embarassment) though.

Unfortunately, it's a little pricey.

Chuck

Re: Deep Well pump's ([none / 0](#)) (#6)  
by desertratjack on Thu Nov 6th, 2003 at 08:03:09 AM MST  
([User Info](#))

The surge amperage capability of my inverter is almost 3 times the continuous amperage. (8000 watts vs 2500 for TRACE SW 2512).

[Deep Well pump's](#) | 7 comments (7 topical, 0 editorial)

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### [Another Well Question](#)

By [dconn](#), Section [Remote Living](#)

Posted on Tue Oct 21st, 2003 at 02:09:39 PM [Water Pumping](#)  
MST

250ft well filling at 15 feet?

---

Hi,

I was just reading a posting by George (browning358) about his well (inside his new house!) so I though I'd ask you about a well question I'd had for quite a while and never had an answer to:

My brother-in-law and I share a well - thankfully the council here paid 75% of the cost of the drilling, pump & piping. It works very well - a bit too much iron (or so a water test said) and a bit too brown (because of the iron I think).

I was surprised when the guys drilling the well said that, although they'd drilled down 250 feet, the water was only pouring in at 15 feet down.

Do you think this is normal? Not that anything is going to be altered now anyway - it works - water comes out of the tap! :)

Thanks,

Derek

[Another Well Question](#) | 5 comments (5 topical, 0 editorial)

Re: Another Well Question ([none / 0](#)) ([#1](#))  
by [Seth](#) on Tue Oct 21st, 2003 at 02:38:48 PM MST  
([User Info](#))

Id say that u have surface water..... no underground spring or aquafer to tap... too bad

Re: Another Well Question ([none / 0](#)) ([#5](#))  
by [TomW](#) on Wed Oct 22nd, 2003 at 07:52:25 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

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I have to agree with Seth, much as I hate to.

Probably time to hire a competent well driller.

If its dumping ground water into that uncased well then you are polluting the aquifer with ground water which is probably illegal and definitely not very good for the health of the aquifer, you or your neighbors. At least here, all wells must be cased and grouted to avoid this exact scenario.

I think this is the wrong forum for the question and it is not a question that can be answered and dealt with responsibly online. As far as I am concerned your well is seriously broken and needs the services of a competent well technician and it needed it months ago.

I just know this stuff because we just went through it here fixing up our 290 foot deep well. This "free" well water we use got a lump sum payment that month of about 6 grand to pull it up to state specs.

Just the view from here.

Cheers.

TomW

[Stuff I have Online](#)

[Contact Me](#)

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Re: Another Well Question ([none / 0](#)) (#2)  
by Anonymous Hero on Tue Oct 21st, 2003 at 03:22:32  
PM MST

dconn;

Please educate me here. What does this have to do with alternative energy again?

Not to ruffle anyones feathers but we seem to be getting lots of this lately.

Whats next? Health care questions?

Just wondering.

AH

Re: Another Well Question ([none / 0](#)) (#3)  
by dconn on Wed Oct 22nd, 2003 at 02:33:59 AM  
MST  
([User Info](#))



Hi Anonymous,

I think, maybe, its got something to do with "Remote Living"?

I wouldn't be surprised to also find some health related questions/answers in Remote Living either.

Derek

[ [Parent](#) ]

Re: Another Well Question ([none / 0](#)) (#4)  
by John on Wed Oct 22nd, 2003 at 03:24:05 AM  
MST  
([User Info](#))

WELLLLLLLLLL, maybe when people need to make their own power they sometimes need to have their own water supply too.

Now that you mention it some knowledge of how to stay healthy and the use of natural remedies is good. Unless, of course, you blindly trust the medical community that pushes the drug company's pills and drugs that relieve symptoms but does not heal or promote good health.

Not ruffled, just stating my opinion.

John

[Toxin absorber/Pain reliever](#)

[ [Parent](#) ]

[Another Well Question](#) | 5 comments (5 topical, 0 editorial)

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## Pump Info

By [browning358](#), Section [Remote Living](#)

Posted on Mon Oct 20th, 2003 at 04:10:27 PM [Water Pumping](#)  
MST

### Submesible Pump

Hi Folks well put an offer in on some property along with a house and shop in Northern Ontario Canada. Everything seems ok but the realstate fellow said the owner had to put a new submersible pump as the old one was fluctuating a bit. He said he is going to put it in in a couple days and I have the right to go in and check it out before I sign the papers. It is a drilled well under the house. There is a crawl space were I can easily get at it and the well is 250 feet deep. It will come with a health inspection on the water. I was wondering how a fellow would go about checking the pump out and maybe how much water is flowing in the well if possible. This part is a bit new to me. Anyone that has one I would appreciate hearing from them. Also any info on checking a septic to see if it works well would be appreciated. Thanks George.

[Pump Info](#) | 6 comments (6 topical, 0 editorial)

Re: Pump Info ([none / 0](#)) ([#1](#))  
by JB on Mon Oct 20th, 2003 at 04:19:55 PM MST  
([User Info](#))

I was just wonderein how do they set a pump at 250 feet when its under the house. Mine is set close to China but its outside. Just curious. JB

Re: Pump Info ([none / 0](#)) ([#2](#))  
by robp on Mon Oct 20th, 2003 at 06:55:16 PM MST  
([User Info](#))

Never heard of a drilled well under a house either. Many older places up our way (South Eastern Ontario) have dug wells on veranda's or in summer kitchens but these would be over 90 years old.

Re: Pump Info ([none / 0](#)) ([#3](#))  
by zubbly on Mon Oct 20th, 2003 at 07:05:34 PM MST  
([User Info](#))

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hello Browning358. i would check with an actual well driller how to determine your flow rate in the well. as far as putting in a new pump, it is done with special black plastic pipe made for wells. lowering in the pump on a sharp 90 degree is not easy but quite duable. hope this helps.

zubbly

Re: Pump Info ([none / 0](#)) ([#4](#))  
by mkseps on Mon Oct 20th, 2003 at 08:29:09 PM MST  
([User Info](#))

I can't imagine a well drilled that wouldn't allow for some direct vertical access. It is possible that someone built a porch over it, but assuming you can gain access to it, this is a procedure to follow:

Open the access to the well and lower a weighted float into the well on a good nylon cord to find the well water static level. Using a calibrated measure (like a five gallon bucket) begin filling the bucket with water at full volume, counting how long it takes to fill the bucket(s) in one minute while maintaining a steady water pressure of let's say 35 lbs. This will give you the yield of the well in gallons per minute. 5 gallons is close to acceptable, 10 gallons would be great.

Let the pump discharge at full volume for as long as it takes for the water drawdown to stabilize. This will tell you the well capacity. While you are doing this you may want to check the water temperature. That temperature should be within a degree or two of the average air temperature in that region. Check with the weather service to obtain the average temperature. Remember, a well 250 feet deep does not mean that's where the pump is. It is possible that the pump is only 100 feet deep in a 250 foot deep well.

Have a well driller verify this. Lacking a well drills log, I would suggest you have a certified well drilled give you the true well specifications so you can make proper choices. I also suggest that the 'downpipe' be of copper and not plastic unless someone can guarantee that that plastic pipe can withstand the starting torque of the motor.

Gene

Re: Pump Info ([none / 0](#)) ([#5](#))  
by signweld on Tue Oct 21st, 2003 at 05:53:59 PM MST  
([User Info](#))

Black "poly" pipe is quite common around here (NY USA) and as for torque, they almost always use a rubber torque arrester that goes down with the pipe so the wires & pipe don't rub raw. The plastic pipe will bend quite a tight radius, and you could always cut a hole in the floorboards (or remove one) if you had to. I've put 1" poly pipe down the hole with only 4 feet of head clearance in the summer. Murphy's laws says plastic pipes are stiff in the winter and don't ever break in good weather. As for recovery rate, run the pump till it runs dry, wait say, 6 or so hours and start it back up & measure how many 5 gal pails you can until it runs out again. This will tell you the recovery rate. This is best done in hot dry weather when water table is lowest.

good luck  
signweld

[ [Parent](#) ]

Re: Pump Info ([none / 0](#)) (#6)  
by browning358 on Wed Oct 22nd, 2003 at  
12:56:25 PM MST  
([User Info](#))

Thanks folks for all the help. The owner of the property says he has ordered a new pump and is installing it on Saturday of this week and we have seven days after that to check it out.

Saturday is the day they sign the house offer as the fellow has to wait for his wife to get there to sign also. So in this household we all have our fingers crossed it goes through as our home is sold right now and we don't have anyplace to go. Along with that we have lived here for over twenty years and one gathers up a lot of things. We have to be out of here at the end of November so we can't fool around too long. I guess the only other solution would be for us to rent a place if this deal falls through and then go looking again through the winter or spring of next year. Give us a bit of a breather. That is if we can find a home to rent. I guess you can tell we are real nervous here. I am not a young chicken anymore or my wife and I have to tell you this has been real stressful on us. Well thanks again. Will keep you all up to date as things unfold. George

[ [Parent](#) ]

[Pump Info](#) | 6 comments (6 topical, 0 editorial)

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## [Bend Aluminum Tubing](#)

By [Alex](#), Section [Quarantine Zone](#)

Posted on Sat Sep 20th, 2003 at 07:48:21 AM [Water Pumping](#)

MST

How?

How can I bend alu tubing

[Bend Aluminum Tubing](#) | 1 comment (1 topical, 0 editorial)

Re: Bend Aluminum Tubing ([none / 0](#)) (#1)  
by RogerAS ([rogeras@cei.net](mailto:rogeras@cei.net)) on Mon Sep 22nd, 2003 at 07:52:53 AM MST  
([User Info](#))

Hi,

Fill the tube with very fine grains of very dry sand. Plug the ends tightly. Bend as needed. Unplug ends, drain sand, wash if needed.

RogerAS

"Put the bunny back in the box!"

[Bend Aluminum Tubing](#) | 1 comment (1 topical, 0 editorial)

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### [water wheel power](#)

By [woodsman](#), Section [Homebrewed Electricity](#)

Posted on Mon Sep 1st, 2003 at 05:46:52 AM [Water Pumping](#)  
MST

[water wheel power](#)

Is it possible to build a water wheel that generates enough power to run a 12 volt water/sump pump? The reason for this would be to use the pumped water to run the generator and the water falling from the wheel could aerate my 550 gal fish tank.

[water wheel power](#) | 10 comments (10 topical, 0 editorial)

Re: water wheel power ([none / 0](#)) ([#1](#))  
by [Electric Ed](#) on Mon Sep 1st, 2003 at 06:01:00 AM MST  
([User Info](#)) <http://www.electric-ed.com>

Sure, if your stream has sufficient flow, and head (height), to supply the energy input.

Can you give us some details of your stream?

Electric Ed

Re: water wheel power ([none / 0](#)) ([#2](#))  
by [RobD](#) on Mon Sep 1st, 2003 at 06:50:07 AM MST  
([User Info](#))

550 gallons!  
What do you have in there, food fish?  
RobD

Re: water wheel power ([none / 0](#)) ([#3](#))  
by [woodsman](#) on Mon Sep 1st, 2003 at 07:42:41 AM MST  
([User Info](#))

The pump draws 7 amps and is rated at 1700 gph. I do not know what you mean by head, I can set it up however you advise !

Re: water wheel power ([none / 0](#)) ([#5](#))  
by [Electric Ed](#) on Mon Sep 1st, 2003 at 10:55:55 AM MST  
([User Info](#)) <http://www.electric-ed.com>

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Water from a stream is channeled into a pipeline to gain enough head (the vertical distance the water falls) to power the system. The water passes through a nozzle, where it accelerates, strikes the water wheel, and turns the generator shaft.

To determine the power available at a site, head and flow measurements must be taken. Flow is the rate at which water moves, measured in liters per second (l/s) or gallons per minute (gpm). This can be measured by channeling the water into a pipeline, then into a container of a known volume, noting the time it takes to do so. A weir can be used to measure flows in larger streams. Head can be measured by using a transit or by sighting along a level and using a measuring tape.

Electric Ed

[ [Parent](#) ]

Re: water wheel power ([none / 0](#)) ([#4](#))  
by Bach On on Mon Sep 1st, 2003 at 08:37:15 AM MST  
([User Info](#)) [change AT: bach\\_on AT hotmail.com](#)

I believe head means the amount of drop in the water. Water has more force to turn your dynamo/alternator if it drops some distance.

Some folks use a pipe and channel the water through it. Then it drops and forces the wheel to turn.

I think drop is often dictated by the geography of your water feature.

I'm sure somebody will correct my misstatements.

Good luck!

Bach On

- I'm just as happy as if I had good sense! -

Re: water wheel power ([none / 0](#)) ([#6](#))  
by WetinOR on Mon Sep 1st, 2003 at 11:54:43 AM MST  
([User Info](#))

I believe the original poster wanted the "pumped" water to run the generator then let the water fall into his fish tank. Basically the way I read the post, he didn't speak of any outside water source to run the wheel. So no it wouldn't work since you would be coming into the realm of "free energy" machines.

George

Re: water wheel power ([none / 0](#)) (#7)  
by woodsman on Mon Sep 1st, 2003 at 04:53:05 PM  
MST  
([User Info](#))

George , are you saying that the last post would not work or what I proposed would not work.

Tommy

[ [Parent](#) ]

Re: water wheel power ([none / 0](#)) (#8)  
by funkeytut42211 on Tue Sep 2nd, 2003 at 12:49:38 PM  
MST  
([User Info](#))

If your stream is steady you dont need to run any water through a pipe that would be for a turbine,not a water wheel. You can use a simple undershot wheel. That is where the wheel simply sits in the stream and the water moving under it turns the wheel. Not fast of course but lots of torque. A simple gearing up to a small PM generator would be simple to do and would work fine for your needs. The 12 volt DC could then be used for aeration of the fish tank,pumping water or what ever you need. Keep in mind that water power is pretty constant unlike wind and your power output will add up even with a small generator. Good luck and have fun.

Re: water wheel power ([none / 0](#)) (#9)  
by woodsman on Thu Sep 4th, 2003 at 01:39:38 PM  
MST  
([User Info](#))

Hello,

I do not have an existing stream of water. The water flow to run the waterwheel would be supplied by the 12 volt water pump. I wanted the water wheel to run a generator of some sort to power the water pump. Then the water splashing/dripping would do the aerating.

[ [Parent](#) ]

Re: water wheel power ([none / 0](#)) (#10)  
by jubalearly on Thu Sep 4th, 2003 at  
05:01:53 PM MST  
([User Info](#))

That would be a perpetual motion machine.  
Try that +water in your favorite search engine  
& I'm sure you'll find lots of interesting articles.  
In fact, I think I'll go try it myself!  
(the search engine, not the machine) There are  
some links here:  
<http://www.phact.org/e/dennis4.html>

Russ

[ [Parent](#) ]

[water wheel power](#) | 10 comments (10 topical, 0 editorial)

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[Bike Pump for pumping water](#)

By [Junkie](#), Section [Remote Living](#)

Posted on Tue Jul 22nd, 2003 at 05:35:35 AM MST

[Water Pumping](#)

**Bike Pump**

You can make a "normal" bike pump pump water easily by inverting the seal. Normally they have a sort of one way valve built into the cylinder, but if you move the seal round the valve no longer works so the pump can suck water in and push it out. You might need to glue the seal onto the plastic if it is for long term use. Still needs one way valves for controlling the flow....

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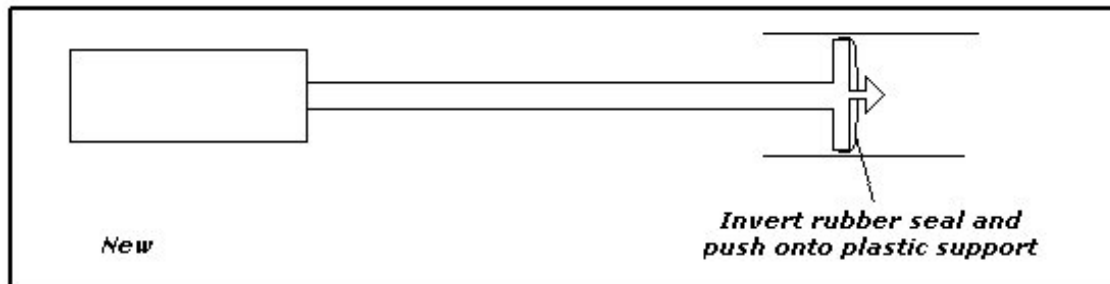
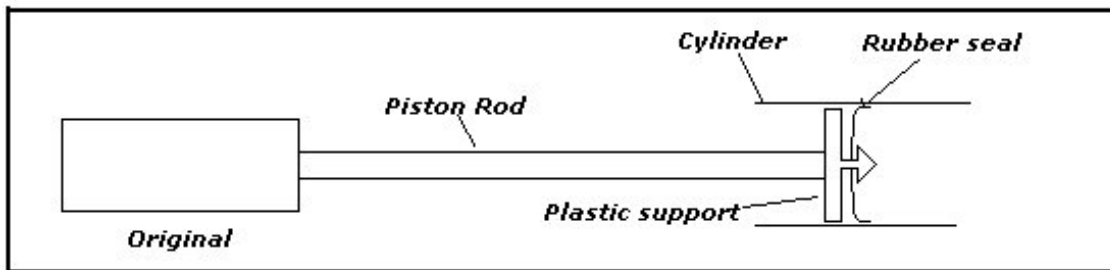
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- [More on Water Pumping](#)
- [Also by Junkie](#)



I thought this might work for a stirling, but it doesn't.

-Chris

[Bike Pump for pumping water](#) | 1 comment (1 topical, 0 editorial)

Re: Bike Pump for pumping water ([none / 0](#)) ([#1](#))  
 by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Tue Jul 22nd, 2003 at 09:17:29 AM MST  
[\(User Info\)](#)

You can also use a single- or double-action Bimba air cylinder as a water pump. DanB had one of these set up years ago, before we owned any digital cameras, so we don't have an pics. He just put an eccentric pulley on it and ran it with a 12vdc windshield wiper motor to pump water to his house.

Cheers  
 ADMIN

[Bike Pump for pumping water](#) | 1 comment (1 topical, 0 editorial)

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## [Car water pump?](#)

By [Anonymous Hero](#), Section [Remote Living](#)

Posted on Tue Jun 17th, 2003 at 10:07:48 PM [Water Pumping](#)  
MST

Think I can hook a car water pump to a lawnmower engine?

People hook alternators to lawnmowers...so why not a car water pump? :) If I was to put a metal plate over the opening on the back of the pump, (where the engine normally would be) and then hook it up to a pulley with a lawnmower engine, would it work? I've never actually seen a water pump not attached to the engine...I'm just going by pictures I've seen online. If it worked how much water do you think it would pump?

[Car water pump?](#) | 3 comments (3 topical, 0 editorial)

Re: Car water pump? ([none / 0](#)) ([#1](#))  
by [wpowokal](#) on Wed Jun 18th, 2003 at 05:20:35 AM MST  
([User Info](#))

While it would work these pumps are designed for low head, therefore the quantity pumped would very much depend on how high you were trying to pump it, I guess any thing over 2m would be very small flow. Say ( and i'm guessing here) one metre around 20 litres / min.

You could also try washing machine pumps, also low head but already enclosed with a pully. Oh and you could run a dozen off a lawn mower engine.

regards Allan

Re: Car water pump? ([none / 0](#)) ([#2](#))  
by [RogerAS](#) ([rogeras@cei.net](#)) on Wed Jun 18th, 2003 at 07:00:43 AM MST  
([User Info](#))

Hi,

I made small gold drege out of the water pump off a big block ford doing exactly what you talk about. I made the plate and welded in pipe fittings on the openings on the block side, which was bolted down on a plate for th engine. It worked great. Never found much gold though.: -)

RogerAS

"Put the bunny back in the box!"

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- [Also by Anonymous Hero](#)



Re: Car water pump? ([none / 0](#)) (#3)  
by 12volt dan ([dan12v@hotmail.com](mailto:dan12v@hotmail.com)) on Fri Aug  
22nd, 2003 at 10:20:22 PM MST  
([User Info](#))

If you use a small block chevy pump you don` t need  
the plate to adapt  
7 years off the grid and counting  
[ [Parent](#) ]

[Car water pump?](#) | 3 comments (3 topical, 0 editorial)

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## [Stirling Water pump Idea #2](#)

By [Junkie](#), Section [Weird Science](#)

Posted on Fri May 16th, 2003 at 12:06:29 PM MST

[Water Pumping](#)

Another idea for a Stirling water pump.

Hi,  
I have another idea(two actually) for a Stirling water pump using a floating lever to open and close two valves. Each valve would let hot or cold air into the main cylinder. The hot and cold air being let into the main cylinder would make the air expand and contract, forcing water out, and sucking water in. I put the springs there to try and stop both valves being open at the same time.

Anyway here are some animations of what I mean...

### [Lever type stirling](#)

This animation(above) lacks springs between the blue part of the valves and the red part(which touches the outside of the cylinder). The springs would push the red part as high as possible. The blue part which actuates the lever (and then the valves) is floating on the water.

### [Another idea](#)

Also the springs are missing on the valves in this animation. Your ideas/thoughts appreciated!

-Chris

[Stirling Water pump Idea #2](#) | 5 comments (5 topical, 0 editorial)

Animation ([none / 0](#)) ([#1](#))  
by Anonymous Hero on Thu May 22nd, 2003 at 10:47:09 PM MST

Nice Animation Job, I totally get the concept (because of the animation.) You have the presentation part down well, except for the part where you show everyone an idea that probably can be patented with out interference.

Hehehe ([none / 0](#)) ([#2](#))  
by Junkie ([madscientist@blownup.com](mailto:madscientist@blownup.com)) on Fri May 23rd, 2003 at 09:15:12 AM MST  
([User Info](#)) <http://www.akuma.dsl.pipex.com/chris>

Well go ahead patent it! I'm not stopping anyone. Patents are lame though. All I need to do is build it....

[ [Parent](#) ]

stirling animation ([none / 0](#)) ([#3](#))  
by troy on Fri May 23rd, 2003 at 10:38:10 AM MST  
([User Info](#))

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- [Also by Junkie](#)

Yes, workable concept, and I have to say that's the best animation work I've seen in a long time. Do you do that type of work professionally or are you just gifted that way?

Best regards,

troy

Stirling pump #2 ([none / 0](#)) ([#4](#))  
by Junkie ([mads scientist@blownup.com](mailto:mads scientist@blownup.com)) on Fri May 23rd, 2003 at  
11:09:59 AM MST  
([User Info](#)) <http://www.akuma.dsl.pipex.com/chris>

Thanks for the kind words. I don't make animations professionally though.

-Chris

[ [Parent](#) ]

Solar water pumps? ([none / 0](#)) ([#5](#))  
by hvirtane on Mon May 26th, 2003 at 01:51:29 PM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

Your animations are really nice.

I see no reason, why these designs would not work.

There are many designs of water Stirlings available. If you will look for 'liquid piston Stirling engines' you'll find a lot of literature.

I've been playing with other ideas of solar pumps as well.

There is one post by me on 'the old board' concerning some ideas:

[http://www.otherpower.com/cgi-bin/webbbs/webbbs\\_config.pl?read=15026](http://www.otherpower.com/cgi-bin/webbbs/webbbs_config.pl?read=15026)

a)  
<http://www.cc.jyu.fi/~hvirtane/pump/>

b)  
<http://www.cc.jyu.fi/~hvirtane/through.jpg>

c)  
Here is a commercial solution.  
<http://www.cc.jyu.fi/~hvirtane/waterpower/steampump1.jpg>

d)  
Here is one really simple design:  
<http://www.cc.jyu.fi/~hvirtane/wind2/solarpump01.jpg>

- Hannu

[Stirling Water pump Idea #2](#) | 5 comments (5 topical, 0 editorial)

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### [Septic system depth](#)

By [Wyomingbob](#), Section [Remote Living](#)

Posted on Sat May 3rd, 2003 at 07:18:33 PM [Water Pumping](#)  
MST

I'm getting mixed messages on freeze-prufing a septic system

I hear leachfields work better nearer the organic layer of topsoil, and I really don't want to excavate deeper than necessary, but my tank supplyer here advises burying the septic tank at least 30" below grade. Add the 5" of tank height, plus extra for a gravel bed, and we're lloking at an 8' deep hole. Then the D-box and leach fields will need to be very deep to maintain gradient.

It gets bloody cold here, yes. The soil is limey sand with cobbles in it, so drainage is great. Question: would I be better served with the deep installation, or should I risk a shallow install andbox it with foam, or what? I also worry about heat loss thru the manways (polyethylene tank). Desperately in need of advice!

[Septic system depth](#) | 3 comments (3 topical, 0 editorial)

Our System ([none / 0](#)) (#1)

by TomW on Sat May 3rd, 2003 at 07:58:34 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Bob;

Wherever you are you probabbly have to follow some darn code or another.

Having said that I will describe our system as I understand it. It was installed 4 years ago at great cost and to code, etc.

The 750 gallon concrete tank is buried such that the top is under maybe 4 to 8 inches of sod and the actual concrete lid is nearly flush with the surface. We have a planter on top to mark and cover the cleanout lid.

The drainfield is 18 inches deep and there are 2 runs of about 200 feet each. Its the minimum allowable septic system for a residence and sized for 4 people I believe.

It gets damn cold here for months at a time and water lines need to be 4 feet or deeper minimum. So apparently at least in our loamy soil the freezing isnt a problem. I think it needs to be close to the surface [drainfield] to operate properly.

Just how I remember seeing it done. I am no expert at all.

Cheers.

TomW

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- [More on Water Pumping](#)
- [Also by Wyomingbob](#)

Next question... ([none / 0](#)) (#2)

by Wyomingbob on Mon May 5th, 2003 at 07:38:25 PM MST

[\(User Info\)](#)

Decided to mound over the tank & build a planter around the tank, with a styro liner for warmth. Now, what's the proper pitch for the sewage & distribution lines, between house & septic tank, tank & D-box, or D-box & the start of the leach field?

pitch ([none / 0](#)) (#3)

by troy on Wed May 7th, 2003 at 01:50:51 PM MST

[\(User Info\)](#)

1/4" per foot is great, 1/8" per foot would be the shallowest I would ever go.

Best of luck!

troy

[Septic system depth](#) | 3 comments (3 topical, 0 editorial)

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### [Stirling Water Pump](#)

By [Junkie](#), Section [Remote Living](#)

Posted on Wed Apr 23rd, 2003 at 02:19:44 AM [Water Pumping](#)  
MST

Simple Stirling(maybe solar) pump idea.

Hi all, I have an idea for a simple stirling pump, I have no idea if it will work, and I've never built a Stirling engine. I have made a little animation [here](#) The idea is the the air is cooled and contracts sucking water in, the displacer which floats on the water moves the displacer so the air is on the hot side. That should force some water out.

What do you think ? I dont think the air will contract enough to suck a decent amount of water in ?

-Chris

[Stirling Water Pump](#) | 3 comments (3 topical, 0 editorial)

sterling water pump response ([none / 0](#)) ([#1](#))  
by Fancy Pants on Tue Apr 29th, 2003 at 08:42:02 AM  
MST  
([User Info](#))

Well, if you know me, I like anything Sterling, and a zillion other ideas.

I think the water would keep it cool enough to run 24-7 and smoother, maybe faster, and maybe give it more power, because of the temp changes drawing the water.

But this might first create some problems too with standard designs not made for pumping and that kind of cooling.

But I think a few minor design changes can really become something, using the pumped water as a coolant too.

Then some old used cooking oil and a wick is all you need.

Too many ideas ([none / 0](#)) ([#2](#))  
by Junkie ([madscientist@blownup.com](mailto:madscientist@blownup.com)) on Wed Apr 30th, 2003 at 03:29:56 AM MST  
([User Info](#)) <http://www.akuma.dsl.pipex.com/chris>

What changes would you make? I know almost nothing about Stirling Engines.... And I got a billion other ideas that always need trying :/.

-Chris

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- [Also by Junkie](#)

Re: Too many ideas ([none / 0](#)) (#3)  
by Anonymous Hero on Fri Jun 20th, 2003 at  
09:59:39 AM MST

Play around with what you want it to do and how that could be accomplished best on paper or Cad program. Making any changes with the water in mind, and the pumping, what ever your needs are.

If you don't care how fast it pumps, it might do it with out the flame wick, depending on the water temp, (vs. air temp) run them backwards on a snow cone, ya know? Stick a big one out a hole in the wall and run my kin folk clan's Cylinder Heater all winter long, free. Dig?

JCP

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[Stirling Water Pump](#) | 3 comments (3 topical, 0 editorial)

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[play ball.....GET BIG](#)

By [Techstuf](#), Section [Homebrewed Electricity](#)  
Posted on Mon Apr 21st, 2003 at 05:33:16 PM [Water Pumping](#)  
MST

**Molecular implosion friction heater**

Then:

<http://www.alternativescience.com/over-unity.htm>

Now:

<http://www.hydrodynamics.com>

Must be rough.

Peace,

TS out

Oh yeah,

P.S. This one fits in between there somewhere:

<http://www.sti.nasa.gov/tto/spinoff2000/ip3.htm>

[play ball.....GET BIG](#) | 2 comments (2 topical, 0 editorial)

Strange stuff... ([none / 0](#)) (#1)  
by [windstuffnow](#) ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon Apr 21st, 2003 at 07:06:54 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

You've been finding some pretty strange stuff. Going back to the basics on how to create heat... thats why moving water doesn't freeze. Look into thermoacoustics also. There are some pretty fasinating stirling engine designs out there being driven by heat produced by sound.

So much cool stuff... so little time

Ed

Good point ([none / 0](#)) (#2)  
by [Techstuf](#) on Mon Apr 21st, 2003 at 08:02:06 PM MST  
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- <http://www.sti.nasa.gov/tto/spinoff2000/ip3.htm>
- [More on Water Pumping](#)
- [Also by Techstuf](#)

I couldn't have put it better.... "So much cool stuff,  
so little time".

Peace,

TS out

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[Centrifugal pump](#)

By [Techstuf](#), Section [Homebrewed Electricity](#)  
 Posted on Fri Apr 18th, 2003 at 01:32:52 PM [Water Pumping](#)  
 MST

Centrifusion or just Confusion?

After careful consideration, I find the following site to be one of the most intriguing and informative sites I have ever come across:..... <http://www.frank.germano.com/>  
 ..... Kudos to Mr. Germano for choosing such a brilliant man as Viktor Schauberger to emulate. As I lack the resources to recreate the complex whirl tube structures....I propose the following for any that are interested: Imagine making a prototype centrifugal pump from 3" id pvc pipe. Take a 1' piece and attach to an elbow piece and then join to a 6' piece. Now duplicate the current assembly so that you have 2 elbowed pipes. Join them together with hose clamps at the 1' sections such that they are back to back with the 6' sections pointing directly opposite one another. Attach an apparatus for hanging the assembly such that it is able to spin freely with the two 1' sections back to back facing downwards above a cistern of water and the two 6' sections parallel with the water's surface pointing away from one another. Provide a motive force for the assembly to spin. Attach choke tubes or other such venturi effect nozzles to the end of the tubes so that the water is constricted somewhat and induced to increase it's flow speed and be directed upon exiting the ends of each tube in a manner that supports the spin direction of the assembly. Something to push against here such as a cylindrical vane assembly or other such beneficial arrangement to augment the forward motion of the spinning tube assembly would be beneficial. So, what we are trying to do is tap into the power of the centrifuge to extract water from a static source via centrifugal force induction to migrate outwardly where the compression force on the water is quantized such that at the outer periphery, the massive pressure is used to spin a turbine assembly to provide electricity to the motor that spins the assembly or used to directly augment the spin of the assembly via vector jet dynamics. Surely, one can already see potential uses in a variety of geometrical configurations such as upright funnel within funnel and disk arrangements that would magnify the energy potentials involved..... The whole idea being to provide a "liquid flywheel" that instead of being spun up to provide energy storage release with resultant speed decrease, is used to constantly replace it's loss of mass in that a constantly outwardly migrating mass, ie. water, is used to produce energy. I believe that if the process is done correctly, high efficiencies can be observed..... Peace, TS out..... PS. this is not to say that, in my opinion, one can improve upon Schauberger's results via this method, only that one might find a simpler design that may work.

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## [Air wells](#)

By [Techstuf](#), Section [Remote Living](#)

Posted on Tue Apr 15th, 2003 at 12:22:22 AM MST

[Water Pumping](#)

Did the greeks really get 500 gallons of water a day from a big pile of rocks?

Rex has really done some research...

<http://www.rexresearch.com/airwells/airwells.htm>

Some good schematics to be had here. Peace, TS out

[Air wells](#) | 5 comments (5 topical, 0 editorial)

more water from air? ([none / 0](#)) (#1)  
by [hvirtane](#) on Tue Apr 15th, 2003 at 06:28:47 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

Hi,

this article you have pointed out is really good.

Do you know about good articles available on the subject

'To use a wind turbine to pull air through the pipes, something similar as in Courneya's first air well?'

Hannu Virtanen  
hvirtane@cc.jyu.fi

Knaplens air well ([none / 0](#)) (#5)  
by [soundoff77](#) on Sun Apr 20th, 2003 at 03:27:08 PM MST  
([User Info](#))

This well reminds me of what is called in the desert. A mans best friend the Barrel Cactus. Cactus can pull water from the air. They store water. If you could find out how a barrel Cactus does this maybe it could give some clues. This well even looks like the cactus.

[ [Parent](#) ]

Re: Did the greeks really get 500 gallons ([none / 0](#)) (#2)  
by [chuckh](#) on Tue Apr 15th, 2003 at 08:17:17 AM MST  
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I can see how they might have. It amazes me the amount of water which will collect in my boat here in Florida due to condensation between the inner and outer fiberglass hulls. Maybe 5 gallons in a couple of weeks. There was a newspaper article recently about an abandoned boat sinking at dock solely due to collected condensation. I had a hard time believing the article for other reasons, but it could happen. Chuck H.

Very interesting, very inspiring ([none / 0](#)) (#3)  
by TomW on Thu Apr 17th, 2003 at 12:39:16 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

It took me a couple of days to click through to that page but it has some amazing old technology.

Air Wells, Fog Fences, Dew Ponds. Simply amazing low complexity water resources.

Been pondering a solar distiller for drinking water but may attempt to devise something along these lines.

Thanks.

Cheers.

TomW

[Stuff I have Online](#)  
[Contact Me](#)

Solar distiller ([none / 0](#)) (#4)  
by soundoff77 on Sun Apr 20th, 2003 at  
03:26:12 AM MST  
([User Info](#))

Hi, I saw a solar distiller once. It was a bowl of water in a plastic bag placed on the window sill.

[ [Parent](#) ]

[Air wells](#) | 5 comments (5 topical, 0 editorial)

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## [I'll have a double Schauberger to go](#)

By [Techstuf](#), Section [Homebrewed Electricity](#) [Water Pumping](#)

Posted on Tue Apr 15th, 2003 at 12:14:56 AM MST

Water water.....everywhere

Viktor Schauberger, the real aqua-man  
<http://www.frank.germano.com/viktorschauberger.htm>

[I'll have a double Schauberger to go](#) | 0 comments (0 topical, 0 editorial)

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### [Water well advice needed](#)

By [Wyomingbob](#), Section [Remote Living](#)  
Posted on Sat Apr 12th, 2003 at 10:31:16 AM [Water Pumping](#)  
MST

A long way to drill for water this bad, but....

I'd appreciate a little wisdom toward installing a submersible well pump. Basics: 135' head, 5 gal/min well; 3/4 hp Flotec 4" submersible pump (3-wire, 230 VAC), connected to an off-grid power system. Only 60' to the house. It gets really cold here -- frost line approx. 50" deep.

Thinking of a 'pitless' install with supply lines and cables just laid into a trench. Must the pipe be laid fully below the frost line? Will proly share trench w/ solar hot-water supply & return lines; perhaps box the whole bundle in rigid foam? Tape power cable to well supply pipe as 'heat tape'?

Drop pipe: prefer the spooled poly pipe; does that work okay hanging from a pitless connector?

Supply pipe (well to house): someone recommended either copper or galvanized over PVC, as they can be thawed via electric current if they do freeze. Thoughts?

Electrical: I want to put the control box in the pumphouse & just run UF cable from house to well. AWG 12-3 should suffice, shouldn't it?  
TIA!

[Water well advice needed](#) | 3 comments (3 topical, 0 editorial)

pitless ([none / 0](#)) ([#1](#))  
by troy on Sat Apr 12th, 2003 at 10:46:43 AM MST  
([User Info](#))

I installed pretty much the same setup in Ontario Canada, which is actually less cold than where you are. I elected to go with the pitless adapter rather than a heated pump house, and it worked beautifully. I used 1" poly down the hole and in the trench. I would want it below frost line though. Installing an insulated box/channel/tunnel of say, 2" blue styro should do it too. And don't forget the safety rope to the pump itself. Have lots of fun! troy

Well ([none / 0](#)) ([#2](#))  
by troy on Mon Apr 14th, 2003 at 11:51:59 AM MST  
([User Info](#))

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Oh yeah Bob, I forgot to mention that I used double hose clamps in the well, and made absolutely sure they were top quality clamps with both stainless screw and stainless band. Lots of them skimp on the screw and it rusts out in wet conditions like a well. But hey, I've seen you're high quality work, and I expect you knew all of that already. Good luck and have fun! troy

pump application info ([none / 0](#)) ([#3](#))  
by mkseps on Mon Apr 14th, 2003 at 06:00:19 PM MST  
([User Info](#))

Your choice of 12 ga wire is a good one. By my calculations, you have 60 ft. to the house with 135 ft. down the casing. This gives you a total of 195 ft. Your pump consumes about 6 amps at 230 volts. With a 2% power loss in the wire this will give the pump motor a voltage of 225 volts with a power loss of 28 watts and a load power of 1352 watts. I suggest that you use a 1 in. copper down pipe as well as copper into the house. Plastic pipe is only recommended if you use safety rope supporting the pump as well as anti rotation blocks to prevent the motor torque from twisting the down pipe during startup

[Water well advice needed](#) | 3 comments (3 topical, 0 editorial)

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[Tower math ?](#)

By [Old F](#), Section [Homebrewed Electricity](#)  
 Posted on Wed Dec 31st, 2003 at 05:02:32 PM MST [Wind](#)  
 counting my toes and pulling my hair : )

Tower math ?

I am crunching some numbers for tower loading and I have run in to a snag.  
 I have work out the thrust load of the wind generator at the top of the tower  
 And the tower drag load.

Now here is the snag the example I am working from says to add the thrust load  
 and tower drag load together and divide by 10 this come from the base being 10 foot  
 square to come up with the lifting force on the two legs opposite the pivot point.

This example is for a four sided tower and I have a three .  
 My base triangle is six foot  
 on a side do I divide by six to come up with the lift force or is there more to it than that. I am thinking there is.

Old F

[Tower math ?](#) | 5 comments (5 topical, 0 editorial)

Re: Tower math ? ([none / 0](#)) ([#1](#))  
 by [kell](#) on Wed Dec 31st, 2003 at 06:15:12 PM MST  
[\(User Info\)](#)

The tower in the example has attachment point(s) 10 feet from the axis of pivoting. Yours has an attachment point 5.196 feet from the axis of pivoting, if I did the geometry correctly. Now if in the example dividing by 10 gives you the total lifting force at the attachment point(s), then for your own tower, dividing by 5.196 will give the total lifting force at the attachment point. But one point (the triangle vertex) will take all the force. The example tower has two feet attached to the ground, or a ten foot connecting rod attached to the ground or however it's built. And I hope your load figures are in foot-pounds, so that when you divide by feet, the final result comes in pounds, which are a unit of force. Only way it would make sense. Foot pounds are a measure of torque. Like if you apply 50 lbs force to a lever at a point 30 feet from the fulcrum you get 1500 ft lbs of torque. If the lever sticks out 10 feet on the far side of the fulcrum you get 1500 ft lbs divided by 10 feet = 150 pounds force at the far end of the lever. Why can't I get carriage returns on this posting?

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Re: Tower math ? ([none / 0](#)) (#2)  
by TomW on Wed Dec 31st, 2003 at 07:44:46 PM  
MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Kell;  
You asked:  
Why can't I get carriage returns on this posting?

The answer is because you need to set your comment posting format preferences to "auto format" and you likely have it set to "html formatted".

In case your not sure where that is it is between the Preview and Post buttons just below the text entry window. You can also set it in your user preferences. Cheers.

TomW

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Re: Tower math ? ([none / 0](#)) (#3)  
by Old F on Wed Dec 31st, 2003 at 09:12:03 PM MST  
([User Info](#)) <http://www.oldf.homestead.com>

Thanks Kell

The force is measured in foot pounds. Should have said that in the first post.  
With that snag out of the way things are starting to make sense.  
And the numbers are falling in to place better than I expected.  
Tho I will add an extra 15 or 20 % as a safety factor.  
Looks like I am well on my way of meeting my goal

A 30 foot tower and from the of looks things now a free stander

Rated for an 8 foot diameter blade set in a 60 mph wind an supporting up to 200 pound of machinery.  
Now off to gather some more data on strength of materials

Kell many thanks till your better paid

Old F

Riding the learning curve and loving it : )

[ [Parent](#) ]

Re: Tower math ? ([none / 0](#)) (#4)  
by monte350c on Wed Dec 31st, 2003 at 11:42:25 PM MST  
([User Info](#))

Hi OldF,

Here's a page that helped me a bit, it's pretty basic but explains the concepts!

<http://www.asme.org/education/precollege/esp/act5sr1.htm>

Hope this helps,

Ted.

Re: Tower math ? ([none / 0](#)) (#5)  
by Old F on Thu Jan 1st, 2004 at 06:55:36 AM MST  
([User Info](#)) <http://www.oldf.homestead.com>

Thanks Ted

Every bit helps

Old F

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[Tower math ?](#) | 5 comments (5 topical, 0 editorial)

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## [Axial Flux Generator](#)

By [applegrower](#), Section [Homebrewed Electricity](#)  
 Posted on Tue Dec 30th, 2003 at 09:15:19 AM MST

[Wind](#)

Do the magnets have to be an even number on the disks?<br>

Can the magnets touch side to side or is an airspace needed?  
 Is there a formula for the number of coils to the number of magnets?

Thanks

Beginning

[Axial Flux Generator](#) | 5 comments (5 topical, 0 editorial)

Re: Axial Flux Generator ([none / 0](#)) (#1)  
 by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Tue Dec 30th, 2003 at 10:18:31 AM MST  
[\(User Info\)](#)  
<http://timmythy.home.mindspring.com/timmy.htm>

I'm not an expert, but I'll explain how I understand it all . . .

You should have an even number of magnets on your rotor. They should be arranged with the North of the first magnet facing up, the next magnet should have it's South facing up, and your magnets will alternate North, South, North, South, etc all the way around the rotor. If you have an Odd number of magnets then you will end up with a place on the rotor that has 2 magnets that are North sitting next to each other.

What is happening here is . . . As a magnetic North passes over one of the coils it will produce a Positive voltage swing, lets call it a 3 volt positive swing for this example. Then when the next magnet which is a magnetic South passes over the same coil, it will produce a -3 volt negative Voltage swing. This has the effect of doubling your voltage to 6 volts AC. A swing from +3 to -3 is 6 volts AC. Because of this the Frequency of the AC output will be 1 cycle for every 2 magnet passes over the coil.

Highest output will come from the same number of coils as magnets, but this setup will also cause the worst cogging, which is the added drag as all the magnets are crossing all the coils at the same time, and then no drag as all the magnets cross between the coils.

To get the highest voltage, your coils should be wound where the hole in the center is the same size as the magnet. If you are winding the coils to work with the magnet like this then you will need a space between the magnets or you won't be able to fit enough coils in there.

}-- W o o f --{

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Re: Axial Flux Generator ([none / 0](#)) (#2)  
by kurt on Tue Dec 30th, 2003 at 10:20:41 AM MST  
([User Info](#))

[http://www.otherpower.com/otherpower\\_wind.html](http://www.otherpower.com/otherpower_wind.html)  
<http://windstuffnow.com/main/>  
<http://homepages.enterprise.net/hugh0piggott/>



Re: Axial Flux Generator ([none / 0](#)) (#3)  
by Chuck on Tue Dec 30th, 2003 at 10:29:00 AM MST  
([User Info](#)) <http://www.greeleynet.com/~cmorrison>

>Do the magnets have to be an even number on the disks?

Yes, assuming you want to generate a decent sine waveform.

>Can the magnets touch side to side or is an airspace needed?

They can touch, but this reduces the flux available to induce current in the coils.

>Is there a formula for the number of coils to the number of magnets?

Several. It depends on what you want to do as to which you use. example: For single phase a coil spanning to the center of two adjacent magnets (of opposite polarity) with a center hole roughly the size and shape of a magnet works. For 3 phase it gets a bit trickier.

Look in the archives of this list for more info than you would ever want.

Chuck

Re: Axial Flux Generator ([none / 0](#)) (#4)  
by charged on Wed Dec 31st, 2003 at 06:09:20 AM MST  
([User Info](#))

Here's a thought.

Make three rotors, all with an even number of magnets on them.

Then wind a matching set of stators for each rotor. The stators don't get solid cores. Wind steel mechanic's wire on the coil form in tandem with the magnet wire. This gives you an integrated low-loss ferrous core.

Put all three on the same axle and offset them so that axle can never cog.

Each set of stators is gets a wired in series with a single rectifier diode.

The three rectified outputs are wired to a common electrolytic capacitor.

Re: Axial Flux Generator ([none / 0](#)) (#5)  
by wooferhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on  
Wed Dec 31st, 2003 at 11:30:01 AM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

Sounds like a new way to go 3 phase.

} = - W o o f - = {

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[Axial Flux Generator](#) | 5 comments (5 topical, 0 editorial)

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[Ed, am I close ? \(blade design\)](#)

By [Dave B](#), Section [Homebrewed Electricity](#)  
 Posted on Tue Dec 30th, 2003 at 01:34:28 AM MST

[Wind](#)

As I promised ... my alternator specs.

Ed,

My alternator outputs 100 VAC @ 400 RPM no load. My stator of 18 coils AWG 18 (series wound 100 winds each) measures approximately 8 ohms total resistance. Plugging in the power formula you helped Jerry with for a given blade set I get the following for a 12' diameter 3 blade with 14" at each blade root and tapering to 4" at the tips in a 25 MPH wind (40% blade efficiency) I get 1778 watts possible. Is this close ? Now figuring in 70% alternator efficiency I get approx. 1245 watts. Am I doing this right ? If so and looking at the blade design program of a 12' TSR-7 3 blade shows approx. 1500 watts @ 25 mph wind. This all seems to fit pretty well. Any suggestions or comments would be greatly appreciated. Again, no batteries but direct to heating element(s) through a variable load controller based on RPM. (a single 120 vac 1500 watt heating element measures approx. 10 ohms.) Thank you very much for your reply. Dave B.

[Ed, am I close ? \(blade design\)](#) | 7 comments (7 topical, 0 editorial)

Re: Ed, am I close ? (blade design) ([none / 0](#)) ([#1](#))  
 by Rich G on Tue Dec 30th, 2003 at 04:41:10 AM MST  
[\(User Info\)](#)

Hi,

Looks to me like 100 volts through a total of 18 ohms will produce 5.6 amps. The total power will be (5.6 x 5.6) x 18, which is 556 watts. 247 watts will be disipated in the alternator and 309 watts will be disipated in the load. I am asuming that the 100 vac is rms. If the alternator turns faster, say 600 rpm, and the open circuit voltage is 150 vac then 8.3 amps flow and total power is 1250 watts with 694 watts disipated by your load.

If I understand whats going on here, it would be really good if you could lower the internal resistance of the alternator. An alternator resistance of 4 ohms would increase the power to the load by 65%.

In all fairness, I don't know much about this. I have never build one and the above has nothing to do with blade design!

I would like to know more about your stator and the magnets your using. I want to build an alternator for a stationary engine and I don't have anything to base performance expectation one.

May the wind on your blades be fair!

Rich

Re: Ed, am I close ? (blade design) ([none / 0](#)) ([#2](#))  
 by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Tue Dec 30th, 2003 at 07:06:41 AM MST  
[\(User Info\)](#) <http://www.windstuffnow.com/main>

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Dave, that sounds about right on the prop. I have no experience in driving a heater element and I'm not real sure how to calculate the outcome. Looks like riches comments make sense and his numbers seem to fall in place using ohms law.

Plugging in some numbers in the blade designer, it looks like you'd need to drive the alternator at a 2 to 1 ratio to achieve the output your looking for at 25 mph. Thats more of a calculated guess.

Is there a way you can adapt it to a small engine and carry the load through the rpm range the prop would be driving it. This way you can get actual output readings at a given rpm driving the load. This would give you a better idea of what will be needed in the way of a prop. Your still guessing on the efficiency unless you can get a torque reading from the stator ( pony brake set-up), but it may at least get you closer to the actual performance.

Have Fun  
Ed

Re: Ed, am I close ? (blade design) ([none / 0](#)) (#3)  
by Dave B on Tue Dec 30th, 2003 at 12:17:25 PM MST  
([User Info](#)) <http://www.madbbs.com/users/bruggelog>

Ed & Rich

Thank you for your information and suggestions on my aplication. I know I can't get blood out of a rock but it looks as though I could at least pre-heat or pre-warm some water anyway with hours of wind averaging 10 mph or better and a very well insulated maybe smaller tank (20 gal ?) I need to focus on getting all this together with some guessing and your help and get it flying. I'll learn more about my next one than if I keep trying to improve what I have without flying solo yet. The numbers dont lie, I can speed things up, double up the magnets (again), squeeze down the airgap, rewind a more wire efficient stator, go with 3 phase, go bigger, bigger , bigger STOP ! It's a love/hate, I'm going to the garage to work on my tower. Just one more question, do you think more of a drag type (fixed pitch) 3 blade set for lower rpm but more torque would be a better option than carving the twisted profile the blade program shows ? I'm done. Thanks again,, Dave B.

[ [Parent](#) ]

Re: Ed, am I close ? (blade design) ([none / 0](#)) (#4)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Tue Dec 30th, 2003 at 03:17:59 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

There is good and bad to both designs. If your looking at a 10mph average the fancy prop may not reach its full potential until the wind picks up. Something like the old Aermotor mills are all torque, They seem to spin even when you can't feel the wind. The problem with those is the top speed of the rotor in a 35mph wind is 105 rpm. ( Thats on an 8ft dia unit). So on the drag type 3 blade your only looking at a TSR of 1 or slightly higher depending on the angle and blade design. You'll definately need a re-drive to get the rpms you want at the alternator. All in all your dropping efficiency. The fancy prop, direct drive is still the most efficient way at this point.

Sounds like you have a unit that could take a good bite out of the electric bill already then put up a couple solar water heating panels to offset the hot water... also put a coil in the furnace and plumb it in to a heat exchanger on the water heater.

Capture as much waste as possible and recycle it. These are some of my summer projects this year...

Have Fun  
Ed

[ [Parent](#) ]

Re: Ed, am I close ? (blade design) ([none / 0](#)) ([#5](#))  
by Dave B on Tue Dec 30th, 2003 at 10:23:07 PM MST  
([User Info](#)) <http://www.madbbs.com/users/bruggelog>

I think I'll attempt to carve as close to the blade design as possible for a 12' rotor maybe tsr-7. I realize how important the "root" and drop is for the torque of this design. Most on this board for both ease of construction with materials available (2X) and their application (charging batteries) have not gone full blown on this part of the blade and not been sorry. I think I would be as I need all the torque I can get and the speed when possible. I know it ain't going to be cheap gluing these up with select lumber but I've gone this far so no skimping on the heart of this thing, especially 12' possibly spinning at 400 + RPM at times seems kinda scary. Any suggestions on glue and lumber and any links that could help me out ? I've been out in the garage all evening cutting & drilling tower sections, a heavy 3 sided I hope to convert to a guyed tilt up between 80-90' Going to need some creative fabricating / engineering for the hinged base but I've got some very good contacts. I also like the heat exchanger idea in the furnace, just not enough time. Any info . is much appreciated, thanks again. Dave B.

[ [Parent](#) ]

Re: Ed, am I close ? (blade design) ([none / 0](#)) ([#6](#))  
by JB on Wed Dec 31st, 2003 at 09:25:49 AM MST  
([User Info](#))

Ive gone the gluing route of gluing good boards together. It works fine. A while back I found a old cabinet at a thrift store for 5 bucks. The wood caught my eye. I tore it apart to make some blades. I found out through a search that it is basswood. No knots, very light and very fine grain and you talk about something easy to carve, its like butter and it didnt splinter. The blades I carved were out of a chunk 40 inches long by 1 3/4 thick by 10 1/2 wide. I made 3 out of this section goin from 3 1/4 to 2 inches at the tips 40 inches long and they come in at 14 ounces each unpainted. I guess this wood is fairly reasonable. i saw some on ebay. I dont know how it holds up. JB

[ [Parent](#) ]

Re: Ed, am I close ? (blade design) ([none / 0](#)) (#7)  
by hvirtane on Wed Dec 31st, 2003 at 10:52:47 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

Hi,

I think that one of the most important things is how strong winds you happen to have.

With slow wind speeds an air foil rotor is not the best, I think.

With one of my friends we made a modified 'reinikainen' wind rotor so that we used 2 x 7 (pieces) 3 m long wooden strips. Glued and screwed them crossing each other so that on the tips only 2,5 cm of the strip was on the top of the previous strip. Every second going 'west - east' was cut on the middle so was every second of the 'north -south' strip. A four blade really fast made wind rotor was formed.

I think you got the picture. A modification of these: [http://www.otherpower.com/cgi-bin/webbbs/webbbs\\_config.pl?read=14319](http://www.otherpower.com/cgi-bin/webbbs/webbbs_config.pl?read=14319) Finally the edges were smoothened a lot. The whole thing was painted well. It works on really slow wind speeds much better than a perfect air foil blade of 4 m the generator had earlier.

But of course if you often have got 25 mp/h winds an air foil rotor is better.

- Hannu

[Ed, am I close ? \(blade design\)](#) | 7 comments (7 topical, 0 editorial)

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### [Windmill tower for sale on eBay](#)

By [AndyA](#), Section [Homebrewed Electricity](#)

Posted on Mon Dec 29th, 2003 at 03:39:53 PM MST

[Wind](#)

Any one in ND need a windmill tower what is a windmill tower!!!

[Windmill tower for sale on eBay](#) | 6 comments (6 topical, 0 editorial)

Re: Windmill tower for sale on eBay ([none / 0](#)) ([#1](#))

by [AndyA](#) on Mon Dec 29th, 2003 at 03:42:21 PM MST

[\(User Info\)](#)

I guess I should have given the link with the post.

<http://cgi.ebay.com/ws/eBayISAPI.dll?ViewItem&category=31490&item=2584821199>

Andy Anderson

Re: Windmill tower for sale on eBay ([none / 0](#)) ([#2](#))

by [Bach On](#) on Mon Dec 29th, 2003 at 03:55:09 PM MST

[\(User Info\)](#) [change AT: bach\\_on AT hotmail.com](#)

Send it to iFred. He's into his destruction testing mode right now. This looks like it would work well for that. ;-)

Bach On

- I'm just as happy as if I had good sense! -

Re: Windmill tower for sale on eBay ([none / 0](#)) ([#3](#))

by [Bach On](#) on Mon Dec 29th, 2003 at 04:05:24 PM MST

[\(User Info\)](#) [change AT: bach\\_on AT hotmail.com](#)

My bad, I meant Old F.

BO

- I'm just as happy as if I had good sense! -

[ [Parent](#) ]

Re: Windmill tower for sale on eBay ([none / 0](#)) ([#5](#))

by [Old F](#) on Tue Dec 30th, 2003 at 05:43:07 AM MST

[\(User Info\)](#) <http://www.olf.homestead.com>

Nope

I would use it as an air canon for VW bugs : )  
Pump her up and let it rip What fun.

Old F

[ [Parent](#) ]

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Re: Windmill tower for sale on eBay ([none / 0](#)) ([#4](#))  
by BrianK on Mon Dec 29th, 2003 at 08:47:23 PM MST  
([User Info](#))

WOW that is one heck of a chunk of tower

Re: Windmill tower for sale on eBay ([none / 0](#)) ([#6](#))  
by laskey on Tue Dec 30th, 2003 at 07:33:20 AM MST  
([User Info](#))

Yeah, and it fell off the truck...89000 pounds of steel...

[ [Parent](#) ]

[Windmill tower for sale on eBay](#) | 6 comments (6 topical, 0 editorial)

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[Question for blade experts.](#)

By [Jerry](#), Section [Homebrewed Electricity](#)

Posted on Sun Dec 28th, 2003 at 11:07:16 PM MST

[Wind](#)

How much power from this blade?

Hi Blade GURUs

I'm intrested on how much power I could expect from this 43 inches tip to tip 3 blade prop? Let say at 25 mph. Its 5 inches at the root tapering to 2 inches at the tip. Starts out at 23 degrees at the root to just a few degrees at the tip.

JK TAS Jerry

[Question for blade experts.](#) | 7 comments (7 topical, 0 editorial)

Re: Question for blade experts. ([none / 0](#)) ([#1](#))  
by [Dave B](#) on Mon Dec 29th, 2003 at 01:47:46 AM MST  
([User Info](#)) <http://www.madbbs.com/users/bruggelog>

Jerry,

You beat me to the punch, I hope you don't mind me riding along with a similar request to the "blade experts". I need as much torque (power) as I can get from 0-400 rpm up to 30 mph from a 12' diameter 3 blade set. This looks like about tsr-7. Is the blade design program geared more toward "high speed efficiency" or would this be the best all around design for torque also ? I plan to heat water direct with my variable load controller NO BATTERIES. Thanks Jerry and to anyone who responds on this subject. Dave B.

Re: Question for blade experts. ([none / 0](#)) ([#3](#))  
by [windstuffnow](#) ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon Dec 29th, 2003 at 09:09:45 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Dave,

It's difficult to match the full torque range because of the cubed power coming through the blade at different wind speeds. It would probably be best to match the average winds in your area. For instance we have a relatively low average 6-12mph I typically set them up to perform best in that range. We quite often have higher winds in the range of 12 - 20 mph so anything extra is a bonus although they tend to drop efficiency as wind increases.

The blade designer program will work with all efficiencies, simply change the efficiency number in the efficiency box. I use an overall efficiency based on the alternator and expected blade efficiency so if your expecting say a 40% blade and a 70% alternator then the number to plug in would be (.4 x

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.7 = .28) 28% overall.

Have Fun  
Ed

[ [Parent](#) ]

Re: Question for blade experts. ([none / 0](#)) ([#2](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon Dec  
29th, 2003 at 08:55:36 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Hi Jerry,

The power you'll get from a given size blade pretty much remains the same regardless of angles. The angles, however, will tell you at what speed the blade will run at a given power output or wind speed. Also, each blade set runs at different efficiencies depending on the air foil. A simple formula for finding power output is...

$.00508 \times \text{blade area} \times \text{windspeed}^3 \times \text{efficiency}$

So at 25mph your 43" blade could make...

$.00508 \times 10 \times 25^3 \times .30 = 238 \text{ watts}$

Thats assuming the prop is 30% efficient, it could be higher or lower.

Another thing to consider is the alternator efficiency... If your alternator is say 80% efficient attached to the 30% blades your actual output or over all efficiency would be  $.3 \times .8 = .24$  or 24% overall. So you'd end up with only 190 watts actual output not including any other losses.

A good airfoil will run in the 40-45% efficiency range.

Have Fun  
Ed

Re: Question for blade experts. ([none / 0](#)) ([#4](#))  
by Dave B on Mon Dec 29th, 2003 at 10:42:52 AM  
MST  
([User Info](#)) <http://www.madbbs.com/users/bruggelog>

Thank you Ed for the great info. We have a wide range of wind here in Western NY but all charts say around 12mph annual average. Sustained winds of 20+ are very common during the winter so it's tough to guess at my design for my application. If this wasn't my first one I'd have a better feel for the specs. I have no easy way to physically measure the power or torque needed under load while I'm testing, pony brake is out. I'm going by feel and guess and just wondered if I'm better off going with more torque and sacrifice some speed, I know I can't have my cake and eat it too. This is great fun, you sold me the silicon steel a while back and I may be in the market again, I'm hooked. Dave B.

[ [Parent](#) ]

Re: Question for blade experts. ([none / 0](#))  
(#5)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com))  
on Mon Dec 29th, 2003 at 11:11:13 AM MST  
([User Info](#))  
<http://www.windstuffnow.com/main>

Dave,

You can usually guesstimate reasonably well if you have a tested output on your machine. I usually make a chart for the rpm range and calculated output for the alternator. This way you have more of a calculated "guess" instead of pulling numbers out of the air and hoping for the best. Once you know your approx alternator output at a given rpm then it makes it much easier to match a blade with that performance.

As an example say your test showed your alternator was making 12 volts at 100 rpm. The resistance of the stator was say 1 ohm to make it simple, and the charging voltage was 12 volts

$$100 \text{ rpm} / 12 = 8.33 \text{ rpm per volt}$$

So at 200 rpm we can calculate what the output might be without any losses...

$$200 \text{ rpm} / 8.33 = 24 \text{ volts open (no load)}$$

Charging to a 12V battery would yeild..

$$(24 \text{ volts open} - 12 \text{ volts charging}) / 1 \text{ ohm} = 12 \text{ amps}$$

You can chart this at any rpm, I use a spread sheet to make it simple

RPM	Open volts	Amps	Watts
200.	24	12	144
300.	36	24	288
400.	48	36	432

And so on...

Then you can easily go on to matching a prop to perform in the range of your wind from

there.

Have Fun...

I have a new shipment of silicon comming in soon, I was going to pick it up but its a 5 hour drive and I didn't have the time to spend on the road. Its going to be trucked in instead.

I'll have about 500 lbs of silicon available shortly and some sample rolls which I'll list in a few days...

Ed

[ [Parent](#) ]

Re: Question for blade experts. ([none / 0](#)) ([#6](#))  
by Jerry on Mon Dec 29th, 2003 at 06:41:21 PM  
MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Ed

Thanks these are the #s I was looking for. Now all I have to do is put it on a genny and wind test it in my S-10 pu. We got about a foot of snow last night so I gota wait till it melts and things warm up a bit.

JK TAS Jerry

[Airheads Page](#)

[ [Parent](#) ]

Re: Question for blade experts. ([none / 0](#))  
([#7](#))  
by Dave B on Mon Dec 29th, 2003 at  
08:27:48 PM MST  
([User Info](#))  
<http://www.madbbs.com/users/bruggelog>

Ed,

Thanks again for all the help. I'll start crunching some numbers and post my results to further narrow in on the blade design. I sure appreciate all the trial & error out there behind your experience that has saved me much time. Believe me if I had the time I would like nothing more than to help pave the way for others through experimenting. I'll keep in mind you will have the steel also, I'm already thinking about maybe bigger and better, that's what happens when you're adicted. Thanks,  
Dave B.

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[Question for blade experts.](#) | 7 comments (7 topical, 0 editorial)

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## [Tower wrecking](#)

By [Old F](#), Section [Homebrewed Electricity](#)

Posted on Sun Dec 28th, 2003 at 04:29:05 PM MST

[Wind](#)

Were can find a hand operated hydraulic pump?

I just got the top section of my tower done. And it is time to do some destructive testing.

I have a three inch bore double acting cylinder and a hydraulic pressure gage.

All I need now is a hand operated hydraulic pump.

I plan on bolting up the two sections on the ground and run a cable from the top to the base.

And the hydraulic cylinder will set at the center of the tower like an arrow strung in a bow.

This will be for side loading.

Then from a safe distant and behind a barrier. Just in case.

I will pump up the pressure writing gage reading an observations as I go.

With this information I can decide were to go from here.

Old F



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[Tower wrecking](#) | 11 comments (11 topical, 0 editorial)

Re: Tower wrecking ([none / 0](#)) (#1)  
by kell on Sun Dec 28th, 2003 at 05:56:08 PM MST  
([User Info](#))

I wonder why you intend to do this test. Do you want to see how much wind load your tower will take? Wind loading exerts external forces. The proposed test exerts internal forces.

The test you described could give you some idea how much sheer weight the tower would support, since the cable will exert a downward force on the tower at its uppermost point, as would a massive mill of some sort. But what mill is so heavy and tower so weak as to buckle in such a way?

A heavy mill poses a risk by making your tower more vulnerable to tipping!

Weakness will likely manifest itself where the sections of tower join and at the base. A tipping tower exerts the most moment (torque) at its base. Like a big lever.

The closest thing to copy wind loading and tipping would entail erecting the tower, attaching a cable to the tower somewhere between the middle and the top and pulling in a horizontal direction, insofar as possible.

Re: Tower wrecking ([none / 0](#)) (#2)  
by rhud on Sun Dec 28th, 2003 at 06:04:56 PM MST  
([User Info](#))

Hello,  
New to this site, but i'll throw this in. Surplus Center has hand pumps with small oil tanks attached. i think they were used to lift the cabs of transfer trucks. seems they were around \$150. you might try one of the "power pak" sets used for auto body work (northern or harbor freight) Are you near a community college? they might have one or a hydraulics lab with pump and gauges. might be a good project for the class. forgive my spelling.

[ [Parent](#) ]

Re: Tower wrecking ([none / 0](#)) (#3)  
by RobC on Sun Dec 28th, 2003 at 06:10:16 PM MST  
([User Info](#))

Determined aren't you. <http://www.surpluscenter.com/>  
RobC



Re: Tower wrecking ([none / 0](#)) (#4)  
by monte350c on Sun Dec 28th, 2003 at 08:48:23 PM  
MST  
([User Info](#))

Hi OldF,

That's going to be a very neat tower! I like the design...

Here's a possibly easier and maybe safer suggestion - if you're just looking to find the buckling strength, you could support the tower in a horizontal orientation (like on strong sawhorses or something similar) at each end.

Then put a couple of empty barrels on top, in the center of the tower. Add measured amounts of water to the barrels until she buckles. Water is 1 kilogram per liter (or 8.34 pounds per gallon). So if you had a 50 gallon drum full it would put 417 pounds plus the weight of the barrel on it. Two or three barrels would probably do it. Or if you had an old oil furnace tank...

At least when it fails, the most danger will be from having a barrel land on you, or getting wet!

Good luck and keep us posted!

Ted.

Re: Tower wrecking ([none / 0](#)) (#5)  
by Old F on Mon Dec 29th, 2003 at 09:50:37 AM MST  
([User Info](#)) <http://www.oldf.homestead.com>

Kell

One of My design goals is a tower that is ridged enough to support its own weight and 200 pounds of mill during raising and lowering using guys just as safeties.

And not like pipe towers that are 100% guy wire dependent and are at there weakest during rasing and lowering.

I have no doubts that this design will meet that goal I want to find out what its upper limits are. Now I wont be putting any thing near that on it but it would be nice to know. Then I can start on wind loading.

My thinking is the stronger and more ridged a structure you start with for a guyed tower. The closer you can set the guys to the tower base even to the point were it take up just a little more room than a free standing tower. The guys will handle the bulk of the wind thrust load. And a ridged tower makes thing so much easier for raising and lowering.

Rob

And I am stubborn to : )

It my be hard to believe. In the same time or less than it takes to build a wind generator

You can have a nice tower to put it on. This design is a lot easier to build than a generator.

Rhud

I will check them out thanks

Monte

I was thinking about this but could not come with a handy way to measure the amount of water used I had the hydraulics laying around just needed a hand pump.

Old F

On the edge of the learning curve and loving It : )

Re: Tower wrecking ([none / 0](#)) (#6)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon  
Dec 29th, 2003 at 11:20:43 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Old F

It sure seem a shame to wreck such a nice looking tower!!! Seems like you can calculate the compression loads on 2 of those tubes and come up with a suitable number for wind loading. If you know the strength of the steel your using it shouldn't be to hard to calculate this out.

Looks like your having fun! Nice Tower.

Ed

[ [Parent](#) ]

Re: Tower wrecking ([none / 0](#)) (#7)  
by Old F on Mon Dec 29th, 2003 at 01:09:05  
PM MST  
([User Info](#)) <http://www.oldf.homestead.com>

Ed

The tubes are emt conduit 3/4 inch.  
The stuffs cheap all I would be out is a little time. Whats neat is the weight fo a 10 foot section of tower comes in at only 41 pounds

Old F

[ [Parent](#) ]

Re: Tower wrecking ([none / 0](#)) (#8)  
by Old F on Mon Dec 29th, 2003 at  
01:29:34 PM MST  
([User Info](#))  
<http://www.oldf.homestead.com>

Ed  
One more thing If you like check out the  
diary I started called More tower Fun  
I have some pics of the press an angle  
gage I used to flatten the conduit.  
There easier to build than they look.  
Old F

[ [Parent](#) ]

Re: Tower wrecking ([none / 0](#)) ([#9](#))  
by Demetri ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Mon Dec  
29th, 2003 at 02:59:15 PM MST  
([User Info](#))

If you've got easy access to a wrecking yard, go look at  
late '80's automatic transmission Hondas. The speedometer  
cable fitting on the transmission contains a hydraulic  
pump; you can see the two hoses coming out of it. I  
believe it is two bolts to remove the fitting. It can be  
chucked into a drill as a drive source, and I've had it to 150  
psi without trouble. Not very many gpm, so it'd take some  
time, but something to consider. Hope this helps.

Demetri  
Always be the lead dog.

Re: Tower wrecking ([none / 0](#)) ([#10](#))  
by Norm on Mon Dec 29th, 2003 at 05:54:20 PM MST  
([User Info](#))

Hoist up about 400 pounds of cement blocks ....hook a  
pulley at the top ...launch a kite about the size of a hang  
glider when the wind kicks up to about 30 or 40mph. that  
ought to give you a safety factor of about 200 if it doesn't  
tip over and especially if it's a real gusty wind.Forces on  
the side of the tower should be negligable. Just kinda far  
out thinking maybe? Norm

Re: Tower wrecking ([none / 0](#)) ([#11](#))  
by Old F on Tue Dec 30th, 2003 at 10:32:52 AM MST  
([User Info](#)) <http://www.olf.homestead.com>

Oops never mind

I think its old age setting.  
I all ready have all the hydraulic power I need.  
I will just put the pressure gage on my Cad digger back  
hoe and run the engine at very low idle.  
Du (sound of palm of hand hitting forehead ).

If you haven't see a Cad digger check out the pics on my  
web site.

Thanks to all

Old F

[Tower wrecking](#) | 11 comments (11 topical, 0 editorial)

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## [Would this cheap material work for laminates?](#)

By [Sponge](#), Section [Homebrewed Electricity](#)

[Wind](#)

Posted on Sun Dec 28th, 2003 at 02:26:13 PM MST

Quick question about certain type of material :)

Hi,

I have arrived at the stage where I'm going to make my laminates. Still, finding proper material for laminations is quite in my surroundings over here.

I have found an metal strip, 1mm thick, 1.2cm wide, and like 1m long, the only suitable strip I have found at a Do it Yourself shop thing. (no idea about magnetic memory stuff)

But, I thought about another material basically without costs, which might just be as suitable as well. It's magnetic, and doesn't have magnetic memory I believe. No idea how to exactly translate this material to english, but cans with vegetables and stuff are made of it. (I think Cola cans too, although those might be aluminium). Well, a picture is sometimes better than words they say :)



(clickable)

Well, just wondering. I'm sure someone thought about it before? :)

Regards,  
Sponge

[Would this cheap material work for laminates?](#) | 5 comments (5 topical, 0 editorial)

Re: Would this cheap material work for laminates? ([none / 0](#)) ([#1](#))

by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Sun Dec 28th, 2003 at 02:31:51 PM MST

([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

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Don't know if it makes a difference or not , But  
A lot of Tin Cans are already lined with plastic on the inside  
Thin Metal, already a thin insulator applied to it . . .

}=- W o o f -= {

Re: Would this cheap material work for laminates?  
([none / 0](#)) (#2)  
by Sponge on Mon Dec 29th, 2003 at 05:28:52 AM MST  
([User Info](#))

Do you mean it might be good, or it's not good? :) I'm  
not sure :)

Regards,  
Sponge

[ [Parent](#) ]

Re: Would this cheap material work for  
laminates? ([none / 0](#)) (#3)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on  
Mon Dec 29th, 2003 at 02:45:46 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

The pieces of metal you use for a Laminate should  
be insulated from each other.

So , Yes it's good to have the insulation layer on  
there. But personally, I do not know if the metal in  
a Tin Can is teh best type.

Cheap though . . .

}=- W o o f -= {

[ [Parent](#) ]

Re: Would this cheap material work for laminates? ([none](#)  
[/ 0](#)) (#4)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon Dec 29th,  
2003 at 05:28:05 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>



That's actually a unique idea! I tried to find out what type of steel they use in make them but didn't find anything. I would imagine its low carbon and then tin coated. Low carbon materials are easy to work with and much cheaper. My guess is it would be a good material for laminants although it would take alot of cans to make up a stator. The rings that add strength to the can may create a problem getting them tight together. If you have a slip roll you can flatten them out quite easy or a small hammer. Could be an interesting project none the less.

Have Fun  
Ed

Re: Would this cheap material work for laminates? ([none](#) / [0](#)) ([#5](#))  
by Sponge on Tue Dec 30th, 2003 at 02:20:34 AM MST  
([User Info](#))

Thanks! :) Time to eat some canned food these days I guess :)

Regards,  
Sponge

[Would this cheap material work for laminates?](#) | 5 comments (5 topical, 0 editorial)

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## [Thirty footer](#)

By [Garry](#), Section [Homebrewed Electricity](#)

Posted on Fri Dec 26th, 2003 at 04:52:11 PM MST

[Wind](#)

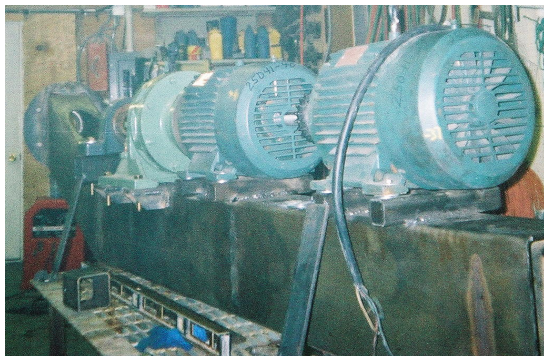
Here are a couple of pictures of progress so far.

The tubing for the back-bone is 8x12 rectangular steel tube. The reducer ( increaser ) is a 17-1 planetary unit. The two generators started life as 480V explosion proof motors. We have extended the shaft on the first to drive the second. The first was reconnected internally to allow 240V operation and will be driven above slip speed to feed the grid when possible. The second will be converted to 480V DC and will feed heating loads and the new Windy Boy grid tied inverter. Normally only one will be in use at a time. The DC unit will help absorb instantaneous gust loads for short periods.

The main prop bearing is a caterpillar tractor ball bearing with a 5 inch bore and 11 inch O.D. The other bearing shown is the top yaw bearing.

Work progresses in fits and starts. We started late Nov. and won't have it up until early summer. I have a lot more pictures but with my connection it takes forever.

Garry



[Thirty footer](#) | 3 comments (3 topical, 0 editorial)

Re: Thirty footer ([none / 0](#)) ([#1](#))  
by [drdongle](#) on Fri Dec 26th, 2003 at 09:47:35 PM MST  
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Looks like a very ambitious project, keep us informed.

Dr.D

Re: Thirty footer --- WIND MILL ?? ([none / 0](#)) (#2)  
by Nando on Sun Dec 28th, 2003 at 09:10:58 AM MST  
([User Info](#))

Interesting project; Please post a detail explanation of qht you are doing, I do not see anything but this message.

I am an Electronic/electrical engineer, retired though, and I have worked Alernative Energy Systems.

I come here very rarely, so please send it to my email : nando37@comcast.net

Regards  
Nando

Re: Thirty footer --- WIND MILL ?? ([none / 0](#)) (#3)  
by Harry Luubovv on Wed Dec 31st, 2003 at 09:06:11 PM MST  
([User Info](#))

Hi Garry,

Very very impressive project !!! Keep up the good works !

Luubovv.

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[Salvage source for silicon steel](#)

By [Reno](#), Section [Homebrewed Electricity](#)  
Posted on Tue Dec 23rd, 2003 at 07:43:40 PM MST [Wind](#)

p

Has anyone heard of Silicon steel bandsaw blades. I came across this looking for steel. One company or product I found is called Timberwolf. These blades would be used in an industrial setting.

[Salvage source for silicon steel](#) | 2 comments (2 topical, 0 editorial)

Re: Salvage source for silicon steel ([none / 0](#)) (#1)  
by RobC on Wed Dec 24th, 2003 at 08:42:55 AM MST  
([User Info](#))

These blades are used on portable bandsaw mills the kind used for sawing logs. They buy the stuff in big rolls and then make blades out of it.  
Hard to say if it would make good laminates. They would probably give you a free sample.  
<http://www.suffolkmachinery.com/scragg.html>

Re: Salvage source for silicon steel ([none / 0](#)) (#2)  
by marv ([windtamer@hotmail.com](mailto:windtamer@hotmail.com)) on Wed Dec 24th, 2003 at 11:51:09 AM MST  
([User Info](#))

They have silicon steel at salvage yards. They take apart large transformer things with sheets of silicon steel about 12" wide & 4 feet long. Its sold by the lb.  
5 cents or 20 cents I cant remember rite now.

[Salvage source for silicon steel](#) | 2 comments (2 topical, 0 editorial)

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## [Tower Fun](#)

By [Old F](#), Section [Homebrewed Electricity](#)

Posted on Tue Dec 23rd, 2003 at 04:48:12 PM MST

[Wind](#)

---

### Tower fun

Have the first ten foot section done.  
For a 30 foot guyed tower its based on the Wind Works plans for a free standing 30 foot octahedron module tower.  
That came out back in the 70s.

Many thanks to Don G for tracking down and getting permission to reprint them they helped a lot.

The vertical struts are 3/4 inch emt conduit and the horizontal triangles are 1 an 1/2 inch angle iron 1/8 inch thick. The sides of the triangles are 1 and a1/2 foot.

I went with angle iron so I would have a flats to bolt the sections together.

I put together a press using a 2 ton bottle jack to flatted the ends of the conduit

When I get the next section built is where the fun starts  
I want to do some destructive testing .I know from my small models that these things can take one heck of a compression load.

I want to find out what kind of load it will take to buckle it in the middle with a force applied to the side should be fun.

I have no doubts that it will meet my goal. And that is to have a structure ridged enough to support its own weight and 200 pounds of machinery on top during raising or lowering.  
Then the guy wires will handle the bulk of the wind load.

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Here is an end view



Old F

Having so much fun it should be legal and banned in 49 of the 50 states : )

[Tower Fun](#) | 13 comments (13 topical, 0 editorial)



Re: Tower Fun ([none / 0](#)) ([#1](#))  
by cevonk ([cevonk\(atsignhere\)aol.com](#)) on Tue Dec 23rd,  
2003 at 05:08:42 PM MST  
([User Info](#))

Way, cool! I've been a fan of Bucky Fuller for a long time.  
It's nice to see his work in a practical application (outside  
of domes.) I wonder what the difference would be with,  
say, 3/4" black pipe versus EMT? Certainly a weight  
penalty.

Do you think you need the guys? How was the  
free-standing version mounted?

Re: Tower Fun ([none / 0](#)) ([#3](#))  
by Old F on Tue Dec 23rd, 2003 at 07:56:18 PM  
MST  
([User Info](#)) <http://www.oldf.homestead.com>

The base on Wind Works free standing tower is 6 foot  
on a side .

3/4 inch water pipe would make for a lot stronger  
tower but even then and with a full yard of concert  
for a foundation.

I wouldn't want to fly any thing over 5 or 6 foot dia.  
blade set if that.

With my version as a free stander

At this time I don't know just what kind of load it will  
carry. And that's why I am plan to some  
destructive testing . That and every so often I like to  
tear the hell out of things : )

Old F

[ [Parent](#) ]

Re: Tower Fun ([none / 0](#)) ([#2](#))  
by South Dakota Farmer ([ken\\_at\\_thebockgroup.com](#)) on  
Tue Dec 23rd, 2003 at 07:19:37 PM MST  
([User Info](#)) <http://www.thebockgroup.com>

Tried to find/buy tower plans and failed. Are they still  
available? and where? Thanks...  
One thing we have in South Dakota is wind...

Re: Tower Fun ([none / 0](#)) ([#4](#))  
by Old F on Tue Dec 23rd, 2003 at 08:19:42 PM  
MST  
([User Info](#)) <http://www.oldf.homestead.com>

I think Dons add is in the classifieds here on the site

Old F

[ [Parent](#) ]

Re: Tower Fun ([none / 0](#)) ([#5](#))  
by South Dakota Farmer  
([ken\\_at\\_thebockgroup.com](#)) on Tue Dec 23rd,  
2003 at 08:59:58 PM MST  
([User Info](#)) <http://www.thebockgroup.com>

Either I am Ebay challenged or they are no longer there. Found them in classifieds referring to Ebay. Searched Ebay. No results. I'm new to the board ('tell). Any other way of contacting this fellow? Thanks again...

One thing we have in South Dakota is wind...  
[ [Parent](#) ]

Re: Tower Fun ([none / 0](#)) ([#6](#))  
by Old F on Wed Dec 24th, 2003 at  
06:39:15 AM MST  
([User Info](#))  
<http://www.oldf.homestead.com>

Ken I have sent you an email that mite help

Have fun  
Old F

[ [Parent](#) ]

Re: Tower Fun ([none / 0](#)) ([#7](#))  
by RobC on Wed Dec 24th, 2003 at 10:13:52 AM MST  
([User Info](#))

Looks great I like it. Definitely got to try one myself one of these days.  
RobC

Re: Tower Fun ([none / 0](#)) ([#8](#))  
by Old F on Wed Dec 24th, 2003 at 11:26:53 AM  
MST  
([User Info](#)) <http://www.oldf.homestead.com>

Well Rob

If there is enough interest I try to put together a how to guide.

It a wide open field not much has been done with it in 30 years.

And it to good of a design to let fade away.

Old F

Have so much fun it should be illegal

[ [Parent](#) ]

Re: Tower Fun ([none / 0](#)) ([#9](#))  
by Kevin L on Wed Dec 24th, 2003 at  
12:51:16 PM MST  
([User Info](#))

Old F

A simple 3 inch diam 1/4 in wall steel pipe will handle a 200 lbs compression load. If you plan to use guy wires anyway, why go to all to constuction trouble and increased cost? Entertainment value?

[ [Parent](#) ]

Re: Tower Fun ([none / 0](#)) ([#11](#))  
by Old F on Wed Dec 24th, 2003 at  
04:59:50 PM MST  
([User Info](#))  
<http://www.olf.homestead.com>

Kevin

Pipe towers are a low cost way to go .  
But I want to get a way from having to transport 20 foot section of pipe or do any welding in the field if I want to go higher.

I have help raise some pipe towers for antennas and if you don't dot your I and cross your Ts thing can get hairy real fast . A pipe tower is 100% dependant on the guy for holding it up and during raising and lowering . A more ridged structure makes life a lot easier. And we are talking more than just compression loads.

That's why I am working with 10 foot sections that bolt together. I can easily transport the materials in my short bed pick up. And the finished 10 foot section weighs in at 41 pounds.

As for cost the conduit cost 14 dollars the angle iron was 5 cents a pound at the scrap yard.

Now that I am set up I can knock out a 30 or 40 tower' in a weekend or at most two.

As I work mostly by my self I want things I can easily handle. I not getting any younger : )

Old F

[ [Parent](#) ]

Re: Tower Fun ([none / 0](#)) ([#10](#))  
by DonG on Wed Dec 24th, 2003 at 03:34:15 PM MST  
([User Info](#))

The original Windworks tower plans were built with one inch conduit and a maximum length of 10 ft for a section. You've shortened the modules so you can use the lighter 3/4" conduit and retain the strength. It should be just as strong. The strongest vector is a triangle and these are just a bunch of triangles. I'm curious what your destructive testing will find and how it matches the engineering data shown on the plans for downforce and sideforce. I'm going to add an email address to the classified ad in case anyone else is interested. I stopped running the ad in Ebay. It would probably be cheaper for someone in SD to just get an old water windmill tower from NE. They're everywhere in that state. The single legged pipe towers have very little strength when your raising or lowering the tower compared to an octahedron module. I've also heard some people complain of tower vibration too. A guyed 1" conduit octahedron module will cost about \$35.00 for each 10 ft module figuring about five \$7.00 ten foot conduit sticks. A ten ft piece 3" pipe will cost you about the same and not be as strong and have no entertainment value. I'm currently restoring an old wind generator out of the 1940s and should have it on top of a 52' free standing octahedron tower at my new house this spring.

Re: Tower Fun ([none / 0](#)) ([#12](#))  
by Old F on Wed Dec 24th, 2003 at 07:05:04 PM MST  
([User Info](#)) <http://www.oldf.homestead.com>

Hi Don

I decided to cut my teeth on a strait section guyed tower be for going for a free standing

Thank agin for come up with the plans.

Old F

[ [Parent](#) ]

Re: Tower Fun ([none / 0](#)) ([#13](#))  
by DonG on Wed Dec 24th, 2003 at 08:08:37 PM MST  
([User Info](#))

It looks like your going to be OK with strength and your design has cut the cost even lower. I'm always amazed how much local interest you will get with this tower design when it is up. In the 70's an alternative energy business in Cambridge, MA put a twenty foot octahedron section up in front of their storefront to get more traffic through the door...it worked. I'm glad to see that your also having fun with this design. Unfortunately I lost my Jack Park 12-16 Helion plans in my many moves. You would have enjoyed his flyball governor and aluminum blade construction too.

[ [Parent](#) ]

[Tower Fun](#) | 13 comments (13 topical, 0 editorial)

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[Wind -- How do you get the windmill power down the tower, since the mill yaws into the wind?](#)

[Wind](#)

By [ADMIN](#), Section [Renewable Energy FAQ](#)

Posted on Mon Dec 22nd, 2003 at 06:15:18 PM MST

Commercial slip rings are expensive...you can build your own, or go with a simple "pendant cable." Read on....

You can certainly buy commercial slip rings to send power from a yawing windmill down the tower. But slip rings rated at 100 amps at 12vdc would be incredibly expensive.

There are plans out there on the internet and in magazines for homemade slip rings. Most use carbon brushes and copper pipe, insulated by PVC pipe. Brushes from car alternators can be used. An example:

<http://www.fieldlines.com/story/2003/5/8/55448/19618>

and another example:

<http://www.fieldlines.com/story/2003/5/8/154641/0612>

DanB and DanF at Otherpower don't use use slip rings. We've always used a "pendant cable," which can either hang down and wrap around the tower or twist inside the tower. We also discussed this issue with homemade wind power guru Hugh Piggott... he also uses a pendant cable inside the tower pole. We looked at a commercial AWP wind turbine install on a 120 foot tower that uses a pendant cable.

Though for most folks it's hard to believe at first (until they try it), problems are rare with a pendant cable. A properly-furling wind turbine won't rotate much. We've never seen one do a 360 turn in less than a week. We put an electrical plug and socket at the bottom of the tower, and have found it necessary to unplug and untwist the pendant cable only once or twice a year, even in a turbulent wind environment! We also shut down our mills using this plug -- we plug it into a shorting block to shut down the mill for maintenance or during high wind events.

Discussion on slip rings vs. pendant cable:

<http://www.fieldlines.com/story/2003/5/8/55448/19618>

[Wind -- How do you get the windmill power down the tower, since the mill yaws into the wind?](#) | 0 comments (0 topical, 0 editorial)

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## [Servo motor-pipe genny update](#)

By [billf](#), Section [Homebrewed Electricity](#)

Posted on Sun Dec 21st, 2003 at 01:22:35 PM MST

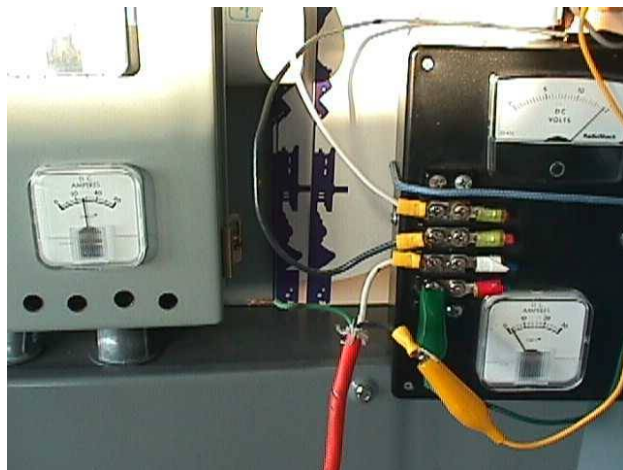
[Wind](#)

Just a quick update on this project.

The unit is mounted on a short test tower of 13' height. I rigged up a quickie test panel and tied it into the main power panel for the axial mill.



Here you can see the big 8' axial mill on it's 65' tower in comparison with the servo motor mill with a 5' prop.



It's amazing how the difference in height correlates with

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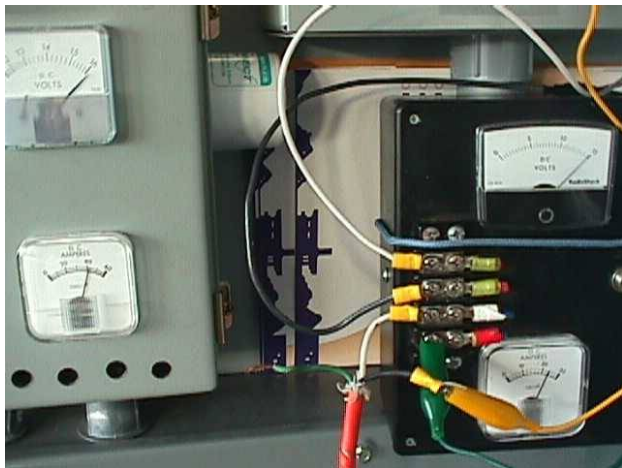
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power output. It's also interesting how much wind shear there is within just 40 to 50 feet. The axial is on the left @434 watts with the servo on the right @30 watts.



Good output from the servo mill. The axial is putting out 640+ watts with the servo mill @372 watts. The leads go to a blocking diode. I'll try a 6 bladed prop this week and check out the difference.

[Servo motor-pipe genny update](#) | 2 comments (2 topical, 0 editorial)

Re: Servo motor-pipe genny update ([none / 0](#)) (#1)  
by billf on Mon Dec 22nd, 2003 at 06:22:10 AM MST  
([User Info](#))

Just a quick update note. Further testing using a hand held digital wind meter, power output looks like this:

9/10mph 4 amps@ 15vdc  
11/12mph 16 amps@ 15vdc

a little less than the spreadsheet but not bad for something so small. However start up is not as good in lower wind speeds. I noticed this morning the axial was putting out 60 watts in a 8mph wind and the servo mill had not started up. Probably a 6 blade prop should help out with this. Overall the axial still beats a servo motor handsdown but for a quick cheap mill for perhaps a cabin or camper, yard lights etc. a servo motor is an alternative.

billf

Re: Servo motor-pipe genny update ([none / 0](#)) (#2)  
by JB on Mon Dec 22nd, 2003 at 07:29:48 AM MST  
([User Info](#))

that really aint too bad for what it is and the initial investment. I think a 6 blade might start easy of course but I dont think You will get the rpm that is needed. That might be one of them high wind turbines with a 2 blade. Getting it up to the height of the other would be a much better comparison of course. Thanks for the info. JB

[ [Parent](#) ]

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[Vawt or S Rotor](#)

By [Arno](#), Section [Homebrewed Electricity](#)

Posted on Sat Dec 20th, 2003 at 11:12:10 AM MST

[Wind](#)

This VAWT thing is making me nutty.....

I,m in my 70's and my math consists of 8th grade arithmetic.I cant quite figure out how to send a diagram so I'll try to paint some mind pictures.In the first one,I see a two blade S rotor but the blades are flat. When the wind hits them equally they dont do much. In the second picture, I see the same rotor but the left half is cupped and the right half is convex (?). This seems to spin a little. I guess the cup side captures the wind and the convex side thins it out a little and makes a differential. The next picture shows the same thing but theres a FIXED baffle at 45 degree's in front of the right side and the blades are spinning nicely. I guess the wind hits the left side and not the right side helping the spin. In the final picture, I see the same deal but two more blades have been added at 90 degree's and three more FIXED baffles at 45 degrees. This seems to funnel the wind from most directions. Ok fellows, please set me straight but without too much math. Windstuffnow and Electric Ed seem to be hot on the trail, and if vawt's have a future, I'd bet on them. Happy Holidays All! Arno

[Vawt or S Rotor](#) | 3 comments (3 topical, 0 editorial)

Re: Vawt or S Rotor ([none / 0](#)) ([#1](#))  
by gps on Sat Dec 20th, 2003 at 12:17:01 PM MST  
([User Info](#))

There's nothing to set straight. The technology is ancient and the principle of operation is simple, just as you describe. Such machines do have a future - terrible efficiency and perpetual 'discovery' by tinkerers.

Go to <http://www.ampair.com/> and compare the output of the Dolphin VAWT to the Hawk HAWT. The VAWT is admittedly smaller but the output is a tiny fraction of the HAWT. A machine like the Ampair 100 is about as reliable as a brick and no more complicated to build than a HAWT, with less materials.

If you just want to experiment, by all means have fun, but if you're interested in producing power, skip the drag devices and build a design that is proven efficient and reliable (see Hugh Piggot's books).

Good luck

Re: Vawt or S Rotor ([none / 0](#)) ([#2](#))  
by wooferhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Sat Dec 20th, 2003 at 12:30:28 PM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

The best Idea for the Savonius rotor that I've seen was from Electric Ed with the shrouded rotor, Here is a picture that I'm borrowing from him.

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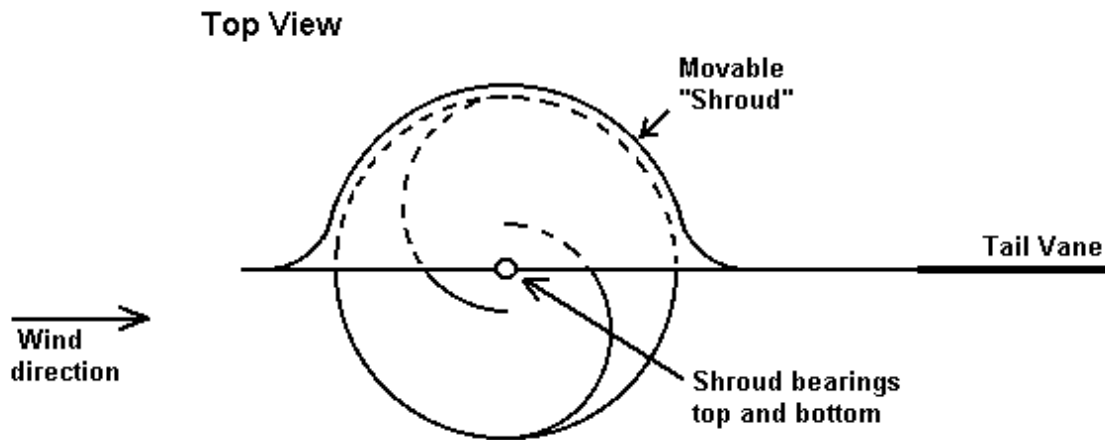
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This is from a well discussed thread about Savonius Systems  
<http://www.fieldlines.com/story/2003/11/22/7365/5340>

} - W o o f - = {

Re: Vawt or S Rotor ([none / 0](#)) (#3)  
 by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Sat Dec 20th, 2003 at 12:45:31 PM MST  
 ([User Info](#)) <http://www.windstuffnow.com/main>

Hi Arno,

I'm not sure I'd do any betting at this point, VAWT's are still quite bulky and have their own set of problems. Personally I like the way they look, I could sit and watch them for hours ( if I had the time ).

Basically what it boils down to is.. Each side has a drag coefficient (Cd) and the object is to get the upwind side as low as possible and the downwind side as high as possible. On a typical Savonius machine the downwind drag is close to 1 and the upwind side is around 0.20 , This shows that its about 80/20 collection. You also have to factor in the speed that the downwind vane is moving away from the wind as well as add the speed the upwind side is moving into the wind. Adding vanes to direct the flow works fairly well and ducting works extremely well. The trick is to remove the upwind restrictions while enhancing the downwind torque. There are specific shapes that provide extreme drag resistance for the downwind side and other shapes that help remove the resistance on the upwind side. The shape that provides the highest drag is a "half tube" ( Like a pvc pipe split in half). This shape has a drag Cd of 2.3 with the C collecting the wind ( C <- wind direction). Unfortunately when you turn it around ( wind direction -> C ) it still maintains a drag Cd of around 1. If you add a shape to the nose but still keep the shape inside you can reduce it considerably ( <C ). As JJ pointed out a few posts back, adding an air foil to the front of it. Since its not a complete airfoil the air breaks up behind it and creates a turbulence and adds drag. This would allow you get the Cd on the upwind side down to around 0.4 or possibly a little less. The half airfoil shape on the "Lenz Turbine" brings it down to around .2 or slightly higher but we're still collecting the higher Cd of 2 on the downwind side or slightly higher. By adding a difuser or ducting the upwind side only sees its own speed ( plus a little turbulence). So now, basically we're collecting almost all of the power in the wind. If the ducting allows for collection of the entire area ( area of the turbine - both sides ) this forms a venturi, the venturi will increase wind speed as it approaches the downwind blades. Now your collecting at a higher speed than the wind coming into the inlet which offsets the downwind blade moving away from the wind. An open Savonius sees 12 mph wind and if the blades are moving 4 mph away from the wind then your only collecting from an 8 mph wind with the upwind side fighting 16 mph head wind. So you can see the benefits of the venturi and blocking the upwind side.<p> I think Savonius had the right idea using the "barrel" or "S" type rotor but I think it would do far better by spacing them out and adding an airfoil shape to the nose of the barrels. Also by adding a simple drum in the center would help direct the air into the barrel and create a low pressure to the back side of the turbine which helps carry the "barrel" farther behind the machine creating a longer torque period. Also adding 3 blades or barrels enhances the overall torque. Either, by ducting or removing the built in flaws can make a big difference in performance over the Standard methods...

Fun Subject!!  
 Windstuff Ed

[Vawt or S Rotor](#) | 3 comments (3 topical, 0 editorial)

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## [JACK PARK BOOK](#)

By [johnjach](#), Section [Homebrewed Electricity](#)  
 Posted on Fri Dec 19th, 2003 at 07:03:39 PM MST [Wind](#)  
 Does anyone have this Jack Park book?

Some time ago, Jack Park authored a book entitled "Simplified Wind Power Systems for Experimenters." Is anyone out there familiar with this? What are it's contents? How many pages, illustrations, etc.?

Thanks for your help.

[JACK PARK BOOK](#) | 2 comments (2 topical, 0 editorial)

Re: JACK PARK BOOK ([none / 0](#)) (#1)  
 by Electric Ed on Sat Dec 20th, 2003 at 06:06:32 AM MST  
[\(User Info\)](#) <http://www.electric-ed.com>

I don't have that one, but do have a later book by Jack Park called The Wind Power Book (1981 - Cheshire Books) which I found very helpful.

It has 250 pages and covers the history of wind power, basic theory, calculations, and design. However, there isn't much on the actual construction details.

Electric Ed

Re: JACK PARK BOOK ([none / 0](#)) (#2)  
 by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Sat Dec 20th, 2003 at 07:08:26 AM MST  
[\(User Info\)](#) <http://www.windstuffnow.com/main>

Hi JJ,

Both books are quite good. Neither of them have any specific building but the one you refer to has alot of math and covers most turbines. This includes the Darrieus, savinous, multi-blade to the modern turbines. I would recomend both if you can find them. Both are similar and each seems to have a bit of detail that the other doesn't. He also goes into some hybrids that are kind of unique.

I found them in Half.com for a reasonable price. Both have been out of print for some time now.

Have Fun  
 Windstuff Ed

[JACK PARK BOOK](#) | 2 comments (2 topical, 0 editorial)

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## [Happy Holidays To All](#)

By [Hank](#), Section [Homebrewed Electricity](#)

Posted on Fri Dec 19th, 2003 at 03:15:46 PM MST

[Wind](#)

Wishing each and everyone of you...

The very best wishes for the holidays and may the New Year find you Happy, Healthy and Prosperous. May the wind keep blowing to your hearts content!!

Thanks to all and keep up the good work,

Hank

[Happy Holidays To All](#) | 2 comments (2 topical, 0 editorial)

Re: Happy Holidays To All ([none / 0](#)) ([#1](#))  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Fri Dec 19th, 2003 at 05:24:38 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

Have a very Solar Christmas  
and a Windy New Year !!!

}=- W o o f -= {

Re: Happy Holidays To All ([none / 0](#)) ([#2](#))  
by The Grinch on Fri Dec 19th, 2003 at 05:33:38 PM MST  
([User Info](#))

Mutter mutter mutter, Bah Humbug!

Grinchy

[Happy Holidays To All](#) | 2 comments (2 topical, 0 editorial)

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[S Rotors](#)

By [Arno](#), Section [Homebrewed Electricity](#)  
 Posted on Thu Dec 18th, 2003 at 10:55:32 AM MST [Wind](#)  
 Questions from a novice about an S Rotor

Say you have a small 4 blade S rotor mounted a foot or so above a flat roof.  
 I assume a wind hitting the concave halves and providing push is also hitting the convex halves and making some resistance. If so, would 4 stationary barriers close to but separate from the convex halves and at a 45 degree angle and as tall as the rotor make a dead area around the convex halves and funnel more wind to the concave halves no matter which way the wind blows? Sort of like a hydro turbine. Would this help efficiency?

Arno

[S Rotors](#) | 2 comments (2 topical, 0 editorial)

Re: S Rotors ([none / 0](#)) ([#1](#))  
 by Norm on Thu Dec 18th, 2003 at 05:12:01 PM MST  
[\(User Info\)](#)

I believe the added complexity would far outweigh any gain in efficiency. I believe when you say S rotors you are referring to a VAWT? For starters on basic Savonius type wind turbines go to <http://www.picoturbine.com/> then for more advanced designs go to <http://www.windstuffnow.com> Ed has some excellent designs even some kits that you can purchase. Have fun! (:>) Norm.

Re: S Rotors ([none / 0](#)) ([#2](#))  
 by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Fri Dec 19th, 2003 at 05:39:41 PM MST  
[\(User Info\)](#)  
<http://timmythy.home.mindspring.com/timmy.htm>

Some elements of your design are referred to in this message thread about Savonius Rotors.  
<http://www.fieldlines.com/story/2003/11/22/7365/5340>

}=- W o o f -= {

[S Rotors](#) | 2 comments (2 topical, 0 editorial)

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## [pipe genny with servo motor](#)

By [billf](#), Section [Homebrewed Electricity](#)

Posted on Wed Dec 17th, 2003 at 07:27:54 PM MST

[Wind](#)

Here is a small mill using a servo motor and sch 40 gal. pipe.

Most of the items can be bought from the hardware store except for the servo motor which can be gotten from here:

<http://www.surpluscenter.com/item.asp?UID=2003040713341264&item=10-1840&catname>

This mill should be relatively easy to build. Keep in mind though it is heavy and will require a substantial sch 40 pipe tower for support (I'm using 1 1/2" pipe for the tower). You can use a 3 or 6 blade prop, 3'- 5' dia. depending on the output you want.



Note the motor is offset so at higher wind speeds it will turn itself out of the wind for protection.

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- [More on Wind](#)
- [Also by billf](#)





When testing is done the downlead will be run through the center of the tower (no slippings).



Note the PVC bushing on the inside of the furling pipe.



This is how the furling should take place. I mounted a light weight tail vane made from plexiglass on the tail so it will swing out earlier. Hope it works.



When the tail swings down, the tail boom hits the main mount and stops the tail from swinging around. When the tail is furled, the bottom rail under the motor will stop the tail from swinging too far up.

Bench testing shows the mill should cut in at around 325rpm (12vdc) and according to the spreadsheet I have this should work out to around 6mph. The purpose is to have a steady 100-150 Wh, 24hrs a day. We'll see.

Bill

[pipe genny with servo motor](#) | 4 comments (4 topical, 0 editorial)

Re: pipe genny with servo motor ([none / 0](#)) ([#1](#))  
by Jerry on Wed Dec 17th, 2003 at 08:57:28 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Bill

Looks like a real hevy duty genny do you know how much it weighs?

I used the same motor to build a genny for a sail boat. I think this guy was crazy cause the sail boat was small and he was sailing from Oregon to Mexico.

I built him the genny. It weighed 24 lbs. He returned an said it was to heavy for his small sail boat. I'm thinking your going out in the ocean and a 24 lb genny is too heavy. I woudn't go any where in that boat and for sure not to sea.

So I did my best to lightin it up. It ended up at 18 lbs and prety rugid too.

I used 2 of my Jerry blades 49 iches tip to tip. These blades are \$15 each. They weigh 9 oz. each. plus homemade hub and yaw system. The blades handeled 68 mph winds just fine. No furling on this genny. In high winds its making over 360 watts and seems to work great.

I'm flying 3 of these small gennies on my shop. They sure are cheap and easy.

All the yaw and tail boom and wing stuff was less than \$25 and light as a feather. Since this genny is so light I fly them on 1.5" EMT electrical conduit. The big box home improvement stores sell this conduit for around \$7 for a 10 ft pice.

JK TAS Jerry

[Airheads Page](#)

Re: pipe genny with servo motor ([none / 0](#)) ([#2](#))  
by Chuck on Thu Dec 18th, 2003 at 08:47:26 AM MST  
([User Info](#)) <http://www.greeleynet.com/~cmorrison>

Bill,

Very interesting design. It'll be interesting to see what your offsets end up being when you test and adjust it. Amazing what can be done with pipes.

My initial reaction is that you might want a way to move the motor further out to the side. On the other hand I see an "L" piece on the end of the tail which should increase furling and it certainly looks like a light tail. Of course blade size will influence all that too.

I don't know if you have any bearing in the yaw assembly, but you might consider a thrust bearing if furling seems a little choppy.

Good luck and let us know how it works.

Chuck(M)

Re: pipe genny with servo motor ([none / 0](#)) (#3)  
by billf on Thu Dec 18th, 2003 at 04:58:18 PM MST  
([User Info](#))

The mount is heavy, probably 40-50 lbs. But once it's up in the air 40' it will get a lot of stress especially from thunderstorms. More metal=more strength. I'm more curious if the furling system will work. I have thought of using a bearing for the yaw mechanism. In fact a 1 1/16" axle bearing for a trailer glued to a 1/2" fender washer-glued to the top of the 1 1/2" pipe will work. However for now, since it's mounted on a short test tower, it will have to wait and it does seem to track alright for now. If the bearing idea works well for the small genny then I may adapt one for the big mill which does have some tracking problems at lower wind speeds especially after there's been a lull and the wind changes direction before picking up.

Bill

Re: pipe genny with servo motor ([none / 0](#)) (#4)  
by Nando on Sun Dec 28th, 2003 at 10:21:04 AM MST  
([User Info](#))

Bill:

I am quite interested in your Furling set up, can you, please email me for further communication.

Thanks

Nando

nando37@comcast.net

[pipe genny with servo motor](#) | 4 comments (4 topical, 0 editorial)

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## [IDEA FOR LENZ TURBINE](#)

By [johnjach](#), Section [Homebrewed Electricity](#)

Posted on Tue Dec 16th, 2003 at 10:04:11 PM MST

[Wind](#)

How would this work for a "Lenz" turbine?

A question for Ed of Windstuffnow: Ed, instead of using the open "J" configuration on your VAWT, what would be the results if you used a "fat" airfoil like an NACA 0024 and "clipped" off about 25% of the trailing edge. If you used these in your "Lenz" turbine or a Darrieus, would you have an airfoil "lift" machine on the upwind leg and a "drag" machine on the downwind leg or would the "clipped" airfoil lose all lift properties because of the broken airflow from the missing trailing edge?

These are just some thoughts I had but maybe I'm trying to do something which is aerodynamically and physically impossible. I'd appreciate your thoughts and comments. Thanks again.

[IDEA FOR LENZ TURBINE](#) | 1 comment (1 topical, 0 editorial)

Re: IDEA FOR LENZ TURBINE ([none / 0](#)) (#1)  
by [windstuffnow](#) ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Wed Dec 17th, 2003 at 07:03:03 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

JJ, that would work. If you keep the half tube in place on the inside and use a partial airfoil on the leading edge you'll still benefit in the lift and collect high drag on the downwind side. Keep in mind on the upwind side we want to basically offset the drag with lift to over come the losses and possibly add some power to the machine. Once the machine reaches a TSR of 1 or higher your no longer making power from drag. ( actually occurs at just below 1)

A drag machine produces it's best power at around a TSR of .33, anything above and up to a TSR of 1 the power starts to fall off drastically.

Fun Stuff  
Ed

[IDEA FOR LENZ TURBINE](#) | 1 comment (1 topical, 0 editorial)

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## [Send a Greeting Card that fights Global Warming](#)

By [Brian in VT](#), Section [Classifieds](#)

[Wind](#)

Posted on Tue Dec 16th, 2003 at 02:04:49 PM MST

Are you searching for a card/present that allows you to tackle the largest problem of today while showing your loved ones that you care? TRY OUR GREETING CARD

Are you searching for a holiday card or present that allows you to tackle one of the largest environmental problems of the day while showing your loved ones how much you care for them?

TRY OUR HOLIDAY GREETING CARD - We have made it easy for you to send a holiday greeting card that combines your blessings with a 1/2 ton or more of Carbon Dioxide reductions, starting at just \$6 a card.

Avoid the seasons' consumerism and give the intangible gift of clean air instead.

Information on our WindBuilders sm Card can be found here:

\* <http://www.nativeenergy.com/WBCard.htm>

Help spread the word about global warming and keep a ton of carbon dioxide out of the air as part of your season's greetings!

Thanks and best wishes for the upcoming Holidays and a cooler 2004!

Sincerely,  
Your Friends at NativeEnergy!

145 Pine Haven Shore Road, Suite 1176  
Shelburne, VT 05482  
Tel: 802.985.9877  
web: [www.nativeenergy.com](http://www.nativeenergy.com)

NativeEnergy is a Shelburne, VT based renewable energy marketing company that provides simple and effective ways for individuals, businesses and organizations to fight global warming.

[Send a Greeting Card that fights Global Warming](#) | 1 comment  
(1 topical, 0 editorial)

Re: [Send a Greeting Card that fights Global Warmin](#) ([none](#) / [0](#)) ([#1](#))  
by [Hank](#) on Tue Dec 16th, 2003 at 02:48:30 PM MST  
([User Info](#))

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▪ <http://www.nativeenergy.com/WBCard.htm>

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Well I'll tell you, here I am in the Northeast, just like you, sitting on over a foot of ice covered snow and freezing my @#^% off.

I've been waiting for this Global warming for some time now so I can eliminate the need to heat my house thereby stopping the dumping of 12 tons of CO2 into the atmosphere each year. Has not happened yet.

Remebering back to the late 70's the fear was that we were heading into an ice age again. Has not happened either.

What's the next phobia?

[Send a Greeting Card that fights Global Warming](#) | 1 comment

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[WWW.WONDERMAGNET.COM](http://WWW.WONDERMAGNET.COM)

# Welcome to my world of renewable energy

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## DISCLAIMER

ELECTRICITY CAN KILL IF YOU DUPLICATE ANY OF THESE EXPERIMENTS AND GO UP IN SMOKE ITS YOUR OWN FAULT! IT ONLY TAKES 1 AMP TO KILL A HORSE. WIND DRIVEN PROPELLERS CAN REACH HIGH SPEEDS AND IF THERE BIG ENOUGH CAN TAKE YOUR HEAD OFF. LEAD ACID BATTERIES CONTAIN SULPHURIC ACID WHICH EATS CLOTHES AND CAN CAUSE SKIN BURNS/REACTIONS. YOU HAVE BEEN WARNED.

Thank you for dropping by and i hope you find the site interesting and informative. The site has been built using 1st page in easy mode so dont expect any flash things to happen because they wont. This site is all about small homemade wind generators, bike generators, hydro generators, lead acid batteries and some experiments in solar.....Enjoy!

My name is Sean i am thirty something live in the uk and read the

message board on [www.otherpower.com](http://www.otherpower.com) everyday. I have learnt a lot on otherpower where people will answer those unknown questions if they know the answers of course

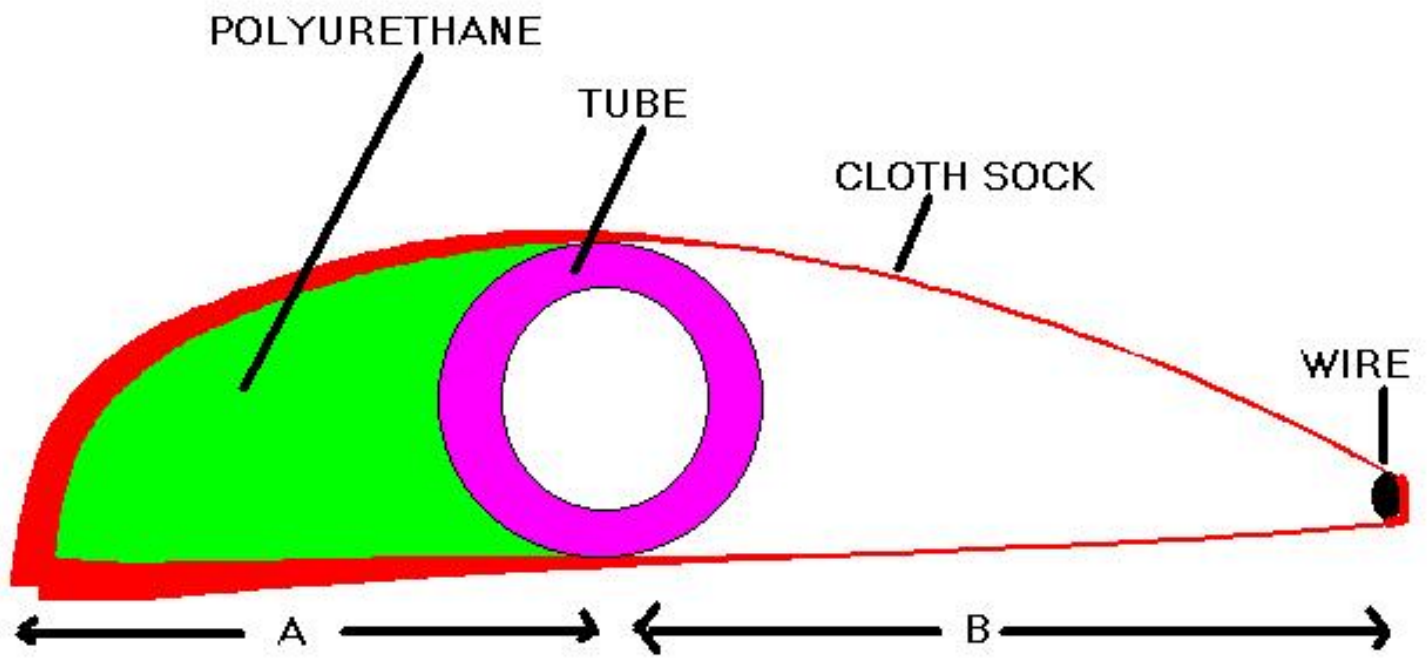
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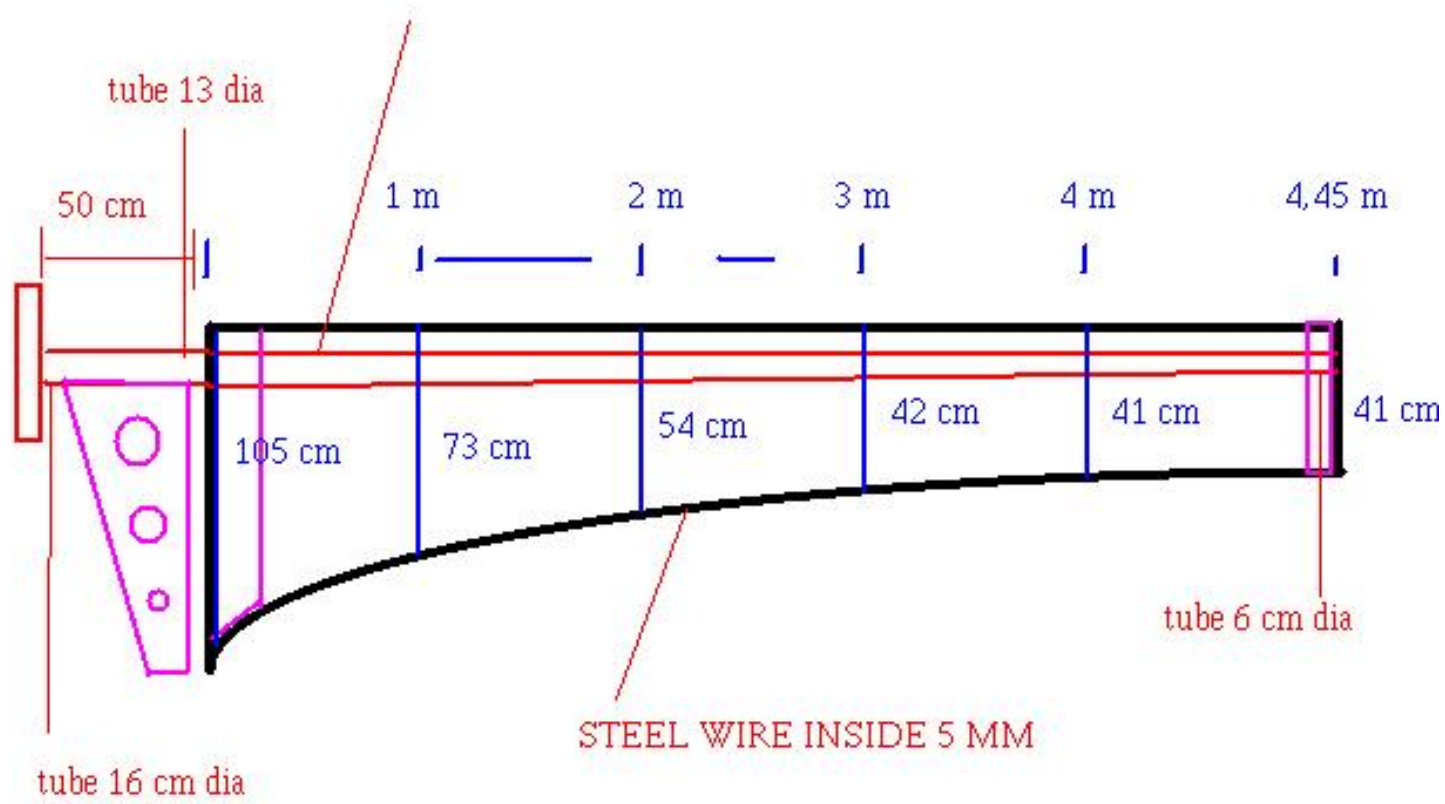


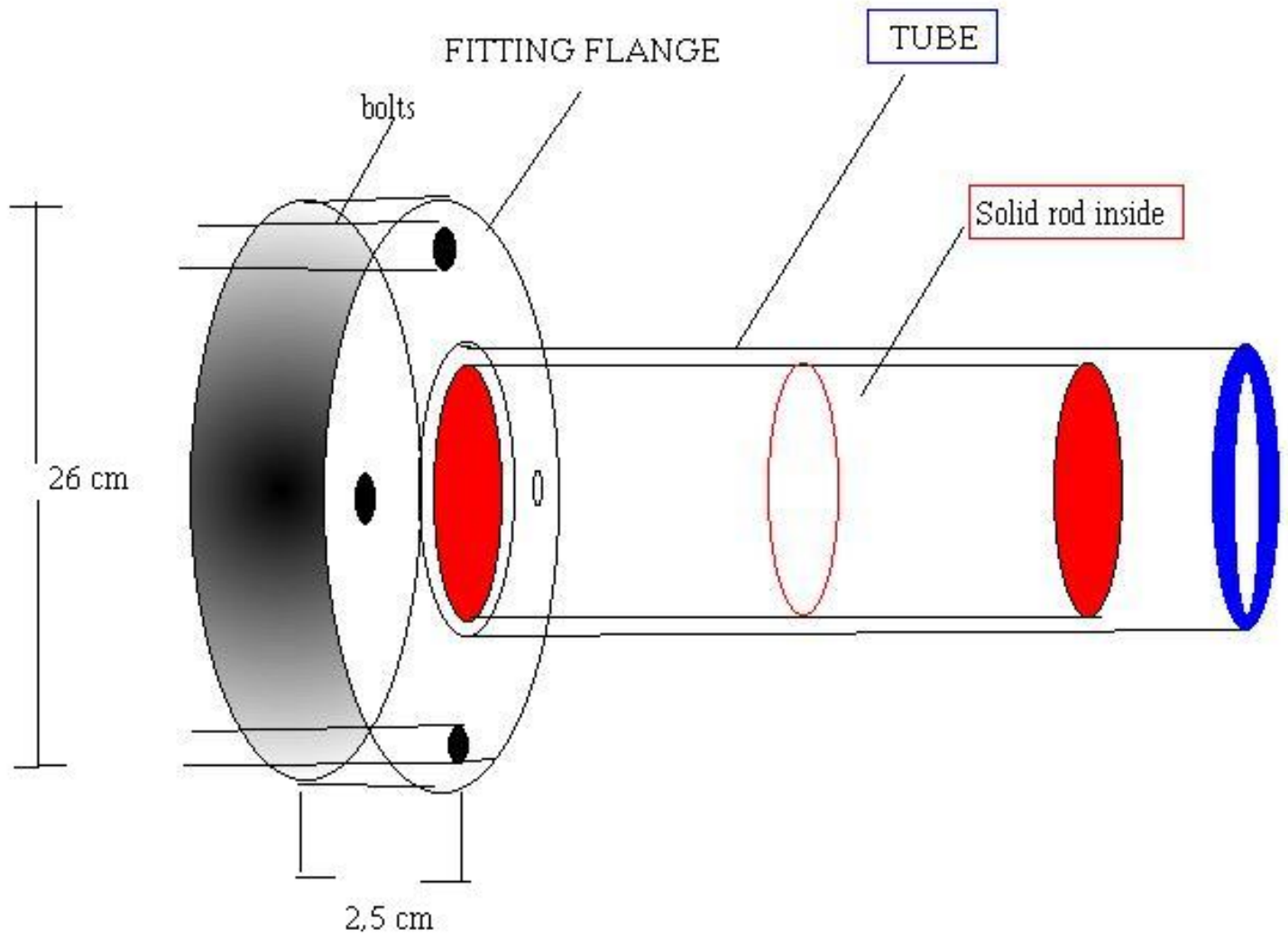


AIRFOIL SHAPE NACA

$A \approx \frac{1}{4} B$

THE TUBE IS IN THE THICKEST PLACE OF THE AIRFOIL











# A Water Pump using solar hot water as the power supply

## *General:*

The working of the pump is based on hot water and cold water inserted cyclically in an expanding and contracting aluminum tube.

Water is heated in a hot-water container using a solar panel and a heat-transformer.

## *The working cycle of the pump is as follows:*

- 1) Hot water is inserted in an aluminum tube. The tube expands because of the heat (about 2mm for each 1 m and 100 C temperature difference). The expanded tube pulls the piston upward. Hotvalve1 is open.
- 2) The hot water is taken out from the bottom of the tube back to the hot-water container. Hotvalve2 is open.
- 3) Cold water is inserted in the tube, which contracts pulling the piston back to its original position. Coldvalve1 is open.
- 4) The cold water is taken out from the bottom of the tube. Coldvalve2 is open.
- 5)=1) Hot water is inserted in the tube.

## *Notes:*

### Note1:

The efficiency of the machine is totally unknown, because this kind of engine has probably never been made before.

### Note2:

The power tube must be supported to prevent it bending.

At the same time it can be thermally insulated by putting it inside a tight wooden tube.

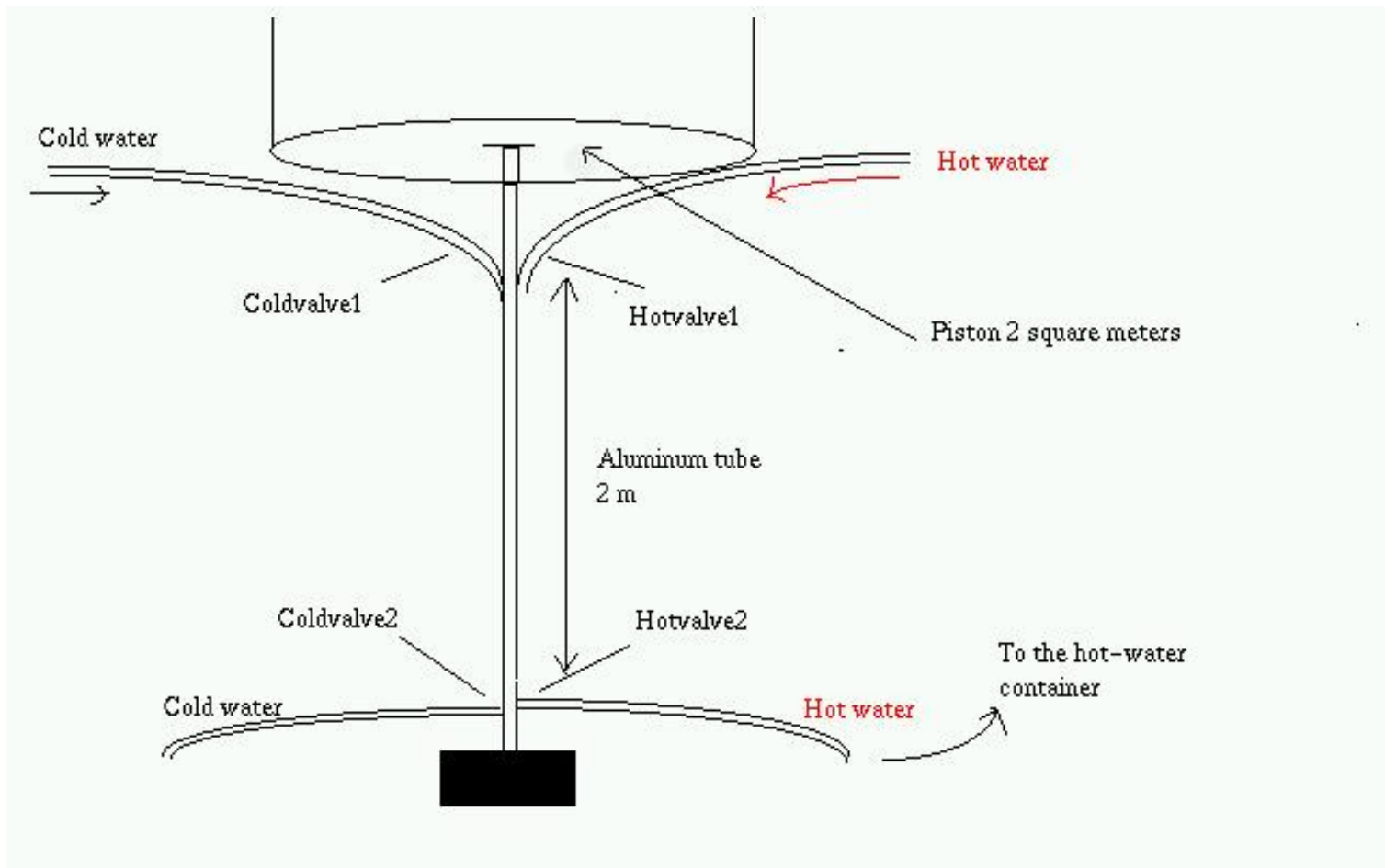
### Note 3:

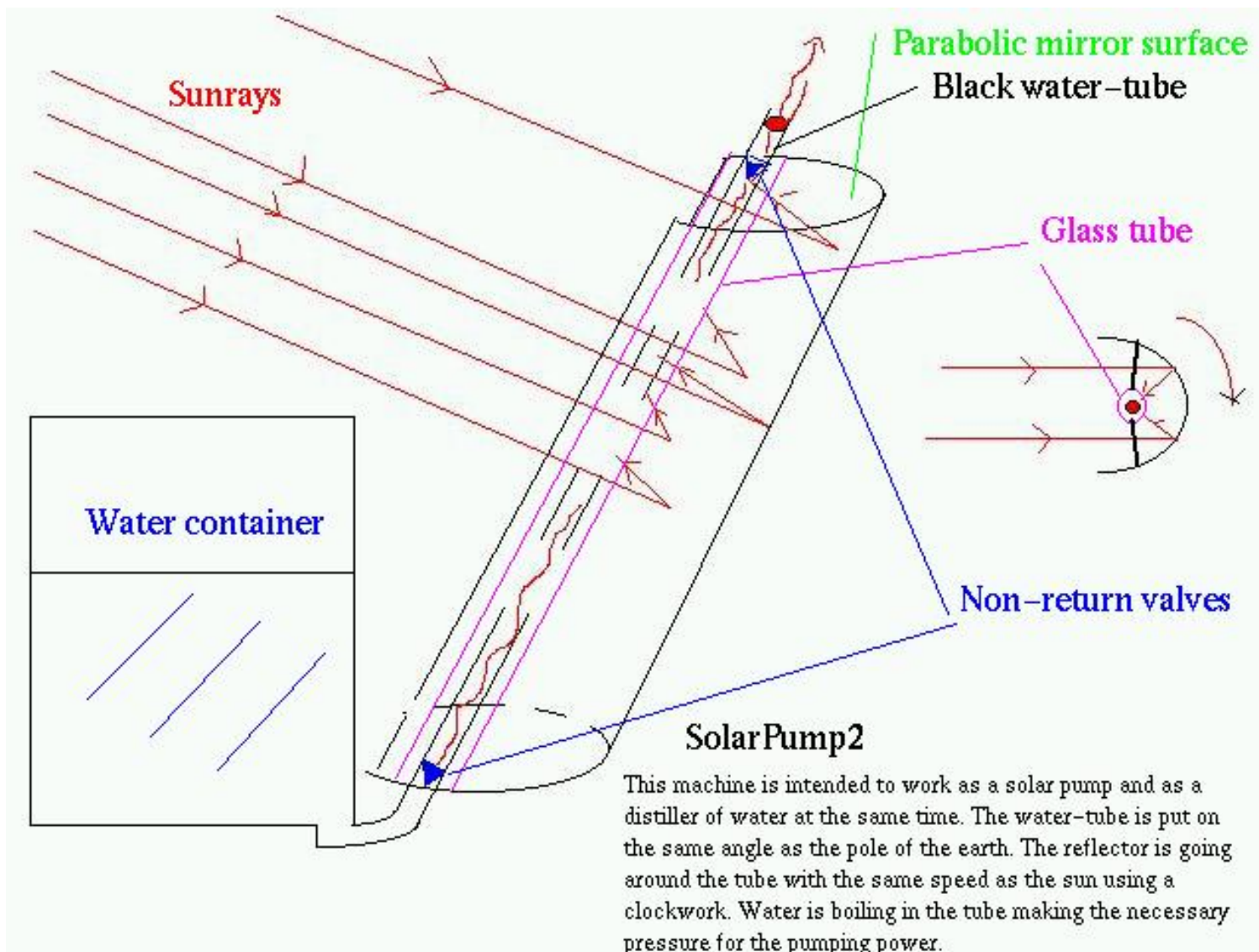
Various technical problems are yet unsolved. For example: does the metal tube fracture because of expanding-contracting cycle?.

### Note 4:

The operation of valves will be easiest to arrange using the power of the lifted water.







# THE AQUILIA SOLAR WATER PUMP

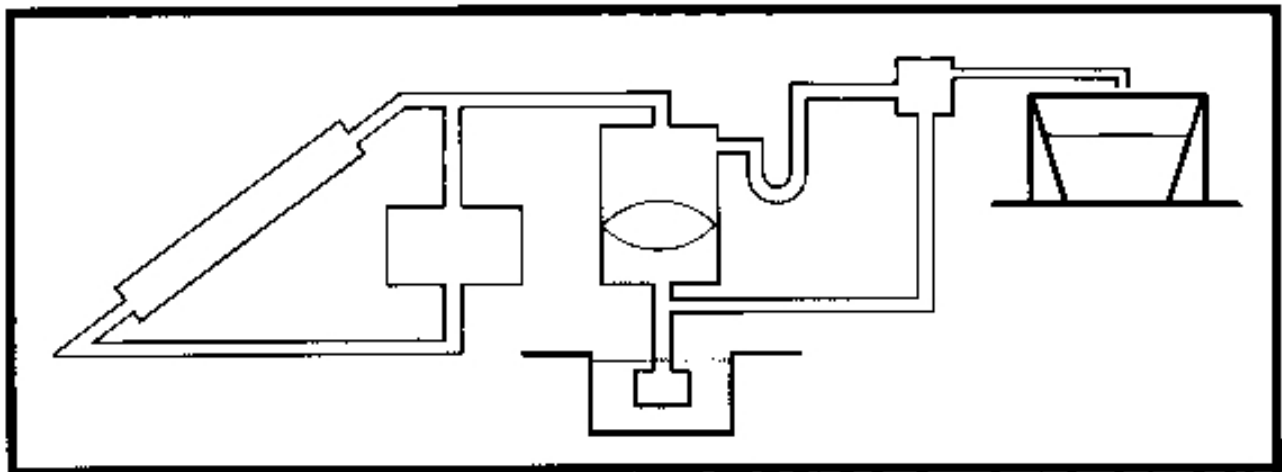
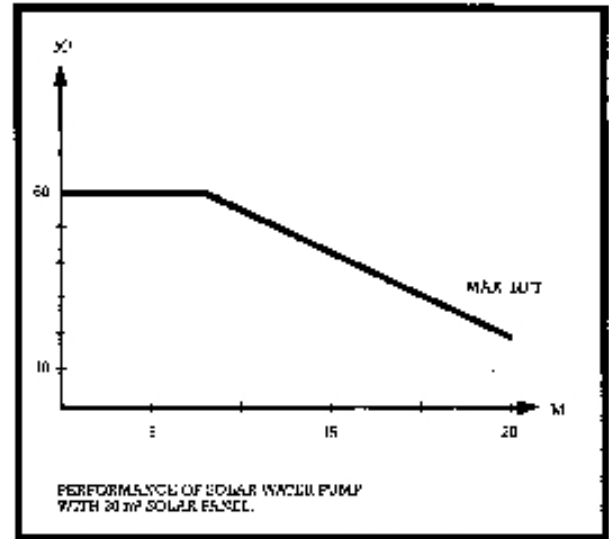
**The Aquilia Solar Water Pump is a unique, simple way of utilizing solar energy for pumping water.**

The system is self-contained and works independently of outside energy sources. All circuitry is enclosed within the system and requires no adjustment. The pump is highly reliable, requires little maintenance and has a long lifetime.

The Solar Water Pump combines suction and pressure to raise the water, which gives a maximum static head of 25 metres.

The Aquilia Solar Water Pump with a solar collector area of 16 m<sup>2</sup> fulfills the World Bank specifications for Category B and C, which are as follows:

Category B - 60 m<sup>3</sup>/day at a static head of 7m  
 Category C - 20 m<sup>3</sup>/day at a static head of 20m  
 with an irradiation of 5.5kWh/day



The system is filled with water only. During sunshine hours the water in the solar panels will be heated and steam will be generated. The steam forces the float in the pump house down. This pressure causes the foot valve in the well to close. The water from the pump house is forced upwards and runs through the condenser into the water tank.

When the steam level in the pump house reaches the bottom level of the steam tube, the steam escapes to the condenser because of

## TECHNICAL SPECIFICATIONS

Energy supply .....	The sun
Key components .....	8 solar collectors, water reservoir for solar collectors, pump house, steam control valve, stand

the difference in pressure. The steam immediately condenses, and a partial vacuum is created in the pump house, which opens the foot valve and water is sucked up from the well refilling the pump house.

*The equipment is manufactured to metric standards, any measurements other than metric are approximate and for comparison only. The company reserves the right to change the technical specification without prior notice.*



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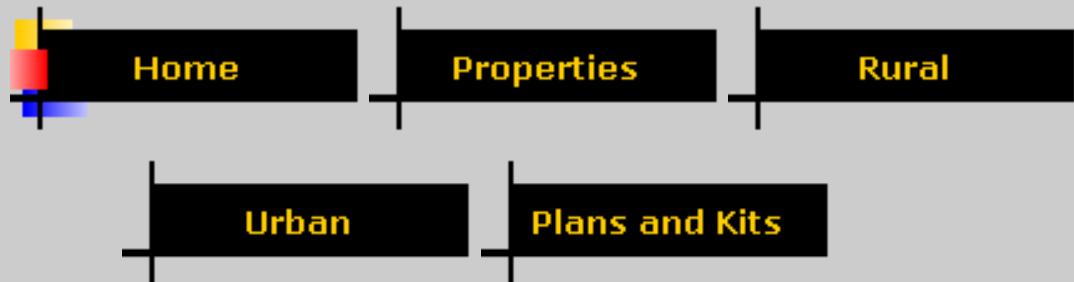






# Green Windmill

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Welcome to the **"Green Windmill"** web site.

Introducing a new vertical axis windmill design for urban and rural applications for home, lawn and garden.

Applications include: Domestic water pumping, pond aeration, fountains, garden irrigation, bird bath fountains, powered wind chimes, and wind driven lawn ornaments.

**Table of Contents:**



## ■ Home page

Description and diagrams of how the "Green Windmill" works

## ■ Properties

Unique features and applications of this new windmill design

## ■ Rural Applications

Illustrated applications for agriculture, aquaculture and remote homes

## ■ Urban

Illustrated applications for home, lawn and Garden

## ■ Plans & Kits

Description of plans and kits available

# "Green Windmill"

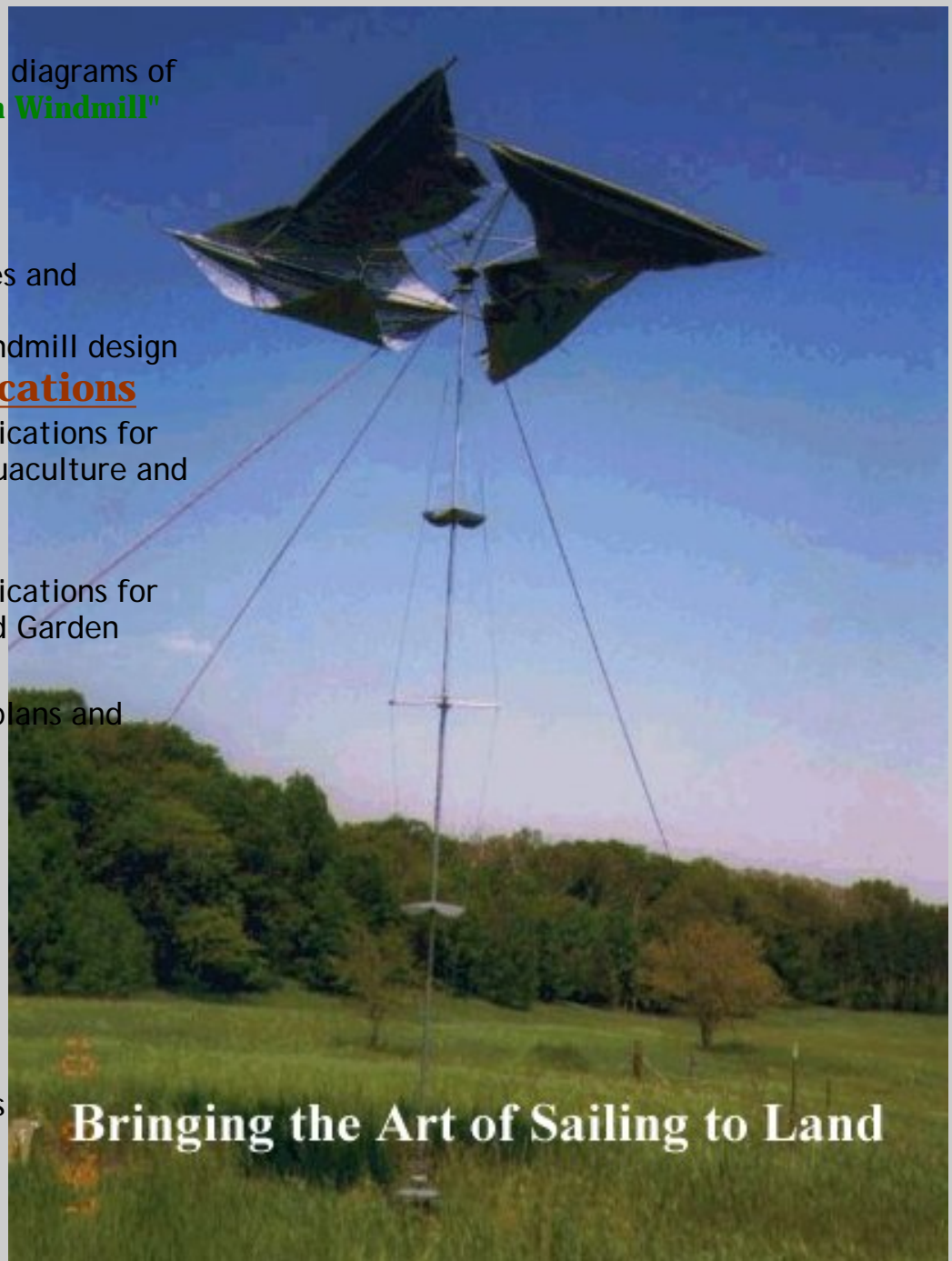
**US Patent #**  
**5,823,749**

The system consists of a horizontally suspended square rotor wheel with a square rim supporting

four sails that are linked by cables in pairs. The sails are not unlike boat sails except that they reside in a horizontal plane. The linkage of the paired sails control the sails to form preferred shapes as they revolve into and out of the wind. This control adjusts the sails in a symbiotic action that reduces friction and turbulence in the advancing sails and increases drag in the receding sails. The two opposing linked sails produce a scoop and a wing shape. The scoop holds the wind and the wing rides the wind. The linked controls additionally dampen the sail action to insure durability of the sails.

Because the rotor rides the wind, rather than bucks the wind, it requires minimal tower structures and is roof mountable.

The rotor is vibration free because the tower does not interfere with the rotor. The resistance to the wind and the force acting upon the tower is directly proportional to the work load. This design is very durable indeed. It has been shown to withstand wind speeds in excess of 70 MPH without damage. Load sensitive sail cables that break under

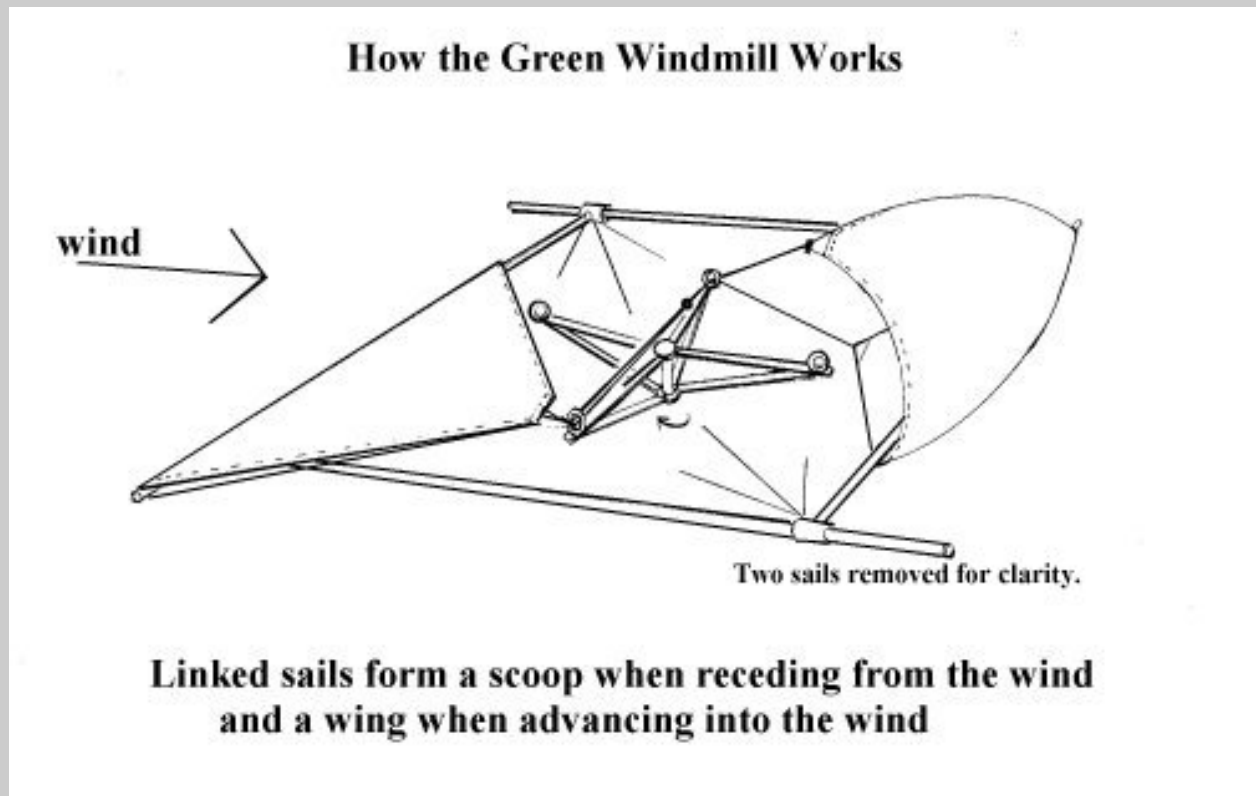


**Bringing the Art of Sailing to Land**

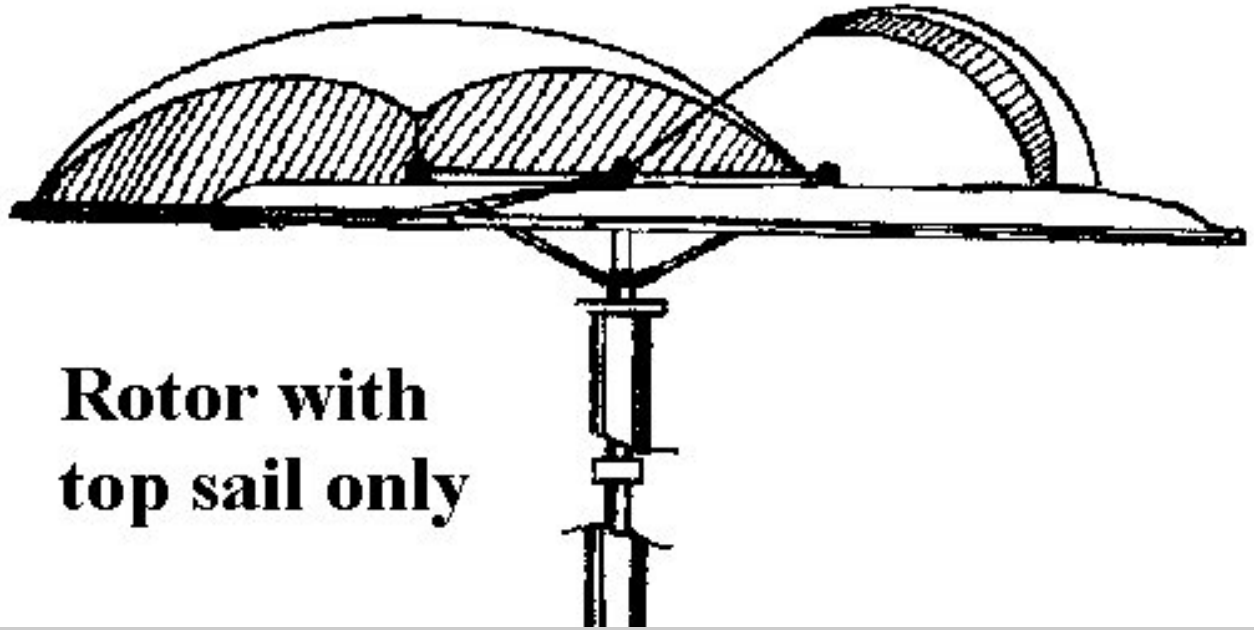


predetermined loads can protect sails, pumps and equipment in extreme conditions.

As will be seen in the following pages, there are many novel applications made practical as well as fun by this convenient and economical windmill design.



A choice of sails can be used for different performance requirements. Full sails such as the ones shown in the above illustrations produce high starting torque and slower speed. Half sails, in which only the top portion of the sail is employed, produces higher rotor speeds with lower starting torque. Different sail configurations can provide the right combination for a particular application.



Turn the page and see some of the interesting properties and applications created from this new patented design

[Properties](#)

[Rural](#)

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**-Already in 30 countries-**  
Extraordinary. Which works.



### Energy from Wind

Wind turbines turn wind energy into electricity and charge it into batteries for use. Man, who utilizes this free energy source, is independent. He is independent on electricity grid, on location, on tariff changes. But power production of wind turbines depends on conditions - on wind speed, turbulence and the changes of wind direction. Unfortunately the conditions are not always as optimal as in sales speeches. Most turbines don't simply work. There is one turbine, which works.

### Why Windside Turbine is the best on the market?

WS-Turbine works, when others don't, with gentle summer breeze and in a violent winter storm. It works, when others are in deep frost. WS-Turbine produces electricity at least 50 % more in a year than traditional propeller models. All the year round. Many things make it extraordinary. And therefore it gives the best value for the money. Not being expensive any more.

### Long-lasting

WS-Turbine produces electricity year after year, long after the others have been wrecked. It is made of special steel, aluminium, glass fibre/wood and stainless steel. Need of maintenance is minimum. It is investment for tens of years. Do not wonder, if it works in year 2100.

### On Nature's Terms

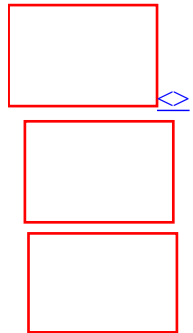
WS-Turbine doesn't keep noise. Doesn't kill birds. Soundless and safe Turbine can be erected in the middle of a population center, and even a child can stop it. Besides it's beautiful.

### Professional

WS-Turbine can be used, where electricity is needed and where the grid is not at hand. Or where power cuts are expected - or unexpected. The Turbine is used in ice fields of Greenland and sands of Sahara. It is used in extreme conditions. Used by professionals.

The Turbine gives light, heat and cold. Current for measuring systems. Water is lifted, signals given, areas guarded, spaces ventilated. In desert. On the ocean. On mountains. In lonely places. Far away. Where electricity is needed.

### Extraordinary. The Best.



## **Background**

Windside Wind Turbine was developed in 1979 by Mr. Risto Joutsiniemi. The Turbines have been made to order since 1982, and so far they have been delivered all over the world. Professional users have been the major customer group from the beginning. After the devices gained more publicity, the turbines were wanted also for civil purposes. The production plant is situated in Pihtipudas, Middle Finland, 400 km south from Arctic Circle.

## **Efficiency**

WS-Turbines are tested and rewarded. Measurements made a.o. on the circumstances of the Archipelago of Finland proved that WS-Turbine produced 50 % more electricity a year than traditional propellers with the same swept area. The average wind speed prevailing in the world is approx. 3 m/s. The special WS Vane Construction makes the Turbine able to utilize winds of 1-3 m/s, which is insufficient speed to others. The WS-Turbine works also in storms, tested in 60 m/s, which is unbearable speed to others. Both these WS-facts are World Records.

Besides the wind speed, will the turbulence and wind direction changes effect on the power production of the turbines. WS-Turbine is able to utilize winds from any direction, even turbulent winds, unlike traditional models. WS Spiral Vanes always reach the wind at right angles.

## **Harmony**

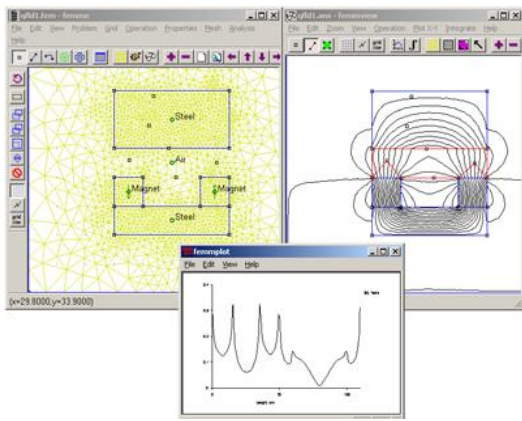
WS-Turbine is in harmony with nature and human environment. It is totally soundless due to the spiral shape and the fact that the rotation speed does not exceed the wind speed. There are no flying ice blocks, leaking oil or cutting blades. The device is safe to people, animals and nature.

Due to its beautiful design and smoothly rotating structure WS-Turbine resembles a work of art. Several artists as well as landscape and building architects have noticed this, and the results can be seen already in ecological building.

---

All available information on Windside Turbines has been  
included in these pages **[www.windside.com](http://www.windside.com)**  
*For further Information and Inquiries, Please contact our Distributors.*

**[Windside distributors](#)**

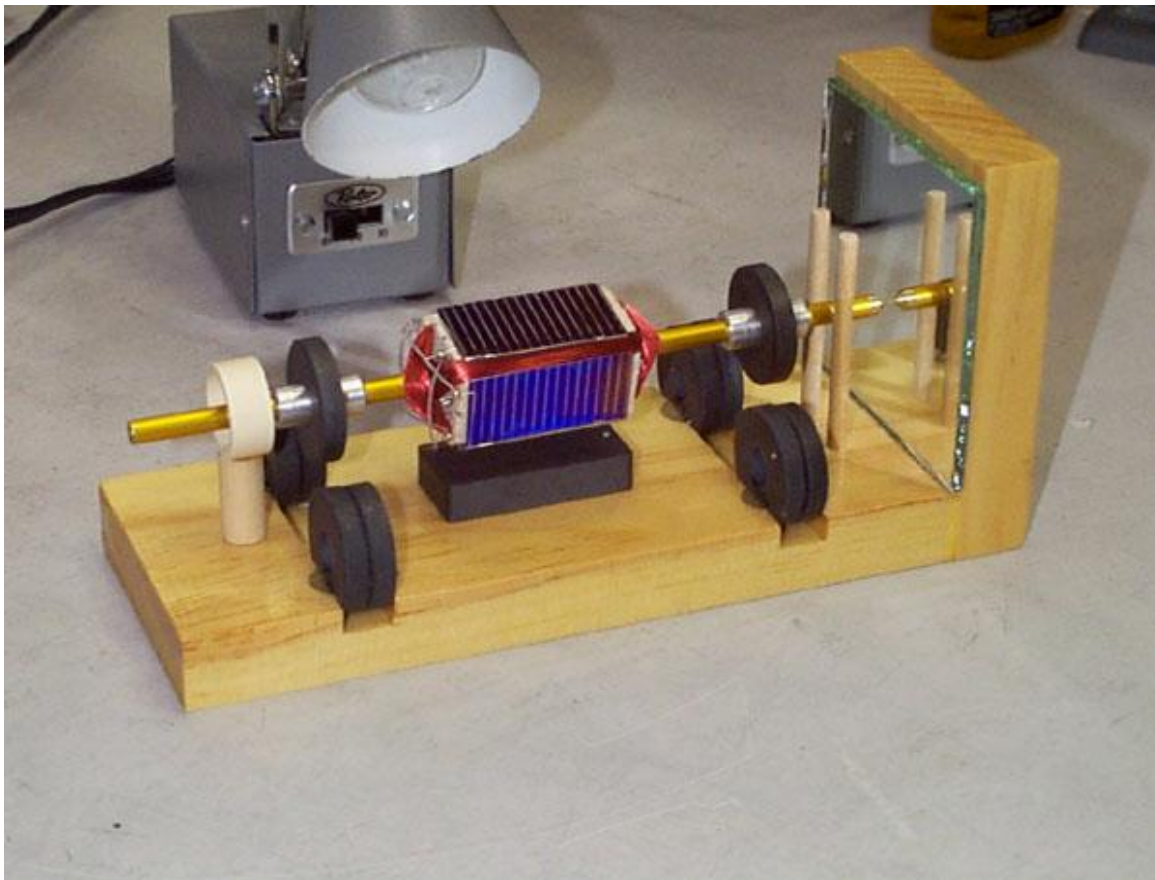


[NEW!! Building Generators- Principles 11/03](#)



[Newest Generator being tested...](#) *Info on High Voltage Wind Turbines*

**Note:** This web page has lot's of pic's - 7.8 min load time at 56k



[Mendocino Motors:](#) From the archives of my old hard drive I found this interesting picture.. It's a solar motor. Which is interesting by it's self, photon's direct to motion. But it's also being levitated by magnets! it's hovering!! I would imagine it rotates very slowly, but it's still very cool... Just found the a link.

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### Thoughts on the stages of human evolution

If we look throughout our human evolution we find one thing that has always stayed as a constant. The need for energy.

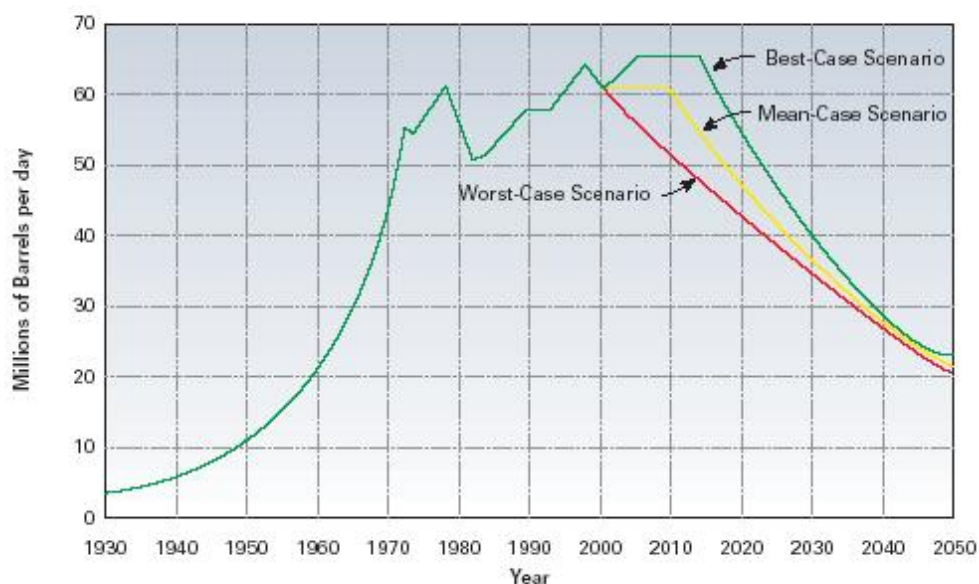
Our entire society is based on the consumption of energy, without which our computers, lights and heating and cooling systems would not function without. So the larger question which everyone should ask is, what is the next evolution or paradigm shift that will occur in human evolution. We have been through the stone age, bronze age and steel age. We have been and are still now in the information age. What's next?

## Welcome to the Energy Age!

We are coming very rapidly to a major crossroads. Our dependence on fossil fuels cannot last, we know this. In the mean time, alternative energy sources must be sought with vigilance. The "space age" cannot be achieved until we overcome the energy age. We require such vast amounts of energy to launch a single vehicle into space that costs are extravagant in the extreme to do it. We need alternative fuels and alternative energy.

From a book entitled- The party's over- Oil, War and the fate of industrial societies- Richard Heinberg 2002-.C.J Campbell draws this graphic.

### World Oil Production: 1930-2050



Source: C.J. Campbell / adapted from *The Party's Over*

World petroleum production is at a peak and about to start its decline. The plots indicate a peak in global oil production somewhere between 2006 and 2015.

*The Party's Over: Oil, War and the Fate of Industrial Societies*, Richard Heinberg, paperback, 288 pages, ISBN: 0-86571- 482-7 • info@newsociety.com • www.newsociety.com

### Notes: Taking the long route to conversion

Chemical energy of coal is converted into thermal energy as it burns. The thermal energy is absorbed by water and produces steam. Steam is directed against the blades of a turbine, converting the thermal energy into kinetic energy. The kinetic energy of the turbine rotates a generator which converts the mechanical energy to electrical energy. This proves it is inefficient! Energy should be put to work in as direct a manner as possible. The long route of changing energy through several stages is costly and wasteful.

## Energy Conversion Matrix

To From → ↓	Electromagnetic	Chemical	Nuclear	Thermal	Kinetic (Mechanical)	Electrical	Gravitational
Electromagnetic		chemiluminescence's (fire flies)	Gamma Reactions (Co60 source)	Thermal Radiation (hot iron)	Accelerating Charge (cyclotron)	Electromagnetic Radiation (TV, Radio Transmitter, electroluminescence)	Unknown
Chemical	photosynthesis (plants, photochemistry, photographic film)		radiation catalysis (hydrazine plant, ionization, cloud chamber)	boiling (water/steam, dissociation)	dissociation by radiolysis	electrolysis (production of aluminum)	unknown
Nuclear	Gamma-Neutron reactions	Unknown		unknown	unknown	unknown	unknown
Thermal	Solar Absorption	Combustion (fire)	Fission (fuel element) Fusion		Friction (brake shoes)	Resistance Heating (electric stove)	unknown
Kinetic	Radiometer (solar cell)	Muscle	Radioactivity (alpha partials)	Thermal Expansion (turbines, Internal Combustion engine)		Motors Electrostriction (sonar transmitter)	Falling Objects
Electrical	Photo electricity	Fuel Cell Batteries	Nuclear Battery	Thermoelectricity, thermionics, thermo magnetism, ferroelectrics	MHD (magnetohydrodynamics) Conventional Generator		unknown
Gravitational	unknown	unknown	unknown	unknown	unknown (mass drive)	Rising Objects (rockets)	

### The four physical expressions of energy are; Radiated, Reflected, Deflected & Absorbed

---

Presently, there are seven known methods for **producing a voltage or electromotive force -EMF**

1. **FRICITION** Voltage produced by rubbing certain materials together.
  2. **PRESSURE** (piezoelectricity) Voltage produced by squeezing crystals of certain substances.
  3. **HEAT** (thermoelectricity) Voltage produced by heating the joint (junction) where two unlike metals are joined.
  4. **LIGHT** (photo electricity) Voltage produced by light striking photosensitive (light sensitive) substances.
  5. **CHEMICAL ACTION** Voltage produced by chemical reaction in a battery cell.
  6. **MAGNETISM** Voltage produced in a conductor when the conductor moves through a magnetic field, or a magnetic field moves through the conductor in such a manner as to cut the magnetic lines of force of the field.
  - 7) **MAGNETIC INTERRUPTION** - Voltage and current is produced when both magnet and wire are stationary and interrupted momentarily by shielding. This is different from above with exceptions.
  - 8) Other unfound and experimental
- 

### Methods for obtaining energy

- Wind Turbine
- Solar
- Thermal & Geothermal
- Water Turbine
- Chemical & Biological

- Nuclear
  - Gravitational
  - Other Sources
- 

## Energy Producing Devices

Headings:

**Wind**

**Solar**

**Thermal**

**Chemical**

**Nuclear Fusion**

**Nuclear Fission**

**Gravitational**

**Other Sources**

**Negative Resistance**

[http://www.st-andrews.ac.uk/~www\\_pa/Scots\\_Guide/RadCom/part5/page1.html](http://www.st-andrews.ac.uk/~www_pa/Scots_Guide/RadCom/part5/page1.html)

<http://jnaudin.free.fr/cnr/>

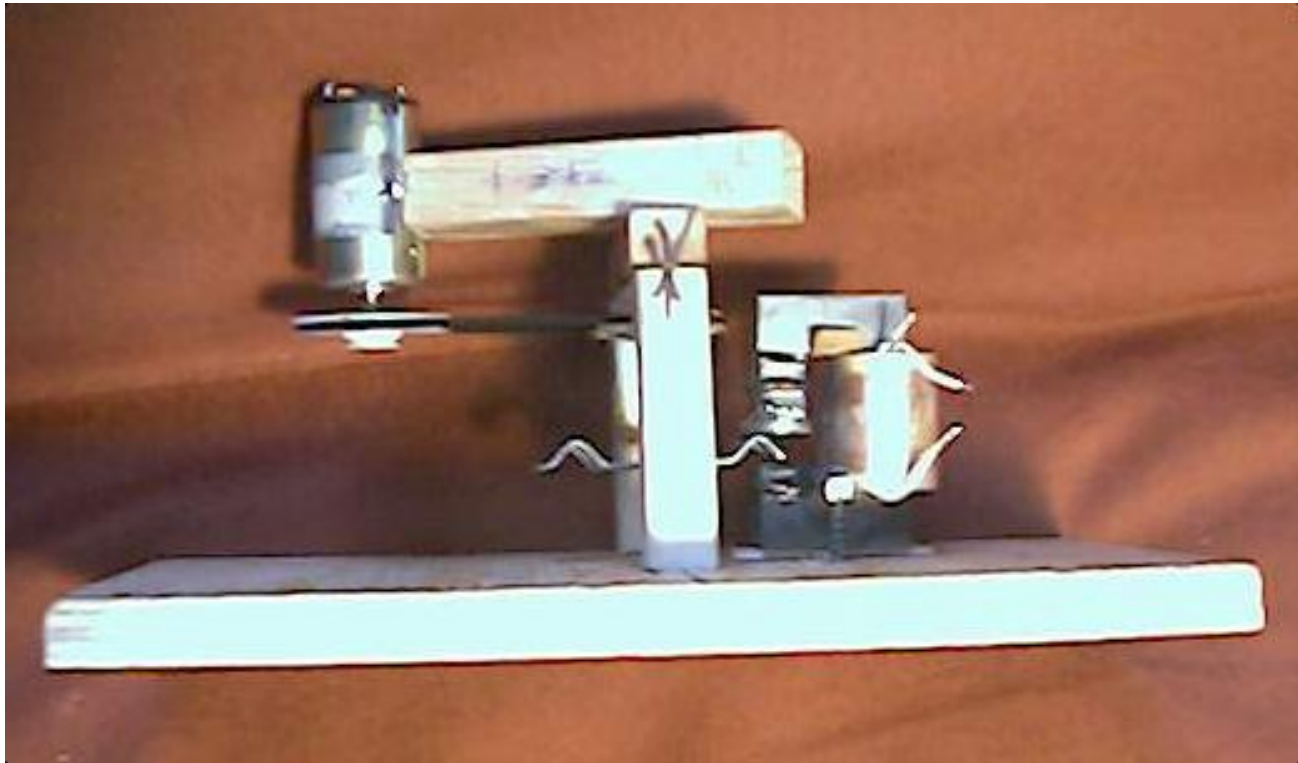
This web page will be updated from time to time..

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# MSIG - Magnetic Shaping and Interruption Generator

Created July 26-2003



Prototype

Working

## MSIG

### The Magnetic Shaping and Interruption Generator

**A totally new concept of power generator.**

#### Proof Of Concept

Built and invented by Fred of [www.internetfred.com](http://www.internetfred.com). on Saturday July 26, 2003. After reading "Basic Physics - for secondary schools" by Eubank-Ramsay-Rickard 1957. Chapter 22 of the book discusses magnetism.

**Note:** There are other interruption generators out there, but not like this one!

I have visited many web sites and looked at other designs on the internet, suggestions of using MU-Metal (magnetic shield material -expensive) or core rotation to cause interruption or shielding the magnet for a moment from a core produces a voltage-current using a core and permanent magnet embedded in the core. However, not one of the designs proposed the concept of "Magnetic Shaping for the purpose of interruption", this is the uniqueness of the idea that I have come up with and to my knowledge and as far as I know has not been done in this way before.

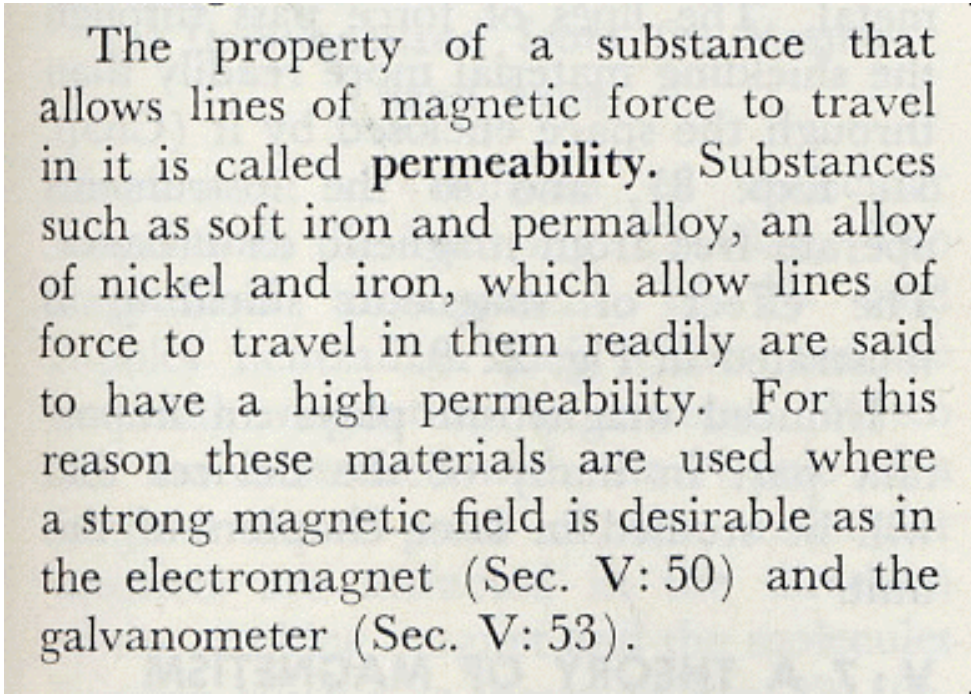
This week I was just scanning a basic physics book looking under magnetics when I came upon some interesting information which struck me as odd. It's not really that odd but the thought that I had required

immediate attention and experimentation.

When building a power generator we normally think in terms of moving the magnets or moving the core, but what if both were stationary? Would the generator produce output... no. What if the magnet was embedded in the core, would that produce output.. no... Ok, then what if the core was magnetically interrupted with a magnet embedded in the core, would that produce an output ??? That is what I'm finding out....**The answer is YES!!!**

**There is a third way in which to produce power in a generator!!**

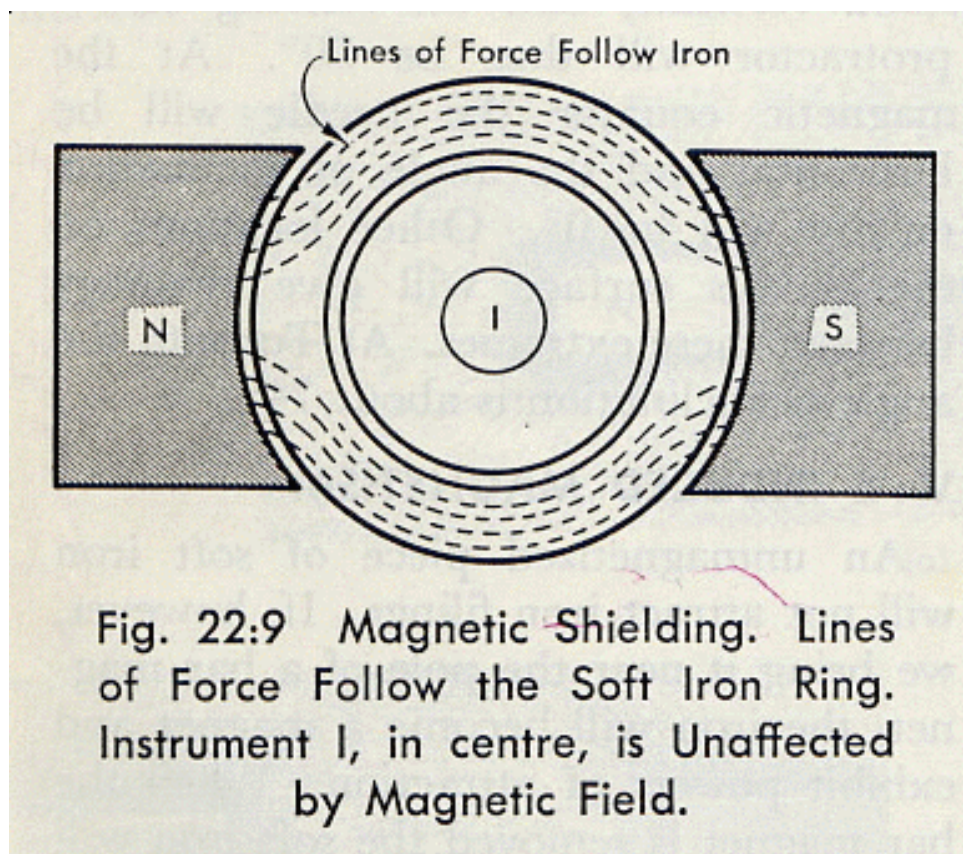
**On page 263 of the book the following description was given for the property of permeability.**

A rectangular box containing text from a book. The text describes the property of permeability, stating that it allows magnetic force lines to travel through a substance. It mentions that substances like soft iron and permalloy (an alloy of nickel and iron) have high permeability and are used in electromagnets and galvanometers.

The property of a substance that allows lines of magnetic force to travel in it is called **permeability**. Substances such as soft iron and permalloy, an alloy of nickel and iron, which allow lines of force to travel in them readily are said to have a high permeability. For this reason these materials are used where a strong magnetic field is desirable as in the electromagnet (Sec. V: 50) and the galvanometer (Sec. V: 53).

**On page 264 the following image describes the effect of magnetic shielding, VERY INTERESTING!**





**What this means is that a magnetic field can be shaped, focused, diverted etc... And that is the key!**

I never really thought of magnetics this way before and after seeing this picture it hit me that this was unique and had not yet been tried before, to my knowledge. The shape determines where the magnetic field will ultimately be focused.. Very neat!

In order to protect such instruments they are frequently enclosed in a magnetic shield of some highly permeable metal. The lines of force pass through the shielding material more readily than through the space enclosed by it (Chap. 31, Exp. 8), and so the instruments operate free from magnetic disturbance. The effect of magnetic shielding is illustrated in Fig. 22:9.

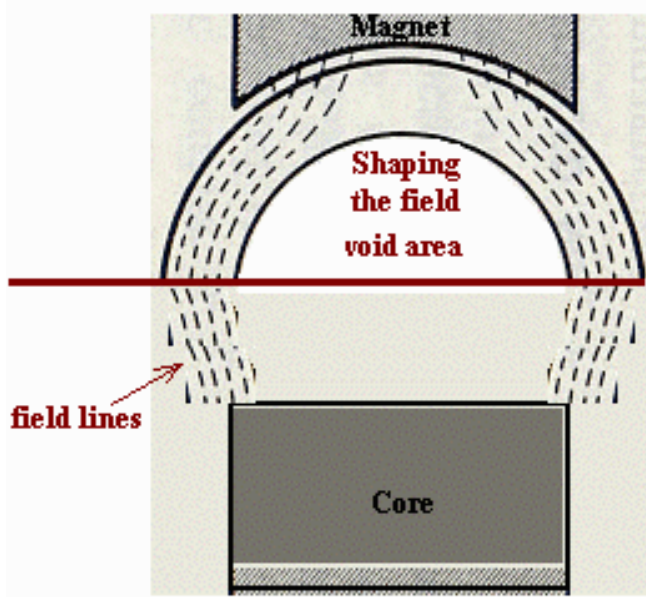
**Ok, so now we have the basic theory and basics of magnetic shaping, now what can we do with it?**

**As soon as I seen this I thought of a new generator.... The rest as they say is history...**

---

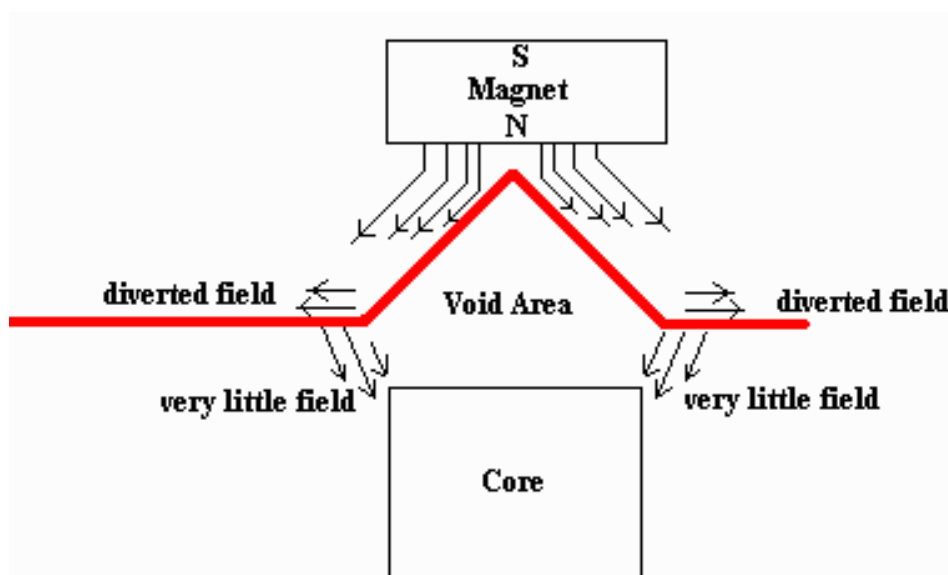
**As I began playing with the idea of shapes....**

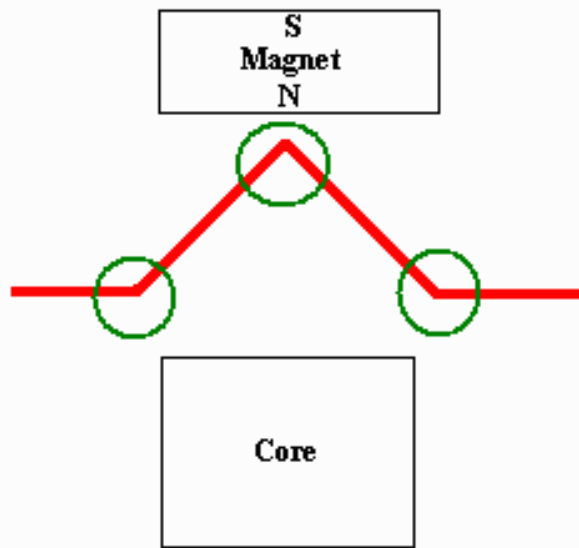




This shapes the field, however the field is being redirected back at the core. Not right.. I wanted almost total diversion of the field. Shielding by diversion. This allows to much field to escape downward into the core, causing magnetic resistance.

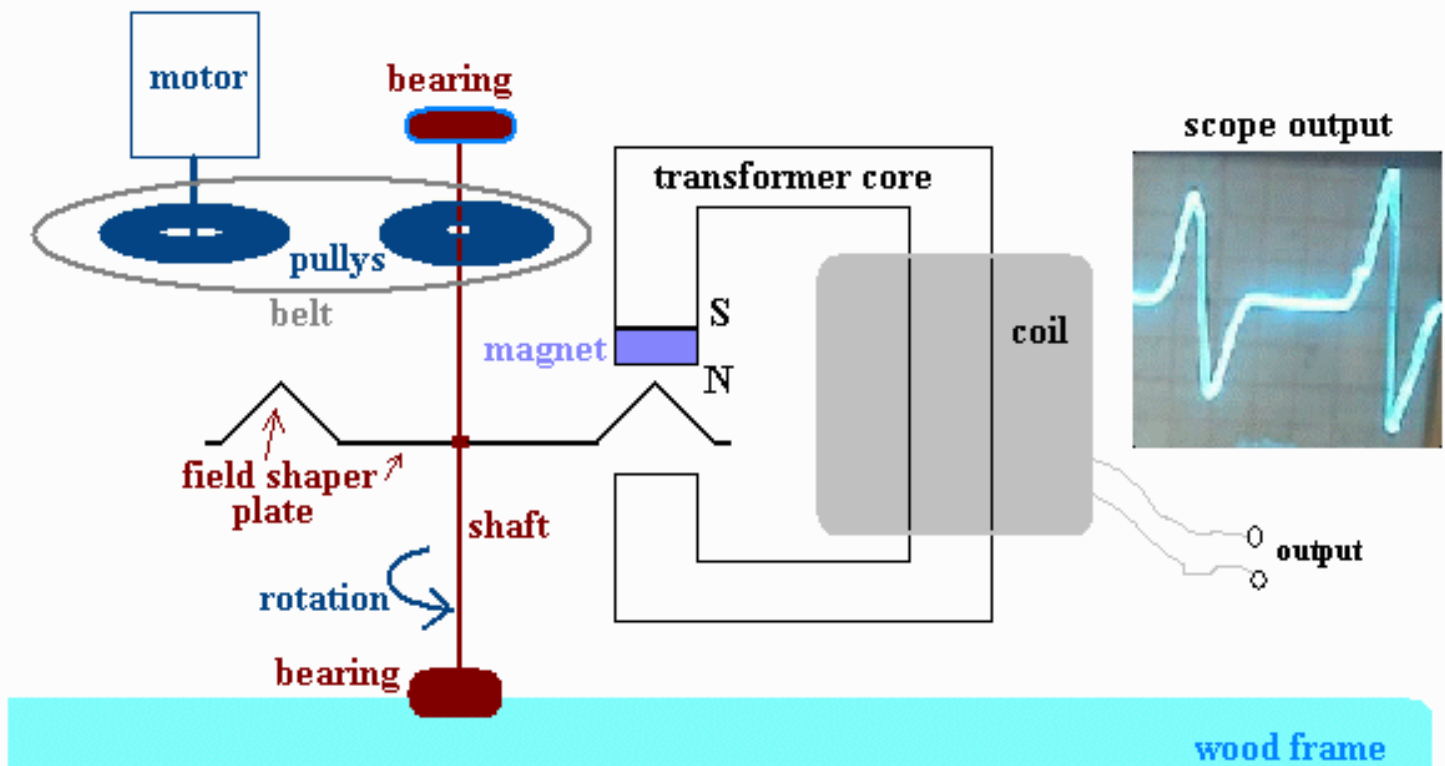
After about a dozen different designs, the secret lies in the concept of divide and conquer. The shape chosen for my final design is the tri-angle. It uses very little magnetic field strength to move through the field, only the tip of the tri-angle is really exposed to the magnet and since it slopes the total surface area available to the magnet and the magnetic field is a small percentage, but the field cannot penetrate through it, so it follows it, which leads outward and away from the core, this produces a total collapse of the magnetic field for a moment during it's rotation. It turns out that a simple design is the key to the success of this generator.



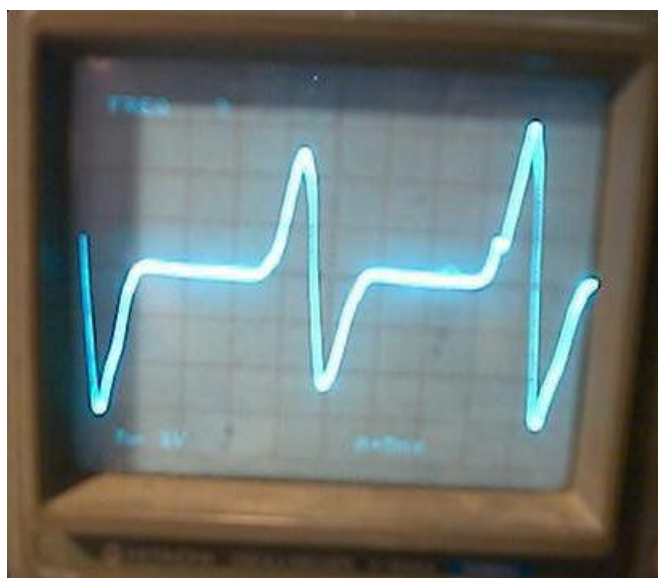


**The surface area's of greatest magnetic contact and drag marked in Green**

Much better, notice the shaping of the field. This produces very little resistance to both air flow as it swings around and magnetic drag by being pulled up or down. In fact the momentum will help it along. The angle of this triangle is what is important. Too steep and the void area might get too much field or too much surface area. Too sharp an angle would mean a larger gap reducing the output. This has to be played with to get it right yet.

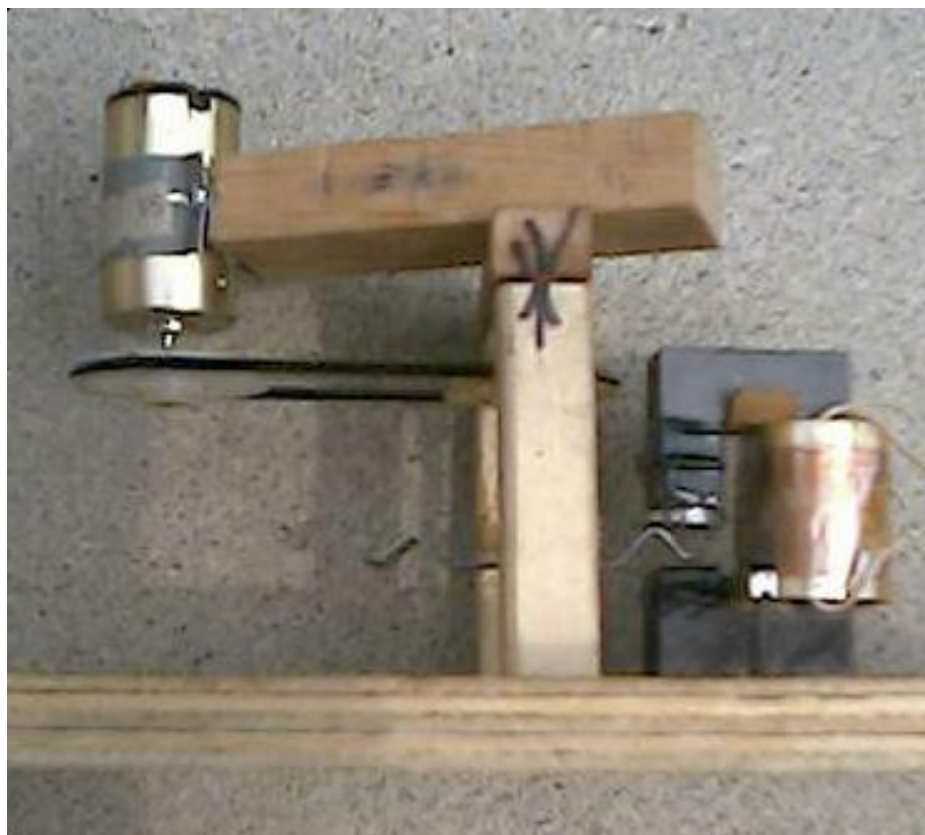


**The magnetic field is shaped and diverted. As the shaft rotates it interrupts the static magnetic field in the gap and produces a voltage & current. This is a new concept - By Fred  
www.internetfred.com**



1v/div

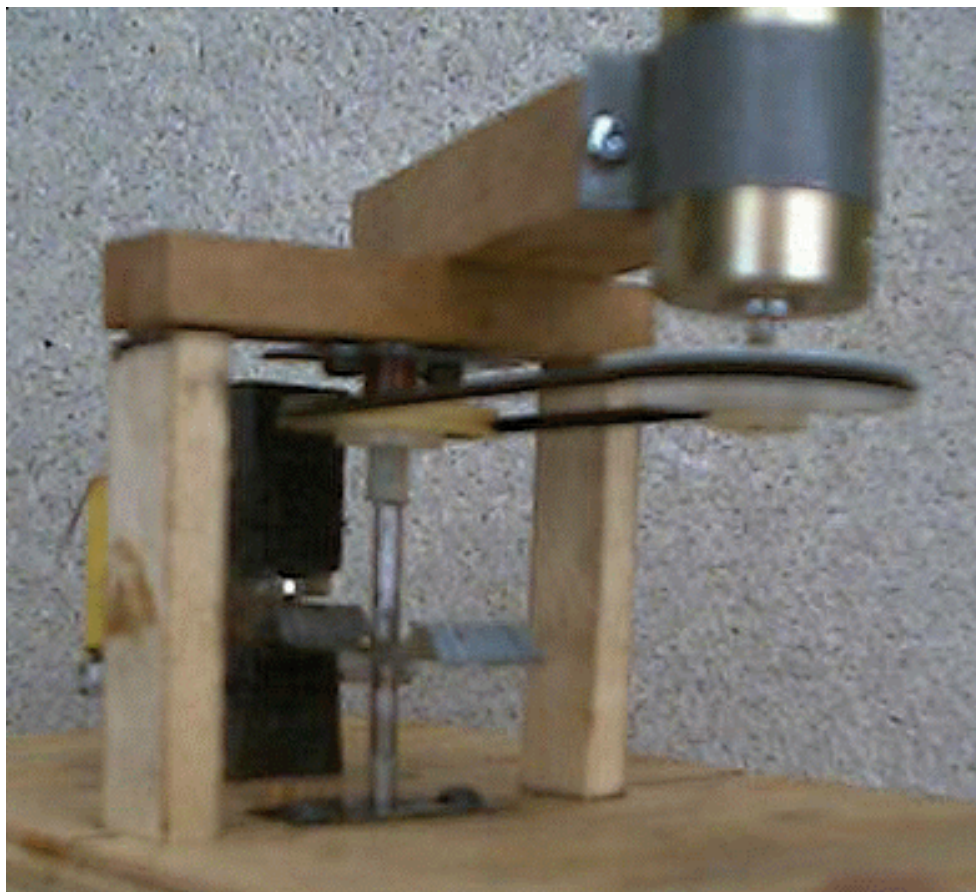
**My Scope Says.... We have output from a static field without rotating the magnets or the field !!!!!**



The core is a transformer I sawed and cut a notch out of.. I then glued a magnet to the top of the cut and taped it together. I left the original coil core alone so I could use it for testing.. The metal field shaper is an old unused slot cover from a computer. In the back these slots are removed when installing hardware cards.. I then bent it to my shape and soldered it to the metal shaft. The pully's where glued.

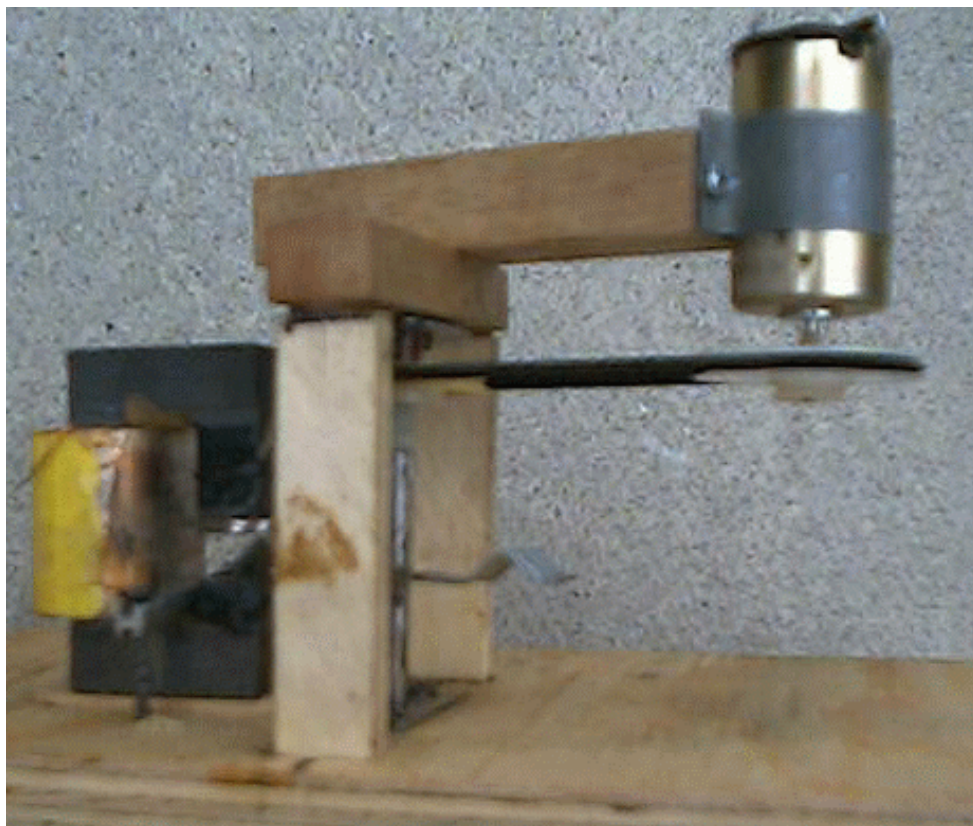


Top view

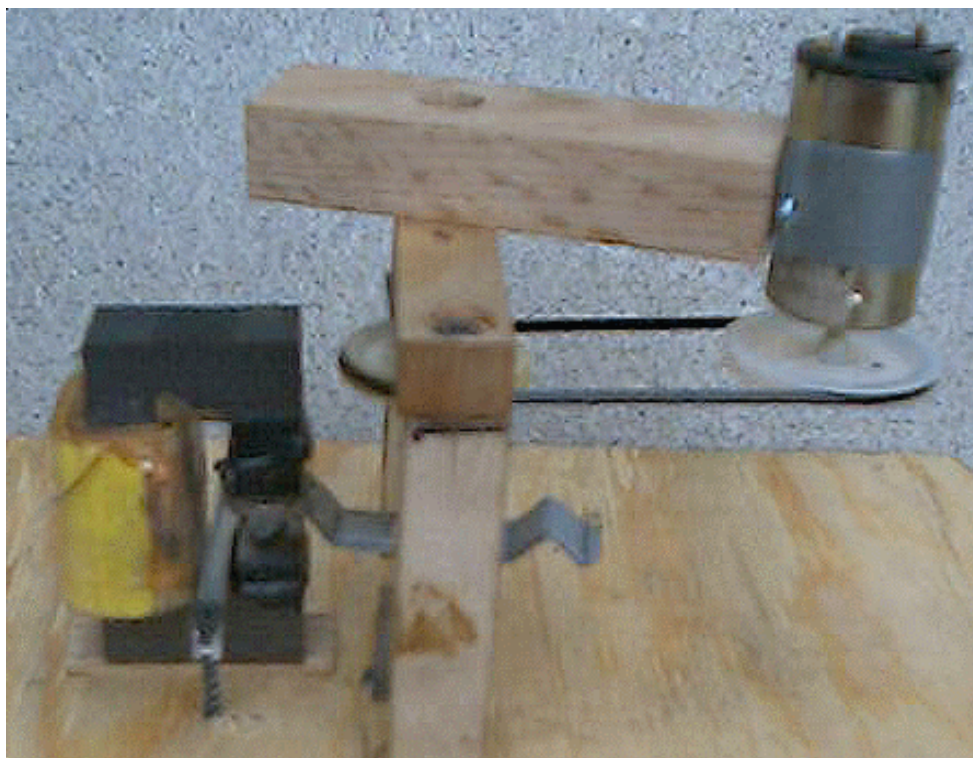


I used bearings from an old VCR to hold the shaft in place. The rest is just simple pieces of metal and wood to hold everything together. The motor is just a simple 12VDC Motor. The pully's came from old VCR's as did the motor. I use a lot of old VCR parts when building, there are so many goodies to find inside them.





The transformer I just had laying around, I removed one of the coils (where the gap is now) and then cut the gap with a hack saw, I then ground it with a file to straighten it all out.



So, now I am in the testing stages..

## The Motor Tests

The motor drains about 200ma stable and does not change much, the motor was put on a variable power

supply and checked for voltage and current simultaneously. As the voltage increased from 4.3 volts DC to 12 VDC the current went from 200 to 275 ma. It did not go above this and the motor in general tended to stay and stabilize around 200 ma nominal. So the swing was not that great. If I locked the motor the meter went to 301ma.

Now, here is the interesting part, no matter if I shorted out the output coils or if I applied any load, no matter how large, the motor shows NO CHANGE ON LOAD!!! In voltage or milliamps. Nothing.. The motor senses no load!!!! No fluctuations.. To verify this we put another magnet under the motor and as soon as we did this the motor began slowing down and the milliamps went up.. So our measurements were confirmed. There was no load during shorting of the output coils.

I do not have RPM gauge but I estimate the motor speed to be between 2000 and 7000rpms for this 12 volt DC motor.

## The Coil checks

There are two coils on the core...

The first coil has smaller wire and many turns, has 14.4 ohms. At motor running 12 volts this coil produces 3.4 volts at 10ma.

The second coil reads 1 ohm. With the motor running 12 volts the output on the coil was .500 or ½ volt and the current was 100ma.

We did run 2 LED's off the output coils at 12 volts no problem, not bad for this size generator and for what I was doing.. As far as concept and ideas are concerned the "proof of principle" works... Need more research. It is both a current and voltage device since it is a transformer.

### Notice about the device and using the idea

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<http://www.fsf.org/copyleft/fdl.html>

I freely give this idea and the device to you to do whatever you wish with it, it is considered freeware. I ask only that you send me a link or picture of your devices should you decide to build one.

**[Click>> To read the www.fieldlines.com message board for more information!](#)**

Visit - <http://www.overunity-theory.de/> Visit this web site for the brown-ekland design.

I hope others verify my results, I will be more than happy to post your link here should you decide to, on this page! [Contact](#)

Thanx!!! [Home Page](#)

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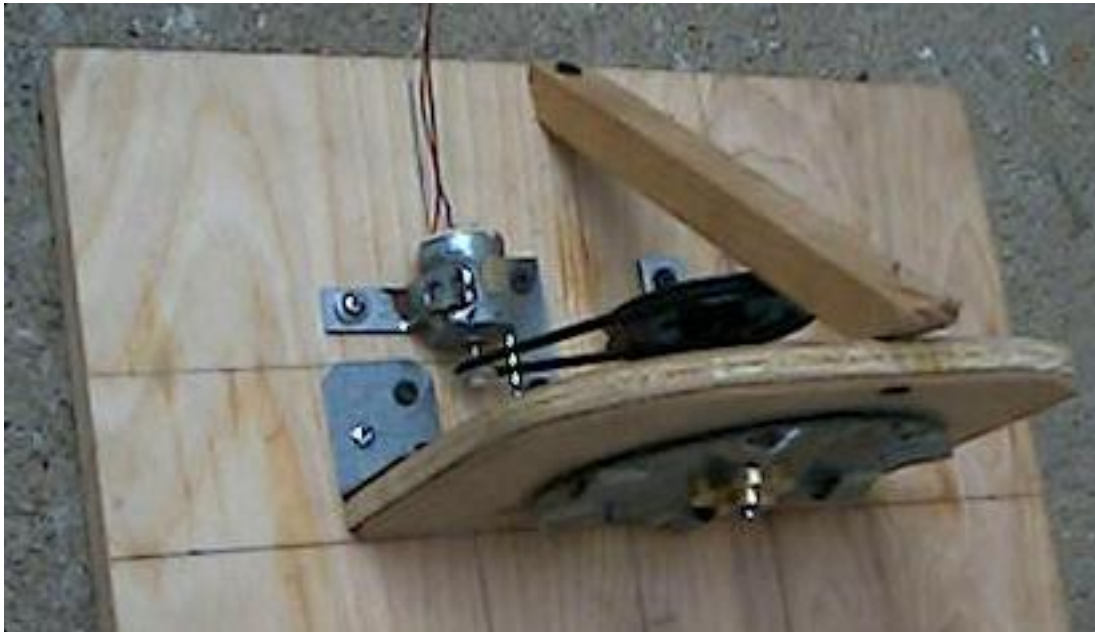


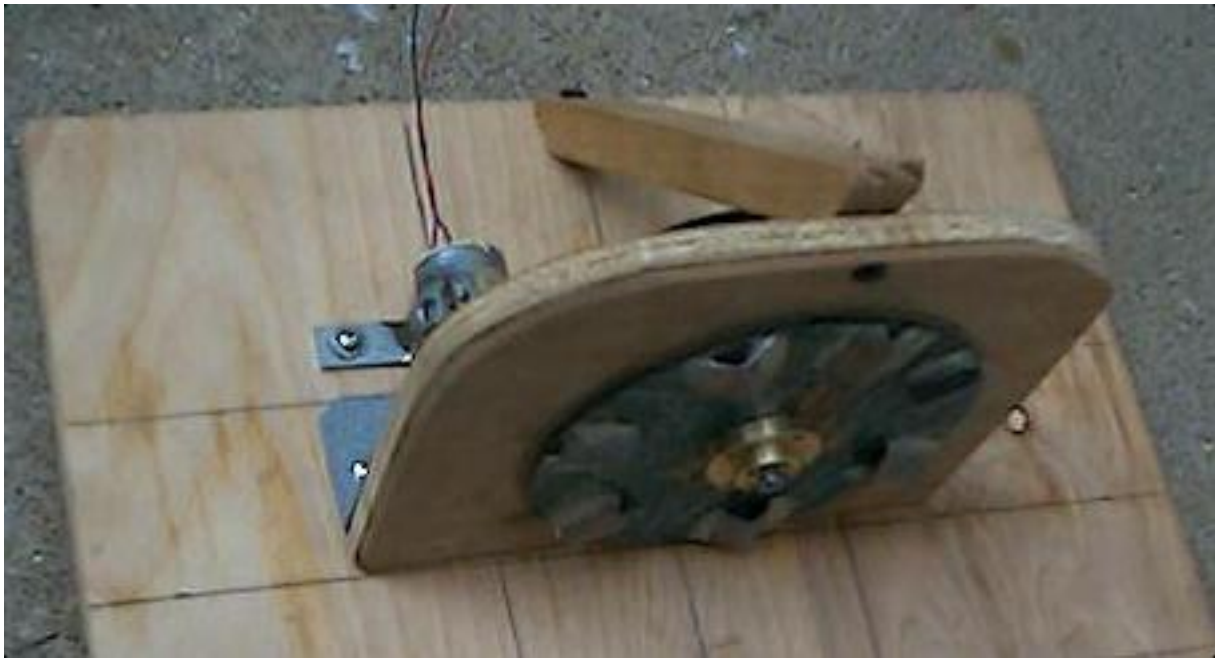
**Under Construction.....**

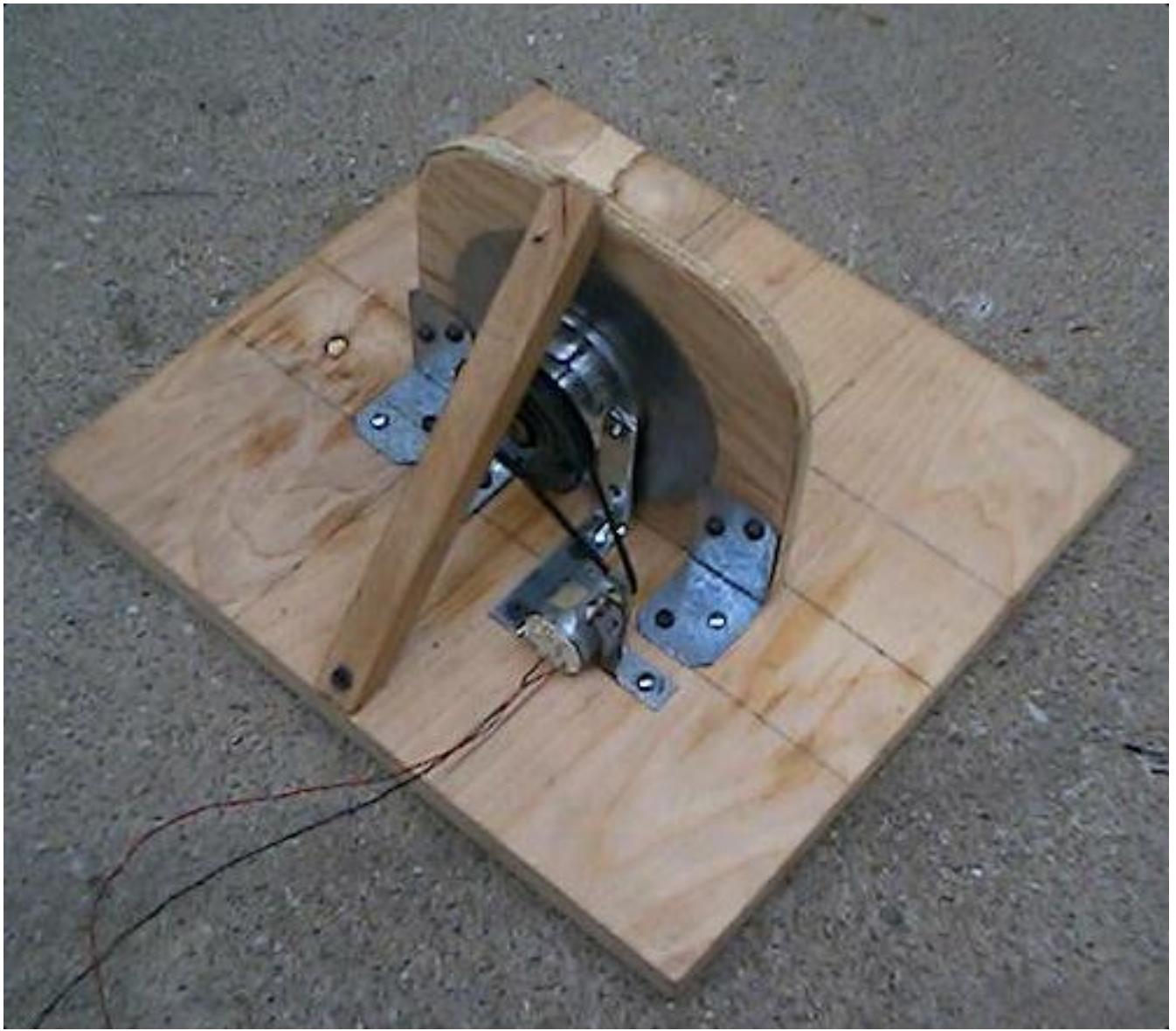
**Using all VCR Parts!**



VCR bearing & shaft, circuit board was used to make the disk, metal from frame was used to make the shapers



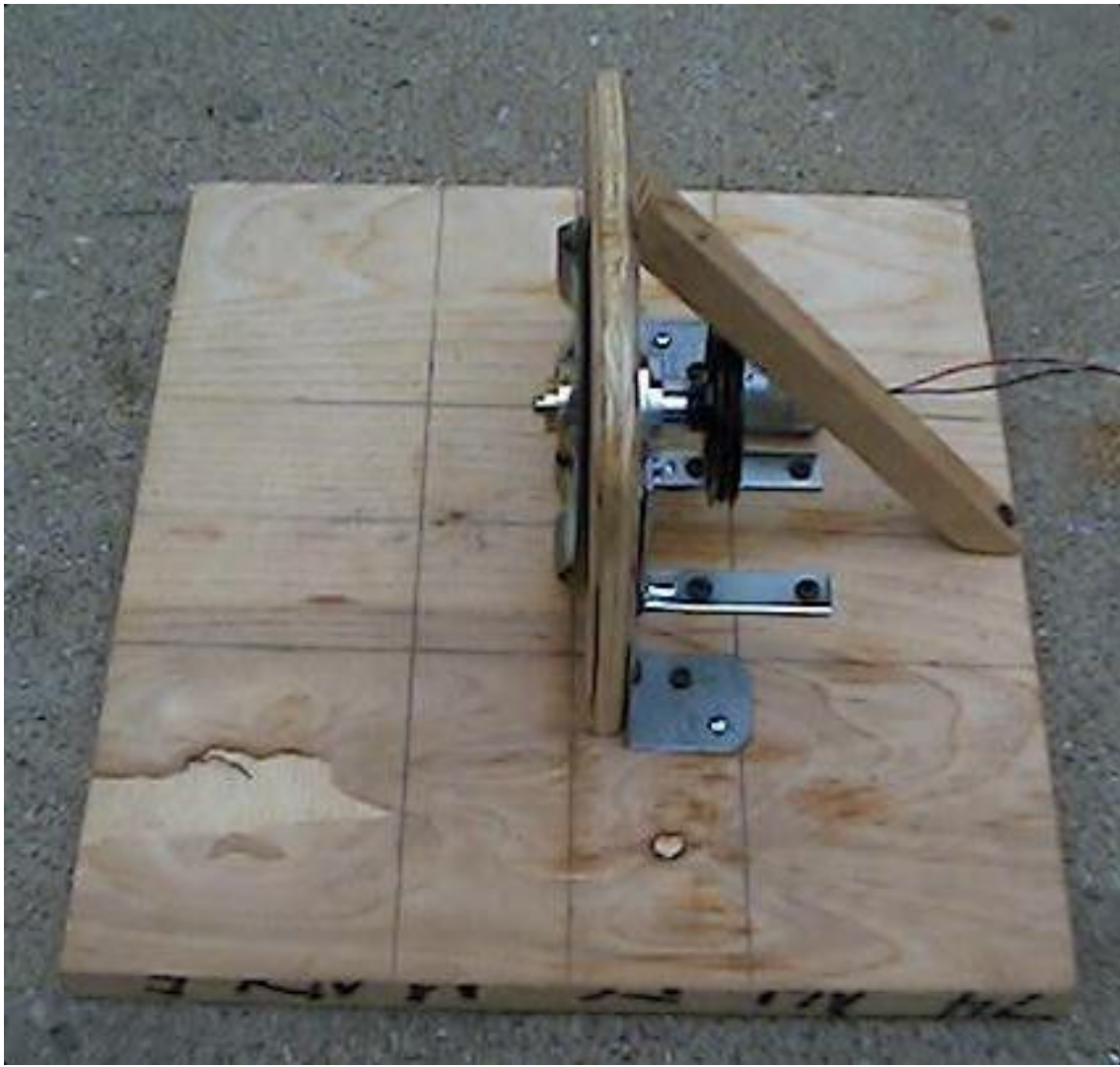




**The back view... Behind the metal disk, embedded in the wood is a bunch of rare earth magnets**









Runs Very Smooth and fast with only slight vibrations.

**[Discuss or comment on this project in the www.fieldlines.com chat room!](http://www.fieldlines.com)**

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# Welcome to the IRC webclient login Page

This webclient only takes you to **otherpower.serveirc.com** port **6667** and channel **#otherpower**

Otherpower IRC Login
Nickname
Channel
<a href="#">Advanced..</a>

[CGI:IRC](#) 0.5.2

The following is a very brief scientific approach to generator design using well known laws of electromagnetic induction principles. Only the basic fundamentals are covered.

---

## Basic Fundamentals

- Faraday's Law of Electromagnetic Induction

- 1) If the flux linking a loop (or turn) varies as a function of time, a voltage is induced between its terminals
- 2) The value of the induced voltage is proportional to the rate of change of flux

**Here we can see that induced voltages are the result of very rapid changes of flux. The more rapid the changes occur the higher the induced voltage.**

To induce large voltages you need a generator that has a rotor that spins rapidly, has significant magnets as the law suggests. The faster those magnets switch the flux in a coil, the more voltage will be induced into the coils, thus the higher the induced voltage.

Faradays Law is stated as

$$\text{induced voltage} = N \frac{\Delta \Phi}{\Delta t}$$

N=number of turns

$\Delta \Phi$  =change of flux inside the coil

$\Delta t$  =the time interval during which the flux changes

---

## **How can a very slow turning generator produce such rapid changes in flux?**

The secret lies in the diameter of the of a generator core size. The larger the core diameter the faster the magnets can produce rapid changes of flux induced into the coils. The more rapid the changes the higher the induced voltage as Faradays Law suggests.

- This concept is called angular velocity to linear velocity exchange.

Which means;

- With a constant angular velocity a larger diameter gives you a larger linear velocity at the circumference.

Angular velocity is measured in rotations per second thus;

**Rotations per second X the circumference (diameter X pi) = The linear velocity in seconds (or RPM's)**

In essence the greater the length of the radius or size of the diameter the faster the magnets are moving if placed at the circumference.

It all works out to the same thing.

---

Now Faraday being the smart guy that he was, also suggested that "it is easier to calculate the induced voltage with reference to the conductors, rather than with reference to the coil itself"

And another calculation pops out;

$$E=BLv$$

E = induced voltage (V)

B = flux density (T)

$L$  = active length of the conductor in the magnetic field (m)

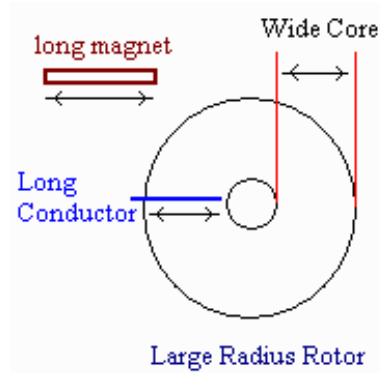
$v$  = relative speed of the conductor (m/s)

**What I want to point out here is that the "length of the conductor", plays a significant role in the induced voltage.**

Notice: This is a single conductive wire, not a coil. The length of that conductor in the above equation is what is of prime importance. This means that the core (and rotor) must be "wide" to optimize the length of the conductor and thus the output. Also the equation states the "active length" of the conductor. I interpreted this to mean that the magnets must be long or as long as the conductor in order for the total conductive surface area of the wire to be active.

**Interpretation; A wide core is a requirement. The magnets are as long as the wire, the wider the core the longer the magnet.**

- The calculation also states the flux density.. The stronger the magnetic flux the larger the output. Thus a very strong magnet is called for to induce maximum voltage.



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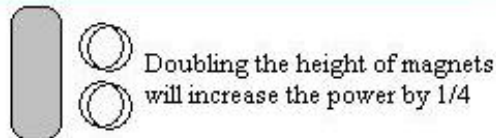
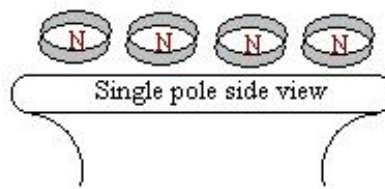
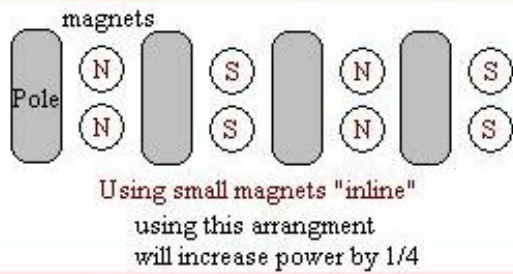
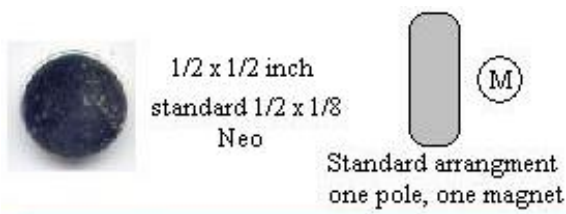
## Learned so far;

- The faster the rate of change of flux the higher the voltage (speed)
  - The concept of angular velocity to linear velocity exchange (speed)
  - The more the number of turns the higher the voltage (lots of turns)
  - The stronger the magnetic flux density from the magnet the higher the voltage (strong magnets)
  - The longer the active length of the conductor the higher the voltage (wide cores)
  - The longer the magnet to match the active conductor the higher the voltage (long magnets)
- 

## Magnetics

---

### **Magnets and making a long magnet from smaller ones**



Smaller magnets can be used inline if longer ones cannot be found. Doubling the length and the height produces a stronger overall magnet. Smaller magnets are cheaper, but you need more of them, so your not saving much. But they can be used in the above configurations if you already have them.

**Note:** a single long thin high magnet is better then several small ones as mentioned above. If you can, go for a single magnet, the forces will be much greater and will produce better output power. The stronger the magnets the better, but there is a trade off of magnet size to magnet output and pole size.

### Neodymium Iron Boron - (\*Neo for short) - (NdFeB)

Known as "Rare Earth" magnets, these magnets are the most advanced permanent magnet, they where developed in the 1980's. Neo magnets are available in sintered as well as bonded forms and are brittle. They have close mechanical tolerances. Almost all Neo's are anisotropic and all are effected by temperature. Most Neo's are coated with nickel, zinc or tin. They have excellent magnetic characteristics in terms of a high energy product and have a high coercive force, they are made of abundant raw material and are relatively low cost.

- There is some great information on the [www.wondermagnet.com](http://www.wondermagnet.com) website about magnetism. Read this FAQ.

## **! Advanced Magnetic Topics**

Hysteresis increases with changes in flux, changing flux to fast creates heat which decreases the coercive forces. To minimize this loss, keep the speed of the generator operating to below approximately 3800 rpm or so.

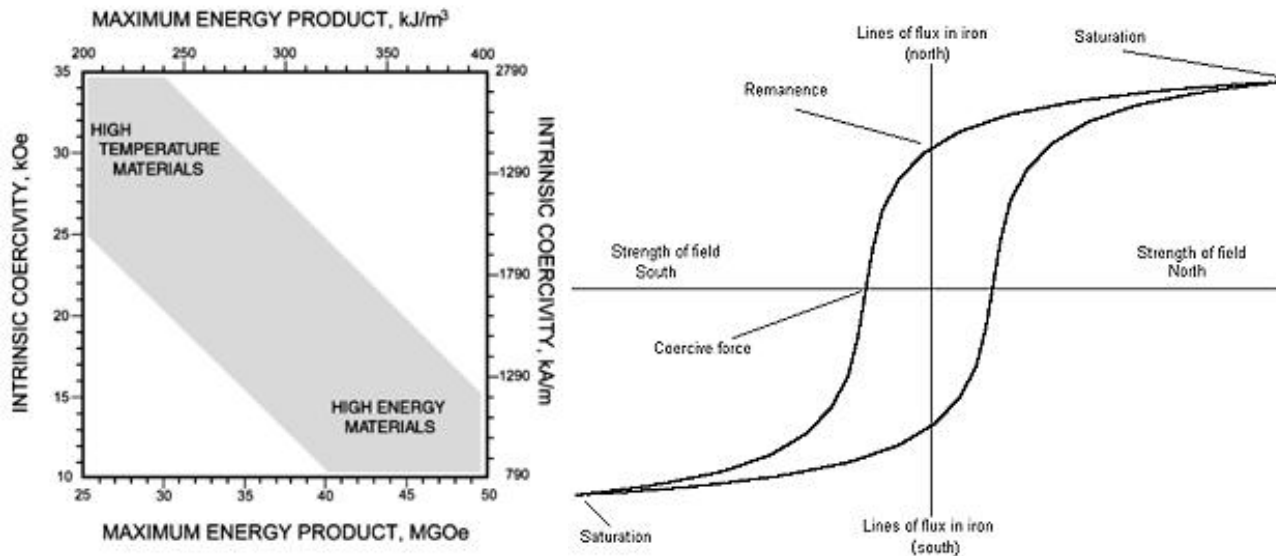
This web site has [Magnetic Formulas](#)

This [web site has tons of graphs](#) showing the energy products and BH curves of various materials

This [web site has tons of interesting info](#) on magnets

The graph below represents basic general Neo magnet properties. The other picture shows a general BH curve

- Most common neo's are 1.1 to 1.2 Tesla's in strength. Most magnetic materials reach saturation at 2.0 Tesla's
- You can guess the magnetic field strength from the rating and grade system for Neo's. eg; a N35 - This number suggests 3.5 inch's magnetic field strength in air.



● If someone could build a simple program for wind turbine builders to do calculations like above and below for simple magnetism and reduce the time for calculations it would be awesome! it would not need to be graphical, just do simple common magnetic equations like below, input variables and provide a data output. If you know of such a program please [contact](#) me.

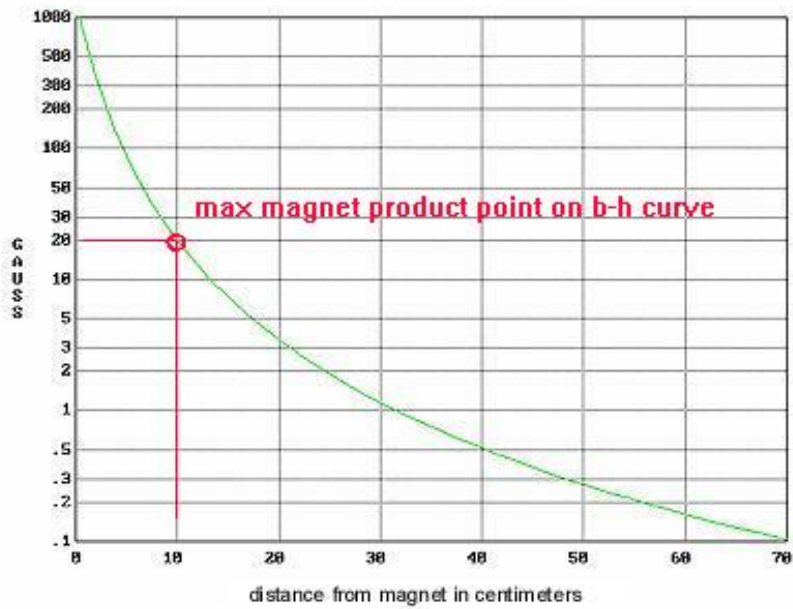
Example Equation:

A magnet measures 1/2 x 1 3/4 x 1 1/2 inches and has an energy product of 37 MGOe (MegaGauss-Oersted). The field strength on-axis can be calculated with the following formula:

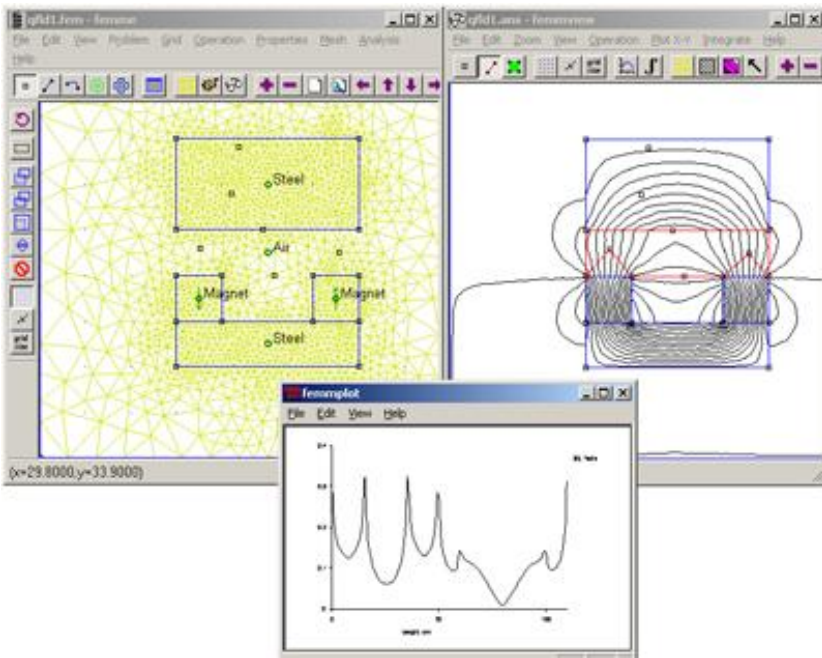
$$B_x = \frac{B_r}{\pi} \left( \tan^{-1} \frac{AB}{2X\sqrt{4X^2 + A^2 + B^2}} - \tan^{-1} \frac{AB}{2(L+X)\sqrt{4(L+X)^2 + A^2 + B^2}} \right)$$

- B<sub>x</sub> = flux density in gauss at distance X from the pole surface
- B<sub>r</sub> = residual flux density = 12700 gauss
- A = width of magnet = 4.42 cm
- B = height of magnet = 3.66 cm
- L = length of magnet = 1.27 cm

Below is a graph showing the theoretical peak magnetic field strength at various distances in cm in air using the above calcs.



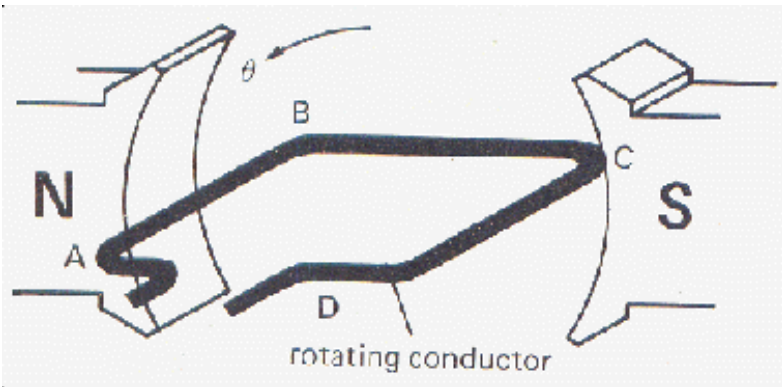
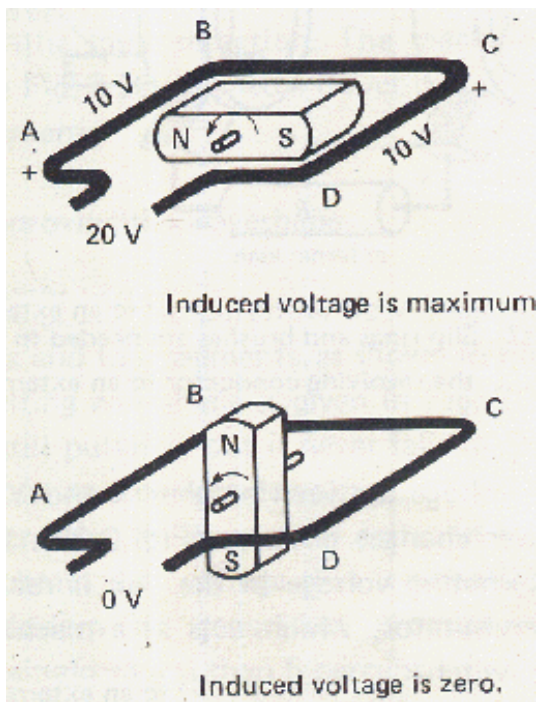
A very neat and simple program called FEMM for magnetic mapping of materials- <http://femm.berlios.de> try this program, it's impressive for graphical magnetic display.



FEMM a simple graphical magnetic mapping program.

## How generators work - Basics





The magnet or conductor is revolving at a constant speed

The first picture shows that maximum induction takes place only when an alignment is achieved on both sides of a conductor simultaneously with a magnet and both magnet poles are facing the conductors at the same time. When the poles are in this position (first picture), maximum induction takes place, otherwise it does not. Voltage induction will only occur if the magnet or the coil moves.

## **THE CORE** and materials to use

The purpose of a core is to increase the magnetic field strength to compensate for use of smaller magnets which are cheaper and also to increase the power output per turn of wire. You can also use big magnets plus a core and get even more power.

- In other words the core takes what you have and makes it better.
  - A magnetic flux travels much more efficiently thru a ferrous core than in air or vacuum

The following are rules of thumb for power applications

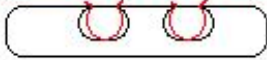
- 1) Air – no core – not very efficient for power applications, but can be driven hard because it never saturates
- 2) Ferrite/iron powder resin core – ( laminate versus iron) –no eddy current- better at higher frequencies
- 3) solid iron – This is the best, unfortunately it suffers badly from eddy current losses which produce heat- at low turning speeds- bolts, screws and nails with coils on them can be used but in slow rotor applications with significant cogging and with substantial higher output. It works well but cogs. Air cool it and it's fine.
- 4) Thin laminate – The frequency handling is much better, has much reduced eddy current losses, is the best of both worlds between ferrite/iron resin core and solid iron.



It is important to coat all laminations with a thin coating of insulation to prevent electrical contact between the laminations and reduce the eddy current losses.

- if machining the laminates or making cores, reduce the burrs, and re-varnish core before coiling. Put a piece of thin cardboard in between the slots so the wire goes inside the cardboard to protect the wires.

installing cardboard protectors



---

## Learned so far;

- Lot's of small magnets can be used, but long magnets are suggested
- The stronger the magnetic field the more power can be generated (use Neo's')
- The more magnets you have the more lines of flux can be produced
- Magnetic calculations can solve a complex problem and indicate output power
- Power generation only works when the field is lined up with the wire or pole and in constant rotation
- A core material gives you more of what you already have, intensifies the fields and increases output power
- Insulation between laminations and poles is important
- Thin laminations are highly suggested to reduce eddy current losses

---

**To be updated from time to time, check back every week for updates.**

● I wish you good luck with your building!

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## Special Page On Generators

Oct 30 -2003

This a picture gallery and as such no major write up's on the construction of the devices. Sorry... I just don't have the time.

### Picture Gallery & High Voltage Designs w/info



*Yep, it's me...*

In my spare time on weekends, I build wind turbine generators. Most are concept proof of theory designs and devices. All are experiments in tweaking and correcting problems at some lower level. Working out the bug's you might say. Presently working on high voltage wind systems.

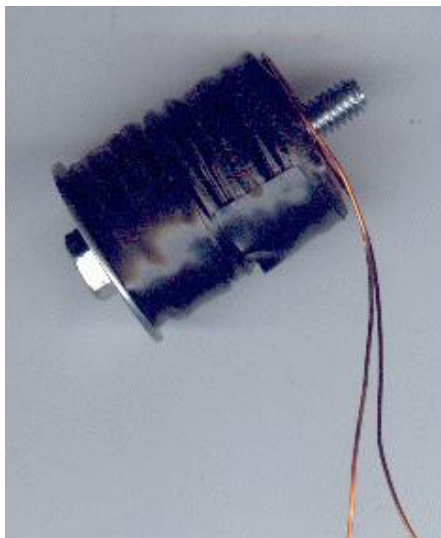
### Revisions... Flattening the coils



Flat- Wide, Long Coils...Does make a major difference.. Low output...Single Rotor. sometime in early 2001



# New Concept Generator - Innovative Design...



Hugh output, High resistance... **lot's of cog...** 3-5 volts per coil. 16 coils. Ceramic magnets...1300 Turns on a 3 inch bolt

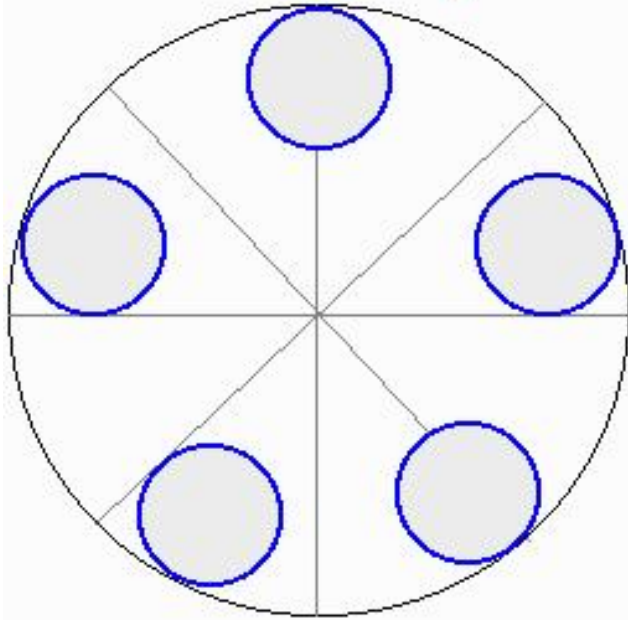


Being presently reborn yet again....

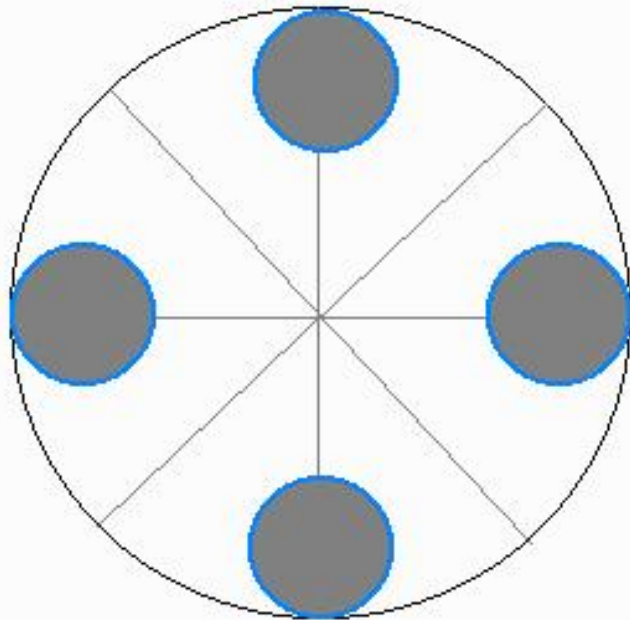
## **New Innovative Design - Reducing the Cog.... Using Displacement..**



**Full Core- No Cog- Skewed Axial field PMG polyphase machine**



Magnet Layout



Coil Layout

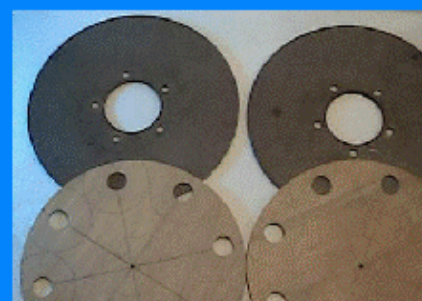
By Bryan and Fred  
visit [www.internetfred.com](http://www.internetfred.com) for updates



Dual Rotor, No Cog.. Nominal Output. Using saw blades for testing... Test Rig..



# Revisiting an old friend... The Dual Rotor - More Wire Plays a Factor







Three hundred turns #20 coil, much too high of a resistance.. Nominal to low output - Starts high and drops on load

## Yet another revision - Alignment...









...  
good...Total alignment is key. Aug-Sept 2003

Much Better.. The output is

**New Concept Generator... Using cuts in a steel strapping laminate core to create poles**





First Set

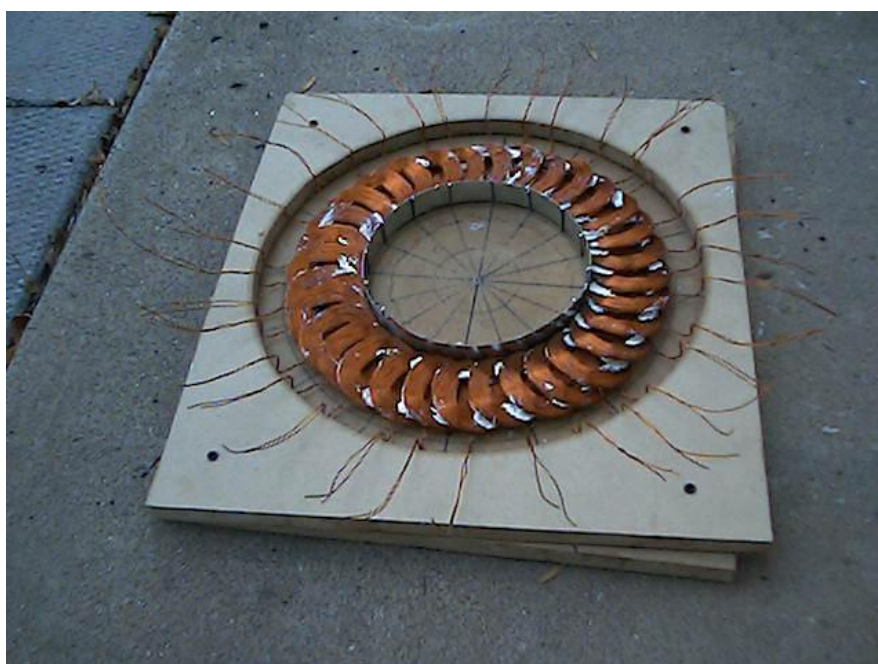


Second Set

This generator performed well...Medium Output. Alignment good. Cog Low.. resistance low, lot's of smaller coils. June-July 2003



# New Concept Generator - Spherical Overlap Layout Dual Rotor - High Voltage Low Current Output



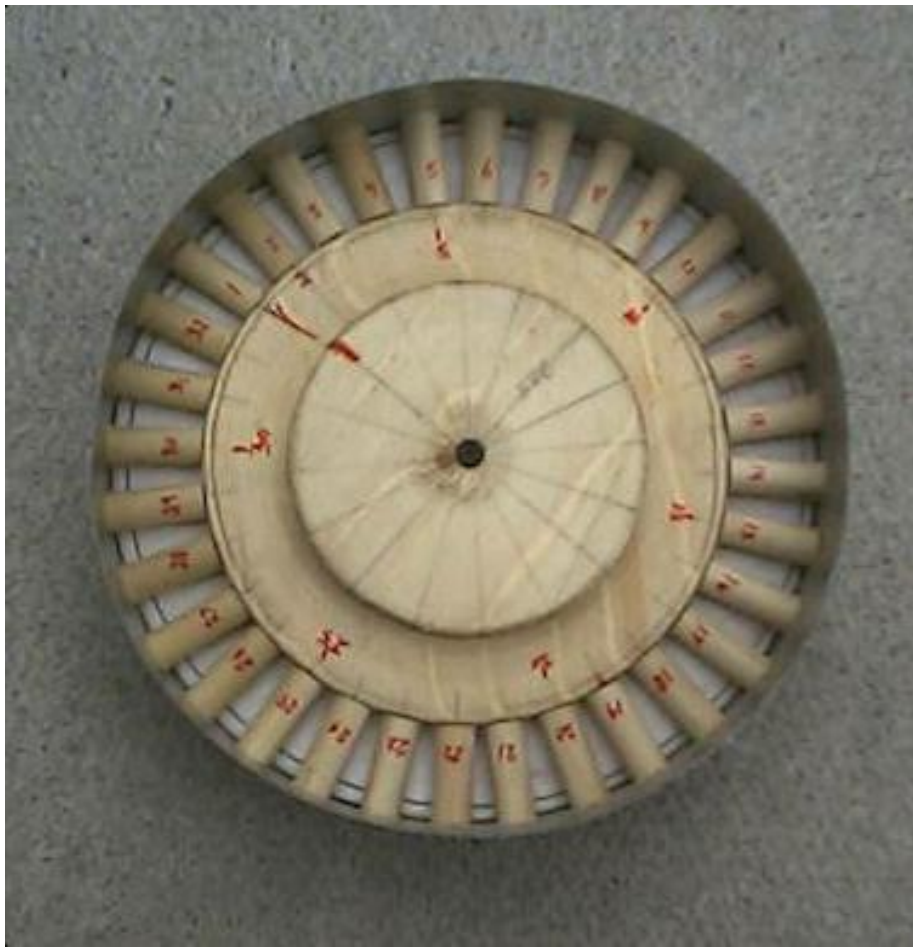






The idea here is to produce as much voltage as possible and to produce a new coil form where more coils could be used. Also to lessen the losses and maintain charging voltages for battery's no matter what. At 40 RPM's it will begin to produce 22.3 volts, at 60 it produces 32.5 and at 100 it produces 41. At 150 rpm it produces 51 Volts DC. By far the best generator for low speed end. Sept-Oct 2003

**New Concept Generator - Poured Stator Core with poles  
-Alignment perfect!**







Proof of concept... Presently Under Development. Coils are #20 - 25 turns per pole. It's total width is only 8 inch's -32 pole - Oct -25 -2003

The poured core is made of 90 % iron filings and 10 % fiberglass resin. It behaves like a piece of metal in a magnetic field. But has no eddy current losses.

**Newest News; High Voltage Systems Approach, a better way...**

**Lately I have come to the conclusion that low wind speed, high voltage generators that are low current is the optimal way to go.**

High voltage at low current has many advantages such as;

- 1) Low transmission loss, long and smaller lines can be used without large losses
- 2) Low resistance and loss to the creation, distribution and conversion of power. Utilizing a power distribution network.
- 3) Finer and more critical control over construction and distribution of wind generator power, conversion and control systems
- 4) High voltage DC power distribution is more effective with lesser loss
- 5) Multiple parallel generators are no problem on same transmission lines
- 6) The higher the voltage the better the lesser the loss
- 7) Generators that are effective and efficient
- 8) Generators that will start at very low wind speeds (breeze), becomes more effective with higher speeds
- 9) Low torque turning rotor because of control, filter and distribution networks. No strain on generator! provide power not load on generator. load is handled by controller and distribution system. **Produces less overall load on generator requiring less torque to turn.**

This is a critical overview of the newer generators that I am producing, they are in the hundreds of volts and average on a couple 2-4 amps max. The lower the amperage and the higher the voltage the better – in my opinion. But keeping within perspective...

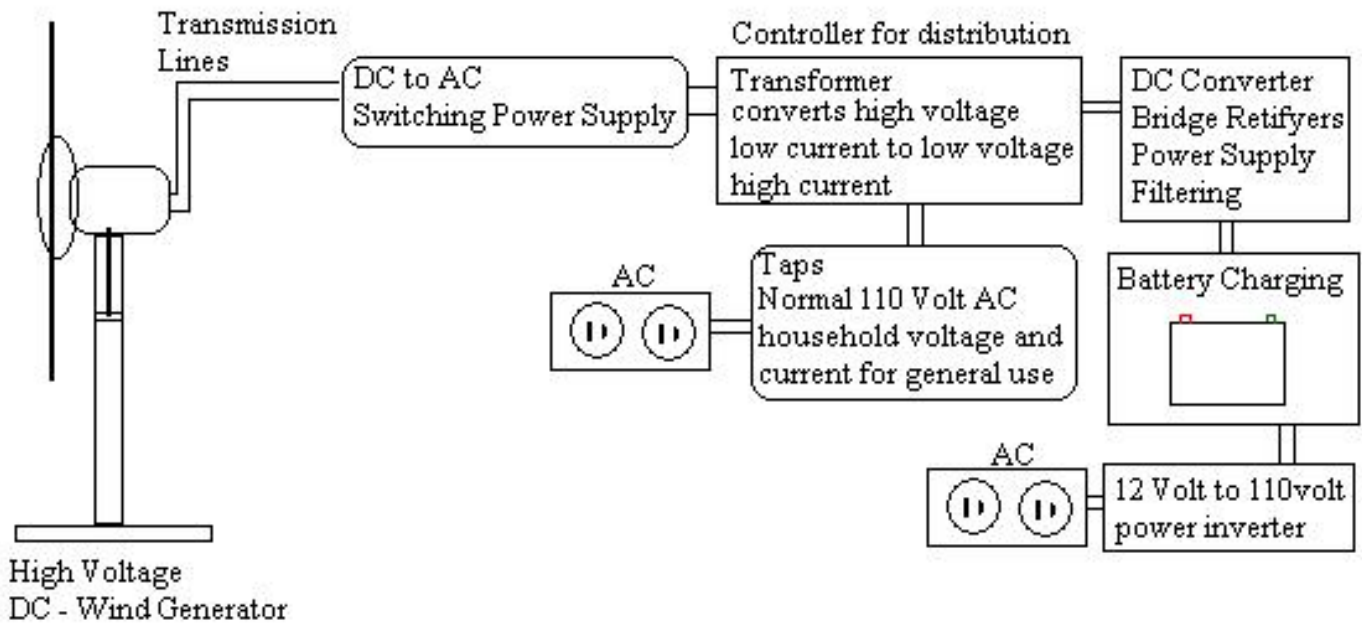
Take for example 250 volts x 2 amps = 500 watts or

Take for example 500 volts x 2 amps = 1000 watts

Power can be converted easily from high voltage to low voltage high current after transmission with very little loss including tapping off AC at 110 volts for general use. The generator works less hard for producing a decent output and will work in the slightest of winds. So it's almost always moving even in a light breeze.

As voltage increases current decreases, as voltage decreases current increases. Hence - Conversion from high voltage DC to AC with the use of switching power supplies produces smooth, ripple free, controlled, continues power. By using switching power supplies you decrease ripple and filter the power instantly. A smooth power is produced.



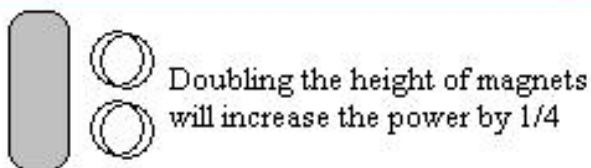
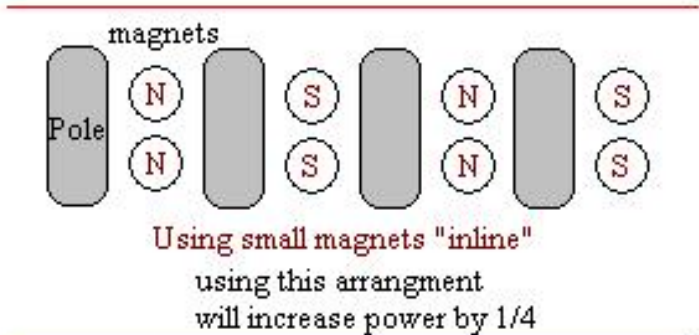
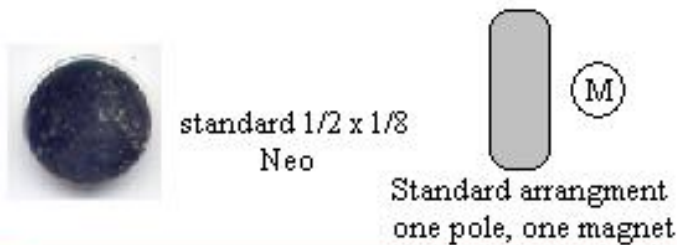


The

controller also contains filtering systems.

## Optimal Generator Design Thoughts

- Lots of small coils reduce overall resistance
- Core form is the way to go, produces much higher voltages. Use Cores
- Smaller wire can be used, bigger wire will reduce resistance but takes more space, # 20 gauge is good start
- More poles, more power more output
- Single phase everything - This is not motor design or household 3 phase design, maximize for voltage not current.
- Use more magnets, can be smaller, in line them for length not width, size dependent on pole size
- Small poles, lot's of them.. the more then better
- Alignment is key. everything has to be in alignment, phase is irrelevant!
- One coil per pole, series winding all coil hookups, again single phase maximize voltage
- Keep direction of coil windings the same on each pole
- Poured stator cores are good - at least 75% or more is metal filings, good for starting point
- Steel laminate strapping cores are better, thinner laminated strapping is even better.. harder to build and more complex
- Half the thickness or a core should be the backing of the core and half the for the pole / evens out the flux path, provides support
- Rectify to DC on pole then filter
- Larger blades to produce a constant overall rpm even in low wind speeds, consistency of motion.
- Large Rotors - This is an interesting one!! Overall liner speed with distance from center, the larger the rotor the faster from center the rotor outside is moving, the more cuts and faster cuts per pole the generator is producing and therefore the higher the output. The poles can now be in the hundreds as is magnets and be producing thousands of volts. The actual generator rpm's are low but the actual speeds on the outside of the rotor are fast. Major output from slow turning blades.



## Thanks go to;

A very special thanks goes first off to Bryan D. -- D for the Deep Thought, Deep Conversations. U Da Man!

[www.fieldlines.com](http://www.fieldlines.com)

[www.windstuffnow.com](http://www.windstuffnow.com)

Both Ed's, both Tom's and Mech you know who you are!! Thanks for the inspirations and thoughts!

And all those that helped along the way. It was worth it! Now lets build it already!!!!

**Thanks For Visiting!**



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[Windmill Repairs](#) | 5 comments (5 topical, editorial)

Re: Windmill Repairs ([none / 0](#)) ([#2](#))  
 by scoraigwind ([magnet@scoraigwind.co.uk](mailto:magnet@scoraigwind.co.uk)) on Mon Nov 3rd, 2003 at 02:14:03 AM MST  
 ([User Info](#)) <http://www.scoraigwind.co.uk>

Hi Dan,

Thanks for the close up views.

I would say that the blades probably expanded and contracted with moisture. When they expanded (in wet weather) the wood was crushed, and when they contracted they came loose. That's why you should not leave the axe out in the rain. (the handle gets loose)

I was surprised by the state of the low end stop. There is not usually much stress on that. Either there has been some heavy turbulence, causing the tail to slam down on its stop, or there has been some heavy vibration perhaps. I wonder is that a single phase machine? Vibration from the alternator could also work things loose.

I am surprised you can get away with such thin pipe between the guys and the windmill.

The anemometer position is a constant problem. Too far below the machine and it as less wind. Too close and it is influenced by the windmill. You will find that the relationship between windspeed and power depends a lot on wind direction.

The best place for the anemometer is on a separate tower upwind. Easier said than done though.  
 Hugh Piggott <http://www.scoraigwind.co.uk>

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Re: Windmill Repairs ([none / 0](#)) ([#3](#))  
 by kww on Mon Nov 3rd, 2003 at 06:59:51 AM MST  
 ([User Info](#))

Hi Hugh,

About the thin pipe, it seems like to me if the turbine turns out of the wind early/with low rotor thrust a much smaller pipe would work. Dan's turbine appears to prove this, since that's how he makes them I've read. I like the idea of such a design since it seems like to me you can get a lot more out of a small setup, except for the rotor, since a large rotor will make a significant amount of power for a small alternator in LOW winds. And, it's not really much harder, time consuming, or expensive to make a 10 footer as opposed to a 6. I'm just hoping my design can hold up to the high winds using smaller pipe, guy lines, etc. like Dan's does. Btw, great book (Windpower Workshop), thanks for writing it as it's come in very handy. Now you just need to write

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one for us electrically challenged. ;-)  
Kevin

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Re: Windmill Repairs ([none / 0](#)) ([#4](#))  
by DanB on Mon Nov 3rd, 2003 at 07:16:35 AM MST  
([User Info](#))

Hi Hugh - yes, I have no doubt it's due to moisture that the prop nuts are coming loose. The wood is definitely crushing beneath them... the nut's have not turned, they were still locktighted in their original position. I expect this will be something to watch for on all the machines we put up this summer. I've noticed we don't have this problem on Wards (the old one I made a couple years ago for him) because we made a solid steel plate to cover the front of the prop that went between the nuts and the wood. Everytime we check that it's still good and tight. I thought washers would be good enough (perhaps they are)... making the plate takes a bit of extra time, although I think in the future it may be worth the extra trouble.

The tail pivot... it would not be hard to make it stronger. I think part of the problem is that the notch was not landing in full contact with the stop... it was making contact at the very bottom first so all the forces used to be at one point. I think it has "worn in" so to speak and suspect it may not get much worse. Time will tell...

It is a 3 phase alternator, this is the machine I made in May, with a single magnetic rotor and laminates, so I don't think alternator vibration is a significant issue. It is however a very turbulent place. The tower is 45' high... I think even 100' would not get me out of the turbulence here too well. We have hills fairly close on both the North, and the South sides and lots of tall trees. It's fairly mountainous and the wind rarely comes from one direction for very long. I believe this is the main problem... to get out of this turbulent situation on our property would probably be impossible, but surely a taller tower would help.

Regarding the small pipe above the guy wires. I agree... it's very much pushing the limit. I never see it flexing, but it still makes me nervous. It is however stronger than it looks. The pipe is fairly thick walled stainless steel, which is much stiffer than common steel water pipe. There is also tight fitting steel pipe, the next size down - pounded down inside it all the way, and there is a 1" steel pipe (which you cannot see in the picture) welded to the back side.

(kind of a conglomeration of junk...). I have no doubt that a single piece of steel water pipe this size would bend over immediately, I know this just from testing machines on my truck! (I've bent a few pipes over on my truck while testing!) Hopefully next spring I'll have the time/resources to build a stronger, taller tower - I'd not feel comfortable putting any larger machine than this on my current tower.

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### User info for scoraigwind

Homepage: <http://www.scoraigwind.co.uk>

Email: [magnet@scoraigwind.co.uk](mailto:magnet@scoraigwind.co.uk)

Bio:

Lived off-grid for near 30 years, mostly using windpower from machines I have built myself. I teach others to build them at my workshop courses, and I offer assistance to manufacturers such as African Windpower (AWP). I also do some intallation work.

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[Windmill Repairs](#) | 5 comments (5 topical, editorial)

Re: Windmill Repairs ([none / 0](#)) ([#3](#))  
 by kww on Mon Nov 3rd, 2003 at 06:59:51 AM MST  
[\(User Info\)](#)

Hi Hugh,  
 About the thin pipe, it seems like to me if the turbine turns out of the wind early/with low rotor thrust a much smaller pipe would work. Dan's turbine appears to prove this, since that's how he makes them I've read. I like the idea of such a design since it seems like to me you can get a lot more out of a small setup, except for the rotor, since a large rotor will make a significant amount of power for a small alternator in LOW winds. And, it's not really much harder, time consuming, or expensive to make a 10 footer as opposed to a 6. I'm just hoping my design can hold up to the high winds using smaller pipe, guy lines, etc. like Dan's does. Btw, great book(Windpower Workshop), thanks for writing it as it's come in very handy. Now you just need to write one for us electrically chalgenged. ;-)  
 Kevin

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[Windmill Repairs](#) | 5 comments (5 topical, editorial)

Re: Windmill Repairs ([none / 0](#)) ([#4](#))  
by DanB on Mon Nov 3rd, 2003 at 07:16:35 AM MST  
([User Info](#))

Hi Hugh - yes, I have no doubt it's due to moisture that the prop nuts are coming loose. The wood is definitely crushing beneath them... the nut's have not turned, they were still locktightened in their original position. I expect this will be something to watch for on all the machines we put up this summer. I've noticed we don't have this problem on Wards (the old one I made a couple years ago for him) because we made a solid steel plate to cover the front of the prop that went between the nuts and the wood. Everytime we check that it's still good and tight. I thought washers would be good enough (perhaps they are)... making the plate takes a bit of extra time, although I think in the future it may be worth the extra trouble.

The tail pivot... it would not be hard to make it stronger. I think part of the problem is that the notch was not landing in full contact with the stop... it was making contact at the very bottom first so all the forces used to be at one point.

I think it has "worn in" so to speak and suspect it may not get much worse. Time will tell....

It is a 3 phase alternator, this is the machine I made in May, with a single magnetic rotor and laminates, so I don't think alternator vibration is a significant issue. It is however a very turbulent place. The tower is 45' high... I think even 100' would not get me out of the turbulence here too well. We have hills fairly close on both the North, and the South sides and lots of tall trees. It's fairly mountainous and the wind rarely comes from one direction for very long. I believe this is the main problem... to get out of this turbulent situation on our property would probably be impossible, but surely a taller tower would help.

Regarding the small pipe above the guy wires. I agree... it's very much pushing the limit. I never see it flexing, but it still makes me nervous. It is however stronger than it looks. The pipe is fairly thick walled stainless steel, which is much stiffer than common steel water pipe. There is also tight fitting steel pipe, the next size down - pounded down inside it all the way, and there is a 1" steel pipe (which you cannot see in the picture) welded to the back side. (kind of a conglomeration of junk...). I have no doubt that a single piece of steel water pipe this size would bend over immediately, I know this just from testing machines on my truck! (I've bent a few pipes over on my truck while testing!) Hopefully next spring I'll have the time/resources to build a stronger, taller tower - I'd not feel comfortable putting any larger machine than this on my current tower.

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[Windmill Repairs](#) | 5 comments (5 topical, editorial)

Re: Windmill Repairs ([none / 0](#)) ([#5](#))  
by veewee77 on Mon Nov 3rd, 2003 at 01:37:24 PM MST  
([User Info](#))

Here is a thought on how to fiux the anemometer/downwind thing. . .

Put the anemometer on a swiveling arm and put a tail out the other direction a foot or two more than the anemometer. The tail will keep the anemometer upwind of the genny at all times.

just my \$.02 and worth!

Doug

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[Wind turbine update!](#) | 11 comments (11 topical, editorial)

Re: Wind turbine update! ([none / 0](#)) ([#1](#))  
by Barnac ([barnac@videotron.ca](mailto:barnac@videotron.ca)) on Thu Oct 30th, 2003  
at 10:46:16 AM MST  
([User Info](#))

Dan,

There is something in your post that I don't get. My poor brain can't figure it.

Usually we say that a windmill will overspeed in strong wind if not loaded (free wheeling). When loaded a windmill will slow down right ?

What I don't get is that you stated in your post that one of the reason your mill was running slow was lack of line lost and that by adding line lost your mill speeded up ? (In my perspective, lower line lost imply less load while higher line lost imply more load) What is that I don't get ? Can someone enlighten me ?

Regards Barnac

I am neither for, nor against, but quite to the contrary ;-)

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Re: Wind turbine update! ([none / 0](#)) ([#2](#))  
by DanB on Thu Oct 30th, 2003 at 11:17:57 AM  
MST  
([User Info](#))

By line loss... we mean resistance in the line.

Imagine if we short the line out... then the resistance in the circuit (except for that in the alternator) is 0 for all practical purposes... and it loads up the machine hugely causing it to turn very slowly. When it's turning this slowly.... the blade is basically forced to go much more slowly that it would like to, or need to in order to produce good power from the wind. (it's stalling...)

Instead of shorting it... we could unhook it completely for any load which would be pretty much infinite resistance and it would free spin, running dangerously fast and probably making lots of noise and not being very efficient.

The batteries are a load, but in our case the load was too much - it took too much. Just a small increase in rpm at the alternator resulted in a big increase in current and that curve didn't match up well with the power available from the prop over a range of windspeeds. By adding resistance it can increase in rpm some (to keep with the prop) and not have such

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an immediate increase in current, so the prop is able to maintain at a higher, and more efficient speed over a range of windspeeds.

On the downside, were losing more power in the line. Basicly we've sacrificed a small bit of efficiency in the electrical end of things to allow the prop to run much more efficiently... in the end we come out way ahead on the deal. Our added line loss doesn't hurt us hardly at all in the low winds (7-10mph) where were getting 10 amps or less anyhow, but we do lose a lot of power when current gets higher. At 12 volts, when we see 40 amps current flowing (480 watts into the batteries), we are losing about 400 watts into heat just in the xtra line I added.... (not very efficient) - but were still gaining in the end. I actually think I will change the line and instead of 25', go to about 15', because that added line really allowed the windmill to speed up a bit too much I think.

Somewhere is the perfect balance! Again though... in the end we don't use it that way, because the machine does well anyhow in low windspeeds and if Tom cant use the extra power anyhow, there is little point in running it faster than necessary. It was a fun week watching/playing with these things...

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Re: Wind turbine update! ([none / 0](#)) ([#5](#))  
by Barnac ([barnac@videotron.ca](mailto:barnac@videotron.ca)) on Thu Oct  
30th, 2003 at 01:40:14 PM MST  
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Re: Wind turbine update! ([none / 0](#)) ([#3](#))  
by [Wolfie1](#) on Thu Oct 30th, 2003 at 12:36:35 PM MST  
([User Info](#))

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by [Dave B](#) on Thu Oct 30th, 2003 at 10:08:09 PM MST  
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[Wind turbine update!](#) | 11 comments (11 topical, editorial)

Re: Wind turbine update! ([none / 0](#)) ([#10](#))  
by DanB on Mon Nov 3rd, 2003 at 07:52:22 AM MST  
([User Info](#))

Hi Dave -

The width at the root depends sometimes on what lumber I find available. Usually about 8" wide, and I prefer to find wood 2" thick, but usually its 1.5" thick. At the tips, I've been making them about 2.5" wide and about 3/8" thick, and on all mine the thickness has tapered to full board thickness at the root, and that taper has been a straight line. (not really proper at all... \*) At the root the pitch is as much as the board will allow. About half way between the root and the tip it's about 5 or 6 deg. So far... my blades have not been very scientific!

I've not done good measurments of rpm, but I'm guessing that my 9' machine (single rotor alternator) is probably running with a TSR of around 10. I believe the 10' dual rotor machines are running with a TSR between 5, and 7 in low winds (each one is different and the TSR changes depending on line loss and the nature of the battery bank). The 10' machines are stalling, probably around 15 - 20mph I think, so as windspeed increases the TSR gets less and less... and the blades become less and less efficient. Adding resistance to the line, having a wider airgap, using smaller magnets next time, putting on a larger prop OR rewinding the coils for higher cutin speed... any of these things would change that and allow the blades to run aat a more efficient speed.

So I think really... we try to make blades that \*like to run at a certain TSR when loaded by the alternator, but in the end it's the loading of the alternator that will determine what TSR they actually run at. My 9' machine runs a bit on the fast side, and the 10' machines are running a bit on the slow side, and changes in the line - and/or the alternator would bring them into more efficient operation. Actually - I think my 9' machine is running with reasonable efficiency over the range of windspeeds, and slowing it down would make it safer - but may cost me a bit of power. None of these machines make much noise - probably the only one I hear any sound from the prop on is Daves (the one at the caboose) - where we had a 4, or 5 deg (cant remember) pitch at the tips. Hugh advised me to try a bit less - and they became almost totally silent. Even the caboose windmill is very quiet, but you do always hear a slight whooshing sound when its running.

When I make blades generally... I tend to work from blades I've made in the past that worked OK, - and I look at other peoples blades. I have a nice set here that Ed made which I use for "inspiration"... although I believe I make some compromises for strength. Mine are a bit wider and thicker at the tips than perhaps they should be... but I

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get nervous with wood when it gets too thin. I also keep my old windcharger in mind when I make blades, it had a straight pitch from root to tip, the thickness remained the same, from root to tip - and you couldve made the whole blade from a 1 X 4. (it was 6' in diameter if I recall).

Bergy blades also have constant thickness and constant pitch from root, to tip - and they are quite efficient.

I could be wrong... but I think that blades are quite forgiving if you're not looking for absolute maximum efficiency... I think anything in the "ballpark" can be reasonably efficient. If you are usin the spreadsheet - I'd just design the prop for a reasonable TSR (like 7), and tune your alternator and your load untill it runs best. Since your not charging batteries here, I should think you have a lot of flexibility by changing the load to get things matched up nicely.

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Re: Wind turbine update! ([none / 0](#)) (#11)  
by Dave B on Mon Nov 3rd, 2003 at 10:48:43 AM  
MST  
([User Info](#))  
<http://www.madbbs.com/users/bruggelog>

Dan,

Thank you for your response on the blade info. Like you say, I will have quite a bit of flexibility with adjusting my load(s), cut in speed etc. as I will be designing a variable load controller circuit using solid state relays. I really will need the torque to keep things turning most efficiently in higher winds with my load adjusted properly. Hopefully through basement testing with my 2 hp electric motor set up running the alternator I can design an efficient auto load circuit depending on rpm. This is fun stuff. I think I may take it a step up to a 12' rotor after reading your comments or possibly a 10' with TSR 7 and carve it to spec. including the "extra" drop needed at the root for torque and startup. Thank you again for sharing your info. and photos. You guys have got me hooked. Dave B.

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Re: Wind turbine update! ([none / 0](#)) ([#6](#))  
by kww on Thu Oct 30th, 2003 at 08:42:27 PM MST  
([User Info](#))

That's quite a tower Dan, looks like something I'd make myself. :-) I've got giant timber bamboo(4" diam., 50 foot tall) planted, when that gets big enough I'll trade you a load for some magnets. ;-) Anyway, I was wondering what size pole you use at the top to mount your 10 foot turbines too and kind, thin conduit, thick water, steam, or gas pipe? Also, you wouldn't happen to have any idea of the force needed on your 10 foot turbines to get them to furl?  
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 by DanB on Fri Oct 31st, 2003 at 07:49:38 AM MST  
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Hi Kevin -  
 At the top there's 2" pipe going all the way to the top (almost) with 1.5" pipe inside that, and the very top stub is 1.25" pipe which is dropped down inside the whole thing, but sticks up about 10" and the wind turbine sits on that. All the pipe is shed 40 water pipe except the 2" which is stainless. (junk I had on hand...)

Then, on the outside of the whole thing, there is a length of 1" pipe which is welded to the side, and drops below all the pipe by about 4' and its chained to the tree...

It doesn't seem to flex much... but a little. When I drop this next time (didn't get to it yesterday) I'll be strengthening things.

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Re: Wind turbine update! ([none / 0](#)) (#9)  
 by kww on Fri Oct 31st, 2003 at 04:31:56 PM MST  
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[Motor generator Grid tie?](#) | 4 comments (4 topical, editorial)

Re: Motor generator Grid tie? ([none / 0](#)) (#1)  
by 5kw on Sat Oct 11th, 2003 at 11:49:54 AM MST  
([User Info](#))

Hi Dan,

Your idea will certainly work, whether it is worth the trouble or not depends on the fun factor of, spinnin the meter backwards.

An induction motor behaves as a generator when connected to the line and spun above its synchronous speed, ie a four pole motor typically rated at 1725 rpm on 60 hz, will start looking like a generator above 1800 rpm and reach full or rated power at approxamatly 1875 rpm ,or the same % slip above synchronous speed as it had below it as a motor. Note the slip is a function of load, the 1725 motor will run slightly under 1800 rpm with no load. All above speeds are for 60 hz power on 50hz sync speed would be 1500 for a four pole motor

To impliment the motor generator I would think torque, not speed, as the induction generator will hit a wall of torque at its rated slip. It is possible to push past this speed with enough horsepower , at which time the generator will become unstable, hoever if your pime mover has limited torque this is not an issue.

As far as safety goes, although the utility will insist on UL listed safety cut out relays, in the real world it would be nearly impossible to generate into a dead line with an induction machine as the machine requires lagging current for exitation but can only produce leading current. A capacitive line ( rare) could supply the lagging current but the electrical load would have to be very low to keep from damping out the whole process. Normally a utility failure would present a very high load. In any case a line failure would lose freq and voltage regulation within a few cycles( this is what trips the safety relays) .

Make the wind fun!  
Victor

[Motor generator Grid tie?](#) | 4 comments (4 topical, 0 editorial)

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[Motor generator Grid tie?](#) | 4 comments (4 topical, editorial)

Re: Motor generator Grid tie? ([none / 0](#)) (#1)  
by 5kw on Sat Oct 11th, 2003 at 11:49:54 AM MST  
([User Info](#))

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[Motor generator Grid tie?](#) | 4 comments (4 topical, editorial)

Re: Motor generator Grid tie? ([none / 0](#)) (#2)  
by monte350c on Sat Oct 11th, 2003 at 07:27:53 PM MST  
([User Info](#))

Hi DanB,

Seems like a pretty good idea, a fairly straightforward circuit could be designed to set the on/off points for the motor generator. A while back I found a pretty good book (free!) online - <http://www.eece.ksu.edu/~gjohnson/> there's some info and ideas especially in chapters 5, 6, 7. The whole book is a good read with detailed calculations on a wide variety of wind topics, but it reads well not at all like a dry tech book. Keep us posted on your progress with this one. I have been thinking about trying an induction generator with a small gas engine to charge batteries. There's a site somewhere where a fella uses capacitors parallel with the motor. If I find it I'll post again.

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# Dr. Gary Johnson's Renewable Energy and Tesla Coil Page

Dr. Gary L. Johnson taught electrical engineering at Kansas State University for 28 years before taking early retirement in 1994. He wrote a textbook "Wind Energy Systems" which was used in a senior elective course for many years. Prentice-Hall let the book go out of print and gave the copyright back to Dr. Johnson. The revised and expanded version was then used for several more years. This textbook is available at no charge in .pdf files, listed below. The file contents.pdf has a title page, prefaces, and table of contents. The files wind1.pdf through wind9.pdf are the nine chapters of the book.

[contents.pdf](#)

[wind1.pdf Introduction \(2474KB\)](#)

[wind2.pdf Wind Characteristics \(892KB\)](#)

[wind3.pdf Wind Measurements \(875KB\)](#)

[wind4.pdf Wind Turbine Power, Energy, and Torque \(563KB\)](#)

[wind5.pdf Wind Turbine on the Electrical Network \(477KB\)](#)

[wind6.pdf Asynchronous Electrical Generators \(503 KB\)](#)

[wind7.pdf Asynchronous Loads \(1184 KB\)](#)

[wind8.pdf Economics of Wind Systems \(204 KB\)](#)

[wind9.pdf Wind Power Plants \(270 KB\)](#)

In addition to traveling, gardening, and other retirement activities, Dr. Johnson has been investigating Tesla coils, especially the Extra coil directly driven by a solid state inverter. History and theory are covered in six chapters, and the inverter and associated equipment are described in Chapter 7. Additional chapters on experimental results will be available at a later time. Comments and questions can be addressed to [gjohnson@ksu.edu](mailto:gjohnson@ksu.edu). Some photos of sparks are given in the jpeg files.

[tcchap1.pdf Introduction \(103 KB\)](#)

[tcchap2.pdf Ideal Capacitors \(97 KB\)](#)

[tcchap3.pdf Lossy Capacitors \(167 KB\)](#)

[tcchap4.pdf Inductors and Transformers \(139 KB\)](#)

[tcchap5.pdf Lumped RLC Model \(93KB\)](#)

[tcchap6.pdf Resistance \(148KB\)](#)

[tcchap7.pdf Tesla Coil Driver \(519KB\)](#)

[tcchap8.pdf Sparks \(180KB\)](#)

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[p213d.jpg](#)

[p213e.jpg](#)

[p213f.jpg](#)

Dr. Johnson has also been interested in finding yet another source of energy for the past two decades. He wrote and self-published a paper-back book called "The Search for a New Energy Source" which details part of his literature search on this exciting topic. Chapters 1, 4, and 8 are available as PDF files, listed below. If you want the entire document, send \$10 cash or check to Dr. Gary Johnson, Box 1032, Manhattan, KS 66505. If you live outside the United States, email Dr. Johnson and the details will be worked out. If you would like to be a part of an informal working group involving this search, let it be known.

[nechap1.pdf Introduction \(106KB\)](#)

[nechap4.pdf Unexplained Atmospheric Phenomena \(185KB\)](#)

[nechap8.pdf Future Development](#)

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Re: Motor generator Grid tie? ([none / 0](#)) (#3)  
 by JW on Mon Oct 13th, 2003 at 01:11:29 PM MST  
 ([User Info](#))

DanB,

I have looked into doing this with engine powered generators for sometime. Once I contacted an engineer at tech support for ELLOT MAGNETEC. I was auditioning as a perspective buyer of a 155kw generator element. I asked the guy how do I connect to the grid with this thing? He then asked me what do you intend to drive the the gen-element with? I replied a 400hp V8 engine. He replied that the engine might be kind of underpowered for the application, but said I could do it, and the engine might wear out in a year or less.

I was told a "VAR POWER CONTROLLER" would keep the freq in phase. He seid it will actually throttle or govern the engine based on the freq in the main line.

There is also another way to do it with an inverter, but its much more experimental, you must use a Isolation Transformer thats rated for the "KVA" of what you expect the power company to buy. And apparently the the "VAR" reads the incoming modified sinewave and reads the output sinewave to the grid and interups the voltages to keep everthing "in phase"

to do this your output must be in the "neighborhood" and the isolation transformer helps in both cases. but I believe the "VAR" makes sure all the power you want to go "upstream" goes out to the grid correctly and in phase.

My best advice would be to find someone who "cogenerates power" with a diesel gen-set. And ask some questions about how they get "all" there output up into the grid. I have run across several people who have done this. but they are moving big power, over 50 to 500kw. They say they can just break even, between the cost of fuel and there needs in there factory, assuming they dont pay taxes on the power they use for themselves.

By the way I happen to have a 500kva isolation transformer just laying around, and will probnably be thrown out pretty soon. what I think is neat about these Isolation transformers is that they will put 3kw into the grid, or 400kw just as easily. depending what the control electronics tell it to do providing you have that much output. and the disconnects are inbetween to Isolation transformer and the grid.

If you want the Isolation transformer I have let me know you can have it, but it weighs about 1000lbs, and is in a nice indoor type cabinet with a control screen.

-JW

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Re: Motor generator Grid tie? ([none / 0](#)) ([#4](#))  
by Beui ([REMOVE~beui@yahoo.com](mailto:REMOVE~beui@yahoo.com)) on Tue Nov  
4th, 2003 at 11:30:53 AM MST  
([User Info](#))

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<http://www.basler.com/html/rscacc.htm>

This might help you with understanding how the pro's do it!

I'm thinking of doing something along these same lines with a diesel motor running on veggie oil and grid-tie the output! I might just break down and buy a whole diesel genset from ebay.

-Beui

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## Voltage Regulator Accessories

Basler Electric offers a broad range of specially designed accessories to enhance voltage regulator capabilities over a wide variance of specifications. Listed below is general information on these types, with specific applications covered in the [Voltage Regulator Accessories Selector Chart](#) that follows. For more information, download [product bulletins](#) by accessory model name or download the [product manual](#).

## Remote Display Panel (RDP-300)

The RDP-300 is a human-machine interface (HMI) used in conjunction with the [DECS-300](#) Digital Excitation Control System to provide remote control, view metered quantities, and provide annunciation of system status and alarms available from the DECS-300 system.

- Touch-sensitive 6" diagonal monitoring screen
- Two-wire, RS-485 Modbus communication protocol
- May be located up to 4000 feet away from the DECS-300



Download [Bulletin SZW](#) for more information or download the [instruction manual](#).

## Paralleling Modules

Basler Electric offers two paralleling modules, the APM300 and the APM2000. Both units provide excellent reactive droop or reactive differential compensation. See the Voltage Regulator Accessories Selector Chart for the paralleling module offered for the different Basler Electric voltage regulators.



Download [Bulletin SPI](#) on the APM300; or for details on the APM2000, download [Bulletin SRJ](#) or the [instruction manual](#).

## Excitation Support Systems

Two basic types of excitation support are offered. One is the Series Boost Option that maintains a constant power input for the voltage regulator and the other is the Current Boost System that supplies needed excitation directly into the field of the generator along with the regulator output. Both types give excellent generator excitation support for short circuit conditions and motor starting. See the Voltage Regulator Accessories Selector Chart for the Excitation Support Systems offered for the different Basler Electric voltage regulators.

Download [Bulletin SP](#) for information on the Series Boost Option. To learn about the Current Boost System, download [Bulletin SQA](#) or [Bulletin SRR](#) or [Bulletin SPW](#). [Product manuals](#) are also available.

## Manual Voltage Controls

A wide range of manual voltage controls is offered as a redundant back-up to the automatic voltage regulator. The manual voltage controller allows for operator control of the generator's voltage when the automatic voltage regulator is removed from the voltage control loop.



Basler Electric offers three families of manual voltage controllers to fit your generator control requirements. These families are the MVC100, MVC200 and MVC300. See the Voltage Regulator Accessories Selector Chart for the Manual Voltage Controller offered for the different Basler Electric voltage regulators.

Download [Bulletin SPC](#) for information on the MVC modules; download [Bulletin SRU](#) for more information on the MVC100 and 200 series; [Bulletin SRK](#) for more information on the MVC300 series. [Product manuals](#) are also available.

## Power Isolation Transformers

Standard models are offered from 208 volts up to 15 KV for voltage matching to the power requirements of the regulator. Medium and high voltage units rated with a primary voltage above 600 VAC have primary line fuse protection and low corona characteristics. Both 50/60 and 400

Hz units are available. Consult the application chart in this catalog for specifics. For special applications, contact Basler Electric for custom designed products.

Download [Bulletin SP](#) or more information.

## Underfrequency/Overvoltage Protection

Basler Electric offers accessory devices to protect against generator underfrequency and overvoltage conditions. UFOV, for use with the SR Series regulators, gives underfrequency rolloff characteristics and overvoltage protection. The UFOV requires a separate breaker with manual reset for overvoltage protection.

Download [Bulletin SPD](#) for more information or download the [product manual](#).

## VAR/Power Factor Control

For cogeneration and other utility parallel applications, Basler Electric offers an SCP250 VAR/Power Factor Controller. This unit receives generator voltage and current inputs to monitor the reactive condition of the generator set. Control signals are sent from the SCP250 to the voltage regulator to maintain the generator's VAR or Power Factor within a regulation band prescribed by the customer. All solid state construction makes the unit easily calibrated on site and maintains levels within +/-5%.



Download [Bulletin UKR](#) for more information or download the [product manual](#).

## Excitation Limiter

For cogeneration and other utility applications, the Model EL200 and Model EL300 Excitation Limiter keeps generator field excitation within safe operating limits to prevent loss of generator synchronization and generator field overheating. Customer adjustments enable tailoring of the exciter system to the generator capability curve. See the Voltage Regulator Accessories Selector Chart for the proper Excitation Limiter offered for the different Basler Electric voltage regulators.

Download [Bulletin SRP](#) for more information or download the [product](#)

[manual](#).

# Exciter Diode Monitor

The EDM200 is designed to monitor diodes in rotating rectifier assemblies on brushless generators. When sensing a shorted or open diode, an auxiliary contact changes state for indication. The EDM200 connects the field output of the voltage regulator and senses ripple current to identify diode condition. It is independent and does not require connection to the rotary portion of the generator.

Download [Bulletin SRO](#) for more information or download the [product manual](#).

## Voltage Regulator Accessories Chart

Regulator Model	Parallel Comp	Excitation Support	Manual Control	UF Devices	Remote Display
<a href="#">DECS-300</a>	Standard	<a href="#">Call Basler</a>	<a href="#">Call Basler</a>	Standard	<a href="#">RDP-300</a>
<a href="#">DECS-200</a>	Standard	<a href="#">Call Basler</a>	<a href="#">Call Basler</a>	Standard	N/A
<a href="#">DECS-100</a>	Standard	<a href="#">Call Basler</a>	<a href="#">Call Basler</a>	Standard	N/A
<a href="#">DECS 32-15</a>	Standard	<a href="#">Call Basler</a>	<a href="#">MVC 236</a>	Standard	
<a href="#">DECS63-15</a>	Standard	<a href="#">Call Basler</a>	<a href="#">MVC 236</a>	Standard	N/A
<a href="#">DECS125-15</a>	Standard	<a href="#">Call Basler</a>	<a href="#">MVC 236</a>	Standard	
<a href="#">AVC63-4</a>	N/A	N/A	N/A	<a href="#">UF 324</a>	
<a href="#">AVC63-4A</a>	<a href="#">Call Basler</a>	<a href="#">Call Basler</a>	<a href="#">MVC 300</a>	<a href="#">UF 312 or UF 324</a>	N/A
<a href="#">AVC63-7</a>	Standard	Standard	<a href="#">MVC 300</a>	<a href="#">UF 324</a>	
<a href="#">VR63-4/UL</a>	N/A	N/A	N/A	<a href="#">UF 324</a>	N/A
<a href="#">VR63-4A/UL</a>	N/A	N/A	N/A	<a href="#">UF 312</a>	
<a href="#">APR63-5/UL</a>	<a href="#">APM 2000</a>	<a href="#">CBS 305</a>	<a href="#">MVC 300</a>	<a href="#">UF 324</a>	N/A
<a href="#">APR125-5</a>	<a href="#">APM 2000</a>	<a href="#">CBS 320</a>	<a href="#">MVC 300</a>	<a href="#">UF 324</a>	
<a href="#">SSR32-12</a>	Standard	<a href="#">Call Basler</a>	<a href="#">MVC 112</a>	<a href="#">UF 312</a>	
<a href="#">SSR63-12</a>	Standard	<a href="#">Call Basler</a>	<a href="#">MVC 112</a>	<a href="#">UF 312</a>	N/A
<a href="#">SSR125-12</a>	Standard	<a href="#">Call Basler</a>	<a href="#">MVC 112</a>	<a href="#">UF 324</a>	
<a href="#">AEC63-7</a>	Standard	<a href="#">SBO 180</a>	<a href="#">MVC 300</a>	<a href="#">UF 312 or UF 324</a>	N/A

<a href="#">AEC42-7</a>	Standard	<a href="#">SBO 180</a>	<a href="#">MVC 300</a>	<a href="#">UF 324</a>	
<a href="#">SR4A</a>	Optional (Built-in) or <a href="#">APM 300</a>	<a href="#">SBO 240</a>	<a href="#">MVC 104</a> or <a href="#">MVC 300</a>	<a href="#">UFOV</a>	N/A
<a href="#">SR8A</a>	Optional (Built-in) or <a href="#">APM 300</a>	<a href="#">SBO 180</a>	<a href="#">MVC 108</a> or <a href="#">MVC 300</a>	<a href="#">UFOV</a>	
<a href="#">SR32H</a>	Standard	<a href="#">Call Basler</a>	<a href="#">MVC 236</a>	<a href="#">UFOV</a>	
<a href="#">SR32E</a>	Standard	<a href="#">Call Basler</a>	<a href="#">MVC 236</a>	<a href="#">UFOV</a>	
<a href="#">SR63H</a>	Standard	<a href="#">Call Basler</a>	<a href="#">MVC 236</a>	<a href="#">UFOV</a>	
<a href="#">SR63E</a>	Standard	<a href="#">Call Basler</a>	<a href="#">MVC 236</a>	<a href="#">UFOV</a>	N/A
<a href="#">SR125H</a>	Standard	<a href="#">Call Basler</a>	<a href="#">MVC 236</a>	<a href="#">UFOV</a>	
<a href="#">SR125E</a>	Standard	<a href="#">Call Basler</a>	<a href="#">MVC 236</a>	<a href="#">UFOV</a>	
<a href="#">SR250H</a>	Standard	<a href="#">Call Basler</a>	<a href="#">MVC 236</a>	<a href="#">UFOV</a>	
<a href="#">SR250E</a>	Standard	<a href="#">Call Basler</a>	<a href="#">Call Basler</a>	<a href="#">UFOV</a>	

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[New Webpage about the triplets.](#) | 10 comments (10 topical, editorial)

Re: New Webpage about the triplets. (none / 0) (#1)  
by troy on Fri Sep 26th, 2003 at 02:33:58 PM MST  
([User Info](#))

Hey guys,

Awesome pictorial guide to building a mill. You're approaching book status you know...

Hugh Piggot watch out, Ha Ha.

Keep up the good work.

Best regards,

troy

[New Webpage about the triplets.](#) | 10 comments (10 topical, 0 editorial)

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[New Webpage about the triplets.](#) | 10 comments (10 topical, editorial)

Re: New Webpage about the triplets. (none / 0) (#2)  
by Reno on Fri Sep 26th, 2003 at 02:40:59 PM MST  
([User Info](#))

Nice job

I was wondering about the shape of the coils in relation to those 2 inch magnets as I have been curious as how to wind a coil for that magnet.

Another thought/question

After seeing your 3 stators in a pic for the three machines it got me thinking.

If you were building a three phase machine could you build 3 single phase stators then adhere them together to get you 3 phase stator. this would definitely make it easier, also each phase could be check prior to assembly and could be seperated if one phase ever needed changing.

Just a thought

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[New Webpage about the triplets.](#) | 10 comments (10 topical, editorial)

Re: New Webpage about the triplets. (none / 0) (#3)  
by sean on Fri Sep 26th, 2003 at 04:17:48 PM MST  
([User Info](#))  
<http://homepage.ntlworld.com/s.amesbury/homepage.htm>

Very, very, very interesting but myself can only take so much in from books or reading web pages and probably like yourself need that hands on class room environment to ask those questions which i need answers to. But i got to give it to you, you put the work in and got the output from that work and they look good...wish i could have something with big prop but not where i live (Damn!!!!). Theres mainly two things i dont grasp and thats the building of the props and how the furling system works, hey maybe i need to attend a course by Hugh!!! It has crossed my mind more than once and one day it might just become realality. I dont know how big your community is up there at otherpower but have you ever wonder of building a wind farm and having your own grid? Keep building them gennys cos i will for sure, even though mine look like toys in comparison they still have a purpose and that is to charge batteries. Love the site and the things you guys make.....sean

<http://homepage.ntlworld.com/s.amesbury/homepage.htm>

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[New Webpage about the triplets.](#) | 10 comments (10 topical, editorial)

Re: New Webpage about the triplets. (none / 0) (#4)  
by RayW on Fri Sep 26th, 2003 at 09:41:23 PM MST  
([User Info](#))

Congrats to all involved in making the wind turbines and web page. Very nice and informative. The pictures are worth thousands of words.

RayW

[New Webpage about the triplets.](#) | 10 comments (10 topical, 0 editorial)

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[New Webpage about the triplets.](#) | 10 comments (10 topical, editorial)

Re: New Webpage about the triplets. ([none / 0](#)) ([#5](#))  
by Norm on Sat Sep 27th, 2003 at 10:18:16 AM MST  
([User Info](#))

Just out of curiosity how much current does one of those produce at say 120 rpm? Well actually how fast would it have to spin to light something like a 40 watt CF? Norm.

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Re: New Webpage about the triplets. ([none / 0](#)) ([#6](#))  
by DanB on Sat Sep 27th, 2003 at 10:54:50 AM MST  
([User Info](#))

Sorry Norm - I've not tested for that yet... I don't have a powerful enough test setup to test current over a range of rpm yet. A 40 watt CF though... wouldn't take much. I suspect probably you'd do that easily at 110 rpm or so, right after it hits 12 volts.

It seems that a very small increase in rpm = quite a current increase into the batteries. I don't think I've seen these ever exceed much over 400 rpm before furling out, just judging from the sound of the alternator. You can hear the alternator start humming shortly after cutin. I've sat/listened even on windy days, and I've heard it on occasion cover about 1 octave (the faster it goes the higher pitch hum).

My digital multimeter, which can measure frequency, doesn't seem to do well at very low frequencies.. the readings I get are chaotic, so Im unable to determine rpm that way when it's up on the tower.

I really need to make a good test setup where I can drive these with a gas engine or something to get some good data.

[ [Parent](#) ]

Re: New Webpage about the triplets. ([none / 0](#)) ([#8](#))  
by Norm on Mon Sep 29th, 2003 at 06:42:48 AM MST  
([User Info](#))

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DanB, That high pitched hum...I'll bet...is music to your ears! Fun! (:>) Norm.

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by DanB on Sat Sep 27th, 2003 at 10:54:50 AM MST  
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Sorry Norm - I've not tested for that yet... I don't have a powerful enough test setup to test current over a range of rpm yet. A 40 watt CF though... wouldn't take much. I suspect probably you'd do that easily at 110 rpm or so, right after it hits 12 volts.

It seems that a very small increase in rpm = quite a current increase into the batteries. I don't think I've seen these ever exceed much over 400 rpm before furling out, just judging from the sound of the alternator. You can hear the alternator start humming shortly after cutin. I've sat/listened even on windy days, and I've heard it on occasion cover about 1 octave (the faster it goes the higher pitch hum).

My digital multimeter, which can measure frequency, doesn't seem to do well at very low frequencies.. the readings I get are chaotic, so Im unable to determine rpm that way when it's up on the tower.

I really need to make a good test setup where I can drive these with a gas engine or something to get some good data.

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by Norm on Mon Sep 29th, 2003 at 06:42:48 AM MST  
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We actually made one machine with a smaller tail and a smaller 8' diameter prop. On that one we had to have a higher cut-in rpm, and allow the alternator to spin up faster. So on that one we opened it up quite a bit - almost 1/4" on each side! This brought "cut in" rpm to about 165 and allows the alternator to run faster without generating so much current, basically an attempt to "match" the alternator to a smaller prop. Not very good use of magnets though - if I was going to build an 8' machine I'd use smaller, or fewer magnets. We did it this way thinking that someday we'd probably want to upgrade the machine to a larger prop once DanF builds a stronger/bigger tower.

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by [jimu](#) - October 31  
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- Hydro
- Wind
- Chemical Reaction
- Steam
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- Fossil Fuels
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### Comment Ratings by jeanpaul

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[Disk Magnet spacing in axial flux alternators](#) | 14 comments (14 topical, editorial)

Re: Disk Magnet spacing in axial flux alternators  
([none / 0](#)) ([#1](#))  
by E man on Tue Sep 16th, 2003 at 12:05:38 PM MST  
([User Info](#))

Number four up there...never thought of that one. I wonder if a gaussmeter would be a good candidate for testing possible leakage in the area you're describing; or even just holding a small nail or paperclip on the steel in these zones to check for leakage?

E-man

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Re: Disk Magnet spacing in axial flux alternators ([none / 0](#)) ([#2](#))  
by DanB on Tue Sep 16th, 2003 at 01:17:24 PM MST  
([User Info](#))

yes - a gaussmeter would tell. Perhaps if I get a few spare min. today I'll do some tests.

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[Disk Magnet spacing in axial flux alternators](#) | 14 comments (14 topical, editorial)

Re: Disk Magnet spacing in axial flux alternators  
([none / 0](#)) (#3)  
by [electronbaby](#) ([electronbaby@hotmail.com](mailto:electronbaby@hotmail.com)) on Tue Sep 16th, 2003 at 02:05:44 PM MST  
([User Info](#))

It seems to me that pic #4 would only be the case if the steel backing that actually was used for the rotor was too thin and allowed to saturate with flux. If the steel disc was thick enough, it should neutralize the flux path throughout the entire steel rotor. Isn't this what you want,... enough strength in the magnet to hold itself to the rotor and not slide around. You want to focus the flux path very sharply between rotors. You do not want the magnets flying off of the rotors so that's why it is important to use a steel rotor that is thick enough to allow for the flux path from the back side of adjacent magnets to complete the 'outside' circuit'. When I say outside circuit, I mean the side of the magnet touching the rotor and not the side facing the stator. But your right Dan, this would only be a problem if the air gap was allowed to get too large. RoyR

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Re: Disk Magnet spacing in axial flux alternators ([none / 0](#)) (#4)  
by [DanB](#) on Tue Sep 16th, 2003 at 04:23:23 PM MST  
([User Info](#))

Well - I should just test it...  
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### User info for electronbaby

Email: [electronbaby@hotmail.com](mailto:electronbaby@hotmail.com)

Bio:

I am a 24 yr. old electronics hobbyist/ mad scientist inventor. I live on the east end of Long Island NY (aprox. 85 miles east of NYC. It gets pretty windy most of the time). I started 'playing' around age 8 and I have been a lisenced ham since age 15.

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- [signweld](#)
- [jeanpaul](#)
- [Harry Luubovv](#)
- Anonymous Users: 19
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Re: Disk Magnet spacing in axial flux alternators  
([none / 0](#)) (#5)  
by zubbly on Tue Sep 16th, 2003 at 05:36:39 PM MST  
([User Info](#))

try using a compass to check for other "phantom" poles.  
have fun. zubbly

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Re: Disk Magnet spacing in axial flux alternators ([none / 0](#)) (#6)  
by DanB on Tue Sep 16th, 2003 at 07:05:53 PM MST ([User Info](#))

that would surely work, except I think it would be a bit large to poke in between the two rotors. It also doesn't give a real good idea of the "strength" of the pole. It would definitely give some idea on a single rotor though.

The Gaussmeter works a lot like a compass, but has a very small probe. It tells polarity though, and field density.

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Re: Disk Magnet spacing in axial flux alternators ([none / 0](#)) (#7)  
by zubbly on Tue Sep 16th, 2003 at 07:09:35 PM MST ([User Info](#))

gonna get me a gauss meter. zubbly

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Re: Disk Magnet spacing in axial flux alternators ([none / 0](#)) ([#6](#))  
by DanB on Tue Sep 16th, 2003 at 07:05:53 PM MST  
([User Info](#))

that would surely work, except I think it would be a bit large to poke in between the two rotors. It also doesn't give a real good idea of the "strength" of the pole. It would definitely give some idea on a single rotor though.

The Gaussmeter works a lot like a compass, but has a very small probe. It tells polarity though, and field density.

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Re: Disk Magnet spacing in axial flux alternators ([none / 0](#)) ([#7](#))  
by zubbly on Tue Sep 16th, 2003 at 07:09:35 PM MST  
([User Info](#))

gonna get me a gauss meter.  
zubbly

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[Disk Magnet spacing in axial flux alternators](#) | 14 comments (14 topical, 0 editorial)

Re: Disk Magnet spacing in axial flux alternators  
([none / 0](#)) (#8)  
by hvirtane on Wed Sep 17th, 2003 at 08:01:40 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

I think that your pictures are qualitatively correct.

But I'm wondering about the picture 4. if there really is that kind of flux much with thick plates.

I'm more concerned about the empty space between the magnets in that sense that there is no flux at all in that area to hit the coils.

It means that you need higher speeds, when the gaps between magnets are bigger?

I think that there isn't any perfect layout, which is always the best and only good measurements will tell, what is the best configuration using different kinds of magnets.

With every layout there are some compromises to be made?

- Hannu

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Re: Disk Magnet spacing in axial flux alternators ([none / 0](#)) (#9)  
by DanB on Wed Sep 17th, 2003 at 08:45:28 AM MST  
([User Info](#))

I would agree - no matter what you do, especially if were having a wide airgap... then some compromises are being made. Every move has its pros and cons.

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[Disk Magnet spacing in axial flux alternators](#) | 14 comments (14 topical, editorial)

Re: Disk Magnet spacing in axial flux alternators  
([none / 0](#)) (#10)  
by troy on Wed Sep 17th, 2003 at 11:47:03 AM MST  
([User Info](#))

Yet another interesting discussion. I would point out that a dual rotor alternator is allowed to have TWICE the "air gap" from magnet face to magnet face (compared to a single rotor, from magnet face to lams) with no degradation in performance or flux loss to adjacent magnets. In a dual rotor setup, each facing magnet of a pair contributes to the transmission of the flux. Think of it as the one magnet pushing the flux and the opposing magnet pulling the flux. But if you have a single rotor, the lams can't produce any "pull", but only contribute a better conduit for the push of the single magnet.

I don't have a gaussmeter, but it would be fun if the Dans could do a quicky experiment to confirm the flux readings between to neos 1/2" appart vs one neo (same size, etc) 1/4" space from lams. You would need a small hole in the lams to measure the flux at the face of the laminations.

Anyway, keep up the excellent work,

troy

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Re: Disk Magnet spacing in axial flux alternators ([none / 0](#)) ([#11](#))  
by DanB on Wed Sep 17th, 2003 at 01:06:55 PM MST  
([User Info](#))

I dont have a good enough 9V battery for my Gaussmeter! Tried....  
Maybe after my next trip to town.

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9V battery woes ([none / 0](#)) ([#12](#))  
by TomW on Wed Sep 17th, 2003 at 01:32:21 PM MST  
([User Info](#))  
<http://oneota.net/~earthsourcepowr/>

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DanB;

I dont have a good enough 9V battery for my Gaussmeter!

When I started messing with data logging with an RS232 meter to the PC I almost immediately dug out a 9 volt DC wall wart and a battery clip from the junkbox. Since the PC runs off AC I simply plug the wall wart into the power strip the PC runs off of. When the PC is powered up the meter is automagically on too.

Seems like in your case you generally would be using the meter in an area where AC is available so this may help. If you use a 9 V battery clip you can always pop a battery in there if you need to go roam with it. Those 9 volt batteries seem to go bad at the worst times. Just my \$0.02. Be aware that the polarity is "backwards" from how the clip may be marked when you use it this way! Mine had red for + and black for - which is good when it will hook to a battery but opposite when you use it as the battery.

Cheers.

TomW

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Re: Disk Magnet spacing in axial flux alternators ([none / 0](#)) (#13)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Wed Sep 17th, 2003 at 02:31:21 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

I've run some similar tests using my magnets for a dual rotor system. The magnets alone show 3200 gauss, on steel show 4500 gauss. Between two rotors and a 1/2 " gap I'm getting about 6800 gauss.

The same set up using 1/2" thick coils over a lamination I get about 4800 at the lamination.

Another setup with a slotted stator and the air gap is .02" reads 9800 gauss in the air gap. Doubling the magnets over the slotted stator jumps to 1.3 Tesla in the gap.

The dual rotor system is much better than the coil over iron system but still falls behind in the overall power you can achieve with a slotted stator. There are advantages and disadvantages to both systems but for the simplicity in building, coil over lams is the simplest, the dual rotor comes in second and of course the slotted stator last. Power wise and efficiency the order is reversed.

I've been contemplating a way to decrease the gap between the two rotors by using the overlapped coils 3phase wiring. I think that has bothered me most about the design. The inline 3phase version has to create all the voltage in fewer coils which makes the amount of turns high and the gap between the rotors larger. By spreading the coils out you need fewer

turns thus keeping the magnets closer to the flux.

I haven't built one as yet but my idea was cut out a ring in plastic. Drill the holes around the outer diameter that would represent the slots in the stator and saw through the top layer of each hole just wide enough to get the wire through. Once wired you would have a very thin stator. From there you would make a mold to make the mounting tabs and pour over the wire in those areas. Still working out some details on the idea but you get the picture. Another idea was to build 2 rings with hooks and wire it to the hooks, It would look like spokes in a bike but the wires would be allowed to spread out a bit that way so the later is still prime in my mind.

Have Fun  
Ed

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Re: Disk Magnet spacing in axial flux alternators ([none / 0](#)) ([#14](#))  
by troy on Thu Sep 18th, 2003 at 10:08:36 AM MST  
([User Info](#))

Hey thanks Ed, excellent food for thought. A slick easy cool strong overlapped thin three phase stator seems to be a very elusive beastie. But I keep thinking about it...

Also, if I embed a 3/8" copper tube for cooling around the outside edge of the stator next to the coils, will the flow of electricity in the coils induce eddy current in the cooling pipe?

Best regards,

troy

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by DanB on Wed Sep 17th, 2003 at 01:06:55 PM MST  
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9V battery woes ([none / 0](#)) (#12)  
by TomW on Wed Sep 17th, 2003 at 01:32:21 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

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Seems like in your case you generally would be using the meter in an area where AC is available so this may help. If you use a 9 V battery clip you can always pop a battery in there if you need to go roam with it. Those 9 volt batteries seem to go bad at the worst times. Just my \$0.02. Be aware that the polarity is "backwards" from how the clip may be marked when you use it this way! Mine had red for + and black for - which is good when it will hook to a battery but opposite when you use it as the battery.

Cheers.

TomW

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[Disk Magnet spacing in axial flux alternators](#) | 14 comments (14 topical, 0 editorial)

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[Disk Magnet spacing in axial flux alternators](#) | 14 comments (14 topical, editorial)

Re: Disk Magnet spacing in axial flux alternators  
([none / 0](#)) (#13)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Wed Sep 17th, 2003 at 02:31:21 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

I've run some similar tests using my magnets for a dual rotor system. The magnets alone show 3200 gauss, on steel show 4500 gauss. Between two rotors and a 1/2 " gap I'm getting about 6800 gauss. The same set up using 1/2" thick coils over a lamination I get about 4800 at the lamination. Another setup with a slotted stator and the air gap is .02" reads 9800 gauss in the air gap. Doubling the magnets over the slotted stator jumps to 1.3 Tesla in the gap.

The dual rotor system is much better than the coil over iron system but still falls behind in the overall power you can achieve with a slotted stator. There are advantages and disadvantages to both systems but for the simplicity in building, coil over lams is the simplest, the dual rotor comes in second and of course the slotted stator last. Power wise and efficiency the order is reversed.

I've been contemplating a way to decrease the gap between the two rotors by using the overlapped coils 3phase wiring. I think that has bothered me most about the design. The inline 3phase version has to create all the voltage in fewer coils which makes the amount of turns high and the gap between the rotors larger. By spreading the coils out you need fewer turns thus keeping the magnets closer to the flux.

I haven't built one as yet but my idea was cut out a ring in plastic. Drill the holes around the outer diameter that would represent the slots in the stator and saw through the top layer of each hole just wide enough to get the wire through. Once wired you would have a very thin stator.

From there you would make a mold to make the mounting tabs and pour over the wire in those areas. Still working out some details on the idea but you get the picture.

Another idea was to build 2 rings with hooks and wire it to the hooks, It would look like spokes in a bike but the wires would be allowed to spread out a bit that way so the later is still prime in my mind.

Have Fun  
Ed

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Re: Disk Magnet spacing in axial flux alternators ([none / 0](#)) (#14)  
by troy on Thu Sep 18th, 2003 at 10:08:36 AM MST  
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Also, if I embed a 3/8" copper tube for cooling around the outside edge of the stator next to the coils, will the flow of electricity in the coils induce eddy current in the cooling pipe?

Best regards,

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[Wiring up the 3 phase stator](#) | 6 comments (6 topical, editorial)

Re: Wiring up the 3 phase stator ([none / 0](#)) (#1)  
by lands on Thu Sep 11th, 2003 at 08:53:32 AM MST  
([User Info](#))

Great pictures Dan. That clears up a lot of questions.  
Les M

[Wiring up the 3 phase stator](#) | 6 comments (6 topical, 0 editorial)

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[Wiring up the 3 phase stator](#) | 6 comments (6 topical, 0 editorial)

Re: Wiring up the 3 phase stator ([none / 0](#)) (#2)  
by yossarian on Thu Sep 11th, 2003 at 03:04:28 PM MST  
([User Info](#))

They say a picture's worth a thousand words, but these pictures are 10,000 worders. Thanks.

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[Wiring up the 3 phase stator](#) | 6 comments (6 topical, editorial)

Re: Wiring up the 3 phase stator ([none / 0](#)) (#3)  
by troy on Thu Sep 11th, 2003 at 05:03:11 PM MST  
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Thanks guys,

DanCad rules! I have a feeling this page is going to get referenced a lot...

Keep having fun!

troy

ps, are you guys quietly plotting to produce an FAQ with DanCad illustrations??? This one would be a must have.

Hope so,

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[Wiring up the 3 phase stator](#) | 6 comments (6 topical, editorial)

Re: Wiring up the 3 phase stator ([none / 0](#)) (#4)  
by TomW on Thu Sep 11th, 2003 at 05:05:17 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Dan;

Got a copy of that CAD program ??

Looks like a good one!

Cheers.

TomW

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Re: Wiring up the 3 phase stator ([none / 0](#)) (#5)  
by JB on Thu Sep 11th, 2003 at 07:49:49 PM MST  
([User Info](#))

Thanks Dan The Pictures are great. What kind of voltage are you getting from them guys wired thata way. JB

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Re: Wiring up the 3 phase stator ([none / 0](#)) (#6)  
by DanB on Thu Sep 11th, 2003 at 08:24:42 PM MST  
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You can get them at Toys R Us... yellow boxes that say "crayola" on them. (crayon aided design) Its the most advanced CAD system I've ever had the patience to try :-)

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[Wiring up the 3 phase stator](#) | 6 comments (6 topical, 0 editorial)

Re: Wiring up the 3 phase stator ([none / 0](#)) (#5)  
by JB on Thu Sep 11th, 2003 at 07:49:49 PM MST  
([User Info](#))

Thanks Dan The Pictures are great. What kind of voltage are you getting from them guys wired thata way. JB

[ [Parent](#) ]

[Wiring up the 3 phase stator](#) | 6 comments (6 topical, 0 editorial)

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#### Who's Online? (20)

- [hvirtane](#)
- [troy](#)
- [DanB](#)
- [ADMIN](#)
- [Harry Luubovv](#)
- Anonymous Users: 15

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### Who's Online? (31)

- [jeanpaul](#)
- [Harry Luubovv](#)
- [DanB](#)
- Anonymous Users: 27
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[Wiring up the 3 phase stator](#) | 6 comments (6 topical, editorial)

Re: Wiring up the 3 phase stator ([none / 0](#)) (#6)  
by DanB on Thu Sep 11th, 2003 at 08:24:42 PM MST  
([User Info](#))

You can get them at Toys R Us....  
yellow boxes that say "crayola" on them. (crayon aided design) Its the most advanced CAD system I've ever had the patience to try :-)

[ [Parent](#) ]

[Wiring up the 3 phase stator](#) | 6 comments (6 topical, 0 editorial)

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[Triplets!](#) | 3 comments (3 topical, 0 editorial)

Re: Triplets! ([none / 0](#)) ([#1](#))  
by sean on Thu Aug 14th, 2003 at 07:51:05 AM MST  
([User Info](#))  
<http://homepage.ntlworld.com/s.amesbury/homepage.htm>

Wow looks like a production line you going there, the way you Dans are going you could have your own community wind farm up with power supplied to all the houses up there. Of course that depend on the distance between houses and could get costly in cable.....sean

[Triplets!](#) | 3 comments (3 topical, 0 editorial)

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Who's Online? (21)

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- [DanB](#)
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[Triplets!](#) | 3 comments (3 topical, editorial)

Re: Triplets! ([none / 0](#)) ([#2](#))  
by Chuck on Fri Aug 15th, 2003 at 02:39:47 PM MST  
([User Info](#)) <http://www.greeleynet.com/~cmorrison>

Looks good guys ! I especially like the lines of your blades.  
You're starting to look like real wood workers now.

I look forward to seeing what the power outputs on these  
stooges are.

Chuck

[Triplets!](#) | 3 comments (3 topical, 0 editorial)

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### User info for Chuck

Homepage: <http://www.greeleynet.com/~cmorrison>

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News: OK, it looks like I'm out of work for a while. If anyone is interested in hiring me for computer related work, you can find my current resume [here](#)

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[Testing soil and perlite cement mixes for wall construction](#)

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[My solar well](#)

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[cmorrison@greeleynet.com](mailto:cmorrison@greeleynet.com)

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[Triplets!](#) | 3 comments (3 topical, editorial)

Re: Triplets! ([none / 0](#)) ([#3](#))  
by scoraigwind ([magnet@scoraigwind.co.uk](mailto:magnet@scoraigwind.co.uk)) on Sat Aug 16th, 2003 at 01:08:02 AM MST  
([User Info](#)) <http://www.scoraigwind.co.uk>

Great to see those 3 reaching completion. Looking frward to hearing about them cranking out the power.

As for grid intertie, the simplest solution is probably a Trace SW or a 'power station'. That would do a god job of turning the DC into grid AC. I am not sure if Outback have a product to do that for you yet.  
Hugh Piggott <http://www.scoraigwind.co.uk>

[Triplets!](#) | 3 comments (3 topical, 0 editorial)

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[Too much fun! 3 windmills...](#) | 15 comments (15 topical, editorial)

Re: Too much fun! 3 windmills... ([none / 0](#)) ([#1](#))  
by RobD on Fri Aug 1st, 2003 at 08:59:58 AM MST  
([User Info](#))

Great stuff guys!  
RobD

[Too much fun! 3 windmills...](#) | 15 comments (15 topical, 0 editorial)

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[Too much fun! 3 windmills...](#) | 15 comments (15 topical, editorial)

Re: Too much fun! 3 windmills... ([none / 0](#)) (#2)  
by Chuck on Fri Aug 1st, 2003 at 09:27:51 AM MST  
([User Info](#)) <http://www.greeleynet.com/~cmorrison>

Good work guys!

Mass production comes to otherpower. Who'd a thunk it.

Chuck

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[Too much fun! 3 windmills...](#) | 15 comments (15 topical, editorial)

Re: Too much fun! 3 windmills... ([none / 0](#)) ([#3](#))  
by xeroid ([centurion27@lycos.com](mailto:centurion27@lycos.com)) on Fri Aug 1st, 2003  
at 09:42:58 AM MST  
([User Info](#))

Dan B, Dan F and the Otherpower guys:

Way to go! As always, I continue to be fascinated by your innovative and practical solutions for alternative power systems.

Looking forward to seeing the test results!  
Regards, XEROID.

[Too much fun! 3 windmills...](#) | 15 comments (15 topical, 0 editorial)

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[Too much fun! 3 windmills...](#) | 15 comments (15 topical, 0 editorial)

Re: Too much fun! 3 windmills... ([none / 0](#)) (#3)  
by xeroid ([centurion27@lycos.com](mailto:centurion27@lycos.com)) on Fri Aug 1st, 2003  
at 09:42:58 AM MST  
([User Info](#))

Dan B, Dan F and the Otherpower guys:

Way to go! As always, I continue to be fascinated by your innovative and practical solutions for alternative power systems.

Looking forward to seeing the test results!  
Regards, XEROID.

[Too much fun! 3 windmills...](#) | 15 comments (15 topical, 0 editorial)

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- [DanB](#)
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### User info for xeroid

Email: [centurion27@lycos.com](mailto:centurion27@lycos.com)

Bio:

I am a Canadian, living in Southern Ontario. I am no professional, but I have been visiting the Otherpower board for quite a while. I am fascinated with the experiments, and appreciate the pool of knowledge and support. Thank Dans!

- [View comments posted by xeroid](#)
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[Too much fun! 3 windmills...](#) | 15 comments (15 topical, 0 editorial)

Re: Too much fun! 3 windmills... ([none / 0](#)) ([#4](#))  
 by [electronbaby](#) ([electronbaby@hotmail.com](mailto:electronbaby@hotmail.com)) on Fri Aug 1st, 2003 at 11:49:52 AM MST  
 ([User Info](#))

Very nice Dan and thanks for the cobalt mags. :-) Im currently working on that machine. I just wanted to say that there is another way to make sure the faces of the mags match up on both rotors. What I do in assemble the dual rotor machine so that it has the rear rotor in place and then the stator just like you do. I then do all the common tests. When it comes time to match up the mags before gluing the second rotor, I mount the front rotor on backwards so that the magnet side is facing out (except of course there is no mags glued yet). I then take a paint pen and mark the two rotors so they only will go on in one direction only. I then take a "T" square and hold it perpendicular to the two rotors (edge wise). I hold the inside of the square to the rear side of the rear rotor so that I can follow and trace a center line to the front rotor. I do this all the way around the front rotor so that I have perfect increments around the side of the front rotor that line up with the mags on the rear rotor. I then remove the front rotor and lay the square across the face of the front rotor and follow my trace in to the center. This will allow you to see where the center of each mag should go on the face of the front rotor. You just have to make sure that you follow the poles over and write on the rotor "N" or "S" depending on which pole should face in (it will be obvious with the square when you follow accross to the second rotor). You then should place your mags and space them with the shims and thats it (well, glue and resin of course :-)) ). Wish I had a pic of how I did it. Hope you can visualize. Sounds like your having fun!!! RoyR

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[Too much fun! 3 windmills...](#) | 15 comments (15 topical, editorial)

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 by [electronbaby](#) ([electronbaby@hotmail.com](mailto:electronbaby@hotmail.com)) on Fri Aug 1st, 2003 at 11:49:52 AM MST  
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[Too much fun! 3 windmills...](#) | 15 comments (15 topical, editorial)

Re: Too much fun! 3 windmills... ([none / 0](#)) ([#5](#))  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Fri Aug 1st, 2003  
at 12:21:19 PM MST  
([User Info](#)) <http://www.internetfred.com>

Nice job guys!!! But I have a question, you don't have a backing material in the back behind the coils... why not and whats up with this ???  
Good Luck!  
Fred.

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Re: Too much fun! 3 windmills... ([none / 0](#)) ([#6](#))  
by xeroid ([centurion27@lycos.com](mailto:centurion27@lycos.com)) on Fri Aug 1st, 2003  
at 01:29:51 PM MST  
([User Info](#))

Hi Fred.

The machines are all dual rotors, meaning that there are magnets in the front and back of each set of coils. No laminates are needed for such a set up since the magnets of the rotor in front are being attracted to the magnets of the rotor on the other side of the coils.

Aren't you working on a double rotor machine yourself? Same principle.

Xeroid.

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Re: Too much fun! 3 windmills... ([none / 0](#)) ([#7](#))  
by DanB on Fri Aug 1st, 2003 at 02:05:11 PM MST  
([User Info](#))

There is fiberglass fabric on both sides of the coils, so hopefully the stator is strong enough! I'm not sure, but was that your question?

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[Too much fun! 3 windmills...](#) | 15 comments (15 topical, editorial)

Re: Too much fun! 3 windmills... ([none / 0](#)) (#7)  
by DanB on Fri Aug 1st, 2003 at 02:05:11 PM MST  
([User Info](#))

There is fiberglass fabric on both sides of the coils, so hopefully the stator is strong enough! I'm not sure, but was that your question?

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Re: Too much fun! 3 windmills... ([none / 0](#)) (#7)  
by DanB on Fri Aug 1st, 2003 at 02:05:11 PM MST  
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Re: Too much fun! 3 windmills... ([none / 0](#)) (#8)  
by zubbly on Fri Aug 1st, 2003 at 06:34:33 PM MST  
([User Info](#))

great job,you guys make it look so easy. keep having fun!  
zubbly

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by zubbly on Fri Aug 1st, 2003 at 06:34:33 PM MST  
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zubbly

Re: Too much fun! 3 windmills... ([none / 0](#)) ([#9](#))  
by JB on Fri Aug 1st, 2003 at 11:02:27 PM MST  
([User Info](#))

Howdy Dan. I take it these magnets arent as thick as the first one the caboose you built a few weeks ago. what is the approximate thickness of the goop you put over the top of the actual magnets themselves once you put the tape around the rotor. This should be a good comparison on the magnet strength. Looking forward to the results and the finish wiring . Thanks JB Dayton Nevada

[ [Parent](#) ]

Re: Too much fun! 3 windmills... ([none / 0](#)) ([#10](#))  
by JB on Sat Aug 2nd, 2003 at 12:19:27 AM MST  
([User Info](#))

My mistake there Dan. The magnets are the same. Im getting a clearer picture on this now. the bearings and everything on the back driving the front hub through the long all thread studs.i like it. I was wondering i got some delrin here or some kind of plastic about 3/4 inches thick. i was wondering if i might drill some big holes in the put the coils in the center and cover both sides with some thin aluminum. i guess the stator could be square and you could use 4 studs also. One thing I forgot is how much is one magnet supposed to cover in coil area. a coil and a third? i guess that is what it works out to be. 9 magnets 12 coils is that right. Getting late . Time to stop thinking. Later on. JB

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Re: Too much fun! 3 windmills...

([none / 0](#)) ([#11](#))

by DanB on Sat Aug 2nd, 2003 at 10:16:12 AM MST

([User Info](#))

Hi JB -

you could probably make the stator from delrin, insert the coils, and glue them in there, that would work fine. Aluminium covers would be a bad idea though... you'd have serious eddy current problems! You might be surprised when the alternator barely wants to turn at all.

Making the mold from plywood is really easy, and we simply place the coils in the right spots (or try) and then bring all the wires out. When we mold the stator, we first grease the mold, then put down some polyester resin (I get it from Autozone in 1 gallon cans for about \$20), then we put down some fiberglass fabric to reinforce it, then we put in the coils over the top of the fabric. Then we mix up new resin and mix it with talcom powder and pour that over the coils so it pretty much fills up the mold. Then we put down more fiberglass fabric, and pour resin over that - and put the lid on the mold. It's real easy, probably a lot less work than messing with delrin and I think a bit stronger and less flexible.

You don't want any metal other than your copper coils in the stator...

[ [Parent](#) ]

Re: Too much fun! 3

windmills... ([none / 0](#)) ([#12](#))

by JB on Sun Aug 3rd, 2003 at 12:15:42 AM MST

([User Info](#))

Thanks Dan. Got ya covered on the stator . Ill make it all resin and fiberglass. another ??? Im not real hot on the wiring yet, in fact im a little slow on it. lets Call any of the nine coils #1. do we start off with one wire of 1 coil at a copper lug and then it is serised thru number 4 coil 120 degrees away then serised thru #7 coil 120 degrees from #4 coil then finished of with the remaining wire of #1 coil at the same copper lug we started with. Is this correct???????? and you do the same for coils # 2 -5 and 8 and 3 -6 and 9 taking them coils to their respective lugs for the total you got on this one of 3 lugs. If this is correct where do you go from here

and where do you pick up the ground wire. I noticed on the papoose windmill you had 6 lugs but i dont want to confuse myself more on this. can you clue me in.  
JB

[ [Parent](#) ]

Re: Too much fun! 3 windmills... ([none / 0](#)) ([#13](#))  
by JB on Sun Aug 3rd, 2003 at 12:17:12 AM MST  
([User Info](#))

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by JB on Fri Aug 1st, 2003 at 11:02:27 PM MST  
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Re: Too much fun! 3 windmills... ([none / 0](#)) (#14)  
by Seth on Mon Aug 4th, 2003 at 03:37:04 PM MST  
([User Info](#))

Make a mpg of the furling in action.. it would help for understanding greatly!!!  
Even if it was by hand.....

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by DanB on Tue Aug 5th, 2003 at 09:24:04 AM MST  
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[Furling system](#) | 17 comments (17 topical, editorial)

Re: Furling system ([none / 0](#)) ([#1](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Wed Jul 23rd, 2003 at 09:45:56 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Great drawings Dan! This must be the notorious DANCAD software that everyone needs to have. I like it!

I've tried alot of different ways to furl these systems. Side furling, tilt, spring and a few stupid ideas of my own. The spring system works but has a built in problem... as the spring stretches it progressively adds more tention which means higher winds to achieve a reasonable furling. I must say that hugh's gravity system is the best I've seen (and used - with several under my belt). The simplicity and functionality of the unit makes it about the best choice for home building.

Have Fun!

Ed

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Re: Furling system ([none / 0](#)) ([#2](#))  
 by Wolfie1 on Wed Jul 23rd, 2003 at 09:51:23 AM MST  
[\(User Info\)](#)

I would agree that it is probably the best but has anyone managed to create one without having to do any welding? If so, pictures would be nice.

Martin.

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Re: Furling system ([none / 0](#)) ([#3](#))  
 by DanB on Wed Jul 23rd, 2003 at 09:58:51 AM MST  
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I think, no matter what you do a bit of welding is necessary. I suppose you could figure a way to bolt it all together, but it would be a bit tricky...

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Re: Furling system ([none / 0](#)) ([#8](#))  
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on Wed Jul 23rd, 2003 at 12:18:48 PM MST  
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Too much fun...

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Re: Furling system ([none / 0](#)) ([#4](#))  
by [DanB](#) on Wed Jul 23rd, 2003 at 10:01:47 AM  
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yes, I do like that system very much. I tend to wonder what the "upper limit" is for prop diameter used with this system. Undoubtably there are strange forces on the blades while it's furling, and while it's furlled... I suspect that in very large machines it might not work so well.

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by DanB on Wed Jul 23rd, 2003 at 10:01:47 AM MST  
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yes, I do like that system very much. I tend to wonder what the "upper limit" is for prop diameter used with this system. Undoubtably there are strange forces on the blades while it's furling, and while it's furlled... I suspect that in very large machines it might not work so well.

Hopefully... we'll never find that limit!

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[Furling system](#) | 17 comments (17 topical, editorial)

Re: Furling system ([none / 0](#)) ([#5](#))  
by Bach On on Wed Jul 23rd, 2003 at 10:53:19 AM MST  
([User Info](#)) [change AT: bach\\_on AT hotmail.com](#)

DanB,

BOINNNNG!!! I think I finally see the crucial piece of information that I've been missing!

Dan wrote:

"the tail is mounted on a pivot. In this case however, the pivot is offset to one side, AND IT IS AT AN ANGLE (about 20 deg usually) TO THE TOWER."

I had understood that the tail was not mounted perpendicular to the plane of the blades. I had assumed that was the 20 degree angle. But that is really what you are calling "offset to one side." THERE ARE ACTUALLY TWO ANGLES INVOLVED.

Viewed from the top - the tail is offset from the plane of the blades by some number of degrees. But the hinge is also mounted at an angle from the straight up of the tower. So the tail doesn't go straight up and down like a see saw. It's leaning.

This means that the tail vane may not really be exactly perpendicular to the ground. It may actually lean to one side at 20 degrees (in your example). So wind can exert force that gets under the vane to push it up.

What had totally flumoxed me was that I couldn't understand where the lift was coming from? I had missed the fact that the tail doesn't move up and down exactly perpendicular to the ground.

Sorry to waste so much bandwidth on this, but I just wasn't grasping the situation accurately. I'd missed the second angle.

Thanks Dan. You're my hero - (just not an anonymous one.) ;-)

Bach On  
- I'm just as happy as if I had good sense! -

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I think he's got it ! ([none / 0](#)) ([#6](#))

by Chuck on Wed Jul 23rd, 2003 at 12:01:10 PM MST

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by DanB on Wed Jul 23rd, 2003 at 12:15:44 PM MST  
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Re: Furling system ([none / 0](#)) ([#14](#))  
by DanB on Wed Jul 23rd, 2003 at 05:24:32 PM MST  
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Re: Furling system ([none / 0](#)) ([#16](#))  
by Wolfie1 on Thu Jul 24th, 2003 at 05:35:01 AM MST  
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[ [Parent](#) ]

Re: Furling system ([none / 0](#)) ([#11](#))  
by Barnac ([barnac@videotron.ca](mailto:barnac@videotron.ca)) on Wed Jul 23rd, 2003 at 02:01:23 PM MST  
([User Info](#))

Hi Bach on

I actually never built myself one of these furling system.

I guess you have a grab on it now, but the fact that the tail vane rise is not caused by the wind exerting a force that gets under the vane to push it up, but simply because It's mounted on a pivot at angle relative to horizontal axis (22 deg relative to the tower or 68 deg relative to the ground).

In the spring system the pivot on wich the tail vane is monted is not on an anle relative to the vertical plane. It's parrallel to the tower and vertical to the ground (0 deg to the tower; vertical plane, 90 deg to the ground; horizontal plane) so when the system is furling the tail vane rotate around the vertical axis, staying in the same plane relative to the ground (horizontal).

Like a garden gate does when you open it. It's rotating around the vertical axis staying in the same plane relative to the ground (horizontal plane). Now imagine that the stupid snow plower strucked the gate post and bented it 22 degree from the vertical axis (the tower)and the edge of the gate is now barely touching the ground when close. Now what happens when you try to open the gate, the edge of the gate will rise relative to the ground... wright? The more you open it the more it rises relative to the ground. Cause now the gate rotate around an axis who is no longer vertical to the ground so the edge of the gate doesn't move in the horizontal plane anymore but keep going away from it the more you open it. Now what happens if you let go ? the door will close by itsel (well helped a bit by gravity ;-)).It's the same thing with the fridge's door when the fridge is not level i.e. on an angle relative to the vertical plane.

Now in the second furling system when the force of the wind against the prop rotate it away from the wind and as the tail vane always stays with the wind, the tail vane as no choice but to rotate around that 22deg of vertical axis and the edge of the tail rise relative to the ground.

Anyway, it's only my perception of the thing and I may be totally wrong...

P.s.: please furling guru if I'am wrong tell me :-)

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[Furling system](#) | 17 comments (17 topical, editorial)

Re: Furling system ([none / 0](#)) ([#14](#))  
by DanB on Wed Jul 23rd, 2003 at 05:24:32 PM MST  
([User Info](#))

Yes... I guess mainly I meant.. that if the tail is not square with the tower it doesnt matter too much, it means that it's probably got less surface area since it should be with the wind all the time, so if the tail is not vertical it has to be a bit larger. If in its resting position it's both not vertical and tipping down (or up I suppose) then it could get some lift from the wind which would not be ideal. So.. it should be vertical...

Itll be fun to see yours after that's fixed... it would benifit in both performance and appearance! I'm dying to see your next one too!

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Re: Furling system ([none / 0](#)) ([#16](#))  
by [Wolfie1](#) on Thu Jul 24th, 2003 at 05:35:01 AM MST  
([User Info](#))

Chuck, since it is coming down this week for the tail fix, could you take a picture of it up close and post it? Please please.

Martin.

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[Furling system](#) | 17 comments (17 topical, editorial)

Re: Furling system ([none / 0](#)) ([#11](#))  
by Barnac ([barnac@videotron.ca](mailto:barnac@videotron.ca)) on Wed Jul 23rd, 2003  
at 02:01:23 PM MST  
([User Info](#))

Hi Bach on

I actually never built myself one of these furling system.

I guess you have a grab on it now, but the fact that the tail vane rise is not caused by the wind exerting a force that gets under the vane to push it up, but simply because It's mounted on a pivot at angle relative to horizontal axis (22 deg relative to the tower or 68 deg relative to the ground).

In the spring system the pivot on wich the tail vane is monted is not on an anle relative to the vertical plane. It's parrallel to the tower and vertical to the ground (0 deg to the tower; vertical plane, 90 deg to the ground; horizontal plane) so when the system is furling the tail vane rotate around the vertical axis, staying in the same plane relative to the ground (horizontal).

Like a garden gate does when you open it. It's rotating around the vertical axis staying in the same plane relative to the ground (horizontal plane). Now imagine that the stupid snow plower strucked the gate post and bented it 22 degree from the vertical axis (the tower)and the edge of the gate is now barely touching the ground when close. Now what happens when you try to open the gate, the edge of the gate will rise relative to the ground... wright? The more you open it the more it rises relative to the ground. Cause now the gate rotate around an axis who is no longer vertical to the ground so the edge of the gate doesn't move in the horizontal plane anymore but keep going away from it the more you open it. Now what happens if you let go ? the door will close by itsel (well helped a bit by gravity ;-)).It's the same thing with the fridge's door when the fridge is not level i.e. on an angle relative to the vertical plane.

Now in the second furling system when the force of the wind against the prop rotate it away from the wind and as the tail vane always stays with the wind, the tail vane as no choice but to rotate around that 22deg of vertical axis and the edge of the tail rise relative to the ground.

Anyway, it's only my perception of the thing and I may be totally wrong...

P.s.: please furling guru if I'am wrong tell me :-)

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Re: Furling system ([none / 0](#)) (#10)  
 by hvirtane on Wed Jul 23rd, 2003 at 01:06:47 PM MST  
 ([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

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Basically this gravity system of furling is the same as used with Marlec small wind chargers for example.

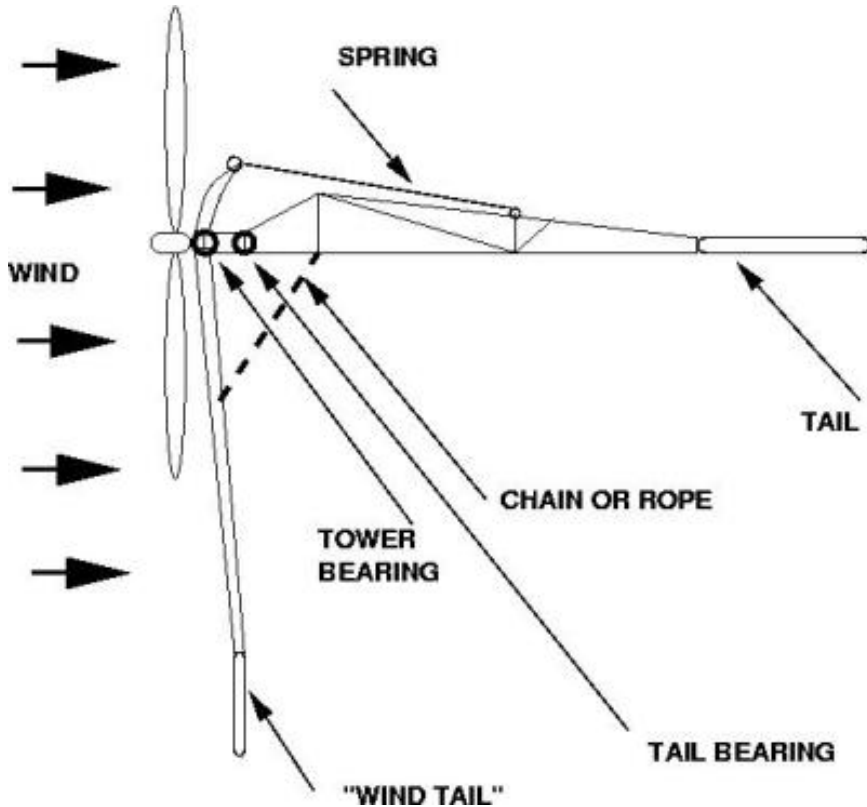
With Marlec the hinge is on the far end of the tail boom.

My friends here are complaining that the system is not really good, when water goes in between the tubes in the hinge and so during the winter there is ice.

I'm still not sure, if the gravity system is better or worse than the old German system with another tail on the same plane as the prop.

I made small drawing of that system during an earlier discussion.

- Hannu



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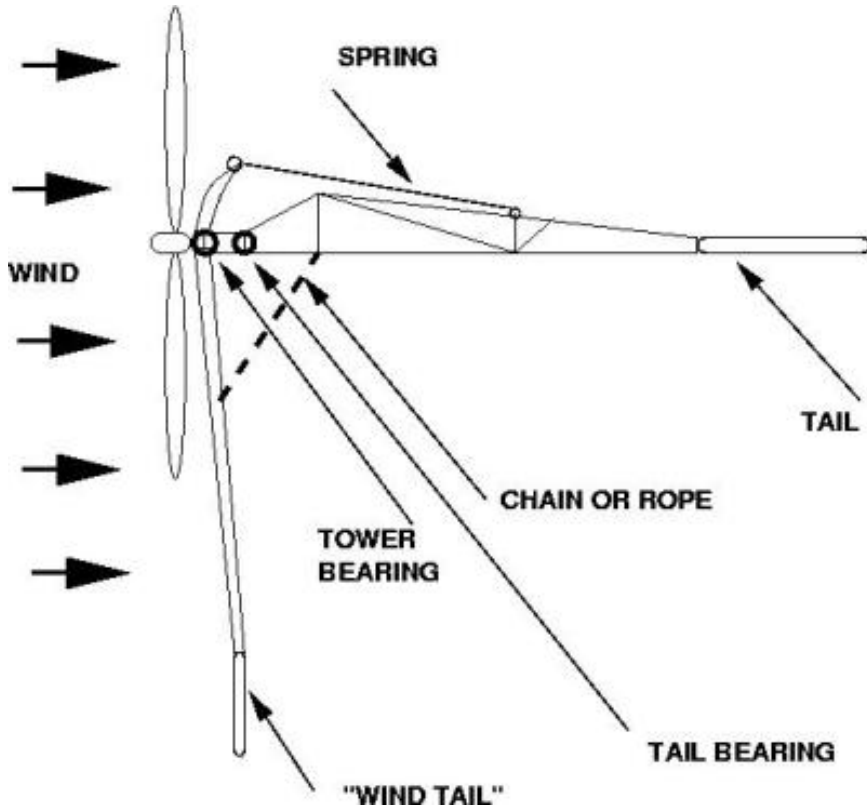
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[Furling system](#) | 17 comments (17 topical, editorial)

Re: Furling system ([none / 0](#)) ([#12](#))  
 by scoraigwind ([magnet@scoraigwind.co.uk](mailto:magnet@scoraigwind.co.uk)) on Wed Jul 23rd, 2003 at 03:54:06 PM MST  
 ([User Info](#)) <http://www.scoraigwind.co.uk>

Thanks for such a clear explanation, DanB. So many people ask me about how that works.

There are problems with getting the best angle for the hinge. Each setting has some side angle and some back angle. I usually set it so the side and back angles of the hinge are almost equal so that the power output stays about the same over a range of winds. But the output peaks a little in the middle where the tail is climbing most steeply.

So when I get really fussy I use a different type of hinge with a cam at the top. The tail hangs off a belt or chain, that wraps around the cam, so that the axis of the hinge changes. That allows full control over the tail furling forces.

The Marlec version with only the vane hinged works after a fashion for a while until the force of the wind on the boom alone is enough to pull the rotor back into the wind.

The system with the side vane is great for a type of pump that needs the crank shaft over the well, but has no other advantages compared to the offset rotor systems. The side vane is unstable in operation and ugly.

My perspectives :-)  
 Hugh Piggott <http://www.scoraigwind.co.uk>

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Re: Furling system ([none / 0](#)) ([#15](#))  
by JW on Wed Jul 23rd, 2003 at 08:13:30 PM MST  
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The level of professional courtesy around here should be some form of development model. Dude,, When I saw the DANCAD drwg#2 I started to salivate. What a fantastic design. On top of the fact the everyone is doing everything right. My hat goes of to you Hugh.^ You are correct the asthetic part is crucial

-JW

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Re: Furling system ([none / 0](#)) ([#17](#))  
 by [Smithson](#) on Thu Jul 24th, 2003 at 04:06:02 PM MST  
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The fact that the lowest setting for the tail is actually [according to Hugh's plans] 100 degrees from the rotation of the blades is what puzzles me. Or 80 degrees [10 degrees off perpendicular]. In other words if the blades were 3 o'clock and 9 o'clock then the tail would be sitting at 11 o'clock not 12 o'clock with no wind. I read some where else that as the wind first hits the machine it settles it tail in the 12 o'clock position with the blades at 3 and 9 o'clock.

What I'm wondering is if you can actually use this to start the machine turning more easily? Let say that the root of the blade is 27 degrees. With the tail at 100 degrees [11 o'clock] would this actually for that time as the wind first hits the blades make the root of the blades 37 degrees and help with starting thr blades in light winds?

Now I haven't fully figured this out but off the top of my head it would seem that you would have to have a counterclockwise rotation, but would that help?

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[Furling system](#) | 17 comments (17 topical, editorial)

Re: Furling system ([none / 0](#)) ([#17](#))  
 by [Smithson](#) on Thu Jul 24th, 2003 at 04:06:02 PM MST  
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The fact that the lowest setting for the tail is actually [according to Hugh's plans] 100 degrees from the rotation of the blades is what puzzles me. Or 80 degrees [10 degrees off perpendicular]. In other words if the blades were 3 oclock and 9 oclock then the tail would be sitting at 11 oclock not 12 oclock with no wind. I read some where else that as the wind first hits the machine it settles it tail in the 12 oclock position with the blades at 3 and 9 oclock.

What I'm wondering is if you can actually use this to start the machine turning more easily? Let say that the root of the blade is 27 degrees. With the tail at 100 degrees [11 oclock] would this actually for that time as the wind first hits the blades make the root of the blades 37 degrees and help with starting thr blades in light winds?

Now I haven't fully figured this out but off the top of my head it would seem that you would have to have a counterclockwise rotation, but would that help?

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# HOMEBREW WIND GENERATOR

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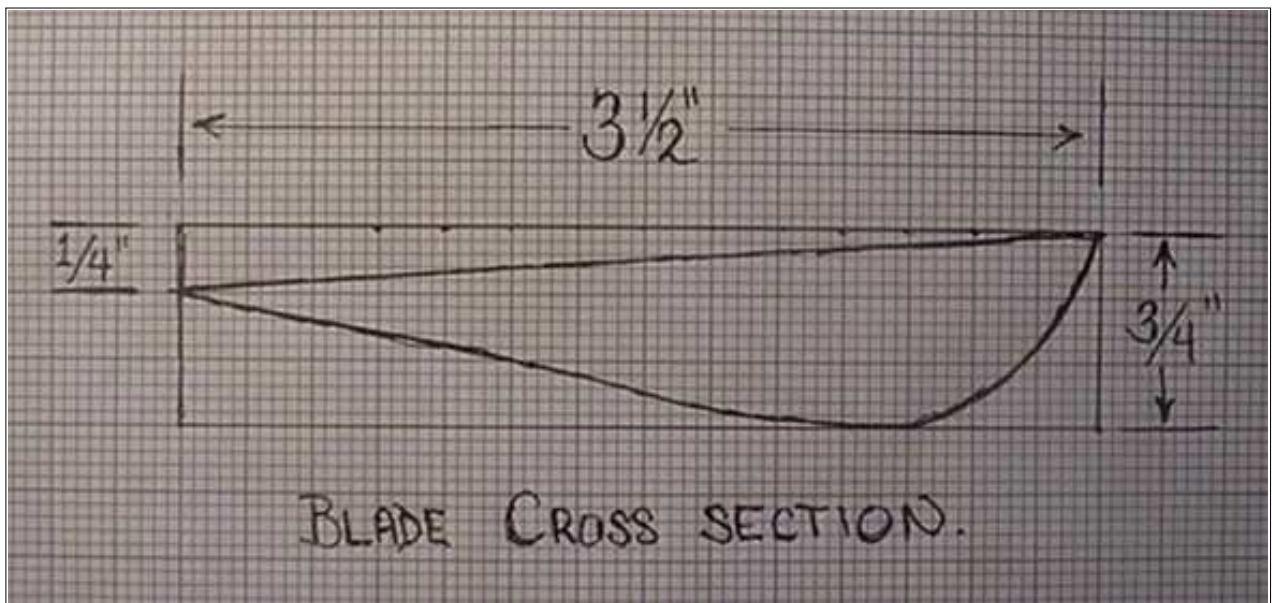
This page is about a windmill experiment. The windmill was built for under \$100, and although there is certainly much room for design improvement, it works fairly well and should provide some data to other folks who'd like to build their own from scratch! If time is money, and one has more money than time, it might be wise to buy a commercial machine, there are many good ones starting from about \$500 on up, however to build one at home is fun, and it can save a lot of money! It's my hope that "experts" (folks more knowledgeable than myself on this topic) will review this page and offer suggested improvements on our discussion board! This page will break down the components of the machine and in the end I'll discuss what I know about its performance!



## The Propeller

The propeller for this machine is a 3 bladed design. Although a 2 blade prop is simpler to build, they have the disadvantage of being harder to start. The other drawback is that when the wind changes direction, a 2 blade prop tends to vibrate

quite a bit while turning. This is hard on the prop, and the generator bearings. I made my prop out of spruce 1" X 4" boards. I tried to pick 3 boards which were knot free, had good vertical grain and seemed to have similar density. (they weighed about the same). Of course other types of wood could be used, this is what I had available. I've made very good props from redwood, ponderosa and lodgepole pine with no problems. I used 1" X4" (actually - it was planed down to about 3/4" X 3 1/2") because I wanted the prop to be light weight, I think this helps them start faster and preserves the bearings on the generator. It seems consistent with props I've seen on small commercial windmills. I carved my prop real fast, took about 2 hours. Undoubtedly, had I spent more time I'd probably have a better prop, but...I have seen folks spend a week on this stage and I feel it can be a fairly quick and simple project. I used "intuition" on both the pitch of the prop, and the airfoil shape. I simply marked 1/4" down on the thickness of the prop, so that over the 3 1/2" width the low end would be 1/4" below the high end. There is a LOT of information on prop carving, airfoil details etc on the Internet. The Lee-Jay manual, published in the 1930's also has good simple instructions for both propeller carving and building a windmill from scratch. See the picture below....



Once roughed out, I weighed each prop and planed them down so they were the same. I then bolted them together, two at a time, and further planed them down so they were reasonably balanced. Once all three blades were the same weight, I painted them, and bolted them to a hub (an old gear about 8" diameter). Once on the hub, I could put the whole assembly on a shaft, and spin it. I would observe the place in which the prop stopped, if it had tendency to stop in 1 place more often than others, I would plane down the heavy side(s) until it seemed perfectly balanced. (of course I had to paint those spots again!). The whole process of building this prop, and balancing it took less than 4 hours. It should be noted that all 3 blades, after being balanced, were NOT of the same thickness. At the tip, they varied from in thickness by over 1/8"! This could have been prevented by finding better wood, and taking more time in the initial carving of the prop. The main tool I used for carving this prop was a power planer. It should also be noted, this prop has NO twist, the pitch remains the same from the hub,



to the tip. Although unsure, I do not think this hurts, especially in a small machine. Total prop diameter is approx. 6 1/2'...although, to be honest, I never measured it! This is the same propeller I tested on my model A ford. [Click here](#) to check out that page! . It worked so well on the Ford test, that I figured it would hold up on a windmill. The only modifications I made since that test was to cut about 8" off the diameter and further balance it.



## The Alternator

The alternator used in this windmill is a 2hp induction motor which I took off a Taiwanese milling machine. I took it apart, and cut a slot into the armature with a metal lathe so that I could insert 8 Neodymium rare earth magnets, thus turning the induction motor into a permanent magnet low rpm alternator. The magnets are rectangular in shape, and curved such that they seem to be a good fit in the armatures of most induction motors 1/2hp on up. I cut a slot in the armature so that when pressed all the way down, the highest point on the magnets is flush with the outer diameter of the armature. The slot is cut so the magnets are a tight fit, and the magnets are glued in with epoxy. This is a 4 pole motor, so it requires 4 alternating poles in the alternator. To accommodate 8 magnets, I had to insert them in pairs, with two magnets of identical polarity beside each other. These particular magnets are surplus from computer hard drives and are available with both North, and South on the convex surface. See a picture of 8 of these magnets in a ring below. You'll find these same magnets for sale on our products page.



The alternator is wired so that it hits 12 volts at approx. 160rpm. Had I wired the motor differently it could have hit charging voltage at 80 rpm, but I was afraid this would limit the current too much. Of course, the output here is alternating current and it must be rectified before charging batteries. I used a 40 amp bridge rectifier to reach this end. We also offer large bridge rectifiers on our products page. It is very important that when using a diode, or a bridge rectifier in this application that it be attached to a suitable heat sink, or else it will get too hot and burn up! [Click here](#) to see our experiments page about converting induction motors into low rpm alternators.

## The Tower

The tower is probably the MOST important part of any wind machine, and is often the most neglected....this is probably the case here! I put this up in the middle of Feb, it was very cold, the ground was very frozen and I didn't have the ability to pour a proper concrete pad which I think would make for a nice tower base. I also have the disadvantage of being in a forest, with no level ground. Although this works OK, I feel a much higher tower would be appropriate. My windmill currently sits 36' feet above the ground. I removed one large pine tree, as I thought that would be the best place for the tower. I cut the stump off about 3' high, and notched it with a chain saw. The mast is made from a lodgepole pine. The base of it was drilled through so that it could pivot in the stump. The top of it has a steel assembly made from pipe, to allow support and pivoting of the windmill. I while assembling the windmill the tower was



supported off the ground by a small tripod made from lodgepole pine. A larger tripod was used for raising it. The tower is supported by 4 guy wires of 1/8" diameter aircraft cable with turn buckles on the ground for adjustment.



I simply used a truck, a long cable, and the large tripod to raise the mast, it went smoothly!



## The windmill chassis and tail

The windmill is really very simple. I started with a 3/8" thick piece of steel to which the alternator could be bolted. To that I welded a pipe, which fits over a smaller pipe on the top of the tower - this is what the windmill pivots on. There are no slip rings in this machine, I simply ran enough aircraft cable so that the machine could pivot several times before it gets tight. The power line from the alternator is slightly longer than this cable, the idea being that the aircraft cable will get tight just before the power cord. The tail sits back about 4' from the pivot, and is bolted into angle iron. Two 1/2" diameter steel rods serve to further support the tail. In home built windmills I've seen...tails breaking off seems a common problem. This part needs to be strong, and a well balanced prop will also help prevent metal fatigue. I offset the tail, and the alternator slightly from the pivot, in hopes that it would turn out of the wind should it get too fast. This was done intuitively, I have no specific data on how to do this right, but it was my intention to move in the direction of several home-built windmill I've seen before. See Hugh Piggots design!

## Performance

So far, so good. The alternator has a slight cogging affect, which keeps this machine from starting easily at low wind speeds (below about 10mph). This could be solved by a bigger prop, wider blades, or...more blades! I think should I try to improve this I

will use wider blades. Once started it keeps spinning well at very low speeds. We have very gusty winds, the direction changes frequently so it is difficult for me to offer specifics on output vs wind speed. Best output I've seen in high winds is approx. 25 amps, though typically it puts out 5-15amps (into my 12 volt batteries) in low, to medium wind speeds. It is possible that a regulator could be made with a matching transformer or possibly a linear current booster that would better match the load to the alternator and provide significantly more output, I've not tried this yet. This machine does perform much better than smaller ones I've made using surplus DC tape drive motors, and so far it has held up well to extremely high winds. It does seem to turn out of the wind somewhat in extreme conditions, although I doubt it needs to.

Again, building these at home is fun, and rewarding. Lots more fun, in my opinion than buying an expensive new machine! I hope that folks provide input about their own machines, and their comments about this one! This machine, although fairly quick and easy to build, is a culmination of several experiments....the prop, the alternator, the tower. Please check out our products page for a few of the items I used to build this machine and some interesting books!

### **April 8 update**

After about 8 weeks up, there was a breakdown! On the radio they were predicting 80+mph winds. I took care to go out, make sure all the guy wires were good and tight and did what I could to help insure its survival. At about 4pm I woke up to a most unpleasant sound. Although still running, and pegging the 20 amp meter it definitely had a problem. Turns out she threw a blade in extremely high winds. Considering the lack of time I put into them, it really came as on surprise and I was grateful for the data.



I found the piece of broken blade only 20' from the base of the mast. Turns out, the



blade definitely had a crack in it, before I even raised the windmill, I could tell by the paint which had seeped into the wood. The other two blades were still in fine shape, suggesting that the design would have been good, had I taken more care to use better wood in making the prop. This was especially surprising considering how long the machine ran in extremely high winds, with only two blades!



Rather than replacing the one broken blade, I decided to make a new prop all together. It's slightly larger, the diameter being just over 7 feet. These new blades are 4" wide at the hub, and 3" wide at the tip. The wood is much stronger. The pitch is similar, although this new blade has a little twist to it. Although it's been up for less than 24 hours, I can already tell it starts much easier. It's still real quiet even at high speeds. It should make for an interesting test, the tips of this new blade are only 3/8" thick. The blades are of good vertical grain pine, each one weighs exactly 11 oz.

Other good information from this breakdown...the tower. It came down and went back up very easily with no problems at all. I simply used an A frame built from lodge poles, my truck, and a cable. Total down time, 4 hours, thats how long it took to lower it, build a new prop, finish it and get her back in the air again!

In conclusion, I believe, judging from the improvements on the new props that this machine will probably hold up well over time. In watching it for a few weeks now it seems to do a find job producing up to 400 watts. In "normal" winds it produces between 100 and 200 watts. It seems to outperform some small commercial windmills, which I have also had opportunity to watch. It's very quiet even in high

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[Difference between 12V and 24V](#) | 3 comments (3 topical, editorial)

Re: Difference between 12V and 24V ([none / 0](#)) ([#1](#))  
by [zubbly](#) on Wed Nov 5th, 2003 at 04:01:58 AM MST  
([User Info](#))

hello Guerrero. the best i can offer here is direct ratio.  
to double volt, you double turns and 1/2 the size of wire  
to triple volt, you triple turns and 1/3 the size wire  
to quadruple volt, you quadruple turns and 1/4 size wire  
your amp output will follow the decrease in wire size.  
double voltage= 1/2 amp output and so forth.

easy way to calculate 1/2 wire size is to count up 3 sizes.  
1/2 of #14= #17, 1/4 of # 14= #20. to be sure consult a  
magnet wire chart that gives circular mills of wire size.

if anyone has a difference of opinion with regards to ratio  
of turns versus wire size, please jump in.

have fun-----zubbly

Re: Difference between 12V and 24V ([none / 0](#)) ([#2](#))  
by [Guerreiro](#) on Wed Nov 5th, 2003 at 10:23:59 AM MST  
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Thanks it was very well explained, very simple for me  
to understand  
Guerreiro

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### [Difference between 12V and 24V](#)

By [Guerreiro](#), Section [Homebrewed Electricity](#)  
Posted on Wed Nov 5th, 2003 at 02:59:34 AM MST

[Alternators](#)

<a href="http://www.fieldlines.com/">http://www.fieldlines.com/</a>

Can anyone help me with the following:

In order to build a PMG I've been searching in several places and I've found some very good tips, mainly from Mr. Hugh Piggott. However I've been having a question:

In the PMG, what should I modify in order to my output be 24V or 48V and not 12V??

Is it in the coils or in the bridge rectifiers??

If it's the coils is it in the number of turns, the thickness of the wire, or in booth??

Thank you everyone

Guerreiro

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Thanks it was very well explained, very simple for me to understand  
Guerreiro

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Re: Difference between 12V and 24V ([none / 0](#)) (#3)  
by desertratjack on Thu Nov 6th, 2003 at 08:24:06 AM MST  
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It could be that wiring the coils in series will raise voltage and in parallel raise amperage, but I have wondered if the wiring size on PMA's is a good indicator of the intended voltage output- probably so.

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[How to get from here to there](#) | 7 comments (7 topical, editorial)

Re: How to get from here to there ([none / 0](#)) (#3)  
by zubbly on Tue Nov 4th, 2003 at 06:45:47 PM MST  
([User Info](#))

hello Robotmaker. thankyou for the mention of use of some of my ideas as well as from others. being still relatively new to the genny field, i often refer to the advise of others who have already done and experimented in paticular fields with great success. sometimes the simplest ideas and solutions work out to be the best in the long run. the subject of slip rings does ring a bell to me as i have repaired many of these units for years. for some reason i seem to keep adding more projects to the ones i have not yet completed. i do have some ideas on simple slip ring assembles that can be made from discarded circular pump parts. need alittle time though. i will post when i complete the design and model. for now, accept the good advise from the people that have been there and done it.

keep having fun, its what it's all about--zubbly

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[How to get from here to there](#) | 7 comments (7 topical, editorial)

Re: How to get from here to there ([none / 0](#)) (#3)  
by zubbly on Tue Nov 4th, 2003 at 06:45:47 PM MST  
([User Info](#))

hello Robotmaker. thankyou for the mention of use of some of my ideas as well as from others. being still relatively new to the genny field, i often refer to the advise of others who have already done and experimented in paticular fields with great success. sometimes the simplest ideas and solutions work out to be the best in the long run. the subject of slip rings does ring a bell to me as i have repaired many of these units for years. for some reason i seem to keep adding more projects to the ones i have not yet completed. i do have some ideas on simple slip ring assembles that can be made from discarded circular pump parts. need alittle time though. i will post when i complete the design and model. for now, accept the good advise from the people that have been there and done it.

keep having fun, its what it's all about--zubbly

[How to get from here to there](#) | 7 comments (7 topical, 0 editorial)

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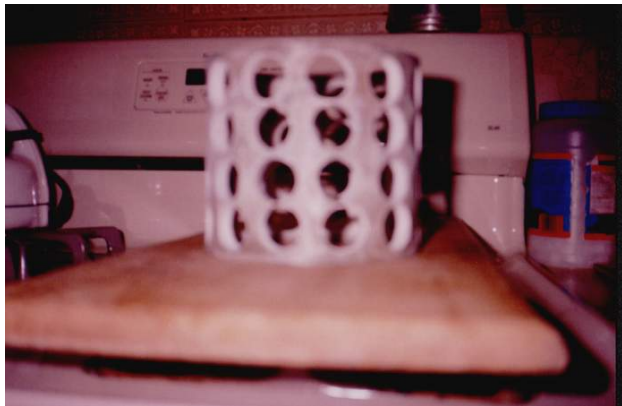
### [For Jerry!](#)

By [zubby](#), Section [Homebrewed Electricity](#)  
Posted on Mon Dec 15th, 2003 at 05:49:53 PM MST [Alternators](#)  
pics of cages with mags

---

hello Jerry.

Here are the pics of the 7 1/2 hp rotor conversion.  
Sorry it took me so long to re-post. also i included pics of the last small conversion. hope it helps.  
[editor's note, by kurt]I linked this story to the original and moved this one off the frontpage



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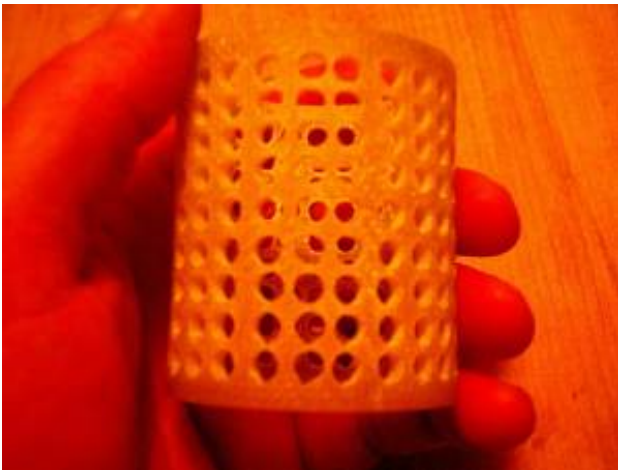






here are some pics of the last rotor conversion.







I have completed the 1 1/2 hp conversion. It shall be my last project of this type of conversion for quite some time. I will post the information as soon as complete the loaded testing.

good luck with your projects

zubbly

[For Jerry!](#) | 4 comments (4 topical, 0 editorial)

Re: For Jerry! ([none / 0](#)) ([#1](#))  
by [cevonk\(atsignhere\)aol.com](#) on Mon Dec 15th,  
2003 at 07:52:13 PM MST  
([User Info](#))

Very cool!

Re: For Jerry! ([none / 0](#)) (#2)  
by Jerry on Mon Dec 15th, 2003 at 08:47:42 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Thanks Zubbly  
I understand the time thing. It is a rarer commodity. I think the text is still there where you originally posted it. I will refer to it when I try this magnet style of motor conversion.

Again thanks very much for taking the time. Right now I'm winding coils for my small disc alt.  
100 turns of #20 wire on a 1/2 X 1 inch form to match the 12 small neos I'm using. I'm using unmodified plumers tape as lamination. Disc is 5 inches in dia.

I don't expect much from this little alt all though I would like to see 100 watts at least. Maybe around 750 rpm?

Now I'm speculating on how to glue down the laminations?

I'll post after testing this little toy. JK TAS Jerry

[Airheads Page](#)

Re: For Jerry! ([none / 0](#)) (#3)  
by Electric Ed on Tue Dec 16th, 2003 at 05:25:18 AM MST  
([User Info](#)) <http://www.electric-ed.com>

[quote]"Now I'm speculating on how to glue down the laminations?"

Try spraying both sides of the metal strip with spray-on contact cement. It insulates the laminations as well as holding them together.

Electric Ed

[ [Parent](#) ]

Re: For Jerry! ([none / 0](#)) (#4)  
by Jerry on Tue Dec 16th, 2003 at 09:56:15 AM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hey Thanks Ed.

I built a small lamination wyinding machine.  
There are 3 spools. 1 to supply the lamination  
(plummers tape), 1 to supply masking tape and  
the 3rd to roll these 2 up on.

I do have lots of the glue at the stereo shop.  
May try that next time?

JK TAS Jerry

[Airheads Page](#)

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[For Jerry!](#) | 4 comments (4 topical, 0 editorial)

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[for WNC in answer to your question for hubs for PVC blades](#)

By [zubbly](#), Section [Homebrewed Electricity](#) [Alternators](#)  
Posted on Fri Nov 14th, 2003 at 08:30:55 PM MST  
50 word limit would not let me post ideas

hello WNC. i tried to answer to your question. i gave a few ideas over 50 words.

message said over 50 words.

tried to post with 36 words.

message said over 50 words.

tried to post with 10 words.

message said over 50 words.

try a lawn mower blade hub.  
hope i can post this one.

keep having fun-----zubbly

[for WNC in answer to your question for hubs for PVC blades](#) | 1 comment (1 topical, 0 editorial)

Re: for WNC in ans ([none / 0](#)) ([#1](#))  
by [kurt](#) on Fri Nov 14th, 2003 at 09:49:27 PM MST  
([User Info](#))

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when a story has a long title shorten it like i did when you go to reply and you won't get that 50 word thing (don't ask me why it just is)



[for WNC in answer to your question for hubs for PVC blades](#) | 1 comment (1 topical, 0 editorial)



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## [diagrams for cutting pvc props](#)

By [zubbly](#), Section [Homebrewed Electricity](#)

Posted on Sat Oct 25th, 2003 at 12:01:59 AM MST

a few diagrams

---

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here are a few drawings for making props from pvc pipes. just a few observations from my own experimenting. i think using any pipe less than 3 inch diamater may be a waste of time unless it is going to drive a very small genny. i also suggest that you practice on paper towel tubes to get the idea of doing it instead of wasting pipe.

the first drawing is of a simple one piece prop. i have not given any dimentions other than how to cut. you must decide in your own mind the size of pipe and length. i will however give my suggestions.

begin by drawing a line from one end to the other (blue line) A to B. often there is printing on the pipe that will give you a good guide. next, draw a line at centre around the diameter (C to D). the junction of these two lines will be your exact centre of blade and this is where you may drill your hole for mounting to hub of your choice. E, F, G, and H ( red line ) is what you will end up with after you cut out at the red lines. my perspective with the drawing is not the best, but you may refer to my last posting on pvc blades to see what they look like. the outer round surface of the blade will end up on the opposite side the wind is blowing from, and the inside of the pipe is what will face the wind. i can suggest that the tip width should be approx. 1/4 of the outside diameter of the pipe. if you have a 4 inch pipe, your tip width will be 1 inch. if you equal the tip marks at the end of line A to B, you will have 0 degree at the tip. moving the tip marks to the side of line A to B will give you some degree of angle. i prefer 0 degree. the straight edge of the blade is your trailing edge and should be cut some what to the side of line A to B.

The angled edge of the blade will be your leading edge and should not be cut more than 1/4 the way around the diameter of the pipe from line A to B. **JUST A REAL GOOD TIP**, to mark the angled edge of blade, use a length of that black metal banding strap they use to hold crates together with. have someone hold one end on the mark and the strap will follow the contour around the pipe to the other end of the mark. a metal measuring tape works good too turned upside down. i prefer a small fine tooth hand held saw to do the cutting. scraping the cuts after with a sharp blade will give you a good finish. this style of blade seems to give decent starting torque and runs very fast. **SORRY FOR ALL THE LINES TO READ BUT THIS IS THE MAIN CONTENT OF THE INSTRUCTIONS AND AM TRYING TO COVER ALL POINTS. GO TO NEXT PICTURE.**



here is what i call a high torque blade. it does not run as fast as the previous blade but seems to provide tremendous torque. a good choice for an alternator with many poles. again, this drawing is not the best, so refer to last posting to see what it looks like. the widest part of the blade has been moved from the middle to the position between middle and end of blade.



here is a method of cutting multiple blades from a shorter piece of pipe. just lay out the pattern and cut. **DO NOT TAKE ONE CUT OUT BLADE AND USE IT TO TRACE OUT OTHER BLADES.** this will result in blades becoming narrower. mark each blade seperately. these blades can then be mounted in any number that you need and to what ever hub style you may design.

i screwed up on showing the last blade design with a hub point. you will have to look at the next posting after this one if i can get it posted. it is an interesting one in that by laying the two seperate



blades on the other, you can slide sideways either blade for fine adjustments for balancing. i think a lawnmower blade hub would be a good one for this assembly. hope it comes out on the next posting.

hope you can use these to your benefit and projects--zubbly

[diagrams for cutting pvc props](#) | 14 comments (14 topical, 0 editorial)

Re: diagrams for cutting pvc props ([none / 0](#)) (#1)  
by RobD on Sat Oct 25th, 2003 at 04:30:18 AM MST  
([User Info](#))

Thanks Zubby,  
Good info, I'll give it a try.  
RobD

Re: diagrams for cutting pvc props ([none / 0](#)) (#2)  
by Norm on Sat Oct 25th, 2003 at 07:09:29 AM MST  
([User Info](#))

Thanks Zubby. You've done just what I hoped you would get around to doing one of these days. Even more detailed than I had expected. One little thought about finishing the edge of the blade ...old time wood craftsmen (before 2HP routers) used to use a tool to scrape the edge of their wood to fashion their own mouldings, anyhow by grind a curve in the edge of a section of saw blade about like this  
(  
, you can scrape a very professional rounded edge on the plastic blades. Ummm!  
Can hardly wait to get started on this next project. Thanks again for taking the time to share with us.  
Norm.

Re: diagrams for cutting pvc props ([none / 0](#)) (#3)  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Sat Oct 25th, 2003 at 09:02:11 AM MST  
([User Info](#)) <http://www.internetfred.com>

Zubbly - Awsome Job!!! We needed an alternative method of making props.. The other message with the pic's you posted and your results where outstanding.. Keep up the good work!  
ifred

Re: diagrams for cutting pvc props ([none / 0](#)) (#5)  
by hvirtane on Sat Oct 25th, 2003 at 11:18:30 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

Hello,

I agree.  
A very good job.  
I hope some others will try making these as well.  
So that we will have more experience to see if  
these can perform as well as profile blades  
carved of wood.

- Hannu

[ [Parent](#) ]

Re: diagrams for cutting pvc props ([none / 0](#)) (#4)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Sat Oct 25th, 2003 at 11:08:58 AM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

How come you are putting the leading edge cut, forward of the A-B line? It seems to me that this reverse angle would give a slower RPM. I havent yet tried a Pipe Prop but I think that your leading edge should be cut along the same line for both ends of the prop.

Also a quick note on photos. I am using a Dial Up connection and it takes a very long time to get the pictures you have uploaded in BMP format. File sizes are much smaller for drawings in GIF format, and smaller for pictures in JPG or JPEG format . . .

. >=- W o o f -=<

Re: diagrams for cutting pvc props ([none / 0](#)) (#6)  
by hvirtane on Sat Oct 25th, 2003 at 11:32:43 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

I completely agree  
with the problem  
of loading and the sizes of the pictures.

It is too painful to lad them.  
I gave up.

I think that any graphics program can save  
the pictures in .jpg format.

- Hannu

[ [Parent](#) ]

Re: diagrams for cutting pvc props ([none / 0](#)) (#8)  
by zubbly on Sat Oct 25th, 2003 at 05:28:19 PM MST  
([User Info](#))

hello Hannu. if you can't put up with the pain, get a faster computer. until i sharpen my skills at posting, take aspirin.

have fun---zubbly

[ [Parent](#) ]

Re: diagrams for cutting pvc props ([none / 0](#)) (#10)  
by hvirtane on Sun Oct 26th, 2003 at 10:28:03 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

Hi,

it is not with the computer speed, but with the Net speed. I'm using a wireless Net connection (the very latest technology in the field). And that is quite slow. Happily I don't need to pay for the amount of the data loaded, but some others have to pay separately for each byte they load.

- Hannu

[ [Parent](#) ]

Re: diagrams for cutting pvc props ([none / 0](#)) (#7)  
by zubbly on Sat Oct 25th, 2003 at 05:22:38 PM MST  
([User Info](#))

hey woof. good to here from ya. just to clarify, the leading edge are the angle lines E&H. the horizontal lines G&F are the trailing edge. the reason G&F are cut on either side of A to B is to allow pipe material to remain to hold the two sides of the blade together. as far a posting the pictures, i am not the greatest at this and you will have to put up with it until i improve these skills. i also have a land line and it does load quite fast. ???

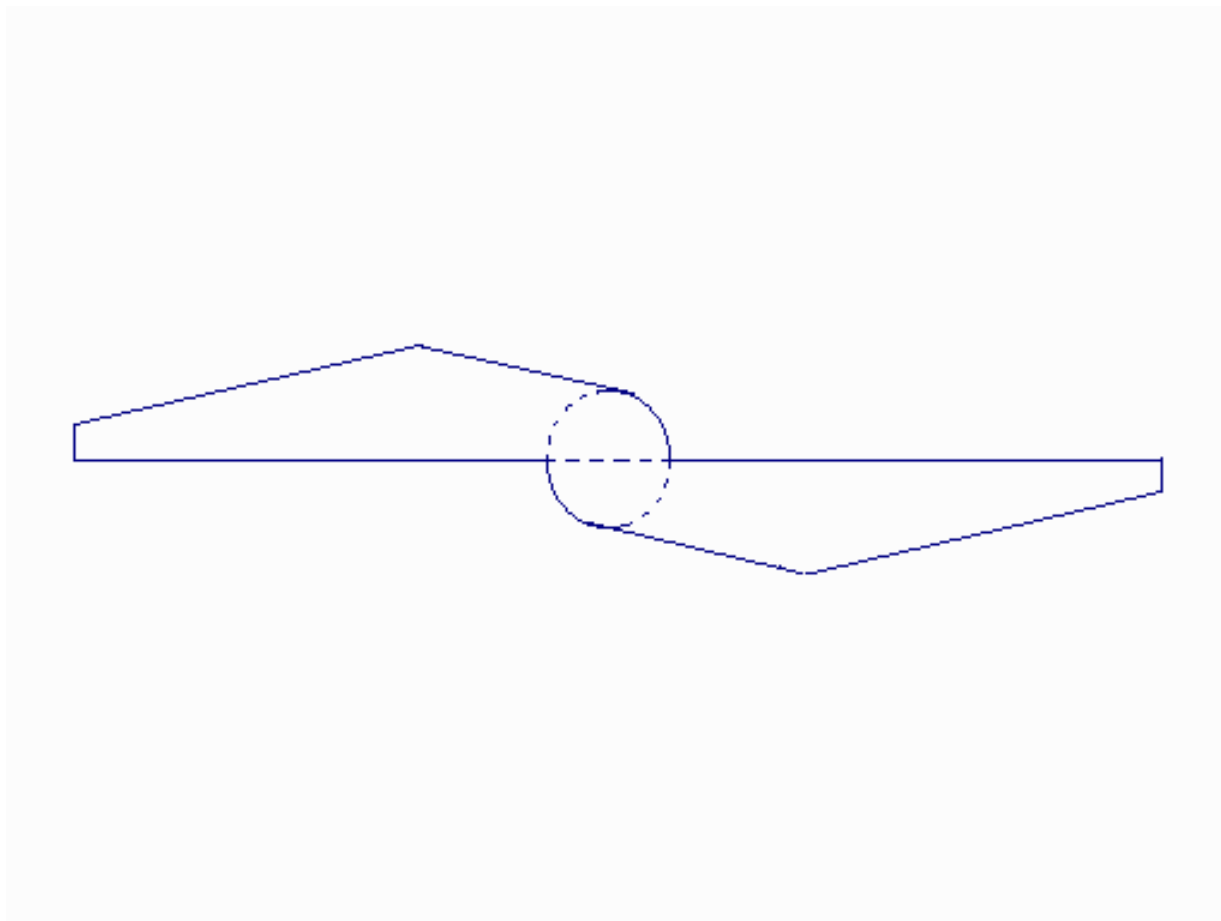
cut a blade and try out. read first paragraph very carefully.

zubbly

[ [Parent](#) ]

Re: diagrams for cutting pvc props ([none / 0](#)) (#9)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Sat Oct 25th, 2003 at 10:34:16 PM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

Here is what I was thinking about when I mentioned the leading edge being on the same line so the curve of the pipe isn't slightly reversed from optimum on the front edge. Notice that it's based on a circle in the center.



If I was'nt working so much these last few weeks, I would have a buncha cut up paper towel tube layin' around or flying in the wind . . .

. >=- W o o f -=<  
[ [Parent](#) ]

Re: diagrams for cutting pvc props ([none / 0](#)) (#11)  
by zubbly on Sun Oct 26th, 2003 at 03:31:34 PM MST  
([User Info](#))

hi Woof. you should be designing these blades. your idea with the circle in the middle is quite brilliant! the line in the middle A to B however is the trailing edge, not the leading. you will discover this once you have cut a blade. the inside of the pipe is what faces the wind when complete. please let us know how this design works. i think that the circle in the middle will also add much more strength to the one piece blades.  
thank you for the constructive feed back.

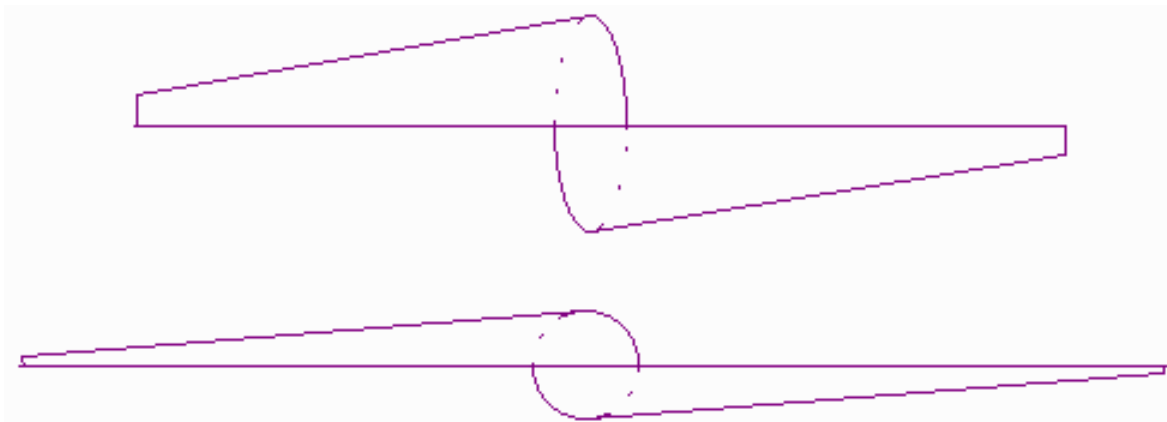
zubbly

[ [Parent](#) ]

Re: diagrams for cutting pvc props ([none / 0](#)) ([#12](#))  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Mon Oct 27th, 2003 at 08:01:07 AM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

Thanks Zubbly

After looking at that last drawing for a while, I realized that the best way is like your first drawing at the top of the page, except with circles or ovals in the center, like this . . .



I'm thinking about pulling the Christmas paper off a tube and start cutting . . .

. >=- W o o f -=<  
[ [Parent](#) ]



Re: diagrams for cutting pvc props ([none / 0](#)) (#13)  
by Budgreen on Mon Oct 27th, 2003 at 12:37:04 PM MST  
([User Info](#))

which blade style (standard or 'high torque') would give a lower startup speed?  
I think it would be fun to experiment with these on small steppers but in limited wind speed.

Re: diagrams for cutting pvc props ([none / 0](#)) (#14)  
by zubbly on Mon Oct 27th, 2003 at 06:43:08 PM MST  
([User Info](#))

hello. the high torque would be my first choice for faster start up. however, i think the design that  
Woof replied with could quite possibly be even better. whatever choice you make, have fun.

zubbly

[ [Parent](#) ]

[diagrams for cutting pvc props](#) | 14 comments (14 topical, 0 editorial)

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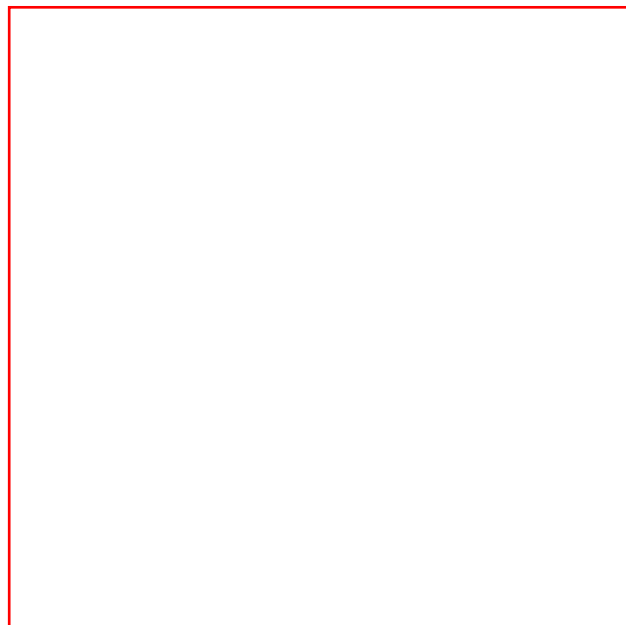
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## [more pictures of plastic props](#)

By [zubbly](#), Section [Homebrewed Electricity](#)

Posted on Sun Oct 19th, 2003 at 05:12:50 PM MST [Alternators](#)

various plastic props



well finally i am getting the hang of posting pictures. took me awhile to learn to transfer pictures from digi cam to files. here is a picture of two one piece props cut for opposite rotation. the one on the left is for clockwise rotation and the one on the right for counter clockwise. the tips have been cut at 0 degree pitch. performance seems slightly slow on start up but do run very fast. i think these are 40 inch in length.



I really liked how this prop turned out. i guess what would

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be referred to as the root, has been moved outward from centre to middle of the blade. start up happens in mild wind with great torque which i found out with the cardboard paper towel tubes that i first cut. the cardboard tubes are a good way of trying the design first. top speed does not compare with the props in the first photo. i think this design would be good for gennys with many poles.



this prop seemed to have the best overall performance. good starting with a very fast speed in higher winds. i think this one worked out better because it was cut from 4 inch diam. pipe. the length is 48 inch. the pvc pipe gets thicker with increased diameter. the 4 inch pipe is approx. 3/16 inch thick.



this is a picture of the first plastic prop that i cut. it is made from 2 1/2 inch abs plastic. a real piece of garbage. did not work worth a ----. the angles were all wrong and when i heated to try and correct angles, it turned like a limp piece of spaghetti. learned a lot from it though.



here is a picture of some of the " FREE " pipe stock i have collected. the green piece on the left is 8 inch diamater. i found it in the scrapp heap at a construction site with a crack on one side. by the scrape marks i think it had something very heavy drop on it. can still get a good size prop out of it as it is 8 feet long. it has about a 1/4 inch thickness. i think it will make a good prop for the 1 1/2 hp induction conversion i am doing. it is going to have 36 poles. the white piece is 6 inch diametor and about 6 feet long. thickness is close to 1/4 inch. i can't find anything wrong with it and can't quite figure out why it was in the scrapp other than having been cut.

these two pictures are the four foot cedar prop that i carved. my first wooden prop. the stock was 4 inches wide and 2 inch thick. learned a lot on this one too. loved the feel of carving wood. my next wooden prop is going to be made from a 1 piece 9 foot long piece of clear ash. it is 9 inches wide and 2 inches thick. a winter project.

i would like to sum up that i think plastic props are a good alternative for someone looking for inexpensive material ( scrapp heap ) and a good way of learning just how they work. i still don't use much science behind it other that what feels right and what i can do with the piece of material. i do intend to learn a little more theory though. by the way, the small little genny is what i tested all these props out on. it is a 108 volt dc motor that i bought brand new for \$10.00. it has a 3/8 shaft with only sleeve bearings. i have used the same hub for all the props. it does light a 12 volt tail light auto bulb. hope this info may be useful to some.

i think the cedar props ended up at the bottom of the page. i previewed before posting and the cedar props won't post. sorry.

keep having fun-zubbly



[more pictures of plastic props](#) | 7 comments (7 topical, 0 editorial)

Re: more pictures of plastic props ([none / 0](#)) ([#1](#))  
by Chuck on Mon Oct 20th, 2003 at 09:52:32 AM MST  
([User Info](#)) <http://www.greeleynet.com/~cmorrison>

Thanks for the pics. I've been interested in this material for quite a while and its really nice to see how you're experimenting with different shapes.

I was wondering (since it appears that you don't have any tail furling mechanism) if the plastic blades exhibit a flutter at high speeds. In strong winds this often sounds like a helicopter.

Thanks,

Chuck

Re: more pictures of plastic props ([none / 0](#))

([#3](#))

by zubbly on Mon Oct 20th, 2003 at 04:34:07 PM  
MST

([User Info](#))

hello chuck. i have seen the mast bend to approx. a 45 degree angle in very strong winds. i then put some guy strings to reinforce the mast. the blade does make some helicopter noise in extremely fast wind, but not that loud, you can just here it. i have seen the blade so fast that the only visible part was at the centre.

thanks for viewing my post.

zubbly

[ [Parent](#) ]

Re: more pictures of plastic props ([none / 0](#)) ([#2](#))

by RobD on Mon Oct 20th, 2003 at 11:28:52 AM MST  
([User Info](#))

Nice job!

How do they hold up?

Rob

Re: more pictures of plastic props ([none / 0](#))

([#4](#))

by zubbly on Mon Oct 20th, 2003 at 04:39:42 PM  
MST

([User Info](#))

hi Rob. there has been no problem so far. although none of them have been up for more than 3 weeks. just really experimenting for now. for permanent service i will coat blade with aluminum paint. working on a couple more alternators right now that i think i will use a one piece prop from the 6 or 8 inch pipe. i should really have one up for a good year before i can comment on durability.

thanks-zubbly

[ [Parent](#) ]

Re: more pictures of plastic props ([none / 0](#)) ([#5](#))

by jt72 on Mon Oct 20th, 2003 at 06:18:18  
PM MST

([User Info](#))



Thanks for the good pictures. I've been wanting to experiment with these PVC props for a while but have been unable to do much with the info. I had but these pictures helped alot. I made my first prototype today and it looks pretty good. I still need to tweak it a bit but I think this should turn out to be a very good system for the time and money put into it.

Jim

[ [Parent](#) ]

Re: more pictures of plastic props ([none / 0](#)) ([#6](#))  
by veewee77 on Tue Oct 21st, 2003 at 08:47:42 PM MST  
([User Info](#))

Which side of the PVC blade goes to the wind/ Inside pipe or outside pipe?

Re: more pictures of plastic props ([none / 0](#))  
([#7](#))  
by zubbly on Wed Oct 22nd, 2003 at 07:22:47 PM MST  
([User Info](#))

the inside of th pipe faces the wind. have fun.

zubbly

[ [Parent](#) ]

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[for zmoz](#)

By [zubbly](#), Section [Homebrewed Electricity](#)  
Posted on Sat Oct 18th, 2003 at 04:59:31 AM MST [Alternators](#)  
well worth making induction conversion

hello zmoz. tried to reply to your posting 3 times. last one had 12 words and said subject line was too long. had to go this route. it is well worth converting induction motors. you don't need curved neos. look at my posting on converting 7 1/2 hp induction. tested out the other night at 3400 watts. capable of 5000 watts. the key is to make a matched winding and rotor. rewind with as many poles as possible and build rotor to suite. great frame, great bearings, great laminations.

have fun---zubbly

[for zmoz](#) | 7 comments (7 topical, 0 editorial)

Re: for zmoz ([none / 0](#)) ([#1](#))  
by [doubter3](#) on Sat Oct 18th, 2003 at 06:42:05 AM MST  
([User Info](#))

Hey Zubbly,

Did you have any way of measuring r.p.m. when you were getting 3400W out? I'd be interested in knowing the results. Also, how did you drive it for the test?

Thanks,  
Matt

Re: for zmoz ([none / 0](#)) ([#2](#))  
by [zubbly](#) on Sat Oct 18th, 2003 at 08:56:57 AM MST  
([User Info](#))

hello Matt. the drive pulley on alternator was measured with a strobe tach. also the cycle function on ampmeter confirmed 60 cycle@600 rpm. the stator has been wound to 12 pole and matching rotor. alternator was belt driven from a 7 1/2 hp baldor dc motor with variable speed control.

zubbly

[ [Parent](#) ]

Re: for zmoz ([none / 0](#)) ([#3](#))  
by [Jerry](#) on Sat Oct 18th, 2003 at 09:55:35 AM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

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Hey Zubbly I've had the same problem. If I post under post a coment it says I've used to many words so I post under reply to this with the same word count and it works fine. The old board didn't have all this weird stuff and it worked every time. And I type in spaces between parigraphs but it bunches all my typing together. This new board is for computer geeks who know what the hay there doin and that ain't me. Back to topic. What did you use for magnets or is this the indution type alt? JK TAS Jerry

[Airheads Page](#)

[ [Parent](#) ]

Re: for zmoz ([none / 0](#)) ([#5](#))  
by zubbly on Sat Oct 18th, 2003 at 05:18:11 PM MST  
([User Info](#))

hi Jerry. i used 48 1 inch round by 1/2 inch thick with special magnet cage that i developed.

zubbly

[ [Parent](#) ]

Re: for zmoz ([none / 0](#)) ([#6](#))  
by Jerry on Sat Oct 18th, 2003 at 08:15:46 PM MST  
([User Info](#))  
<http://www.dplusv.com/Photo-03.html>

How is the cogging? JK TAS Jerry

[Airheads Page](#)

[ [Parent](#) ]

Re: for zmoz ([none / 0](#)) ([#7](#))  
by zubbly on Sun Oct 19th, 2003 at 08:45:24 AM MST  
([User Info](#))

hi Jerry. when i built cage for alternator i skewed by 10 degrees ( 1 stator slot ). with leads shorted, it really wants to lock up. running under load, everything seems to be fine. i will connect load and turn by hand just to see if cogging is present. i will get back to you on this.

zubbly

[ [Parent](#) ]

Re: for zmoz ([none / 0](#)) ([#4](#))  
by zmoz on Sat Oct 18th, 2003 at 12:33:38 PM MST  
([User Info](#))

Thank! :D

[for zmoz](#) | 7 comments (7 topical, 0 editorial)

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### [Plastic prop pictures \(again \)](#)

By [zubbly](#), Section [Homebrewed Electricity](#)

Posted on Sun Oct 5th, 2003 at 06:58:24 PM MST

[Wind](#)

plastic props

---

hello everyone. the prop pictures that i tried to post before have mostly disappeared into thin air. thats even another story. anyhow, i just got some new pictures developed and even bought a new scanner and digital camera to help in my postings. these are only a couple of pictures, but more will be coming with full detail.



here are the six blades that i have cut out from a piece of 1 foot diamater plastic water main pipe. i have cut them at 6 foot and 3 inches long each. the tips are 4 inch wide and approx 1 foot at the root. one side is straight and the other side is curved from root to tip. after assembly with hub, the diamater will be approx. 14 foot. my strength in blade design is so far not acomplished. i just have basically "winged it ". it has been fun so far. i plan to use this prop on my 7 1/2 hp induction conversion. the material is 3/8 inch thick and very strong, but heavier than i would like. i cut a 3/4 inch strip of it and put it in the freezer. after two days, i cannot fracture it at all. i don't know the exact composition of the material but will find out.

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i hope in this picture that you can see the profile. straight on one side and nicely twisted to the tip on the other side. by the way, this stuff is very tough to cut.



here is the photo of the pipe stock. it is 1 foot diameter by 6 and 1/2 foot long. i think you can see the twist in the picture. it is very easy to make the blades. i started out by cutting test blades from empty paper towel tubes. i then stood in front of the air conditioner for the tests, and was quite surprised at the results i got with speed, torque, and start up. i then made different sizes from pvc pipes and tested on a small genny outside to see what the results would be. today i mounted my first cedar prop with good results. it seems to start a little easier, but does not attain the speed that the plastic props do. on my 7 1/2 induction conversion, i will only need 600 rpm to attain my 230 volt 60 cycle output. hope you enjoyed this and got some useful ideas. i have been having a lot of fun. will post more info and pictures on plastic props soon.

i believe fun and laughter is measured in not how loud it is, but how long it takes you to get off the floor.

zubbly

---



Zubby: Your pictures would have been fine if you had simply put a couple of linefeeds or carriage returns after the text where you insert them. All fixed now. TomW

[Plastic prop pictures \(again \)](#) | 15 comments (15 topical, 0 editorial)

Re: Plastic prop pictures (again ) ([none / 0](#)) ([#1](#))  
by Chuck on Mon Oct 6th, 2003 at 10:26:18 AM MST  
([User Info](#)) <http://www.greeleynet.com/~cmorrison>

They look nice. I'm glad someone posted some info on using pipes for blade material. I definately look forward to progress reports.

Just a comment, and hoping I'm not misunderstanding your application... Don't expect your 14 footer to be pushing 600rpm very often. This high an rpm for cut in could be a problem. If possible, shoot for a number under 150rpm. Remember, the larger the rotor, the slower it will go for a given TSR (tip speed ratio) and wind speed. If the motor can't be modified to reduce the speed, this may be a case where a 1-2 or 1-3 gearing might be worth investigating.

Chuck

Re: Plastic prop pictures (again ) ([none / 0](#)) ([#3](#))  
by JB on Mon Oct 6th, 2003 at 02:20:01 PM MST  
([User Info](#))

Zubby. Things are looking good but i was thinking a little like Chuck on this one. 600 rpm might look slow on a lathe or something but at 12 or 14 foot diameter I dont think You would even want that or seldom ever even get that. You will probably have to gear it up for speed. What size is that shaft on that thing. JB

[ [Parent](#) ]

Re: Plastic prop pictures (again ) ([none / 0](#)) ([#6](#))  
by zubby on Mon Oct 6th, 2003 at 05:16:48 PM MST  
([User Info](#))

hi JB. i just replied to Chuck and explained that the alternator will be geared up from the prop. will be looking to get a maximum of 200 rpm at prop. the alternator will produce 60 cycle at 600 rpm. the cycles don't really matter though on heating elements. the shaft on alternator is 1 and 3/8 inches. bearing on shaft end is a 6308 and a 6306 on opposite shaft end. the prop shaft will be supported on two pillow block bearings (thinking 1 and 3/4 inch) and will belt drive alternator from there.

thanks for your comments-zubby

[ [Parent](#) ]

Re: Plastic prop pictures (again ) ([none / 0](#)) (#5)  
by zubbly on Mon Oct 6th, 2003 at 05:07:33 PM MST  
([User Info](#))

hi Chuck. i guess i should have explained a little further. i will be gearing up to the generator. i would be scared to be in area with this prop going at 600 rpm. i think the tip speed would be somewhere in the 300mph area. i should further say that i won't be using gears but pulleys and belts. i am hoping to get somehwere from 150 to 200 rpm at the prop. the alternator is going to be connected to heating elements.

thanks for your comments-zubbly

[ [Parent](#) ]

Re: Plastic prop pictures (again ) ([none / 0](#)) (#2)  
by sean on Mon Oct 6th, 2003 at 10:34:20 AM MST  
([User Info](#))  
<http://homepage.ntlworld.com/s.amesbury/homepage.htm>

A similiar way to how i build props and surprising how well they work, i will try one day to carve a wooden prop. I use buckets my self but big ones are harder to come by. Its all in the name of fun for me just a hobby and i love to use junk as much as possible, my latest genny which is a converted induction motor cost me about £30;00 and that included the concrete for the mast!!!! Ok i used ceramic magnets but its working a dream. Soon i will get my site updated and show the board.....sean

Re: Plastic prop pictures (again ) ([none / 0](#)) (#7)  
by zubbly on Mon Oct 6th, 2003 at 05:20:52 PM MST  
([User Info](#))

high Sean. i think this pipe sells for \$365.00 a 18 foot length. this was a scropp piece that i picked up at a construction site for \$5.00. hows that for being frugal.

thanks for looking at my post-zubbly

[ [Parent](#) ]

Re: Plastic prop pictures (again ) ([none / 0](#)) (#4)  
by J Steele ([JvsinThai@yahoo.com](mailto:JvsinThai@yahoo.com)) on Mon Oct 6th, 2003  
at 02:48:38 PM MST  
([User Info](#))

Zubbly,

You should be smiling in the photo, they are fine looking blades. I friend of mine that works with plastics told me to paint plastics with silver engine spray paint. The aluminum in the paint protects the plastic from UV damage from the sun. How are you going to attach the blades to the hub?  
John

Re: Plastic prop pictures (again ) ([none / 0](#)) ([#8](#))  
by zubbly on Mon Oct 6th, 2003 at 05:27:06 PM MST  
([User Info](#))

high John. thanks for the tip on the engine paint. i will paint them with that. i will be attaching blades to hub with a bracket that i am having made. bracket will be made from 1/8 inch aluminum plate with a 1 inch solid aluminum round bar welded to it. bracket will be fastened to blade with counter sink 1/4 inch bolts. aluminum round bar will be U-bolted to flat aluminum hub so that i will be able to adjust angle if needed.

thanks for your comments-zubbly

[ [Parent](#) ]

Re: Plastic prop pictures (again ) ([none / 0](#)) ([#9](#))  
by Garry on Mon Oct 6th, 2003 at 07:43:40 PM MST  
([User Info](#))

Please do not try to spin those blades with that hub. Metal fatigue on welded aluminum will break the hub in days. Centrifugal force will break them at a low rpm. Find a machinist who builds machine parts for farmers or an engineer with common sense who interested in your project. Good luck.  
Garry

[ [Parent](#) ]

Re: Plastic prop pictures (again ) ([none / 0](#)) ([#10](#))  
by zubbly on Tue Oct 7th, 2003 at 03:43:46 AM MST  
([User Info](#))

hi Garry, thanks for the info. never considered fatigue in such a short time. got any ideas or does anyone else?

thanks-zubbly

[ [Parent](#) ]

Re: Plastic prop pictures (again ) ([none / 0](#)) ([#11](#))  
by Garry on Tue Oct 7th, 2003 at 11:32:05 AM MST  
([User Info](#))

If I were going to build a hub for myself that was limited to 250 rpm and 10 pound blades I would use 3/16 plate steel in a Y shape on both sides welded to at least an inch and a quarter shaft. The plates would be twistable with a six inch vise and an eighteen inch crescent wrench for pitch purposes. This would be a minimum and could be done with hand tools except for the welding.

Garry

[ [Parent](#) ]

Re: Plastic prop pictures (again ) ([none / 0](#)) ([#12](#))  
by troy on Tue Oct 7th, 2003 at 04:50:30 PM MST  
([User Info](#))

Hey, steel is cheap, especially second hand. A piece of half inch plate that size isn't that expensive. If they cut it with a plasma arc cutter, the labor is not that much different either. And I would put three triangular gussets between the plate and the shaft, using 1/4" steel plate welded on both sides.

There is a sign in my shop that says:

If it's worth building, it's worth overbuilding.

troy

[ [Parent](#) ]

Re: Plastic prop pictures (again ) ([none / 0](#)) ([#13](#))  
by zubbly on Tue Oct 7th, 2003 at 07:08:01 PM MST  
([User Info](#))

hi Garry. do you mean to sandwich the blade between the two Y's, and weld the shaft to the bottom of the Y's? sorry, sometimes it is just hard to sink into my thick skull. heh heh.

thanks-zubbly

[ [Parent](#) ]

Re: Plastic prop pictures (again )  
([none / 0](#)) ([#14](#))  
by Garry on Tue Oct 7th, 2003 at 08:25:32 PM MST  
([User Info](#))

I was assuming that you were using three blades. You could use a piece of steel that was disc shaped but it would be hard to set the pitch that you want. If you cut out the parts that don't touch the blades you could twist the remaining strips to a pretty steep angle. By using two of these wye shaped parts, one on each side of the blades your hub will be many times stronger. After the pitch is set up the way you want then weld the center holes to the shaft. You would still be able the twist the arms slightly if you needed to by removing the blade bolts and twisting the arms separately. The movement after welding will be much more restricted than before. According to "Machinery's Handbook" a blade that weighs 10 lbs, that is 6 feet long, at 250 rpm would weigh 640 lbs. So the stresses are much higher than it would appear at first glance. The force goes up by 4 times if the rpm doubles. Hope this helps. My typing quota for the month is about used up.

[ [Parent](#) ]

Re: Plastic prop pictures (again ) ([none / 0](#)) ([#15](#))  
by zubbly on Wed Oct 8th, 2003 at 06:01:15 PM MST  
([User Info](#))

thanks for the additional info. all will be considered when assembling and testing.

zubbly

[ [Parent](#) ]

[Plastic prop pictures \(again \)](#) | 15 comments (15 topical, 0 editorial)

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## [7 1/2 HP induction conversion](#)

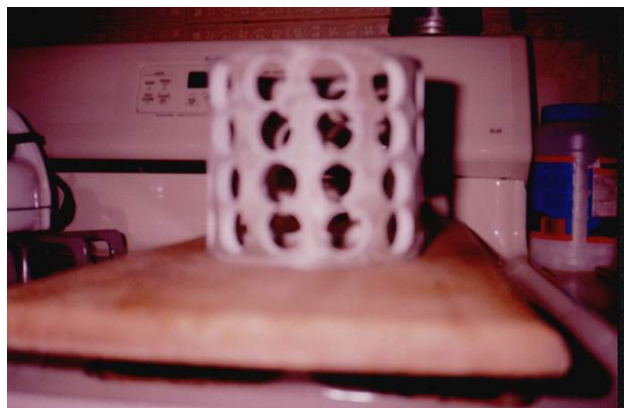
By [zubby](#), Section [Homebrewed Electricity](#)

Posted on Sun Oct 5th, 2003 at 02:58:50 PM MST [Alternators](#)  
conversion almost completed

hello again everyone, my posting on the 1.5 hp DC repair seemed to work, so here is the next one.

a little while back i had mentioned that i will be doing a 7 1/2 HP induction conversion. i had previously talked about in another posting about a special cage i was thinking about in order to hold the magnets in place. on this rotor i installed 48 1 inch diam. by 1/2 inch thick neo's. i began by turning the rotor down by 1.1 inches. this allowed me to maintain the original .020 air gap. the motor was originally a 7 1/2 hp, 1800 rpm, 575 volt high efficiency motor, totally enclosed, fan cooled. i re-designed the stator for 12 poles( more on this later with more photos) and i ended up with 12 rows of 4 magnets.i also skewed the magnet rows by 10 degrees to reduce cogging. the stator has 36 slots so the 10 degrees represents one stator tooth. i made the cage by first using a piece of plastic pipe and applied what is called pre-mix in layers until i worked up to about 1/8 inch short of the required diamater. i next turned in the lathe to a level finish. i next applied multiple layers of woven fibre glass cloth and resin and built up to more than the required diamater. i then lathed down to 1/16 inch less than finished diamater. in pictures you will notice that the cage has a hollow to it. this is to allow room for the epoxy encapsulant to fill in all around the magnets. by the way, this encapsulating material is specifically made to encapsulate motor coils, is class F ( 150 degree C ) and is extremely strong. in my opinion much stronger than fibre glass resin. i poured a 1/8 inch thick blob of it by 3 inches round, and when cured, i can't snap it. after i installed all the magnets, i formed the cage section with plastic, sealed, drilled holes in one end to pour in epoxy, and ended up with excellent results. here are the pictures.

Update [2003-12-16 10:46:59 by kurt]: pics reposted [here](#)



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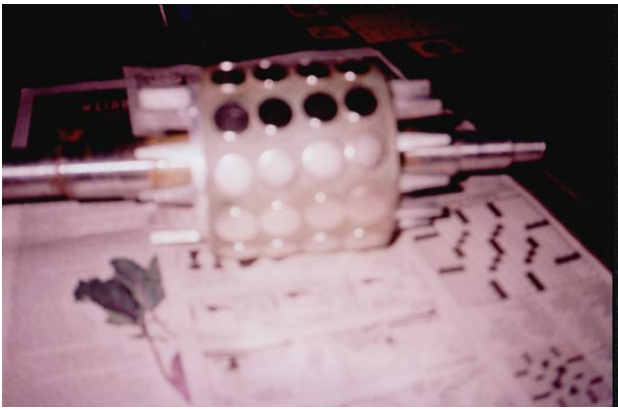
here are pictures of the cage after the 48 holes have been drilled in it. i think you will be able to see the hollow space allowed for the epoxy. this cage also ended up extremely strong with all the pre-mix and layers of woven fibre glass cloth.





here are the pictures of magnets being put into rotor. i may have inserted a wrong picture as i did with the DC posting. i hope you can see the skewing and the hollow space for epoxy encapsulating material.





here are pictures of the rotor after the encapsulating material has been poured in and formes removed. this is also a picture of my son Christopher holding the rotor. he has also taken a genuine interest in wind energy and has been a great help in my efforts. preliminary tests with a completed test winding of only 4 turns per coil have yielded excellent results. the permanent winding with 42 turns per coil has been completed and the testing is continuing. here is a picture of the unit being driven by a large DC motor from a balancing machine. the flat belt was fine for the testing with test winding, but cannot supply enough torque for the permanent winding. i hope to direct couple with a ten HP this week and make final tests. will let you know results later. any questions will be gladly answered.

having fun-----zubbly

[7 1/2 HP induction conversion](#) | 1 comment (1 topical, 0 editorial)

Re: 7 1/2 HP induction conversion ([none / 0](#)) ([#1](#))  
by drdongle on Sun Oct 5th, 2003 at 10:50:07 PM MST  
([User Info](#))

WOW, way cool. keep us informed.

Dr.D

[7 1/2 HP induction conversion](#) | 1 comment (1 topical, 0 editorial)

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### [1.5 HP repair](#)

By [zubby](#), Section [Homebrewed Electricity](#)  
Posted on Sun Oct 5th, 2003 at 01:39:53 PM MST [Alternators](#)  
here is the repaired 1.5 HP DC motor from previous post

Well i hope that i have finally figured out how to post pictures. lets see if this is going to work the way it should. in a previous post i was given a 1.5 hp dc motor gift. of course it was burnt. i have given the armature a complete rewind, dynamic balance and new bearings. the motor was tested as a motor and not yet as a dc generator. the motor is 180 volt armature, permanent magnet. i expect in the future that it will make a good battery charger. the motor has been repaired for the last couple of months, but it is not up and flying yet. i have been given a 30 ft. tv tower which i must go and take down next weekend. i think i have an advanced case of the BUG from this site and have a half dozen projects on the go at the same time. i will share these to date in the next posts. anyhow, here are a few pictures of the dc repair.



there may not be enough detail in the photo, but the wire is burnt blacker than toast and has even totally burnt out the wedges that hold the wire in.

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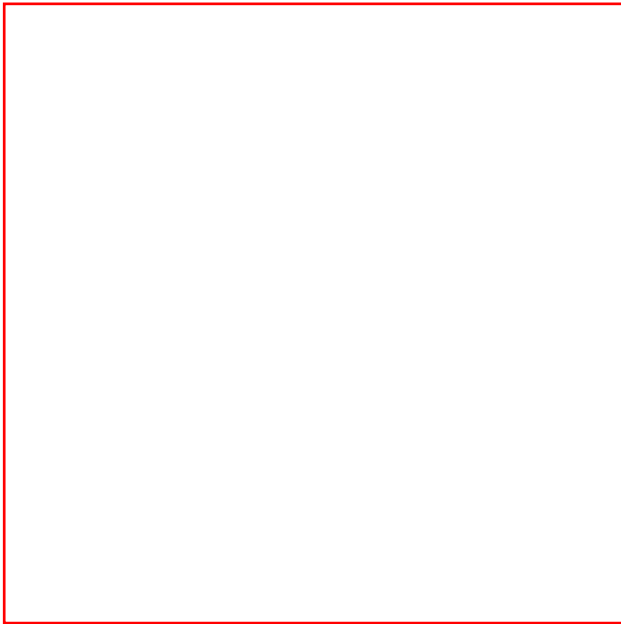
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i think i have picked the proper picture out of files to show you the permanent magnet assembly of the dc motor. they are big and strong, and run the full length of the armature laminations.



here is a picture of the armature that i am winding on the kitchen table. i am using class H inverter duty magnet wire, and all class H insulation. this class H insulation is good for 180 degree c and the magnet wire is good for 220 degree c. all top of the line materials.



here is a picture of the rewind completed. it has been dipped and baked twice in class H motor varnish, balanced- ( you can see the white blob of balancing compound on the winding ), commutator has been dialed to less than .001 inch runout, turned and undercut, and new bearings installed. i have also installed heavier gauge lead wire on the brush holder assembly.

the weather here is starting to get quite cold and hope i will be able to finish some of these projects before the snow flies. if anyone has any questions about this repair, please ask.

i have not forgotten about the plastic props i have been working on, and hope to get these pictures and info posted soon. thanks to everyone for being patient with me.

having the most fun in years-zubbly

[1.5 HP repair](#) | 4 comments (4 topical, 0 editorial)

Re: 1.5 HP repair ([none / 0](#)) ([#1](#))  
by Norm on Sun Oct 5th, 2003 at 05:35:14 PM MST  
([User Info](#))

Zubbly I see you finally got the hang of it JPEG pictures! Now finally I'll be able to see those plastic props...How do you figure and lay out the lines to cut? Well I guess that will be all forthcoming eh? Well good luck on your projects. Oh by the way is that a Leeson dc motor that you rewound the armature on? (:>) Norm.

Re: 1.5 HP repair ([none / 0](#)) ([#2](#))  
by zubbly on Sun Oct 5th, 2003 at 06:06:37 PM MST  
([User Info](#))

hi Norm. that is a Leeson motor. it had only been used for a couple of months when a client of mine burnt it. my client bought a new 3 hp dc and was going to throw out this one. i asked for it and i received. this provides me with an almost endless source of units for wind gennys. i feel almost guilty-heh heh. the plastic props and diagrams will be posted soon.

have fun-zubbly

[ [Parent](#) ]

Re: 1.5 HP repair ([none / 0](#)) (#3)  
by Norm on Tue Oct 7th, 2003 at 01:24:07 PM  
MST  
([User Info](#))

Zubbly: Quite a few years back my oldest son was given one from work(they had replaced it with a slightly larger motor)nothing wrong with it. ("Here Dad...Want a motor?") That was before I got interested in wind power. I really must get it hooked up to a couple of blades one of these days...a nice 2 bladed 6 footer maybe.... that would be a biggie for me, as the rest of my pm motors are ones from car heater blowers. Well anyway this is a Leeson 1hp 110vdc 1800 rpm. It's fun just thinking about it! (:>) Norm.

[ [Parent](#) ]

Re: 1.5 HP repair ([none / 0](#)) (#4)  
by zubbly on Tue Oct 7th, 2003 at  
06:55:13 PM MST  
([User Info](#))

hi Norm. please let me know how your dc works out for you. i have had the dc that i wound done for well over a month now. the main problem i have is starting to many projects and not getting enough time to follow through getting them to fly. the 7 1/2 hp induction conversion is just about complete except for the final testing. am now looking around for a suitable free standing 60 ft. tower. just might not be able to finish before snow flies. this weekend i am going to take down a 30 ft. tv tower that was given to me. i will use this one for the leeson dc. i don't have a prop for the leeson, but i do have an eight foot length of i think 8 inch plastic pipe that i might cut a one piece prop from. hey, did you have a chance to look at my plastic blade posting and 7 1/2 hp induction conversion. let me know what you think. by the way, where do you live?

keep having fun---zubbly

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[1.5 HP repair](#) | 4 comments (4 topical, 0 editorial)

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[wafer coil](#)

By [zubbly](#), Section [Magnets & Magnetism](#)

Posted on Thu Oct 2nd, 2003 at 04:31:37 PM MST

[Alternators](#)

question for Electric Ed or anyone who can answer



hello Electric ED, or whoever may comment.

please view the image as what i would call a wafer coil. imagine the black line as a thin sheet of plastic or fibre board. the red line is the coil wrapped around the fibre board so it is basically flat. now imagine the blue and green lines as your magnets, one on each side of the coil. assuming that there are steel plates attached to the magnets, and both legs or sides of the coil are being passed at the same time with the two magnets, would you still be creating useable flux and where would the flux path be? hope someone can answer this.

thanks in advance--zubbly

[wafer coil](#) | 3 comments (3 topical, 0 editorial)

Re: wafer coil ([none / 0](#)) (#1)  
by Electric Ed on Fri Oct 3rd, 2003 at 08:52:19 PM MST  
([User Info](#)) <http://www.electric-ed.com>

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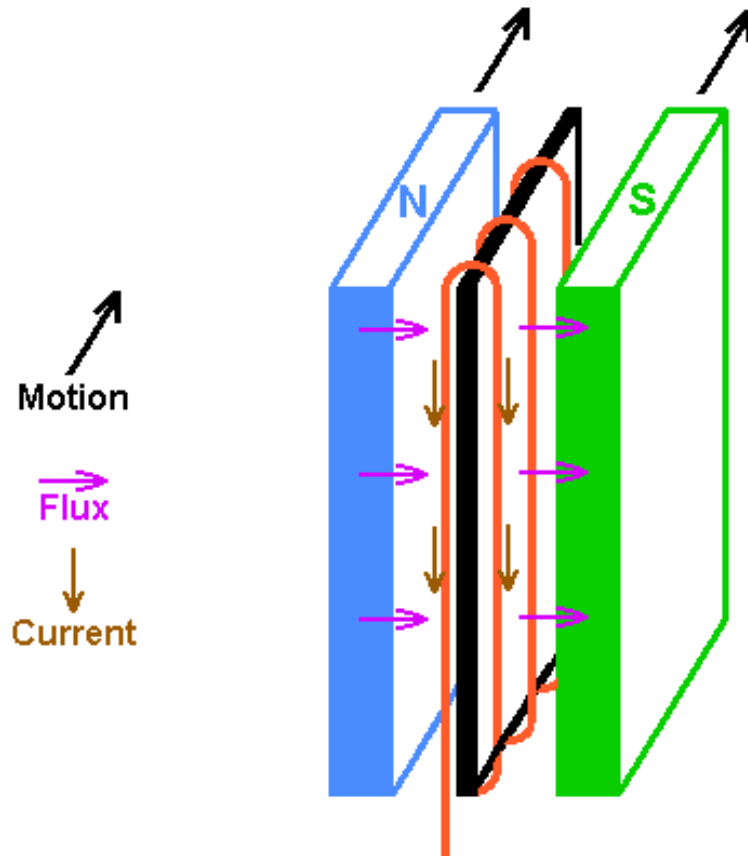
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If your proposed design is similar to the sketch below, I believe it will not work.

There would be flux (purple) but it would be cutting all of the wires, that is, both "sides" of the coil in such a way that the induced voltage is trying to force current (brown) down in all the wires at the same time.

The result would be almost complete voltage cancellation.

Electric Ed



Re: wafer coil ([none / 0](#)) (#2)  
by zubbly on Sat Oct 4th, 2003 at 02:21:47 PM MST  
([User Info](#))

hello electric Ed, and thanks so much for your reply. your diagram is exactly what i mean. your perspective really nails it on the head. my idea was to get a way to really get those magnets close together. i understand what you mean by the magnets forcing the current in both sides of the coil at the same time, but i guess my train of thought figured that the current would follow the coil direction the same as if water were flowing through a water pipe. i will make a few experiments with this and will let you know the results. again thank you for your valued opinion.

zubbly

[ [Parent](#) ]



Re: wafer coil ([none / 0](#)) ([#3](#))  
by hwf71603 ([hwf\\_71603@yahoo.com](mailto:hwf_71603@yahoo.com)) on Sun Dec 7th,  
2003 at 09:34:21 PM MST  
([User Info](#))

When the coils are wound in a direction perpendicular to the direction of rotor motion, you must use the same polarity magnet on each side of the coil to generate a current. That is, the magnets on either side of the coil would need to be arranged such that either the north poles or the south poles faced each other. Not sure you could make such an arrangement work without a laminated steel core for the stator coil, though, but it would certainly be interesting to try. Leaving out a laminated steel core for the stator leaves at least two questions to be answered: 1) the magnets of the two rotors would want to repel each other, and what structural stress would this cause on the two rotors for a given air gap (e.g., air gap = distance between the faces of the two magnets)? and 2) would this same "repulsion" help redirect most of the flux back to the originating magnet in the absence of a laminated steel core?

When the coils are wound in a direction parallel to the direction of rotor motion, then the magnets on either side of the coil should have opposite polarity. That is, the magnets on either side of the coil would need to be arranged such that a north pole faced a south pole.

[ [Parent](#) ]

[wafer coil](#) | 3 comments (3 topical, 0 editorial)

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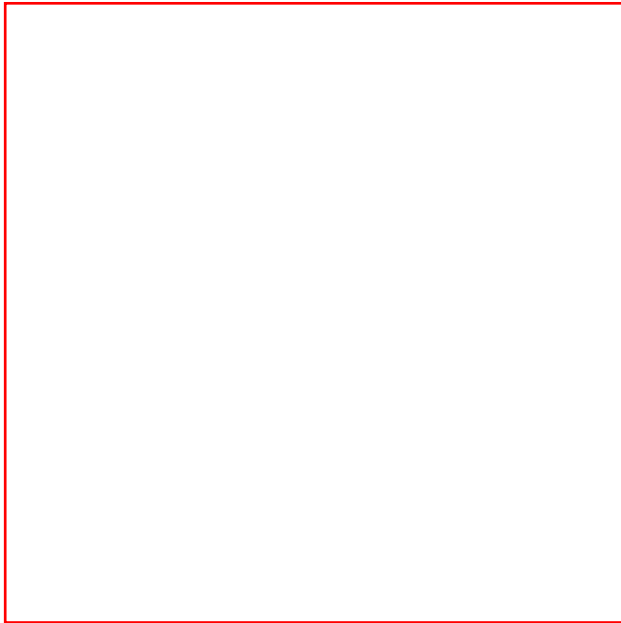
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[pvc props](#)

By [zubbly](#), Section [Homebrewed Electricity](#)  
Posted on Sun Sep 21st, 2003 at 07:35:32 PM MST

[Wind](#)

**pvc props**



since my posting seemed to work for coils, lets see if my pictures of the pvc props that i tried to post before will work.

zubbly

[pvc props](#) | 9 comments (9 topical, 0 editorial)

Re: pvc props ([none / 0](#)) ([#1](#))  
by [zubbly](#) on Sun Sep 21st, 2003 at 07:38:37 PM MST  
([User Info](#))

sorry for wasting your time guys. don't understand it, it worked for the coils. back to the drawing board.

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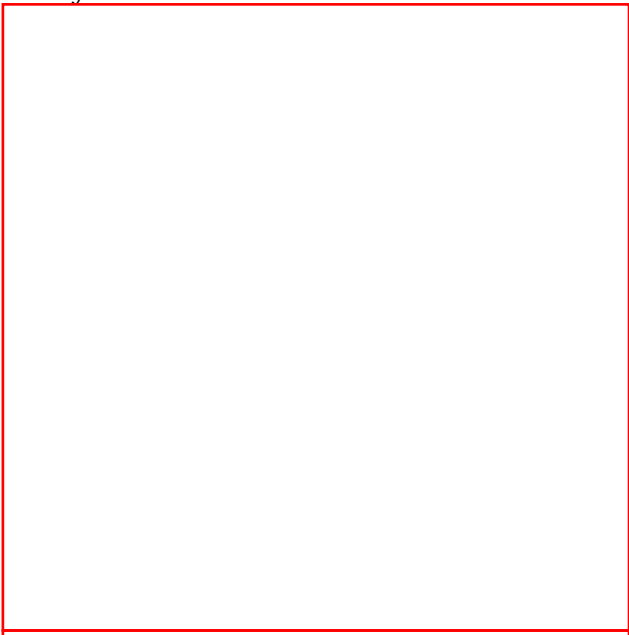
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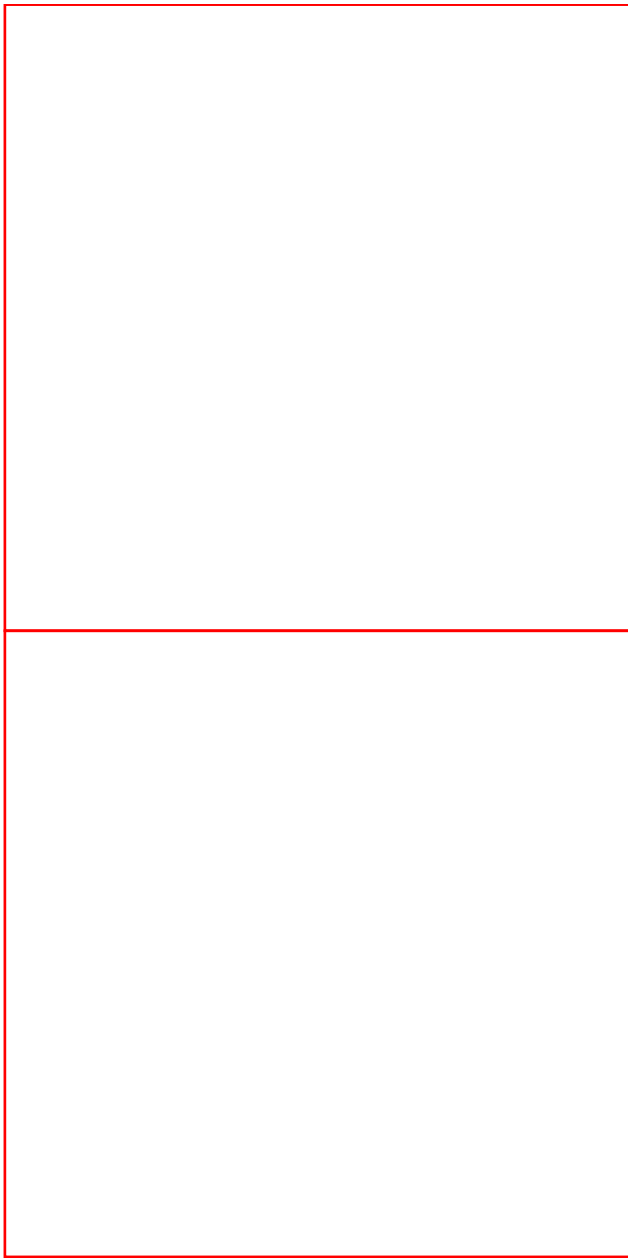
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zubbly





Re: pvc props ([none / 0](#)) (#3)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on  
Sun Sep 21st, 2003 at 08:06:03 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

Please let me see your PVC Props !!  
I have good luck with the pictures, let me try to explain

On the righthand side of teh screen that you are looking at right now should be a box with your name on it (zubbly, if not then you are not logged in)

In this box click on "Your Photo Uploads", once in there you can control the images that you can put into your message posts. Upload your Photos at this point.

Then go back to the Message Board and click "Submit Posting" from the Menu Box on the top righthand side of the screen. In the "Comment box" enter your text. When you want to insert an image scroll down to the bottom of the page to the "User Files" box, click the downarrow and select one of the photos that you uploaded earlier, then click "Insert Image"

Scroll back up to your text and you will see some HTML code that represents your photo inserted into the message that you are posting. Do Not change or remove this code from the message.

Add more text and photos  
repeat as necessary

-- W o o f  
[ [Parent](#) ]

Re: pvc props ([none / 0](#)) (#4)  
by zubbly on Sun Sep 21st, 2003 at 08:26:51 PM MST  
([User Info](#))

hey Woof, thanks for the info. i want to get these pictures up more that anything. i don't seem to have trouble posting drawings from paint, but seem to have trouble posting the pictures. i will master this eventually. i just cut out 6 blades from a 1 foot diameter by 6 foot plastic sewage pipe that i will be making a 13 foot diam. prop for my 7 1/2 hp induction conversion. i bench tested this weekend and was able to choke 5.3 kw out of it with full test winding. almost completed. there will be lots of pictures and text for this one. last weekend i completed the rotor with installation of 48 1" x 1/2" neo's, total encapsulation, and dynamic balancing. the unit is a 12 pole conversion. I WILL GET THESE PICTURES UP ONCE DEVELOPED.

zubbly

[ [Parent](#) ]

Re: pvc props ([none / 0](#)) (#5)  
by Norm on Sun Sep 21st, 2003 at 09:29:51 PM MST  
([User Info](#))

Ah...Zubbly there you have it...the key!  
i don't seem to have trouble posting  
**drawings** from paint, but seem to have  
trouble posting the **pictures**. drawings  
and pictures are two different things and  
I can't quite explain but those are the  
clues perhaps someone else reading this  
can explain it better. The paint program  
is an integral part of your word processor  
so your drawings are in memory just like  
text. I think that if you follow Woof's  
instructions step by step you will be  
successful in posting your pictures. Good  
Luck! Keep trying ...I want to see those  
pics! (:>) Norm.

[ [Parent](#) ]

Re: pvc props ([none / 0](#)) ([#8](#))  
by thefoot on Mon Sep 22nd, 2003 at 07:14:07 PM  
MST  
([User Info](#))

Please keep trying with those bloody pics the one u  
sent me would not work either  
very keen to take a peek at that stuff  
Regards  
Bob

[ [Parent](#) ]

Re: pvc props ([none / 0](#)) ([#2](#))  
by Electric Ed on Sun Sep 21st, 2003 at 08:01:36 PM MST  
([User Info](#)) <http://www.electric-ed.com>

Zubbly, it isn't you that is wasting people's time, it's the  
guy that invented SCOOP. :-)

Electric Ed

Re: pvc props ([none / 0](#)) ([#6](#))  
by DanB on Mon Sep 22nd, 2003 at 04:57:45 AM  
MST  
([User Info](#))



I don't think we can blame Rusty here :-)

Zubbly... looking at the picture, it appears you tried to upload a file thats a .wps

When you upload a picture, in order to keep the file size reasonable and assure that it will work, make sure that it's a .jpg, thats the most common picture format and itll work for everyone. .wps is a special microsoft "word perfect" file if Im not mistaken. Our server doesnt run microsoft ANYTHING and has no idea what to do with a word perfect document!

So, next time, try to save the file on your own machine as a .jpg before yo upload it and I think it'll work fine! Good luck!!

[ [Parent](#) ]

Re: pvc props ([none / 0](#)) (#7)  
by Wolfie1 on Mon Sep 22nd, 2003 at  
06:21:31 AM MST  
([User Info](#))

Hey Zubby, if you send me the original files, I can probably extract the pictures and send you back jpegs. Send it to martin.wolffdontspam@globalcroaaasing.com (remove the "dontspam" in the name).

Martin.

[ [Parent](#) ]

Re: pvc props ([none / 0](#)) (#9)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Wed Sep 24th, 2003 at 01:40:00 AM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

If you can't post some pictures, I'd like a brief discription of your PVC Props...

-- W o o f

[pvc props](#) | 9 comments (9 topical, 0 editorial)

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[inserting pictures with posting](#)

By [zubbly](#), Section [Homebrewed Electricity](#)  
Posted on Sun Sep 7th, 2003 at 04:40:30 PM MST [Alternators](#)  
please help

ok, everyone loved the pictures of invisible props. did you like all the curves? would someone please direct me how to get to the instructions of how to insert pictures in postings for dummies.  
thanks--zubbly

[inserting pictures with posting](#) | 4 comments (4 topical, 0 editorial)

Re: inserting pictures with posting ([none / 0](#)) ([#1](#))  
by [wdyasq](#) on Sun Sep 7th, 2003 at 05:39:20 PM MST  
([User Info](#))

Zubbly,

That picture posting can be confusing - well, it was to me for a "while". I then started looking at the "properties" of a post that had the cursed things in them. Then I played with the the "review" button after I uploaded some pictures. I finally "GOT" the process.

I think almost anyone who does not think the "CD Tray" is a drink holder can master enough to effectively post here.

Ron

Re: inserting pictures with posting ([none / 0](#)) ([#2](#))  
by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Mon Sep 8th, 2003 at 12:29:05 PM MST  
([User Info](#))

It's slightly different depending on where your pictures reside. If you already have your pictures on the internet, you just make sure your Scoop Comment Preferences are set to "Auto" or "HTML" and include an image tag like this:

```
<IMG SRC="http://www.mysite.com/photo1.jpg">
```

If you want the photos to reside on our server -- once you have created an account and logged in, whenever you do a "submit posting" or reply to a posting, there will be a "user files" box somewhere on your screen. To upload an image, click "view your files." You can either type the name of the photo to upload off your computer, or click "browse" to choose and select it off your computer. Then click "upload" and after it's done it will appear in your files list on the top of that page.

After it's up on our server, it will appear in the "select file" pulldown menu in your "user files" box. Just select it and click the "insert image" button to automatically paste the

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code for the image tag into the body of your message.

Hope that helps clear it up, and good luck.

ADMIN

Re: inserting pictures with posting ([none / 0](#)) ([#3](#))  
by scoraigwind ([magnet@scoraigwind.co.uk](mailto:magnet@scoraigwind.co.uk)) on Mon Sep  
8th, 2003 at 12:44:14 PM MST  
([User Info](#)) <http://www.scoraigwind.co.uk>

OK I think I have got it.

If you are logged on you can upload files to the board. Do this first of all. Find 'Your photo uploads' on the right hand side (so long as you are logged on) and click there.

Then 'upload files' choose 'Browse', find your file and click on 'Upload'.

Now you are half way there.

Start a new post and do all that, and you will have a box on the upper right called User files. Use Select files to select the file you have uploaded and then click on 'Insert image'. Bingo.

Now of course you mor elikely to be are commenting on a post instead. You can still do it! Now 'User files' is at the bottom of the window. Once again select your file from the drop down menu. click on insert image. Couldn't be easier. Once you have found out where things are.

Have fun :-)

Hugh Piggott <http://www.scoraigwind.co.uk>

Re: inserting pictures with posting ([none / 0](#)) ([#4](#))  
by Windnutone on Mon Sep 8th, 2003 at 09:40:21 PM  
MST  
([User Info](#))

Well here goes ..... I'm one who has a vcr thats been blinking at me for about 12 years now. I'll try my second pic with this posting ... and a question or two. Just got another Old 32 Volt Wincharger ( basket case but complete. Has anyone of you electronics Gurues ever turned one into a PM Gen .... If anyone from the Wincharger site is reading this I know its sacriligious ... but ... well ... I'm just asking a simple question ... They're touchy about these old



machines.

Whoa .... thats amazing ... I'm good ..(:>)

[inserting pictures with posting](#) | 4 comments (4 topical, 0 editorial)

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[pictures of pvc props](#)

By [zubbly](#), Section [Homebrewed Electricity](#)

Posted on Sun Sep 7th, 2003 at 04:31:30 PM MST

[Wind](#)

pvc props



i don't think the pictures came through on the first posting. i hope they come through now. don't forget, please be patient, i am no good at this yet. thanks for understanding--zubbly

[Editors Note: ]Zubbly; That "picture" is a word processing file and can't display on the web. This picture display stuff only works for files that end in .gif, .jpg, .png, etc. If you figure out how to get an actual image uploaded post a comment and I'll fix the story. TomW

[pictures of pvc props](#) | 0 comments (0 topical, 0 editorial)

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## [pvc props](#)

By [zubbly](#), Section [Homebrewed Electricity](#)

Posted on Sun Sep 7th, 2003 at 04:25:04 PM MST [Alternators](#)

### pvc props

here is my first posting with pictures. hope it works. these are two pictures of props cut from 3 inch and 4 inch pvc. i will be making another posting with instructions of how to do it. i have not got a lot of science or equations in these, just winged it. did most of my experimenting with paper towel tubes first and stood in front of air conditioner with props on a bamboo sc sewer. i have one of these props on a very mini dc generator on top of the garage. works pretty damn good. these two props are 42 inch and 48 inch. i have a length of 12 inch diameter plastic sewer pipe that i will be making prop for my 7 1/2 hp 3 phase conversion. it will be a two blade approx. 18 feet in diameter. will post this story when completed. hope this works, here are the pictures.

[pvc props](#) | 0 comments (0 topical, 0 editorial)

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[more questions on magnet spacing and sizing](#)

By [zubbly](#), Section [Homebrewed Electricity](#) [Alternators](#)  
Posted on Thu Aug 21st, 2003 at 08:48:38 PM MST  
[more questions on magnet spacing and sizing](#)

assuming that the ideal spacing for magnets is from the centre of leg to leg of coil, and that the width of magnet is the distance between legs, what would you consider the centre of coil legs when you have more than one coil in a group? suppose you are converting a three phase motor, 4 poles, to alternator. 36 slots, 6 groups of three coils, coil span of groups are 1-8,1-10, and 1 to 12. would you say that magnet width should equal the distance between coil legs of span 1-8, and that magnet spacing should equal centre distance of coil legs in span of 1-10? another sanario would be 36 slots, 36 coils, 2 coil sides per slot, and all coils have span of 1-8. would magnet width be the distance between coil legs of 1-8 span, and would coil spacing be centre distance of coil legs of span of 1-8? most diagrams i have seen on this site seem to refer to having one coil. when trying to convert a 3 phase motor to alternator you are usually dealing with more than one coil per pole group. these are just questions i have to ask. hope someone can clarify. thanks in advance----zubbly

[more questions on magnet spacing and sizing](#) | 4 comments (4 topical, 0 editorial)

Re: more questions on magnet spacing ([none / 0](#)) (#1)  
by Electric Ed on Fri Aug 22nd, 2003 at 10:50:14 AM MST ([User Info](#)) <http://www.electric-ed.com>

You said - "coil span of groups are 1-8,1-10, and 1 to 12."  
This sounds like the poles are concentric wound, one inside the other.

This is not an ideal layout for conversions. The best you can do is space your magnets (center-to-center) the same distance apart as the center-to-center distance between the poles (of one phase), and use the widest magnets you have space for.

If your motor had a lapped winding, like this-

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-the center-to-center spacing of your magnets should be the same as the span of any one coil, which are all identical.

This type of three phase winding makes a much better conversion.

Electric Ed

Re: more questions on magnet spacing ([none / 0](#)) (#2)  
by zubbly on Fri Aug 22nd, 2003 at 07:24:42 PM MST  
([User Info](#))

thanks for your reply Ed, i kind of figured that you would. i am quite familiar with lap wound stators as in the picture. just curious, are you or were you a member of E.A.S.A.? those pictures were distributed to easa repair centres for illustration of winding failures. since you mentioned lap winding, would you be concerned about the different polarities from the two coil sides in one stator slot cancelling out each other, or two different phases in one slot. i am just concered here that what works in motors may not work when being used as generator. looking forward to your reply, thanks-----zubbly

[ [Parent](#) ]

Re: more questions on magnet spacing ([none / 0](#)) (#3)  
by Electric Ed on Sat Aug 23rd, 2003 at 05:10:09 PM MST  
([User Info](#)) <http://www.electric-ed.com>

No, I never was a member of EASA, but have rewound a few motors, and converted an old three phase "Wound Rotor" (slipring) motor to a 120/208 volt alternator by rewinding the rotor to produce a 4-pole, 12 volt field winding. I use it for emergency power and drive it with a 10 HP gas engine.

(quote) - "would you be concerned about the different polarities from the two coil sides in one stator slot cancelling out each other, or two different phases in one slot. i am just concered here that what works in motors may not work when being used as generator"

Yes, it is quite possible that some winding arrangements will not work well for generator conversions.

Electric Ed

[ [Parent](#) ]

Re: more questions on magnet spacing ([none / 0](#)) (#4)  
by zubbly on Sat Aug 23rd, 2003 at 06:49:07 PM MST  
([User Info](#))

thanks again Ed--zubbly

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[can you have too strong a magnet?](#)

By [zubbly](#), Section [Homebrewed Electricity](#)

Posted on Wed Aug 6th, 2003 at 05:31:14 PM MST

[Alternators](#)

[can you have too strong a magnet?](#)

hello everyone, i was just thinking. i know that in electric motor design that you can over saturate the core with flux and cause severe heating. in permanent magnet alternatures ( home brew ) is it possible to have too strong a magnet in the design and end up over stressing coils and saturating lamination core? i have not seen this posted before and was wondering if anyone can comment.

many thanks in advance-----zubbly

[can you have too strong a magnet?](#) | 10 comments (10 topical, 0 editorial)

Re: can you have too strong a magnet? ([none / 0](#)) ([#1](#))  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Wed Aug 6th, 2003 at 11:06:11 PM MST  
([User Info](#)) <http://www.internetfred.com>

I believe so. Saturation of the core would just limit the total power coming out of the unit beyond a certain limit. Once the core is saturated the material cannot withstand more then what it has, so in effect you can't push it any further then full saturation. I wouldn't worry so much about the coils as the core.

However, the thickness of the material is another matter all together... The thicker the core the more it can handle, so technically it's based also on thickness, the thicker the core material the more you can drive it with larger fields/magnets. Now this also plays into gap thickness and gap depth. The gap depth is a large determining factor of how far you can push saturation. If your coils are well embeded within the core (there is a limit here, depth wise), you can drive it harder.

Gap width is something else, most of us in this chat room space our magnets and core gaps equally (to match), however, there is another way according to gap width, magnet width and depth calculations and phasing.. but thats something else, sorry... I just ramble.

Re: can you have too strong a magnet? ([none / 0](#)) ([#2](#))  
by Electric Ed on Thu Aug 7th, 2003 at 05:55:53 AM MST  
([User Info](#)) <http://www.electric-ed.com>

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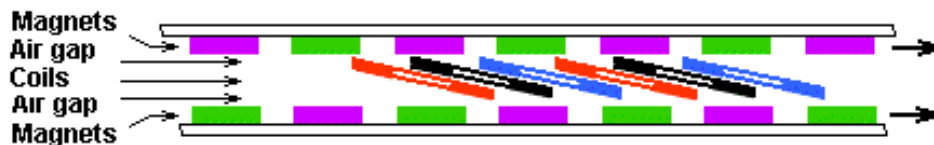
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I agree with the advice given by iFred.

In an iron-core machine, if all other factors are equal, iron = power.

With regard to efficiency, the only practical alternative is the twin-rotor configuration.

### Twin Rotor Magnet Arrangement - "Edge-on" View

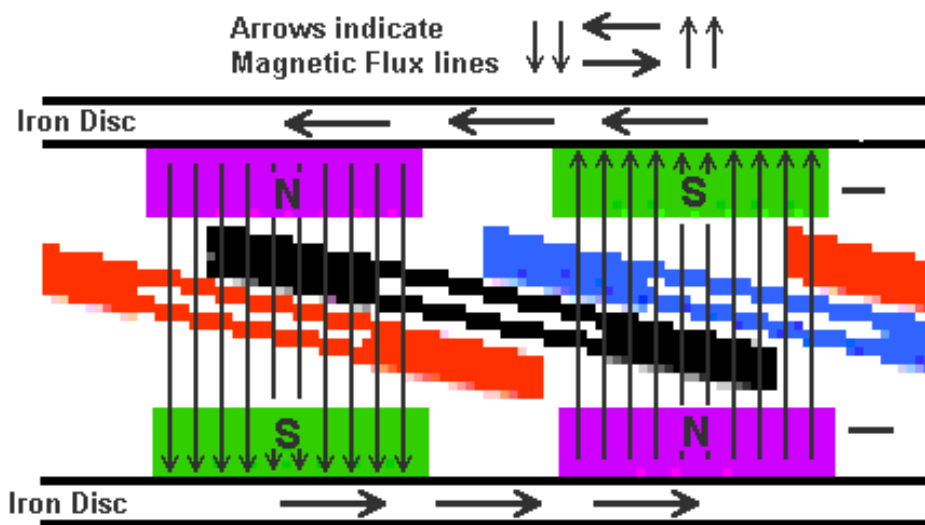


Magnetic flux lines are always in the form of closed "loops" called the "magnetic circuit." The flux lines are assumed to flow, in air, out of North magnetic poles and into South poles.

The magnetic circuit in a typical dual-rotor air-core machine is indicated by the black arrows in the enlarged section below.

Out of the bottom North, up through the coils, into the top South, to the left through the rotor disc to the top North, then out of the top North, down through to coils to the bottom South, and through the disc to their point of origin.

The flux density (magnetic strength) is constant across the width of the air gap and stator windings.



Electric Ed

Re: can you have too strong a magnet? ([none / 0](#)) (#3)  
by [scoraigwind](#) ([magnet@scoraigwind.co.uk](mailto:magnet@scoraigwind.co.uk)) on Thu Aug 7th, 2003 at 01:19:32 PM MST  
([User Info](#)) <http://www.scoraigwind.co.uk>

Nice diagrams, Ed, that really helps visualisation.

The reality of flux in the gap is a little different, because leakage plays a very strong role, and so the lines curve toward the neighbouring magnets. This means the the flux is much stronger at the centre of the magnet face and close to the magnet face.

You can't really have a magnet that is too strong but some designs are better than others at using the strength. If I had really strong magnets, I would space them apart so as to get the best value from them.

Hugh Piggott <http://www.scoraigwind.co.uk>  
[ [Parent](#) ]

Re: can you have too strong a magnet? ([none / 0](#)) (#4)  
by zubbly on Thu Aug 7th, 2003 at 05:18:39 PM MST  
([User Info](#))

thank you all greatly, very appreciated!

zubbly

Re: can you have too strong a magnet? ([none / 0](#)) (#6)  
by BSparky on Sun Aug 10th, 2003 at 08:44:22 AM MST  
([User Info](#))

I'm in agreement with this board as yes. First hand experience, core will saturated, and becomes a giant short that produces heat.

Hi Ed, I've notice that you have pictured the rotor iron discs directions going both parallel flow top graph, and counter flow in reference to the stator bottom graph. I'm missing something here?? I can visualize how the top will work, but the bottom makes it more challenging in what it looks like (to me anyhow) a flux cancellation point when two like poles will line up.

Bob

[ [Parent](#) ]

Re: can you have too strong a magnet? ([none / 0](#)) (#7)  
by Electric Ed on Sun Aug 10th, 2003 at 10:29:05 AM MST  
([User Info](#)) <http://www.electric-ed.com>

[Quote]"I'm missing something here??"

Yep!

[Quote]"you have pictured the rotor iron discs directions"

No, the arrows in the enlarged sketch indicate the magnetic circuit path - not the direction of the rotor rotation.

Electric Ed

[ [Parent](#) ]



Re: can you have too strong a magnet? ([none / 0](#)) (#8)  
by BSparky on Sun Aug 10th, 2003 at 08:30:24 PM MST  
([User Info](#))

Thanks Ed, Thought they were the flux return lines. But with the ground breaking technology around here I've started to ponder if the discs were too rotate opposing.

sparks-bob

[ [Parent](#) ]

Re: can you have too strong a magnet? ([none / 0](#)) (#5)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Thu Aug 7th, 2003 at 07:34:00 PM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

I keep thinking about those 2inch X 2inch neo Disk Magnets they have for sale on Ebay. It would be quite an engineering challenge to build a dual rotor machine with 12 or 16 of those big suckers pulling at each other across the gap. Not to mention how hard it would be to bring the rotors together during construction, or apart for repairs. But then maybe I could get 120vac at 200 rpm . . .

}=- W o o f -= {

2inch X 2inch neo Disk Magnets ([none / 0](#)) (#9)  
by hvirtane on Mon Aug 11th, 2003 at 02:06:11 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

I would like to see your results.

In principle you might have quite easy ways to do it by using an axle with treads and nuts and pulling the disks near each other and apart by nuts.

- Hannu

[ [Parent](#) ]

Re: can you have too strong a magnet? ([none / 0](#)) (#10)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Tue Aug 12th, 2003 at 05:24:19 PM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

The last time I was on Ebay they had 4inch diameter X 1inch thick disk magnets That would make a pretty big generator...

}=- W o o f -= {

[can you have too strong a magnet?](#) | 10 comments (10 topical, 0 editorial)

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[where do i find info. on Jerry blades design and mike Mods?](#)

By [zubbly](#), Section [Homebrewed Electricity](#) [Alternators](#)

Posted on Mon Jul 28th, 2003 at 06:53:17 PM MST

Jerry blades and Mike Mods.

hello everyone, would someone please direct me to more information on Jerry Blades and Mike Mods.

thanks in advance guys!

[where do i find info. on Jerry blades design and mike Mods?](#) | 1 comment (1 topical, 0 editorial)

Re: where do i find info. on Jerry blades design a [\(none / 0\)](#) (#1)

by TomW on Tue Jul 29th, 2003 at 05:09:31 AM MST

[\(User Info\)](#) <http://oneota.net/~earthsourcepowr/>

zubbly:

<http://oneota.net/~earthsourcepowr/jblades.php>

about all I know about them includes what I know about the mike mods.

Cheers.

TomW

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[where do i find info. on Jerry blades design and mike Mods?](#) | 1 comment (1 topical, 0 editorial)

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## [steel or aluminum blades](#)

By [zubbly](#), Section [Homebrewed Electricity](#)

Posted on Wed Jul 23rd, 2003 at 08:04:26 PM MST

[Alternators](#)

steel or aluminum blades

hello everyone,  
all the information i have seen and read about making props, have been based on wood.  
i am not that great when it comes to woodzzy blade carving and just don't quite yet understand the roots and angles and all the tip speeds. ( eventually it will sink in) i am more the hammer, welder, bend it type of guy. does any one know a site or have info on making blades from sheet steel or aluminum? just one other point of interest. now available in canada there is lumber made from recycled plastic in all standard board sizes and lengths. even has wood grain. guaranteed for a zillion years not to rot, bend, or splinter. has any one ever tried carving blades from this plastic wood? you would never have to paint it or coat it.

all thoughts appreciated

thanks in advance-----zubbly

[steel or aluminum blades](#) | 11 comments (11 topical, 0 editorial)

Re: steel or aluminum blades ([none / 0](#)) ([#1](#))  
by [electronbaby](#) ([electronbaby@hotmail.com](mailto:electronbaby@hotmail.com)) on Wed Jul 23rd, 2003 at 08:38:08 PM MST  
([User Info](#))

I've always wanted to try carving blades with that recycled plastic board stuff, but Ive never got around to it yet. Too many projects. :-) I think the majority of us make props out of wood simply because its cheap, light weight, and it doesnt take long to make a set. Im sure there is much room for improvement. If you try making a prop out of other materials, it would be great to see pics. Just be careful of steel flying loose, it could be deadly. Ive always wanted to carve one close to perfect blade out of wood and make a fiberglass mold to make another three blades, but I havent gotten to it yet. Hopefully soon. :) Have fun!!! RoyR

Re: steel or aluminum blades ([none / 0](#)) ([#2](#))  
by Norm on Wed Jul 23rd, 2003 at 09:10:13 PM MST  
([User Info](#))

Have you been to [windstuffnow.com](#)? He has an interesting tube and wire method of making a prop shown in his one hour projects. Norm

Re: steel or aluminum blades ([none / 0](#)) ([#3](#))  
by JB on Wed Jul 23rd, 2003 at 09:58:20 PM MST  
([User Info](#))

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i spent hours and hours looking at how to carve wooden blades. one day i just took a scrap 2 by 4 drew just a couple lines with a felt pin and took my 9 inch body grinder to it. in about 15 minutes i had a rough blade to look at 4 awhile. i improved on that. it really aint that hard, it just seems that way. forget the math and make it look like a blade for starters. The Jerry blades are a good start also to see what you might want to do. JB Dayton Nevada

[ [Parent](#) ]

Re: steel or aluminum blades ([none / 0](#)) ([#4](#))  
by Jerry on Wed Jul 23rd, 2003 at 11:33:13 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Zubbly

I've used steel blades in the past. I had them up 3 years with no problems but they were not very efficient. They were 40 inch 4 blade. They were off a very large fan. the most I ever got from them was about 150 watts.

The plastic Jerry blades work much better. I've seen over 1200 watts from these in a 4 blade at 49 inches (40 mph) and at \$10 each they're lots of fun.

They'll do 5 amps at 10 mph

JK TAS Jerry

[Airheads Page](#)

Re: steel or aluminum blades ([none / 0](#)) ([#9](#))  
by Bach On on Fri Jul 25th, 2003 at 07:08:10 AM MST  
([User Info](#)) [change AT: bach\\_on AT hotmail.com](mailto:change AT: bach_on AT hotmail.com)

I'm curious:

Where were you able to order 40 inch blades for \$10 each? Is there a website?

Bach On

- I'm just as happy as if I had good sense! -

[ [Parent](#) ]

Jerry Blades for \$10 ([none / 0](#)) ([#10](#))  
by TomW on Fri Jul 25th, 2003 at 07:26:04 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Bach On;

Jerry sells those blades and hubs to fit them.

He has posted his email before so I suppose its ok for me to post it now:

Audiosourcesalem@aol.com

Cheers.

TomW

[Stuff I have Online](#)

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[ [Parent](#) ]

Re: Jerry Blades for \$10 ([none / 0](#)) ([#11](#))  
by DaveR on Fri Jul 25th, 2003 at 08:18:50 AM MST  
([User Info](#))

TomW,

Which are better at lower wind speeds, the Jerry blades or the Jerry with Mike mod blades? I'm a little confused on this point.

DaveR

P.S. Jerry, Mike, or anyone with any experience with these blades feel free to jump in also : )

[ [Parent](#) ]

Re: steel or aluminum blades ([none / 0](#)) ([#5](#))  
by hvirtane on Thu Jul 24th, 2003 at 03:51:36 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

Hi,

1)  
there is one guy in Finland, who is producing in small scale blades basically the same way as modern jets are made.

His blades have got an aluminum skin and filled with polyurethane. There is as well a steel tube inside.

Please see pictures here:

<http://www.saunalahti.fi/~kkhuolto/pentakone/>  
(There is nothing in English there.)

One of my friends is using those blades. In principle they seem to be good.

Basically the technology how to make similar is not very difficult to master.

2)  
I personally like most the tube wire method.



Another friend of mine has made big tube wire blades for 15 kW genny. There are nearly ready made drawings by me for those blades in a discussion on 'the old board'.

[http://www.otherpower.com/cgi-bin/webbbs/webbbs\\_config.pl?read=15028](http://www.otherpower.com/cgi-bin/webbbs/webbbs_config.pl?read=15028)

3)

I've seen here one more method how to make cheap easy blades.

[http://www.otherpower.com/cgi-bin/webbbs/webbbs\\_config.pl?read=14319](http://www.otherpower.com/cgi-bin/webbbs/webbbs_config.pl?read=14319)

One of my friends in Australia has copied that design and he is telling me that they work better (start easier and go faster) than carefully carved NACA airfoil blades.

He made them with three 'blades' only, not six as the originals made by a wind turbine designer called 'Reinikainen' in Finland.

4)

In the great book 'Penryn Windmill book' there are good descriptions how to make old-fashioned 'multi-blade water pumper' metal blades of oil drum sectors.

- Hannu

Re: Tekniikkaa ([none / 0](#)) (#6)  
by Norm on Thu Jul 24th, 2003 at 07:08:37 AM MST  
([User Info](#))

I was a little intrigued by what looks like a flat multigroove belt drive...must be something like 6:1 ratio or more. Looks pretty good and feasible. probably lower maintainence than a chain drive to offset slightly higher friction loss. Most everything is a compromise, but I guess you really can't complain when it comes to free energy! Right? (:>) Norm.

[ [Parent](#) ]

Sailwings ([none / 0](#)) (#8)  
by hvirtane on Fri Jul 25th, 2003 at 06:49:20 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

I forgot to tell about the simplest good 'blades'.

My good friend from Denmark John Furze has told me a lot about 'Cretan Sail wings'.

There are lots of descriptions concerning sail rotors in the literature as well.

One of the really good books to be again recommended is 'Penryn Windmill Book':  
The Penryn Windmill Book. Arnoldi. Canada 1995.  
It has got a good description of sail rotors.  
There is one good book by Dick Mann:  
Cretan Sail Windpump. Mann. UK.  
1983/1992. 0-903031-66-3.

There are other books , too.  
Here is a bibliography given to me by John Furze:

Shelter. Shelter Publications. Bolinas California USA.  
1973. 0-394-48829-6.

A Windmill for Serbia. Høite, Eriksen [FREJA]. DK.  
1978. 87-7344-005-1.

Sail Windmill. Bagsvaerd School Copenhagen.  
Denmark.

The Penryn Windmill Book. Arnoldi. Canada 1995.

The Wind Power Book. Park.  
Cheshire Bks/Van Nost. USA 1981.  
0-917352-05-X.

Cretan Sail Windmill. CAT.  
Machynlleth Powys Wales UK. 1977.

Technological Self-Sufficiency. Clarke. UK.  
1976. 0-571-11057-6.

Sail Wing. New Alchemy Institute # 3.  
Woods Hole Mass. USA. 1976.

Food from Windmills. Fraenkel.  
IT Publications. London UK. 1975.

Cretan Sail Windpump. Mann. UK. 1983 / 1992.  
0-903031-66-3.

-----

In my pictures below, the diameter of the whole rotor could be about the same as you intend to build your wooden carved blades.

For the sails the best material is said to be 'Dacron'.  
Good cotton will do as well.

The angle of the sails should be something like 5 - 7 degrees, when the ropes are tight.

These rotors are very powerful, but will not go very fast.  
Your PMG must have lots of wire in the coils.

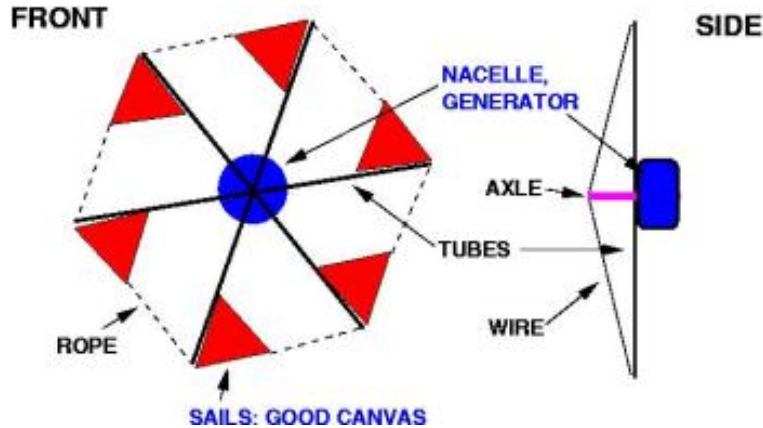
But what I've heard sail wing rotors might be the really best for home builders.

We made one rotor like this about one year ago

with John Furze, Lars Camprat, Ville Vernerimo, Arjo Heinsola, Timo Jodat, Arvi Karhumäki, Olavi Nykänen and other friends from 'Technology For Life' at Keuruu Eco Village.

That rotor is not in use at present, but I hope to be able soon to instruct the ecovillage to complete the machine.

- Hannu



[ [Parent](#) ]

Re: steel or aluminum blades ([none / 0](#)) ([#7](#))  
by [wdyasq](#) on Thu Jul 24th, 2003 at 08:25:49 AM MST  
([User Info](#))

At one time the Gougeon Brothere (WEST Epoxy) had a report on the longevity of wood-epoxy/Carbon-Fiber/FRP (fiberglass)/steel/Aluminum. The report is worth reading and will convince one the safest blades are wood.

If one were to build molds, it would be advisable to build several "prototypes" of a "tunable" material until they got the best performance they could. The cost of molds needs to put over a large number of units - ask any Plastic Boat builder.

I think one solution might be to have the blades "CNC" machined of wood. I have a small "Homebuilt" CNC machine and could probably put out a 4' blade every half-hour once a design was set. This would allow one to make blades for an 8'-10' mill in an hour or two.

The CNC machining will also allow one to laminate "Blanks" with minimal waste and minimal machining of unnecessary material.

Ron

[steel or aluminum blades](#) | 11 comments (11 topical, 0 editorial)

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## [1.5 HP DC GIFT](#)

By [zubbly](#), Section [Homebrewed Electricity](#)

Posted on Tue Jul 22nd, 2003 at 06:11:17 PM MST [Alternators](#)

1.5 HP DC GIFT

hello everybody,

today i was given a 1.5 hp DC gift. this food manufacturer bought the motor 1 month ago and burnt it from overloading. they bought another one.

my question, is how if at all, can the output voltage have been calculated for being used as a DC wind generator, ( with out being able to run it ). the armature is burnt, and i can rewind it, but i don't want to wind it a second time if the voltage output is not ideal for charging batteries. the motor is permanent magnet, 180 volt dc armature. i know that i will probably have to get brushes with more copper content and larger wires on the brushes. the motor has two permanent magnets ( huge ), and two brushes.

here is the name plate data.

Leeson, 1.5 HP, 180 volt DC, 7.6 amp, 1750 rpm, cat#108262.00, MOD #c4d17fk19d, Duty-Cont., Frame-wms56cz, torque-54 inch/lbs, tefc, insulation class-H3, sf. 1.0

the motor has a 7/8 inch shaft with key way, mounting feet, and c-flange.

if anyone can help or suggest, please do so.

many thanks in advance-----zubbly

[1.5 HP DC GIFT](#) | 4 comments (4 topical, 0 editorial)

Re: 1.5 HP DC GIFT ([none / 0](#)) ([#1](#))  
by [doubter3](#) on Fri Jul 25th, 2003 at 07:14:49 PM MST  
([User Info](#))

Hi Zubbly,

If I am understanding your question correctly, you're wondering what the output voltage of your D.C. motor will be when it's used as a generator. If at 180 volts your motor runs at 1750 rpm, then you can assume it will generate about that same voltage when it is driven at 1750 rpm by an outside power source. I have one of the 2 HP Leeson permanent magnet treadmill motors that American Science and Surplus had (has?) for sale. I've tested it at various speeds and its voltage output is linearly related to its speed. I'm guessing most permanent magnet motors behave similarly. So your motor probably will generate around 90 volts when driven at half of 1750 rpm, or 875 rpm.

Volts/RPM = 180V/1750 RPM or RPM = Volts / 0.103  
V/RPM

So the drive speed necessary to generate 12V would be 12

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$V / 0.103 \text{ V/RPM} = 117 \text{ RPM}$

Now the problem...there's always a problem. The windings in your motors are designed for a current of 7.6 Amps regardless of whether you want it to generate 12V or 180V. So the maximum power you can get from it at 12V is  $12\text{V} * 7.6\text{A} = 91 \text{ Watts}$ . Drawing more power from those windings will be inefficient and cause overheating and possibly failure. I'm using 12V just for an example since you didn't mention your desired output voltage, and higher output voltages would obviously yield higher power output.

If you're going to be rewinding the armature anyway, you could always rewind it with fewer turns of heavier gauge wire to increase it's current handling capability, but that would also require the motor to spin at higher RPM's to achieve the same voltage output.

Good luck,  
Doubter3

Re: 1.5 HP DC GIFT ([none / 0](#)) (#2)  
by hvirtane on Sat Jul 26th, 2003 at 02:58:17 AM  
MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

I think that Doubter3's text is about correct.

Now, to rewind your machine is a big job.

Other possible solutions:

1)  
A DC to DC converter from 40 V - 180 V to 14 V  
and run the machine as it is as a battery charger for  
a 12 V battery.

These converters might be costly to build, but  
I bet somebody posting on this site knows about  
them.

2)  
Build a battery bank of 48 V made of four 12 V  
batteries  
in series and use the engine as it is as a battery  
charger  
for that battery bank.

I bet that there are ready made inverters, which can  
use  
that battery bank to get out of it 110 V AC or 220 V  
AC.

- hv

[ [Parent](#) ]

Re: 1.5 HP DC GIFT ([none / 0](#)) (#3)  
by zubby on Sat Jul 26th, 2003 at 02:20:33 PM  
MST  
([User Info](#))

hello Doubter3, your comments are exactly what i was looking for. there is a lot of extra room in the armature slots as it is. so when i rewind i will do it with a compromise of less turns and much heavier wire. i estimate with less turns and the existing extra room in the slots, that i can just about double wire size.

thanks again-----zubbly

[ [Parent](#) ]

Re: 1.5 HP DC GIFT ([none / 0](#)) ([#4](#))  
by zubbly on Sat Jul 26th, 2003 at 02:33:10 PM MST  
([User Info](#))

hello hv, your ideas are also very good, but i wish to keep the expense down as much as possible. i commented back to doubter3, but forgot to mention that i may convert the dc motor to 3 phase. if i am going to rewind anyway, i can make a set of slip rings, and get much more output from the unit.

thanks again----zubbly

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### [machining of neo's](#)

By [zubbly](#), Section [Homebrewed Electricity](#)  
Posted on Sun Jul 20th, 2003 at 08:50:18 PM MST [Magnetism](#)  
**machining of neo's**

here i go again about neo magnets, another question.

once neo's have been glued to rotor and encapsulated with resin or epoxy, can the face of neo's be machined with carbide bit in order to get a rounder surface in order to make a smaller air gap between rotor and stator laminations? i would also coat face of rotor after as to prevent neo's from rusting.

thanks again-----zubbly

[machining of neo's](#) | 3 comments (3 topical, 0 editorial)

Re: machining of neo's ([none / 0](#)) (#1)  
by JB on Mon Jul 21st, 2003 at 09:26:21 AM MST  
([User Info](#))

Ive done it just taking a thousands or 2 at a time and a real slow feed rate about 500 rpm JB

Re: machining of neo's ([none / 0](#)) (#2)  
by zubbly on Mon Jul 21st, 2003 at 05:09:06 PM MST  
([User Info](#))

thanks JB, this is what i needed to know.

zubbly

[ [Parent](#) ]

Re: machining of neo's ([none / 0](#)) (#3)  
by JB on Tue Jul 22nd, 2003 at 01:11:59 PM MST  
([User Info](#))

ya i did it. I took about .040 off of one . i had it epoxied real goog between the magnets it still puts out little red sparks at taking a couple thousands at a time cover your lathe ways and a lot of stuff around the lathe becomes magnetic and off course your tools like to jump up on the magnets but it went away. They say be careful of the fumes also. JB

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## [converting 25 hp motor to alternator----need your thoughts](#)

By [zubby](#), Section [Homebrewed Electricity](#) [Alternators](#)

Posted on Sat Jul 19th, 2003 at 11:04:41 PM MST

### [converting 25 hp motor to alternator--your thoughts](#)

hello everyone, i am going to attempt converting a 25 hp motor to alternator. i intend to use it as 3 phase to power heating bank in forced air heating system. here is what it currently is. 25 hp, 1800 rpm ( 4 pole ), 575 volt, TEFC ( totally enclosed, fan cooled ). i will be stripping the old winding out and rewinding. there are 48 stator slots. i wish to have 230 volt 3 phase output, as this is the voltage requirement of the heating coils. usually, each bank of elements is 5 KW, 3 phase.

new winding will have 24 coils, 8 coils per phase- ( i will test voltage of one coil after rotor is complete )

the span of coils will be 1-4. the spacing of magnets on rotor will be equal to the centre to centre distance of coil sides. the width of magnets will be equal to the width of three stator teeth between coil.

with this coil spacing and stator teeth measurments, it works out to 12 magnets spaced 30 degrees apart. i will be using 12 rows of magnets on the rotor, round, approx. 3/4" inch diam. by 1/2 or 3/4 long. there will be 7 magnets per row as the stator length is 7 inches.

if anyone sees a problem with the coil/magnet combination, please give me your remarks.

now this is a lot of weight on the rotor with all those magnets, and i think i know a good way to hold them on. i will turn down the face of the rotor to accomodate the thickness of magnets. next i will construct a thick walled tube made of fibre glass. the tube will be bored to fit the rotor snugly and i will use industrial retaining compound to hold tube on rotor. then turn outer face of tube to the original diam. of rotor. before installing the tube on rotor, i will drill 12 rows of holes, spaced 30 degrees apart, parrallel with the length of tube for the magnets to be glued into. now install the tube on rotor, glue in magnets, and hope it stays together. by the way, the industrial retaining compound i refered to is made by LOCKTITE, or commonly refered to as thread locker.

does anyone know if i could make the tube out of aluminum or brass. would these materials short out the field of magnets?

before doing all this, i may make a similar unit out of a 2 or 3 horse power first to see how well it works.

if anyone has any idea of how big a prop i am going to need, let me know. keep in mind that this is going to be a low rpm alternator.

any comments will be very appreciated!!!! let them fly

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thanking everyone in advance-----zubbly

[converting 25 hp motor to alternator----need your thoughts](#) | 6

comments (6 topical, 0 editorial)

thoughts ([none / 0](#)) ([#1](#))

by wdyasq on Sun Jul 20th, 2003 at 04:03:01 AM MST  
([User Info](#))

Zubbly,

If I were doing this I would have the tendency to turn the rotor to proper dimension and glue the magnets in place. I would then wind the core with Kevlar thread and coat with epoxy. All of the Kevlar fibers would be oriented in the proper direction for maximum strength against the centrifugal force and the coating would be very thin.

The tube you are speaking of might be handy for gluing/bonding the magnets in place. All of the "spaces" might be filled with epoxy -- "Cast in place".

All in all, an ambitious project. I'm not sure I would build a "single purpose" turbine where if any part of the project failed, it was all for naught. Heat pumps are a lot more efficient than resistance heating. For the same amount of power, even a "homebuilt" heat pump might produce four or six times the "heat" as resistance heating.

Using this "pie in the sky" reasoning, DC motors driving heat pumps would require a wind turbine with a rotor 1/2 the diameter with 1/4 the loads on bearings, tower and related pieces. This relates to an easier to manage lifting and project. The "Quarter Scale" (but still a damn good sized project) would give you the experience to tackle a project of a size usually associated with government. And if one took money from the populace as the government does, they would end up in a state sponsored hotel with bars across the windows.

Ron

Re: thoughts ([none / 0](#)) ([#2](#))

by zubbly on Sun Jul 20th, 2003 at 06:09:05 AM MST  
([User Info](#))

hello Ron, thanks for your suggestions on the rotor. this is exactly what i am looking for, and i will incorporate all good ideas into project. the reason i am going this route is that i just about have an endless supply of these motors available to me. this 25 hp motor weights approx. 350 pounds with heavy cast iron frame and massive bearings. my heating system now is forced oil heating, and all i have to do is insert heating bank in air return just before blower. when there is wind, i will have additional heat. last year i spent over \$3000 on heating oil. my penalty for living in Canada. i loved your comment about " hotel with iron bars ", and at work we have a big sign that reads " PLEASE DON'T STEAL!, OUR GOVERNMENT HATE'S COMPETITION ".

i am still hoping to receive comments from others in

regards to the coil/magnet combination, projected kw output, and size of and style of prop.

thanks again-----zubbly

[ [Parent](#) ]

Re: thoughts ([none / 0](#)) (#3)  
by Smithson on Sun Jul 20th, 2003 at 08:52:36 AM  
MST  
([User Info](#))

Would 16 magnet poles work out better if you are winding one to four? How are you winding it? If coil one ends in slot four are you starting coil two in the same slot [Four]?

One thing you could do is use the wave winding to save wire. And if you have not bought the magnets yet then rectangle magnets would be more efficient. My thoughts only.

[ [Parent](#) ]

Re: thoughts ([none / 0](#)) (#4)  
by zubbly on Sun Jul 20th, 2003 at 03:39:30  
PM MST  
([User Info](#))

hello, and thank you for your input.  
the stator consists of 48 stator slots. i am still working on many methods of winding the stator. so far, i have come up with using 24 coils, and each coil fills two slots. span will be 1-4, #1 coil will sit in slots 1&4, #2 coil will sit in slots 3&6, #3 coil will sit in slots 5&8, #4 coil will sit in slots 7&10 and so on. basically you just keep missing a slot from the previous coil. all slots will be filled. you are correct about using square magnets, they would work better, but i think it would be easier to drill round holes in the tube that i mentioned rather than trying to cut square holes. i worked out the number of magnet poles based on what i have read on other postings. i remember that ideal magnet spacing was the centre distance of coil sides, and that magnet width was ideally the width of stator teeth between coil sides, and it worked out to exactly 12 magnets. ( please, if i am wrong here, someone jump in ). i will work out all possible ways first and then decide. also, it will be much less expensive for 12 rows of neo's rather than 16. one thing i forgot to mention in the original posting is that i am going to remove the laminations and skew by one slot so as to help or eliminate possible cogging  
you also mentioned about wave winding. one thing i learned over the years is that depending where you live or how you were taught, often we will say the same thing but with a different word. wave winding, basket winding, lap winding, concentric winding, pam winding, consequent pole, series pole, adjacent pole,

skip pole.

i guess you understand me now. also some will say a span of 1-4, some mean that the coil will sit in slots 1&4, and some mean that there is 4 teeth between coil sides.

would you please explain your wave wound?

often wave wound refers to armature windings meaning that the start and end of coil sit many commutator bars from each other, and series wound means that the coil ends sit next to one another in the commutator. SORRY FOR ALL THE RAMBLING!

thanks again-----zubbly

[ [Parent](#) ]

Re: thoughts ([none / 0](#)) ([#5](#))  
by zubbly on Sun Jul 20th, 2003 at  
08:12:25 PM MST  
([User Info](#))

hi Smithson, you were right about using 16 magnets instead of twelve. i drew all the coils including 12 magnets on graph paper and found that coils did not have an equal amount of magnet coming and leaving coils.

after drawing all coils and 16 magnets on graph paper, it worked out perfectly, with even magnet covering all coils.

thank you again----zubbly

p.s. still need more input from you fellows.

[ [Parent](#) ]

Re: thoughts ([none / 0](#)) ([#6](#))  
by Smithson on Mon Jul 21st,  
2003 at 08:15:37 PM MST  
([User Info](#))

Hello

I can't find the info on wave winding. It was from a dead address on the internet. Basically you would run your wire down one slot then without completing a full coil circle run the wire up the fourth slot [or whatever] and then down slot 7 and so forth in a serpentine arrangement. It saves a lot of wire and is easier to wind. That would be phase one, then you would wire phase two same way. The magnet width would need to fit in the legs of coil.

I have never done it and the only wiring I have read about is the concentrated winding type.



If your stator stack is 7 inches you might want to cut that in half. I read somewhere that the longer the stack the hotter it will run. Maybe thats why they make alternators with a thin stack. Also I'm winding a 5 horse motor, [concentrated winding] 3 inch stack, 48 slots using 8 of the big block ceramic magnets. 3x1x2 Smithson

[ [Parent](#) ]

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[savonius turbine that looks like cork screw](#)

By [zubbly](#), Section [Homebrewed Electricity](#)

Posted on Tue Jul 15th, 2003 at 06:02:00 PM MST

[Alternators](#)

wind side turbine

hello everyone, just wondering if anyone has tried building a modified savonius turbine. does anyone know where on the web i can find more info other than what WIND SIDE has one their site? would like to no more about how to design, match to expected load, design details, and how fast does this type of turbine rotate.

hope to here from someone.

thanks in advance-----zubbly

[savonius turbine that looks like cork screw](#) | 3 comments (3 topical, 0 editorial)

Re: savonius turbine that looks like cork screw ([none / 0](#)) (#1)  
by [dizzy](#) on Tue Jul 15th, 2003 at 08:42:34 PM MST  
([User Info](#))

I just found this board this week and have been thinking about building a small savonius this summer. Likewise I just found the Windside site from a post(thanks someone). There is also a company in Austraila called Satec that says they are developing a comercial Savonius but their web site also speaks of trying for two years unfruitfully. So of course I had to build a scale model 12" tall out of mat board this weekend on the helix version. Their design helix is at 68 degrees (per descifering their spec pages)and the concept should greatly reduce vibration from individual blades at 90 degrees. We may take a stab at mounting one on the roof. As many have said the speed will be at a maximum equal to the wide speed. I will be inquiring to Windspeed about vibration since they even show them on a roof. Hopefully someone speaks English there. But you have to figure their stiffest design it rated for 135 mph(90mps) and with winters in Finland they also must have proved reliable to be around for so many years.

The helix construction on the scale model was difficult to wrap. The first one so far did not have deep enough vanes even though it did spin OK given just a dowel for a bearing. The full scale one(4' high in our case since code has us restricked to 35'high and the house is 31' now) I'm thinking about starting by constructing a full foam core which will act like a mold for fiberglass. The core would be one half so it would be used twice to get the match between the side. I'm wondering after a static balance if it could be fixture mounted and balanced at speed on a computer tire balancer?

Seeing all these folks here making their own generators is my next research project to fully understand. Since this will be a slow RPM does anyone have any suggestions on what type of pole etc configuration may work best? I may try some sort of planetary gear arrangment to speed up the actual generator speed.

Thanks  
dave

Re: savonius turbine that looks like cork screw ([none / 0](#)) (#2)  
by [witapple](#) on Tue Jul 15th, 2003 at 11:45:44 PM MST  
([User Info](#))

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Dizzy, dont use gears to speed up the generator, that is a big power waster. If you scan this board and also sites like scorigwind.com you can see some very good slow speed designs that will be much better than gears. As far as my thinking goes now the only reason to ever gear the speed up on a windgenerator is so you can use off the shelf components that are not really well suited for wind power. Slow is good and power can be generated if you build insted of trying to use something that needs speed.  
Dan W

[ [Parent](#) ]

Re: savonius turbine that looks like cork screw ([none / 0](#)) (#3)  
by hvirtane on Wed Jul 16th, 2003 at 03:07:19 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

Hi,

there is quite a lot information available concerning 'Savonius' type wind rotors on 'the old board' of the otherpower.com.

There has been some discussion on this new board as well.

Please see:

[http://www.otherpower.com/cgi-bin/webbbs/webbbs\\_config.pl?read=12283](http://www.otherpower.com/cgi-bin/webbbs/webbbs_config.pl?read=12283)  
[http://www.otherpower.com/cgi-bin/webbbs/webbbs\\_config.pl?read=14202](http://www.otherpower.com/cgi-bin/webbbs/webbbs_config.pl?read=14202)  
[http://www.otherpower.com/cgi-bin/webbbs/webbbs\\_config.pl?read=15075](http://www.otherpower.com/cgi-bin/webbbs/webbbs_config.pl?read=15075)  
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[http://www.otherpower.com/cgi-bin/webbbs/webbbs\\_config.pl?read=11653](http://www.otherpower.com/cgi-bin/webbbs/webbbs_config.pl?read=11653)  
<http://www.fieldlines.com/story/2003/4/3/95557/80233>

Concerning the types like 'windside'.

I have seen one self-made here quite near.  
The guy has made his turbine vanes of metal sheets.  
It is about 1,5 m tall, 70 cm wide.  
The generator is made of a washing machine PM motor. The gearing is 1:3.  
Seems to be working quite well.  
I have no details of the performance, but that project shows that the construction is not very difficult.

I think that it is best to make a direct drive alternator, something similar as the 'otherpower Volvo' alternator. If you will use enough wire in coils you can make it to charge batteries on really slow windspeeds.

You can estimate RPM of your rotor quite easily by using the estimate that the tip of the vane doesn't exceed the windspeed.

- Hannu

[savonius turbine that looks like cork screw](#) | 3 comments (3 topical, 0 editorial)

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### [need help-multiple magnets](#)

By [zubbly](#), Section [Homebrewed Electricity](#)  
Posted on Thu Jul 10th, 2003 at 06:06:06 PM MST [Magnetism](#)  
using multiple magnets in place of one

hi guys, i submitted a long thought with many questions about magnets. i guess it was too long and didn't make it to the board.  
question???? can you use multiple magnets stacked and layed end to end to take the place of larger magnets? can you use progressively smaller magnets end to end to form a tapered magnet?

thanks again in advance. zubbly

[need help-multiple magnets](#) | 4 comments (4 topical, 0 editorial)

Re: need help-multiple magnets ([none / 0](#)) ([#1](#))  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Thu Jul 10th, 2003 at 06:43:29 PM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

I dont know if it was you or not , but somebody named 'zork' asked that same question and got a lotta comments.

You can find that message thread here . . .  
<http://www.fieldlines.com/story/2003/5/21/214954/852>

} = - W o o f - = {

Re: need help-multiple magnets ([none / 0](#)) ([#2](#))  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Thu Jul 10th, 2003 at 11:29:24 PM MST  
([User Info](#)) <http://www.internetfred.com>

If you mean side by side, yes. Not up down? i think thats what your trying to say?  
I would say no problem.

Re: need help-multiple magnets ([none / 0](#)) ([#3](#))  
by troy on Fri Jul 11th, 2003 at 08:27:14 AM MST  
([User Info](#))

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Stacking a second magnet of the same size and strength will give you more magnetic flux, but not double, more like 30-40% increase. Stacking a third magnet also helps, but even less. Side by side will work ok, but not as good as a solid neo of the perfect size/shape.

Best regards,

troy

Re: need help-multiple magnets ([none / 0](#)) ([#4](#))  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Sun Jul 13th,  
2003 at 09:43:04 PM MST  
([User Info](#)) <http://www.internetfred.com>

I agree with Troy, you can stack them on top each other, but there is a limit to the power achieved and as troy mentioned, the correct orientation/configuration and size greatly matter.

[need help-multiple magnets](#) | 4 comments (4 topical, 0 editorial)

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[can neo's be bent?](#)

By [zubbly](#), Section [Magnets & Magnetism](#)  
Posted on Thu Jul 10th, 2003 at 05:58:11 PM MST [Magnetism](#)  
can neo's be bent?

hi guys, i think i know the answer even before asking. can neo's be bent slightly to form an arch, by appling heat and pressure at the same time without compromising the magnets strength?

thanks again in advance. zubbly

[can neo's be bent?](#) | 6 comments (6 topical, 0 editorial)

Re: can neo's be bent? ([none / 0](#)) (#1)  
by [RobD](#) on Thu Jul 10th, 2003 at 07:26:52 PM MST  
([User Info](#))

No. Think of them as similar to cast iron. RobD

Re: can neo's be bent? ([none / 0](#)) (#2)  
by [wooferhound](#) ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Thu Jul 10th, 2003 at 08:58:09 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

They bend about as god as a Cracker will bend  
but the peices of the magnet fly around faster  
after they Breakk k k k k k k k k  
k  
T i m

Re: can neo's be bent? ([none / 0](#)) (#3)  
by [Traqr](#) on Fri Jul 11th, 2003 at 01:24:21 AM MST  
([User Info](#))

Isn't neodymium a ceramic?

[ [Parent](#) ]

Re: can neo's be bent? ([none / 0](#)) (#4)  
by [Andrew](#) ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Fri Jul 11th, 2003 at 04:48:08 AM MST  
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neodymium is neodymium

A neodymium magnet is called that because of what it is made out of.

I believe the actual magnet material is neodymium Iron boron or chemically, NeFeB

If you hear about people saying samarium cobalt (sp?), ceramic, etc. that is the material that the magnet is actually made out of. (Never end a sentence with a preposition!)

I think most magnets are plated in something nonmagnetic anyways as to not affect the magnetic material inside (neos have mostly nickel plating, I seen a couple gold, and once in a while, zinc)

-Andrew

[ [Parent](#) ]

Re: can neo's be bent? ([none / 0](#)) (#5)  
by troy on Fri Jul 11th, 2003 at 08:21:35 AM MST  
([User Info](#))

Dear Zubbly,

Neos are made from sintered metallic powder. Sintered means they start with small metal particles and crush them together until they bond. It's not a strong bond though. So if by bend, you mean break...

Best regards,

troy

Re: can neo's be bent? ([none / 0](#)) (#6)  
by troy on Fri Jul 11th, 2003 at 08:23:33 AM MST  
([User Info](#))

Oh Yeah,

And I forgot to mention that the Curie temperature (at which they start to lose their magnetism) is surprisingly low, a few hundred degrees.

troy

[can neo's be bent?](#) | 6 comments (6 topical, 0 editorial)

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## [is bigger better?](#)

By [zubbly](#), Section [Homebrewed Electricity](#)

Posted on Sun Jul 6th, 2003 at 07:56:58 PM MST

[Alternators](#)

is bigger better?

hi guys, i would really appreciate your comments before i take the actual plunge of building a large genny. please give your comments on prop size and style, tower construction, and approx. output of what i would like to build. where i work, my colleagues had just scrapped a 25 hp, 1800 rpm, 3phase, because the client was in a rush and bought a new one. here was the perfect frame and core that i was looking for. it has 48 slots that would allow me to make a 16 pole genny-3phase, with a perfect one inch span of 3 stator teeth that will allow me to use one inch wide neo's by 5 inch long. the span of coils would be 1-4, coil turns i have not determined yet as i would be doing a little trial and error. the rotor would be machined to accept 16 neo's by 1 inch wide by 5 inch long. i would have skewed the neo's by one slot as to help prevent cogging ( please confirm your thoughts here ). there are good buys out there on 1"x1/2"x1/8 thick. can i put these end to end to make up my 5" length and can i stack them on top of each other to increase their thickness? also how thick would you suggest that i stack them. after the rotor has been machined, magnets stacked, magnets epoxy encapsulated, and the rotor wrapped with resin glass tape and heat cured, i think i shall have a reliable unit. bad news though, after going to retrieve my unit at the shop, i found that the scrap dealer had already picked it up. oh well, won't be long before there is another unit. my intention is not to use it this year to charge batteries, but to supply a 3 phase heating bank that i will be installing in my oil furnace.i hope to be able to design winding for close to 230 volt 3phase low rpm. heating last winter cost me approx. 3,500 dollars for heating oil. any and all comments would be greatly appreciated. thanks to all in advance. zubbly

[is bigger better?](#) | 1 comment (1 topical, 0 editorial)

Re: is bigger better? ([none](#) / [0](#)) ([#1](#))  
by [windstuffnow](#) ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon Jul 7th, 2003 at 08:09:49 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Stacking them does work but it makes it difficult to place them in position or more so holding them in place while the glue dries. A jig would be handy for this. Doubling the width increases the flux but not by 2.

Fun Stuff

Ed

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### [where to purchase NEO magnets](#)

By [zubby](#), Section [Magnets & Magnetism](#)  
Posted on Wed Jun 11th, 2003 at 01:31:10 PM MST [Alternators](#)  
need NEO magnets

' HELP " anyone. does anyone know a good source for NEO magnets in Canada?

[where to purchase NEO magnets](#) | 3 comments (3 topical, 0 editorial)

Re: where to purchase NEO magnets ([none / 0](#)) (#1)  
by [xeroid](#) ([centurion27@lycos.com](mailto:centurion27@lycos.com)) on Wed Jun 11th, 2003 at 01:55:59 PM MST  
([User Info](#))

I just order mine from Otherpower.com - under the products page.  
Even with the shipping, they are still cheaper than anything I've seen in Canada.  
Regards,  
Xeroid.

Re: where to purchase NEO magnets ([none / 0](#)) (#2)  
by [Seth](#) on Wed Jun 11th, 2003 at 06:14:43 PM MST  
([User Info](#))

this guy used to have quite a bunch....  
<http://www.andale.com/gallery?cid=8327744&mid=1> but not any more right now.... wonder why...

Re: where to purchase NEO magnets ([none / 0](#)) (#3)  
by [Anonymous Hero](#) on Sun Jun 15th, 2003 at 07:19:59 AM MST

I just bought 5, 1 inch neo's from Lee Valley tools for \$12.95 can. for the package.I bought them to experiment.The stores are pretty well in every province except for Quebec.I will probably buy from Otherpower for the main project as Lee Valley's is limited in sizes. dondos

[where to purchase NEO magnets](#) | 3 comments (3 topical, 0 editorial)

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### User info for windstuffnow

Homepage: <http://www.windstuffnow.com/main>

Email: [elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)

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- [ADMIN](#)
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- Anonymous Users: 14

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[New Year...](#) | 5 comments (5 topical, editorial)

Re: New Year... ([none / 0](#)) ([#3](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Wed Dec 31st, 2003 at 03:40:08 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Happy New Year to all, and may all your projects be successful!

Windstuff Ed

[New Year...](#) | 5 comments (5 topical, 0 editorial)

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- Anonymous Users: 23
- Cloaked Users (2)

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#### Who's Online? (15)

- [Putte](#)
- [wind pirate](#)
- [Harry Luubovv](#)
- [troy](#)
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[Ed, am I close ? \(blade design\)](#) | 7 comments (7 topical, editorial)

Re: Ed, am I close ? (blade design) ([none / 0](#)) ([#4](#))  
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There is good and bad to both designs. If your looking at a 10mph average the fancy prop may not reach its full potential until the wind picks up. Something like the old Aermotor mills are all torque, They seem to spin even when you can't feel the wind. The problem with those is the top speed of the rotor in a 35mph wind is 105 rpm. (Thats on an 8ft dia unit). So on the drag type 3 blade your only looking at a TSR of 1 or slightly higher depending on the angle and blade design. You'll definately need a re-drive to get the rpms you want at the alternator. All in all your dropping efficiency. The fancy prop, direct drive is still the most efficient way at this point.

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Ed

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Re: Ed, am I close ? (blade design) ([none / 0](#)) ([#5](#))  
by Dave B on Tue Dec 30th, 2003 at 10:23:07 PM MST  
([User Info](#))  
<http://www.madbbs.com/users/bruggelog>

I think I'll attempt to carve as close to the blade design as possible for a 12' rotor maybe tsr-7. I realize how important the "root" and drop is for the torque of this design. Most on this board for both ease of construction with materials available (2X) and their application (charging batteries) have not gone full blown on this part of the blade and not been sorry. I think I would be as I need all the torque I can get and the speed when possible. I know it ain't going to be cheap gluing these up with select lumber but I've gone this far so no skimping on the heart of this thing, especially 12' possibly spinning at 400 + RPM at times seems kinda scary. Any suggestions on glue and lumber and any links that could help me out ? I've been out in the garage all evening cutting & drilling tower sections, a heavy 3 sided I hope to

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Re: Ed, am I close ? (blade design) ([none / 0](#)) (#6)  
by JB on Wed Dec 31st, 2003 at 09:25:49 AM MST  
([User Info](#))

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[Ed, am I close ? \(blade design\)](#) | 7 comments (7 topical, 0 editorial)



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Plugging in some numbers in the blade designer, it looks like you'd need to drive the alternator at a 2 to 1 ratio to achieve the output your looking for at 25 mph. Thats more of a calculated guess.

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Have Fun  
 Ed

Re: Ed, am I close ? (blade design) ([none / 0](#)) ([#3](#))  
 by Dave B on Tue Dec 30th, 2003 at 12:17:25 PM MST  
 ([User Info](#)) <http://www.madbbs.com/users/bruggelog>

Ed & Rich

Thank you for your information and suggestions on my application. I know I can't get blood out of a rock but it looks as though I could at least pre-heat or pre-warm some water anyway with hours of wind averaging 10 mph or better and a very well insulated maybe smaller tank (20 gal ?) I need to focus on getting all this together with some guessing and your help and get it flying. I'll learn more about my next one than if I keep trying to improve what I have without flying solo yet. The numbers dont lie, I can speed things up, double up the magnets (again), squeeze down the airgap, rewind a more wire efficient stator, go with 3 phase, go bigger, bigger , bigger STOP ! It's a love/hate, I'm going to the garage to work on my tower. Just one more question, do you think more of a drag type (fixed pitch) 3 blade set for lower rpm but more torque would be a better option

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than carving the twisted profile the blade program shows ? I'm done. Thanks again,, Dave B.

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[QUESTION ON MAGNETS](#) | 3 comments (3 topical, editorial)

Re: QUESTION ON MAGNETS ([none / 0](#)) ([#3](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon Dec 29th, 2003 at 07:23:10 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Kell is right, you won't find a magnet, electric or permanent that will have a force that you describe. If your looking for a magnet that has a large field, your looking for a ceramic magnet. I have some ring magnets that will affect a TV from 4 ft away. They are 8 inches in diameter with a 4 inch hole and are 3/4" thick. They aren't real strong in the sense a neo is but the field size is impressive.

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Ed

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[QUESTION ON MAGNETS](#) | 3 comments (3 topical, 0 editorial)

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[Would this cheap material work for laminates?](#) | 5 comments (5 topical, 0 editorial)

Re: [Would this cheap material work for laminates?](#) ([none / 0](#)) (#4)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon Dec 29th, 2003 at 05:28:05 PM MST  
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Thats actually a unique idea! I tried to find out what type of steel they use in make them but didn't find anything. I would imagine its low carbon and then tin coated. Low carbon materials are easy to work with and much cheaper. My guess is it would be a good material for laminants although it would take alot of cans to make up a stator. The rings that add strength to the can may create a problem getting them tight together. If you have a slip roll you can flatten them out quite easy or a small hammer. Could be an interesting project none the less.

Have Fun  
Ed

[Would this cheap material work for laminates?](#) | 5 comments (5 topical, 0 editorial)

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[Tower wrecking](#) | 11 comments (11 topical, editorial)

Re: Tower wrecking ([none / 0](#)) ([#6](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon Dec 29th, 2003 at 11:20:43 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Old F

It sure seem a shame to wreck such a nice looking tower!!! Seems like you can calculate the compression loads on 2 of those tubes and come up with a suitable number for wind loading. If you know the strength of the steel your using it shouldn't be to hard to calculate this out.

Looks like your having fun! Nice Tower.

Ed

[ [Parent](#) ]

Re: Tower wrecking ([none / 0](#)) ([#7](#))  
by Old F on Mon Dec 29th, 2003 at 01:09:05 PM MST  
([User Info](#)) <http://www.oldf.homestead.com>

Ed

The tubes are emt conduit 3/4 inch.  
The stuffs cheap all I would be out is a little time. Whats neat is the weight fo a 10 foot section of tower comes in at only 41 pounds

Old F

[ [Parent](#) ]

Re: Tower wrecking ([none / 0](#)) ([#8](#))  
by Old F on Mon Dec 29th, 2003 at 01:29:34 PM MST  
([User Info](#)) <http://www.oldf.homestead.com>

Ed

One more thing If you like check out the diary I started called More tower Fun

I have some pics of the press an angle gage I used to flatten the conduit.

There easier to build than they look.

Old F

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[Question for blade experts.](#) | 7 comments (7 topical, editorial)

Re: Question for blade experts. ([none / 0](#)) ([#5](#))  
 by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon Dec 29th, 2003 at 11:11:13 AM MST  
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Dave,

You can usually guesstimate reasonably well if you have a tested output on your machine. I usually make a chart for the rpm range and calculated output for the alternator.

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Once you know your approx alternator output at a given rpm then it makes it much easier to match a blade with that performance.

As an example say your test showed your alternator was making 12 volts at 100 rpm. The resistance of the stator was say 1 ohm to make it simple, and the charging voltage was 12 volts

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You can chart this at any rpm, I use a spread sheet to make it simple

RPM	Open volts	Amps	Watts
200.	24	12	144
300.	36	24	288
400.	48	36	432

And so on...

Then you can easily go on to matching a prop to perform in the range of your wind from there.

Have Fun...

I have a new shipment of silicon comming in soon, I was going to pick it up but its a 5 hour drive and I didn't have the time to spend on the road. Its going to be trucked in instead. I'll have about 500 lbs of silicon available shortly and some sample rolls which I'll list in a few days...

Ed

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[Question for blade experts.](#) | 7 comments (7 topical, 0 editorial)

Re: Question for blade experts. ([none / 0](#)) (#3)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon Dec 29th, 2003 at 09:09:45 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Dave,

It's difficult to match the full torque range because of the cubed power coming through the blade at different wind speeds. It would probably be best to match the average winds in your area. For instance we have a relatively low average 6-12mph I typically set them up to perform best in that range. We quite often have higher winds in the range of 12 - 20 mph so anything extra is a bonus although they tend to drop efficiency as wind increases.

The blade designer program will work with all efficiencies, simply change the efficiency number in the efficiency box. I use an overall efficiency based on the alternator and expected blade efficiency so if your expecting say a 40% blade and a 70% alternator then the number to plug in would be (.4 x .7 = .28) 28% overall.

Have Fun  
Ed

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[Question for blade experts.](#) | 7 comments (7 topical, 0 editorial)

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[Question for blade experts.](#) | 7 comments (7 topical, editorial)

Re: Question for blade experts. ([none / 0](#)) ([#2](#))  
 by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon Dec 29th, 2003 at 08:55:36 AM MST  
 ([User Info](#)) <http://www.windstuffnow.com/main>

Hi Jerry,

The power you'll get from a given size blade pretty much remains the same regardless of angles. The angles, however, will tell you at what speed the blade will run at a given power output or wind speed. Also, each blade set runs at different efficiencies depending on the air foil. A simple formula for finding power output is...

$.00508 \times \text{blade area} \times \text{windspeed}^3 \times \text{efficiency}$

So at 25mph your 43" blade could make...

$.00508 \times 10 \times 25^3 \times .30 = 238 \text{ watts}$

That's assuming the prop is 30% efficient, it could be higher or lower.

Another thing to consider is the alternator efficiency... If your alternator is say 80% efficient attached to the 30% blades your actual output or over all efficiency would be  $.3 \times .8 = .24$  or 24% overall. So you'd end up with only 190 watts actual output not including any other losses.

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Have Fun  
 Ed

Re: Question for blade experts. ([none / 0](#)) ([#4](#))  
 by Dave B on Mon Dec 29th, 2003 at 10:42:52 AM MST  
 ([User Info](#))  
<http://www.madbbs.com/users/bruggelog>

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Thank you Ed for the great info. We have a wide range of wind here in Western NY but all charts say around 12mph annual average. Sustained winds of 20+ are very common during the winter so it's tough to guess at my design for my application. If this wasn't my first one I'd have a better feel for the specs. I have no easy way to physically measure the power or torque needed under load while I'm testing, pony brake is out. I'm going by feel and guess and just wondered if I'm better off going with more torque and sacrifice some speed, I know I can't have my cake and eat it too. This is great fun, you sold me the silicon steel a while back and I may be in the market again, I'm hooked. Dave B.

[ [Parent](#) ]

Re: Question for blade experts. ([none / 0](#))  
(#5)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com))  
on Mon Dec 29th, 2003 at 11:11:13 AM MST  
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Ed

[ [Parent](#) ]

Re: Question for blade experts. ([none / 0](#)) ([#6](#))  
by Jerry on Mon Dec 29th, 2003 at 06:41:21 PM  
MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Ed

Thanks these are the #s I was looking for. Now all I have to do is put it on a genny and wind test it in my S-10 pu. We got about a foot of snow last night so I gota wait till it melts and things warm up a bit.

JK TAS Jerry

[Airheads Page](#)

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Re: Question for blade experts. ([none / 0](#))  
([#7](#))  
by Dave B on Mon Dec 29th, 2003 at  
08:27:48 PM MST  
([User Info](#))  
<http://www.madbbs.com/users/bruggelog>

Ed,

Thanks again for all the help. I'll start crunching some numbers and post my results to further narrow in on the blade design. I sure appreciate all the trial & error out there behind your experience that has saved me much time. Believe me if I had the time I would like nothing more than to help pave the way for others through experimenting. I'll keep in mind you will have the steel also, I'm already thinking about maybe bigger and better, that's what happens when you're adicted. Thanks,  
Dave B.

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[Question for blade experts.](#) | 7 comments (7 topical, 0 editorial)



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Have Fun  
Ed

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[Question for blade experts.](#) | 7 comments (7 topical, 0 editorial)



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[GM-90 power plant owners](#) | 7 comments (7 topical, 0 editorial)

Re: GM-90 power plant owners ([none / 0](#)) ([#4](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon Dec 29th, 2003 at 07:17:32 AM MST  
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I purchased a GM90/8 a bit ago then ordered a 5kw ST Head for it. I'm using the pulley that came with the unit and a 5VX belt to drive the head. I haven't had time to make up the mounting frame as yet but have all the materials to get it together. I'm hoping some time will free up in the next couple weeks so I can finish it up. I'll post some pics when its together and functional.

Have Fun  
Ed

[GM-90 power plant owners](#) | 7 comments (7 topical, 0 editorial)

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- [Harry Luubovv](#)
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[Silicon steel](#) | 3 comments (3 topical, editorial)

Re: Silicon steel ([none / 0](#)) (#3)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Tue Dec 23rd, 2003 at 03:00:01 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

If you interested in the 1/2" silicon the formula to find weight is:

$$(OD^2 - ID^2) \times .7854 \times .134 = lbs$$

This is for the 1/2" stuff, the 3/4" will have a different conversion, I'll know when I get it here.

The cost of the stuff is \$4.00 per lb. for either

You can email me with any specifics.

I'm thinking of putting it on my site but in specific size rolls instead of winding each one specific for an application. So there will most likely be 5 or 10lb rolls as a standard.

Have Fun  
Ed

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[Silicon steel](#) | 3 comments (3 topical, 0 editorial)

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- [jeanpaul](#)
- [DanB](#)
- Anonymous Users: 20

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[Silicon steel](#) | 3 comments (3 topical, 0 editorial)

Re: Silicon steel ([none / 0](#)) (#3)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Tue Dec 23rd, 2003 at 03:00:01 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

If you interested in the 1/2" silicon the formula to find weight is:

$$(OD^2 - ID^2) \times .7854 \times .134 = lbs$$

This is for the 1/2" stuff, the 3/4" will have a different conversion, I'll know when I get it here.

The cost of the stuff is \$4.00 per lb. for either

You can email me with any specifics.

I'm thinking of putting it on my site but in specific size rolls instead of winding each one specific for an application. So there will most likely be 5 or 10lb rolls as a standard.

Have Fun  
Ed

[ [Parent](#) ]

[Silicon steel](#) | 3 comments (3 topical, 0 editorial)

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- [Hank](#)
- [jeanpaul](#)
- [DanB](#)
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[The 88 cent counter](#) | 13 comments (13 topical, editorial)

Re: The 88 cent counter ([none / 0](#)) ([#9](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon Dec 22nd, 2003 at 06:35:41 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Ok Tom, your going to have my ears smokin' if I have to count that high ;o)... I think I'll stick to Norms idea with the number device.

Have Fun!  
Ed

[ [Parent](#) ]

Re: The 88 cent counter ([none / 0](#)) ([#10](#))  
by Norm on Mon Dec 22nd, 2003 at 06:52:55 AM MST  
([User Info](#))

A little fun game between you and one of your younger relatives see how fast you can click this 'counter' in a minute ...about 360 in a minute for me...(but then 'Granpa' was always slow!) ( :> )  
Norm.

[ [Parent](#) ]

[The 88 cent counter](#) | 13 comments (13 topical, 0 editorial)

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#### Who's Online? (19)

- [hvirtane](#)
- [ADMIN](#)
- [Harry Luubovv](#)
- [troy](#)
- [DanB](#)
- Anonymous Users: 14

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[The 88 cent counter](#) | 13 comments (13 topical, 0 editorial)

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by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon Dec 22nd, 2003 at 06:35:41 AM MST  
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[ [Parent](#) ]

[The 88 cent counter](#) | 13 comments (13 topical, 0 editorial)

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#### Who's Online? (19)

- [hvirtane](#)
- [troy](#)
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- Anonymous Users: 14

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[The 88 cent counter](#) | 13 comments (13 topical, editorial)

Re: The 88 cent counter ([none / 0](#)) ([#2](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Sun Dec 21st, 2003 at 05:34:52 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Thats a slick idea Norm!!! My brain goes numb if I have to take my socks off to count past 10 so winding those 30 turn coils really messes me up.

Have Fun!

Ed

[ [Parent](#) ]

Re: The 88 cent counter ([none / 0](#)) ([#5](#))  
by TomW on Sun Dec 21st, 2003 at 05:52:27 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Ed;

actually you can get to 110 using toes.

for every 10 on fingers curl one toe when all toes are curled its 100 then you still got the 10 fingers .

Cheers.

TomW

[Stuff I have Online](#)

[Contact Me](#)

[ [Parent](#) ]

Re: The 88 cent counter ([none / 0](#)) ([#9](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon Dec 22nd, 2003 at 06:35:41 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

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- [troy](#)
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- [ADMIN](#)
- [Harry Luubovv](#)
- Anonymous Users: 14

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Have Fun!  
Ed

[ [Parent](#) ]

Re: The 88 cent counter ([none / 0](#))  
([#10](#))  
by Norm on Mon Dec 22nd, 2003 at  
06:52:55 AM MST  
([User Info](#))

A little fun game between you and one of your younger relatives see how fast you can click this 'counter' in a minute ...about 360 in a minute for me... (but then 'Granpa' was always slow!) (:>) Norm.

[ [Parent](#) ]

[The 88 cent counter](#) | 13 comments (13 topical, 0 editorial)



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[The 88 cent counter](#) | 13 comments (13 topical, editorial)

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by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Sun Dec 21st, 2003 at 05:34:52 PM MST  
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Ed

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[The 88 cent counter](#) | 13 comments (13 topical, 0 editorial)

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- [troy](#)
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[Vawt or S Rotor](#) | 3 comments (3 topical, editorial)

Re: Vawt or S Rotor ([none / 0](#)) ([#3](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Sat Dec 20th, 2003 at 12:45:31 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Hi Arno,

I'm not sure I'd do any betting at this point, VAWT's are still quite bulky and have their own set of problems.

Personally I like the way they look, I could sit and watch them for hours ( if I had the time ).

Basically what it boils down to is.. Each side has a drag coefficient (Cd) and the object is to get the upwind side as low as possible and the downwind side as high as possible.

On a typical Savinuous machine the downwind drag is close to 1 and the upwind side is around 0.20 , This shows that its about 80/20 collection. You also have to factor in the speed that the downwind vane is moving away from the wind as well as add the speed the upwind side is moving into the wind. Adding vanes to direct the flow works fairly well and ducting works extreemly well. The trick is to remove the upwind restrictions while enhancing the downwind torque. There are specific shapes that provide extream drag resistance for the downwind side and other shapes that help remove the resistance on the upwind side.

The shape that provides the highes drag is a "half tube" ( Like a pvc pipe split in half). This shape has a drag Cd of 2.3 with the C collecting the wind ( C < - wind direction).

Unfortunately when you turn it around ( wind direction -> C ) it still maintains a drag Cd of around 1. If you add a shape to the nose but still keep the shape inside you can reduce it considerably ( <C ). As JJ pointed out a few posts back, adding an air foil to the front of it. Since its not a complete airfoil the air breaks up behind it and creates a turbulance and adds drag. This would allow you get the Cd on the upwind side down to around 0.4 or possibly a little less. The half airfoil shape on the "Lenz Turbine" brings it down to around .2 or slightly higher but we're still collecting the higher Cd of 2 on the downwind side or slightly higer. By adding a difuser or ducting the upwind side only sees its own speed ( plus a little turbulance). So now, basically we're collecting almost all of the power in the wind. If the ducting allows for collection of the entire area ( area of the turbine - both sides ) this forms a venturi, the venturi will increase wind speed as it approaches the downwind blades. Now your collecting at a higher speed than the wind comming into the inlet which offsets the downwind blade moving away from the wind. An open Savinuous sees 12 mph wind and if the blades are moving 4 mph away from the wind then your only collecting from an 8 mph wind with the upwind side fighting 16 mph head wind. So you can see the benifits of the venturi and blocking the upwind side.<p>I think Savinuous had the right idea using the "barrel" or "S" type rotor but I think it would do far better by spacing them out and adding an airfoil shape to the nose of the barrels. Also by adding a simple drum in the center would help direct the air into the barrel and create a low pressure

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#### Who's Online? (19)

- [signweld](#)
- [Harry Luubovv](#)
- Anonymous Users: 16
- Cloaked Users (1)

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to the back side of the turbine which helps carry the "barrel" farther behind the machine creating a longer torque period. Also adding 3 blades or barrels enhances the overall torque. Either, by ducting or removing the built in flaws can make a big difference in performance over the Standard methods...

Fun Subject!!  
Windstuff Ed

[Vawt or S Rotor](#) | 3 comments (3 topical, 0 editorial)



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- [signweld](#)
- [Harry Luubovv](#)
- Anonymous Users: 16
- Cloaked Users (1)

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[reading material](#) | 10 comments (10 topical, editorial)

Re: reading material ([none / 0](#)) ([#3](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Sat Dec 20th, 2003 at 10:57:20 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Mine did the same thing, I have Norton Firewall. It wants to install some kind of ad spyware as well as a billion tracking cookies. Good place to stay away from...

Windstuff Ed

[ [Parent](#) ]

[reading material](#) | 10 comments (10 topical, 0 editorial)

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#### Who's Online? (31)

- [jeanpaul](#)
- [Harry Luubovv](#)
- [DanB](#)
- Anonymous Users: 27
- Cloaked Users (1)

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[reading material](#) | 10 comments (10 topical, 0 editorial)

Re: reading material ([none / 0](#)) ([#3](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Sat Dec 20th, 2003 at 10:57:20 AM MST  
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[reading material](#) | 10 comments (10 topical, 0 editorial)

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#### Who's Online? (25)

- [Hank](#)
- [jeanpaul](#)
- [DanB](#)
- Anonymous Users: 22

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[JACK PARK BOOK](#) | 2 comments (2 topical, 0 editorial)

Re: JACK PARK BOOK ([none / 0](#)) (#2)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Sat Dec 20th, 2003 at 07:08:26 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Hi JJ,

Both books are quite good. Neither of them have any specific building but the one you refer to has alot of math and covers most turbines. This includes the Darrieus, savinous, multi-blade to the modern turbines. I would recomend both if you can find them. Both are similar and each seems to have a bit of detail that the other doesn't. He also goes into some hybrids that are kind of unique.

I found them in Half.com for a reasonable price. Both have been out of print for some time now.

Have Fun  
Windstuff Ed

[JACK PARK BOOK](#) | 2 comments (2 topical, 0 editorial)

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#### Who's Online? (19)

- [signweld](#)
- [Harry Luubovv](#)
- Anonymous Users: 16
- Cloaked Users (1)

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[JACK PARK BOOK](#) | 2 comments (2 topical, editorial)

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[Laminated Copper Coils?](#) | 8 comments (8 topical, editorial)

Re: Laminated Copper Coils? ([none / 0](#)) ([#6](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Thu Dec 18th, 2003 at 08:24:47 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

I've used bar stock to make some extremely powerful alternators as well as copper sheet. It is, however, very difficult to work with and you have to do some advanced planning on winding them and setting them into place.

One I experimented with was made from copper sheet, punched out the coils and soldered together to form a "slinky" style coil. You can get almost double the turns of an equivalent size but it will take a couple days on each coil. The outcome, of mine, wasn't real rewarding for the amount of work I put into it and the idea was scrapped. I believe the limit was 30 to 1 which is to say the width of the sheet can't exceed 30 times the thickness of the metal. Ribbon wire would be much better and easier to work with. I used a thin plastic sheet for insulating between the copper and I'm sure I was getting a "capacitor" or "skin" effect from the unit.

Another idea was to use a circuit board to form the coils, simply etching the coils from a copper clad board and laying them in place. This worked well but didn't make any real power, but... I believe it could be done with a thicker copper using less turns and more magnets. Yet another attempt to solder straight wires between circuit boards to create coils. The idea here was to use thicker return lines to reduce the wasted resistance on the upper and lower portion of the coil thus reducing the over all resistance of the phase. This also worked fairly well if you have the patience. If they were made on an assembly line put together by robots would have great potential... doing it by hand, and making all the wires and parts... well it took me a month to make one set of coils for a 3 phase unit... needless to say it was never finished. The phase that was finished kicked butt! Laying bar stock in slots and wiring them together using heavy wire also makes an extremely powerful "welder" or an alternator that will power a small town. Sky's the limit! Your only limited to your imagination!

Have Fun  
windstuff Ed

[ [Parent](#) ]

Re: Laminated Copper Coils? ([none / 0](#)) ([#7](#))  
by cevonk ([cevonk\(at\)signhere\)aol.com](mailto:cevonk(at)signhere)aol.com)) on Thu Dec 18th, 2003 at 11:33:37 AM MST  
([User Info](#))

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- [Harry Luubovv](#)
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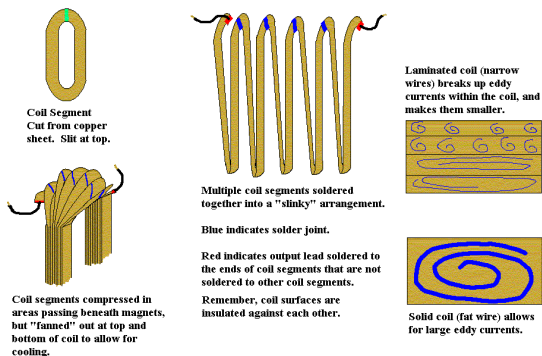
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That is the general idea that I had in mind. Here is a (hopefully small) picture of what I had in mind. I'm guessing (literally) that the eddy currents would be as bad with laminations as they would be with solid stock. I think that the same situation would exist with regard to eddy currents as exists with laminated stators, or thinner versus thicker wires. The thinness of the laminations would hopefully reduce the problem of "skin" conduction as it exists in very thick conductors (which sounds like a different kind of "skin" conduction than the capacitance induction that you mention in using the film as an insulator between the coil layers in your experiment.

The thought is that the coil segments could be struck from copper sheet on some kind of die, or that they could be cut in a stack on a scroll saw. Having been shaped, they could be coated with a thin film of insulation (polyester resin?) Then they could be soldered together at the top. An adhesive would be placed between the insulated layers where the magnet passes over them, and they would be compressed until the adhesive cured. The end sections of the coil would not be glued to each other so that they could be bent into the fan shape at the top of the coil to provide surface area for cooling the coil.



[ [Parent](#) ]

[Laminated Copper Coils?](#) | 8 comments (8 topical, 0 editorial)



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[Laminated Copper Coils?](#) | 8 comments (8 topical, editorial)

Re: Laminated Copper Coils? ([none / 0](#)) ([#6](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Thu Dec 18th, 2003 at 08:24:47 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

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Have Fun  
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[Laminated Copper Coils?](#) | 8 comments (8 topical, 0 editorial)

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["Perpetual Motion" Experiment.....](#) | 6 comments (6 topical, editorial)

Re: "Perpetual Motion" Experiment..... (none / 0) (#6)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Thu Dec 18th, 2003 at 07:53:26 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Andy,  
Those are driven by a small kicker circuit and are quite simple. The basic circuit was used in the "adams" and "bedini" motors. Another site that has a very simple circuit for doing just what you described is here....

<http://home.earthlink.net/~lenyr/magkick.htm>

That should get you going...

Have fun  
Windstuff Ed

[ [Parent](#) ]

["Perpetual Motion" Experiment.....](#) | 6 comments (6 topical, 0 editorial)

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["Perpetual Motion" Experiment.....](#) | 6 comments (6 topical, 0 editorial)

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by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Thu Dec 18th, 2003 at 07:53:26 AM MST  
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["Perpetual Motion" Experiment.....](#) | 6 comments (6 topical, 0 editorial)

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[IDEA FOR LENZ TURBINE](#) | 1 comment (1 topical, 0 editorial)

Re: IDEA FOR LENZ TURBINE ([none / 0](#)) ([#1](#))  
 by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Wed Dec 17th, 2003 at 07:03:03 AM MST  
 ([User Info](#)) <http://www.windstuffnow.com/main>

JJ, that would work. If you keep the half tube in place on the inside and use a partial airfoil on the leading edge you'll still benefit in the lift and collect high drag on the downwind side. Keep in mind on the upwind side we want to basically offset the drag with lift to overcome the losses and possibly add some power to the machine. Once the machine reaches a TSR of 1 or higher you no longer making power from drag. (actually occurs at just below 1)  
 A drag machine produces it's best power at around a TSR of .33, anything above and up to a TSR of 1 the power starts to fall off drastically.

Fun Stuff  
 Ed

[IDEA FOR LENZ TURBINE](#) | 1 comment (1 topical, 0 editorial)

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[IDEA FOR LENZ TURBINE](#) | 1 comment (1 topical, editorial)

Re: IDEA FOR LENZ TURBINE ([none / 0](#)) ([#1](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Wed Dec 17th, 2003 at 07:03:03 AM MST  
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Fun Stuff  
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[IDEA FOR LENZ TURBINE](#) | 1 comment (1 topical, 0 editorial)

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[Twin Rotor Question??](#) | 5 comments (5 topical, editorial)

Re: Twin Rotor Question?? (none / 0) (#3)  
 by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Tue Dec 16th, 2003 at 06:55:20 PM MST  
 ([User Info](#)) <http://www.windstuffnow.com/main>

Hi JB,

In the past I've used an equal number of magnets to coils on the slotted stators. The drawback to this is the slots line up with the poles causing a cogging as the magnetic field changes polarity from one slot to another. If you think of the coil arrangement used in the dual rotor machines the cogging issue is solved. I've designed a progressive 3phase machine that should prove interesting... It's definately been a challenge in designing. 16 magnets over 36 slots.

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Have Fun  
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[Twin Rotor Question??](#) | 5 comments (5 topical, 0 editorial)

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[Twin Rotor Question??](#) | 5 comments (5 topical, 0 editorial)

Re: Twin Rotor Question?? (none / 0) (#3)  
 by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Tue Dec 16th, 2003 at 06:55:20 PM MST  
 (User Info) <http://www.windstuffnow.com/main>

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[Twin Rotor Question??](#) | 5 comments (5 topical, editorial)

Re: Twin Rotor Question?? (none / 0) (#1)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Tue Dec 16th, 2003 at 01:21:36 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Hi Hank,

I believe this is another "personal preference" type answer as well as skill and tools available. There are advantages and disadvantages to both. I prefer building them with laminants. I think there is more bang for the buck, but... there is alot more work involved in slotting the laminants and its not something that's easily accomplished without the right tools. The dual rotor system compensates for the missing laminant by using the magnets to concentrate the field through the coils but is fairly expensive depending on the magnets you choose.

Cogging is only a problem when the magnets are lined up with the slots on the laminants this is easily overcome.

Cogging, due to current following through the coils is still a consideration in either system. Single phase systems tend to hum or vibrate, the 3phase systems still have the hum but its far less distinctive. So its basically back to the personal preference, skill and tools again... decisions... decisions....

Have Fun  
Windstuff Ed

Re: Twin Rotor Question?? (none / 0) (#2)  
by JB on Tue Dec 16th, 2003 at 05:43:37 PM MST  
([User Info](#))

Hey Ya Ed. Can you get into a little more detail how the cogging issue is easily overcome on the single rotor with laminates. Is it the laminates on the backside like the one that Dan did here the magnets actually the laminates on the backside. Thanks JB

[ [Parent](#) ]

Re: Twin Rotor Question?? (none / 0) (#3)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Tue Dec 16th, 2003 at 06:55:20 PM MST  
([User Info](#))  
<http://www.windstuffnow.com/main>

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[Twin Rotor Question??](#) | 5 comments (5 topical, 0 editorial)



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[Twin Rotor Question??](#) | 5 comments (5 topical, 0 editorial)

Re: Twin Rotor Question?? (none / 0) (#1)  
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[Twin Rotor Question??](#) | 5 comments (5 topical, 0 editorial)



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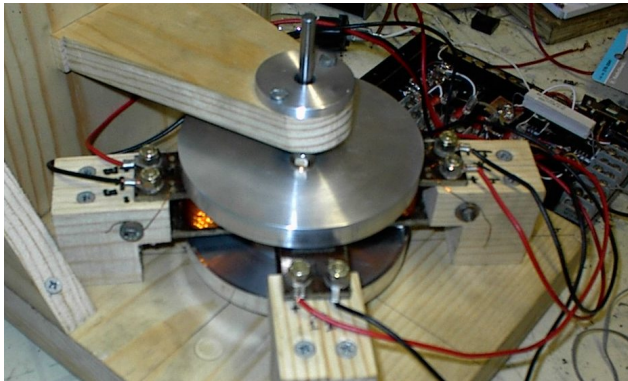
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[Bedini questions](#) | 8 comments (8 topical, 0 editorial)

Re: Bedini questions ([none / 0](#)) ([#1](#))  
 by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon Dec 15th, 2003 at 10:14:21 AM MST  
 ([User Info](#)) <http://www.windstuffnow.com/main>

Hi Monte,

I haven't built a "bedini" motor per say, I've built a few based on the original "Lenz" concept which was used to prove the "Lenz law" then later went on to experimenting with the "Adams motor" which is what I believe the bedini motor principal is based on. One of my early models ran for 6 months by switch charging 2 dead 9V batteries. The coils ran about 20 degrees below ambient for the whole time. Later I went on to building some more advanced models the last one shown below... This one had dual rotors with 4 coils. Each coil had 2 windings (primary and secondary) for extracting back emf. The voltage going into the caps sometimes exceeded 1500 volts. When connected to 2 8ft flourescent bulbs, had no trouble powering them up to full light. The motor ran at 7200 rpm and ran from a 12V battery drawing about 5 amps. It never made an "over unity" output but It did come in at around 97% as long as it only ran itself and powering flourescents or recharging the secondary battery. So basically it was extremely efficient as long as it did no real work. I used a hall sensor for the timing and mosfets for powering the coils. I must have spent 2 years playing with about 40 different motors I built before I decided to move on to other things. Then built a magnetic rotary engine followed by a new hobby into the stirling engines... and on and on and still going!  
 Have Fun  
 Ed



[Bedini questions](#) | 8 comments (8 topical, 0 editorial)

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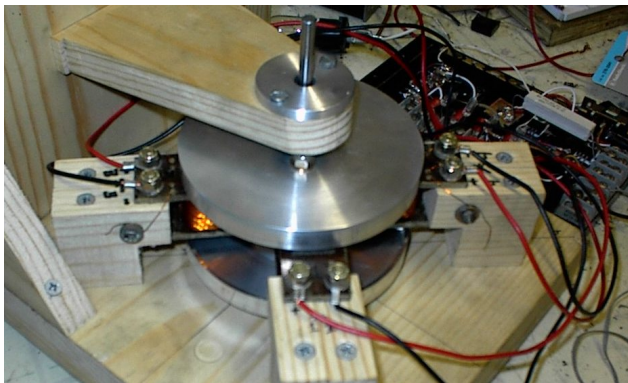
[Bedini questions](#) | 8 comments (8 topical, editorial)

Re: Bedini questions ([none / 0](#)) ([#1](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon Dec 15th, 2003 at 10:14:21 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Hi Monte,

I haven't built a "bedini" motor per say, I've built a few based on the original "Lenz" concept which was used to prove the "Lenz law" then later went on to experimenting with the "Adams motor" which is what I believe the bedini motor principal is based on. One of my early models ran for 6 months by switch charging 2 dead 9V batteries. The coils ran about 20 degrees below ambient for the whole time. Later I went on to building some more advanced models the last one shown below... This one had dual rotors with 4 coils. Each coil had 2 windings (primary and secondary) for extracting back emf. The voltage going into the caps sometimes exceeded 1500 volts. When connected to 2 8ft flourescent bulbs, had no trouble powering them up to full light. The motor ran at 7200 rpm and ran from a 12V battery drawing about 5 amps. It never made an "over unity" output but It did come in at around 97% as long as it only ran itself and powering flourescents or recharging the secondary battery. So basically it was extremely efficient as long as it did no real work. I used a hall sensor for the timing and mosfets for powering the coils. I must have spent 2 years playing with about 40 different motors I built before I decided to move on to other things. Then built a magnetic rotary engine followed by a new hobby into the stirling engines... and on and on and still going!

Have Fun  
Ed



[Bedini questions](#) | 8 comments (8 topical, 0 editorial)

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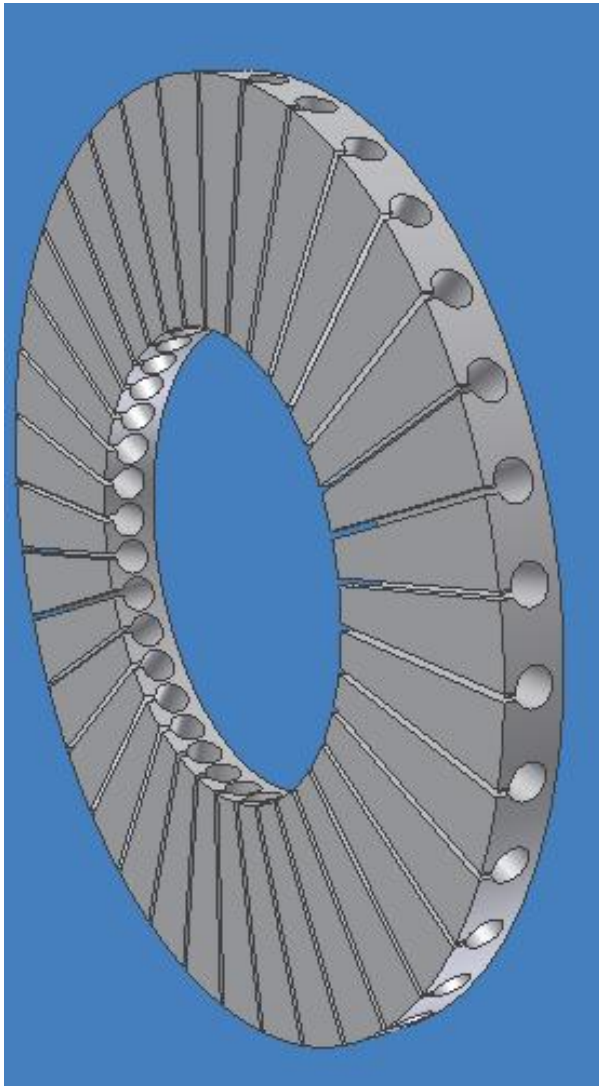
[3 Phase Question](#) | 6 comments (6 topical, editorial)

Re: 3 Phase Question ([none / 0](#)) ([#3](#))  
 by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Sun Dec 14th, 2003 at 05:38:33 PM MST  
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Actually, You can get more coils with fewer turns between the magnets to do the same job. Thus reducing the air gap and increasing power and efficiency. The only problem with the dual rotor system is you need a certain thickness to maintain the integrity of the stator, especially under load. Over lapping doesn't mean they overlap in the gap only at the top and bottom of the coils.

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Re: 3 Phase Question ([none / 0](#)) ([#4](#))  
by JB on Sun Dec 14th, 2003 at 07:02:38 PM MST  
([User Info](#))

not trying to butt in here but this looks like a good place for these ??s. I like the diagrams and pictures they are very helpful but i want to be sure Im OK.i get confused.Give me a automatic transmission and I can probably fix that. here is what i got or plan to do. I want to make the dual rotor like Dans but with a qty of 12 1.5 by 1/4 magnets on 2 steel discs that i got that are .440 thick and 9 inch in diameter. . The overlapping coil is a little bit out of my league for right now though I have toyed with the idea in my head for quite a while. This is what I thought. Dans machines have 9 coils, 12 magnets on each rotor. I can squeeze in 15 coils by making the hole in the stator 10 inches OD . If i series coils 1-4-7-10-13 for one phase and coils 2-5-8-11-14 for another phase and coils 3-6-9-12-15 for another phase will i be allright for a 3 phase machine or is there a better way to wire it or will this work?? . I was hoping to sandwich these coils in between some lexan I got that is 1/4 thick. Thanks JB

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[3 Phase Question](#) | 6 comments (6 topical, 0 editorial)



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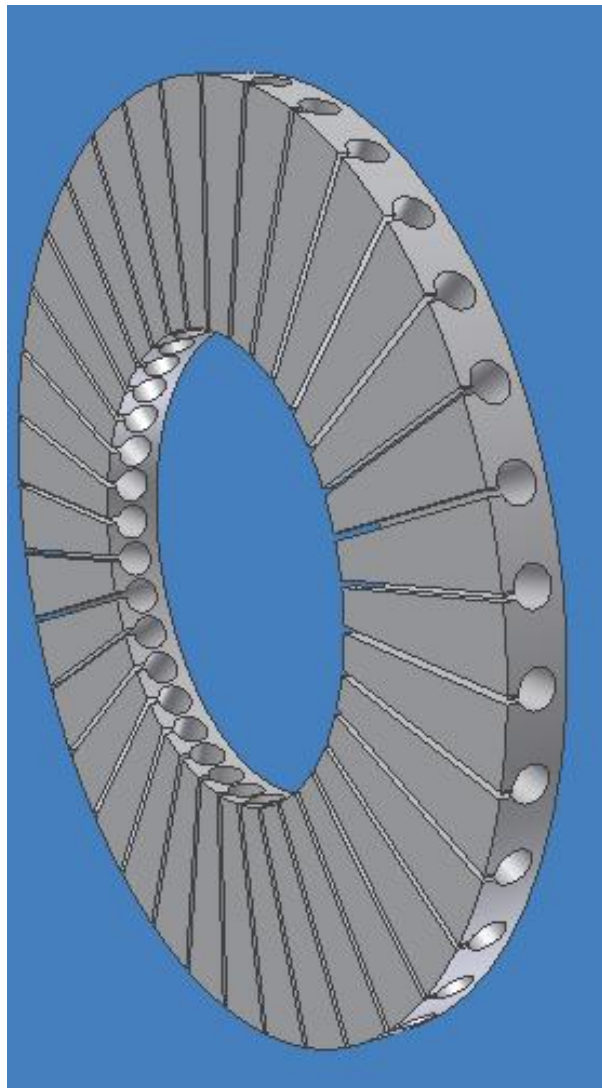
[3 Phase Question](#) | 6 comments (6 topical, editorial)

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 Windstuff Ed



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[3 Phase Question](#) | 6 comments (6 topical, 0 editorial)



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### 3 Phase Question

By [Hank](#), Section [Homebrewed Electricity](#)

Posted on Sun Dec 14th, 2003 at 11:56:54 AM MST

[Wind](#)

Now that one is flying... Thinking about a 3 Phase

What are the benefits of a 3 Phase unit?

If I build a 3 phase genny based on the single phase I built (Volvo type). I will in essence have to reduce my coil windings to fit in the additional coils for the 3 phase so as not to increase the laminate to magnet gap.

If my single phase unit is using 40 windings of #14 wire per coil with 16 poles then I would have to decrease these windings per coil to about 20.

However the amount of coils would increase from 16 to 24 coils.

If, for arguments sake, I am getting 2 volts per coil in the single phase unit at some arbitrary rpm that will total 32 volts (16 x 2).

Now if I need to cut down the coil windings to 20 then the voltage will decrease to 1 volt per coil. The amount of coils will increase from 16 to 24 so my voltage at the same rpm will now be 24 volts rather than the original 32 volts. Or will it be less still as any one phase of the 3 phase unit will only have 8 coils (1.73 X 8 = 13.84 volts)

Would be interested in comments and advice from the 3 phase as well as single phase advocates as this sounds like an interesting project.

[3 Phase Question](#) | 6 comments (6 topical, 0 editorial)

Re: 3 Phase Question ([none / 0](#)) (#1)

by Electric Ed on Sun Dec 14th, 2003 at 01:33:55 PM MST

([User Info](#)) <http://www.electric-ed.com>

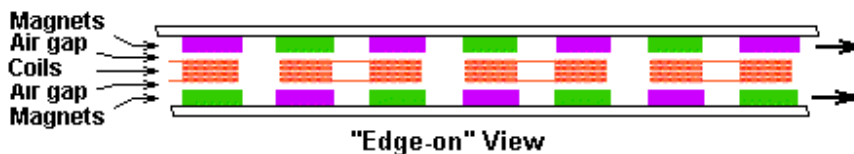
If all other factors remained unchanged, which I know is difficult to accomplish, adding two more windings (sets of coils) identical to the first, should increase the power output by 73%

Whether the voltage or the current is increased will depend on whether the three phases are connected wye or delta.

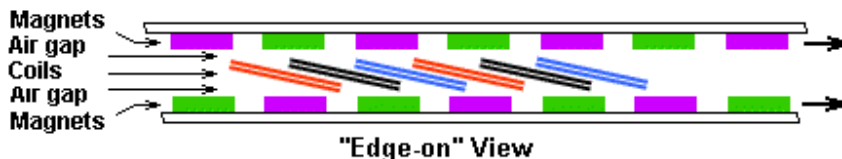
#### Twin Rotor Magnet Arrangement

- North pole
- South pole

#### SINGLE PHASE



#### THREE PHASE



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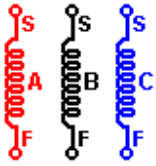
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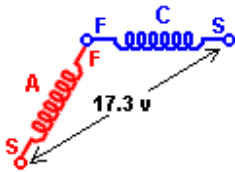
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### Three Phase Connections

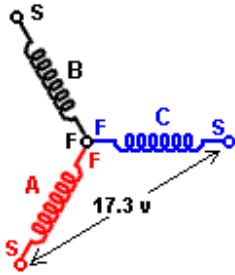


Assume each of these symbols represents a complete phase winding, and that each is producing 10 volts, in a test setup.

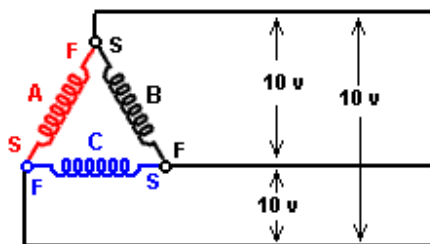
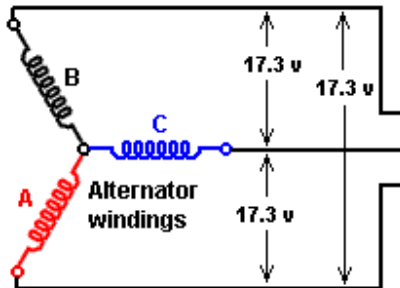


For a Wye connection, connect any two Finish leads together. The voltage between the Start leads should be approximately 17.3 volts.

If the total voltage is 10 volts, interchange, and re-identify, the leads of one of the windings. The total should now be approximately 17.3 volts.



Then connect the Finish lead of the remaining phase as shown, and use the Start leads as the output line terminals. Check for 17.3 volts between any two line leads.

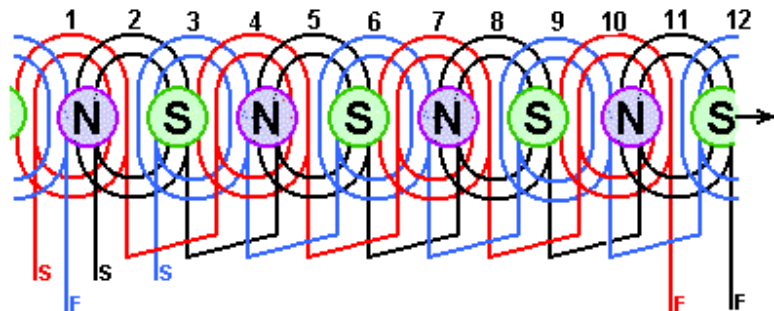


Make a Delta connection, by connecting the Finish of one phase to the Start of the next as shown. The voltage between lines should be 10 volts, equal to the phase voltage.

## Two examples of a Three Phase winding/magnet layout

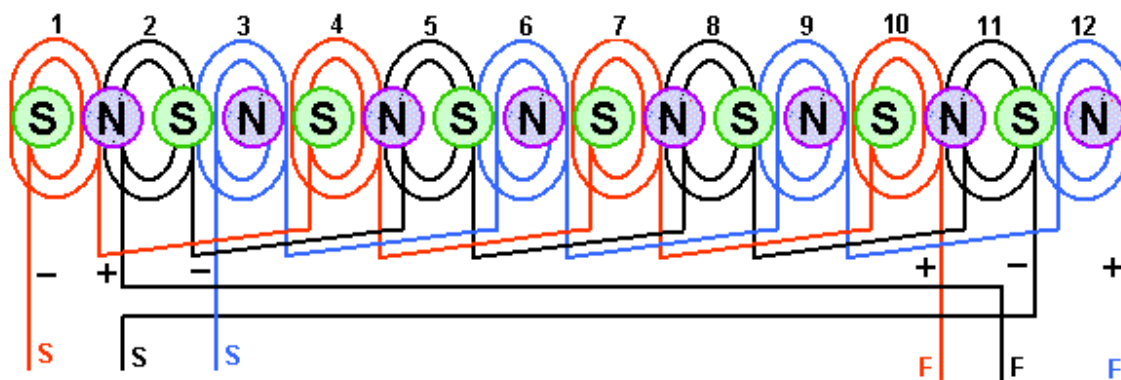
3 phase winding - 4 coils per phase - Connected in series

Overlapped winding - requires 8 magnets



3 phase winding - 4 coils per phase - Connected in series

"One layer" winding - requires 16 magnets



### Twin Rotor Magnet Arrangement



Electric Ed

Re: 3 Phase Question ([none / 0](#)) ([#5](#))  
by Hank on Mon Dec 15th, 2003 at 08:22:47 PM MST  
([User Info](#))

Electric Ed,

Excellent graphics!

I guess "everything else being equal" is the key phrase. I would have to reduce my windings to get everything to fit in the limited realstate.

Question I have for you, in the above diagrams which would generate more power for the same rpm and coil size. The overlapping version (with fewer magnets) or the "one layer" version with more magnets.

Also, seems like twin rotors are in vogue now. Apart from not needing laminates and possibly reducing/eliminating cogging is there a real benefit to these to justify the increase magnet requirement/cost and perhaps complexity?

[ [Parent](#) ]

Re: 3 Phase Question ([none / 0](#)) ([#6](#))  
by Nando on Sun Dec 28th, 2003 at 01:31:24 PM MST  
([User Info](#))

Electric ED:

Where I can get the software have to do the graphics you display here ?.

Email direct please : nando37@comcast.net

Nando

[ [Parent](#) ]

Re: 3 Phase Question ([none / 0](#)) ([#2](#))  
by wind pirate on Sun Dec 14th, 2003 at 03:15:10 PM MST  
([User Info](#))

Question

Ed - I like the overlapping coils idea, but that would require increasing the distance between the rotors. If flux is inversly proportional to distance squared (is that correct?), which method above would be the most efficient?

The way it looks for the overlapping coils you would have to double (at least) the distance between rotors resulting in 1/4 the flux field. The alternative is to use "flat" coils and increase the number of magnets.

Anyone tried this for comparison?

I know that Ifred built an overlapping setup, but I never heard the results of his testing.

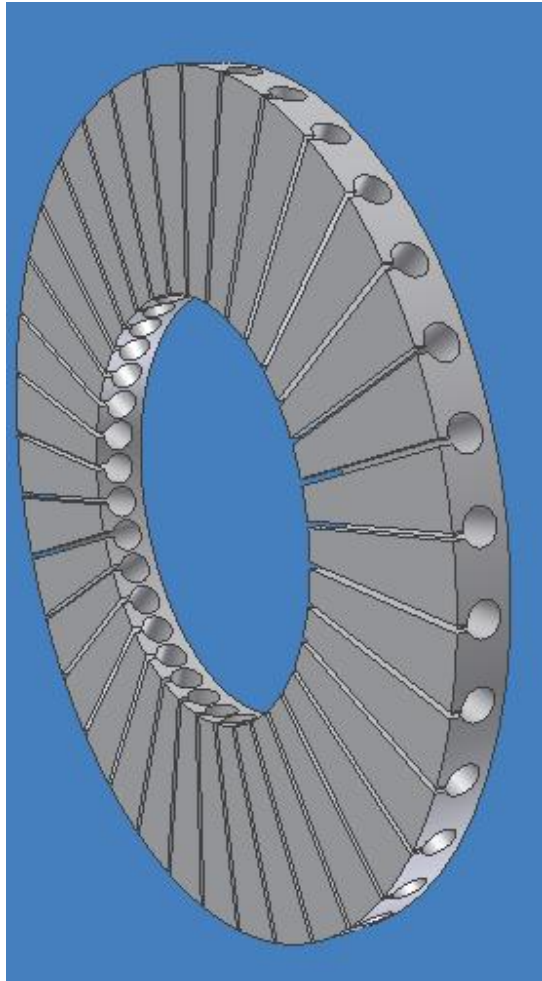
Re: 3 Phase Question ([none / 0](#)) ([#3](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Sun Dec 14th, 2003 at 05:38:33 PM MST  
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Here is the pic again.... Have Fun..  
Windstuff Ed



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Re: 3 Phase Question ([none / 0](#)) ([#4](#))  
by JB on Sun Dec 14th, 2003 at 07:02:38 PM MST  
([User Info](#))

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[Up and flying](#) | 10 comments (10 topical, editorial)

Re: Up and flying ([none / 0](#)) (#8)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Sun Dec 14th, 2003 at 08:52:12 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

I share your excitement!! Although, my first one didn't work as well as yours, I was still quite happy and excited when it was up and it worked.

I know, now that the machine is up and running, your mind is going a hundred miles an hour and contemplating the next machine... the addiction has begun...

Have Fun as I know you are!

Ed

[Up and flying](#) | 10 comments (10 topical, 0 editorial)

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### [Up and flying](#)

By [Hank](#), Section [Homebrewed Electricity](#)

Posted on Sat Dec 13th, 2003 at 07:57:52 PM MST

[Wind](#)

Finally producing power



After almost an year of planning, scrounging, tinkering and building it's up and producing power.

Special thanks to this board especially the Dans, Ed and Hugh who's advice and help made this possible.

It stands about 45' high supported by guy wires on a 60' radius secured to the ground using home made "duckbill" anchors.

I'm using an 8' 2 bladed rotor and it starts in winds of 8-10 mph.

It starts to furl at about 40 mph winds and time will tell how long it will last.

The most current I've measured out of it was about 36 amps at 14.5 volts into the battery banks. This was during a gust estimated to be about 30-35 mph.

Have to complete my electronics and monitoring system to get reliable data. Line loss is a killer, 500 watts into the batteries and another 1000 watts in copper/line losses.

Having a hell of a lot of fun though,  
Hank

[Up and flying](#) | 10 comments (10 topical, 0 editorial)

Re: Up and flying ([none / 0](#)) ([#1](#))  
by [drdongle](#) on Sat Dec 13th, 2003 at 08:29:39 PM MST  
([User Info](#))

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- [More on Wind](#)
- [Also by Hank](#)

Looking good. Keep us informed.

Dr.D

Re: Up and flying ([none / 0](#)) (#2)  
by [cevonk \(cevonk\(at\)signhere\(aol.com\)\)](#) on Sat Dec 13th,  
2003 at 09:46:05 PM MST  
([User Info](#))

Looks great! :-) How does it sound?

I like the colors.

Re: Up and flying ([none / 0](#)) (#3)  
by [charged](#) on Sat Dec 13th, 2003 at 11:58:04 PM MST  
([User Info](#))

Put a heavy induction booster at the genny and a large capacitor bank at the battery bank. Pulse the capacitors into the batteries.

The induction booster is very simple. They use them in small electronic equipment all the time. Just make sure that the inductor winding has a very low resistance.

You need to short the genny output into the heavy inductor with a pulse. I single high voltage, high-power transistor can do it with a simple pulse generator. Put a scope across the inductor and watch the input pulse as you gradually increase the pulse width. You should see a little ramp during the input pulse, but NO STEADY DC. If you get the pulse too wide, you'll see some DC at the top of the input pulse ramp and that much is wasted power. Just keep the pulse-width a wee bit short of that DC point.

Then you need a single heavy-duty high-voltage diode with it's cathode attached to the positive connection on the inductor.

The lines going to the house are connected to the inductor's negative negative side and the Anode of the diode.

The lines at the house are connected to the capacitor bank. The diode lead is connected to the cap negative and the other lead goes to cap positive. The very first capacitors in the parallel bank should be several small 400v electrolytics, about 1000uf total. These will absorb the highest peaks of spikes coming down the lines. Then run 2ft jumpers to the BIG cap bank. Put three car-stereo 1F super-caps in series for a 330,000uf capacitance.

Then, set up a simple discharge circuit between the big caps and the batteries. Connect the capacitor bank common negative to the battery negative. Then put a HEAVY SCR in the capacitor positive lead going to the batteries.  
Connect the Anode of a 5v ZENER DIODE to the SCR GATE.  
Connect the CATHODE of the zener to the CAPACITOR POSITIVE.



Put an analog meter on the caps so you can watch the voltage changes and then engage the genny.

You should see a fairly steady oscillation on the meter.

The caps will fill with the incoming spikes and when they reach 5v above battery voltage, the SCR will turn on and SLAM a high-current pulse into the batteries. Don't worry, the batteries will love it. No sulfating.

All your genny power will be converted to what amounts to "transient spikes" on the lines and your line losses will disappear. CEMF is almost pure voltage, almost no real current. The capacitors convert these spikes back into usable current to charge your batteries.

The engineering community mostly ignores everything Tesla patented after 1890 or so.

This is one aspect of his "radiant energy" power transfer systems.

Enjoy!

Re: Up and flying quick rant ([none / 0](#)) (#4)  
by bob golding ([yubba at clara dot net](#)) on Sun Dec  
14th, 2003 at 06:21:05 AM MST  
([User Info](#))

hi charged,  
i used to live in cambridge UK and know quite a few university engineers. when i tried to submit a Tesla coil as my degree project it was kicked out as fringe science. with well informed engineers like that about it is not surprizing that he is ignored. i thought it was maybe a UK thing but alas seems you have the same degree of ignorance over there as well. bit strange that someone who more or less invented most of the things we take for granted is unknown by people who should know better. opps getting on my soapbox again back to my VAWT project. Just to prove Teslacoils do exist have a look at our website WWW.HVFX.CO.UK  
end of blatant plug.

[ [Parent](#) ]

Re: Up and flying quick rant ([none / 0](#))  
(#5)  
by kww on Sun Dec 14th, 2003 at 07:22:07  
AM MST  
([User Info](#))

I'm off topic as well, but I have to comment on this. I've observed that those who are way above and beyond the norm, like Bruce Lee in martial arts, Einstein in physics, Jesus in religion, etc., there seems to exist a large group(the norm) that reject the truth each of these great individuals have revealed. So much so it's rather comical in a maddening sort of way. I guess if you don't understand something most would rather pretend it's not real than learn about it. LOL Many "teachers" I had seemed to be especially prone to such behavior. LOL Beam me up Scotty!!!! :-)  
Kevin(mostly self-educated, with a b.s. degree I'll sell real cheap :-)

[ [Parent](#) ]

Re: Up and flying ([none / 0](#)) (#6)  
by Hank on Sun Dec 14th, 2003 at 07:27:53 AM  
MST  
([User Info](#))

Hi Charged,

This sounds interesting.  
Can you sketch out a schematic of this circuit or point me to where I can find one?

How would this circuit work with a charge controller when I have to divert the load. I'm thinking of using a Trace C40 charge controller.

This genny is pretty quiet, however at higher wind speeds you can hear it humming as the coils load up. The faster it goes the louder the the humming, it's single phase.

Thanks,  
Hank

[ [Parent](#) ]

Re: Up and flying ([none / 0](#)) (#7)  
by Electric Ed on Sun Dec 14th, 2003 at 07:43:40  
AM MST  
([User Info](#)) <http://www.electric-ed.com>

And then, on the other hand, there is something to be said for keeping things simple.



Electric Ed

[ [Parent](#) ]

Re: Up and flying ([none / 0](#)) (#9)  
by 5kw on Sun Dec 14th, 2003 at 10:02:14 AM MST  
([User Info](#))

This is a boost converter. Nothing magic here, it can be useful for DC to DC voltage converters , power point tracking ect. However kw in = kw out - losses  
Victor

[ [Parent](#) ]

Re: Up and flying ([none / 0](#)) (#8)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Sun Dec 14th, 2003 at 08:52:12 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

I share your excitement!! Although, my first one didn't work as well as yours, I was still quite happy and excited when it was up and it worked.

I know, now that the machine is up and running, your mind is going a hundred miles an hour and contemplating the next machine... the addiction has begun...

Have Fun as I know you are!

Ed

Re: Up and flying ([none / 0](#)) (#10)  
by Nando on Sun Dec 28th, 2003 at 01:39:15 PM MST  
([User Info](#))

Congratulations for hte job done.

I is sad taht the industry is not realizing that to have generators producing low voltage are, lot of them, power limited by tehcabling to the battery or load.

With present technology, it would be best to have a high voltage generator with AC Voltage transmission.  
At the load a converter is installed to hav emaximumpower transfer.

In your case, I see that you could reduce the losses to about 10 % so, instead of 2/3 power transmission losses just 10 % or around 1350 watts into the battery and 150 watts into the losses, also it may be possible to charge at lower wind velocity regimes and the charger(converter) can be supplied with MPPT to maximize the power harvesting.

Regards

Nando

[Up and flying](#) | 10 comments (10 topical, 0 editorial)

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[Alt rotor Questions : magnets](#) | 11 comments (11 topical, 0 editorial)

Re: Alt rotor Questions : magnets ([none / 0](#)) (#7)  
 by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Fri Dec 12th, 2003 at 12:20:52 PM MST  
 ([User Info](#)) <http://www.windstuffnow.com/main>

By laying them out the way iFred explained works well also but the field doesn't extend out as far as pushing them together. By allowing them to spread apart will match the field of the magnet. In turn open up the area of the field.

On a dual rotor system with a fairly large gap it would be better to butt them together. Where'as a laminated stator may better use the area of the magnetic field as opposed to the concentration. It all works well in the right places.

iFred tends to think outside the normal, this is usually where new things are found. I for one like unusual and creative thinking... the stranger the better! I'd like to say I think in similar terms but there are so many rules that are in the back of my head that sometimes makes it difficult.

Like a cup overflowing... there is no more room to add more... sometimes we need to empty our cup in order to get more.

More fun than my cup will hold!  
 Ed

[ [Parent](#) ]

[Alt rotor Questions : magnets](#) | 11 comments (11 topical, 0 editorial)

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[Alt rotor Questions : magnets](#) | 11 comments (11 topical, editorial)

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Ed

[ [Parent](#) ]

[Alt rotor Questions : magnets](#) | 11 comments (11 topical, 0 editorial)

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- [Putte](#)
- [wind pirate](#)
- [Harry Luubovv](#)
- [troy](#)
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## [How many wires can you fit in a hole...](#)

By [windstuffnow](#), Section [Diaries](#) [windstuffnow's Diary](#)

Posted on Sat Sep 20th, 2003 at 12:00:05 PM MST

Formula...

Here is a formula to find how many wires you can fit in a certain size hole:

$$(\text{hole dia} / (1.14 \times \text{wire diameter}))^2 = \text{total wires (turns)}$$

If you know how many turns you want to use but need to find out what size hole you'd need to fit them in:

$$1.14 \times \text{diameter of wire} \times \text{sqrt}(\text{Number of turns}) = \text{Hole size}$$

Its better ( more efficient use of space) to use a square or rectangular hole or slot but its easier to drill a hole as opposed to cutting slots for the home builder. I'm still looking for a square drill bit...

Back to playing in my toy box...

Have Fun  
Ed

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[How many wires can you fit in a hole...](#) | 3 comments (3 topical, 0 editorial)

Re: How many wires can you fit in a hole... ([none / 0](#))  
(#1)  
by troy on Sat Sep 20th, 2003 at 12:12:18 PM MST  
([User Info](#))

Hi Ed,

I have to tell you, you are a veritable cornucopia of intersting formulae.

Hey you still have your ultralight???

Best regard,

troy

Re: How many wires can you fit in a hole... ([none / 0](#))  
(#2)  
by mkseps on Fri Oct 3rd, 2003 at 05:50:12 PM MST  
([User Info](#))

Hi Ed:

They do make square drills. They call them broaches and are available in many sizes.

Another approach is to have a machine shop equipped with a traveling wire machine cut the slots for the wire by EDM.

Might cost a bit but the results would be very professional.

EDM machines are programmed via CNC programming and can very accurately cut the whole stator slots and all.

Gene

Re: How many wires can you fit in a hole...

([none / 0](#)) (#3)

by [windstuffnow \(elenz@windstuffnow.com\)](mailto:elenz@windstuffnow.com) on Tue Oct 14th, 2003 at 09:40:14 PM MST

([User Info](#)) <http://www.windstuffnow.com/main>

Hey, thanks for the tip! I do use broaches for cutting key slots in my homemade hubs. Not sure how I would use them in cutting slots in the stators. I've machined them which works fairly well but its time consuming and it leaves the slots a bit wide at the surface. I've been working on a punch machine with a gear driven indexer to punch the slots one at a time as the material is wound. Still working out the gear change system to punch slots for just about any configuration. The tooling is quite expensive. Also trying to figure out a way of cutting different size slots with the least amount of tooling. I purchased the gears and materials to make the gear box and finished machining a 4 point geneva drive for the stop/punch motion all I need now is a few 36 hour days to get caught up with everything...

Have Fun

Ed

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[How many wires can you fit in a hole...](#) | 3 comments (3 topical, 0 editorial)

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[How many wires can you fit in a hole...](#) | 3 comments (3 topical, editorial)

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[How many wires can you fit in a hole...](#) | 3 comments (3 topical, editorial)

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by mkseps on Fri Oct 3rd, 2003 at 05:50:12 PM MST ([User Info](#))

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[How many wires can you fit in a hole...](#) | 3 comments (3 topical, editorial)

Re: How many wires can you fit in a hole... ([none](#) / 0) (#1)  
by troy on Sat Sep 20th, 2003 at 12:12:18 PM MST ([User Info](#))

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## [Draggy shapes....](#)

By [windstuffnow](#), Section [Homebrewed Electricity](#)

Posted on Thu Oct 16th, 2003 at 07:54:11 AM MST

[Wind](#)

Curious

I've been searching the web to get more information about VAWT's. There are alot of sites out there but none really get into any of the nitty gritty. There are no formula's for them, with the exception of the darrieus which relates to the lift formula's of the basic HAWT.

In particular, I'm looking for the drag coefficient of different materials and/or shapes that create lots of drag. The highest I've seen so far relates to a cup shape similar to a parachute or an anemometer which has a Cd of 1.42 on the cupped side and .38 on the curved side. Anyone seen anything like this on the web? or a higher Cd than 1.42?

Thanks and as always... Have Fun

Ed

[Draggy shapes....](#) | 4 comments (4 topical, 0 editorial)

Re: Draggy shapes.... ([none / 0](#)) ([#1](#))  
by [windstuffnow](#) ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Thu Oct 16th, 2003 at 12:33:25 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Never mind... After sending several emails out to some engineers, my question was answered. The reason I wanted to know was because I was using the 1.42 in my formula's and it wasn't working out on the "Lenz Turbine" compared to the output I'm getting. When proving it out I was getting a Cd number over 2 and wasn't sure this was possible. I found out the downwind side was achieving a Cd of around 2.3 and the .3 was lost from the upwind side.

Anyway, I'm still on track... Still working out some new ideas. Oh yea... I've build a difuser for the unit ( a couple different designs actually) and have achieved almost 21 watts on the output shaft in a 12.5mph wind.

Way to much fun!

Ed

Re: Draggy shapes.... ([none / 0](#)) ([#2](#))  
by [bob golding](#) ([yubba at clara dot net](#)) on Thu Oct 16th, 2003 at 02:06:33 PM MST  
([User Info](#))

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hi ed,

here is a progress report on my lenz tubine. got the tower guyed up and have lifted the turbine up 6 feet! it still worried about thrashing it before its finished. have built the alternator apart from the stator. am going to try and reduce the weight a bit by using spiders on the ends instead of the 3/4 ply i am using at the moment. am taking lots of pics.

cheers  
bob

[ [Parent](#) ]

Re: Draggy shapes.... ([none / 0](#)) (#3)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com))  
on Thu Oct 16th, 2003 at 02:18:00 PM MST  
([User Info](#))  
<http://www.windstuffnow.com/main>

Great! Can't wait to see it! I agree on the plywood, there is alot of mass. I suppose there could be benifits from it but I still think if it responds quicker to gusts you'll end up farther ahead in the long run. I plan to build the real world version using aluminum to keep the weight down as much as possible. Its starting to "morph" into something a little different than the picture posted on my site. I believe the final version is just around the corner... still have a few more alterations to try.

Havin' Fun  
Ed

[ [Parent](#) ]

Re: Draggy shapes.... ([none / 0](#)) (#4)  
by bob golding ([yubba@clara.net](mailto:yubba@clara.net))  
on Fri Oct 17th, 2003 at 12:56:20 PM MST  
([User Info](#))

trying struts made of oval shaped pvc tubing, the stuff you use for running cables along walls its about 1/2" by 1/4" only done one end of the turbine so far. the bottom end is still 3/4 ply and is bolted to the volvo hub at the moment. got lots of very cold easterly wind at the moment so a good test. will see if it is still in one piece tommorow. Went to the local scrap yard today and got them to save an old caravan for me. going back with my tin snips monday and cutting all the ally off it. just as i was leaving noticed a large pile of 6 volt 225 amp vrla batteries some with bulging cases some not some brand new, better take my meter with me as well hehehe. thinking of making the airfoil ribs from

plastic chopping boards. a good cheap source of polyethelene sheeting 12" x 8" x 3/8" thick is about 3 bux. wish it was a bit warmer..... think i will curl up and read windpower workshop which just arrived.

still having fun

bob

[ [Parent](#) ]

[Draggy shapes....](#) | 4 comments (4 topical, 0 editorial)

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## Dual rotor stator ...

By [windstuffnow](#), Section [Homebrewed Electricity](#)

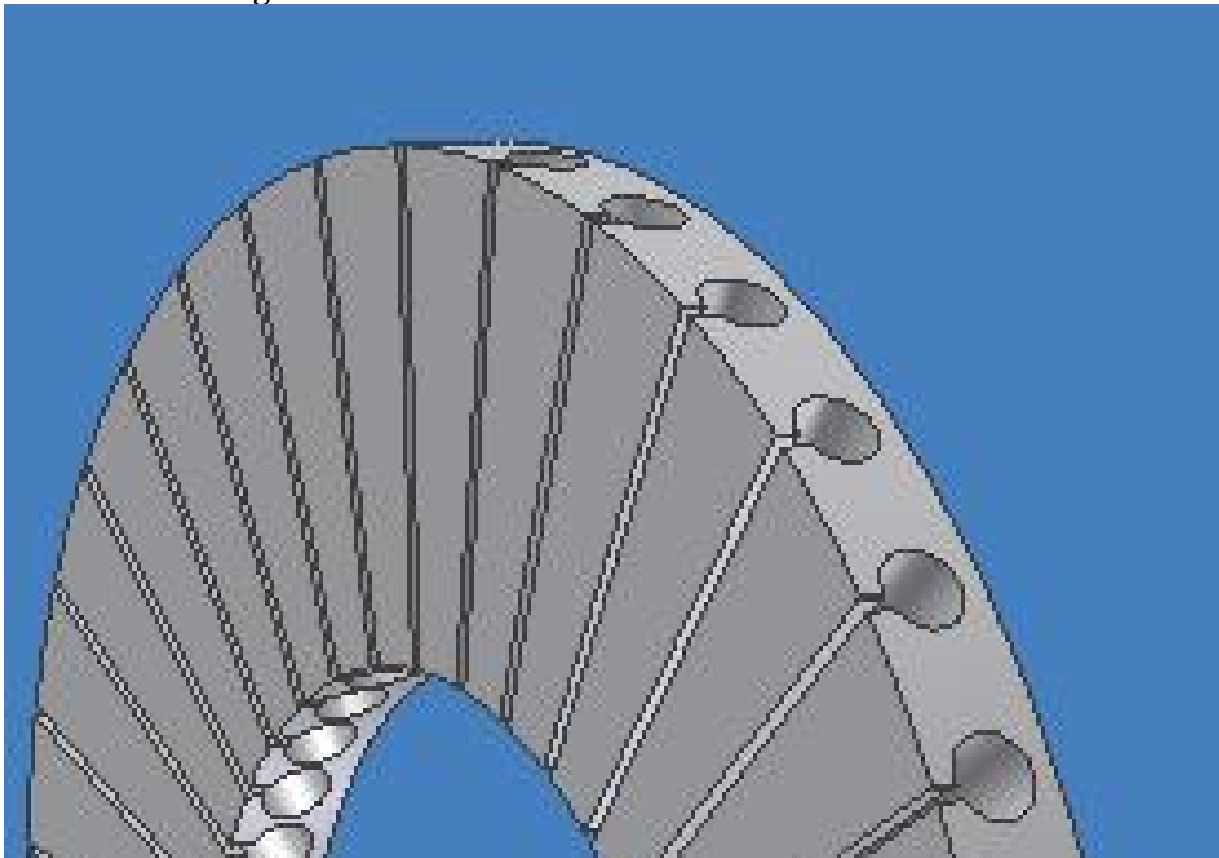
Posted on Thu Sep 18th, 2003 at 10:23:46 AM MST

Thoughts on making them thinner

[Alternators](#)

Here is a drawing on the idea of making the stator on a dual rotor system thinner. Basically a plastic disc with holes drilled into it for winding the coils. This would spread out the coils making them much thinner to increase efficiency/power from the unit. This would also help to keep the resistance down. After it was wound you would have to make a mold for the mounting tangs and pour the plastic around the wires. The drawing shows a 12 pole 36 slot disc.

Continuous thoughts... Have Fun... Ed



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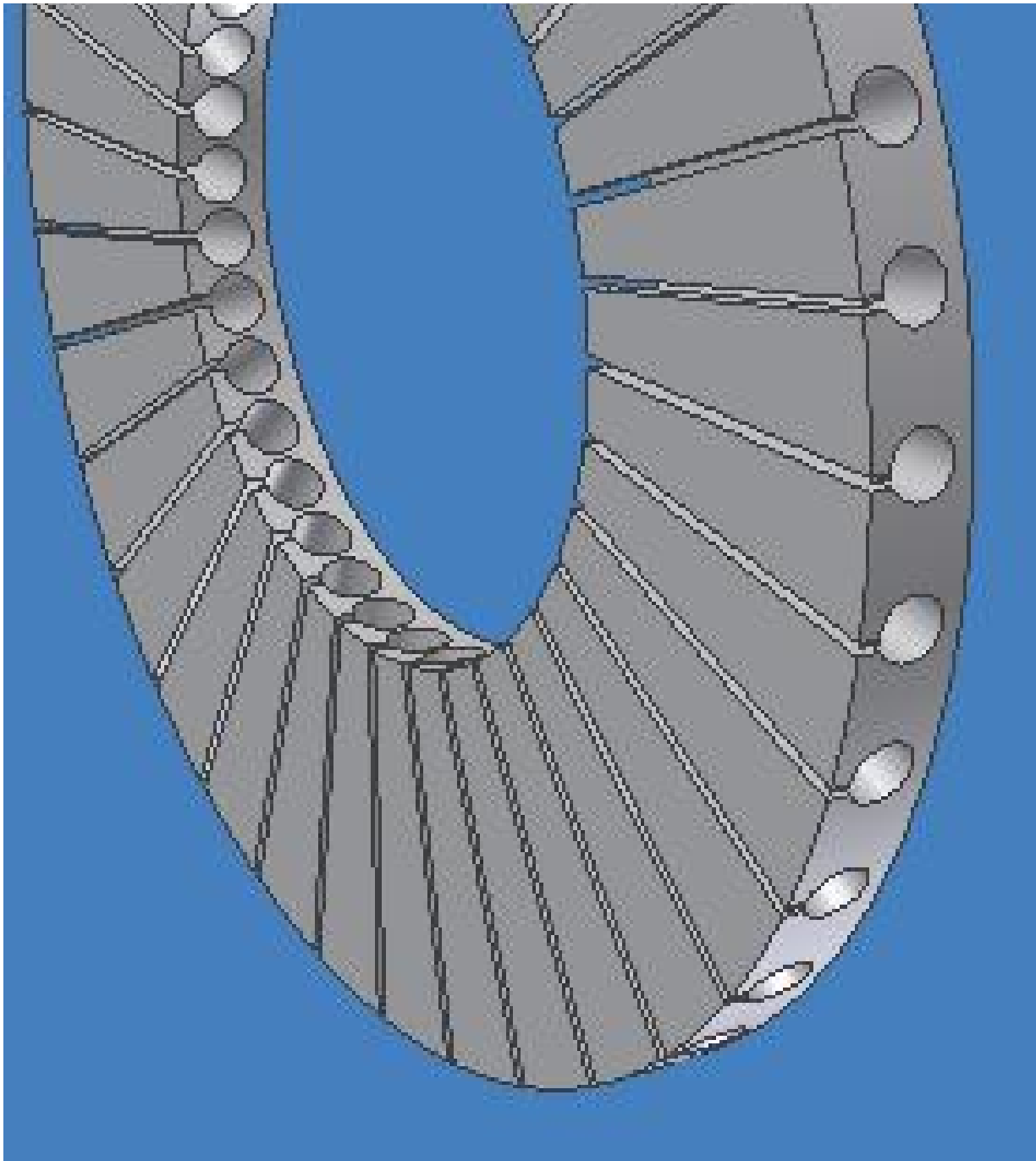
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- [Also by windstuffnow](#)



[Dual rotor stator ...](#) | 31 comments (31 topical, 0 editorial)

Re: Dual rotor stator ... ([none / 0](#)) ([#1](#))  
by Old F on Thu Sep 18th, 2003 at 11:20:56 AM MST  
([User Info](#)) <http://www.oldf.homestead.com>

Hi ED

To make it easier to build how about a 1/4 inch thick plywood disk with 3/4 inch pine wedges glued to it. Than after winding the coils you set it in a mold and cast resin over it.

This way you could get by with hand tools.

Just a thought.

Old F

Re: Dual rotor stator ... ([none / 0](#)) ([#2](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Thu Sep 18th, 2003 at 12:22:29 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

That would work. You'd have to make a jig to crush the coils down when you were done to keep the thickness down. The idea above is basically the same, you only need a drill and hack saw and probably a jig saw to cut the circle out. Also a protractor to lay it out. I think it would help contain the wires in the area the magnets are moving in. You still have to deal with the thickness of the overlapped wires on the outer and inner part of the ring but the magnetic area would still be quite thin.

I'm sure there is a better way... keep thinking.

Have Fun  
Ed

[ [Parent](#) ]

Re: Dual rotor stator ... ([none / 0](#)) ([#3](#))  
by JB on Thu Sep 18th, 2003 at 03:20:16 PM MST  
([User Info](#))



excellent idea there Ed. JB

[ [Parent](#) ]

Re: Dual rotor stator ... ([none / 0](#)) (#4)  
by bob golding ([yubba at clara dot net](#)) on Thu Sep 18th, 2003 at 03:29:37 PM MST  
([User Info](#))

thinking you could wave wind it if you worked out how much wire to use.

keep having fun i am.

Re: Dual rotor stator ... ([none / 0](#)) (#6)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Thu Sep 18th, 2003 at 08:31:49 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Use lots of small magnets and simply push copper bar stock through the holes and wire it like a wave winding. End up with negative resistance.... ok not quite but pretty darn low. I built one using bar stock makes a heck of a welder ;O)

Have Fun  
Ed

[ [Parent](#) ]

Re: Dual rotor stator ... ([none / 0](#)) (#5)  
by zubbly on Thu Sep 18th, 2003 at 05:51:30 PM MST  
([User Info](#))

one of the best ideas I have seen yet. fantastic!  
zubbly.

Re: Dual rotor stator ... ([none / 0](#)) ([#7](#))

by JB on Thu Sep 18th, 2003 at 08:46:40 PM MST

([User Info](#))

OK ED. You got me thinking now. I have some 9 1/4 by 3/4 round delrin discs. Now here are my ???. If you knew how you were going to wire this either star or delta could you wire or actually be snaking the wire 3 slots next to one another and go over 4 slots and do the same, I think thats delta but im not sure and keep on goin without a bunch of splices so in the end you would end up with 6 wires and no splices instead of 24 wires and splices or would the wires from the other coils or other phase cancel things out as they would be going over the top of the others on the outside diameter. I was thinking of doing this on my mill with a superspacer and making a groove in the inside and outside diameter to keep all the wires tidy. I hope you understand my ???. The hub and discs are not a problem. I finally got that part figured out. Im a little slow. Thanks JB

Re: Dual rotor stator ... ([none / 0](#)) ([#9](#))

by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Fri Sep 19th, 2003 at 08:20:42 AM MST

([User Info](#)) <http://www.windstuffnow.com/main>

Hi JB, I'm not sure I understand what your trying to explain... I usually wind them just like a single phase. But add two more phases in. So in the stator above you would have 12 poles, one coil for each of the poles make up one phase. So you'd start in one slot, skip two slots and finish the coil in the 4th slot. So the first coil would have 2 empty slots between it when your done. The second coil would be wound in the reverse direction as the first and so on until all 12 coils are in place. Second phase goes in the next open slot to the right wired the same as the first phase, and finally the remaining slots are filled with the same configuration. You end up with 3 starts and 3 ends of which you can wire it for star or delta or set it up for both with a switch.

I'm not real good at explaining things... sometimes pictures are much better than words and I think some time back electric Ed posted a diagram of the same winding arrangement. I'll see if I can find it...

Have Fun in any case..

Ed

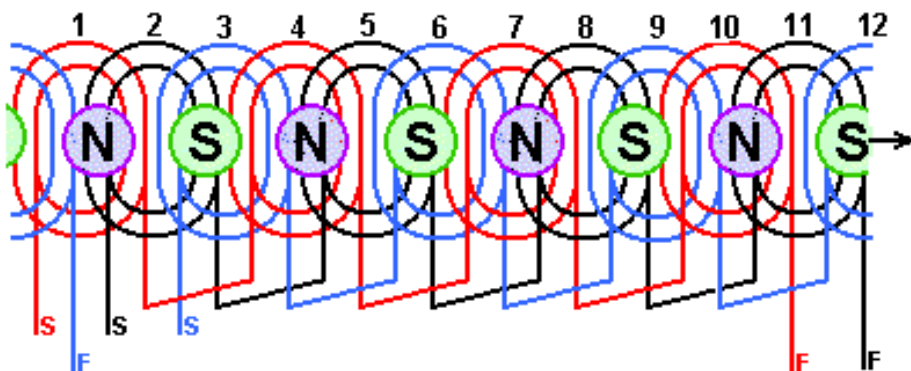
[ [Parent](#) ]

Re: Dual rotor stator ... (none / 0) (#11)  
by Electric Ed on Fri Sep 19th, 2003 at 10:55:28 AM MST  
(User Info) <http://www.electric-ed.com>

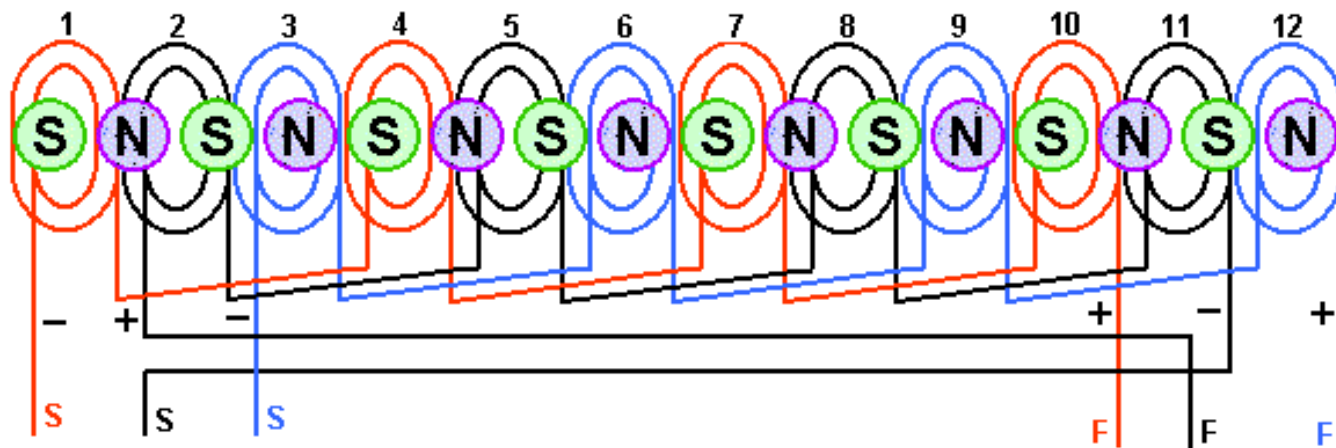
Perhaps it was this sketch Ed was referring to.

### Two examples of a Three Phase winding/magnet layout

3 phase winding - 4 coils per phase - Connected in series  
Overlapped winding - requires 8 magnets



3 phase winding - 4 coils per phase - Connected in series  
"One layer" winding - requires 16 magnets



### Twin Rotor Magnet Arrangement



Electric Ed

[ [Parent](#) ]

Re: Dual rotor stator ... ([none / 0](#)) ([#13](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Fri Sep 19th, 2003 at 11:26:42 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Hi electric Ed,

I think its the one but it seems like you had another one that was closer. When I wind them each coil shares the same slot as the one before and after it. Seems to compact the wire better. I use 2 poles for 3 coils but the second set of 3 is partially covered by the first two magnets... I don't know if that came out right... I can see it but words don't seem to make the picture. Basically 3 legs under each magnet.

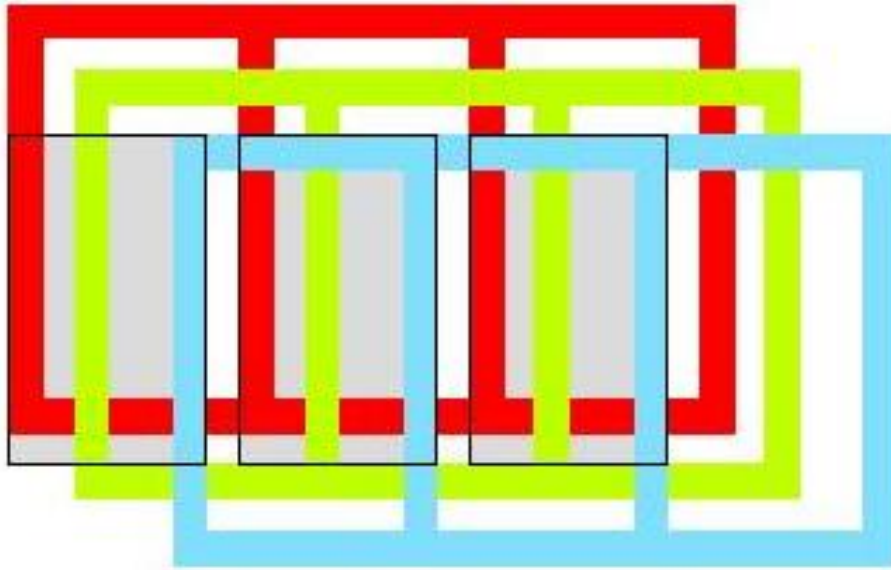
Have Fun

Ed

[ [Parent](#) ]

Re: Dual rotor stator ... ([none / 0](#)) ([#14](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Fri Sep 19th, 2003 at 12:45:54 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

I made an attempt to diagram the wiring I'm talking about...



In the diagram, Red is phase 1, green phase 2 and blue phase 3. The grey represents the magnets. Each coil shares a slot with the coil before and after. This allows 6 legs positioned under each magnet or 6 coils are affected by each magnet. This allows you to pack alot of copper in small areas and allows for less turns per coil to achieve the same output of other configurations. This ultimately helps to lower resistance as well as cure other problems.

Have Fun!  
Ed

[ [Parent](#) ]

Re: Dual rotor stator ... ([none / 0](#)) ([#15](#))  
by JB on Fri Sep 19th, 2003 at 03:43:55 PM MST  
([User Info](#))

Ok Ed. I got ya covered now. Thank You. That word reverse in there through me for a loop but after about 6 times I figured it out. 36 slots that has to be. Got ya covered there also. Now my last ?? for a little bit. I got 1500 feet of 22 gauge neopreme covered door bell copper wire and 8 large neos. I realize that aint enough magnets for a non laminated dual rotor machine but im thinking that should be enough for a single rotor machine with 12 poles 3 phase. I hope im right on this. I guess I should by the book but my basic question is if I put a lot of turns of this 22 gauge would I get some good results or should I await till i get some money and buy the book and some 14 or 18 gauge. Thanks JB

[ [Parent](#) ]

Re: Dual rotor stator ... ([none / 0](#)) ([#16](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Fri Sep 19th, 2003 at 06:55:36 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

JB, using 22 wire won't make a power wagon but it will make a nice learning machine. Use 24 slots with 8 magnets or 12 slots with 4 magnets on each rotor. If you use a small diameter prop ( like 2 or 3 ft) it will run faily fast. Set it up for a TSR of about 3 or 4. A 2ft prop at a TSR of 3 will run just over 400 rpm in a 10 mph wind so you really don't need to over do the amount of turns per coil.

Have Fun  
Ed

[ [Parent](#) ]

Re: Dual rotor stator ... ([none / 0](#)) ([#18](#))  
by JB on Fri Sep 19th, 2003 at 08:25:56 PM MST  
([User Info](#))



Okie Dokie Ed. Thank You. Im still having fun. I havent messed up anything on this one Yet||\$\$\$\$\$. Ive built an induction motor and a pm motor and they worked ok through trial and error and lots of time of course. I was thinking the 8 magnets and 24 slots basically the single rotor type 3 phase but I got to do a little more thinking. The magnets are 1 1/4 by 1 1/2 by 1/4 thick. If i put 24 evenly spaced slots they wouldnt cover all 3 legs at the same time not at a 9 1/4 inch diameter anyway. I could make 24 slots in 8 bunches of 3 making them either 1 1.4 wide or 1 1/2 wide by drilling 8 evenly spaced holes on the outer edge and a hole on both sides of them to the width of the magnets so I would end up with 8 magnets over 8 of the 12 coils or I can downsize the diameter of the rotor. I really dont want to go single phase. Decisions Decisions Decisions. JB

[ [Parent](#) ]

Re: Dual rotor stator ... ([none / 0](#)) ([#21](#))  
by JB on Sat Sep 20th, 2003 at 01:00:53 PM MST  
([User Info](#))

Hello ED and others. Im thinking that my yesterdays thinking and last post was messed up. If i space 24 slots evenly and 8 magnets evenly everything should line up to one of the 3 phases. Im thinking I dont have to cover 3 legs at the same time. just one phase at the same time.I wonder If Im thinking correctly now. Thanks JB

[ [Parent](#) ]

Re: Dual rotor stator ... ([none / 0](#)) ([#22](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Sat Sep 20th, 2003 at 01:23:15 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Thats right JB... As long as everything is lined up it should work. Its better to cover as much of the wire with magnets as possible but even if the magnet only covers one leg at a time it will work. More magnetic surface means more power.

Lots of fun!  
Ed

[ [Parent](#) ]

Re: Dual rotor stator ... ([none / 0](#)) (#23)  
by JB on Sat Sep 20th, 2003 at 01:59:23 PM MST  
([User Info](#))

Why Thank You Very Much Ed. I was getting a little Goofy thinking there. I was looking at the Dans triplets and then Electric Eds Diagrams and Your new stator Idea and getting foggy. Then I realized Electric Eds Diagrams are one for Dans type wiring scheme and One similar to Your wiring scheme which uses less magnets and more coils where Dans wiring uses more magnets and less coils. Thanks again. This is Very Nice of You. JB

[ [Parent](#) ]

Re: Dual rotor stator ... ([none / 0](#)) (#24)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Sat Sep 20th, 2003 at 03:46:55 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

JB, you can download the instructions to my educational turbine to get an idea of how I do my windings ( as well as anyone else interested ). Maybe you already have... The little alternator uses 6 magnets and is a 3 phase system so there are 18 coils.

<http://www.windstuffnow.com/3phasekit.pdf>

It will give you a better representation of how I've been doing most of my alternators. To make it much easier for beginners I wind one large coil for each phase and its twisted into the slots. By doing it this way you end up with each coil reversed from the one before it.

If you have a large coil of 50 turns twist it and fold it in half you now have a coil of 100 turns, in half again you have 200 turns. So my little turbine basically has 6 folds or the equivalent of 300 turns of wire per phase and a total of 900 turns of wire in a tiny space.

Lots of wierd ideas that turn into something useful...

Have Fun  
Ed

[ [Parent](#) ]

Re: Dual rotor stator ... ([none / 0](#)) ([#27](#))  
by JB on Sat Sep 20th, 2003 at 07:58:04 PM MST  
([User Info](#))

Hello Ed. I just figured out Acrobat reader and downloaded it and your diagrams. I think i see what you are doin. I was going to do it wrong. I was going to fill up slots one and four and then go to slots seven and 10 but wind them in the other direction fill them and so on. The way you are doing it slot 4 will be completely filled when you are doing 4 and 7 and slot 7 will be filled when you are doin slot 7 and 10 and so on. Basically the next slot 3 over will be filled halfway and filled all the way when you are doin the next slot 3 over from it. I hope I explained this ok and that sounds right? Thank You. JB

[ [Parent](#) ]

Re: Dual rotor stator ... ([none / 0](#)) ([#8](#))  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Fri Sep 19th, 2003 at 07:02:25 AM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

That stator design looks almost exactly like the stator in the "3 phase turbine kit" offered on the windstuffnow site . . .

[http://www.windstuffnow.com/main/3phase\\_turbine\\_kit.htm](http://www.windstuffnow.com/main/3phase_turbine_kit.htm)

.  
-- W o o f

Re: Dual rotor stator ... ([none / 0](#)) ([#10](#))  
by boomer on Fri Sep 19th, 2003 at 08:52:08 AM MST  
([User Info](#))

hi ed I am Handy Andy (post as boomer). I would like to say thanks for posting so many usefull drawings this one is awesome. For some reason this drawing cleard up how you can overlap coils and have the same amount of flux through pass through both legs of the coil. Do you have any suggestions how to deal with the big 3 coil overlap that happens on the inside and outside without loosing that nice small gap?

Handy Andy

[ [Parent](#) ]

Re: Dual rotor stator ... ([none / 0](#)) ([#12](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Fri Sep 19th, 2003 at 11:17:32 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Hello, boomer

On the outside of the rotor it really isn't a problem since the magnet rotor rides over the thin part of the stator. The problem arises within the center. This would have to be dealt with by using fairly thick magnets or at least thick enough to provide clearance between the discs and wires. The outer diameter you could make a mold to pour plastic around the wires and incorporate a mounting structure. This would allow for leaving a portion of the wires exposed for cooling and some would be enclosed in resin. I haven't built, just an idea so there is lots of room for improvements.

Another idea was to make 2 rings with wire hooks ( as posted earlier ) making the windings similar to bike spokes. This would be much harder to make the coils remain thin but wouldn't require any resin and the coils would be exposed. Also, the outer ring would serve as a mounting structure.

Lots of ideas... little time to try them all...

Have Fun  
Ed

[ [Parent](#) ]

Re: Dual rotor stator ... ([none / 0](#)) ([#17](#))  
by TomW on Fri Sep 19th, 2003 at 07:59:46 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Woofers;

Here's a news flash:

Ed is Windstuffnow.com.

And between Ed and Jerry they have probably built more wind machines than you and I will ever see. Both have been continuing contributors here for years.

Cheers.

TomW

[Stuff I have Online](#)

[Contact Me](#)

[ [Parent](#) ]

Re: Dual rotor stator ... ([none / 0](#)) (#19)  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Fri Sep 19th, 2003 at 09:37:04 PM MST  
([User Info](#)) <http://www.internetfred.com>

Hi Ed, That's a sweet idea. I think a simple round mould like normal, and insert wood dowels into place. I think the accuracy will be the issue, but when your working dry and slow it would be better. As long as the dowels are lubed or waxed up good you could then just slide them out when the mold is completed. Then a simple small cut with a hand saw per each center point where the dowel is and wola! done. I'm interested on how you do with this one! Good Luck!  
Fred

Re: Dual rotor stator ... ([none / 0](#)) (#20)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Sat Sep 20th, 2003 at 08:18:43 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Thats a good idea iFred... Especially if you wanted to do a few of them instead of building "one offs" It would take a bit more work to lay it out and set it up but once you had it made you could make dozens of them as long as the mold lasted.

It was just an idea and I really hadn't planned on building one right away. It seems my mind wanders and ideas pop up now and then that I put down in a journal and when I have time I like to try new things. Looking back through my "idea" book sometimes what seemed like a good idea at first doesn't always work well in real life... others do... so I have to at least give them a try...

Have Fun  
Ed

[ [Parent](#) ]

Re: Dual rotor stator ... ([none / 0](#)) ([#25](#))  
by Old F on Sat Sep 20th, 2003 at 06:02:24 PM MST  
([User Info](#)) <http://www.oldf.homestead.com>

iFred

Looking at this like a foundry pattern you could use key stock glued to the bottom of the mold to form square slots in the casting.

You mite have to round the corners of the key stock a little. So that what will be the bottom of the slot of the finished stator will release from the mold this is called draft.

This would not be to hard to set up for a one of .

Old F

[ [Parent](#) ]

Re: Dual rotor stator ... ([none / 0](#)) ([#26](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Sat Sep 20th, 2003 at 06:18:59 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>



OldF, thats actualy a great idea. You could really pack it with alot of wire either turns or wire size depending on what you wanted out of it. Could almost make a corrugated type structure. This is getting better every minute.  
I take it you used to work in a foundry or still do?

Have Fun! Keep thinking!  
Ed

[ [Parent](#) ]

Re: Dual rotor stator ... ([none / 0](#)) ([#28](#))  
by Old F on Sat Sep 20th, 2003 at 09:08:02 PM MST  
([User Info](#)) <http://www.oldf.homestead.com>

Well ED

Foundry work is one of my other hobbies. All I cast is aluminum and a little brass. I know there are some others here that do some casting too. I think by go to a stack type mold you could center a square core that can be removed after it is setup. Let me think on this and I can try to come up with some drawings.

Old F

Have so much fun it should be illegal : )

[ [Parent](#) ]

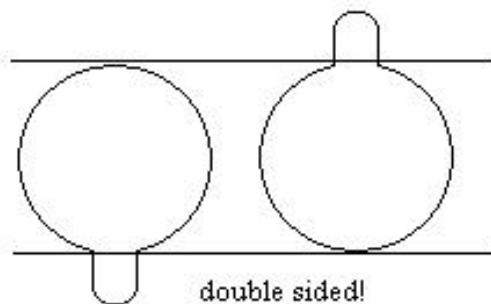
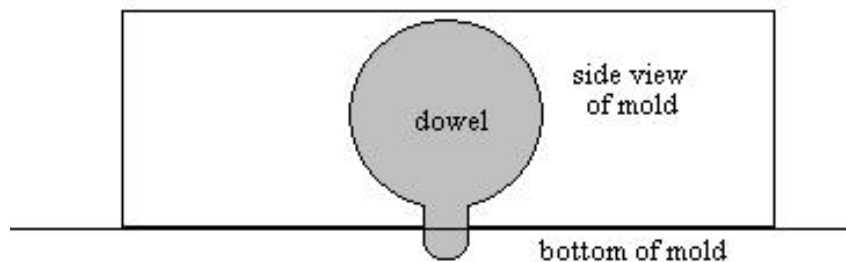
Re: Dual rotor stator ... ([none / 0](#)) ([#29](#))  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Sat Sep 20th, 2003 at 10:36:10 PM MST  
([User Info](#)) <http://www.internetfred.com>

Yes, that sounds about right! A single mold could be reusable if made properly. You know, you could have a slot on the dowel that is raised and ends in the bottom of the mold so that your cut is even made for you. Very cool!! I wonder what OLD F is thinking???? ummmm.. casting and foundry.. Very Cool!!!

Re: Dual rotor stator ... ([none / 0](#)) (#30)

by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Sat Sep 20th, 2003 at 10:54:26 PM MST

([User Info](#)) <http://www.internetfred.com>



This is what I was thinking!!  
Fred.

Re: Dual rotor stator ... ([none / 0](#)) (#31)

by Old F on Sun Sep 21st, 2003 at 07:47:48 AM MST

([User Info](#)) <http://www.oldf.homestead.com>



Here some thing that could work.

It is a split mold . When you lay out your mold you would drill holes the dia of your slot cores on the edge of the mold and the center mold core this will give you slots to place the key stock cores and hold them in place

This will all so give you some thing to get a hold of when it comes time to remove the cores from the stator.

You would have to coat the cores with melted wax so you can get them out.  
And I am thinking you could use a hair dryer to heat the cores soften the wax if need be.

Sorry about the ruff drawing all I have and know how to use is paint.

Old F

[ [Parent](#) ]

[Dual rotor stator ...](#) | 31 comments (31 topical, 0 editorial)

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## [Yet another VAWT](#)

By [windstuffnow](#), Section [Homebrewed Electricity](#)

Posted on Wed Sep 3rd, 2003 at 12:48:26 PM MST

[Wind](#)

What do you get when you combine a Darrieus, Savonius with other ideas...?

About a year ago I became intrigued by a couple patents dated in the mid 80's. They were basically the venturi effect type mills. After building each and testing them, I felt there was some real potential but they still lacked in efficiency, although, they did performed much better than the Savinious. I found after building them in varrious arrangements some were real duds and others seemed to work extreemly well and converted in the 30% range. The picture below shows a 2ft by 2ft turbine. This incorporates all that I've learned from building a dozen or more test units not including the darrieus and savonius units I built for learning and experimenting with...



This unit makes 17 watts in a 12.5mph wind and runs at 240 rpm. Its kind of frayed and was built in about 3 hours using simple materials (plywood and aluminum flashing) but definately shows it is possible to get very close to the efficiency of a Horizontal unit using a drag/lift type Vertical. It will start turning in a 4mph wind although it doesn't start charging until around 6mph.

It has a "fat" wing design similar to the savonius as well as leaving part of the wing uncovered, also similar to the savonius but the blades are angled differently. The "fat" wing creates really good lift but has a tendency to create more drag. The drum in the center helps to alter the direction of the incomming wind which adds lift on the

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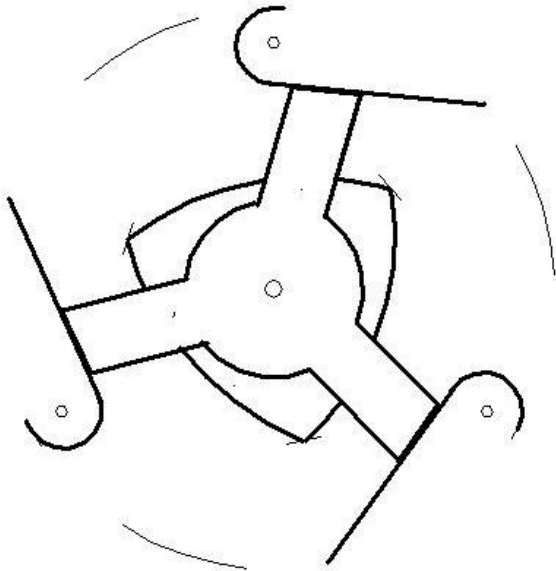
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upwind side. The original conception, as some of you may remember, was the "700 rpm coffee can". Unfortunately when I built a larger one using a 5 gal bucket it didn't work at all. After putting a small round can inside it started spinning on its own although not very well. This idea was changed and rebuilt several times before I finally realized what was going on. I believe I posted another one sometime ago but I can't seem to find any pictures of it. It worked very well but I wasn't completely satisfied with it. Once the "venturi effect" was embedded in my brain I started playing with different configurations of the coffee can design in larger 5 gal sizes. I found if you leave the inside wing flat instead of the original forming a wing on both sides it runs and starts much better. Adding a smaller drum in the center increased the power considerably. All the variables from all the designs are incorporated into this design in some way can you see them all in the diagram below?



Any thoughts or ideas?

Just having fun as usual...

Ed

[Yet another VAWT](#) | 16 comments (16 topical, 0 editorial)

I'm starting to feel tempted! ([none / 0](#)) ([#1](#))  
by DanB on Wed Sep 3rd, 2003 at 01:04:13 PM MST  
([User Info](#))

VAWT (vertical axis wind turbines) have always bugged me a bit...

but that's awesome Ed! I'm starting to feel tempted to try one! Thankyou so much for sharing.

Re: Yet another VAWT ([none / 0](#)) ([#2](#))  
by hvirtane on Wed Sep 3rd, 2003 at 02:18:40 PM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>



Really nice.

Thank you very much for sharing this design.

Can you give any book references about the 'Venturi effect'?

Which kind of generator are you using?

Are you going to build bigger ones using the same design?

What happens if you've got more blades and a corresponding middle part?

What happens if you make it tall and narrow?

What about fat and short?

RPM change only or different efficiency?

What about different blade shapes?

- Hannu

Re: Yet another VAWT ([none / 0](#)) (#5)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Wed  
Sep 3rd, 2003 at 05:08:55 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Hannu,

The alternator is an axial design ( of course) but its only a single phase unit. I built this up primarily for testing these things.

"Are you going to build bigger ones using the same design?"

I plan to build a 4ft dia x 6ft tall for practical testing, hopefully this year still but time is running short to get it up.

"What happens if you've got more blades and a corresponding middle part?"

I think it would increase drag and not allow the air to flow properly around the wings and drum.

"What happens if you make it tall and narrow?"

What about fat and short?

RPM change only or different efficiency?"

Since I've only been making models at this point I don't know the outcome of changing the aspect ratio.

I believe building it identical only taller shouldn't hurt the efficiency and the rpm's should remain similar, larger diameters would of course move much slower. This one runs at a TSR of about 1.3 loaded and just over 2 with no load.

I've also tried a bunch of different shapes for blades but these seem to have the best ( so far) bang for the buck. I'm sure there are some others that may improve it. The position of the triangular drum makes a major difference in its performance also which could be put on a centrifugal control system and control rpm for overspeed situations. Keeping it simple for now though....

Have Fun  
Ed

[ [Parent](#) ]

Re: Yet another VAWT ([none / 0](#)) ([#3](#))  
by Norm on Wed Sep 3rd, 2003 at 03:18:15 PM MST  
([User Info](#))

Beautiful Ed...an idea popped into my head the second I saw it ...the drum in the middle gives enough room inside of it for a very large diameter rigid pole that could be buried deep enough or with a wide supporting platform so there would be no need for any other support. (by the way that drum reminds me of a Wankel rotor!) still Havin Fun in NE Ohio please send some wind...I'm only gettin about 1-5 mph according to my homebrew anemometer 6.5" center of cup to axis figure 60rpm is 2.3 mph (about right?)Norm.

Re: Yet another VAWT ([none / 0](#)) ([#4](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Wed Sep 3rd, 2003 at 04:51:53 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Norm,Those were my thoughts exactly! I thought of using a pillow block bearing for the top support and 3 wheels around the pole at the bottom. It would be quite easy building the alternator inside the drum also but may present a maintenance problem.

I'm favoring the tower someone posted some time ago that pivots in the center... should be a fun project...

Have Fun  
Ed

[ [Parent](#) ]

Re: Yet another VAWT ([none / 0](#)) ([#6](#))  
by E man on Wed Sep 3rd, 2003 at 05:34:34 PM MST  
([User Info](#))

Very nice work Ed. I was planning to build a darrieus out of two old snowboards, but I can't find em for cheap. I think now I'll try my hand at one of your new-fangled VAWTs. How about "The Venturinator"? :-) One thing about VAWTs that's always puzzled me is when "lift" is produced it seems like the force would simply be directed in line with the axis and not produce any torque. I guess it's a resultant vector force thingy, but I can never quite figure out how the darn things work. Thanks again for the great info, Ed.

E-man

Re: Yet another VAWT ([none / 0](#)) ([#8](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Wed  
Sep 3rd, 2003 at 06:37:21 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Eman,

It is kind of mind boggling until you really get into the thick of it. Actually, I owe a bit of thanks to Hugh once again for helping me with the formula's for the wing angles.

If you take this thing apart and only use the drum it will spin but not much in the way of power.

If you remove the drum and only use the wings once again there isn't much there. The two combined at the correct angles and Zooom off she goes.

The Darrieus is sort of like that, it may start and it may spin but until it gets hit with the right air flow thats all it will do. Unless you give it a helping push to get it past the stall zone. Its like an engine with fouled plugs until they clear then its like a turbo kicked in. The force on the darrieus is very close to the center so you really don't get the full potential of the torque produced by the lift.

This design, I think so far, has the best of both worlds with start ability, low wind torque and reasonable rpms. It also produces good torque even loaded down to a TSR of .5 so matching the alternator isn't quite as critical as Horizontals although still a contributing factor for efficiency.

Time will tell...

Have Fun  
Ed

[ [Parent](#) ]

twisting the wind ([none / 0](#)) ([#7](#))  
by wdyasq on Wed Sep 3rd, 2003 at 06:22:02 PM MST  
([User Info](#))

Nice work, some of the features were used on the "Cory Jib Windmill", a 'soft sailed' machine designed by Will Cory in the late 60's or Early 70's. Will's design furled to self-regulate using centrifical force and a series of weights and springs. But he also pulled power both with drag and lift.

The gaps and airfoil shapes will be an interesting design problem. And one will also be able to pull power off the "rim" using it as a pully and driving a high speed alternator, if desired.

Ron

details for calculating the drum,wing, etc.  
([none / 0](#)) ([#12](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Thu  
Sep 4th, 2003 at 06:36:13 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

If anyone would like to build one to experiment with the formula's below will size things up. These dimensions were what I've calculated to work the best so far although I'm still working on some others...

Wing width or leading edge circle = diameter of the machine you wish to build x .14

Wing chord = circumference x .09 ( not to be confused by diameter)

Center drum radius = diameter x .28

The triangle drums points are set to point directly in line with the trailing edge. If you vary it more than a few degrees you loose efficiency. The top portion of the leading edge circle and the circle line up with the radius and creates a negative angle of attack. Its a very simple machine and takes very little time to put it together.

Have Fun  
Ed

[ [Parent](#) ]

Re: details for calculating the drum,wing, etc. ([none / 0](#)) ([#14](#))  
by John on Fri Sep 5th, 2003 at 03:05:16 AM MST  
([User Info](#))

Ed,  
Combined with your drawing your formulas should be enough to build your machine, but what about the radius of the bulge out of the triangle sides? Is it very critical?

Good work Ed, keep having fun!

John  
[Toxin absorber/Pain reliever](#)  
[ [Parent](#) ]

Re: details for calculating the drum,wing, etc. ([none / 0](#)) ([#15](#))  
by windstuffnow  
([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Fri Sep 5th, 2003 at 07:48:34 AM MST  
([User Info](#))  
<http://www.windstuffnow.com/main>

If you draw the center drum radius, section it into 3 points on the circle. The secondary radius is from one point to the next.

Have Fun  
Ed

[ [Parent](#) ]

Re: details for calculating the drum, wing, etc. ([none / 0](#)) ([#16](#))  
by John on Fri Sep 5th, 2003 at 02:08:59 PM MST  
([User Info](#))

Thanks Ed, now if I can only find (make) time to make one!

John

[Toxin absorber/Pain reliever](#)

[ [Parent](#) ]

Re: Yet another VAWT ([none / 0](#)) ([#9](#))  
by RobD on Wed Sep 3rd, 2003 at 09:04:43 PM MST  
([User Info](#))

Nice job as usual Ed.  
By the way I haven't forgotten the star/deltas. The world is spinning as fast as the mill here now.  
RobD

Re: Yet another VAWT ([none / 0](#)) ([#10](#))  
by LowTechWreck on Thu Sep 4th, 2003 at 05:51:03 AM MST  
([User Info](#))

Good Morning  
What If the blades were air foils with adjustable swivels where they connect to the top and bottom for easy angle of attack adjustment?

Re: Yet another VAWT ([none / 0](#)) ([#11](#))  
by drdongle on Thu Sep 4th, 2003 at 03:59:16 PM MST  
([User Info](#))

Seems that you could add an arm with a spring at the the end of each shaft with a weight on the end of it to automatically adjust the angle of attack depending on the speed/ centrifical force.

[ [Parent](#) ]

dimensions ([none / 0](#)) (#13)

by hvirtane on Fri Sep 5th, 2003 at 12:26:49 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

Ed told:

"If anyone would like to build one to experiment with the formula's below will size things up. These dimensions were what I've calculated to work the best so far although I'm still working on some others..."

Excellent.

This can lead to a development of a very good new style wind turbine.

I will introduce this idea of Ed to some people here capable of building wind turbines.

---

I've many times suggested in various places that somebody should start a movement to create freely available drawings for renewable energy things. In the style of the well-known GPL licence for 'free software'. I've several times written to the highest guru of the free software movement, RMS (Richard Stallmann) about this idea.

Please see:

<http://www.gnu.org>  
about the GPL licence.

- Hannu

[Yet another VAWT](#) | 16 comments (16 topical, 0 editorial)

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## [Air Foils](#)

By [windstuffnow](#), Section [Homebrewed Electricity](#)

Posted on Sat Jul 26th, 2003 at 08:49:16 AM MST

[Wind](#)

Database of airfoils....

Those of you that like to experiment with different airfoils for the blades may find it interesting to download a program that shows the profile of many different airfoils. The program is free and can be downloaded from...

<http://aerolab.virtualave.net/airfoil/index.html>

I've used the program for quite a few years and its very interesting. I typically print the profile and design the blade from there.

If you don't want to mess with the program but would like to look at the profiles of different airfoils you can click on the link at the top to get to a database of over 1500 airfoil designs in gif format.

Have Fun  
Ed

[Air Foils](#) | 1 comment (1 topical, 0 editorial)

Re: Air Foils ([none / 0](#)) ([#1](#))  
by Dutch ([rf.leenders@-###-NO-SPAM-###-planet.nl](mailto:rf.leenders@-###-NO-SPAM-###-planet.nl)) on  
Thu Jul 31st, 2003 at 02:21:18 PM MST  
([User Info](#))

Hi Ed,

It's a nice program especially considered the price...In my ongoing quest I found another program with a lot more features. It has a builtin virtual wind tunnel inside! Unfortunately its only free for five days. It's called DesignFOIL and you can find it here: [DesignFOIL](#)

DesignFOIL is based on the former program SNACK. DreesCode Software isn't selling it anymore, but if you search with Google you can find it still somewhere. It's a shareware program and you are allowed to use it for 30 days. It also has the virtual wind tunnel inside. You can even find a crack for it.

Moreover DreesCode has also a primer on aerodynamics: [primer](#)

Dutch

[Air Foils](#) | 1 comment (1 topical, 0 editorial)

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[Multi-Disc again](#)

By [windstuffnow](#), Section [Homebrewed Electricity](#)  
 Posted on Thu Jun 12th, 2003 at 04:38:35 PM MST  
 Still disappointed in the results...

[Alternators](#)

Well I'm going to write this one in as a learning experience. Although it performs fairly well, it doesn't do what I need it to do. It's going to go on another project sometime in the future. Voltage is a bit lower than I wanted and the amps aren't comming close in the rpm range I wanted. Maybe I expected to much from those tiny magnets. Connected to a 5hp honda connected through 4 100 amp auto rectifiers it was making about 165 amps at just over 700 rpm. I didn't hold it at that speed very long because my battery bank voltage was reaching close to 15 volts. I've built better single disc units... alot less work too! So I'm going to build a single disc unit for the one needed for my ongoing project. I must admit it was a fun project.

Back to the drawing board.

Always having fun...

Ed

[Multi-Disc again](#) | 19 comments (19 topical, 0 editorial)

Re: Multi-Disc again ([none / 0](#)) ([#1](#))  
 by TomW on Fri Jun 13th, 2003 at 01:32:51 AM MST  
[\(User Info\)](#) <http://oneota.net/~earthsorcepowr/>

Ed;

Man I never saw 165 amps from anything here. 2.5KW @ 700 rpm sounds pretty nice to me. Don't you get cut a lot out there on that bleeding edge? Not even sure if my measley 1300 AH bank could soak up much of that power without all the inverters running heaters.

Cheers.

TomW

[Stuff I have Online](#)  
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Re: Multi-Disc again ([none / 0](#)) ([#3](#))  
 by billf on Fri Jun 13th, 2003 at 07:26:23 AM MST  
[\(User Info\)](#)

I agree with Tomw. I thought I was happy with the 70 amps I was getting from mine. Now I wish I could get 165 amps from mine. So much for happiness. Oh well. You do good work Ed and even though you might be disapointed with the outcome, most of us, me especially, eagerly learn from the projects you undertake. billf

[ [Parent](#) ]

Re: Multi-Disc again ([none / 0](#)) ([#2](#))  
 by DanB on Fri Jun 13th, 2003 at 07:24:39 AM MST  
[\(User Info\)](#)

maybe you should "double up" the magnets!  
 not a very scientific way to go... that's what I always do when they don't come up to what I'd hoped for!

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Re: Multi-Disc again ([none / 0](#)) (#4)  
by xeroid ([centurion27@lycos.com](mailto:centurion27@lycos.com)) on Fri Jun 13th, 2003 at 07:44:48 AM MST  
([User Info](#))

Hi Ed.

Did I notice that in your picture you had 2 magnet rotors and 4 stators? is that right? I seem to remember hearing somewhere that dividing magnet disks up with 2 stators on either side divides up the magnetic field and murders the efficiency... I wasn't going to say anything, since I also noticed you had magnets on both sides of each rotor, but maybe the thing to try (when you have time in the future) is to have two rotors with a single stator between each set of 2 magnet disks on either side.

Something like this (poor excuse for a) diagram shows:



What do you think? It would be expensive, to use all those magnets, but the wire losses should not be too great, and the cogging issue should not be a problem...

Regards,

Xeroid

Re: Multi-Disc again ([none / 0](#)) (#5)  
by Bach On on Fri Jun 13th, 2003 at 08:20:16 AM MST  
([User Info](#)) [change AT: bach\\_on AT hotmail.com](mailto:bach_on@hotmail.com)

Ed,

If I'm following you, you're saying the problem is that the thing is not producing enough voltage at low RPMs? You said you're getting 165 amps at 700 RPMs. Can you go with fewer turns per coil to increase the voltage? Sounds like you're getting lots of amps, though you didn't tell us how it does for voltage or amps at lower RPMs.

Several questions:

1. How many coils per stator?
2. How many magnets per rotor?
3. I think you said the gap between rotor stator was .05 inches. Was that right?
4. How many magnets are actually placed close enough to excite each coil at any particular time?
5. What voltage/amperage readings do you get at various RPMs?

You had said there was an initial wiring screw-up (the coils on one stator were not alternated). Was that right? Did you correct this?

I'm just trying to understand the "internal" details. That's where the devils often lie in wait to screw us up.

Bach On

- I'm just as happy as if I had good sense! -

Re: Multi-Disc again ([none / 0](#)) (#7)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Fri Jun 13th, 2003 at 08:47:45 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Hi Bach On,

Here are the reading I got while testing...

100. rpm 8.78Vopen  
200. rpm 17.57Vopen 18.5 amps  
300. rpm 26.3Vopen 47.9 amps  
400. rpm 35.1Vopen 77 amps  
500. rpm 43.9Vopen 106 amps  
600. rpm 52.7Vopen 135 amps  
700. rpm 61.5Vopen 165 amps

Battery bank voltage varried from 12.6 to 15 where I stopped. Actually after I learned it wouldn't make 1000 watts at around 250 rpm the test seemed irrelevant but I continued to see what it would do. I didn't do any efficiency testing on the unit but it may be an interesting test just to see where it leads. I'm sure there are some hidden factors that havent been looked into as yet.

Actually it would need more turns to get the voltage up and this would change the resistance which would lower the oveall output to some degree.

Other data as per your question...

There are 120 coils per stator: 3 sets of 40

40 magnets per side on the disc's

The air gap ended up being about .045 thats magnet to coil. The over all gap from magnet to core is .105

In a 3 phase set up there are 2 phases excited at any given time. I guess the answer to #4 would be all 40 magnets will excite 80 coils at any given time per stator.

The wiring problem was cured by reversing the phase's on stators 2 and 4.

Interesting learning...

Have Fun  
Ed

[ [Parent](#) ]

Re: Multi-Disc again ([none / 0](#)) ([#10](#))  
by Bach On on Fri Jun 13th, 2003 at 11:34:47 AM MST  
([User Info](#)) [change AT: bach\\_on AT hotmail.com](#)

Sorry the new prototype didn't meet your expectations. Those output figures are, you must admit, nothing shabby. Many of us would soil our pants if our generators even began to hit figures approaching these - especially at such low RPMs.

Not sure of your sources for magnets, but you must have a substantial amount invested in those. I can understand your hesitation to add extra rotors. But I'd be willing to bet (with your money) extra rotors would increase the output to something more like what you wanted.

Is the voltage produced on all stators pretty much the same?

I suspect the gap from the magnets to the extra coils is causing losses. Too, the first set of coils may be creating something like eddy currents to block the other set of coils from getting the full amount of available flux. But, what do I know?

Bach On

P.S. Were these magnets placed in at an angle or laid out flat?  
- I'm just as happy as if I had good sense! -

[ [Parent](#) ]

Re: Multi-Disc again ([none / 0](#)) ([#11](#))  
by Bach On on Fri Jun 13th, 2003 at 03:05:40 PM MST  
([User Info](#)) [change AT: bach\\_on AT hotmail.com](#)

I said:

Were these magnets placed in at an angle or laid out flat?

I meant to say, "Were these coils placed in at an angle or laid out flat?"

B.O.

- I'm just as happy as if I had good sense! -

[ [Parent](#) ]

Re: Multi-Disc again ([none / 0](#)) (#6)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Fri Jun 13th, 2003 at 08:25:39 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Thanks all for the kind words. I really don't need the 165 amps for what I'm doing but I wanted a 1000 watt load at around 225 to 250 rpm max and it doesn't make 1000 watts until around 400 rpm. It performs far less than I've calculated it should. I measured .55 tesla in the air gap and calculated the output from this but going back over the output data its only achieving about .3 saturation. Or something else is going on I'm not realizing as yet. Xeroid may have a good point with the losses in a multidisc unit. I've built a single disc 2 stator unit that performed very well and exceptionally close to my calc's so I assumed ( a dangerous word - assumed) adding another set would do the same. Also, the center stators are separated by the width of the plywood...seems the losses of transferring flux between the stator cores would be minimul, although I never measured flux loss between the cores. DanB's idea of doubling the magnets may cure the problem but thats alot of magnets. I may just use it as is on another project.

Thanks for your kind words TomW and BillF and 80 amps is nothing to be ashamed of thats a nice machine. Some of my early machines I was tickled pink to see 30 amps... I never had a wonderful board like this to learn from.

Here is a question that I have about magnets and maybe someone has run into a site or book with some data about it... Is there a limit to the amount of amps a magnet will produce given a size and strength of the magnetic field. Since the magnets I used are very small ( 1" x .5 x .125) possibly the amount of power they can produce is much lower than my actual calculations. Just another thought.

Have Fun  
Ed

Re: Multi-Disc again ([none / 0](#)) (#8)  
by troy on Fri Jun 13th, 2003 at 10:17:34 AM MST  
([User Info](#))

Hi Ed,

I think your prototype is an important and successfull step. And in my prior experience (not just in alternators), the first prototype barely works at all, the second one shows that it's possible but never really makes it and the third one actually meets most of the original design criterion. So if this is your first multi-rotor/multi-stator multi-phase prototype, you're way ahead of where I would be on the first prototype.

I hope my next "failure" is as good as yours.

On the separate question of the limiting factor for max watts out of a given size magnet, one of the neo mag sites I read said that total flux for a single magnet was linearly proportional to mag volume. So I'm guessing that with your small magnets, the flux density is adequate right in the middle of the face of the magnet, but limited in it's area. ie it falls off rapidly as you leave the magnetic epicenter of the small neo. Or perhaps I am just showing my love for large expensive magnets...

Best Regards as always,

troy

[ [Parent](#) ]

Re: Multi-Disc again ([none / 0](#)) (#9)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Fri Jun 13th, 2003 at 10:33:51 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>



Thanks for the input troy,

This isn't my first multi stator unit but it is the first one with multi disc/ multi stator units. It seems they are pretty much isolated from each other and should perform about the same. There could be other things going on I'm not seeing as yet. I don't consider it to be a failure, it simply failed to perform to my expectations. I needed 36 ft lbs at 250 rpm for a load and it just doesn't quite make the load. That assumes I can get 75% efficiency through the alternator. At this point I'd say the efficiency is pretty poor on the multi unit (this one anyway)... I have another one in mind...

Have Fun  
Ed

[ [Parent](#) ]

Re: Multi-Disc again ([none / 0](#)) ([#12](#))  
by troy on Fri Jun 13th, 2003 at 03:26:36 PM MST  
([User Info](#))

When I finally get one built to my satisfaction, I'm going to name it the HG-2k25, which stands for:

Holy Grail, 2kw at 25mph

Keep sluggin',

troy

[ [Parent](#) ]

Re: Multi-Disc again ([none / 0](#)) ([#13](#))  
by scoraigwind ([magnet@scoraigwind.co.uk](mailto:magnet@scoraigwind.co.uk)) on Sat Jun 14th, 2003 at 11:08:59 AM MST  
([User Info](#)) <http://www.scoraigwind.co.uk>

If you have stators on both sides of the magnet disk, then you need twice as much magnetic force to create the same flux as a single sided version. You will need to double the thickness of your magnets to overcome the double air gap.

A case of not getting something for nothing.

If you want to get the most possible output from a given weight of magnets and coils, then multidisk (stacked up) machines are not the best way to go. You would do better if every coil saw the flux from every magnet in each revolution, so you should put all the magnets on one disk, and then increase the diameter of the rotor to as large as possible. I know this may not be practical but it can work at low speed.

Looking at the data you have given, it appears that the alternator may already be past its best by the time you get 1000 watts. You could probably get 1000 watts at lower rpm by reducing the number of turns per coil and going for a higher cut-in speed but steeper output curve.

I do wonder what you can use to drive this beast other than an engine though and how long it would last before overheating? I estimate you may be using 8kW of drive power to produce 2kW of output.

Hugh Piggott <http://www.scoraigwind.co.uk>

[ [Parent](#) ]

Re: Multi-Disc again ([none / 0](#)) ([#14](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Sat Jun 14th, 2003 at 06:51:47 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

I believe your quite right, I was driving it with a 5hp honda engine and when it was making about 2400 watts the engine was pulling hard to maintain. The efficiency is really poor as my results have shown and I'm guessing at around 50% at low speed and diving to around 30% as the load increases. Definatly not one of my better ideas. It would be difficult to reduce the turns per coil since they are all one turn. I may try doubling the magnets just for the test and learning but doubt I'll use this one. Its actually 10lbs over what I wanted also... back to the drawing board...

Having fun!  
Ed

[ [Parent](#) ]

Re: Multi-Disc again ([none / 0](#)) ([#15](#))  
by wiredup on Mon Jun 16th, 2003 at 07:35:21 PM MST  
([User Info](#))

hey ed keep up the good work.i like your endeavors of thinking outside the box,helps us all to know. thanks for your time spent wisely,even if every experince dont prove positive. and thanks for posting your findings.....staples

Re: Multi-Disc again ([none / 0](#)) ([#16](#))  
by hvirtane on Tue Jun 17th, 2003 at 03:11:34 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

" You would do better if every coil saw the flux from every magnet in each revolution, so you should put all the magnets on one disk, and then increase the diameter of the rotor to as large as possible. I know this may not be practical but it can work at low speed."

I think that the above comment is very true.

Of course you will get the best power at slow speeds, if your magnetic flux is as strong as possible and it changes as fast as possible.

a)  
With the disc layout.  
It is easiest to achieve this using a big disc for the magnets, because then they are moving fast past the coils.

b)  
But on the other hand your magnets must be near each other to get the magnetic flux changing fast...

These two points a) and b) are demanding a bit different layouts?

I think that you are doing the best if you first make your disc that big only that the magnets can be laid next to each other only a couple of mm between them.

And then make as many discs as needed to fulfill that task?

I think that a multi disc layout is an important development, because that way alternators can be made scalable.

But:  
I think that better alternators could be done by using a steel cylinder and putting the magnets inside that; making the laminated core of a plastic cylinder coiled with thin steel wires and gluing copper coils on the top... so that the laminated coil core can be fitted inside the magnet cylinder...

The magnet cylinder should be as big as possible for

magnets so that there is only little space between them to achieve the alternator to reach its peak efficiency at slow speeds?

Some modern motorcycle alternators are using this kind of layout.

- Hannu

Re: Multi-Disc again ([none / 0](#)) ([#17](#))  
by [Wolfe1](#) on Tue Jun 17th, 2003 at 06:12:31 AM MST  
([User Info](#))

But your logic breaks down on this part: -

I think that you are doing the best if you first make your disc that big only that the magnets can be laid next to each other only a couple of mm between them.

And then make as many discs as needed to fulfill that task?

If you are going to make more discs, you are going to use more magnets. You could make the single disc bigger and use those other magnets here as well. Wouldn't that produce more power than two discs at the original size?

There are obvious limitations on size of these discs and the glue that will hold these magnets down but we are talking theoretical here not practical.

Martin.

[ [Parent](#) ]

Re: Multi-Disc again ([none / 0](#)) ([#18](#))  
by [Electric Ed](#) on Tue Jun 17th, 2003 at 10:18:14 AM MST  
([User Info](#)) <http://www.electric-ed.com>

[quote]But on the other hand your magnets must be near each other to get the magnetic flux changing fast...[quote]

The statement quoted above is not accurate.

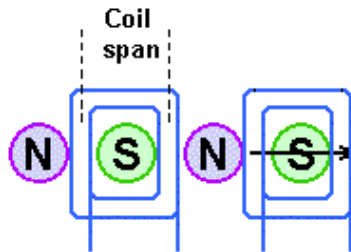
Some flux is actually wasted if the magnets are spaced closer than the optimum spacing, which is always equal to the coil "span".

## Magnet / Coil Spacing

In order to connect coils in series or parallel, so that the voltages, (or currents in parallel) will add instead of cancelling, the voltages induced in the coils must be "in phase" with each other.

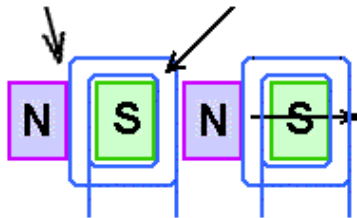
The only way to ensure that the coil voltages are in phase is by accurate magnet / coil spacing.

Magnet center-to-center spacing should equal the coil "span".



The objective is to have the leading edge of a NORTH pole reach one side of the coil - -

- - just as the leading edge of a SOUTH pole reaches the other side of the same coil.



Both leakage flux and voltage cancellation can occur if the magnets are too close together.

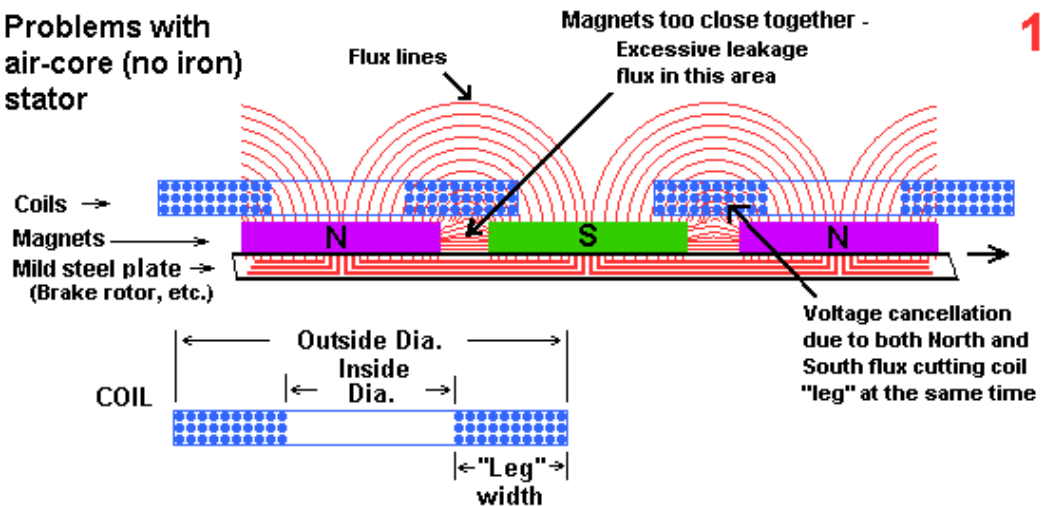
It is not a "fast change" in magnetic polarity that increases voltage. Voltage is determined by the number of magnetic flux lines cut (by the conductors) per second.  
 $100,000,000 \text{ lines-per-second} = 1 \text{ volt.}$

The voltage generated per coil can be increased by increasing any of the following:-

1. Total flux cutting (linking) coil.
2. Length of conductor in coil influenced by the flux lines
3. Linear speed of motion.

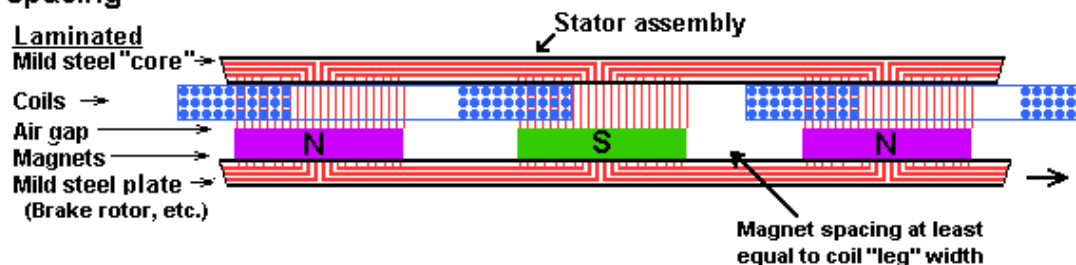
I like the dual-rotor for an efficient magnetic circuit.

**Problems with air-core (no iron) stator**



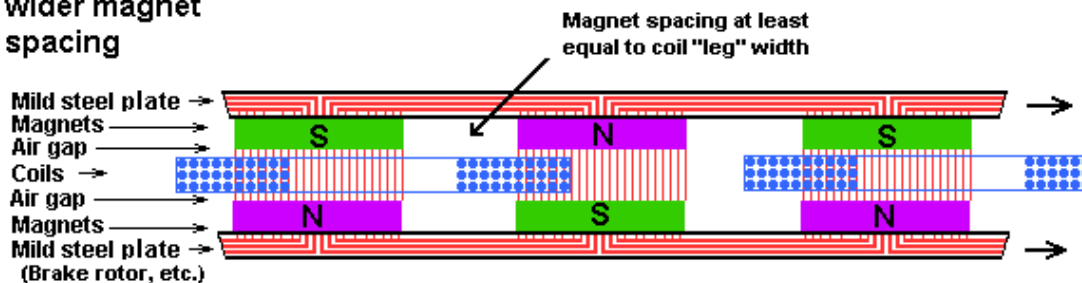
**Laminated "Core" and wider magnet spacing**

**2 - BETTER**



**Dual rotors with wider magnet spacing**

**3 - BEST**



Electric Ed

[ [Parent](#) ]

Re: Multi-Disc again ([none / 0](#)) (#19)  
 by hvirtane on Wed Jun 18th, 2003 at 04:42:18 AM MST  
 (User Info) <http://www.cc.jyu.fi/~hvirtane/cooker/>

If you are going to make more discs,  
you are going to use more magnets.  
You could make the single disc bigger  
and use those other magnets here as well.  
Wouldn't that produce more power  
than two discs at the original size?

There are obvious limitations on size of  
these discs  
and the glue that will hold these magnets  
down  
but we are talking theoretical here not  
practical.

Martin.

Yes, you are right.

I was just thinking that it would be usable to  
develop 'a scalable generator' such a way that  
for a given set of magnets we first developed  
a best possible disc layout. And then could scale  
the generator up by just adding more similar discs.  
No need to redesign the whole thing again.

I agree that better power probably would be got by  
making a new design with a bigger disc if we add  
more magnets. But then we have again got the  
all the same design problems?

There are so many things, which have to be considered.  
Cf. below.

-----  
-----

[quote]But on the other hand your magnets  
must be near each other to get the magnetic  
flux changing fast...[quote]

The statement quoted above is not accurate.

Some flux is actually wasted if the magnets  
are spaced closer than the optimum spacing,  
which is always equal to the coil "span".

I agree.  
The coils must be taken into consideration as well.

But basically I think that the magnets  
should be as near to  
each other as 'possible'.  
(If there is empty space between them  
there is very little magnetic flux starting  
from that 'empty area'?)  
If we could get coils to fit to the arrangement  
of putting magnets near to each other  
it would be good?

I think that by using round disc magnets  
it is not possible to  
make really 'ideal' alternators.  
The coil shape cannot be  
made really ideal?

Maybe sectors, which Ed is often using are quite a lot  
better?

And on the other hand I think that  
if the coils would be long  
and narrow, it would make better alternators?

That could be possible, if the layout would be something  
like Hugh's 'brakedrum alternator'.

- Hannu



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[Multi Disc alternator...](#)

By [windstuffnow](#), Section [Homebrewed Electricity](#)  
Posted on Wed Jun 11th, 2003 at 12:10:16 PM MST  
I screwed this one up...

[Alternators](#)

Well I finally found time to complete the unit... Shown below...



After getting it together and was looking at, things for some reason didn't look right. It dawned on me that although I offset the phasing to connect them all together I wound the stators in the same direction... So the 1st and 3rd stators are the only ones that were done correctly. I'm glad I caught it before I started wiring it or went any farther...

Needless to say its 40 pounds of junk as is... goes to show you if your busy doing other things you tend not to think things through completely. I should know better to try and build anything for myself when other projects are in my mind. I'll go back to it when things are caught up...

Still Fun though... you learn the most from the things you screw up..

Ed

[Multi Disc alternator...](#) | 11 comments (11 topical, 0 editorial)

Re: Multi Disc alternator... ([none / 0](#)) ([#1](#))  
by [RonD](#) on Wed Jun 11th, 2003 at 12:29:11 PM MST  
([User Info](#))

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Could you just switch the tails and starts? It sounds like its only off 180 degrees or simply reversed.

Re: Multi Disc alternator... ([none / 0](#)) ([#2](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Wed Jun 11th, 2003  
at 01:35:03 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

I was just pondering the delemma and came to the same conclusion. I would basically have to designate the 3rd phase of the second stator as the first phase. I scraped a couple wires and did some quick voltage tests and it seems to work. So basically I have to reverse the phase's on the 2nd and 4th stator.

That should save some time... very short of at this point.

Having Fun again...

Ed

[ [Parent](#) ]

Re: Multi Disc alternator... ([none / 0](#)) ([#3](#))  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Wed Jun 11th, 2003 at 06:27:10 PM MST  
([User Info](#)) <http://www.internetfred.com>

Yeaaaaa, thatsssss nice! I was thinking the same thing this week, multi-rotor. Cool that you built it! And yes the mind does have a way of wondering around doesn't it.... Always wants more, and the more you give it the more it wants...confusing. Anyway, I think you have now set the boundary line for next generation gennys. Multi-rotor designs have many advantages. But core is still somewhat a problem. The metal strapping works good, also i found out that the more narrow the cuts into it the better. Wider cuts means cogging it seems. How's the cog or resistance on this machine?

Re: Multi Disc alternator... ([none / 0](#)) ([#4](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Wed Jun 11th, 2003  
at 06:59:19 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

I still haven't completed it for any real tests. I did do a quick wire on one phase to check the voltage and amps and its quite impressive. Dead short turning by hand showed 8 amps. I have a key slot in the shaft to line up the magnetic rotors and it was torquing into my hand so I didn't push it. There is no noticeable cogging and it turns very smooth and easy. Open voltage on 1 phase was just over 8 at about 60 rpm. That should get me about 13+ volts wired in star at 60 rpm. After confusion, dissatisfaction in my wiring and kicking myself in the butt several hundred times I calmed down enough to think it through and switched the first with the 3rd phase all turned out well.

It has a couple bugs I don't like and I'm going to disassemble it tonight and try to fine tune it a bit. One rotor has a very slight wobble so I want to put it back in the lathe and surface the hub and

I think I made one to many spacers for the end plate because the air gap on the rear stator is at about .05 the others came in correct at .03 go figure... To much of a hurry in the short time spans I had to play with it... lesson learned.

Picture of the rotors before installed...



Having fun  
Ed  
>

[ [Parent](#) ]

Re: Multi Disc alternator... ([none / 0](#)) ([#5](#))  
by Anonymous Hero on Wed Jun 11th, 2003 at 07:47:14 PM MST

Beautiful work, Ed! What are you going to have driving that machine? Oh to have a lathe!! REal nice. Jungle Bill

Re: Multi Disc alternator... ([none / 0](#)) ([#7](#))  
by RobD on Thu Jun 12th, 2003 at 07:25:50 AM MST  
([User Info](#))

Looks nice Ed. I'm thinking of a material better than the plywood, although I may be underestimating its durability. RobD

[ [Parent](#) ]

Re: Multi Disc alternator... ([none / 0](#)) ([#6](#))  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Wed Jun 11th, 2003 at 10:26:32 PM MST  
([User Info](#)) <http://www.internetfred.com>

Hey Ed, don't kick to hard, it's a learning phase, I've noticed is that when you make a mistake you learn from it and learn never to do it again! He he.. ;-). As for the output, that is sweet! What's the diameter of that stator? anyway, sounds however like you really wanted to complete the project to see if it's going to put out. Tolerances=output! Stick with it and fine tune. She's a really fine machine however no matter how much trouble she gives you!! Keep it up, your only getting better each time!!

Re: Multi Disc alternator... ([none / 0](#)) ([#8](#))  
by DanB on Thu Jun 12th, 2003 at 08:09:47 AM MST  
([User Info](#))

Incredible Ed...  
Curious... what are the physical dimensions of this, Im having a hard time picturing its size.

Is it for a wind turbine?

Wonderful thing about alternators and wind turbines... most of that stuff isnt junk! Even if you have to do a bit of rewinding it's not the end of the world...

Good luck and have fun!

Re: Multi Disc alternator... ([none / 0](#)) ([#9](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Thu Jun 12th, 2003  
at 08:39:58 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

The physical dimensions of the unit are 5.75" wide (board to board) and 11" square. The discs are 10" diameter. Weight is 45 lbs. The shaft is 12 inches.

Basically a test bed for wind power applications, although, I have some real strange idea's for a concept motor that will require a heavy load. For the most part it was designed around the free wing concept.

I had no intentions of throwing in the towel on this. I was frustrated because of time limits and wanted to move forward with the project. With the thoughts of rewinding the two stators would have pushed the project farther into the future because of other work comming in. So in my mind it was junk until I had time to get back to it.

But, if all goes well I should have some numbers on it by this weekend... Seems like I've been saying this for a few weekends now... Anyway all is still a go and no matter what the project will go forward.

Have Fun!  
Ed

[ [Parent](#) ]

Re: Multi Disc alternator... ([none / 0](#)) ([#10](#))  
by troy on Thu Jun 12th, 2003 at 10:29:44 AM MST  
([User Info](#))

Glad you found a shortcut to make things right! Exciting design and can't wait for numbers. Do you have a bearing numberbrand for your bearings, as that looks like a nice neat assembly.

Best Regards,

troy

[ [Parent](#) ]

Re: Multi Disc alternator... ([none / 0](#)) ([#11](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Thu Jun  
12th, 2003 at 11:25:32 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

The bearings are standard pillow block bearings with a 4 bolt flange. I purchased them from Northern tools and they were 9.99 each. Quite reasonable and simple to use.

Have Fun  
Ed

[ [Parent](#) ]

[Multi Disc alternator...](#) | 11 comments (11 topical, 0 editorial)

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### [Multi-disc alternator preview](#)

By [windstuffnow](#), Section [Homebrewed Electricity](#)

Posted on Tue Jun 3rd, 2003 at 12:29:17 PM MST

[Alternators](#)

Going slow - but its getting there...

Between all the interruptions and other things going on this project has slowed down a bit. I wanted to get this together this last weekend but had to finish a 49 panel truck. So its been an hour here and an hour there...

Building up the stators...



This shows the silicon core laminated to the plywood...

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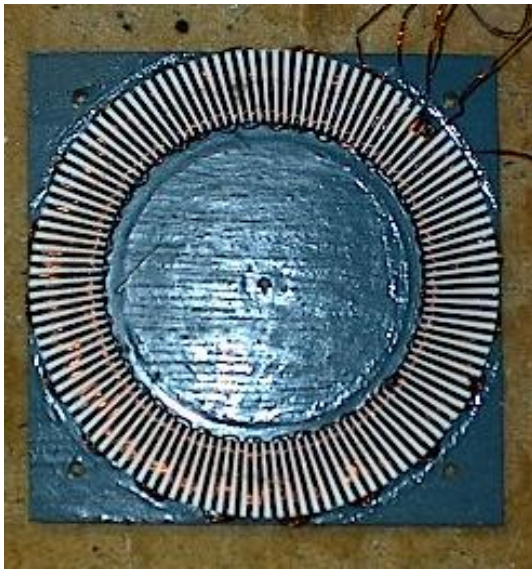
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I had to make some rubber gaskets to pour the plastic over the iron and wood. You can see the plastic poured in place before it hardened...



After the plastic hardened the slots were machined in the plastic... super smooth cuts and it went quite quickly.



Here shows the stator wired and waiting for the bearing holes.

There is 1 turn per coil, 40 magnets on each side of the disc. There will be 4 stators altogether utilizing 160 magnets (they are small - 1" x .5" x 1/8"). All the stators will be wired in series. This is a 3phase unit and the resistance per phase is .03 ohms. It should come out to about .3 ohms wired in star or close. My calculations show it should make just over 2000 watts at 500 rpm but I don't plan to run it over 300 rpm so it should lug along making just over 1000 watts quite nicely. The air gap will be one wire thickness (.064) plus the clearance gap of about .020+ . It should make 12V at around 60 rpm but like all calculations there is a difference between calculated and reality because of all the variables. This is the first time I've tried the plastic as a wire retainer so I don't know how it will hold up. It seems to be fine at 200 degrees and at about 250 you can push your thumbnail into it. I don't think it will run this hot so it should work out... we'll see. I'm hoping to see it ready for tests this coming weekend... barring any other interruptions...

Having Fun as usual...  
Ed

[Multi-disc alternator preview](#) | 9 comments (9 topical, 0 editorial)

Building Stator ([none / 0](#)) (#1)  
by Bruce Downunder on Tue Jun 3rd, 2003 at 02:44:55 PM MST  
([User Info](#))

Lovely work Ed. Is it possibly that you took some photo's of the machining of the slots in the plastic ? please. The plastic, could you describe it's most common application --I would like to lookaround here in Sydney for the stuff. Thanks, and you are very neat. Bruce.

Liquid plastic... ([none / 0](#)) (#2)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Tue Jun 3rd, 2003 at 04:16:03 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Thanks Bruce for the kind words. The liquid plastic and rubber for that matter was purchased from <http://www.smooth-on.com> . They have alot of different grades for different purposes. It's really easy to use and you can start machining 25 minutes after pouring. The rubber for making molds takes several hours to harden up. I've been making a bunch of stuff with it. We'll see how it holds up in an alternator..

Have Fun  
Ed

[ [Parent](#) ]

Hi Ed, ([none / 0](#)) (#3)  
by troy on Tue Jun 3rd, 2003 at 04:48:10 PM  
MST  
([User Info](#))

Lovely work as usual, and innovative too. Did I notice that the slots in the stator are a little bit skewed from "true radial" orientation???

Is that a means of reducing cogging or some other cool feature I am unaware of? Or perhaps just an optical illusion.

Best Regards,

troy

[ [Parent](#) ]

Quite observent! ([none / 0](#)) (#4)  
by windstuffnow  
([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Tue Jun 3rd,  
2003 at 06:58:35 PM MST  
([User Info](#))  
<http://www.windstuffnow.com/main>

Ha ha you have a keen eye... your right they are. I never in my wildest dreams thought anyone would notice that... I noticed along time ago when using rectangular magnets over triangular shaped coils that the lower edge of the magnet is going in as the other side is comming out... canceling basically. By setting them slightly on an angle the full side of the magnet goes into the coil and only a very tiny tip of the trailing corner is in the field. Basically lining up the entry edge of the magnet with the entry of the coil.

Good catch troy... can't keep any secrets from you ;o)

Have Fun  
Ed

[ [Parent](#) ]

Coil leg angle ([none / 0](#)) (#9)  
by scoraigwind  
([magnet@scoraigwind.co.uk](mailto:magnet@scoraigwind.co.uk)) on Sun  
Jun 8th, 2003 at 04:50:52 PM MST  
([User Info](#))  
<http://www.scoraigwind.co.uk>

Hmm, Ed

I am not convinced that you will gain anything by angling the slots, because it will put the other side of the coil just as far 'off line' as it put the leading edge on the desired line.

In the end, the voltage is induced by the rate at which flux through the coil as a whole changes.

You will get the most flux by laying the coil legs radially along the centres of the magnets. That way they will both peak at once, and both hit zero at once. No fighting each other.

Of course you can't put all the wires there. Also, there is a small tradeoff in making the coil narrower so as to reduce the length of wire (resistance).

That's how I see it anyway :-). We all have our own mental map.  
Hugh Piggott  
<http://www.scoraigwind.co.uk>  
[ [Parent](#) ]

my eyes ??? ([none / 0](#)) (#5)  
by Bruce Downunder on Tue Jun 3rd, 2003 at 09:58:42 PM  
MST  
([User Info](#))

Hey guys, I saw that offset angle . But ,having to live with these set of eyes for 58 years, I just shut my mouth . Very good, you seem to think very deeply about the small details. Can't wait to see the next photo show !!. Thanks Bruce.

WOW!! Nice design. ([none / 0](#)) (#6)  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Thu Jun 5th, 2003  
at 01:49:16 AM MST  
([User Info](#)) <http://www.internetfred.com>

You outdid yourself on that one! Very nice design. Keep up the great work Ed!



49 panel delivery ([none / 0](#)) (#7)  
by wiredup on Thu Jun 5th, 2003 at 11:50:30 AM MST  
([User Info](#))

hey ed your stator is looking good.but what are you doing to the 49 panel. have owned to old deliveries a 58 ford and 57 chevy. cleaned them up put new motor and complete interiors used them to haul furniture to be reupholstered.now i only do cars and truck coustome interior, and read about new ground being broke here on this board...staples

Old cars... ([none / 0](#)) (#8)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Thu Jun 5th, 2003 at 01:54:03 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

The 49 is the last of my restoration projects. This one was sitting for a very long time and was used as a billboard. Basically moved out in the summer and back in in the winter. It has 8,000 acutal miles on it. I did it as a favor for a friend that I restored a 56 2drHt. I retired from building streetrods and restorations about 10 years ago... just got burned out, seemed everyone wanted their car/truck done and I just started loosing interest. So basically all I do now is R&D work and design.

Have Fun  
Ed

[ [Parent](#) ]

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## Odd Idea...

By [windstuffnow](#), Section [Homebrewed Electricity](#)  
 Posted on Fri May 16th, 2003 at 11:25:09 AM MST [Free Energy](#)  
 Thinking of the gravity motor idea...

I've always been intrigued with these types of motors ( or any motor for that matter). After calculating out the potential of a gravity motor I started thinking of ways to power it. I'm looking for the cheapest method to move weights and by cheap I mean the least amount of power or the least loss between energy transfere.

Some of the methods that I've pondered are:

compressed air:

- driving a cylinder to move the weights  
 (drawback: not very efficient energy transfere and high volumn of air necessary)

Solar:

- using the expansion or contraction of soft metals or other material with better expansion rates. ( drawback: High maintenance with fatigue)
- hybrid stirling displacer to drive the cylinders.

The stirling idea seems about the best for the purpose but also has its drawbacks.

Any ideas out there to move the weights? This is just an idea at this point and was spawned from the Pelton wheel as well as Techstuf's version.

I built a small solar gravity motor many years ago using 2 paper cups, cut strips of black garbage bag plastic and some tape, a pencil and pins. You stretch the plastic and place strips around the cups. The cups have a hole in the bottoms in the center and are placed on the pencil bottom to bottom with a small space between them. Pins are used for a frictionless surface to rotate. There were about 10 strips of plastic around the outer edge of the cups taped in place. When placed in a window the sun would heat the plastic, shrinking it a bit and pull the cups off balance. It took a little while but it would actually find a speed with the heat given and would run about 10 rpm. Fun to watch but no practical use for it.

All in good fun!

Ed

[Odd Idea...](#) | 4 comments (4 topical, 0 editorial)

air ([none / 0](#)) (#1)  
 by Chuck on Fri May 16th, 2003 at 12:23:42 PM MST  
 ([User Info](#)) <http://www.greeleynet.com/~cmorrison>

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I picked up a book called "Perpetual Motion, history of an obsession" a while back and it puts me to sleep on those few nights I need help.

In about the middle of the book is a chapter on a fellow who used changes in atmospheric pressure (think big barometer) to wind a clock spring. While it was a clunky looking thing, it all fit into a grandfather clock case and lo and behold, it actually worked for many years. In a climate with a decent amount of weather, this could be the ticket for keeping those gravity motors going. What is a clock anyway but a gravity motor (pendulum).

Could be just the thing. :o)

Chuck

PS, nice little solar motor idea. Could be a good classroom project.  
Chuck

Class Room Project ([none / 0](#)) (#2)  
by Johnny Cool Pants on Fri May 16th, 2003 at 07:48:31 PM MST  
([User Info](#))

Yes could be a class room project, but I saw the words, "Gravity Wheel" Hmmmmmm? Sounds like an article for the Quarantine Zine???? My gander feels goosed.

Not Free energy.... ([none / 0](#)) (#3)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Fri May 16th, 2003 at 08:24:41 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Nope JCP this one would require power to drive the weights... I wasn't sure what category to put it under and figured since its a strange idea I'd put it under the FE area even though its not.

Trying to find ways to alleviate one or two steps in energy transference.... Seems like we're always defeating ourselves.. Wind blades to alternator to wire to batteries to inverter whew... lucky there is anything left in the end. Or, Gasoline in a car... 3/4 of the energy in a gallon of gas is wasted... engines aren't good converters.

Here is another crazy idea.... instead of using a gas engine or electric motor to drive a pump to compress air, why not simply inject the tank with a preset amount of oxygen and gas mixture and ignite it... instant 160 psi...or BOOM!... assuming you get the mixture right of course... that would have to be an underground experiment to find the correct mixture, going in small increments.

Anyway, you get my point... reduce the amount of steps to get what we want from the stored source...

Having Fun... must be the pain killers

Ed

[ [Parent](#) ]

hard way ([none / 0](#)) (#4)  
by Johnny Cool Pants on Tue Jun 3rd, 2003 at  
04:26:18 AM MST  
([User Info](#))

Okay Ed, I'm gonna tell you how to do it the hard way, since none of you believe it can be done the easy way.

Gas is lighter than water, but water gas increases in volume, weighing the same or not.

Have a huge iron wheel, each spoke is hollow and has (some) water in it.

As the wheel turns, the spokes on the way up have their water flash steamed, making it a gas for a moment.

Or, on the way down, if you have a vacuum in the spoke and the spoke is a long piston. Then hydrogenate it on the way down, sending out the long extended iron spoke piston (leverage for the way down.

The vacuum sucks it back in again on it's way up the other side of the wheel. Might end up with left over electricity, never know.

Or use hydraulics, try beeswax with Bill if you can find him. I intended to try it with memory metal, but then I forgot. I need more iron in my diet.

I'll work on anything at this point. That's the problem with free juice, once you figure it out, you have no project anymore.

JCP

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### [More on coils...](#)

By [windstuffnow](#), Section [Homebrewed Electricity](#)  
Posted on Wed May 14th, 2003 at 07:29:31 PM MST [Alternators](#)  
Need more wire in a small space?...

You can pack more of the same size wire in the same space by using ribbon wire. For instance using a slotted stator with a slot of .25 wide by .25 deep. If say your using #15 wire which is .062 diameter with the coating you can only get 16 turns of wire in the slot. In order to increase the number of turns you either need to open up the slot or go with smaller wire. Well, If you use ribbon wire that is .012 wide x .25 tall you can increase the amount of turns to 21 thus increasing voltage at a given rpm. Square wire also helps to fill the lost area from circular wire and can increase the output considerably. If you used square wire that was .062 square you'd still only get 16 turns in the slots but would be the equivalent of #14 wire instead of #15. So if you needed 6 inches per turn x 16 turns = 96 inches (8ft) of wire per coil the resistance would go from #15 wire .026 ohm to #14 wire .020 per coil. Say a set of 16 coils means going from .416 ohms down to .32... thats quite a boost of power at a given rpm.

DanB shows a concern in the wasted wire on the top and bottom loops... I too went there and came up with some pretty strange configurations that worked well but were difficult to build. Imagine cutting sections of wire for the slots on both ends a perf board for the wires to go into.

On the perf board are plates that match up the turns of wire. Each of the plates are large enough to be considered 0 resistance or so low the resistance is irrelevant so the current flows freely through the top and bottom. Difficult to build but the output is astronomical. Another way is to use stamped plates with the top and bottom very wide while the area through the slots are sized proportionately.

The plates are stacked and each has an attachment slot and assembled such as a slinky. This also works very well with the exception of the wide area of copper showing in the magnetic field. I was able to actually double the amount of turns in a slot with 1/2 the resistance of the wire replaced using this theme. The drawback... Because of the wide area of copper showing in the slots created much more drag ( lenz's law ) and produced alot of heat.

There are many ways to overcome geometry problems some good and some well not so good but it can be done.

This is just my experience with these things and for those who want to take it to another level. I'm still waiting for the room temp super conductors to play with... Although I believe I can come up with a configuration that will come very close to the output of such a wire...

My quest for the holy grail in wind power goes on... It seems I'm always at the beginning.

So much fun... so little time

Ed

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Ribbon Wire ([none / 0](#)) (#1)

by DanB on Wed May 14th, 2003 at 07:40:28 PM MST  
([User Info](#))

I was thinking about that Ed...

Like this stuff : <http://alphacore.com/laminax.htm>

These guys have some interesting products. Wish they had a nice size "in stock" laminated torroid core!

My guess is that stuff costs a bit more, but it sure would make for tight/tidy coils max possible copper packed in there.

link ([none / 0](#)) (#2)

by Johnny Cool Pants on Thu May 15th, 2003 at 01:21:27 AM MST  
([User Info](#))

I was going to ask about copper foil in place of wire but since I knew it all this week... Well anyway that link you just posted answered some questions.  
Thanks Dan

[ [Parent](#) ]

well ([none / 0](#)) (#3)

by Johnny Cool Pants on Thu May 15th, 2003 at 01:32:14 AM MST  
([User Info](#))

Well you know, get half way through Harper's "Boy Electrician Book" and well, No way man, this will make me even lamer.  
Oh well, have it coming. Staring at the screen for 20 minutes now, at the words "windsuff" realizing "Ed" is the same Ed I got my coffee can sterling plans from.

Maybe you need to make a cell phone activated electro shock collar for me? Did I mention I suffered a head injury when I was 12?

[ [Parent](#) ]

Interesting site.... ([none / 0](#)) (#4)

by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Thu May 15th, 2003 at 07:47:11 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

It seems I've read somewhere that the ratio in elongation has a maximum of 30:1 or 30x the width. If you go smaller than that then the "skin" effect of AC takes over.

I've tried alot of different methods, sizes, shapes etc. I've even built an alternator with bar stock... very difficult to bend copper bar stock. The resistance is so low that my meters couldn't make an accurate ohm measurement so I never knew what it really came out to. It required a large amount of power input once it reached charging voltage. The unit would make 12V at 80 rpm and at 85 rpm It was making 12V charging at about 700 amps... Not practical for most applications but makes a very strong welder if you have an engine to drive it.

I'm designing a similar unit with 2 discs with 50 magnets on each side of the discs and using 4 stators. A single phase all in series to make 12V charging at 30 rpm. The resistance of the coils will be .2 ohm or less (in series from all 4 stators. I'm using very small magnets in this project and its meant for a VAWT with a large diameter (slow turning) maintaining a constant force on the turbine... The size of the unit will be approx 11" tall and about 6" deep and weigh about 30 pounds (end result may vary)...just need to find some time to build the unit.

Have Fun!  
Ed

[ [Parent](#) ]

[More on coils...](#) | 4 comments (4 topical, 0 editorial)

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## [More fun with Magnets and Coils...](#)

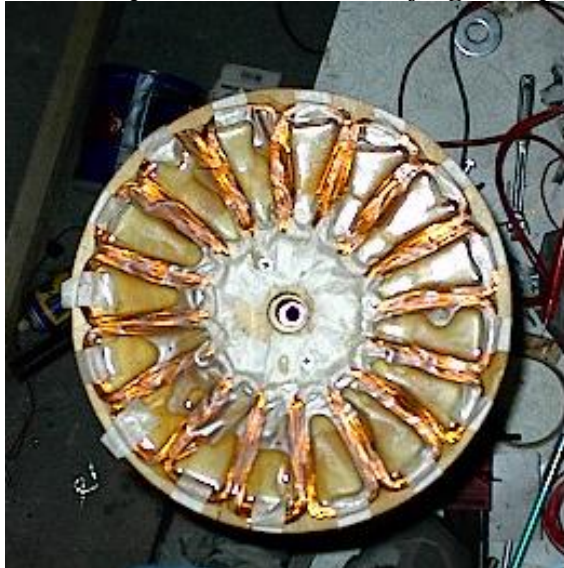
[2?](#)

By [windstuffnow](#), Section [Homebrewed Electricity](#) [Alternators](#)

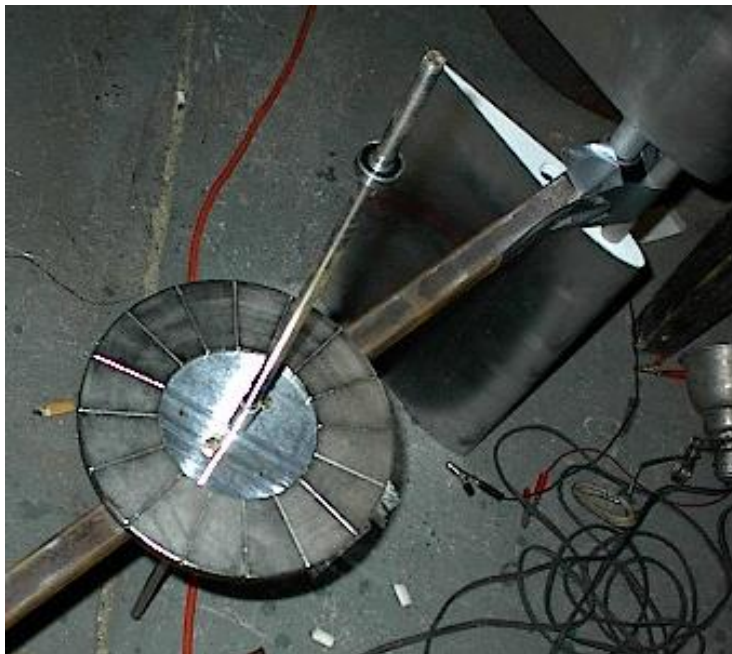
Posted on Wed May 14th, 2003 at 12:17:26 PM MST

Not sure how to post pics in a reply so I've revised the topic...

Here is a picture of what I'm trying to explain..



Each leg of each coil is shared... sorry about the poor quality of the picture. This one actually exceeds my 1/4 width theory but works very well. This is the one I use for testing small turbines. There are 30 turns per coil giving 60 wires at each junction point which matches the magnets center point. There is no gap between the magnets shown in the picture below...



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Definitely a waste of magnets for a small output alternator. This is a simple single phase unit also. It makes 130 watts at 500 rpm and about 325 watts at 1000 rpm. Anyway it shows the coils I'm trying to explain.

Have Fun  
Ed

[More fun with Magnets and Coils... 2?](#) | 5 comments (5 topical, 0 editorial)

I see... ([none / 0](#)) ([#1](#))  
by DanB on Wed May 14th, 2003 at 02:13:15 PM MST  
([User Info](#))

that makes perfect sense..

I guess perhaps with coils that long, and maybe a bit more "slack" at the ends you could stack them to achieve 3 phase without compromising the airgap too much.

It seems similar to my "coil#1" - with basically a bigger hole in the middle so that you could get more wire in the right spots and perhaps have room for another phase or two... ? I wonder if you'd shape them slightly differently if you were dealing with disc magnets instead.

I tried another one this afternoon.. which was suggested to me via email. I'll post about that one shortly.

I'd leave them the same ... ([none / 0](#)) ([#2](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Wed May 14th, 2003 at 03:00:28 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

I don't see any reason to change them because of the disc magnets. For that matter I wouldn't change the style for rectangular types either. This seems to be the best from all I've tested... so far...

Always open to new suggestions and ideas though...

Have Fun  
Ed

[ [Parent](#) ]

coil shapes. ([none / 0](#)) ([#4](#))  
by DanB on Wed May 14th, 2003 at 04:10:46 PM MST  
([User Info](#))

Part of me thinks, if the sharp corners were rounded off (so they were rounded instead of square)... there'd be less wire in there so less resistance.

The rest of me sees that it makes sense to be right dead center between the poles like you are, and more room in the middle for the wire/coils of extra phases.

Thankyou for the pictures and discussion on this... it's enlightening!

[ [Parent](#) ]

PS... ([none / 0](#)) ([#3](#))  
by DanB on Wed May 14th, 2003 at 03:01:21 PM  
MST  
([User Info](#))

I like that VAWT setup there... neat looking! Does it have 1 wing or two? How big is it?

[ [Parent](#) ]

VAWT ([none / 0](#)) ([#5](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com))  
on Wed May 14th, 2003 at 05:32:09 PM MST  
([User Info](#))  
<http://www.windstuffnow.com/main>

Thats actually one of many failed test subjects of the "VAWT free wing" that became parts for others. It's actually fairly small standing about 3ft tall and 3 ft in diameter. There are 4 wings that make it up, 2 on each side and pivot in the center on the main shaft. Had alot of fun building them but was dissappointed in the overall results. Learned alot about VAWT's in the process but its time to move on. The HAWT "free wing" is still in the works though.

Lots of Fun!  
Ed

[ [Parent](#) ]

[More fun with Magnets and Coils... 2?](#) | 5 comments (5 topical, 0 editorial)

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## Fun Stuff

By [windstuffnow](#), Section [Homebrewed Electricity](#)

Posted on Fri May 2nd, 2003 at 02:46:09 PM MST

[Wind](#)

I've made and wrecked many wings so there had to be a way to make them quicker and easier...

I've been reusing parts as possible but making wings ( or blades for that matter) can be time consuming and tedious. This was sort of a spin off from the 1 hour blades and a bit quicker actually.

First off my son is an aspiring movie maker and works with lots of different materials for making props. One that caught my eye was liquid rubber for making molds and liquid plastic's for making the actual model. Anyway I figured I'd try it for making small parts. This stuff is amazing to say the least. You simply make the first part, make a mold with the rubber then make as many parts as you want out of plastic.



The above picture shows the ribs made from plastic for the wings of the free wing turbines. One large hole for the spar and the other two holes for the controls and rods. It takes 15 minutes to pour and demold the parts... quite fast.

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- <http://www.smooth-on.com>
- [More on Wind](#)
- [Also by windstuffnow](#)



The above picture shows the ribs on the main spar ( 1" dia 6061 T6 x .058" aluminum tube). One nice thing about making them is they all come out identical... So if you get the first part right they're all right.



The above photo shows the trailing edge of the wing covered in aluminum. These can be built from start to finish in about a half hour. These make up a total of a 64 inch wing section ( or 2 32" wings).

The materials used was purchased from <http://www.smooth-on.com>

They are a bit expensive for making only one or two parts but if your making lots of them its actually quite cheap on the per part cost.

All in good fun as always....

Ed

[Fun Stuff](#) | 4 comments (4 topical, 0 editorial)



really nice! ([none / 0](#)) (#1)  
by hvirtane on Tue May 6th, 2003 at 10:45:38 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

A great project.

That stuff seems to be working really well.

Maybe one good way to start a kind of mass-production of blades... Covered with plastic cloth...

If you would make a ready set of ribs for three blades for 5 m in dia prop... How much do you think it would cost?

I mean only the profile pieces, not tubes and the cover.

- Hannu

Costs ??? ([none / 0](#)) (#2)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Tue May 6th, 2003 at 11:53:40 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

These are small ones, only 9 inches for the blade width... you talking about a large prop. What size tubing are you using for the main spar? They would have to be spaced about 8 to 12 inches appart so there would be a need for lots of them. The small ones I'm making use about 2 oz of material so the cost to make lots of them is minimul. This is a symetric airfoil and better used for Verticals but a standard airfoil wouldn't be any problem to fabricate using the same material. The strength qualities are quite good in the plastic also, they remain somewhat bendable and I believe the sheet said it had a psi of 375 lbs. I don't believe any one section would ever see this kind of wind pressure ( short of a major storm ).

Have Fun!  
Ed

The rough idea ([none / 0](#)) (#3)  
by hvirtane on Wed May 7th, 2003 at 03:00:25 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

You say:

"What size tubing are you using for the main spar?  
They would have to be spaced  
about 8 to 12 inches apart  
so there would be a need for lots of them."

-

The tubes I purchased for a 'tube wire project' are  
2,5 m long and 4 cm diameter (made of steel).

-

You say:

"but a standard airfoil wouldn't be any problem  
to fabricate using the same material."

-

My idea has been to use no twist and no taper.  
5 degree pitch all the way. The airfoil maybe NACA 412  
or something similar. (See my post on the old board  
'big tube wire blades') The width of the airfoil 20 cm.  
What do you think about that?

I checked the resellers of the product you are  
using. It is not available here. We probably could  
make similar things quite easily of polyurethane, but as  
far as I know, nobody has done it yet.

If you have time and a suitable turbine available, maybe  
you could have a try, if it makes better blades than  
carving of wood. Maybe a good product for mass  
production.

If you can make cheaply ribs described above I would  
buy them, if the price would be suitable.

My Indian friends would probably be interested in this  
development, too. Please see the post and the website  
by Mr. Desai on the old board.

Hannu Virtanen  
hvirtane@cc.jyu.fi

[ [Parent](#) ]

5m 3 blade rotor ([none / 0](#)) (#4)  
by RonD on Wed May 7th, 2003 at 08:41:05 AM  
MST  
([User Info](#))

Chord width (length?) of 20cm for a 5m rotor should  
be fine.  $5m \times .04 = .2m$  or 20cm.  
Thanks, RonD

[ [Parent](#) ]

[Fun Stuff](#) | 4 comments (4 topical, 0 editorial)

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[Vertical Free Wing...](#)

By [windstuffnow](#), Section [Homebrewed Electricity](#)

Posted on Fri May 2nd, 2003 at 01:28:39 PM MST

[Wind](#)

Here goes another one...

This is the last and final attempt on the Vertical type free wing. After about 9 or 10 of these things I've decided that the Vertical unit is unreachable. The numbers look good but the problems involved make it such that its not a real reliable machine as well as the complexity. So this version of the free wing has ended. However, I've learned alot about the Verticals and believe there is still considerable hope for such units. I have one more idea to follow through on the Vertical free wing before its over completely but the path I've been following has ended. The horizontal free wing, however, has shown considerable advances since my last post. With very minor changes I've reached 55% efficiency. The most noticable item to mention about this unit is when standing behind the prop there is very little wind. Measuring windspeed in front of the unit I get readings of 12.83 mph and behind the unit reads 5.1 mph. The vertical comes close but the highest efficiency reading was 45%. Onward and upward... new ideas that clutter my mind need to be free'd

Have Fun  
Ed

[Vertical Free Wing...](#) | 1 comment (1 topical, 0 editorial)

Re: Vertical Wing ([none / 0](#)) (#1)  
by Zed on Fri May 2nd, 2003 at 07:45:46 PM MST  
([User Info](#))

Hello Ed I haven't been active on the boards lately, my apologies. I have great respect for all on board but have been only able to lurk due to a busy schedule these days. I am anxious to see a PIC of the Vertical Wing. Is it the VAWT by Ropatec or more correctly Darrius Venturi (1984 Patent) you are referring to? I was depending on this design to provide me with some power in the near future pending. I'll try to find some time to keep posting. Baby wakin' up, gotta go. Coudos, Zed>Thanks.

[Vertical Free Wing...](#) | 1 comment (1 topical, 0 editorial)

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## [Magnetic bearings](#)

By [windstuffnow](#), Section [Magnets & Magnetism](#)

Posted on Thu May 1st, 2003 at 06:41:39 PM MST

[Magnetism](#)

Has anyone dabbled in magnetic bearings?

I've searched the web and only find reference to electromagnetic bearings, these have no interest to me.

I'd like to build a passive magnetic bearing system using magnets only... anyone have any info on these?

Thanks in advance

Ed

[Magnetic bearings](#) | 6 comments (6 topical, 0 editorial)

Not as such, but... ([none / 0](#)) ([#1](#))

by [Don](#) on Fri May 2nd, 2003 at 07:35:01 AM MST  
([User Info](#))

Howdy, Ed,

Well, I've worked with magnetic bearings, and haven't had any reason to look into them (optically or theoretically), but it's one of those things that, I, too, find fascinating, ever since I first heard of them.

I'm guessing that the bearing design would have to be similar to an old car's wheel bearing, because you're going to have to have it "thrust" away from some point to maintain equilibrium. Earnshaw's theorem is going to get in the way, otherwise. It may end up being similar to a spherical roller bearing, allowing thrust in two different directions.

Regarding radial generators, they should line up at magnetic center when spinning, due to Lenz's law. I think the bearings on those should be more protected from induced currents, rather than for friction. I'm not saying that lubrication is unnecessary, just that there won't be much stress on the bearings when the rotor is spinning.

On the axial generators mostly being made here, then you'll have the load (weight), thrust (Lenz's law, except on dual-rotor designs), and currents to fend against. A magnetic bearing would need some type of friction-reducing mechanism while coming up to speed, at which time the Lenz effect can take over.

I'm just "thinking out loud" here, but it is a subject I've thought about for quite some time. I'd be interested in any design ideas you have, including pointing out fallacies I've convinced myself are true, in my ponderings.

Regards,  
Don

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magnetic bearings ([none / 0](#)) (#6)  
by rlortie on Fri May 9th, 2003 at 10:51:52 PM MST  
([User Info](#))

Don, I made a test bed some years back of a vertical shaft model with a 14" inch rotor weighing aprox 13 pounds. I was intended to be a scale replica of a GE 80 megawatt hydro generator. The unit has been suspended for over four years now and has not decreased in clearance or magnet weakening. The magnetic suspension is acheived using speaker doughnut magnets, bottom of rotor is opposing base while there are two sets above, first or upper is attracting second set is opposing. Unit has noticable vibration at low speeds but smooths out at higher rpm. although rotor is complete with exciter magnets I never got the stator coils installed as I got sidetracked into magnetic motor ideas, so lenz law has not been tested. The above description handles thrust with no problem, but I still need a little work on guide bearings. I do not believe that this is much of a problem. It is nice to think that no grease or lubricant is required as there is no bearing friction. A little twist of the wrist and this thing will spin for an extended coffee break.

[ [Parent](#) ]

Magnetic bearings ([none / 0](#)) (#2)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Fri May 2nd, 2003 at 09:19:33 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Hi Don,

Thanks for your input! This is simply an experiment and there won't be any loads on it for the most part with the exception of gravity holding the load of the flywheel. I've always been curious about the set up, A friend brought back one of those floating thingies from Hong Kong and of course the first thing I did was tear it appart to see how it was set up. Its interesting because you can spin it up to around 500 rpm and it will continue spinning for over an hour.

Anyway, I sort of have the basics of how to set it up but would like to see some that have been completed and/or some tech data on them. This would save time in experimenting and building different set ups to find a proper solution. Also I'm limited to magnet sections (stuff I have on hand)and would like to know if there are any problems I will run into by using these. I think balancing will be quite critical both radially and axially since it will be literally floating in the air gap... could get mighty scarry above 5000 rpm's.

Lots of fun!  
Ed



mag bearings ([none / 0](#)) (#3)  
by troy on Fri May 2nd, 2003 at 11:57:31 AM MST  
([User Info](#))

Hi Ed,

Magnetic bearings are a very cool piece of work. My understanding of industrial sized magnetic bearings (which is basically nerd gossip) is that they need conventional bearings to support/align things until the rotational mass reaches the full stable RPM.

There are lots of interesting web sites on the Levitron magnetically levitated top which was quite popular.

A significant number of these websites dealt with the physics and may point you in the right direction for a more scientifically rigorous understanding of what's going on. Too much heavy slogging for me though.

If you get one to work I'd love to hear more about it.

Best wishes

troy

[ [Parent](#) ]

Hi Ed ([none / 0](#)) (#4)  
by Anonymous Hero on Mon May 5th, 2003 at 07:26:07 AM MST

I was playing with these when I was working on a special pendulum. It showed to be more complex than it first appeared. One thing I noticed is that you have to balance both sides of the shaft AND you will need some ball bearings to stabilize the shaft, at last that's what I found. Regards, RobD

[ [Parent](#) ]

magnets as load bearing ([none / 0](#)) (#5)  
by wiredup on Wed May 7th, 2003 at 10:44:01 AM MST  
([User Info](#))

made a virticle shaft mill, sience project.has been running for eight years. it has a magnet at the base south pole up it has another magnet atached to the mill south down it repales enough to hold the mill and more.center shaft has brass bushings to keep centered. the mill free floats it will bounce up and down. travels up and down about one inch.this makes no power,it was built to show how magnets could be used to lessen the friction on the bearing that carry the weight of a mill

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[Magnetic bearings](#) | 6 comments (6 topical, 0 editorial)

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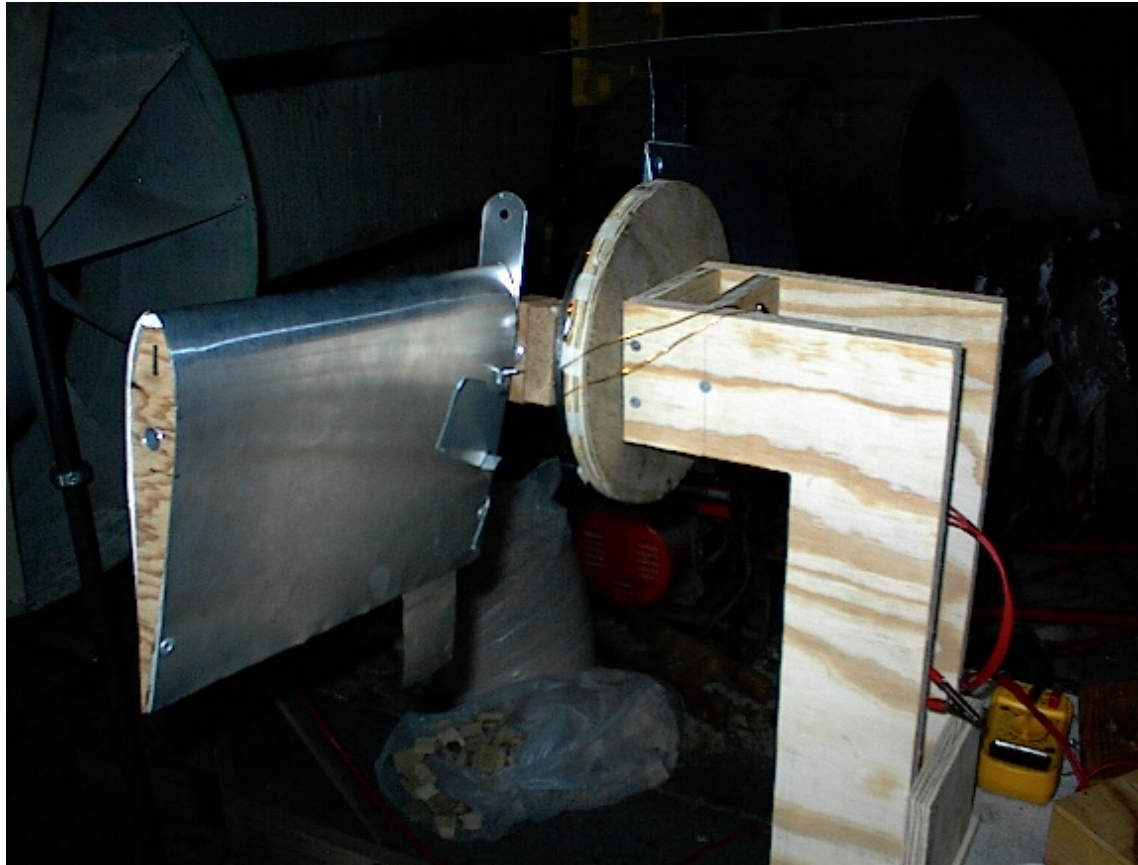
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[Horizontal Free wing...](#)

By [windstuffnow](#), Section [Homebrewed Electricity](#)  
Posted on Sun Apr 20th, 2003 at 02:11:36 PM MST

[Wind](#)

Here is a glimps of the Free wing turbine...



The picture doesn't show exactly how the wings operate but just imagine the wing has full freedom of movement caused by the wind ... kind of a balancing act caused by the wind and movement...

[Horizontal Free wing...](#) | 7 comments (7 topical, 0 editorial)

Pretty neat! ([none / 0](#)) ([#1](#))  
by TomW on Sun Apr 20th, 2003 at 03:21:00 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Ed;

You come up with some of the most interesting concepts and ideas. I am ready for details.

I wish my R&D [Rough n Dirty] samples had anything near the elegance yours have. Proof of concept stuff is rarely pretty or refined but it draws us down the road.

Oh, and when you finally chronicle all this in a book i want one of the first copies, signed of course.

Thanks for sharing, Ed.

Cheers.

TomW

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Free wing... ([none / 0](#)) (#3)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Sun Apr 20th, 2003 at 08:29:10 PM  
MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Thanks for the kind words Tom. Its actually rather ragedy and under built and would be scarry in any kind of wind other than low winds.

I found by making some minor changes brought it up to over 50% efficiency. Here is some other data to ponder...

Wing area is 3x the area of a 403 but the unit is 1/2 the sq ft frontal area making the same amount of watts a 403 makes in the same wind. It has 2 wings. It runs at 328 rpm loaded and 480 no load.

When shorted, won't stop it... the wings go to an extreemly deep angle and it keeps running.

The vertical unit performs about the same but I'm stumbling over some of the bugs with this model. The biggest problem I'm having with this one is the reversal of the downwind wing, the angle changes drastically for the downwind side to continue creating lift. It will be worked out this summer.

Lots of fun... and challenges..

Ed

[ [Parent](#) ]

Kewl hands on ([none / 0](#)) (#2)  
by Techstuf on Sun Apr 20th, 2003 at 07:13:54 PM MST  
([User Info](#))

Interesting! So is the upright stationary and only the blade allowed to pivot so as to take advantage of northerly and southerly winds? Or does the whole assembly turn?

Peace,

TS out

Free wing ([none / 0](#)) (#4)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Sun Apr 20th, 2003 at 08:33:31 PM  
MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Its just a test model, its on a stationary bed but the final design would be just like a standard upwind design ( or built as a downwind).

Have Fun!

Ed

[ [Parent](#) ]

how does it work? ([none / 0](#)) (#5)  
by hvirtane on Tue Apr 22nd, 2003 at 03:31:37 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

I have been an admirer of your very good website and of your really nice drawings and machines since I found them.

It is difficult to understand from the picture how this machine works.

Is it possible for you to make a rough drawing of the movements and the shape of the wing?

Hannu Virtanen  
hvirtane@cc.jyu.fi

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free wing ([none / 0](#)) (#6)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Tue Apr 22nd, 2003 at 07:17:50 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

The wings air foil is basically an E168. This is a symmetrical wing and quite possibly not the best choice for the horizontal free wing. These wings were used with the Vertical version and instead of building new wings I used these. Although they perform exceptionally well in the application.

I'm not going into any detail on the actual working of the wing as yet but soon. I'm basically trying to prove the concept at this point. Details will come later.

Thanks for the kind words about my site...

Ed

OK I will wait for it ([none / 0](#)) (#7)  
by hvirtane on Tue Apr 22nd, 2003 at 02:29:34 PM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

'I'm not going into any detail on the actual working of the wing as yet but soon.'

OK. I will stay tuned.

I've had regular talks with my friends on the idea that people will probably still invent much better windmachines than we have got at present.

For example with horizontal axis wind turbines the parts of the blades near the axle are almost useless. Almost all the work is done by the last third parts of the blade near the tips. Maybe your free wings will solve this problem.

Hannu Virtanen  
hvirtane@cc.jyu.fi

[ [Parent](#) ]

[Horizontal Free wing...](#) | 7 comments (7 topical, 0 editorial)

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[Wind tunnel power plant...](#)

By [windstuffnow](#), Section [Homebrewed Electricity](#)  
Posted on Sun Mar 30th, 2003 at 03:53:21 PM MST

[Wind](#)

This is my wind tunnel power plant.

A blue and gold macaw standing 2ft tall and a wing span of about 3 ft. Can fly at 60 mph if given a chance. Ok, obviously he has other chores around the farm one being keeping me entertained. Just having fun checking out this new board... Ed [www.windstuffnow.com/main](#)



[Wind tunnel power plant...](#) | 3 comments (3 topical, 0 editorial)

bird ([none](#) / 0) (#1)  
by [outback](#) on Tue Apr 1st, 2003 at 04:02:26 AM MST  
([User Info](#))

has that bird ever got a hold of your finger?do you trim those birds beaks at some point?

Bird....WOW ([none](#) / 0) (#2)  
by [Wolfles](#) ([wolfles-@-netzero.net](#)) on Tue Apr 1st, 2003 at 02:26:36 PM MST  
([User Info](#))

Ed, that is surely a beautiful bird....!!!! Is it messy or well trained. Also, do you run a coffee shoppe or are those cups to be use one a day for each day of the year..???.....  
MyWattsWorth,...Les...spell checker still broke

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Related Links

- [More on Wind](#)
- [Also by windstuffnow](#)

bird ([none / 0](#)) ([#3](#))

by [outback](#) on Fri Apr 4th, 2003 at 06:08:41 PM MST

([User Info](#))

hey Ed i wasn't joking with you on that last post, those were two serious questions i had about that great bird.animal lover ya know.outback

[Wind tunnel power plant...](#) | 3 comments (3 topical, 0 editorial)

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[Just testing this new board....](#)

By [windstuffnow](#), Section [Homebrewed Electricity](#)  
Posted on Sat Mar 29th, 2003 at 03:16:46 PM MST [Wind](#)  
This is quite confusing.... especially for a low tech joe like myself...



[Just testing this new board....](#) | 8 comments (8 topical, 0 editorial)

The alternator shown in the picture ([none / 0](#)) (#1) by [windstuffnow](#) ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Sat Mar 29th, 2003 at 03:30:10 PM MST ([User Info](#)) <http://www.windstuffnow.com/main>

This alternator was wound with 1 ( yes one) coil. The single phase shown is 50 turns around a 9.5 inch disc then twisted into place to form the 6 coils of the first phase. Its similar to Rob's wave windings using both ends. Have Fun

Interesting... ([none / 0](#)) (#2) by [DanB](#) on Sat Mar 29th, 2003 at 06:34:02 PM MST ([User Info](#))

Hi Ed -thanks for testing the new board! It is a "complicated sucker" - powerful though, and I guess it'll have it's pros and cons.

Regarding your strange winding here...  
What is the diameter of the unit pictured? This looks like the 1st winding (set of windings) for a 3 phase machine.  
The thing that makes me wonder... and maybe I'm not understanding something, is that it \*seems\* like the ratio of wire parallel to the moving magnetic field vs that which is perpendicular to the moving field may not be kind of high - vs small individual coils. Is that right? - or am I missing something. Seems like the resistance would be higher winding coils like that.

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Related Links
<a href="#">More on Wind</a>
<a href="#">Also by windstuffnow</a>

Interesting... ([none / 0](#)) (#6)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Sun  
Mar 30th, 2003 at 08:07:38 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

If you measure it out the length of wire is exactly the same as winding individual coils. This is a small unit so the wires are small and this wouldn't work very well winding larger units with heavy wire in them. There is no difference in resistance either way. Yes it is a 3 phase unit with one phase in place... or as is a single phase unit. Have Fun Ed

[ [Parent](#) ]

Paid Member ([none / 0](#)) (#3)  
by Wolfles ([wolfles-@-netzero.net](mailto:wolfles-@-netzero.net)) on Sat Mar 29th, 2003  
at 08:16:13 PM MST  
([User Info](#))

What's this about being a Paid Member????????? and yes it's to complicated for me. Although, it's your Board and I (we) are guess I find it very difficult. Powerfully.....DIFFICULT!!

Paid member... ([none / 0](#)) (#4)  
by DanB on Sat Mar 29th, 2003 at 08:25:29 PM  
MST  
([User Info](#))

I just noticed that too!  
Its obviously in here by default... we need to get rid of that! - 'cause theres no such thing as a paid membership here...  
woops...

[ [Parent](#) ]

Paid member??? ([none / 0](#)) (#5)  
by Wolfles ([wolfles-@-netzero.net](mailto:wolfles-@-netzero.net)) on Sat Mar  
29th, 2003 at 08:46:56 PM MST  
([User Info](#))

Hummmm, what's that old saying,....No money, no touchie??? Anyway,.....sure scared me...!!! Les

[ [Parent](#) ]

Paying Membership ([none / 0](#)) (#7)  
by TomW on Sun Mar 30th, 2003 at 08:31:03 AM  
MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Some sites use the paid membership gimmick to offer you "enhanced" services like spell checker email digests etc.

Not likely here.

[Stuff I have Online](#)

[Contact Me](#)

[ [Parent](#) ]

Paid member turned off. ([none / 0](#)) (#8)  
by DanF ([danf@otherpower.com](mailto:danf@otherpower.com)) on Sun Mar 30th,  
2003 at 08:44:57 AM MST  
([User Info](#))

It's turned off now, Les. Hang in there. DANF|

[ [Parent](#) ]

[Just testing this new board....](#) | 8 comments (8 topical, 0 editorial)

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#### Who's Online? (21)

- [hvirtane](#)
- [richard](#)
- [Budgreen](#)
- [troy](#)
- [DaveR](#)
- [electronbaby](#) (3)
- [RobC](#)
- [dconn](#)
- Anonymous Users: 11

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[formatted re-post of more on ferrous cores...](#) | 10 comments (10 topical, 0 editorial)

Re: formatted re-post of more on ferrous cores...  
([none / 0](#)) (#5)  
by monte350c on Thu Jan 1st, 2004 at 10:22:59 PM MST  
([User Info](#))

Hi guys,

Still recovering from New Year's...

I like the brush concept - but what about trying to put the brushes on the magnets instead? Perhaps some kind of fine hardened steel wire like a brush.

I'm still doing more playing around with various coil formats. I'll post more when I've tested a few. Sure wish Santa had brought me a lathe - maybe next year!

Ted.

[ [Parent](#) ]

Re: formatted re-post of more on ferrous cores... ([none / 0](#)) (#6)  
by charged on Fri Jan 2nd, 2004 at 10:26:45 AM MST  
([User Info](#))

Get a roll of soft-steel MIG welding wire or just plain 'ol mechanics wire from the hardware store. Wrap the mechanics wire right along with the copper wire as you make your winding. Start winding on a 3/8" dowel and work your way out. This integrates the ferrous material right into the coil and virtually zeros out the eddy-current losses.

[ [Parent](#) ]

Re: formatted re-post of more on ferrous cores... ([none / 0](#)) (#7)  
by Electric Ed on Fri Jan 2nd, 2004 at 03:03:52 PM MST  
([User Info](#)) <http://www.electric-ed.com>

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#### Who's Online? (28)

- [Harry Luubovv](#)
- Anonymous Users: 25
- Cloaked Users (2)

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Better do this with a coil that you don't value very highly. There will be voltage induced into the iron wire, and if the turns are not insulated from each other, short circuits will exist where adjacent turns come in contact.

Current will flow in these "shorted" coils, producing hot spots, similar to what happens in a motor winding that has partially shorted coils.

Electric Ed

[ [Parent](#) ]

Re: formatted re-post of more on ferrous cores... ([none / 0](#)) ([#9](#))  
by Jerry on Sat Jan 3rd, 2004 at 10:09:42 PM MST  
([User Info](#))  
<http://www.dplusv.com/Photo-03.html>

Ok guys now you've went a done it again. And just when I thought i had to many ideas and projects you go and add another one. This board is addictive and dangerus. OK so heres my next progect idea. My brother use to work for Mead paper Corp. you know those folks that make spieral note books and stuff like that. He use to bring me large carboard tubes. We make sub woofer inclosers at the car stereo store. Some of these tubes still had a very nice varnish coated soft steel wire they used to make the spiroll spring things. However its nice and straight on these big rolls. I still have a few 100 feet. Magnets realy like this stuff. So I'm going to wind some coils with copper and this stuff in perelell. I have a zilion speaker magnets so I'll wind the coils same size and shape as the speaker magnets. This will get the magnets very close to the laminations (Mead wire) and copper coils at the same time. Very small gap. Thanks so much for this idea. I guess better get ahold of Mead or = to see about more of the soft and candy coated steel wire? JK TAS  
Jerry

[Airheads Page](#)

[ [Parent](#) ]

Re: formatted re-post of more on ferrous cores... ([none / 0](#)) ([#10](#))  
by bill541 on Sun Jan 4th, 2004 at 07:16:41 PM MST  
([User Info](#))

I would have to agree with Ed on this one. The steel wire will make an inductor, not unlike your copper wire does. This steel inductor will have voltage induced on it, so it must be insulated from itself just as the copper magnet wire is. If you could wind a full layer of the steel wire and bond it to itself so that it did not form an inductor, then I think you would get it to work. Otherwise it should be insulated steel wire. You may be able to wind the coil so that the copper insulated wire always keeps the steel wire separated, but you would need to put a layer of insulating material between each winding layer... Just my thoughts, Bill

[ [Parent](#) ]

[formatted re-post of more on ferrous cores...](#) | 10 comments (10 topical, 0 editorial)



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[formatted re-post of more on ferrous cores...](#) | 10 comments (10 topical, 0 editorial)

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([none / 0](#)) (#5)  
by monte350c on Thu Jan 1st, 2004 at 10:22:59 PM MST  
([User Info](#))

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Ted.

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Who's Online? (22)

- [Hank](#)
- [jeanpaul](#)
- [DanB](#)
- Anonymous Users: 19

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[Tower math ?](#) | 5 comments (5 topical, editorial)

Re: Tower math ? ([none / 0](#)) ([#4](#))  
by monte350c on Wed Dec 31st, 2003 at 11:42:25 PM MST  
([User Info](#))

Hi OldF,

Here's a page that helped me a bit, it's pretty basic but explains the concepts!

<http://www.asme.org/education/precollege/esp/act5sr1.htm>

Hope this helps,

Ted.

Re: Tower math ? ([none / 0](#)) ([#5](#))  
by Old F on Thu Jan 1st, 2004 at 06:55:36 AM MST  
([User Info](#)) <http://www.oldf.homestead.com>

Thanks Ted

Every bit helps

Old F

[ [Parent](#) ]

[Tower math ?](#) | 5 comments (5 topical, 0 editorial)

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#### Who's Online? (27)

- [Harry Luubov](#)
- Anonymous Users: 24
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#### Who's Online? (22)

- [signweld](#)
- [wind pirate](#)
- [Harry Luubov](#)
- Anonymous Users: 18
- Cloaked Users (1)

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[New Year...](#) | 5 comments (5 topical, editorial)

Re: New Year... ([none / 0](#)) ([#4](#))  
by monte350c on Wed Dec 31st, 2003 at 03:49:05 PM MST  
([User Info](#))

Wow what an interesting year this has been! Here's hoping for a great 2004 - hoping for: Less gaps and more flux More axial and radial More vertical & horizontal More capacitors and innovation Glad I found this board. I hope 2004 is better in every way for all you guys! Ted.

Re: New Year... ([none / 0](#)) ([#5](#))  
by Harry Luubovv on Thu Jan 1st, 2004 at 01:41:31 PM MST  
([User Info](#))

HAVE A GOOD NEW YEAR ! MAY EVERYTHING BE FLYING RIGHT FOR ALL ! !

Luubovv.

[ [Parent](#) ]

[New Year...](#) | 5 comments (5 topical, 0 editorial)

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Who's Online? (26)

- [Harry Luubovv](#)
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[New Year...](#) | 5 comments (5 topical, 0 editorial)

Re: New Year... ([none / 0](#)) ([#4](#))  
by monte350c on Wed Dec 31st, 2003 at 03:49:05 PM MST  
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[New Year...](#) | 5 comments (5 topical, 0 editorial)

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Who's Online? (15)

- [Putte](#)
- [wind pirate](#)
- [Harry Luubovv](#)
- [troy](#)
- [DanB](#)
- Anonymous Users: 10

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[Guitar string](#) | 11 comments (11 topical, 0 editorial)

Re: Guitar string ([none / 0](#)) ([#4](#))  
by monte350c on Tue Dec 30th, 2003 at 07:38:57 AM MST  
([User Info](#))

Hi Norm,

I spent "some" time in the past couple of months fiddling around with hot wire cutters and now I've got a good reliable unit that really works well.

I started with plans from the net that used a Rad Shack xformer and a regular light dimmer which lasted about 1 hour, then the transformer smoked.

So I got another heavier transformer, and kept on truckin' but went through about 6 fuses.

My final configuration that really works well is as follows:

Hammond PH100JG transformer - 100 VA, 120 volt primary, 24 volt secondary (about \$35 from a local electronic supply place)

I use a Leviton fan speed control on the 120 volt side of the transformer. This looks just like a light dimmer but seems to hold up for this use. (less than \$10 Home Depot)

Then on the hot wire side of the transformer, I use 2 of those old ceramic ballast resistors they used to use in a lot of Chrysler cars in series with the wire.

For the wire I use 20 guage stainless wire which is available at Home Depot in 20 foot rolls for about \$3

I turn the unit on and set the fan speed controller to its lowest setting. Then slowly increase the setting until the wire is warm enough to melt the foam. I found a lot better results by just heating the wire barely enough to melt the foam. If the wire gets red-hot it will lose its tension and sag a lot in the middle.

The bow I made up out of 3 / 4 " copper pipe with a pair of 90 degree elbows. I use a couple of pieces of wood dowel in the ends of the pipe legs to insulate the wire from the bow. And a couple of small turnbuckles attached to the dowels to hold and tension the wire.

I found nicer cuts when the temperature of the wire is just hot enough to cut the foam, with a lot of tension on the wire. This way if the bow jerks a bit during the cut, it won't leave bumps in the cut.

If you need some pics of this setup let me know and I'll come back and post them!

Having fun!

Ted.

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- [Harry Luubovv](#)
- [DanB](#)
- Anonymous Users: 28
- Cloaked Users (2)

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Re: Guitar string ([none / 0](#)) ([#10](#))  
by RobD on Tue Dec 30th, 2003 at 09:58:40 PM  
MST  
([User Info](#))

Ted,  
I put a heavy spring on one end of my wire to keep it  
tense even if it got to hot.  
RobD

[ [Parent](#) ]

[Guitar string](#) | 11 comments (11 topical, 0 editorial)



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[Guitar string](#) | 11 comments (11 topical, 0 editorial)

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- [Putte](#)
- [wind pirate](#)
- [Harry Luubovv](#)
- [troy](#)
- Anonymous Users: 12

5 minute interval.

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[Guitar string](#) | 11 comments (11 topical, 0 editorial)



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[Tower wrecking](#) | 11 comments (11 topical, editorial)

Re: Tower wrecking ([none / 0](#)) ([#4](#))  
by monte350c on Sun Dec 28th, 2003 at 08:48:23 PM  
MST  
([User Info](#))

Hi OldF,

That's going to be a very neat tower! I like the design...

Here's a possibly easier and maybe safer suggestion - if you're just looking to find the buckling strength, you could support the tower in a horizontal orientation (like on strong sawhorses or something similar) at each end.

Then put a couple of empty barrels on top, in the center of the tower. Add measured amounts of water to the barrels until she buckles. Water is 1 kilogram per liter (or 8.34 pounds per gallon). So if you had a 50 gallon drum full it would put 417 pounds plus the weight of the barrel on it. Two or three barrels would probably do it. Or if you had an old oil furnace tank...

At least when it fails, the most danger will be from having a barrel land on you, or getting wet!

Good luck and keep us posted!

Ted.

[Tower wrecking](#) | 11 comments (11 topical, 0 editorial)

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- [wind pirate](#)
- [Harry Luubovv](#)
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- [signweld](#)
- [Harry Luubov](#)
- Anonymous Users: 17
- Cloaked Users (1)

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[Would this be an efficient way to heat the garage?](#) | 11 comments  
(11 topical, editorial)

Garage Heat ([none / 0](#)) ([#1](#))  
by monte350c on Thu Dec 25th, 2003 at 09:50:35 PM  
MST  
([User Info](#))

Hi zmoz,

My guess would be that just for straight heating, probably it would be cheaper and more efficient just to use propane. Unless you need the electricity for something of course...

Every conversion of energy from one form to another always seems to involve some kind of loss.

Picture running the Briggs on propane, driving the alternator vs. just burning the propane to make heat. I think the burning would necessarily be more efficient.

But it would be cool to have the Briggs churning away in the garage!

Ted.

[Would this be an efficient way to heat the garage?](#) | 11 comments  
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- [DaveR](#)
- [electronbaby](#) (3)
- [hvirtane](#)
- [richard](#)
- [Budgreen](#)
- [dconn](#)
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[Progressive winding alternator](#) | 5 comments (5 topical, editorial)

Re: Progressive winding alternator ([none / 0](#)) ([#3](#))  
by monte350c on Mon Dec 22nd, 2003 at 09:37:12 PM  
MST  
([User Info](#))

Hi Ed,

Looks really interesting!

I can appreciate the problem with the smallest windings at peak speeds. How about a power resistor switched into the small winding's circuit at a certain point?

Or you could always try one of those capacitive discharge circuits Charged has been posting about, might solve the current problem...

Good luck with this Ed, it's important research, and looks like a lot of fun!

Ted.

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[Progressive winding alternator](#) | 5 comments (5 topical, 0 editorial)

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[Bedini questions](#) | 8 comments (8 topical, 0 editorial)

Re: Bedini questions ([none / 0](#)) ([#8](#))  
by monte350c on Wed Dec 17th, 2003 at 01:26:04 PM MST  
([User Info](#))

Hi Charged,

Hmmmm.... that's kind of what I was thinking about when I asked about eliminating the second belt-driven wheel. Very interesting! Thanks for the link.

Ted.

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[Bedini questions](#) | 8 comments (8 topical, 0 editorial)

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- [jeanpaul](#)
- [Harry Luubovv](#)
- Anonymous Users: 18
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[suggestions please.](#) | 7 comments (7 topical, editorial)

Re: suggestions please. ([none / 0](#)) ([#6](#))  
by monte350c on Tue Dec 16th, 2003 at 02:48:52 PM  
MST  
([User Info](#))

Hi All,

Charged is right on the money with this one but perhaps a little pessimistic about the amount of KWH available.

Check out this site:

[http://www.focus-solar.com/insolation\\_levels\\_us.htm](http://www.focus-solar.com/insolation_levels_us.htm) It gives the amount of power, in KWH, available in a square meter in various locations, in different seasons throughout the year.

I made a small parabolic trough about a year ago which was able to heat water quite quickly to an impressive temperature. Like boiling.

If it's mainly heating you're after, there really is a lot to recommend this approach.

Here's another page that illustrates the main kinds of "solar concentrate"

[http://www.eere.energy.gov/csp/csp\\_tech.html](http://www.eere.energy.gov/csp/csp_tech.html)

Have fun!

Ted.

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[Auto Alternator Conversion](#) | 3 comments (3 topical, editorial)

Re: Auto Alternator Conversion ([none / 0](#)) ([#1](#))  
by monte350c on Mon Dec 15th, 2003 at 08:53:02 PM MST  
([User Info](#))

Hi Sibirsk,

If you're not too concerned about 60 hz but just want the 110-120 volts check this out. There's a plan for a regulator there too:

<http://www.qsl.net/ns8o/welcome.html>

Have fun!

Ted.

Re: Auto Alternator Conversion ([none / 0](#)) ([#2](#))  
by Harry Luubovv on Wed Dec 31st, 2003 at 09:38:49 PM MST  
([User Info](#))

Actually, it is a piece of cake if the secret is spoken out loud ! Basically there is no such a thing as "12 Volt" or whatever other volts for that matter with a car type alternator. The voltage is held by the regulator alone, the regulator determines the voltage available in other words. If you defunct the regulator and remove the diode group from the inside of an automobile alt. GM or not, (Which is easy, but leave the brushes there) Then you will let the engine idle up to higher speed and watch the volt meter which is hooked to the output of the alternator, keep the engine speed steady when you see 120 Volt. There bingo, you have an instant 120 Volt "Generator" from a GM set !!!

Ciao !  
Luubovv.

[ [Parent](#) ]

Re: Auto Alternator Conversion ([none / 0](#)) ([#3](#))  
by Harry Luubovv on Wed Dec 31st, 2003 at 09:42:02 PM MST  
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- [electronbaby](#) (3)
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- [richard](#)
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- [dconn](#)
- [troy](#)
- Anonymous Users: 11

5 minute interval.  
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Sorry about a couple of typos.  
Ciao, Luubovv.

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[Auto Alternator Conversion](#) | 3 comments (3 topical, 0 editorial)



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[Auto Alternator Conversion](#) | 3 comments (3 topical, editorial)

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### [Auto Alternator Conversion](#)

By [sibirsk](#), Section [Homebrewed Electricity](#)  
Posted on Mon Dec 15th, 2003 at 08:34:00 PM MST [Alternators](#)  
Need a regulator schematic.

I am converting a 12 volt Delco-Remy alternator to produce 110 volts.  
I was wondering if anyone knew of a good schematic to follow for a regulator.  
Simple is good. An explanation of how she works is also a plus.  
Thanks. Sibirsk.

[Auto Alternator Conversion](#) | 3 comments (3 topical, 0 editorial)

Re: Auto Alternator Conversion ([none / 0](#)) ([#1](#))  
by [monte350c](#) on Mon Dec 15th, 2003 at 08:53:02 PM MST  
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Re: Auto Alternator Conversion ([none / 0](#))  
([#3](#))  
by Harry Luubovv on Wed Dec 31st, 2003 at  
09:42:02 PM MST  
([User Info](#))

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Ciao, Luubovv.

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[Auto Alternator Conversion](#) | 3 comments (3 topical, 0 editorial)

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[Bedini questions](#) | 8 comments (8 topical, editorial)

Re: Bedini questions ([none / 0](#)) (#6)  
by monte350c on Mon Dec 15th, 2003 at 07:29:53 PM MST  
([User Info](#))

Hi Guys,

Thanks for all the replies! If I wasn't going to try one before this I sure am now. Might take a week or so but I'll post any results as they're available. Great minds think alike... (modify saying and place period here!)

Lots of fun!

Ted.

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[Bedini questions](#) | 8 comments (8 topical, 0 editorial)

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[Bedini questions](#) | 8 comments (8 topical, editorial)

Re: Bedini questions ([none / 0](#)) (#6)  
by monte350c on Mon Dec 15th, 2003 at 07:29:53 PM MST  
([User Info](#))

Hi Guys,

Thanks for all the replies! If I wasn't going to try one before this I sure am now. Might take a week or so but I'll post any results as they're available. Great minds think alike... (modify saying and place period here!)

Lots of fun!

Ted.

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[What size and voltage](#) | 8 comments (8 topical, editorial)

Re: What size and voltage ([none / 0](#)) ([#6](#))  
by monte350c on Mon Dec 15th, 2003 at 07:24:34 PM MST  
([User Info](#))

Hi Charged,

Is there a practical limit to paralleling caps to increase capacity? Say each phase of a wind generator has an open circuit voltage of around 40 VAC, any suggestions for cap sizes at the generator, and at the battery end?

Thanks - learning lots!

Ted.

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[What size and voltage](#) | 8 comments (8 topical, 0 editorial)

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by monte350c on Mon Dec 15th, 2003 at 07:24:34 PM MST  
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### [What size and voltage](#)

By [Norm](#), Section [Homebrewed Electricity](#)  
Posted on Mon Dec 15th, 2003 at 02:36:28 PM MST [Alternators](#)  
are the capacitors on lawnmower engines?

Just wondered if they would be suitable for pulsating capacitor charging or anything along that line? Norm.

[What size and voltage](#) | 8 comments (8 topical, 0 editorial)

Re: What size and voltage ([none / 0](#)) (#1)  
by [charged](#) on Mon Dec 15th, 2003 at 04:32:18 PM MST  
([User Info](#))

You got me. I've never used them.  
Electrolytics are what you want for pulse-charging systems. You can scavenge them from old TV's and monitors pretty easy.  
Or, you can hit some of the electronic surplus places on the net.  
Last, you can shop at digikey.com and get everything that's shiny and new!

Later...

Re: What size and voltage ([none / 0](#)) (#3)  
by [bob golding](#) ([yubba at clara dot net](#)) on Mon Dec 15th, 2003 at 05:08:17 PM MST  
([User Info](#))

hi charged what voltage caps will i get away with on the pulse charging circuit you talked about the other day? i notice 1 F audio grade at 25 volts are 180 bucks apiece. 3 of those would buy a lot of batteries. the memory back up 1f ones are much cheaper. they are rated at 5 volts so would say 2 banks of 3 in parralell work ok? that should be 330,000uF at 30 volts i think?

bob

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Re: What size and voltage ([none / 0](#)) (#4)  
by [bob golding](#) ([yubba at clara dot net](#)) on Mon Dec 15th, 2003 at 05:28:04 PM MST  
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scrub that last post i just looked at the current rating. well it doesnt give a figure but talks abouts microamps. i suppose getting several amps though something that small is a bit unrealistic, but there again so was i farad a few years ago.

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Re: What size and voltage ([none / 0](#)) (#7)  
by Jerry on Mon Dec 15th, 2003 at 09:03:43  
PM MST  
([User Info](#))  
<http://www.dplusv.com/Photo-03.html>

Hi Bob

I've metioned here B-4 that I will sell you guys car stereo stuff cheaper. This is easy for me since I've owned and operated my own store since 1986. I started as an installer in 1976 I've been involved with audio & electronics since 1958.

Now that I've patted myself on the back heres the deal. That \$180 1 farrad cap you mentioned. I'll sell that to my wind freinds here for \$75 + shipping & hadling.

Plus I have I have a 1000 or 2 of caps with voltages and UFs all over the map. Many of these start at \$5 depending on UF and voltage rating. All or computer grade, many are take outs.

JK TAS Jerry

[Airheads Page](#)

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Re: What size and voltage ([none / 0](#)) (#5)  
by Norm on Mon Dec 15th, 2003 at 05:52:35 PM  
MST  
([User Info](#))

What is the physical size of a high voltage 300uf? for this 4 bolt bicycle charger I have one in a 700 watt microwave(found in the junk but works good enough to reheat my coffee out in the shed.) I think the capacitor is about the size of a toilet paper tube... will that work(if it would I'll be coming back in the house to reheat my coffee)? I don't think I need those \$180 ones that Bob Golding mentioned???? .....(as Lil' Abner used to say 'Amoozin' but confuzin ' ) (:>) Norm.

[ [Parent](#) ]

Re: What size and voltage ([none / 0](#)) (#6)  
by monte350c on Mon Dec 15th, 2003 at 07:24:34  
PM MST  
([User Info](#))

Hi Charged,

Is there a practical limit to paralleling caps to increase capacity? Say each phase of a wind generator has an open circuit voltage of around 40 VAC, any suggestions for cap sizes at the generator, and at the battery end?

Thanks - learning lots!

Ted.

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Re: What size and voltage ([none / 0](#)) (#2)  
by veewee77 on Mon Dec 15th, 2003 at 04:56:48 PM MST  
([User Info](#))

Those capacitors on lawnmower engines are very low capacitance. They wouldn't be of much use.

DS

Re: What size and voltage ([none / 0](#)) (#8)  
by charged on Tue Dec 16th, 2003 at 06:09:06 AM MST  
([User Info](#))

Whoa! Lots of questions!

Ok, here's how to set it up.

HV inductive spikes need someplace to "land" that can tolerate their peak voltage.

For this reason, RIGHT ON the genny winding (or right beside it), mount the HV capacitor. A 300v or so electrolytic should more than suffice. Next, build a bank of LARGE low voltage caps. I'd build for a 50v nominal rating, minimum. Run a couple of feet of heavy twin lead between the genny mounted cap and the large cap bank.

This capacitor bank is the HEART of your battery charging system. DO NOT SKIMP if you can help it. It will be serving as the mediator between ALL your various generators and the battery bank. The more capacitance, the better. That's the rule.

You never want HV spikes hitting the low voltage caps. It'll pop the dielectrics inside and you're out the cash.

You might want to build an overvoltage bleeder to put on the large cap bank so that if it goes over peak, a few heavy parallel power transistors can bleed the excess before any damage takes place.

If you build your cap bank with enough capacitance, it

shouldn't ever be a problem.

When you have sufficient capacitance, your bank voltage will float just over the battery voltage (whatever it may be).

Makes sense?

[What size and voltage](#) | 8 comments (8 topical, 0 editorial)

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[More speed? or more wire?](#) | 14 comments (14 topical, editorial)

Re: More speed? or more wire? ([none / 0](#)) ([#14](#))  
by monte350c on Fri Dec 12th, 2003 at 09:58:31 PM MST  
([User Info](#))

Hi Charged,

So... let me see if I've got this straight. The timing thing is mainly to discharge the cap - but that should happen when there's no interaction with any of the coil(s)?

If that's the right answer - could I skip the belt and timing disk and add a hall effect sensor in between the magnets on the main flywheel and achieve the same result? Say discharge the cap once per revolution.

Looked over the sketches on the link you sent, and it doesn't look too difficult to build. Very cool in fact. Out of curiosity how long does your motor run on 1 or 2 9 volt batteries?

Ted.

[ [Parent](#) ]

Re: More speed? or more wire? ([none / 0](#)) ([#15](#))  
by charged on Sat Dec 13th, 2003 at 09:21:44 AM MST  
([User Info](#))

Depends on how you build the motor. There is no "one" answer. Look at the video clip at [www.keelynet.com/bedmot/bedmot.htm](http://www.keelynet.com/bedmot/bedmot.htm) and read the text about what's happening. You'll have your answer.

I don't want to be rude and continue blabbing about that device in this particular thread. Just toss any other questions on the Bedini system over to this message thread.

<http://www.fieldlines.com/story/2003/11/12/8365/3048>

See ya there!

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[More speed? or more wire?](#) | 14 comments (14 topical, editorial)

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by monte350c on Fri Dec 12th, 2003 at 09:58:31 PM MST  
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Ted.

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## [More speed? or more wire?](#)

By [Norm](#), Section [Homebrewed Electricity](#)

Posted on Tue Dec 9th, 2003 at 05:21:07 PM MST

[Alternators](#)

Oh & ^ %&%\* &% !!! 100 turns around a 1/2 inch bolt...<br>

needed some more wire for 200 turns...no problem scrape the coating off and splice some more wiring....hmmm...that bare wire is silvery Gahh...aluminum wire!  
Went to Google and was checking out properties of aluminum wire and found out that aluminum is not as conductive as copper so would need larger wire versus copper and also and at the bottom...it says One last note on aluminum magnetic wire. The polyester insulating varnish commonly used on a motor's magnetic wire has a copper hue. This makes it almost impossible to distinguish the material used in the motor windings. So I guess ...maybe just a higher ratio so it spins faster?Fun...fun..fun! Norm.

[More speed? or more wire?](#) | 14 comments (14 topical, 0 editorial)

Re: More speed? or more wire? ([none / 0](#)) ([#2](#))  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Tue Dec 9th, 2003 at 09:00:37 PM MST  
([User Info](#)) <http://www.internetfred.com>

Ah, Norm, your just having to much fun, gotta curb that! LOL  
why are you turning 100 turns around a 1/2 inch bolt?  
just curious..  
Good Luck!  
Fred

P.S. like this?



Re: More speed? or more wire? ([none / 0](#)) ([#5](#))  
by Norm on Tue Dec 9th, 2003 at 10:10:36 PM MST  
([User Info](#))

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<http://www.fieldlines.com/story/2003/12/3/72018/9323>

I'm quoting 'Charged'in a reply to 60 amp altenator won't work.

Forget using alternators. They're junk. You already have a high velocity spinning surface, the wheel. Make use of that.

Go to Radio Shack and get \$10 worth of those LARGE high power ceramic magnets that they sell (part #64-1879). They're something like 1"x1 3/4" or so. Remove the tire and stick the 10 magnets around the outside of the rim, evenly spaced. Make sure all the magnets have the SAME POLE facing out. Use glass-fiber packing tape to wrap around the magnet and rim. Plastic tapes tend to flex and release the magnets like bullets when you're really cranking, Centrifugal projectile launcher. Nasty.

Get four 1/2"x 4" bolts, 8 large washers, 8 nuts, and a piece of 2x6 lumber. Cut the curvature of the wheel into one edge of the 2x6 so you can mount it under the wheel. Wrap about 200 turns of #14 wire onto the first 1 1/2" of the bolt by positioning the two washers with one at the head of bolt and the other one held in place by one nut. All the windings go between the two washers.

Drill 4 holes into the curved piece of lumber so that the bolts can be mounted so that they're heads all line up with 4 of the ceramic magnets at the same time.

Wire the 4 coils in series and put a single diode on the output, feeding a high voltage capacitor of at least 300uf.

Take your power off the capacitor directly.

and so I'm halfway thru winding the first bolt will it work? I'm shooting for 35-45 watts.....(:>) Norm.

[ [Parent](#) ]

Re: More speed? or more wire? ([none / 0](#)) (#6)  
by DanB on Wed Dec 10th, 2003 at 06:44:42 AM MST  
([User Info](#))

35-40 watts is not much to ask - I suspect it could work if you wind it right...

But its not an ideal design. Youll have significant eddy current losses in the bolts/washers (laminates, or even small soft steel rods instead of bolts would probably work better I think) - so I dont think it would be very efficient.

I think it will also cog pretty badly - perhaps not a big deal once you get it running, but it might be. The cogging will make it a bit hard to start and once it does start it will vibrate.

Im not sure why wed have the same pole pointing out around the rotor...

I think iit would work, but I think it would not be very efficient. I'd do some things differently...

If you throw enough magnets at it (and you can - because again - 35 watts is not a lot to ask) - then you could forget about using any steel/iron inside, or behind the coils alltogether, and wind very flat coils that run very close to the magnets. This would eliminate the cogging, and the eddy current losses in the bolts - but you'd need more magnets to get the same result I think.

[ [Parent](#) ]

Re: More speed? or more wire? ([none / 0](#)) (#8)  
by charged on Wed Dec 10th, 2003 at 07:49:56 AM MST  
([User Info](#))

Eddy currents will be more than offset by the lack of hysteresis loss from pole reversal in the cores. Also, the flat washers will only be swept by the fields edge-on. I learned a lot about eddy currents in various metal structures when I worked at an MRI magnet facility a few years ago. Different shapes handle the field-lines in different ways.

Ever get to play with a 3 Tesla, steady-state superconductive magnetic field? Very cool. I highly recommend it.

That's so strong that it slows down the water flow in your inner ear if you turn your head too fast inside the field. Also very cool. I highly recommend it.

I could drag a flat 1/4" thick aluminum plate into that field edge-on. But, I could literally dangle in mid-air from that same plate when I tried to pull it down face-on into the field. Very strange to see yourself hanging there from a plate that's stuck in a bunch of "nothing" about 4 feet off the ground. Tremendously cool. Recommendation goes without saying.

In any case, the monopole rotor will produce a spike/ramp waveform to charge the capacitor(s). This is a magneto, not an alternator, in the truest sense.

Since most folks have never even bothered to build something like this, they make assumptions that don't really reflect what the device can do. "Wasted flux" means nothing. Efficiency can be very very high with simple components.

You can also space your stator cores so that there is a continual imbalance of PM forces to prevent cogging. But, this will require that all the windings share a common ground to the capacitor's negative terminal. Also, each winding will need a single diode between the other lead and the capacitor positive. That's one diode for EACH winding so that they can't feed back on eachother. You'll have a multi-phase "machine-gun" pulsation going to the capacitor.

OR you can put a single diode AND a single capacitor on EACH WINDING. Then just wire each of those capacitors in series and draw you power (higher voltage) off the top (positive) and bottom (negative) capacitors.

The single diode also causes an inductive kick effect since it "chops" the sine-wave into individual "upward" voltage ramps that are the peak to peak voltage difference in the sine-wave. If your winding is producing, let's say 10vac, then the diode turns that into 20v spikes.

Your individual capacitor's floating voltage would be 20v.

Low resistance, and lots of turns, 200+ on each stator.

You can also use a much larger capacitance either way. 300uf is about the minimum for my tastes though. Bigger is always better for filtering purposes.

The velocity of your magnets, the field strength and the number of turns on each stator will determine your peak voltage. The system resistance will determine your max current.

Of course, impulse current from your capacitor bank can be much higher and can produce some interesting effects in loads, especially lighting, since the capacitor has no significant internal resistance.

40 watts is nothing. A "standard" human (is there such a thing?) can do about 500 watts for a pretty fair duration.

[ [Parent](#) ]

Re: More speed? or more wire? ([none / 0](#)) ([#10](#))  
by Norm on Wed Dec 10th, 2003 at 06:06:38 PM MST  
([User Info](#))

OK First things first...the wheel rim I suppose an old 10 speed would be about right....(got it for \$2.50 the tires are rotten anyways) the magnets go lengthways in the rim? ...and some strapping tape to hold them in. Some JB Weld on the edges..Maybe? As far as the 200 turns of aluminum goes ...if it doesn't work good enough can always add more or rewind with copper wire. Well that's about it for now your comment has been very enlightening and encouraging...and fun...thanks (:>) Norm.

[ [Parent](#) ]

Re: More speed? or more wire? ([none / 0](#)) (#13)  
by charged on Fri Dec 12th, 2003 at 02:02:36 PM MST  
([User Info](#))

Ok, you can use the aluminum with great success.... IF.....

IF you set it up so the capacitor discharges ONLY when there are NO PM INTERACTIONS WITH ANY OF THE STATOR WINDINGS.

In other words, separate the two current loops in your system.

Go ahead, scratch your head. It's ok. Nobody ever does this. Well, some people do. But, they probably keep it some sort of "trade secret". Ha! Not anymore, whoever you may be.

Actually, the idea's been out there a long time. But, the generator industry seems to be stuck in a sine-wave rut for some reason. Yek. Tesla's post 1890 "impulse" or "radiant" patents work MUCH better than AC systems. He said so himself, AFTER his AC designs were already running most of the industrial world. But, that's another story. Go read his autobiography.

You ONLY need commutation for the capacitor DISCHARGE, nothing else.

If you're doing the "imbalanced fields" thing to eliminate cogging, try this...

Let's say you put 8 pm's around the outside of the wheel. Now, remove 2 of them, from opposite sides. Now you have 6 magnets in two sets of three on either side of a center-line. Got it? Ok....

Set up your stators so that they all fit inside that "blank" area of the wheel without interacting with any magnets. In other words, let's say you have about 30 degrees of arc on either side where there aren't any magnets. Make the stator windings line up in less than that 30 degrees of arc. This will produce 2 "blank" periods per rotation where the stators do nothing.

This doesn't "waste" anything since the guy peddling is just storing a little flywheel inertia that will be collected by the next set of pulses. Got it? Ok.

Set up a commutator on the wheel near the hub. It should make contact with two brushes that are in series with the cap, to discharge it. That commutator should only make contact with the brushes at the MID-POINT of the blank space, while the stators are doing nothing.

So, what you will get on each rotation is a little tat-tat-tat-tat, pause, SNAP! , pause, tat-tat-tat-tat, pause, SNAP!, pause, etc.....ad nauseum.

Why are we doing this? Well, your wire has a specific impedance and your load also has IT'S OWN impedance. The windings and your load will never come close to matching impedance, even on the best of days. Impedance mismatch is loss. Aluminum may be RESISTIVE but since it's wound into an inductor there is also an INDUCTIVE field-collapse component in this particular application. The inductive "spike" component of the output is a "radiant" (ala Tesla) component, or PURE VOLTAGE with little or no associated electrons. Therefore it easily bypasses the resistance of the aluminum windings and fills the capacitor virtually losslessly. Don't worry if you don't understand it. You don't absolutely need to. It will work based on the laws of physics, not on your belief patterns. heh. Below a certain voltage coming from the windings (RMS), it IS electron current and must fight the wire resistance. So, you have BOTH of these components supplying charge to the capacitor.

Along comes this capacitor. To be quick about it, it will "match" itself to any other impedance, in this particular application.

First, the cap charges at the source and reaches peak voltage. The it floats away and dumps it's charge into the load. Then it disconnects from the load and floats back over to the source for more charge. It's an impedance translator.

The generator always floats up to peak voltage and the load ALWAYS gets the maximum available generator power. Given, it's in microbursts. But, you CAN put a filter cap across the load.

You might even see some "strange" effects that you weren't expecting.

This is a GREAT way to run resistive heating elements.

After you see the weirdness at the commutator and you're no longer fascinated by it, you'll probably want to step up some high-power solid-state switching components and a little slotted photo-coupler.

This system also works well for homemade wind generators.

Once you have determined your maximum generator voltage, place enough batteries in series to come up just short of that voltage without going over it.

Fire your capacitor discharges into this series stack to recharge them.

Hmmm....Why is it so easy to peddle this thing?

Enjoy!

[ [Parent](#) ]

Re: More speed? or more wire? ([none / 0](#)) ([#11](#))  
by monte350c on Wed Dec 10th, 2003 at 07:35:25 PM MST  
([User Info](#))

Hi Charged,

Do you have any idea if it's possible to actually build a small version of that Bedini motor 2 battery thing I keep seeing on the web? I think it would be pretty cool to have one of those spinning on my desk...

I've seen a few sketches and schematics but none were complete enough to send me to Radio Shack, I'm looking for some fairly straightforward drawings. If you've seen any I'd appreciate a drawing or link! Thanks!

Could be fun...

Ted.

[ [Parent](#) ]

Re: More speed? or more wire? ([none / 0](#)) ([#12](#))  
by charged on Fri Dec 12th, 2003 at 01:13:42 PM MST  
([User Info](#))

The motor is REALLY simple. There is not a "fixed" set of plans, per se.

Almost any configuration conceivable will work.

In a nutshell, the CIRCUITS and the basic layout are here. Build the stator winding just like the diagram shows. I use 1/2" ID cpvc with a couple of plastic ends to make a spool. Wind a triplet of #24 wire (trifilar winding) about 500 turns and that's about it.

Magnets can be just about any kind. If your wheel isn't metal, use high-power ceramic magnets. If you have a non-magnetic metal rotor, use neodymiums. Using the neo's with a light rotor makes a disturbing rumbling sound as it spins.

[www.keelynet.com/bedmot/bedmot.htm](http://www.keelynet.com/bedmot/bedmot.htm)

The circuits are actually more critical than the rotor and timing wheel designs.



A good TIP3055 transistor is all you need. Just check the gain on the transistor with a meter and make sure that it exceeds 80. You might have to go through a bunch in order to find one that high. It WILL run with a lower gain. But, it runs optimally with higher gain.

If you stick with 1/4" steel rod for the axles, you can use a set of hole-saws to cut all your wheels from whatever material you like. Just make sure the rotor has some mass to it since this is pulse driven. It's not much different from an IC engine in this respect. It needs the flywheel mass to run smooth.

I use string for the belt. Just tie the string in a snug loop around the big pulley and the axle. Then start the motor and rub silicone rubber into the string while the motor is running. It will dry in about 20 minutes and then the rpm's will go up a little.

A couple of brass strips for brushes and a chunk of brass glued to the side of the commutator wheel and let'r rip!

Hope this helps!

[ [Parent](#) ]

Re: More speed? or more wire? ([none / 0](#)) ([#14](#))  
by monte350c on Fri Dec 12th, 2003 at 09:58:31 PM MST  
([User Info](#))

Hi Charged,

So... let me see if I've got this straight. The timing thing is mainly to discharge the cap - but that should happen when there's no interaction with any of the coil(s)?

If that's the right answer - could I skip the belt and timing disk and add a hall effect sensor in between the magnets on the main flywheel and achieve the same result? Say discharge the cap once per revolution.

Looked over the sketches on the link you sent, and it doesn't look too difficult to build. Very cool in fact. Out of curiosity how long does your motor run on 1 or 2 9 volt batteries?

Ted.

[ [Parent](#) ]

Re: More speed? or more wire? ([none / 0](#)) ([#15](#))  
by charged on Sat Dec 13th, 2003 at 09:21:44 AM MST  
([User Info](#))

Depends on how you build the motor. There is no "one" answer. Look at the video clip at [www.keelynet.com/bedmot/bedmot.htm](http://www.keelynet.com/bedmot/bedmot.htm) and read the text about what's happening. You'll have your answer.

I don't want to be rude and continue blabbing about that device in this particular thread. Just toss any other questions on the Bedini system over to this message thread.

<http://www.fieldlines.com/story/2003/11/12/8365/3048>

See ya there!

[ [Parent](#) ]

Re: More speed? or more wire? ([none / 0](#)) (#3)  
by monte350c on Tue Dec 9th, 2003 at 09:07:36 PM MST  
([User Info](#))

Hi Norm,

Sounds like a conundrum...

I'm now using exclusively new magnet wire - I went to a local shop that rewinds motors and they will sell wire by the pound really reasonably. I got a roll of 18 AWG that I used in my very first alternator project:



It's got 18 coils in it of 70 turns each, plus I've used the wire for another couple of projects and experiments too - total cost was about \$20 - and I still can't see the bottom of the reel!

At least with the new stuff you know what you've got - just check your local yellow pages under electric motor service - bet you'll find a local source pretty reasonable. Saves all that cussing!!

Ted.

Re: More speed? or more wire? ([none / 0](#)) (#4)  
by Jerry on Tue Dec 9th, 2003 at 10:04:46 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Norm

Thats right. You'll find aluminum wire in ac motors. I've found this in the garbage disposal motors in the 1/3, 1/2, 5/8 and 3/4 hp. The 1 hp has copper but out of the 300 or 400 motors I've collected 3 have been 1 hp. They are rare. The aluminum dose work but not as good. It has higher resistance and less amperage. It is prety though, just like the copper? But who needs prety just give me AMPS.

JK TAS Jerry

[Airheads Page](#)

Re: More speed? or more wire? ([none / 0](#)) (#7)  
by Budgreen on Wed Dec 10th, 2003 at 07:00:36 AM MST  
([User Info](#))

aluminum is technically a semiconductor,

just figured i'd throw that in here, not many people ever realize that :)

[ [Parent](#) ]

Re: More speed? or more wire? ([none / 0](#)) ([#9](#))  
by bob golding ([yubba at clara dot net](#)) on Wed Dec 10th, 2003 at 05:07:26 PM MST  
([User Info](#))

yes over on the tesla list pupman.com there was a discussion on alumimium for spark gaps acts like a diode. it will work as long as you dont have to try and join it. a good source is the deguassing coils in old tv sets.

having lots of fun

bob

[ [Parent](#) ]

[More speed? or more wire?](#) | 14 comments (14 topical, 0 editorial)

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[Magnet Strength vs Thickness](#) | 26 comments (26 topical, editorial)

Re: Magnet Strength vs Thickness ([none / 0](#)) (#1)  
by monte350c on Fri Dec 12th, 2003 at 01:39:43 PM MST  
([User Info](#))

Hi Dave,

Here is a site I found extremely useful for this kind of thing:

<http://www.magnetsales.com/Design/Tools1.htm#disc>

You can just punch in magnet thickness, size, type (ie. Neo 35) and the distance from the magnet, or between them if they're on a dual disk and it will return the gauss at that point.

It really illustrates that small air gaps are good - a small magnet on a small air gap can give the same results as a much bigger magnet with a corresponding big air gap. So I think you can save money on magnets to some degree if you up the diameter and close the air gap down... Just my two cents worth!

Have fun,

Ted.

Re: Magnet Strength vs Thickness ([none / 0](#)) (#2)  
by dburt on Fri Dec 12th, 2003 at 01:58:59 PM MST  
([User Info](#))

Thanks Ted,

That's a super calculator! I used the one for rectangular magnets yoked in steel path. I think that answers my needs perfectly!

Dave in PA

[ [Parent](#) ]

Re: Magnet Strength vs Thickness ([none / 0](#)) (#3)  
by jimpep on Fri Dec 12th, 2003 at 02:44:00 PM MST  
([User Info](#))

What a great site ! Thanks for the information. Jim

[ [Parent](#) ]

Re: Magnet Strength vs Thickness ([none / 0](#)) (#4)  
by cevonk ([cevonk\(at\)signhere@aol.com](mailto:cevonk(at)signhere@aol.com)) on Fri Dec 12th, 2003 at 04:13:19 PM MST  
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That's really a handy tool! Thanks for the link!

One thing it learnt me (that's proper English in my dialect) was that paying for the Neo 48s is probably not worth the price difference over the Neo 35s.

Another thing is that a 1/8" air gap is probably a worthwhile target.

(If I ever get around to building one.)

[ [Parent](#) ]

Re: Magnet Strength vs Thickness ([none / 0](#)) (#5)  
by 5kw on Fri Dec 12th, 2003 at 04:46:26 PM MST  
([User Info](#))

How are you going to get any wire into a 1/8 " gap.

[ [Parent](#) ]

Re: Magnet Strength vs Thickness ([none / 0](#)) (#6)  
by cevonk ([cevonk\(at\)signhere.aol.com](mailto:cevonk(at)signhere.aol.com)) on Fri Dec 12th,  
2003 at 07:13:48 PM MST  
([User Info](#))

Long, skinny coils?

[ [Parent](#) ]

Re: Magnet Strength vs Thickness ([none / 0](#)) (#7)  
by Jerry on Fri Dec 12th, 2003 at 08:38:54 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

My gap is 1/16 or less in motor conversion. Also with the very best posable lamination matereal. Also no problem with plenty of copper. Just a thought for the disc builders. We gave up on the curved neos way to soon.

JK TAS Jerry

[Airheads Page](#)

[ [Parent](#) ]

Re: Magnet Strength vs Thickness ([none / 0](#)) (#15)  
by dburt on Mon Dec 15th, 2003 at 11:58:36 AM MST  
([User Info](#))

I was real excited about the site with magnetic gauss calculator, but then I hit a feature that has me concerned about accuracy of equations used by the calculator. If you use:

[http://www.magnetsales.com/Design/Calc\\_files/FluxDensityRectYoke.asp](http://www.magnetsales.com/Design/Calc_files/FluxDensityRectYoke.asp)

(supposed to calculate gauss at the center between 2 rectangular magnets in a steel yoke) and put in 3 by 3 by 1/4 neo N45's with .75 gap between magnets, it calculates about 4149 Gauss... Increase the size of the magnets to 5 by 5, with everything else remaining constant, and the Gauss calculation decreases to 3606!?! I cannot think of a reason how that could be correct. What am I missing here?? Sure wish I had access to the formulas they're using...

Dave in PA

[ [Parent](#) ]

Re: Magnet Strength vs Thickness ([none / 0](#)) ([#17](#))  
by 5kw on Mon Dec 15th, 2003 at 04:15:26 PM MST  
([User Info](#))

dbert,

It's true. The wider magnet causes a demagnetizing force on the center point.

You can verify this with a flux meter.

Flux lines repel each other and cannot cross but there all "trying "to get to the same place. The more the crowding the higher the reluctance.

Make the wind fun!

Victor

[ [Parent](#) ]

[Magnet Strength vs Thickness](#) | 26 comments (26 topical, 0 editorial)



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[Magnet Strength vs Thickness](#) | 26 comments (26 topical, editorial)

Re: Magnet Strength vs Thickness ([none / 0](#)) ([#1](#))  
by monte350c on Fri Dec 12th, 2003 at 01:39:43 PM MST  
([User Info](#))

Hi Dave,

Here is a site I found extremely useful for this kind of thing:

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It really illustrates that small air gaps are good - a small magnet on a small air gap can give the same results as a much bigger magnet with a corresponding big air gap. So I think you can save money on magnets to some degree if you up the diameter and close the air gap down... Just my two cents worth!

Have fun,

Ted.

[Magnet Strength vs Thickness](#) | 26 comments (26 topical, 0 editorial)

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[Test Results](#) | 16 comments (16 topical, editorial)

Re: Test Results ([none / 0](#)) ([#6](#))  
by monte350c on Fri Dec 12th, 2003 at 12:50:31 PM MST  
([User Info](#))

Hi Charged,

Wow some pretty neat ideas. Here's a ?:

What kind of waveform would I get if I had 2 caps wired to a transformer - one discharges + , then the next discharges - , into the primary of the transformer. The pulses would be timed so they're 180 degrees apart.

Would this give a sort of quare wave output? Or some kind of sine wave? You're making me very curious....

Have fun!

Ted.

[ [Parent](#) ]

[Test Results](#) | 16 comments (16 topical, 0 editorial)

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[Test Results](#) | 16 comments (16 topical, editorial)

Re: Test Results ([none / 0](#)) ([#6](#))  
by monte350c on Fri Dec 12th, 2003 at 12:50:31 PM MST  
([User Info](#))

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Have fun!

Ted.

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[Test Results](#) | 16 comments (16 topical, 0 editorial)

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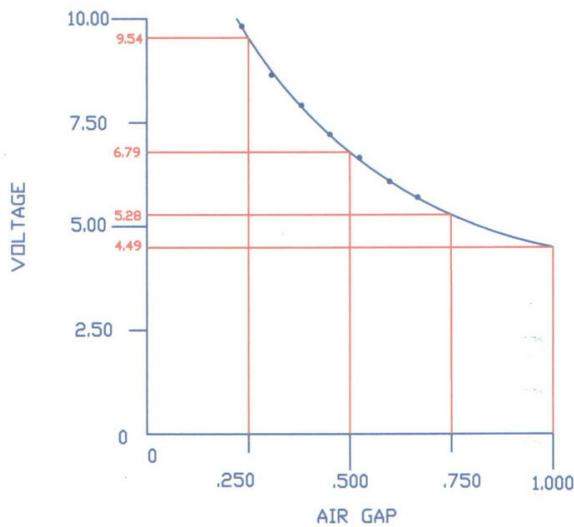
By [Firefly](#), Section [Magnets & Magnetism](#)  
 Posted on Thu Dec 11th, 2003 at 05:06:46 PM MST [Alternators](#)

**Air Gap Vs. Voltage**

Here is results from a air gap vs voltage test. The test set up is as follows:  
 rpm was 500 in all test  
 single coil

- 36. turns
- 18. ga
- 6. airgaps tested

open voltage



Comments?

Firefly

[Test Results](#) | 16 comments (16 topical, 0 editorial)

Re: Test Results ([none / 0](#)) ([#1](#))  
 by troy on Fri Dec 12th, 2003 at 08:57:17 AM MST  
[\(User Info\)](#)

Is this a single rotor setup, or dual? And is the air gap the distance between the face of the magnet and the face of the coil?

Thanks,

troy

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Re: Test Results ([none / 0](#)) (#3)  
by Firefly on Fri Dec 12th, 2003 at 11:35:01 AM  
MST  
([User Info](#))

Its a dual disk. I started with the smallest air gap that I could get, then increased the air gap without moving the coil. The coil at this point was not centered in the air gap at the wider gaps. The test is the open ac voltage of a single coil. I think that I will test to see if coil centering in the air gap makes a difference. Keep an eye open for these results. I can do this later today. The air gap is the distance between the magnet faces.

Firefly

[ [Parent](#) ]

Re: Test Results ([none / 0](#)) (#7)  
by Firefly on Fri Dec 12th, 2003 at 04:21:56  
PM MST  
([User Info](#))

Troy,  
I missed your question, The air gap is the distance between the magnets.  
I have also completed a test to see if the coil voltage varies with position of the coil in the air gap. The air gap is .660", the coil is .160" thick. With the coil up to the right side disk the voltage was 5.75 @ 500rpm. When the coil is centered in the air gap the voltage was 5.54 @ 500rpm. When the coil was to the left side disk the voltage was 5.70 @ 500rpm. I had about 1/32" gap between the coil and magnet in the above side test.

Firefly

[ [Parent](#) ]

Re: Test Results ([none / 0](#)) (#8)  
by JB on Fri Dec 12th, 2003 at 04:37:07  
PM MST  
([User Info](#))

how thick are your magnets and rotors  
firefly. ?? thanks JB

[ [Parent](#) ]

Re: Test Results ([none / 0](#))  
(#10)  
by Firefly on Fri Dec 12th, 2003 at  
07:53:00 PM MST  
([User Info](#))

JB

The magnets are 3/16" thick and the disk are .28" thick. I purchased the magnets from windstuffnow. They are the pie shaped ones. I have 16 magnets per disk. Disk dia. is 12"

Heres some misc. photos



Firefly

[ [Parent](#) ]

Re: Test Results ([none / 0](#)) ([#2](#))  
by [charged](#) on Fri Dec 12th, 2003 at 11:01:11 AM MST  
([User Info](#))



That's an excellent test you've set up.

Just wondering, is that an AC voltage measurement with no rectification?

Here's something you can try if you like.

Tighten up that air gap as much as you can. Put a single diode on one lead from the coil and charge a 500uf (or more) electrolytic capacitor that's rated for at least 50v.

Connect a pair of leads to the capacitor and put a momentary contact switch on one lead.

Hook up a battery and a small analog ammeter in series with it. Start tapping the switch with very sharp pulses and watch the battery voltage with another meter.

If you want to get really fancy, replace the switch with a commutator on the generator's rotor shaft. Set it so that the commutator only dumps the capacitor IN BETWEEN the times when the magnet is passing your winding.

You'll love this.

The capacitor will "float" at a minimum of the battery's voltage. The generator will only be topping off the capacitor and will never be directly interacting with the battery. The capacitor acts as an impedance "translator" between the genny and the battery. It's much more efficient to charge this way.

Watch what happens at the commutator. It can be a real freakshow.

I'm planning on building a sealed commutator box and flooding it with Argon to prevent oxidation of the contacts. The commutator shaft has a small magnetic gear on one end (inside the box) and it's coupled to a magnetic gear OUTSIDE the sealed box that's mounted to the genny axle. It's kinda like a magnetic clutch-plate.

Oops. I've gone off on one of those little technobabbles again.... my bad.

(puts on bunny ears and walks off into the crowd).....

Re: Test Results ([none / 0](#)) (#4)  
by Firefly on Fri Dec 12th, 2003 at 11:39:10 AM MST  
([User Info](#))

I got to think about this one a while. It is ac measure without rectification.

Firefly

[ [Parent](#) ]

Re: Test Results ([none / 0](#)) (#5)  
by Jerry on Fri Dec 12th, 2003 at 11:57:22 AM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Charged

I would guess there would be some arching between swiching cicles. Both at the battery end and the coil end. It neat that the coil and the battery never meet electricaly. The coil hands the power to the cap and the cap takes the power to the battery. The cap charges more easily than the battery and dumps a large reseve of amperage onto the battery. Man I'm liken this.

We've had problems with swich arching on our 156 volt dc system. We've cured this by placing 2 UF caps accross the swiches.

I think this might help here if arching problems are incountered and the small value of this cap should not interfear with the large caps storage and power transfer function.

If the dose not work then maybe soild state swithing with SCRs.

I've built CDI ignition systems and they work on a simular princapal.

The CDIs have a 200 to 300 volt suplly that chargese a 2 UF cap that is then dicharged accross the ignition coil. An SCR is use as the electronic switch that discharges the cap accross the ign. coil. No arching.

An electronic trigering lobe on the alt shaft would act just like the points in a cars ignition to triger the SCR. Heck take an old distributer and hook it to the alt shaft.

I know caps are very powerfull. Some of our lit on the 1 Farrad caps state that when a 1 Farrad cap is charged to 12 volts that at the instant of dead short discharge 4000 amps of current is released.

This Idea may be the next greeneration. I have zilions of caps so I like it.

JK TAS Jerry

[Airheads Page](#)

[ [Parent](#) ]

Re: Test Results ( <a href="#">none / 0</a> ) ( <a href="#">#6</a> ) by monte350c on Fri Dec 12th, 2003 at 12:50:31 PM MST ( <a href="#">User Info</a> )
---

Hi Charged,

Wow some pretty neat ideas. Here's a ?:

What kind of waveform would I get if I had 2 caps wired to a transformer - one discharges + , then the next discharges - , into the primary of the transformer. The pulses would be timed so they're 180 degrees apart.

Would this give a sort of quare wave output? Or some kind of sine wave? You're making me very curious....

Have fun!

Ted.

[ [Parent](#) ]

Re: Test Results ([none / 0](#)) ([#9](#))  
by [kell](#) on Fri Dec 12th, 2003 at 07:36:02 PM MST  
([User Info](#))

IGBT's (insulated gate bipolar transistors) used in ignitions have built-in protection in the form of avalanche diodes to clamp overvoltage spikes, and unlike SCR's they turn off when you release the gate. The gate on an IGBT acts just like a MOSFET gate.

They're a good alternative to mechanical switching. You can use a hall effect sensor and a magnet attached to a shaft or flywheel, or use a shutter disc that interrupts the field of a stationary magnet.

Re: Test Results ([none / 0](#)) ([#11](#))  
by [charged](#) on Sat Dec 13th, 2003 at 09:17:49 AM MST  
([User Info](#))

This guy's as sharp as a tack. :)

First, SCR's definitely not the best way, in THIS application. They can float "on" longer than the commutator signal and cause genny-capacitor-load connection overlaps.

You can use mosfets, bipolar transistors, IGBT's, etc., as long as the reverse voltage tolerance is high enough. I've destroyed many transistors that were rated too low for this system.

It's pretty strange to see a 25v capacitor discharge into a 12v battery pop the guts out of a 150v transistor. 200v rating is about minimum. Make sure the "on" state resistance of your transistor is very low.

Anyone not familiar with paralleling semiconductors to lower switching resistance and increasing amp tolerance should dig around the web a little and learn how to do it.

Capacitive discharge is much more "kinetic" than a

sinewave system. It's also MUCH more effective for battery charging.

Imagine, all of Tesla's patent designs on "radiant" energy had to be done with purely mechanical switching. What could he produce with access to today's semiconductors?

[ [Parent](#) ]

Re: Test Results ([none / 0](#)) ([#13](#))  
by drdongle on Sat Dec 13th, 2003 at  
04:50:45 PM MST  
([User Info](#))

I suspect that the problems you describe with blowing transistors was more of a problem with a limited current handling ability than with voltage.

Dr.D

[ [Parent](#) ]

Re: Test Results ([none / 0](#)) ([#15](#))  
by charged on Mon Dec 15th, 2003 at  
04:13:12 PM MST  
([User Info](#))

Nope. The voltage peaks when breaking the circuit were popping them. I solved it when I went to higher voltage rated components.

Current is easy. That's just a matter of wiring a suitable number of parallel transistors. They were still popping. That's what threw me a little at first. I was building WAY over the wattage required and still frying the parts.

Breaking the current flow off has some strange (and useful) effects.

[ [Parent](#) ]

Re: Test Results ([none / 0](#))  
([#16](#))  
by drdongle on Sun Dec 21st,  
2003 at 07:18:33 AM MST  
([User Info](#))

Were you able to observe these "transients" that blew the transistors? Your comment leads me to think that it was inductive "kick" that produced them. If so it would be a simple matter to add a limiting circuit ( zeners, and or a triac) to clip these spikes to a safe level.

Dr.D

[ [Parent](#) ]

Re: Test Results ([none / 0](#)) ([#14](#))  
by Firefly on Sat Dec 13th, 2003 at 04:54:11 PM MST  
([User Info](#))

Why not trigger it right off of the ac sign wave as it crosses zero?

Firefly

[ [Parent](#) ]

Re: Test Results ([none / 0](#)) ([#12](#))  
by kell on Sat Dec 13th, 2003 at 04:49:43 PM MST  
([User Info](#))

I looked at one website where a guy made a tesla coil using MOSFETs. He did it so that the MOSFETs would turn on and off when they weren't conducting. Very efficient.

People burn up transistors all the time in inductive applications... That's why IGBT's are so useful. They are designed expressly for firing a coil (automotive). When I converted my old bike over from points to a homebrew solid-state setup, I ordered my IGBT's and hall effect sensors from Newark.com. I mounted a shutter disc on a bushing and slid it down over the points cam, with a set screw to hold it. I put little quarter inch neos pressed into holes in an aluminum plate above the disc, and mounted the hall sensors on the plate the points used to be on. The usual wiring scheme is to have a pull-up resistor to bias the transistor or transistors ON. When the shutter disc spins it intermittently allows the hall unit to see the magnetic field and, when it does, the hall unit shunts current to ground, turning off the transistor... shutting off current to the coil. This is when the spark fires. I think you could use a related setup for this charging circuit you're talking about. You could also wire in a voltage regulation circuit to turn the transistor off when necessary. Might even be able to work out a way to use a voltage regulator from a car alternator so you don't have to do a lot of circuit building. Instead of regulating voltage at the output of a charging system, they are designed to turn on and off the field coils (depending on the voltage measured across the battery), so you could just use it instead to control the transistor.

You don't have to use the hall effect units if it feels to complicated. A mechanical switch to turn the transistor on and off would work fine without arcing because the gate

current is truly negligible with MOSFETs and IGBTs.

[Test Results](#) | 16 comments (16 topical, 0 editorial)

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[More speed? or more wire?](#) | 14 comments (14 topical, editorial)

Re: More speed? or more wire? ([none / 0](#)) ([#11](#))  
by monte350c on Wed Dec 10th, 2003 at 07:35:25 PM MST  
([User Info](#))

Hi Charged,

Do you have any idea if it's possible to actually build a small version of that Bedini motor 2 battery thing I keep seeing on the web? I think it would be pretty cool to have one of those spinning on my desk...

I've seen a few sketches and schematics but none were complete enough to send me to Radio Shack, I'm looking for some fairly straightforward drawings. If you've seen any I'd appreciate a drawing or link! Thanks!

Could be fun...

Ted.

[ [Parent](#) ]

Re: More speed? or more wire? ([none / 0](#)) ([#12](#))  
by charged on Fri Dec 12th, 2003 at 01:13:42 PM MST  
([User Info](#))

The motor is REALLY simple. There is not a "fixed" set of plans, per se.

Almost any configuration conceivable will work.

In a nutshell, the CIRCUITS and the basic layout are here. Build the stator winding just like the diagram shows. I use 1/2" ID cpvc with a couple of plastic ends to make a spool. Wind a triplet of #24 wire (trifilar winding) about 500 turns and that's about it.

Magnets can be just about any kind. If your wheel isn't metal, use high-power ceramic magnets. If you have a non-magnetic metal rotor, use neodymiums. Using the neo's with a light rotor makes a disturbing rumbling sound as it spins.

[www.keelynet.com/bedmot/bedmot.htm](http://www.keelynet.com/bedmot/bedmot.htm)

The circuits are actually more critical than the rotor and timing wheel designs.

A good TIP3055 transistor is all you need. Just check the gain on the transistor with a meter and make sure that it exceeds 80. You might have to go through a bunch in order to find one that high. It WILL run with a lower gain. But, it runs optimally with higher gain.

If you stick with 1/4" steel rod for the axles, you can use a set of hole-saws to cut all your wheels from whatever material you like. Just make sure the rotor has some mass to it since this is pulse driven. It's not much different from an IC engine in this respect. It needs the flywheel mass to run smooth.

I use string for the belt. Just tie the string in a snug loop around the

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big pulley and the axle. Then start the motor and rub silicone rubber into the string while the motor is running. It will dry in about 20 minutes and then the rpm's will go up a little.

A couple of brass strips for brushes and a chunk of brass glued to the side of the commutator wheel and let'r rip!

Hope this helps!

[ [Parent](#) ]

Re: More speed? or more wire? ([none / 0](#)) ([#14](#))  
by monte350c on Fri Dec 12th, 2003 at 09:58:31 PM MST  
([User Info](#))

Hi Charged,

So... let me see if I've got this straight. The timing thing is mainly to discharge the cap - but that should happen when there's no interaction with any of the coil(s)?

If that's the right answer - could I skip the belt and timing disk and add a hall effect sensor in between the magnets on the main flywheel and achieve the same result? Say discharge the cap once per revolution.

Looked over the sketches on the link you sent, and it doesn't look too difficult to build. Very cool in fact. Out of curiosity how long does your motor run on 1 or 2 9 volt batteries?

Ted.

[ [Parent](#) ]

Re: More speed? or more wire? ([none / 0](#)) ([#15](#))  
by charged on Sat Dec 13th, 2003 at 09:21:44 AM MST  
([User Info](#))

Depends on how you build the motor. There is no "one" answer. Look at the video clip at [www.keelynet.com/bedmot/bedmot.htm](http://www.keelynet.com/bedmot/bedmot.htm) and read the text about what's happening. You'll have your answer.

I don't want to be rude and continue blabbing about that device in this particular system thread. Just toss any other questions on the Bedini system over to this message thread.

<http://www.fieldlines.com/story/2003/11/12/8365/3048>

See ya there!

[ [Parent](#) ]

[More speed? or more wire?](#) | 14 comments (14 topical, 0 editorial)



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[More speed? or more wire?](#) | 14 comments (14 topical, editorial)

Re: More speed? or more wire? ([none / 0](#)) (#11)  
by monte350c on Wed Dec 10th, 2003 at 07:35:25 PM MST  
([User Info](#))

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Could be fun...

Ted.

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[More speed? or more wire?](#) | 14 comments (14 topical, 0 editorial)

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[WHICH ALTERNATOR BEST?](#) | 3 comments (3 topical, editorial)

Re: WHICH ALTERNATOR BEST? ([none / 0](#)) ([#2](#))  
 by monte350c on Wed Dec 10th, 2003 at 07:24:30 PM  
 MST  
 ([User Info](#))

Hi Johnjach,

As Windstuffnow said, it's pretty much up to the individual. I got into this whole wind and energy thing about 6 months ago and ended up building an axial flux machine. It wasn't all that tough once I got started. DanB has posted a whole bunch of really good photos that are an excellent step by step guide to this sort of thing. I don't have a machine shop - so I just farmed out the cutting of the disks. I used a new trailer axle and hub since they're quite cheap. I had the machine shop weld it to an X shaped base too. The whole machine shop bill came to about \$100. The rest can mainly be done with regular home shop tools - ie. jigsaw, drill etc. It was pretty cool to see the light bulbs come on during the first test!

Jerry's garbogen also seems to get pretty good results at low windspeeds. From what I've read those and the axial machines are good in the low speed regime - and if you honestly look at it I would say it's probably better to have a machine that really performs well in a 15 mph wind than one that's only good in 25 mph. Just my \$.02!

Have fun!

Ted.

[WHICH ALTERNATOR BEST?](#) | 3 comments (3 topical, 0 editorial)

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[WHICH ALTERNATOR BEST?](#) | 3 comments (3 topical, editorial)

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Have fun!

Ted.

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[WHICH ALTERNATOR BEST?](#)

By [johnjach](#), Section [Homebrewed Electricity](#)  
 Posted on Wed Dec 10th, 2003 at 12:32:31 PM MST [Wind](#)

Which would work best if I don't want to attempt building a PMA from scratch?

If I don't want to build a PMA from scratch, which is best? (disregard cost and labor)

An auto alternator refitted with thinner stator wires, new neos on the rotor, and direct drive to the prop.

An unmodified auto alternator geared down to the prop with a belt or chain drive.

A "garbogen", or AC induction motor with a ground-down rotor, new neos attached, and a direct drive to the prop.

[WHICH ALTERNATOR BEST?](#) | 3 comments (3 topical, 0 editorial)

Re: WHICH ALTERNATOR BEST? ([none / 0](#)) ([#1](#))  
 by [windstuffnow](#) ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Wed Dec 10th, 2003 at 05:43:20 PM MST  
[\(User Info\)](#) <http://www.windstuffnow.com/main>

JJ, I think this question would be opinion based... The simplest is to get a PM motor, blades and a pole... instant wind generator.

There are some that are more inclined to build the gen's from motors and those of us who build them from scratch. We all have a nitch in what we do. Personally I feel more inclined to build them from scratch, but that's me.

I think it's got to be pretty overwhelming for someone starting out in wind power and finding this site. There is a ton of information all leading in different directions... When I started out there was no internet and I learned by experimenting and blowing things up... found things that worked and things that didn't... Its all quite easy now except deciding which direction to follow... what the heck build them all!!!

Have Fun  
Ed

Re: WHICH ALTERNATOR BEST? ([none / 0](#)) ([#2](#))  
 by [monte350c](#) on Wed Dec 10th, 2003 at 07:24:30 PM MST  
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Have fun!

Ted.

Re: WHICH ALTERNATOR BEST? ([none / 0](#)) ([#3](#))  
by daddybro on Fri Dec 12th, 2003 at 10:15:08 AM MST  
([User Info](#))

Hi Guys

I am new to this discussion board, this is my first post. About six months ago I wanted to build a wind turbine as we have moved into a mobile home which is not near an electricity supply. I have only simple tools and no previous experience. While looking for advice I came across Otherpower.com. I read about all of their experiments and decided to give it a go. I have had a few problems and made several mistakes but I now have a very useful wind generator.

I found the of building the alternator is one of the easier parts of the project and apart from the magnets the materials are not expensive.

Ali

[WHICH ALTERNATOR BEST?](#) | 3 comments (3 topical, 0 editorial)

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[Small Disc Alt](#) | 4 comments (4 topical, 0 editorial)

Re: Small Disc Alt ([none / 0](#)) ([#1](#))  
by monte350c on Wed Dec 10th, 2003 at 07:05:13 AM MST  
([User Info](#))

Hi Jerry,

Nice looking unit! Enjoyed your other posts and your approach to using lots of small units to add up to very respectable power levels. That really makes sense. Also that's a pretty cool battery bank - what's the scoop on those aircraft batteries? Are they 24 or more volts?

Anyhow, I am also working on a couple of laminate / coil alternators at the moment. I did a post a while back (<http://www.fieldlines.com/story/2003/11/25/202715/52>) and got a reply from Charged with an interesting looking setup using an "E" from transformer cores and 3 magnets rotating past them. When I saw the alt. you posted here, I wondered what would happen if the "E" part of the transformers were facing the rotor, and the magnets charged drew were arranged to pass over the "E" - sort of like charged's picture but laid down flat. I did a very unscientific experiment and laid down 3 magnets (N - S - N) on a piece of steel then waved it over a transformer "E" section, then compared that with the same magnets laid out N - N - N. The first way there was a lot less cog.

Lots of fun wish I had a lot more time to play with this stuff!

Ted.

Re: Small Disc Alt ([none / 0](#)) ([#3](#))  
by Jerry on Wed Dec 10th, 2003 at 10:42:13 AM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Ted

You and Charged are responsible for my trying this. After seeing your posts. I have a few hundred of these little transformers. They are audio isolatin trans. with a 1 to 1 ratio. When both coils are siriessed it measures 2 ohm,s DC. I cut the laminations so there are a "T". I place the top of the "T" in the round slot where normally a circle of lamination matereal would go. This alowed the "T" part to almost tuch. I filled the small void between each "T" with JB Weld. It has steel in it so it bridged the magnetic gap between transformers. The cogging was bad until rpm was up.

JK TAS Jerry

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[Small Disc Alt](#) | 4 comments (4 topical, editorial)

Re: Small Disc Alt ([none / 0](#)) ([#1](#))  
 by monte350c on Wed Dec 10th, 2003 at 07:05:13 AM MST  
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## [Small Disc Alt](#)

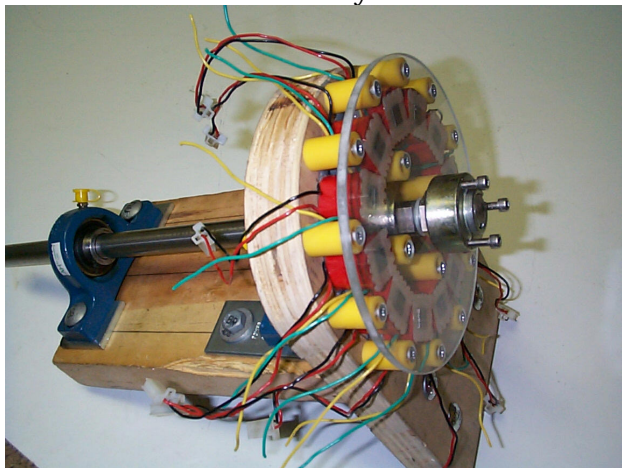
By [Jerry](#), Section [Homebrewed Electricity](#)

Posted on Tue Dec 9th, 2003 at 11:14:59 PM MST [Alternators](#)

First disc alt.

This is my first attempt at a disc alt. I'm using 12 little transformers. It cogs real bad and out put is low. I'll change it to regular laminations and coils. The disc is not shown its a 5 inch with 12 small neos 1X1/2X1/8 in. There is a 1/4 pice of pleaxy holding the coils/transformers in place.

JK TAS Jerry



[Small Disc Alt](#) | 4 comments (4 topical, 0 editorial)

Re: Small Disc Alt ([none / 0](#)) ([#1](#))  
by monte350c on Wed Dec 10th, 2003 at 07:05:13 AM MST  
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Re: Small Disc Alt ([none / 0](#)) ([#3](#))  
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Re: Small Disc Alt ([none / 0](#)) ([#2](#))  
by Old F on Wed Dec 10th, 2003 at 08:45:59 AM MST  
([User Info](#)) <http://www.oldf.homestead.com>

Jerry

Here is a inductor coil I found at a Ham swap meet I got 32 of them at 50 cents each.

The guy that I got them from said they were for speaker cross overs.

I tested one with eight neos 3/4 by3/4 by1/4 on the 6 inch face plate on my lathe.

I got 3.4 voltes at 138 rpm with a 1/4 inch air gap. This is as slow as the lathe would go.

Cogging has been my main worry for not going any farther than this the tool post that I had clamped the coil in had some play in it and shook like the devil.

Keep them flying

Old F





Re: Small Disc Alt ([none / 0](#)) (#4)  
by Jerry on Wed Dec 10th, 2003 at 10:53:12 AM  
MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Old F

Yes these are subwoofer crossover coils. We don't use these at our stereo shop because you loose 36 watts out of 100 watts in this coil. We do use them as part of a hipass xover for midrange speakers some times however. I have these also.

Dan B did an experimnt with a simular coil arrangement befor he discovered the disc alt. I think preformance was poor however so the idea was not persude.

I'm getting the same voltage from the small disc alt no load per coil but very low amperage. In thirory it should have worked but in reality I'm moveing on to the normal laminations and coils. I am however going to use small gage wire and do a diode bridge for each coil.

Its that large # of small things working together?

JK TAS Jerry

[Airheads Page](#)

[ [Parent](#) ]

[Small Disc Alt](#) | 4 comments (4 topical, 0 editorial)

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[SURPLUS PERMANENT MAGNET DC MOTORS](#) | 4 comments (4 topical, editorial)

Re: SURPLUS PERMANENT MAGNET DC MOTORS  
([none / 0](#)) (#3)  
by monte350c on Tue Dec 9th, 2003 at 09:22:47 PM MST  
([User Info](#))

Hi Johnjach,

If you're looking to find out about the realistic power available from a certain amount of wind, there's a lot of info out there. That link I posted the other day to Dr. Johnson's book has several examples and a lot of math to back it up. But basically, for verticals, if you have a look at Chapter 1, page 16, he gives an example of a unit built by Kansas State U. It has 4 savonius rotors, each one measuring 3m high x 1.75 diameter. That unit is rated at 5 KW in a 12 m / s wind ( about 26 mph)

I found a wealth of info in his book, in fact I printed it and put it in a binder. It's really readable and I spent quite a few nights perusing this book. It makes for easy reading, but has all the tech info when you get to the stage to need it.

You'll also find lots of practical (and tested) info on Hugh Piggott's web site ( <http://homepages.enterprise.net/hugh0piggott/> )

Good luck and keep having fun!

Ted.

[SURPLUS PERMANENT MAGNET DC MOTORS](#) | 4 comments (4 topical, 0 editorial)

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[SURPLUS PERMANENT MAGNET DC MOTORS](#) | 4 comments (4 topical, 0 editorial)

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## [SURPLUS PERMANENT MAGNET DC MOTORS](#)

By [johnjach](#), Section [Homebrewed Electricity](#)

[Wind](#)

Posted on Tue Dec 9th, 2003 at 01:44:33 PM MST

What kind of output can be expected from permanent magnet DC motors?

Almost every day, E-Bay has permanent magnet DC motors for sale at reasonable prices.

Dan B. said himself on this site that they make adequate generators for someone just starting out in this DIY jenny hobby. What would be the best one to purchase since they range from 20 vdc to 72 vdc. I'm not an electrician -- how do these voltages convert to amps or watts per wind speed or propeller diameter or swept area or whatever?

Again, thanks for your help and input.

[SURPLUS PERMANENT MAGNET DC MOTORS](#) | 4 comments (4 topical, 0 editorial)

Re: SURPLUS PERMANENT MAGNET DC MOTORS

([none / 0](#)) ([#1](#))

by [windstuffnow](#) ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Tue Dec 9th, 2003 at 05:38:06 PM MST

([User Info](#)) <http://www.windstuffnow.com/main>

Multiply the rated amps by the charging voltage it will be used for. For example if its rated at 10 amps and your charging a 12V battery bank then you'll get 120 watts from it or at 14V 140 watts. If it runs beyond its Amp rating it could possibly burn up, its best to set up a furling system for them so they won't go over the rated amps. It would probably be fine going over for short bursts but not for prolonged periods.

Look at rpm its rated to run. If it's rated at 12V 10 amps at 5000 rpm then chances are you'll never get it to produce any power from a wind machine. The lower the rpm the better. If you take the rpm and divide it by the volts you'll find an RPM per volt ratio ( 5000 / 12 = 416 rpm per volt ).

So if the 72 volt unit was rated at 1250rpm then you would have 17.3 rpm/volt and it would make 12volts at about 208 rpm. This is just a ball park figure but will get you close for designing blades to run it.

Have Fun  
Ed

Re: SURPLUS PERMANENT MAGNET DC MOTORS

([none / 0](#)) ([#2](#))

by [Scott](#) on Tue Dec 9th, 2003 at 08:24:59 PM MST

([User Info](#))

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I think this is the easiest way to get started. A 40V Ametek tape drive motor off of Ebay is what I used. I get up to 150 watts into 4 golf cart batteries at 12V. Put 2 Jerry blades with mike mods and a tail and your set. Total cost about \$60 - \$80. I've got 2 running now. I don't furl mine and they have been in a blizzard this fall with 50 - 60 mph winds with no problem. I don't think there is an easier way to build your own. I used a chevy waterpump mounting flange for a shaft hub and then a piece of 1/8" x 1 1/2" flat steel to mount the blades. Twist it to 23 degrees. I learned alot building and flying these tape drive mills.

Scott

Re: SURPLUS PERMANENT MAGNET DC MOTORS ([none / 0](#)) (#4)  
by Jerry on Tue Dec 9th, 2003 at 10:18:03 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

To back up what Scott said. This is a very easy and cheap way to get started.

And just think you could spend \$400 or \$500 on a 100 watt solar panel that dose not work at night or with low output in the winter, when you need the power or make a wind genny for under a 100 bux and make 100 watts plus 24/7 depending on the wind?

I'm using a 50 volt Ametek 4"X7" with 2 Jerry blades. This thing makes an amp or 2 at 5 mph and I've seen a peak of 364 watts. Real cheap and easy go for it.

BTW \$10 each on unmodifide Jerry blades and \$15 each for Mike mod Jerry blades.

JK TAS Jerry

[Airheads Page](#)

[ [Parent](#) ]

Re: SURPLUS PERMANENT MAGNET DC MOTORS  
([none / 0](#)) (#3)  
by monte350c on Tue Dec 9th, 2003 at 09:22:47 PM MST  
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Good luck and keep having fun!

Ted.

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[More speed? or more wire?](#) | 14 comments (14 topical, editorial)

Re: More speed? or more wire? ([none / 0](#)) (#3)  
by monte350c on Tue Dec 9th, 2003 at 09:07:36 PM MST  
([User Info](#))

Hi Norm,

Sounds like a conundrum...

I'm now using exclusively new magnet wire - I went to a local shop that rewinds motors and they will sell wire by the pound really reasonably. I got a roll of 18 AWG that I used in my very first alternator project:



It's got 18 coils in it of 70 turns each, plus I've used the wire for another couple of projects and experiments too - total cost was about \$20 - and I still can't see the bottom of the reel!

At least with the new stuff you know what you've got - just check your local yellow pages under electric motor service - bet you'll find a local source pretty reasonable. Saves all that cussing!!

Ted.

[More speed? or more wire?](#) | 14 comments (14 topical, 0 editorial)

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[How to fix a 'bad' lawnmower coil...\(maybe\)](#) | 6 comments (6 topical, 0 editorial)

Re: speed? ([none / 0](#)) (#5)  
by monte350c on Sat Dec 6th, 2003 at 08:06:00 AM MST  
([User Info](#))

Hi Norm,

Makes me wonder just how long those 3,600 rpm generators will really last. Seems to me it might be better to use a larger engine and make it 4-pole to run at 1,800 rpm instead. 3,600 is really honking for most stock 1 cyl. engines.

Ted

[ [Parent](#) ]

Re: speed? ([none / 0](#)) (#6)  
by Norm on Sat Dec 6th, 2003 at 01:56:21 PM MST  
([User Info](#))

Yeah if it was up to me as I look at emergency generators at Sears....why emergency when you could have a Liston engine powered with bio-diesel as the main power supply and heat your home to boot with a nice quiet lugging engine would be music to my ears instead of a screaming engine that sounds like it might fly apart at any moment! Norm.

[ [Parent](#) ]

[How to fix a 'bad' lawnmower coil...\(maybe\)](#) | 6 comments (6 topical, 0 editorial)

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[How to fix a 'bad' lawnmower coil...\(maybe\)](#) | 6 comments (6 topical, editorial)

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Ted

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[DARRIEUS BLADE AIRFOILS](#) | 5 comments (5 topical, editorial)

Re: DARRIEUS BLADE AIRFOILS ([none / 0](#)) ([#1](#))  
 by monte350c on Fri Dec 5th, 2003 at 10:07:06 PM MST  
[\(User Info\)](#)

Hi Johnjach,

There is a lot of info out there about VAWT's and research into blades. I've switched to a HAWT project, but would still like to try a VAWT at some time in the future. The main problems I saw with the VAWT / H-Bar proejct I have been working on all center around centrifugal force and the complexity of dealing with an appropriate furling / protection system for the generator. Centrifugal loads get pretty spectacular when the rpms go up - and it becomes obvious pretty quickly that dealing with those potential runaway scenarios should be the main preoccupation when designing a VAWT. Having said that - I'm still hopeful about the VAWT thing. I found Dr. Gary Johnson's book particulary helpful. You can download it for free here:

<http://www.eece.ksu.edu/~gjohnson/>

Also if you haven't already found it there's a very good resource for VAWT's at Sandia Labs site:

[http://www.sandia.gov/Renewable\\_Energy/wind\\_energy/topical.htm](http://www.sandia.gov/Renewable_Energy/wind_energy/topical.htm)

If you scroll down you'll come to a section titled "VAWT archives"

There's good reading in:

"Final Project Report: High-Energy Rotor, Development, Test and Evaluation"

"Aerodynamic Characteristics of Seven Symmetrical Airfoil Sections Through 180-Degree Angle of Attack For Use In Aerodynamic Analysis of Vertical Axis Wind Turbines"

"Aerodynamic Performance of a 5-Metre-Diameter Darrieus Turbine with Extruded NACA-0015 Blades"

"Free-Air Performance Tests of a 5-Metre-Diameter Darrieus Turbine"

Good luck with you project, and keep us posted!

It is a lot of fun in any case

Ted.

Re: DARRIEUS BLADE AIRFOILS ([none / 0](#)) ([#2](#))  
 by johnjach on Sat Dec 6th, 2003 at 10:05:44 AM MST  
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Thanks Ted,

I wasn't aware of this information. I looked at the websites you mentioned are a gold mine of ideas. This will make for very interesting reading and research.

[ [Parent](#) ]

[DARRIEUS BLADE AIRFOILS](#) | 5 comments (5 topical, 0 editorial)



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[DARRIEUS BLADE AIRFOILS](#) | 5 comments (5 topical, editorial)

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 by monte350c on Fri Dec 5th, 2003 at 10:07:06 PM MST  
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## DARRIEUS BLADE AIRFOILS

By [johnjach](#), Section [Homebrewed Electricity](#)

Posted on Fri Dec 5th, 2003 at 09:51:18 PM MST

[Wind](#)

What type of airfoils should be used for a Darries VAWT?

If I were to build a straight-bladed, H-rotor type Darrieus turbine, what would be the optimal number of blades and the best type of airfoil to be used if I wanted the unit to be self-starting? If the machine were to have a swept area of about 16 square feet (a 4 x 4 machine), what I've garnered from reading so far is that I would be better off with a thicker, more bulbous shape airfoil and 3-4 blades. Is this correct?

I got this idea from looking at the Solwind turbine at [www.solwind.co.nz](http://www.solwind.co.nz). This machine is said to self-start in low winds and the photos show the blades to be wider than most Darrieus blades.

[DARRIEUS BLADE AIRFOILS](#) | 5 comments (5 topical, 0 editorial)

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by [monte350c](#) on Fri Dec 5th, 2003 at 10:07:06 PM MST  
([User Info](#))

Hi Johnjach,

There is a lot of info out there about VAWT's and research into blades. I've switched to a HAWT project, but would still like to try a VAWT at some time in the future. The main problems I saw with the VAWT / H-Bar proejct I have been working on all center around centrifugal force and the complexity of dealing with an appropriate furling / protection system for the generator. Centrifugal loads get pretty spectacular when the rpms go up - and it becomes obvious pretty quickly that dealing with those potential runaway scenarios should be the main preoccupation when designing a VAWT. Having said that - I'm still hopeful about the VAWT thing. I found Dr. Gary Johnson's book particulary helpful. You can download it for free here:

<http://www.eece.ksu.edu/~gjohnson/>

Also if you haven't already found it there's a very good resource for VAWT's at Sandia Labs site:

[http://www.sandia.gov/Renewable\\_Energy/wind\\_energy/topical.htm](http://www.sandia.gov/Renewable_Energy/wind_energy/topical.htm)

If you scroll down you'll come to a section titled "VAWT archives"

There's good reading in:

"Final Project Report: High-Energy Rotor, Development, Test and Evaluation"

"Aerodynamic Characteristics of Seven Symmetrical Airfoil Sections Through 180-Degree Angle of Attack For Use In Aerodynamic Analysis of Vertical Axis Wind Turbines"

"Aerodynamic Performance of a 5-Metre-Diameter Darrieus Turbine with Extruded NACA-0015 Blades"

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- [More on Wind](#)
- [Also by johnjach](#)

"Free-Air Performance Tests of a 5-Metre-Diameter Darrieus Turbine"

Good luck with you project, and keep us posted!

It is a lot of fun in any case

Ted.

Re: DARRIEUS BLADE AIRFOILS ([none / 0](#)) (#2)  
by johnjach on Sat Dec 6th, 2003 at 10:05:44 AM MST  
([User Info](#))

Thanks Ted,

I wasn't aware of this information. I looked at the websites you mentioned are a gold mine of ideas. This will make for very interesting reading and research.

[ [Parent](#) ]

Re: DARRIEUS BLADE AIRFOILS ([none / 0](#)) (#3)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Sun Dec 7th, 2003  
at 08:35:38 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

I've found the 3 blade unit to be the best for reliable self starting. 2 blades will sometimes "bobble" back and forth until either a gust hits it or some turbulent air forces it past the point of no return.

The same will happen with a 4 blade arrangement although more reliable than simply 2.

The "fat" wing will start quicker than the thin blades but there are advantages and disadvantages to either. The fat wing has more drag ( especially on the downwind side ) and will tend to run slower than the thin aerodynamic foils but will produce power at lower wind speeds. Also, the fat wing has a better tendency to stay "in check" for overspeeding because of the extra drag. The thin blades are impressive and a bit more efficient but If you've ever built a small one, the rpm gets quite scary fast. If you've ever noticed the standard HAWT air foil has a start up sound and when it reaches its designed TSR it sounds like a turbo kicked in... the same happens to a properly designed darrieus wing. It's hard to explain unless you've actually experienced it. As long as the wings are stalled to some degree it will spin but the output is considerably low, but once it reaches its designed TSR the whole tone of the machine changes, its making power... and it sounds like it!!!

Build one of each ( small ones to experiment with) Take note of the differences... I prefer the "fat" wing design, although not as efficient in high winds its not as scary as the fater moving thin wing.

Have Fun!  
Ed

Re: DARRIEUS BLADE AIRFOILS ([none / 0](#)) (#4)  
by RayW on Sun Dec 7th, 2003 at 09:48:26 AM MST  
([User Info](#))

Hi Ed;  
Should the airfoil shape of a darrieus blade flat on one side or both sides curved??  
RayW

[ [Parent](#) ]

Re: DARRIEUS BLADE AIRFOILS ([none / 0](#)) ([#5](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Sun  
Dec 7th, 2003 at 12:06:28 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

The standard blade is symmetrical, that is to say it has an airfoil on both sides. The "flat on one side" will work with a lesser degree of torque depending on the design.

If your depending on developing power from strictly lift then the symmetrical blade is what you want. If your building a combination of lift and drag there are many different variations that will work quite well. Lift and drag versions attempt to offset any upwind forces that robs power from the downwind side.

Althought there are "standard" ways to build specific machines the world is still open for unique and untried versions. There is always a better way!

Ed

[ [Parent](#) ]

[DARRIEUS BLADE AIRFOILS](#) | 5 comments (5 topical, 0 editorial)

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[How to fix a 'bad' lawnmower coil...\(maybe\)](#) | 6 comments (6 topical, 0 editorial)

Re: on decarbonizing a Briggs ([none / 0](#)) ([#3](#))  
by monte350c on Fri Dec 5th, 2003 at 09:30:52 PM MST  
([User Info](#))

Hi Norm,

Yeah, it's pretty unbelievable what people expect out of their small engine products. If you took a car, only used it at full throttle, stored it for 6 months at a time, and never changed the oil or otherwise maintained it, I suspect it wouldn't last half as well as most Briggs last.

Hats off to the Briggs company - where else can you buy a brand new source of 3.75 hp for \$60?

Ted.

[ [Parent](#) ]

speed? ([none / 0](#)) ([#4](#))  
by Norm on Sat Dec 6th, 2003 at 06:58:26 AM MST  
([User Info](#))

Full throttle? One guy even mentioned to me one time the secret of cutting grass... 'You don't really need a sharp blade ...the speed is what does it! ....then another person says 'Yeah you know you shorten that little spring on the carbuerator and you get a lot more power!... (Oh Wow!) Next year ....those very same people were asking me if I could fix their mowers! They didn't even have a clue! Big mystery! Norm.

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Re: speed? ([none / 0](#)) ([#5](#))  
by monte350c on Sat Dec 6th, 2003 at 08:06:00 AM MST  
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Makes me wonder just how long those 3,600 rpm generators will really last. Seems to me it might be better to use a larger engine and make it 4-pole to run at 1,800 rpm instead. 3,600 is really honking for most stock 1 cyl. engines.

Ted

[ [Parent](#) ]

Re: speed? ([none / 0](#)) (#6)  
by Norm on Sat Dec 6th, 2003 at  
01:56:21 PM MST  
([User Info](#))

Yeah if it was up to me as I look at emergency generators at Sears....why emergency when you could have a Liston engine powered with bio-diesel as the main power supply and heat your home to boot with a nice quiet lugging engine would be music to my ears instead of a screaming engine that sounds like it might fly apart at any moment! Norm.

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[How to fix a 'bad' lawnmower coil...\(maybe\)](#) | 6 comments (6 topical, editorial)

Re: How to fix a 'bad' lawnmower coil...(maybe) ([none / 0](#)) (#1)  
by monte350c on Fri Dec 5th, 2003 at 03:26:59 PM MST  
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Hi Norm!

Woo - hoo!! (as Homer would say!)

That's a great tip and may very well come in useful some day.

I got a free lawnmower last week with a Briggs 3.5 Classic on it. I was looking for something to load test alternators - and this just showed up. Took the head off and decarbonized it and the piston top - no scores in the bore. The old owner complained it was hard to start and wouldn't rev up. The choke plate was completely missing from the carb (!), and the control cable was all jammed up. Fixed the control cable, got a new choke plate from our local small engine shop, put in a new carb diaphragm while I was at it, and now this thing runs like new. Total: \$10

Here are another couple of small engine links I've found useful:

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and a good general forum for small engines:

<http://forums2.gardenweb.com/forums/lmower/nph-ind.cgi?n=60>

Both links probably good for folks looking for generator engine parts or troubleshooting tips.

Lots of fun!

Ted.

on decarbonizing a Briggs ([none / 0](#)) (#2)  
by Norm on Fri Dec 5th, 2003 at 09:04:02 PM MST  
([User Info](#))

Yeah I used to get them all the time one time one was so bad it lost compression got a chunk of carbon lodged under the exhaust...now that's carbon!

Another time saw this lawnmower in the junk...looked like new after taking it home wouldn't turn over...took the head off the cylinder wall had a deep gouge in it about 1/8" deep the owner tipped it over to check the blade gas from the carb had washed all the oil from the cylinder wall. ...still I had a lot of like new parts. Lot of fun almost unbelievable what some people do to lawnmowers. Norm.

[ [Parent](#) ]

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by monte350c on Fri Dec 5th, 2003 at 09:30:52 PM  
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speed? ([none / 0](#)) ([#4](#))  
by Norm on Sat Dec 6th, 2003 at 06:58:26 AM  
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by monte350c on Sat Dec 6th, 2003 at  
08:06:00 AM MST  
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by Norm on Sat Dec 6th, 2003 at 01:56:21 PM MST  
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Re: How to fix a 'bad' lawnmower coil...(maybe) ([none / 0](#)) (#1)  
by monte350c on Fri Dec 5th, 2003 at 03:26:59 PM MST  
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## [Transformer E's and I's](#)

By [monte350c](#), Section [Homebrewed Electricity](#)  
Posted on Fri Dec 5th, 2003 at 09:24:54 PM MST

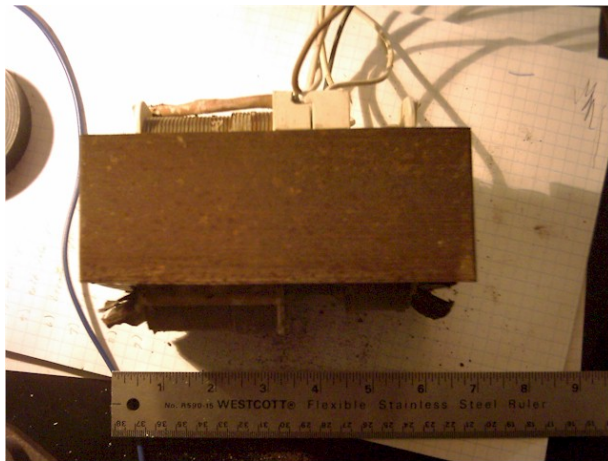
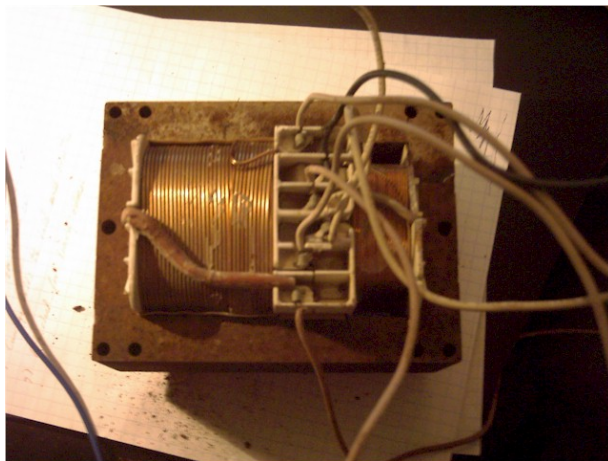
[Wind](#)

A couple of transformer questions!

---

Hi All,

Was 'lucky' enough to pick up this junked transformer. No idea what it's from!



A couple of questions -

I'm trying to take it apart - it seems to be welded or fused together. There's 2 small depressions like grooves across the laminations at both ends. If I take my disk grinder and grind through those will that damage the laminates from heat etc?

Is there any "better" transformers to watch for? Our local scrap metal dealer has lots of this sort of thing.

And finally - does anyone know where to get and how expensive new transformer 'E' and 'I' laminations are?

I want to try out a couple of coil on laminate alternator configurations like the ones posted by Electric Ed and Charged in response to another post I made

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- [More on Wind](#)
- [Also by monte350c](#)

<http://www.fieldlines.com/story/2003/11/25/202715/52>

This is definitely fun!

Ted.

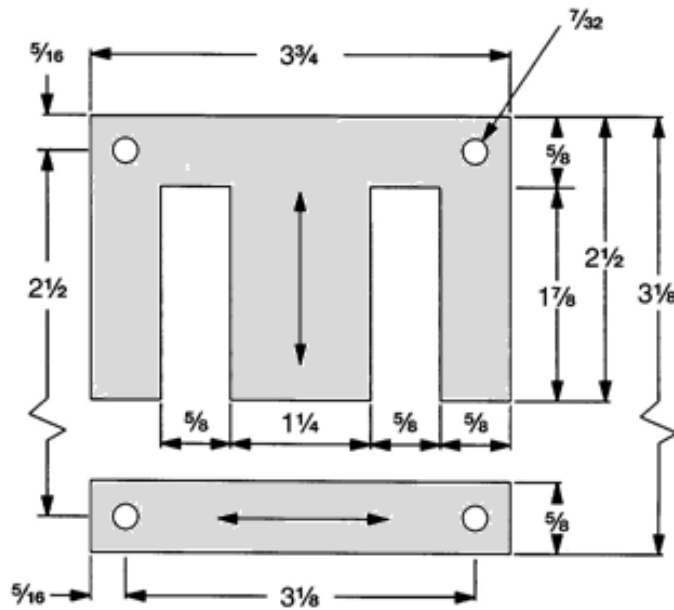
[Transformer E's and I's](#) | 3 comments (3 topical, 0 editorial)

Re: Transformer E's and I's ([none / 0](#)) (#1)  
by Electric Ed on Fri Dec 5th, 2003 at 09:53:40 PM MST  
([User Info](#)) <http://www.electric-ed.com>

This company, Lamination Specialties Corp, has many sizes of lamination sets. I didn't see any prices on their website, but they may be there somewhere.

<http://www.laminationpecialties.com/TOC/products.htm>

Example - This is their EI-100 size.



**GRAIN DIRECTION**



**APPROXIMATE WEIGHTS**

GAGE	THICKNESS	PER 1000 SETS	SETS PER POUND
29	.014	35.25	28.4
26	.0185	47.26	21.2
24	.025	64.09	15.6

Electric Ed

Re: Transformer E's and I's ([none / 0](#)) (#2)  
by drdongle on Sat Dec 6th, 2003 at 08:53:41 AM MST  
([User Info](#))

Looks like it might be from a Halogen or Sodium street light.

Dr.D

Re: Transformer E's and I's ([none / 0](#)) ([#3](#))  
by bob golding ([yubba at clara dot net](#)) on Mon Dec 8th,  
2003 at 06:43:28 AM MST  
([User Info](#))

hi ted, taken dozens of transformers apart. for small ones i dont think it is worth the hassle as lams for small transformers are quite cheap anyway. differant story when you get to multi kva ones. dont let that stop you. just think the time would be better spent on working out your design.

bob

[Transformer E's and I's](#) | 3 comments (3 topical, 0 editorial)

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## What would happen if

By [monte350c](#), Section [Homebrewed Electricity](#)

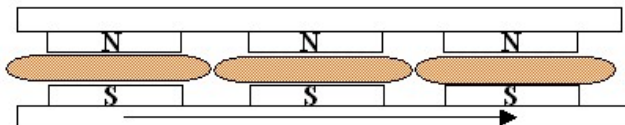
Posted on Tue Nov 25th, 2003 at 08:27:15 PM MST

[Wind](#)

a PM alternator was designed with only north poles?

Hi All,

This may seem like a really dumb question but here goes - what would happen if a permanent magnet alternator was assembled with only one direction of flux like this:



Would there be any generating going on? Would it produce a wierd type of AC with the sine wave displaced up of the normal axis? Or....

Just curious!

Have fun!

Ted.

[What would happen if](#) | 10 comments (10 topical, 0 editorial)

Re: What would happen if ([none / 0](#)) ([#1](#))

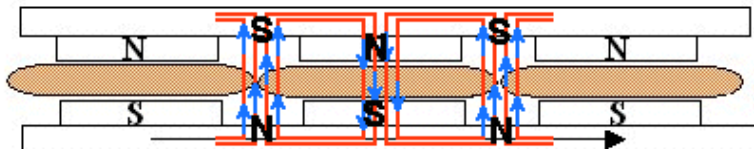
by Electric Ed on Tue Nov 25th, 2003 at 09:19:37 PM MST

([User Info](#)) <http://www.electric-ed.com>

You would get normal AC. Because magnetic flux lines form closed loops, each line returns to the magnet it started from, and "consequent poles" will develop in the iron rotor disc, between the "salient" (actual) poles.

You will have twice as many poles as actual magnets, but the flux will be weakened, due to the wider air gap at the consequent poles.

Also, the pole spacing will not be optimum, unless the consequent poles are considered when spacing the magnets.



Electric Ed

Re: What would happen if ([none / 0](#)) ([#2](#))

by monte350c on Tue Nov 25th, 2003 at 09:38:30 PM MST

([User Info](#))

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Thanks Ed,

Actually I was trying to figure out if it would be possible to have an alternator that would operate at 60hz, 2400 rpm. I have pretty much always seen multiples of 2 when it comes to poles - so I guess if you had 3 poles arranged as above, spinning at 2400 rpm it would give 60hz?

Thanks for your thoughts!

Having fun,

Ted.

[ [Parent](#) ]

Re: What would happen if ([none / 0](#)) (#3)  
by charged on Wed Nov 26th, 2003 at 07:13:49 AM MST  
([User Info](#))

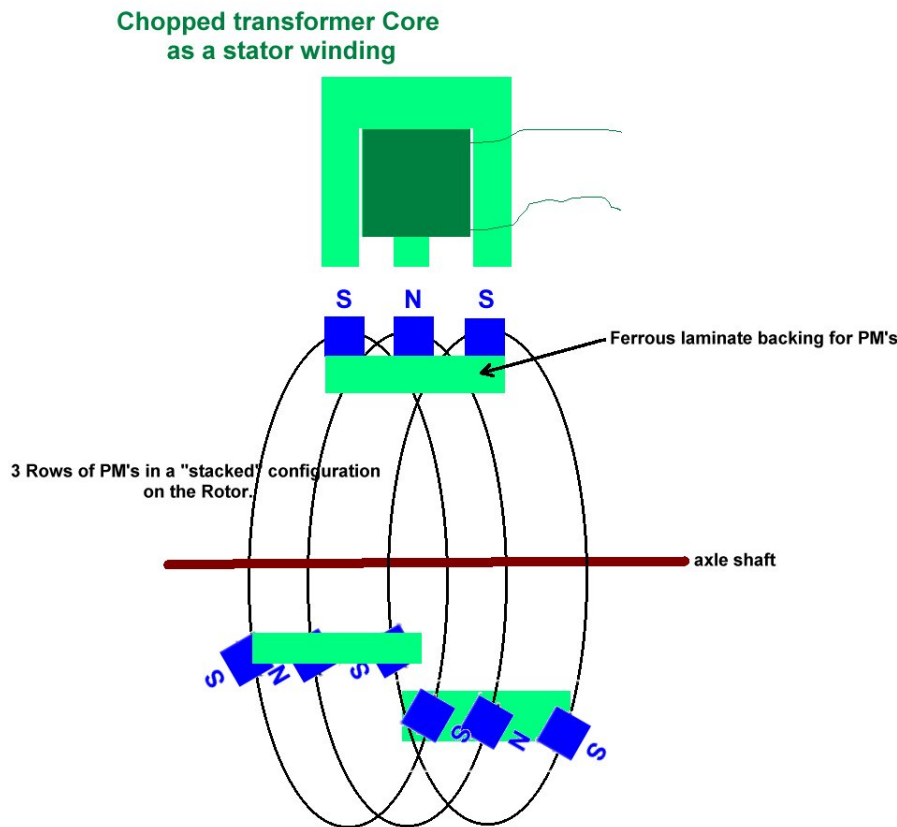
Here's a configuration that works quite well. It maintains full flux-usage but never "flips" the core back through it's hysteresis loss zone.

Sorry the drawing is so crude. Using a scavenged transformer core and three sets of magnets spaced 120 degrees apart around the outside of the rotor, at 2400 rpm this would produce 120 full cycles per second.

It would make more sense to put a single rectifier diode on each winding, output those current pulses to a large electrolytic capacitor. Then use a power mosfet (or IGBT) to pulse the capacitor into a heavy 1:1 transformer with 50% duty-cycle 60hz pulses to get your desired AC frequency out of the secondary winding. It's just a simple chopper-inverter circuit.

Hope this helps.

### Low hysteresis PM Dynamo Generator





Re: What would happen if (none / 0) (#4)  
by monte350c on Wed Nov 26th, 2003 at 08:57:14 AM MST  
([User Info](#))

Hi Charged,

That's a pretty interesting idea! I'd love to give it a try.

My goal for this particular project is to make up a small alternator. I'd like 60 hz at 2400 rpm - I could do a 4 pole for 1800 rpm without much problem but I was interested to see if 2400 is a do-able number. This unit needs to be very simple without electronics.

A 2 pole unit will lead to 3600 rpm operation - too high for this application.

I gathered that the formula for frequency is (number of poles x rpm) / 120 but every textbook example of alternators I've seen so far always has poles in multiples of 2.

This made me curious about odd numbers of poles - ie. 3, 5, 7 etc. to tune rpm more exactly. Possible or not - I'm really kind of past the limit of my electro-magnetic knowledge at this point!!

But it's definitely a lot of fun - learning a lot.

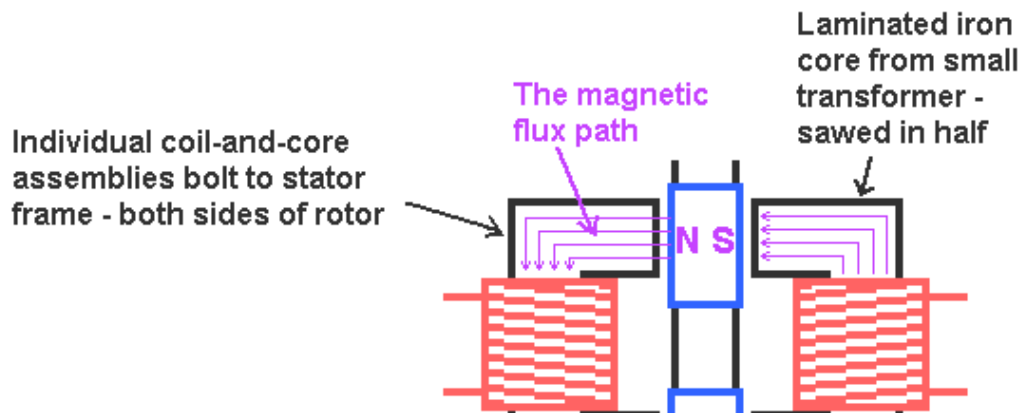
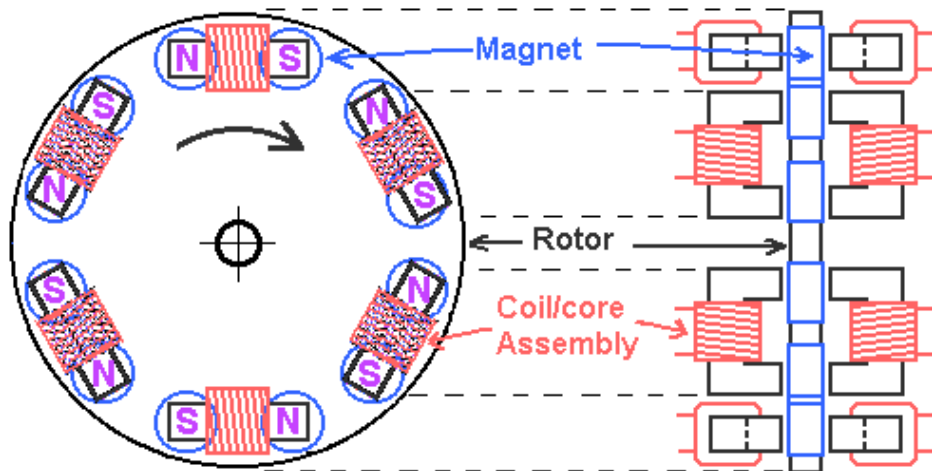
Ted.

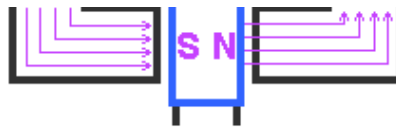
[ [Parent](#) ]

Re: What would happen if (none / 0) (#5)  
by Electric Ed on Wed Nov 26th, 2003 at 09:53:56 AM MST  
([User Info](#)) <http://www.electric-ed.com>

Your sketch reminded me of another layout I'd like to try. Although it isn't low hysteresis, it makes use of old transformer cores.

Electric Ed





[ [Parent](#) ]

Re: What would happen if ([none / 0](#)) ([#6](#))  
by Jerry on Wed Nov 26th, 2003 at 09:23:21 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

The problem I see on this one. The cogging would huge. You'd need a 4ft pipe wrench to break it loose. Ask Zubly on this one?

JK TAS Jerry

[Airheads Page](#)

[ [Parent](#) ]

Re: What would happen if ([none / 0](#)) ([#7](#))  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Wed Nov 26th, 2003 at 11:48:26 PM MST  
([User Info](#)) <http://www.internetfred.com>

I have seen this in a machine a couple months ago from someone on this web site that posted here, had this configuration. I think the cog would be a problem, but the output would be fantastic and high!! Would be good as a backup for a gas engine generator though!

[ [Parent](#) ]

Re: What would happen if ([none / 0](#)) ([#9](#))  
by Kevin L on Sat Nov 29th, 2003 at 09:11:58 AM MST  
([User Info](#))

Ed,

You would know a good source of transformers that would work well for this layout would you. I would like to give this a try.

Kevin L

[ [Parent](#) ]

Re: What would happen if ([none / 0](#)) ([#8](#))  
by RobD on Thu Nov 27th, 2003 at 08:46:11 AM MST  
([User Info](#))

I think you could run the magnets at an angle on this and cut down the cogging somewhat. I like the idea.

RobD

Re: What would happen if ([none / 0](#)) ([#10](#))  
by charged on Sun Nov 30th, 2003 at 01:16:37 PM MST  
([User Info](#))

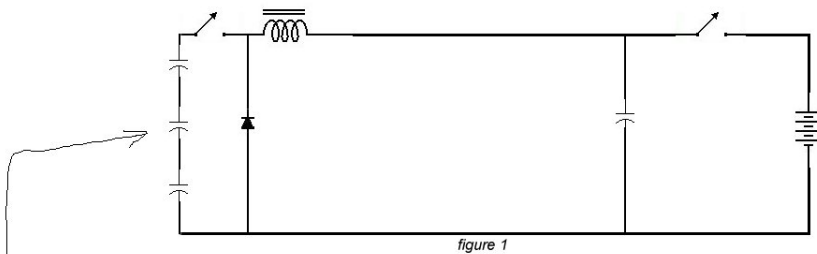
If you are applying the low hysteresis method without inverting the stator poles, getting rid of the cogging is easy.

There is no limit to the number of magnets or stators you can "stack" on the axle. It is not limited to just three poles. You can make as many layers to the stack as you want and then just add more transformer cores that are in parallel with the axle shaft. Like my cruddy ascii drawing here.

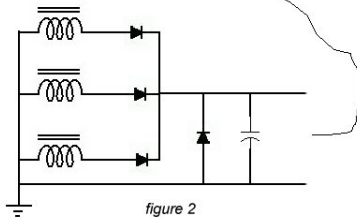
```
E ||
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Around the circumference of the rotor, use and EVEN number of stator sets and an ODD number of rotor magnets. Each set or "stack" of stator poles is wired in series with a single rectifier diode and it feeds an electrolytic capacitor.

Then just wire it up like so and shuttle your power around to wherever you like.



The two switches represent two heavy-current transistors or mosfets rated for at least 200v.



Each of the three capacitors on the left of figure 1 is wired to it's respective alternator as shown in figure 2.

[What would happen if](#) | 10 comments (10 topical, 0 editorial)

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### [Wow - good software download](#)

By [monte350c](#), Section [Homebrewed Electricity](#)  
Posted on Sun Nov 23rd, 2003 at 08:58:26 PM MST  
for simulation of alternators etc

[Wind](#)

Hi all,

As I post this I'm downloading a program that promises to be really interesting!

[http://www.ansoft.com/about/academics/simplorer\\_sv/index.cfm](http://www.ansoft.com/about/academics/simplorer_sv/index.cfm)

It's for simulating design of all sorts of electrical components (like alternators for example)

The student version is available free at the above link. Suggested to have a high-speed connection - it's about 36 mb.

I'll run the program tomorrow and post the results. If you look at their web site this certainly sounds interesting.

Anyone else looked at this one before?

Sure would be nice to know if that new design you're thinking about would actually work or not!!

Ted.

[Wow - good software download](#) | 4 comments (4 topical, 0 editorial)

Re: Wow - good software download ([none / 0](#)) (#1)  
by [windstuffnow](#) ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon Nov 24th, 2003 at 07:39:12 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

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- [More on Wind](#)
- [Also by monte350c](#)

Ted, I ran into the Maxwell 3D back when I was involved with stirling engines. I had run into it while surfing the NASA web on their stirling projects. I never downloaded it, but it sounds quite interesting... keep us posted on your findings if you download it!

Have Fun  
Ed

Re: Wow - good software download ([none / 0](#)) (#2)  
by [monte350c](#) on Mon Nov 24th, 2003 at 08:21:33 PM MST  
([User Info](#))

Hi Ed,

Downloaded both Ansoft's Simplorer and Maxwell programs last night. Just installed them but haven't started the learning curve with them yet. There's a program on their site called RMXprt which is for rotating electro-magnetic machines both motors and generators. Unfortunately, I found a price for this on another reseller's site (only \$36K!!). Oh well. At least pencils are cheap!

<http://www.ansoft.com/products/em/rmxprt/>

I'll post anything useful I can get out of the software I downloaded. Fun!

Ted.

[ [Parent](#) ]

Re: Wow - good software download ([none / 0](#)) (#3)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Tue Nov 25th, 2003 at 06:40:33 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Yikes... 36k?? We can make alot of mistakes and still come out with money in our pockets as well as at least one successful turbine for far less than that... I'll stick with my calculator and multiple pads of paper for the design work... it does sound interesting though ... wish I knew some one who had the program and could look over their shoulder...

Have Fun  
Ed

Re: Wow - good software download ([none / 0](#)) (#4)  
by monte350c on Tue Nov 25th, 2003 at 07:23:18 AM MST  
([User Info](#))

Hi Ed,

My mistake - I think the \$36K is for the whole suite. RMXprt is available for (only!) \$9,400. I too wish there was someone around here who had this so I could try it out without the major investment!

I could build about 8 wind turbines for the price of that software....

I found another piece of software too for magnetic field analysis - femm 3.3 - I'll plug away at both of these as time permits. If there's anything good to be seen I'll post the results.

At least the price is right for these programs.

Am having fun!

Ted.

[ [Parent](#) ]

[Wow - good software download](#) | 4 comments (4 topical, 0 editorial)

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## [HAWT blade question](#)

By [monte350c](#), Section [Homebrewed Electricity](#)

Posted on Sat Nov 15th, 2003 at 06:39:34 PM MST

[Wind](#)

about the forces present on the blades...

Hi All,

I'm just finishing up a set of 3 blades for my downwind HAWT. I've been immersed in math and Excel for the past three days, and after reading Hugh Piggot's article on how to make blades about 100 times I think the various concepts have finally sunk in! By the way thanks Hugh for the formulas (off your Web page) I did the chord calculations as you suggested and the Reynolds number for each "slice" comes out pretty much exactly the same - it's nice to arrive at the same numbers by two different methods. Let's me know I probably didn't do anything wrong.

I'm using a TSR of 6.5 for this set of blades which will see them (hopefully) spinning at about 235 rpm in a wind of 18 mph.

Here's the question: It seems logical that the force of the wind acting on the 3 blades will try to push them downwind. (blade area x .00256 x V<sup>2</sup> (mph))

Is there anything else pushing or pulling them downwind? Does the lift being generated by the downwind section of the blade pretty much all get used up in rotating the blades, or is there part of that force pulling the blades downwind too?

I'd like to try to figure out the safety margin for the blade hub, and also the balance arrangement for furling.

Thanks again - still having fun!

Ted.

[HAWT blade question](#) | 6 comments (6 topical, 0 editorial)

Re: HAWT blade question ([none / 0](#)) ([#1](#))  
by [scoraigwind](#) ([magnet@scoraigwind.co.uk](mailto:magnet@scoraigwind.co.uk)) on Sun Nov 16th, 2003 at 04:39:47 PM MST  
([User Info](#)) <http://www.scoraigwind.co.uk>

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Ted,

"Here's the question: It seems logical that the force of the wind acting on the 3 blades will try to push them downwind. (blade area x .00256 x V<sup>2</sup> (mph))

Is there anything else pushing or pulling them downwind? Does the lift being generated by the downwind section of the blade pretty much all get used up in rotating the blades, or is there part of that force pulling the blades downwind too?"

The forces on the blade are lift and drag. they are aligned parallel to and at right angles to the direction of the wind that actually hits the blades as they spin.

If the speed ratio is high, then drag is almost in the plane of the blades. It slows them down but it does not push them downwind in the sense of the background windspeed.

Or maybe just slightly but not significantly. Drag has to be quite small or it will not have got up to that speed. So we are talking about a small fraction of very little.

Lift on the other hand is pushing the blades back quite hard (and slowing the wind at the same time - action/reaction).

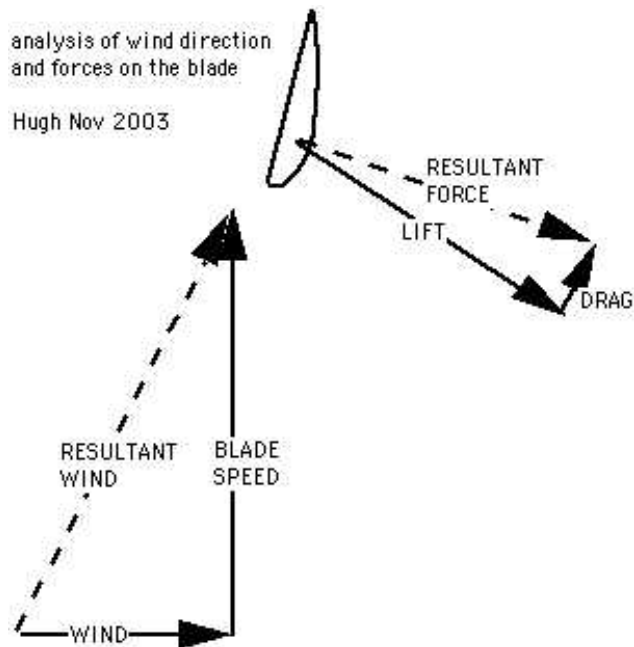
Lift will have a small component driving the blades (or they would not be spinning) but most of it is backwards.

This is the dominant aerodynamic force on the machine.

There will also be centrifugal forces on the blades, and gyro forces when it yaw suddenly.

Hugh Piggott <http://www.scoraigwind.co.uk>

Re: HAWT blade question ([none / 0](#)) (#2)  
by [scoraigwind \(magnet@scoraigwind.co.uk\)](mailto:magnet@scoraigwind.co.uk) on Sun Nov 16th, 2003 at 05:00:28 PM MST  
([User Info](#)) <http://www.scoraigwind.co.uk>



Hugh Piggott <http://www.scoraigwind.co.uk>

Re: HAWT blade question ([none / 0](#)) (#3)  
by monte350c on Sun Nov 16th, 2003 at 08:25:33  
PM MST  
([User Info](#))

Thanks Hugh,

The calculation for thrust - I'm reading page 6 of the PDF file I got from your web site - (drag not considered)

$CL * (\rho / 2) * BC \Delta r * (tsr * V * (r / R) / \cos(\phi))^2$  gives a nice way to calculate thrust for a certain segment of the blade.

Is there a way (or formula) to calculate thrust for the whole blade?

The thrust, if metric units are used in the formula, that's in kg?

For example the blades I'm working on:

Diameter: 14 ft (4.26 m) (three blades)  
TSR: 6.5  
CL: .748  
Radius: 7 ft (2.13 m)  
Blade begins at 1 ft (.3 m) from the hub centre so the length of the actual blade is 6 ft (1.83 m)  
The chord at the root is 16" (.4 m) and at the tip is 3.7" (.094 m)

I'm not too sure about my calculations at this point! I'm coming up with a number of about 180 kg of thrust if the wind speed was 12 metres per second. (Trust me it will be furled long before that!)

Does that thrust number sound reasonable? Is there a formula I can plug into Excel for future reference? I really like putting formulae into Excel, it's so easy to play around with the variables.

Thanks again Hugh, learned a lot from your Web and hope to attend one of your workshop sessions.

Ted.

[ [Parent](#) ]

Re: HAWT blade question ([none / 0](#)) (#4)  
by monte350c on Sun Nov 16th, 2003 at 09:27:57  
PM MST  
([User Info](#))

Hi Hugh,

(Again!!)

I should read more and type less!!!!

On the same page where I got the formula for the last post, I noticed:

$$(4/9) * \rho * A * V^2$$

I suppose in a perfect world that will give the thrust on the whole rotor, just divide by the number of blades to get the thrust on each blade.

Sorry about all the questions - one more - what units result from that formula if I use 1.29 kg m<sup>3</sup> for density of air, square metres for area, and meters per second for wind speed?

I'd like to boil it down to kg or lb.

Thanks again Hugh,

Ted.

[ [Parent](#) ]

Re: HAWT blade question ([none / 0](#)) (#5)  
by scoraigwind ([magnet@scoraigwind.co.uk](mailto:magnet@scoraigwind.co.uk))  
on Mon Nov 17th, 2003 at 04:15:24 PM MST  
([User Info](#)) <http://www.scoraigwind.co.uk>

Ted,

Yes you have found the right formula for the total thrust.

$$(4/9) * \rho * A * V^2$$

I use 1.2 for rho.

In metric units, it boils down to Diameter<sup>2</sup> \* windspeed<sup>2</sup> / 24

giving the answer in kg force.

if blade diameter is 4 metres and wind is 10 m/s (22 mph) then the thrust would be about (4x4)x(10x10)/24= 67 kg or 146 lb.

Hugh Piggott <http://www.scoraigwind.co.uk>

[ [Parent](#) ]

Re: HAWT blade question ([none / 0](#)) (#6)  
by monte350c on Mon Nov 17th, 2003  
at 08:16:30 PM MST  
([User Info](#))

Thanks Hugh!

That now makes sense and I can get back to designing a safe hub for this blade set. They are going to be a foam core with fibreglass cloth and an outer layer of carbon fibre with epoxy resin (it doesn't smell and has a bit of 'give' when cured). I'll give the whole thing a coat of polyurethane 2 stage clear coat for UV protection.

Other than cutting the templates this system is quite easy, accurate, light, and strong. I use a hotwire on the templates to cut the cores. I've tried a bit of wood carving and I guess I just don't have the knack. I'll post some pictures when they're done.

Thanks again for the help Hugh - it's nice to learn from others - I won't live long enough to make all the mistakes myself!

Ted.

[ [Parent](#) ]

[HAWT blade question](#) | 6 comments (6 topical, 0 editorial)

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### [Small free program to print wing profiles](#)

By [monte350c](#), Section [Homebrewed Electricity](#)

Posted on Wed Nov 12th, 2003 at 12:48:52 PM MST

[Wind](#)

It's only 48 kb but works great to print your wing profiles...

Hi all,

I've been using Xfoil to work with wing profiles, and it's a great program that lets you take an airfoil, make changes, and see what the results are to flow, as well as the mechanical strength of the wing. But it's really obtuse to print from.

Found this:

<http://www.aae.uiuc.edu/m-selig/ads/register/AIRFOIL1.EXE>

which basically loads the profile, displays it on the screen. You can make some minor changes like scaling it up or down. Then it will print a good quality profile to your PC printer. Two good things, it solves a problem, and it's free.

More fun than before!

Ted.

[Small free program to print wing profiles](#) | 0 comments (0 topical, 0 editorial)

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### [Plans for Gauss Meter?](#)

By [monte350c](#), Section [Homebrewed Electricity](#)  
Posted on Fri Nov 7th, 2003 at 10:39:07 PM MST [Wind](#)

**Anyone know of plans for a home-built Gauss Meter?**

Hi All,

After my first alternator, (and looking towards building some more) and reading many posts here on the board, it seems like gauss in the airgap is a very important subject. BUT - I've pretty much been flying blind. I'd love to be able to build something as a stand alone meter or something that would attach to my Fluke 85 to measure gauss in the airgap...

Ted.

[Plans for Gauss Meter?](#) | 1 comment (1 topical, 0 editorial)

Re: Plans for Gauss Meter? ([none / 0](#)) ([#1](#))  
by Windswept Cypress on Sat Nov 8th, 2003 at 03:33:24 AM MST  
([User Info](#))

Monte,  
Heres one I saw a while back on the net-it has several versions:

<http://my.execpc.com/~rheadley/magmetr1.htm>

Hope this helps.

Cypress

[Plans for Gauss Meter?](#) | 1 comment (1 topical, 0 editorial)

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### [Visualize what's going on in a bridge rectifier...](#)

By [monte350c](#), Section [Homebrewed Electricity](#)

Posted on Sun Nov 2nd, 2003 at 04:01:06 PM MST

[Wind](#)

A pretty cool site lets you try various things with rectifiers -

then view the output animated. It's helping my thick cranium to sort this stuff out a bit!

[http://www.eng.uts.edu.au/~venkat/pe\\_html/ch05s1/ch05s1p1.htm](http://www.eng.uts.edu.au/~venkat/pe_html/ch05s1/ch05s1p1.htm)

If anyone finds a circuit for MOSFET bridge rectifiers pls fwd the link. Soldering iron ready.

Ted.

[Visualize what's going on in a bridge rectifier...](#) | 0 comments (0 topical, 0 editorial)

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## [HMMM anybody good with a soldering iron?](#)

By [monte350c](#), Section [Homebrewed Electricity](#)  
Posted on Sat Nov 1st, 2003 at 10:21:57 PM MST  
MOSFETS for rectifiers instead of diodes

[Wind](#)

Hi All,

This looks pretty interesting - it's a new release from IR about a 25% efficiency boost in low speed current production.

<http://www.irf.com/whats-new/nr021113.html>

It's some very interesting technology - hope we can find a way to use it!

Ted.

[HMMM anybody good with a soldering iron?](#) | 7 comments (7 topical, 0 editorial)

2800 Watts @ IDLE ([none / 0](#)) (#1)  
by [wdyasq](#) on Sun Nov 2nd, 2003 at 07:23:14 AM MST  
([User Info](#))

WOW, they are talking some serious power 200 amps at 14V for today's cars. If one were using the new 42 Volt system we would be talking 8.4 kW at idle and 14.7 kW at 6000 RPM with a peak of 525A making over 22 kW - I guess that is for 20 seconds or the magic smoke appears, whichever comes first.

I'll be combing the wrecking yards looking at all the wrecked, junk Maybachs I'm sure are there for give-a-way prices. Does the color of the vehicle matter? If not, I'll take the one the Easter Bunny drove.

Ron

Re: [HMMM anybody good with a soldering iron?](#)  
([none / 0](#)) (#2)  
by [drdongle](#) on Sun Nov 2nd, 2003 at 08:18:21 AM MST  
([User Info](#))

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Sounds interesting though were still talking auto engine speeds of 6000 RPM, I'd like to know if the technology will be applicable to lower speed wind applications, 600 RPM and lower.

The technical description is as usual is vague, though it sounds like there using some form of synchronous rectification. This could enhance power delivered by reducing losses in conventional rectifiers. considering the typical alternator with two rectifiers in circuit at all time a voltage drop of 1.2 volts at 50 amps works out to 60 watts of power lost ( $P$  or  $W=VxA$ ). Perhaps one of us needs to explore synchronous rectification for use in PMA's.

Dr.D

Re: HMMM anybody good with a soldering iron?  
([none / 0](#)) (#3)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Sun Nov 2nd, 2003 at 08:59:31 AM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

From what I understand is that FETs have less losses, so they are hooking them up in a bridge rectifier layout, and turning them on and off at zero crossing on the waveform. sounds like it would be very easy to make electronic relay/rectifiers.

>=- W o o f -=<

Re: HMMM anybody good with a soldering iron?  
([none / 0](#)) (#4)  
by RobD on Sun Nov 2nd, 2003 at 09:44:24 AM MST  
([User Info](#))

I did not look at the circuit but I imagine this is synchronous rectification where the diodes are replaced by low  $r_{ds(on)}$  FETs. For those of you who don't understand, this is not an alternator that IR has developed as far as I can see. It is a way to replace the diodes in the alternator which allows very high current to be developed at low losses.

RobD

Re: HMMM anybody good with a soldering iron?  
([none / 0](#)) (#5)  
by monte350c on Sun Nov 2nd, 2003 at 01:18:43 PM MST  
([User Info](#))

Hi All,

I guess that's what got me so excited about this idea - if you're putting out 600 watts and you have a chance to increase that by 25% in the recifier stage by changing from diode to mosfet - it's certainly worth a try.

It sounds like the hi-amp project they're talking about is more or less another claw-pole alternator. That of course is interesting too, but how 'bout using this technology on a PMA? Especially on the smaller mills it could really shine.

Ted.

Re: HMMM anybody good with a soldering iron?  
([none / 0](#)) ([#6](#))  
by RobD on Sun Nov 2nd, 2003 at 09:59:35 PM MST  
([User Info](#))

Ted,  
You might want to look up synchronous rectification on google and see what you get. The technology has been around awhile but it sure is nice to have it in a pre-made package.  
RobD

Re: HMMM anybody good with a soldering iron? ([none / 0](#)) ([#7](#))  
by monte350c on Mon Nov 3rd, 2003 at 08:09:58 PM MST  
([User Info](#))

Thanks RobD,

Actually I've spent quite a bit of time looking for a MOSFET synchronous bridge rectifier circuit without much success I'm afraid. Maybe there hasn't been too much of this because of the low current capabilities of the older MOSFETs compared to the units mentioned in that IR article. I did another post about bridge rectifiers that links to an interesting site - it lets you play with the firing angle for a controlled bridge rectifier and see the output that results.

Anyhow - if you come across a circuit for this MOSFET bridge rectifier thing please post! I'm going back to cutting some NACA0015 foam cores for my Darrieus!

Ted.

[ [Parent](#) ]

[HMMM anybody good with a soldering iron?](#) | 7 comments (7 topical, 0 editorial)

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## [Delco alternators](#)

By [monte350c](#), Section [Homebrewed Electricity](#)

Posted on Fri Oct 31st, 2003 at 07:26:25 PM MST

[Wind](#)

They have to be spun too fast....

Hi all,

This probably falls into the hare-brained scheme category but here goes:

What would happen if the field on a Delco or other automotive alternator was fed on a diet of carefully phase controlled AC? Anybody think it would be possible to fool the stator into thinking there's more poles going by? It'd reduce rpm but really not sure if such a thing is even practical?

Ted.

Having fun & asking lots of questions!

[Delco alternators](#) | 3 comments (3 topical, 0 editorial)

Re: Delco alternators ([none / 0](#)) ([#1](#))  
by Jerry on Fri Oct 31st, 2003 at 07:43:51 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Ted

Don't know about the ac thing. I recently posted on some modifications to a GM alt to reduce rpm requierments. I prefure to replace the rotor with NEO magnets. This way no power is wasted energizing this coil. I think your first 50 watts gose to just make this electromagnet work.

However I did an expiriment with a tape drive/servo motor wind genny and a GM alt. The small tape drive wind genny supplied power to the rotor coil in the GM alt. The GM alt wind genny had its own set of blades. These 2 machines worked as a team.

4 amps from the tape drive genny was connected directly to the GM alt rotor no other connection to these 2. 4 amps was all that was needed to energize the GM alt rotor. However the tape drive can do an easy 10 amps and peak out around 27 amps.

Also made some mods to the GM alt wire scheam. There was a post about this last week or so.

Hey TomW help could you post that post here or tell us where it is. The bottom line was, getting about 30 amps at 30 mph from the GM alt with direct mounted blades.

Thanks

JK TAS Jerry

[Airheads Page](#)

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Re: Delco alternators ([none / 0](#)) (#2)  
by monte350c on Fri Oct 31st, 2003 at 08:21:31 PM  
MST  
([User Info](#))

Hi Jerry,

Thanks for the info - I think this is the post you were talking about?

<http://www.fieldlines.com/story/2003/10/3/2301/87723>

That's very interesting, and when you tried your blades on the GM alternator with the tape drive powering the field of the alternator, did you get any performance specs in lower winds - like 18-20? The reason I ask is it seems there is always a lot of wind around where I live, especially in the winter, but always from 15-20 mph. A lot of the commercial units (usually rated at 28 mph) would only be sort of putting along at those speeds - and the net effect is a rather large lightening of the wallet without much "amps" to back it up! So I'm always interested in hearing about what's going on below 20 mph. I'm beginning to see the brilliance in your idea of a bunch of smaller machines too. Couple of questions -

1. Have you tried anything with the smaller squirrel-cage motors as induction generators - or have they all got PM cores?
2. Any bigger versions of those blades available?

Thanks again Jerry!

Ted.

[ [Parent](#) ]

Re: Delco alternators ([none / 0](#)) (#3)  
by Jerry on Fri Oct 31st, 2003 at 11:55:05 PM  
MST  
([User Info](#))  
<http://www.dplusv.com/Photo-03.html>

Hi Ted

At 20 mph I was seeing 10 amps and at 30 mph the meter was reading 22 amps. The neo magnet version of the GM alt did 25 amps at 30 mph.

I have not tried a small or any size ac motor as an induction generator yet. Although the idea is tugging at me.

In the beginning it was tape drive motors but most have been ac motor converted to pma,s.

As an example the GARBOGEN with a 4 blade 49 inch plastic prop does around 15 amps at 20 mph and 40 amps at 30 mph. Also see a few amps at 5 mph. This thing smokes my lazy 403. The GARBOGEN is a 1 hp converted garbage disposal motor. It uses 4 \$5.50 curved neo magnets. The blades are 22 3/4 inches long. You can use extensions. But so far I've had best luck under 50 inches. I've built a couple 62 inch but get better results around 50 inch. I've also seen 80 amps at

45 mph and I've wind tested them to 68 mph.  
This was the limits of the cuntry road and my  
S-10 pu. The blades held up fine.

JK TAS Jerry

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[Delco alternators](#) | 3 comments (3 topical, 0 editorial)

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## [D-OH!](#)

By [monte350c](#), Section [Homebrewed Electricity](#)

Posted on Tue Oct 28th, 2003 at 08:13:35 AM MST

[Wind](#)

Miscalculation on my part for RPM and resulting VAWT confusion!

Oh Brother!!

Somehow my addled brain was using frequency = (poles x rpm)60 to calculate rpm. I was measuring the frequency with a Fluke meter and working backwards to get rpm. I read recently in another post about having to account for the south poles, and have since checked in several reference books and the correct formula is:

frequency = (poles x rpm) (2 x 60)

The highest consistent frequency I measured from my 24 pole alternator was 50 hz, and on that day I was getting wind gusting from 16 to 19 mph. Guess that means the Savonius blades were doing 250 rpm?? So the TSR on those 18" diameter blades was in the .8 to .9 range? There was a small load on the alternator too consisting of 3 x 25 watt (120 volt) light bulbs, one on each phase.

If it was totally unloaded, and I'm sorry I didn't test it that way, I wonder if the TSR would have gotten to 1 or... maybe better?

Interesting - time for more testing! Ed, you mentioned that this type of rotor likes to be loaded down to about 1/3 of its free rotation speed to extract the most from it. So I would have had to load it to about 80 rpm that day?

Still learning (obviously) and having a lot of fun!

Ted.

[D-OH!](#) | 2 comments (2 topical, 0 editorial)

Re: D-OH! ([none / 0](#)) ([#1](#))

by [monte350c](#) on Tue Oct 28th, 2003 at 08:16:38 AM MST

[\(User Info\)](#)

Those formulas somehow dropped the "/" when I posted - this is what I meant:

I was using frequency = (poles x rpm) divided by 60

The corrected formula should read: frequency = (poles x rpm) divided by (2 x 60)

Ted.

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Re: D-OH! ([none / 0](#)) ([#2](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Tue Oct  
28th, 2003 at 08:42:09 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Hi Monte, There is a formula to calculate the savonius, or any drag type turbine which you can find the "optimum" output of the machine...

$.5 \times .00492 \times \text{Area} \times (\text{Windspeed} - \text{Rotor speed})^2 \times \text{Cd} =$   
pounds of pressure on the rotor wing

Area = Area of either the downwind or upwind side in square ft

Windspeed = MPH

Rotor speed = MPH

Cd = drag coefficient

Savonius has a drag coefficient of around 1 on the downwind side and about 0.2 on the upwind side.

When calculating the upwind side remember to add the rotor speed to the windspeed.

Optimum extraction is at around a TSR of .33

You can convert the pounds on the blade to HP then HP to watts...

$\text{lbs on the blade} \times \text{Radius} \times \text{rpm} / 5252 = \text{HP}$

Then of course  $\text{HP} \times 746 = \text{watts}$

The "torque", you'll notice, from a locked rotor drops drastically as rotor speed picks up. You can calculate your start up torque by leaving out the rotor speed in the formula (locked rotor readings)... the start torque is quite high depending on the wind. My savinious will start rotating in a 3-4 mph wind although very slowly... its usually the only one spinning on calm days.

Lots of Fun!!!

Ed

[D-OH!](#) | 2 comments (2 topical, 0 editorial)

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### [For DanB idea for big Volvo based alternator](#)

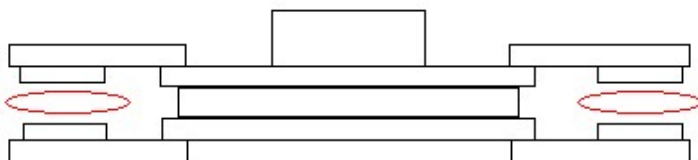
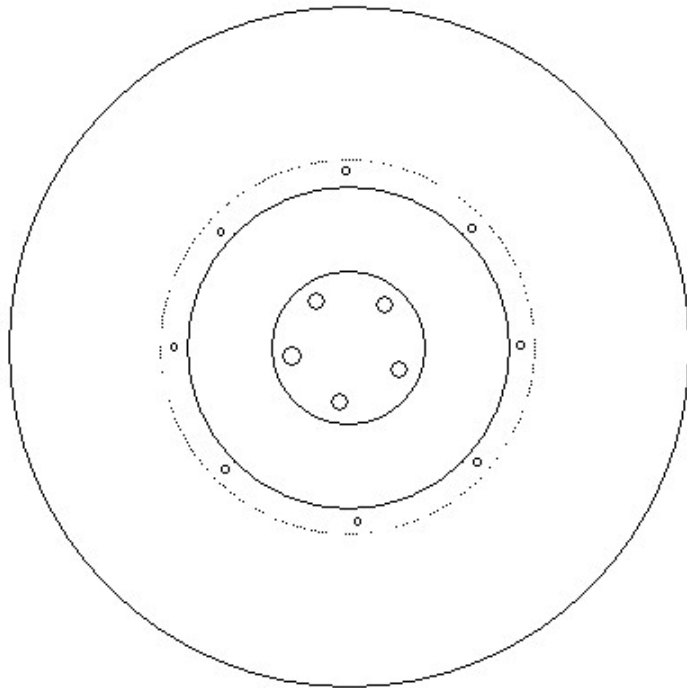
By [monte350c](#), Section [Homebrewed Electricity](#)  
Posted on Mon Oct 27th, 2003 at 08:39:59 AM MST

[Wind](#)

More Volvo parts, less custom fab work...

Hi DanB,

Ever since I read your first post on using Volvo stuff I really liked the idea, the less custom fab work the better. But I wanted larger diameter than a brake disk so my first alternator uses custom water-jet cut pieces. OK but expensive, and fairly heavy rotating mass. Last night I came up with this idea: Cut 2 circles out of 3/8" plate, the ID maybe 1" smaller than the OD of the Volvo disk, and the OD the size you want for the new alternator. Put one of these on top of the Volvo disk and the other on the bottom. Drill through both and the Volvo disk and sandwich the three pieces together. Something like this:



Then there's just one rotating item, in a stock location on the hub. There could be spacers between the disk and the steel circles if more room is needed for the stator. I will be giving this a try for my next alternator.

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[For DanB idea for big Volvo based alternator](#) | 10 comments (10 topical, 0 editorial)

Re: For DanB idea for big Volvo based alternator ([none / 0](#)) ([#1](#))  
by DanB on Mon Oct 27th, 2003 at 08:47:07 AM MST  
([User Info](#))

Funny you bring that up... I've thought a lot lately about exactly the same thing!

The problem with the Volvo disk... is limited diameter. 2" tall magnets are the max we can use - and of course, the circumference is an issue too. I think they are adequate for pretty big alternators, but... I've got this urge to try something a bit larger.

Anyhow - I thought about it, and it may well be the best way to go. As it turns out... I've decided to not use brake disks in the next larger one and instead I've cutout some 14" diameter disks from 3/8" steel, and I'll be biting the bullet and doing a bit of extra fabricating I guess..

But yes, you're right - that would work quite well I'm sure and it may be the simpler way to go, hard to say...

Seems like... the more fun we have the more power tools we need!

Re: For DanB idea for big Volvo based alternator ([none / 0](#)) ([#2](#))  
by JB on Mon Oct 27th, 2003 at 10:29:44 AM MST  
([User Info](#))

I disagree with you there Dan. I look at it this way. The more power tools we have the more fun we have. JB

[ [Parent](#) ]

Re: For DanB idea for big Volvo based alternator ([none / 0](#)) ([#3](#))  
by bob golding ([yubba at clara dot net](#)) on Mon Oct 27th, 2003 at 11:17:50 AM MST  
([User Info](#))

power tools? dream on. after spending days filing out a volvo disk i bit the bullet and paid someone to turn the hub down for me. at least doing it this way i can use any volvo disk without having to pay out for machining twice. had a dream about finding an abandoned machine shop full of lathes and milling machines and folders and stuff. oh by the way i filed out the wrong disk just to rub it in.

having as much fun as you have with a battery drill and a jig saw and a 300 watt inverter.

bob

[ [Parent](#) ]

Re: For DanB idea for big Volvo based alternator ([none / 0](#)) ([#8](#))  
by kww on Mon Oct 27th, 2003 at 09:34:46 PM MST  
([User Info](#))

I have a 19-20" diam. thick steel disk I got from "Agri-Supply" years ago to make a disk plow out of. It's got about a 2" diam. hole in the middle. Anyway, it was cheap from what I remember and I think there's different sizes, if you're interested.

Kevin

[ [Parent](#) ]

Re: For DanB idea for big Volvo based alternator ([none / 0](#)) ([#4](#))  
by gps on Mon Oct 27th, 2003 at 12:05:24 PM MST  
([User Info](#))

Already have an 8-bolt idler hub awaiting disks to build such a 'sandwich'...

Re: For DanB idea for big Volvo based alternator ([none / 0](#)) ([#5](#))  
by wdyasq on Mon Oct 27th, 2003 at 03:53:42 PM MST  
([User Info](#))

As one built larger diameter rotors, some interesting weight reduction ideas could be incorporated. Also, with the proper design, the rotor plates might become a sandwich. The magnets could be in pockets. There would be little need to glue the magnets on and all the magnets would be properly located if the parts were done properly.

BTW - I think wooden templates could be made to locate -centers- and a drill press might be used to bore rather large holes with the proper - and not real expensive, tools.

Ron

Re: For DanB idea for big Volvo based alternator ([none / 0](#)) ([#6](#))  
by DanB on Mon Oct 27th, 2003 at 05:04:53 PM MST  
([User Info](#))

yes, we could make a sandwich... the rotors could ultimately wind up as one piece so they never had to be seperated, and if the stator is made in two parts it could slip into the slot on both sides. I think, once the magnetic forces get so strong this could have advantages and be a good bit safer.

Re: For DanB idea for big Volvo based alternator ([none / 0](#)) ([#7](#))  
by monte350c on Mon Oct 27th, 2003 at 07:13:12 PM MST  
([User Info](#))

Hi DanB,

Good idea, I was thinking about making a mold out of polyethelene or another plastic that doesn't stick to fiberglass (test it with acetone). The mold would hold three coils only. It will have small holes drilled in through the outer edge to pass the wires out through. Plus a tapered 'core plug' to go in each coil center (ventilation!). The mold will be sort of pie-shaped and on the two cut edges of the pie there will be plastic pins that will go into the fiberglass and hold each coil to its neighbour.

I figure by casting them in 3's the mold will be quite small, so it'll be easier to make it exactly a certain size (ie. to fit between the two rotor plates) and keep a close air gap. Each pie-shaped piece will have two small holes on the outer edge that will mount to a stator ring supported on the alternator frame. So the rotors never have to come apart and the whole thing ends up being quite strong. Also easy to change one or more stator coils. It IS fun!!

Ted.

[ [Parent](#) ]

Re: For DanB idea for big Volvo based alternator ([none / 0](#))  
(#9)  
by paulpic on Tue Oct 28th, 2003 at 03:14:26 AM MST  
([User Info](#))

I have just completed assy of my 1st alternator and had problem with disc diameter being too small,so i decided to just remove them completely.

I then machined 2 new discs,drilled and tapped 5 more holes in hub to hold discs.

5 studs go from rear of back disc to front of blades,other 5 screw into hub and bolt front disc on.

If you do this just remember to thread discs so a jacking plate can be made for seperation.

if i build a another one i would do it the same way.

hope this helps

[http://www.otherpower.com/images/scimages/351/DCP\\_0285.JPG](http://www.otherpower.com/images/scimages/351/DCP_0285.JPG)

[http://www.otherpower.com/images/scimages/351/front\\_disc.jpg](http://www.otherpower.com/images/scimages/351/front_disc.jpg)

Thanks  
Paul

[ [Parent](#) ]

Re: For DanB idea for big Volvo based alternator ([none / 0](#)) (#10)  
by Firefly on Wed Oct 29th, 2003 at 11:46:55 AM MST  
([User Info](#))

Check this out





Maybe you will get some ideas. Just a reminder that the forces that the magnets can put on the disk may be big so make the disk assembly strong!

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[PM motor site](#)

By [monte350c](#), Section [Homebrewed Electricity](#)  
Posted on Thu Oct 23rd, 2003 at 10:06:57 AM MST

[Wind](#)

Just came across this site.....

Hi All,

As usual while looking for something on the web I came across this site which was totally unrelated to what I was looking for!

<http://www.goldenmotor.com/frame22-hubx.htm>

There's a couple of low RPM brushless DC hub motors that look interesting, and the prices listed at the bottom of the page seem fairly reasonable too.

Looks to me if you combined a couple of those plastic pipe blades posted by zubbly and one (or more) of these little motors you might have a good cheap source for 400 to 500 watts.

Ted.

[PM motor site](#) | 6 comments (6 topical, 0 editorial)

Re: PM motor site ([none / 0](#)) ([#1](#))  
by johnjach on Thu Oct 23rd, 2003 at 11:38:01 AM MST  
([User Info](#))

Neat website find! Sounds like a good idea to me but I wish someone who knew more about electricity than me would comment. Are these "hub" motors also made in USA?

Re: PM motor site ([none / 0](#)) ([#2](#))  
by johnjach on Thu Oct 23rd, 2003 at 11:41:12 AM MST  
([User Info](#))

Sounds like a good idea to me but I wish someone who knew more about electricity than me would comment.

Re: PM motor site ([none / 0](#)) ([#3](#))  
by DanB on Thu Oct 23rd, 2003 at 01:44:28 PM MST  
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- <http://www.goldenmotor.com/frame22-hubx.htm>
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looks like theyre made in china. Pretty neat though - and the prices are great. As they are wound, they are not 12 volts, and the rpm are pretty low. So I suspect they might make for good small 12 volt windmills... better might be 24 volts. They all seem to be 24, or 36 volts and the rpm are real low, so I think they might not be quite right for your average HAWT. Hard to say though - itd sure be fun to experment with one.

[ [Parent](#) ]

Re: PM motor site ([none / 0](#)) ([#4](#))  
by Geek on Fri Oct 24th, 2003 at 04:04:15 PM MST  
([User Info](#))

I wonder how much the shipping from china would be?  
what does this mean?

\*All prices quoted as F.O.B Shanghai, and subject to change from time to time  
sounds to me like they might male nice little generators.  
I wonder if we could get OP to test and carry them if it works out?  
Just a though  
Geek

Alway have a dream. Those with out dreams are just waiting to die.

FOB mean Freight on Board ([none / 0](#)) ([#5](#))  
by TomW on Fri Oct 24th, 2003 at 06:29:37 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Geek:

\*All prices quoted as F.O.B Shanghai, and subject to change from time to time"

Pretty much means they will load it on the shippers vehicle and that the price may change any time.

Cheers.

TomW

[Stuff I have Online](#)

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Is China a State known as Arkansas? ([none / 0](#)) ([#6](#))  
by wdyasq on Fri Oct 24th, 2003 at 08:09:16 PM MST  
([User Info](#))

Note:

Input Voltage: 12/24/36VDC  
Movement: Forward and Reverse  
Output Power: 100W -- 180W  
Speed: 174 RPM, Weight: 4.3Kgs  
Diameter: 192mm, Width: 112mm  
Prices F.O.B Arkansas, USA

1. to 99 per order: \$143/unit  
100. to 499 per order: \$136/unit  
500. + per order: \$129/unit

I had heard CHINA was making inroads to the economy  
but I didn't know they had purchased Arkansas.....

Ron

[PM motor site](#) | 6 comments (6 topical, 0 editorial)

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## [Number of blades 3 or 4?](#)

By [monte350c](#), Section [Homebrewed Electricity](#)

Posted on Sun Oct 12th, 2003 at 06:47:35 PM MST

[Wind](#)

About to launch into a Darrieus experiment...

and I have thought of a good, strong, and mechanically simple method of dealing with 4 blades instead of 3. Are there any factors I should be aware of that differ from a horizontal turbine for blade number calculations?

I'm aiming for a solidity of around .24 with 4 blades. The planned unit will be 10' diameter, 6' high wings. Planned rotational speed of 150 to 200 rpm.

Have done a lot of other calculations for Re, centrifugal force, tip speed etc.

Is there any reason I have never seen a 4 bladed Darrieus?

[Number of blades 3 or 4?](#) | 8 comments (8 topical, 0 editorial)

Re: Number of blades 3 or 4? ([none / 0](#)) ([#1](#))  
by [johnjach](#) on Mon Oct 13th, 2003 at 08:53:37 AM MST  
([User Info](#))

Go the the net at [www.windharvest.com](#). This is a commercial outfit that has made four-bladed Darrieus turbines for years and actually has them in operation. They're obviously too big for residential application but the photos are great and should give you a few ideas if not inspiration.

Also, go to the U.S. Patent office at [www.uspto.gov](#) and search for Darrieus patents. There are a lot of them and they're a lot of fun looking at the various ideas. If you have any trouble searching patents, do another posting on the board and I'll give you specifics on how to search.

One more resource: use your search engine and look for Sandia Laboratories. They also have volumes on VAWTs.

Re: Number of blades 3 or 4? ([none / 0](#)) ([#2](#))  
by [monte350c](#) on Mon Oct 13th, 2003 at 10:42:56 AM MST  
([User Info](#))

Hi - and thanks for the windharvest link. I've been (extensively) looking at the VAWT archives at Sandia, there is a lot of good reading there, and as you pointed out at the USPO.

Looking around at the [windharvest.com](#) site answered another question - looks like a 4 blade unit will be self-starting.

Thanks again for the info! Now back to having fun!

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Re: Number of blades 3 or 4? ([none / 0](#)) (#3)  
by johnjach on Mon Oct 13th, 2003 at 01:44:40 PM MST  
([User Info](#))

Forgot to tell you this in my first comment: I also am intending to build a Darrieus turbine and I bought the NACA 0012 aluminum airfoils from MTM Scientific . They sell it at \$7.00 per foot and that's pretty good for something professionally extruded. As of today, they only have about forty feet left so move quickly if you want some ([www.mtmscientific.com](http://www.mtmscientific.com)). I intend to do some experimenting using the piece I bought to make a mold and then make duplicates from fiberglass resin strengthend with carbon fiber rods--hope they withstand the centrifugal forces.

If you're interested in VAWTs, also check out [www.ropatec.com](http://www.ropatec.com). This is a unique machine which appears to be sort of a "Darrieus-Venturi" concept. Ed Lenz of this discussion board made one similar to this. Check out the "Lenz Turbine" on [www.windstuffnow.com](http://www.windstuffnow.com). If you want the proportions of the Ropatec machine, again go to [www.uspto.gov](http://www.uspto.gov) and check out patent no. 4490623. For the "Darrieus-Venturi" concept, check out patent no. 4537559.

I'm starting construction on mine soon and I'll keep the board posted.  
Good luck.

Re: Number of blades 3 or 4? ([none / 0](#)) (#4)  
by bob golding ([yubba at clara dot net](#)) on Tue Oct 14th, 2003 at 05:00:30 PM MST  
([User Info](#))

this vawt stuff is really addictive hehehe doing a crash course in aerodynamicns. found this site very useful.  
<http://www.dreeseencode.com/> they do a 30 day free demo. i can almost work out what a NACA 0012 is now. was thinking if we work out the best shape for the airfoil i will see if it is possible to get someone to make one with a standard metal folder then use that as a mold. wonder if aluminium filled with that expanding foam used for fixing gaps in window frames would work to stiffen it up?

having lots of fun

bob

[ [Parent](#) ]

Re: Number of blades 3 or 4? ([none / 0](#)) (#5)  
by monte350c on Tue Oct 14th, 2003 at 08:13:19 PM MST  
([User Info](#))

Hi Guys!

You're right about the VAWT's. I can't stop thinking about this - though I know very well if I just put a HAWT prop on it my gen would be flying a lot sooner!!

About the best program I've found so far for playing around with airfoils is "X-Foil". The great part is that it's free, takes endless custom settings, and comes with a huge database for many different NACA and other profiles. Based on what I've read at Sandia, I think the NACA0015 is a pretty good starting point.

You can download the X-foil program at this link:

<http://raphael.mit.edu/xfoil/>

There is a pretty good read-me attached, and with a bit of prodding the program will save a file to the hard disk in Adobe Acrobat format. Then you can use your printer software to scale and print it. When the program loads, type NACA0015 (enter) then ppar and (enter) and it will plot the foil on screen. That's if you want to use the NACA0015 profile - there's lots of others to play with too.

The program works in a DOS window, I run W2000 and it works fine. Not a demo or time limited offer either, it's the full program.

I've decided on a 4 blade approach since it's mechanically simpler - with 4 x NACA0015 profiles about 6 to 8" chord (watch the rpm, rcf, tip speed, and Re number!)

All factors = compromise in one way or another.

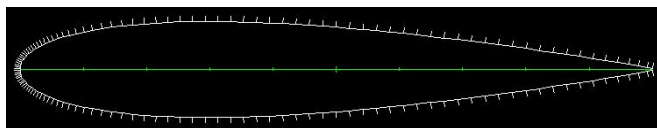
I have done 1 test wing in foam core, laminated with 2 layers of epoxy fiberglass and vacuum bagged. I am amazed by the strength and light weight.

Seems every step of the way you have to invent something to continue. But that's the fun part, and as we say I am definitely having fun!

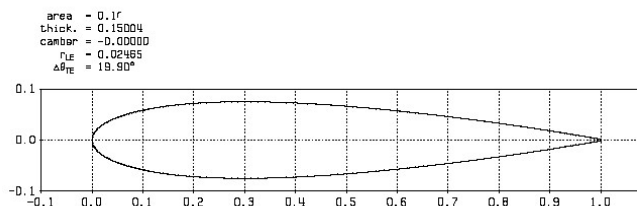
[ [Parent](#) ]

Re: Number of blades 3 or 4? ([none / 0](#)) ([#6](#))  
by monte350c on Tue Oct 14th, 2003 at 08:21:11 PM MST  
([User Info](#))

Here's a screen shot of the X-Foil program with a NACA0015:



And here is the same thing, but output from the program to a PDF file (actually PS but who's counting!)



From the screen shot you can see the plot points, you can modify those and see the results. Also the program will give you lots of info about the foil, such as bending moments, and airflow.

[ [Parent](#) ]

Re: Number of blades 3 or 4? ([none / 0](#)) (#7)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Wed Oct 15th, 2003 at 08:03:35 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

I've made them using rubber molds and pouring a 2 part plastic mix in the mold. Makes nice ribs for the darrieus wings. The Main spar is aluminum and to stiffen them up for higher rpm and/or longer spans to a support you can add 2 3/4 inch thinwall tubes.



The first one is made from plywood, the rubber is poured over the plywood and cured. Once the mold is done you can make as many as you want. The rubber and plastic is from [www.smoothon.com](http://www.smoothon.com) and part for part ( as well as the ease to use it) is quite inexpensive. Each rib costs about 40 cents to make. I cover them in aluminum using contact cement then add rivets in key locations. These could be stiffened up by doing an expanded foam fill. A 3 ft wing comes in at around 18 ounces using 1" .083 wall aluminum tubing.

Fun stuff ;o)  
Ed

[ [Parent](#) ]

Re: Number of blades 3 or 4? ([none / 0](#)) (#8)  
by monte350c on Wed Oct 15th, 2003 at 09:33:11 PM MST  
([User Info](#))



Nice blades Ed!

Believe it or not I don't have any scales in my possession at all right now! As soon as I fix that problem, I'll weigh one of these foam core blades and post the weight. I'll be static testing one to destruction very soon, I'll report on that too.

Ted.

[ [Parent](#) ]

[Number of blades 3 or 4?](#) | 8 comments (8 topical, 0 editorial)

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## [Alternator output vs. rpm](#)

By [monte350c](#), Section [Homebrewed Electricity](#)

Posted on Tue Oct 7th, 2003 at 08:34:22 PM MST

[Wind](#)

Question about the relationship between output and speed...

Hi All,

Sorry in advance if this has already been dealt with!

What's the relationship between the voltage and rpm for a pm alternator??

I have been able to fairly accurately measure open voltage of 27.5 VAC at 100 RPM and 40 hz on my first alternator. I took the measurement on one of the three phases.

Does the voltage vary in a linear way with rpm?

Also how does one go about doing actual output testing - let's say I can attach my alternator to a gas motor (geared down for a range between 75 to 300 rpm). Keep adding load until... what should I be watching for? I've got a Fluke 85 and that's about it for instrumentation!

The specs on the alt.:

Resistance for 1 phase: 2.8 ohms

# coils: 18 (80 turns of 18 AWG ea.)

# magnets: 24 x 2 dual rotor

diameter @ magnet centerline: 15.25"

Thanks in advance for any help!!

[Alternator output vs. rpm](#) | 9 comments (9 topical, 0 editorial)

Re: Alternator output vs. rpm ([none / 0](#)) ([#1](#))  
by [wpowokal](#) on Tue Oct 7th, 2003 at 11:51:13 PM MST  
([User Info](#))

Ok my two bobs worth,

Output unloaded will be aproximatly linear, usefull for determining cut in speed, oh remembering to convert AC back to DC volts.

As to testing on a motor the most important parameter I would monitor is current output as one could easily overheat the stator. Resistance of 2.8 ohm/phase at 5 amps/phase =  $5 \times 5 \times 2.8 = 70$  watts of heat/phase.

With a single metre, if it has a DC current measuring capacity I would measure one phase output. Remembering multimeters are only short term rated so dont leave the metre in the circuit for lengthy periods.

Once connected to a load the output voltage will depend on the load as it would if connected to batteries. ie output

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voltage is "somewhat" stabilised at load voltage, subsequent increases in speed will result in more current.

If your load/s have known watt values at a given volts you could use the metre to monitor volts whilst adding load, because knowing watts gives amps (voltsXamps = watts), always remembering not to melt the stator.

hope this helps more than confuses  
regards Allan

Re: Alternator output vs. rpm ([none / 0](#)) (#2)  
by DanB on Wed Oct 8th, 2003 at 08:24:17 AM MST  
([User Info](#))

Hi -

"What's the relationship between the voltage and rpm for a pm alternator??"

- it's linear, so double the rpm and the voltage doubles.

"Resistance for 1 phase: 2.8 ohms"

That's quite a lot unless you're goal is fairly high voltage.

What voltage are you planning to charge at? If it was 12 or 24 volts, I'd consider rewiring the coils so that you have a higher cutin rpm and lower resistance.

"# coils: 18 (80 turns of 18 AWG ea.)"

So do you have 6 coils in series for each phase?

How big are the magnets? Sounds like a heck of an alternator! Love to see some pictures.

Re: Alternator output vs. rpm ([none / 0](#)) (#3)  
by monte350c on Wed Oct 8th, 2003 at 12:42:12 PM MST  
([User Info](#))

Hi Dan,

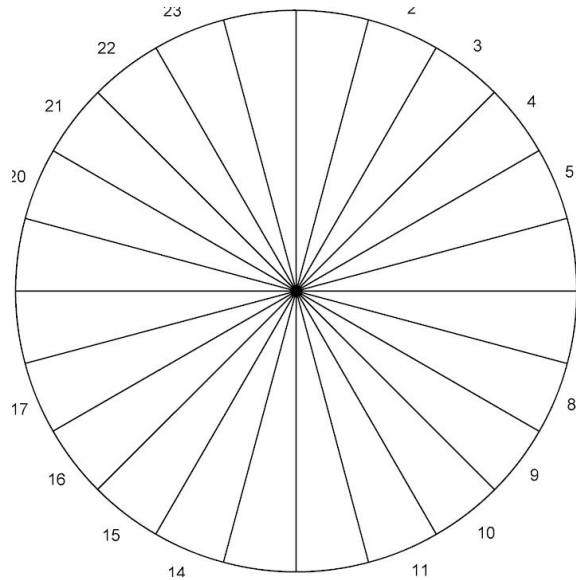
Thanks for the answers. The plan is to leave the voltage fairly high, send the AC to the house, then rectify it. Figured there might be some savings in wire this way - it's about 200 feet to the base of the pole.

Yes, there are 6 coils in series for each phase.

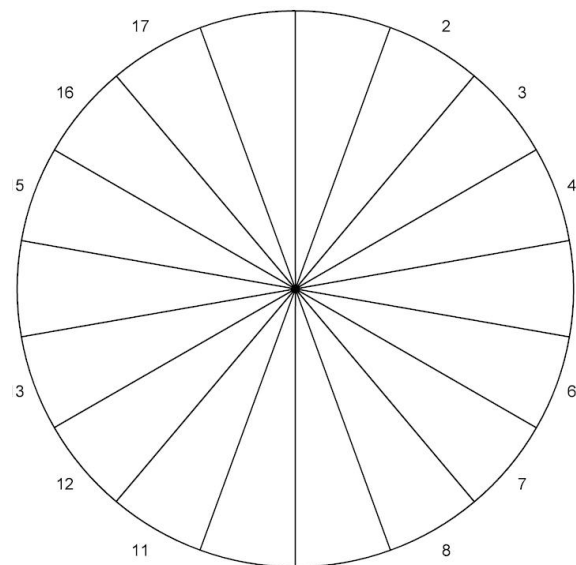
The magnets are teeny by comparison to your Volvo projects! Actually since I'm fairly new at this, I looked all over near where I live, and ended up buying the magnets at Lee Valley, they were the biggest they carry. They are 1" diameter, and 1/8" thick neos.

So with my magnets in hand, I thought about a dual rotor machine, with 24 magnets per rotor. I ended up making the rotors to suit the magnets. There's a 15.25" diameter around the magnet mounting circle.

( $15.25 \times 3.14159 = 47.9$ ) which gives about a 1" space between each magnet. Since I'm not too good with the protractor and compass (!) I did up a couple of charts in Excel - one for the magnets:

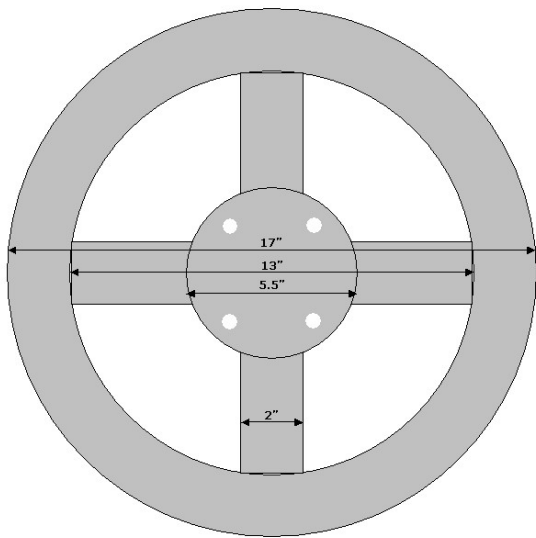


and one for the coils:



Then printed them out, after a bit of fiddling around got the magnet chart to 15.25" diameter. My printer has a poster printing feature - it prints a piece on several sheets, then you just tape them together for a full size chart.

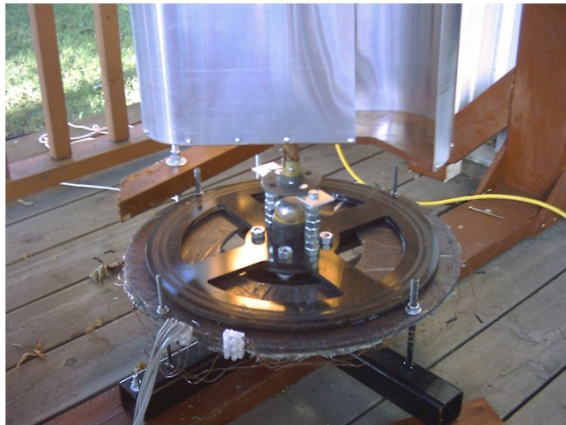
I took this pic to the machine shop:



In addition to the four holes to mount it to the trailer hub, I drilled 2 more 3/8" holes and tapped them. I can screw 3/8" bolts in those extra holes, the bolts push the rotor up off the hub for removal (and less exciting installations!)

The coils are 1/4" thick, and I put down 2 layers of fiberglass cloth in the mold, then the coils, then filled it with resin, then 2 more layers of cloth. The lid went on plus lots of weight. When the stator came out it's exactly 3/8" thick and very flat, so I was able to hold an airgap of about 1mm between the magnets and the stator.

Here's the finished unit:



The base is a 2" square box tubing with 1/4" wall.

At this point I have been playing around with different blades - tried a small Savonius set on it. I wrote more details about that in an earlier posting. It's under the title "I promised a few pics".

Next up I plan to put a fair size set of Darrieus wings on it. The wings are 10' long and 6" chord. They're foam core with epoxy fiberglass coverings. Light and strong. There's some more detail in that other post.

Of course if that doesn't work out then I'll try some 3 bladed horizontal designs.

Really glad to have come across this board, and in particular I owe you a big thank-you for all the help on how to do stators. This really is a lot of fun!

[ [Parent](#) ]

Re: Alternator output vs. rpm ([none / 0](#)) (#4)  
by bob golding ([yubba at clara dot net](#)) on Wed Oct 8th,  
2003 at 03:57:19 PM MST  
([User Info](#))

hi all been thinking about this speed thing a bit and it seems to me that to get an idea of the probable voltage all other things being equal, which i know they aren't, what is needed is the formula for time taken for one magnet to pass over one coil. this will depend on the size of the magnet and the diameter of the rotor. so the actual rpm is not as important as the transition time of one magnet over one coil. can someone with a better memory than me tell me the formula for working this out please. i did know it from building rotary spark gaps for tesla coils but can't remember it for the life of me. i think it is called the dwell time.

still havin fun

bob

Re: Alternator output vs. rpm ([none / 0](#)) (#5)  
by troy on Thu Oct 9th, 2003 at 12:37:26 PM MST  
([User Info](#))

I don't think dwell time alone will predict relative voltage very well. A better criterion would be to calculate the speed of coil vs magnet, which is easy:

$(\text{rpm}) (\pi * \text{diameter in inches}) / 12 = \text{linear feet per minute}$

if you double the linear feet per minute, either by increasing rpm or by increasing diameter, you pretty much double the voltage, until the stator starts heating up and losing efficiency due to increased resistance. We can't make any absolute predictions about voltage without knowing a bunch of other variables like magnet strength, coil turns, resistance, airgap, magnetic circuit efficiency (difficult to quantify), temperature and so on.

Good luck and have fun,

troy

[ [Parent](#) ]

Re: Alternator output vs. rpm ([none / 0](#)) (#6)  
by deezl on Thu Oct 9th, 2003 at 03:36:30 PM MST  
([User Info](#))



Hi, you could try this one

$N * A * R * B * P = \text{voltage}$  N= #of wire turns in coil. A= area of 1 magnet in square meters (square " \* .000645). R= R.P.S. (rpm/60). B= tesla in air gap (gaoss/1000). P= # of magnet poles.

Could re arrange to find missing #'s.

Deezl

Re: Alternator output vs. rpm ([none / 0](#)) (#7)  
by monte350c on Thu Oct 9th, 2003 at 09:06:23 PM MST  
([User Info](#))

HMMMM!!

About the only thing I really don't know for sure is the tesla in the air gap - but I do know it makes 27.5 volts @ 100 rpm so...

$$80 * .00051 * 1.67 * 16.81 * 24 = 27.48$$

So for a slightly larger version of this alternator, assuming I leave all other things the same, but just increase the number of magnets to 32 (24 coils) with a 20" magnet mounting circle instead of 15.25" and change the rpm (to 112.5)-

$$80 * .00051 * 1.875 * 16.81 * 32 = 41.15$$

If I could find a nice transformer with a 3:1 secondary:primary ratio I could have some nice 123/60hz ac voltage.

Does that make any sense?

[ [Parent](#) ]

Re: Alternator output vs. rpm ([none / 0](#)) (#8)  
by yossarian on Fri Oct 10th, 2003 at 11:57:27 AM MST  
([User Info](#))

Here's a link to some equations.

<http://icosym-nt.cvut.cz/course/node53.html>

As I understand them, the voltage is dependent on the radius \* angular velocity \* cosine of the angular velocity. I find that a little surprising, as I would have guessed it would be directly dependent on the linear velocity (pi \* diameter \* angular velocity). Hope that helps.

Re: Alternator output vs. rpm ([none / 0](#)) (#9)  
by bob golding ([yubba at clara dot net](#)) on Fri Oct 10th, 2003 at 01:18:16 PM MST  
([User Info](#))

thanks for all the equations guys. should keep me quiet until my Volvo hub is machined. As i have to pay for the machining getting the hub turned down to fit the brake rotor, rather than the other way round. means i can try differant rotors on the same hub. yes angular velocity is the one i was having trouble remembering. its going well should start on the stator this weekend.

still having lots of fun

bob

[Alternator output vs. rpm](#) | 9 comments (9 topical, 0 editorial)

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### [I promised a few pics...](#)

By [monte350c](#), Section [Homebrewed Electricity](#)

Posted on Thu Oct 2nd, 2003 at 05:15:21 PM MST

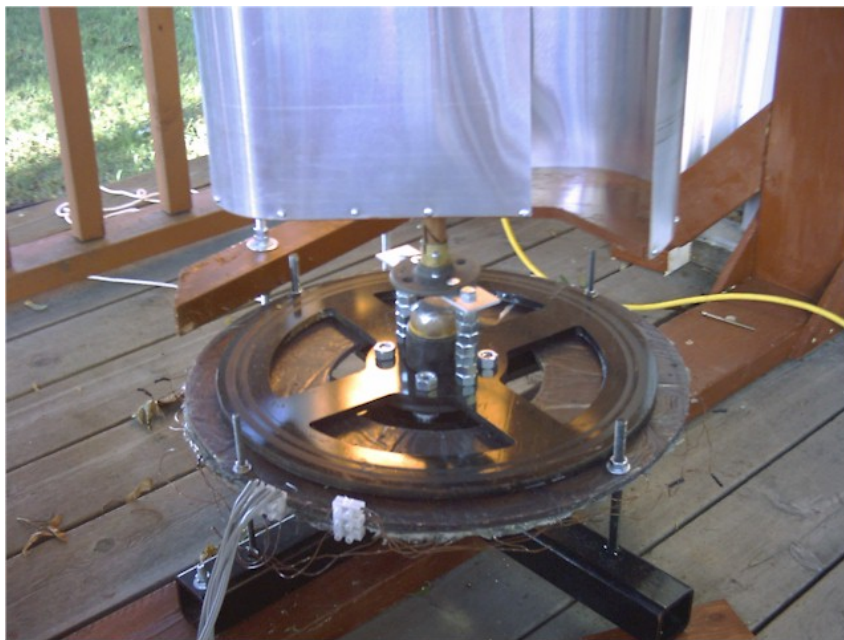
[Wind](#)

Here are a few pics of my home made electricity adventure so far...

Hi all,

Thanks for the replies about the stall question I posted last night. I'm trying to find out if stall regulation of speed is worthwhile considering or not.

I built a 15.25" diameter alt. with 18 coils - 18 AWG, 70 turns ea. with 24 neo mags 1" x 1/8" round on each rotor. The rotors I had made at a local machine shop for about \$75 total. They are made out of 3/8" steel plate. I had 4 cutouts put in each one to cut down the weight a bit. The rotors ride on a 4 bolt trailer hub/axle, which is welded to an X-shaped frame made out of 2" box tube, 1/4" wall.



I wound the coils using the usual sort of former - 2 pieces of 3/8" plywood, but I used a 1/4" dowel in each of the 4 corners of the coils, with a spacer in between of about 1/4" thickness. I cast the rotor with 2 layers of fibreglass cloth on both sides for strength. The overall thickness of the rotor is 3/8". The airgap on each side between the stator and magnets is a little under 1 mm (sorry about the mixed units!).

The first place this alt. ended up was on the bottom of a Savonius rotor assembly:

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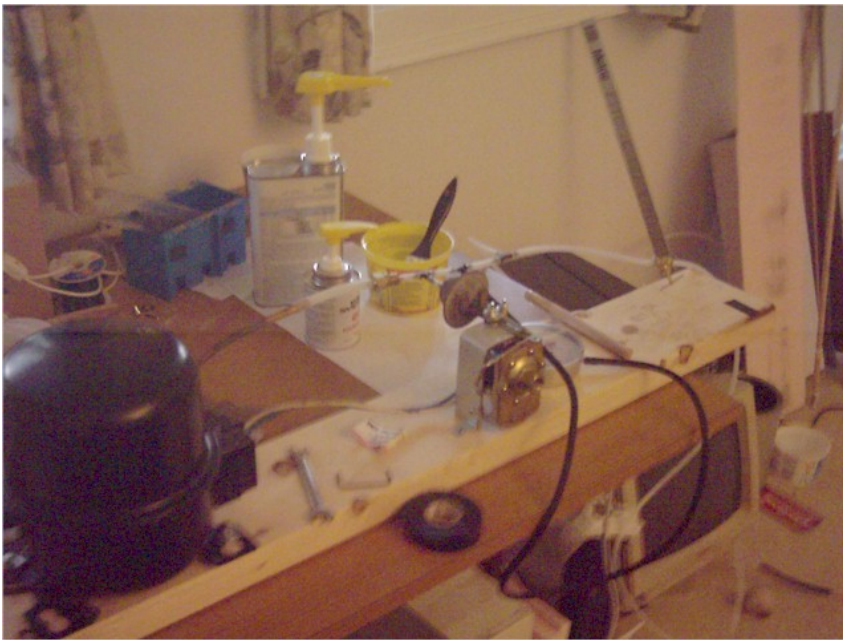
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One day last week when the wind was at around 16 mph, this thing was turning at 125 RPM. The load was one 25 watt light bulb on each phase (48 ohms ea.) I measured the voltage on one of the phases by taking out the light bulb. The Fluke reported a peak of 34.5 VAC/50hz.

I hate to say it but I am undecided what will be flying on this alternator - Darrieus wings, or a conventional prop! Now that I've tried a small Savonius, I kind of get the idea that a big one would work - but there are problems with scaling these up. So now I'm making some foam core/fibreglass covered Darrieus wings to try on it. BTW it's EPOXY resin - not the normal styrene based stuff you get at the Auto Zone. I tried that and it melts the foam quite effectively!

I cut out some NACA0015 profiles using a home-made hot wire setup, and profiles from the excellent X-Foil program which you can download for free at <http://raphael.mit.edu/xfoil/> With a little prodding the program will create a ps file, which can be opened in Acrobat, then scaled as desired. It's pretty easy to make a vacuum bagging setup:



That's an old frig compressor - and the switch is from a water pressure pump - with a vacuum advance unit from a GM HEI distributor pulling on it...

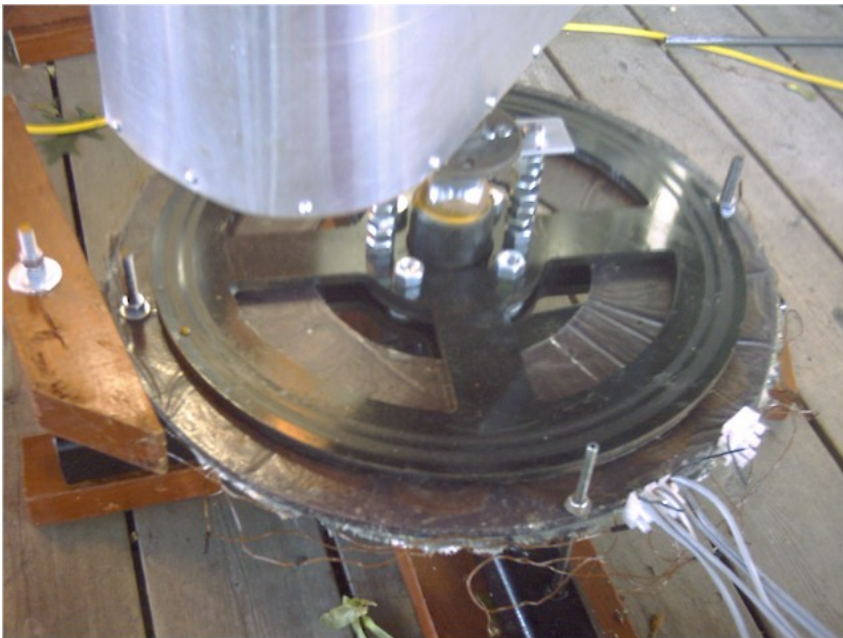


Here's a pic of the first wing in the vac bag:





I'm aiming for 200 RPM or so with this test setup. It will be mounted to horizontal struts on the same frame where the Savonius now resides. About those wings - they do have to be strong, and light, due to centrifugal forces. At 200 RPM, and a 54" diameter on this test unit, the force involved will be about 30G! So if the wing weighs in at 2 lb. it will weigh 60 lb at speed. There's a nice mechanical brake on the top rotor with a long piece of rope attached if things don't work out!



Sorry for being so long winded! I'll post results of the Darrieus wings as soon as they are mounted. Again my sincere thanks to all you guys - I've learned a lot in a short period of time. And got a new hobby/obsession!

[I promised a few pics...](#) | 5 comments (5 topical, 0 editorial)

Re: I promised a few pics... ([none / 0](#)) ([#1](#))  
by RobC on Thu Oct 2nd, 2003 at 08:28:18 PM MST  
([User Info](#))



What a nice looking alternator. I can't wait to see your next project. Keep up the good work.  
RobC

Re: I promised a few pics... ([none / 0](#)) ([#2](#))  
by sean on Fri Oct 3rd, 2003 at 01:32:28 PM MST  
([User Info](#)) <http://homepage.ntlworld.com/s.amesbury/homepage.htm>

Fantastic stuff i gotta hand it to you, like the blades in fact i like the whole thing. have tested to see what wind speed the drag blades start up and when the alternator hits charging voltage? Something i havent tried on a large scale yet and thats a drag type vawt so im courious as to any data you may have on it.....sean

Re: I promised a few pics... ([none / 0](#)) ([#3](#))  
by monte350c on Fri Oct 3rd, 2003 at 02:22:05 PM MST  
([User Info](#))

Hi Sean,

The unloaded blades will start to rotate in about 7 mph worth of breeze. The alternator hits 12 volts AC at 40 RPM. The fastest I have seen this particular unit spin was at 125 RPM in a really stiff breeze of 16-20 MPH. The output at that point was around 35 volts AC. That day it had a load of one 25 watt/120 volt bulb on each phase. To measure the voltage I unscrewed one of the bulbs - this was at night, and I would say the bulbs were at about 1/3 to 1/2 their rated brightness. If it was more highly loaded, of course it would slow down. The blades are 18" wide and the stack of 4 is 56" high. For the next couple of days I'll be continuing to work on the foam core Darrieus blades. I'll mount them, probably removing a few of the Savonius sections and see what happens!

[ [Parent](#) ]

Re: Vawt's get a bad rap... ([none / 0](#)) ([#4](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Fri Oct 3rd, 2003 at 07:07:50 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

You really have to load the Savinous to about 33% of free speed rpm to achieve full power out of them. So if it runs no load at say 100 rpm's in a given wind then the best power extraction will be at around 33 rpm for that wind speed.

I think the VAWT's get a bad rap because the blades really extract power quite efficiently. They simply have alot of built in design flaws. You figure at any given time only half of the machine is extracting power, the other half is simply robbing the power. You calculate the entire area of the machine when in reality your only collecting from 1/2. Then consider what the downwind blade is doing... its moving away from the wind. This means your really collecting 1/2 of the machine and from a slower windspeed. So if the wind is 12 mph and the blade is running at 4mph your collecting from an 8mph wind. This also means the upwind blade is being held back by a 16mph wind. If you calculate exactly what the downwind blade is doing you'll find its collecting at over 50% efficiency.

Analyzing a 2ft x 2ft unit (4 sq ft total) in a 12.5 mph wind. Free

speed is 175 rpm so the optimum rotor speed would be around 58 rpm. The total watts available in that area would be around 39. The down wind blade makes about 3.23 watts but the up wind blades steals 1.12 watts leaving 2.1 watts harvested... pretty poor indeed.

Lets say your only collecting from the downwind side and the upwind is blocked off. That leaves you with only 2sq ft of collection area but your getting the 3.23 watts well geeze thats much better. Total available watts in 2sq ft at 12.5 mph is around 19 that jumped the machine up to 17% efficiency. But wait !! The blade is moving away from the wind so in reality we're only collecting from a 8.5 mph wind. There's only 6.2 watts available in that wind and we are getting 3.2 of that... (  $3.2/6.2 = .51$  ) Yes thats 51% efficient on the downwind blade. Getting very close to the Betz theory. So basically the machine gets a bad rap but the blade is quite efficient, It simply needs a bit of redesigning... without all the flaws.

Have Fun  
Ed

[ [Parent](#) ]

Re: Vawt's get a bad rap... ([none / 0](#)) (#5)  
by monte350c on Fri Oct 3rd, 2003 at 10:28:02 PM MST  
([User Info](#))

Hi Ed,

Yep - I kinda favor verticals too - that's why the emphasis so far has been with this configuration. I think there will be a way to do this - so even if it's going over ground previously covered I feel sort of compelled to keep trying (and of course having fun at it!). I liked your venturi ideas and this may be a good way to combine D & S styles to produce something good.

The trailer axle & hub I used for this alternator I feel will be able to accept quite a bit of loading. I am considering using a schedule-40 pipe with a flange welded to it that bolts under the hub bolts, about 6' long, with no top bearing.

The alternator is a fairly large diameter so it can develop some power at lower RPM's. I think for these power levels a gearbox or rpm step-up devices are not going to be to efficient.

Current plans will see a couple of different things attached to this. The first will be an upscaled Darrieus with NACA0015 wings. Big. (inspiration: [http://infoserve.library.sandia.gov/sand\\_doc/1977/771063.pdf](http://infoserve.library.sandia.gov/sand_doc/1977/771063.pdf)) The wings will be 10' high, the dia. 17'. Perhaps by eliminating the smaller diameter regions of the trop. shape, and using struts instead, good things will happen. The wings for this will have an aircraft type stainless control cable in them, running back through the struts and bolted to the torque tube for containment just in case...

I am working out moveable aerodynamic devices for the struts, rather than the wings themselves. Downwind deployment for startup, and deployment on all three sides for speed control (with a mechanical governor friction brake as backup, and a hydraulic caliper with master cylinder a long way from the tower as a backup for that!). This I suppose could be called an H-Bar D. setup. I like the idea of large diameter, since that way rpm and therefore RCF can be held to a reasonable level. If things go well I will be winding a bigger alternator.

The experiments I have been working on with vac bagging foam core wings look very promising. The first one out of the bag is a NACA0015 with a 7" chord - 5' long. Last night I

placed it on 2 chair backs and put a box of books in the middle that weighs about 60 lb. There was no deflection at all. These things are really strong, and very light. Boy am I long winded!

I'll post more as this develops!

[ [Parent](#) ]

[I promised a few pics...](#) | 5 comments (5 topical, 0 editorial)

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## [New user - Stall speed question](#)

By [monte350c](#), Section [Homebrewed Electricity](#)

Posted on Wed Oct 1st, 2003 at 08:45:07 PM MST

[Wind](#)

Question about stall speed for turbine wings

Hi All - after doing lots of reading on this board, I've got a question. This is easily the most informative board I've seen for wind topics! I've really enjoyed Dan B's work on the triplets, and have had a good read through Hugh P.'s site too.

Using some of the things I learned here, I have built a dual rotor axial flux PM alternator. The diameter is 15.25", and each rotor uses 24 magnets. There are 18 coils in the stator. Testing gives 12 volts at 40 rpm, and 27.5 at 100 rpm unloaded. It's wired 3-phase star at the moment, but I'll probably change to delta. I'll post some pics within the next day or two. I digress...

The question I have, (possibly for Hugh P.) - I've read through most of the stuff about blades - and I can see the basics about profile, twist, taper - but is there a way to calculate at what rpm a particular profile will stall?

I do a little flying too, so from that experience we were taught that a wing will always stall at the same angle of attack regardless of speed etc.

Does the angle of attack relate to the apparent wind for wind turbine blades? And is there a way to ballpark the stall speed?

[New user - Stall speed question](#) | 2 comments (2 topical, 0 editorial)

Re: New user - Stall speed question ([none / 0](#)) ([#1](#))  
by [wdyasq](#) on Thu Oct 2nd, 2003 at 03:34:21 AM MST  
([User Info](#))

If one looks at the angles of attack, they should come to the conclusion too much power, rather than stalling, might be a problem with a turbine blade. The outboard part of the blade is stalled when stopped. As soon as any significant speed is attained, the tips "start flying" and are in a whole new set of conditions. These conditions, in my opinion, are created by the machine itself and stall angles become far less than critical.

The attach angle of the tips is low. With an 8:1 tip speed to wind speed ratio, it would be difficult, if not impossible, to stall the blade by increasing wind speed.

Ron

Re: New user - Stall speed question ([none / 0](#)) ([#2](#))  
by [BSparky](#) on Thu Oct 2nd, 2003 at 04:16:07 PM MST  
([User Info](#))

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Monte why go to a delta? Stay a star and try paralleling some of the phases.

In NE Ohio we have wind but at the low end of the spectrum. With this in mind.

For what I'm working on is kind of in the same lines here. Building a twin axial. 10.5" brake rotors and rear hub off a Chrysler k frame car. I'm using 24(12 off my PMA for now) .5 x 1" squares N38?s. Each of the rotors has 12 equally space magnets and air gaps which fits fairly well in the middle of the braking pad surface. Was going with a 12 pole six paralleled star stator 3 phase but stator, but with thickness of this stator of 36 coils I believe will play a big facture in affecting flux strength. I've downsize it to a 6 pole stator with 18 coils two layers of nine coils. Thinking later could sandwich another 6 pole stator inline later on. The coils are wound in a wedge shape for parallel flux cuts. The wire size 22ga.at 90 turns each, which has a 3/8 thick footprint cutting the flux.

As for each coil the maxim current will be 3 amps (wire ampere little over). 90 turns for voltage. Now with 18 coils to play with my first attempt will be hooking up into a 6 pole 6 parallel star. Used the star over the delta config for greater voltage, and parallels for max current. From there I should have a reference point to start with.

Genentor wired in star 18 coils.

Phase 1 in parallel coils # 1,4,7,10,13,16

Phase 2 in parallel coils # 2,5,8,11,14,17

Phase 3 in parallel coils # 3,6,9,12,15,18

That's my start.

Don't have any graphics software to draw this, maybe some could here. For pictures I guess taking the some photos to Walmart to may then digital.

Bob

[New user - Stall speed question](#) | 2 comments (2 topical, 0 editorial)

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[PM motor ?](#) | 3 comments (3 topical, 0 editorial)

Re: PM motor ? ([none / 0](#)) ([#3](#))  
by Hank on Tue Dec 23rd, 2003 at 08:03:22 AM MST  
([User Info](#))

Sounds great,

Boy, my guess was off by a bit. Do you know what rpm you were getting at the various speeds?

Have fun and be carefull,

Hank

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[PM motor ?](#) | 3 comments (3 topical, 0 editorial)

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[PM motor ?](#) | 3 comments (3 topical, editorial)

Re: PM motor ? ([none / 0](#)) ([#1](#))  
by Hank on Sun Dec 21st, 2003 at 10:13:13 PM MST  
([User Info](#))

Let me try a guess,  
In 60 mph winds using a suitable sized rotor with a TSR of 8 I would guess about 500 watts. Cut in speed for charging batteries will be in the order of 600 rpm meaning about 25 mph winds for that prop.

Let us know what you test out at.

Re: PM motor ? ([none / 0](#)) ([#2](#))  
by Jerry on Mon Dec 22nd, 2003 at 09:15:10 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Hank  
Well it took me 2 days but I got the 200 lb genny in the test truck.  
That was a scary addventure?

Charging started at 10 mph at 5 amps, at 15 it hit 10 amps at 25 mph the amp meter was showing 20 amps.

The blade was a littel out of balance so i'm going to try a diferant blade.  
This blade was my plastic blades at 5 1/2 ft tip to tip.

I'm going to try a smaller blade. One of my 49 inches. Thanks for your help I'll keep working on it.

JK TAS Jerry

[Airheads Page](#)

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Re: PM motor ? ([none / 0](#)) ([#3](#))  
by Hank on Tue Dec 23rd, 2003 at 08:03:22 AM MST  
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[Using different kinds of magnets on same rotor](#) | 17 comments (17 topical, editorial)

Re: Using different kinds of magnets on same rotor  
([none / 0](#)) (#14)  
by Hank on Sun Dec 21st, 2003 at 06:07:22 PM MST  
([User Info](#))

Yes that's more like it. NOT like the bottom one it's too large. Also I think you might want to make the legs a bit longer so the whole magnet can be seen thru the hole in the center of the coil.

Magnets passing parallel with the coil windings don't produce power. This is a waste of potential power.

The coils don't have to be perfectly rectangular, you may want to make them a bit trapezoidal to sort of fit to the shape of your magnets. Perhaps similar to the pic I have above in an earlier thread.

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[Using different kinds of magnets on same rotor](#) | 17 comments (17 topical, 0 editorial)

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[Using different kinds of magnets on same rotor](#) | 17 comments (17 topical, editorial)

Re: Using different kinds of magnets on same rotor  
([none / 0](#)) (#12)  
by Hank on Sun Dec 21st, 2003 at 02:14:13 PM MST  
([User Info](#))

You may want to make your coils look more like Ed showed, sort of rectangular. You want the magnets crossing the wire at a right angles (90 deg.) not parallel. So the hole in the center should be larger then your magnets are wide and the magnets should just cross the legs of the coil.

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Re: Using different kinds of magnets on same rotor  
([none / 0](#)) (#13)  
by Sponge on Sun Dec 21st, 2003 at 02:45:13 PM MST  
([User Info](#))

Yeah, Itried rectangular before, but somehow the circular one gave more output :). But I guess it was my first "flat" coil. So, if I understand correctly, it should be like this? (or more like the bottom coil?).

With one magnet per pole, it's easier to be sure than with these HD magnets :) So.. just checking :) (And I think there are more people looking for answers like these in the future too :-) !)

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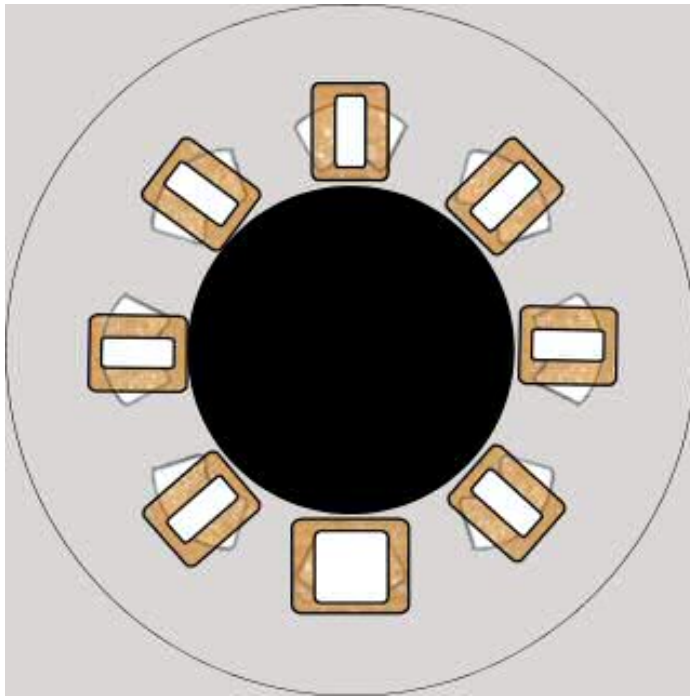
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Regards,  
Almar

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by Hank on Sun Dec 21st, 2003 at 06:07:22 PM MST  
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Re: Using different kinds of magnets on same rotor ([none / 0](#)) ([#16](#))  
by DanB on Mon Dec 22nd, 2003 at 08:27:57 AM MST  
([User Info](#))

I think thats close... the best bet is experiment I suppose. Id try the coils slightly larger. If it were me, If you're not going to break the magnets, then Id try to run them close together so the poles are as equally spaced as possible.

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[Using different kinds of magnets on same rotor](#) | 17 comments (17 topical, 0 editorial)



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[Using different kinds of magnets on same rotor](#) | 17 comments (17 topical, editorial)

Re: Using different kinds of magnets on same rotor  
([none / 0](#)) (#6)  
by Hank on Sun Dec 21st, 2003 at 09:43:02 AM MST  
([User Info](#))

Jeremy,

Low carbon steel is probably the cheapest steel. Probably used in making cars. You may also find it in a Auto Body supply shop. It's soft and easy to work. You can also call a steel supply shop and ask about it. Key here is "low carbon" and that's what I would reccommend as being the most cost effective.

The strips are concentric rings insulated from each other. I used masking tape on one side for the insulation.

The pic here shows my stator. If you look carefully behind the coils in the center you will see the laminates. The width of all the laminates should be at least the size of your magnets and they serve the purpose of focusing and completing the magnetic circuit.



This greatly enhances the power capabilities of the genny.

Have fun,  
Hank

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[Using different kinds of magnets on same rotor](#) | 17 comments (17 topical, 0 editorial)

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[4 component load control system](#) | 25 comments (25 topical, editorial)

Re: 4 component load control system ([none / 0](#)) ([#7](#))  
by Hank on Sun Dec 21st, 2003 at 09:06:08 AM MST  
([User Info](#))

I'm no wiz on electronics either but I think current is the limiting factor and not necessarily voltage. For instance you have those small glass fuses which, for arguments sake, are rated at 10 amps but 250 volts. They will fry at 10 amps even at 12 volts. I believe it's the internal resistance of the component that limits its current carrying capacity.

I guess another example would be using #14 wire to carry 1200 watts. In one case using 120 volts and 10 amps, in another case 12 volts and 100 amps. Both are 1200 watts but the wire will fry in the case of 12 volts and 100 amps.

But what the hell we will have fun trying and I hope someone else chimes in on this one.

By the way what type of genny do you have? Do you know what voltage it puts out and at what rpm, also your internal resistance of the coils?

[ [Parent](#) ]

Re: 4 component load control system ([none / 0](#)) ([#8](#))  
by charged on Sun Dec 21st, 2003 at 09:21:40 AM MST  
([User Info](#))

For the record, this can be "souped up" by using the triac to trigger a mosfet.

This difference will be that you need TWO mosfets and TWO triacs to control the mosfet gate to drive it positive.

OR, even simpler, put a FULL-WAVE rectifier across the generator AC and then use the single triac/transistor circuit to control the pulsed DC signal.

It's the same basic circuit you can use to discharge a capacitor bank. Bipolar transistors work better than mosfets for this application.

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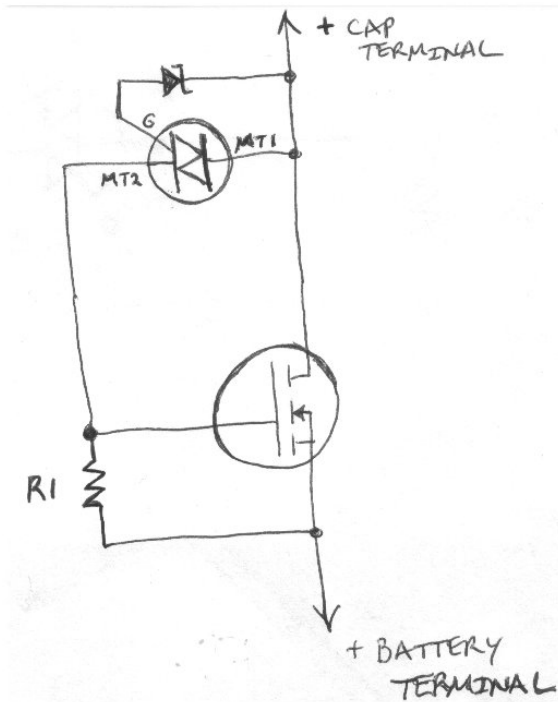
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Re: 4 component load control system ([none / 0](#))  
([#9](#))  
by kww on Sun Dec 21st, 2003 at 09:31:53 AM MST  
([User Info](#))

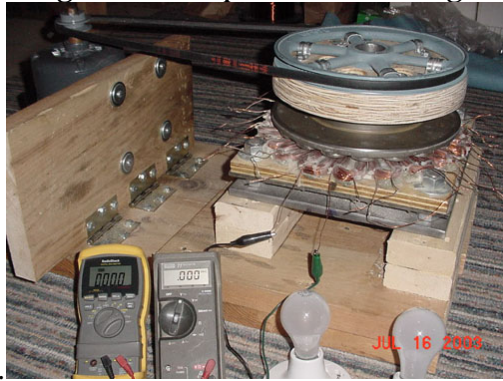
I see what you're saying, makes sense to me.

The genny I've been talking about has a 10 ft rotor and a 3-phase alternator. At around 1000rpms it makes 129volts, but I've only seen 52 volts with the 10 ft rotor driving it. The resistance of all the coils that make up each phase is 1.5ohms.  
Kevin

[ [Parent](#) ]

Re: 4 component load control system  
([none / 0](#)) ([#10](#))  
by Dave B on Sun Dec 21st, 2003 at 10:11:23 AM MST  
([User Info](#))  
<http://www.madbbs.com/users/bruggelog>

Great information and thank you for your replys. Once I get a chance to work with this I'll keep you up to date on how it's all working out. It sounds as if I should be able to get the circuit working, all I need is some more time. I can't wait to get this up and flying, with the weather we have had lately and I'm still working out the details of my tilt up tower it looks like Spring will be a realistic target. This is a great group and I'm having alot of fun. Any other suggestions or modifications to the control circuit as you guys out there work with it would be great to see posted. Thanks again,



Dave B.

[ [Parent](#) ]

[4 component load control system](#) | 25 comments (25 topical, 0 editorial)



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[S Rotors](#) | 2 comments (2 topical, editorial)

Re: S Rotors ([none / 0](#)) (#2)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Fri Dec 19th, 2003 at 05:39:41 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

Some elements of your design are referred to in this message thread about Savonius Rotors.  
<http://www.fieldlines.com/story/2003/11/22/7365/5340>

}-- W o o f --{

[S Rotors](#) | 2 comments (2 topical, 0 editorial)

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## [Untraditional Magnet/Coil Shape/Spacing](#)

By [wooferhound](#), Section [Homebrewed Electricity](#)

Posted on Sun Dec 7th, 2003 at 10:52:57 PM MST

[Wind](#)

**But the coils are Not shaped like the Magnets**

I've got my wire and I'm winding coils now. I am making a Dual rotor machine with 6 magnets on each rotor. The Magnets are Large 2" x 2" x 1/2" Ferrite magnets, quite strong. However the rotors are too small at 9 inches in diameter.



So winding the coils has been a little bit of a problem. If I wind the coil properly (square to fit the magnet, hole size slightly smaller than the magnet) then the wire gets bunched up toward the hub of the rotor and limits the size that the coils can be wound.

I have seen genny designs here that use 2 magnets per coil, so that a South is crossing one Leg of a coil, as a North is crossing the other Leg of the coil. By making my coils triangular I was able get a Lot more wire in there, and achieve the arrangement of the second design with opposite poles on opposite legs.

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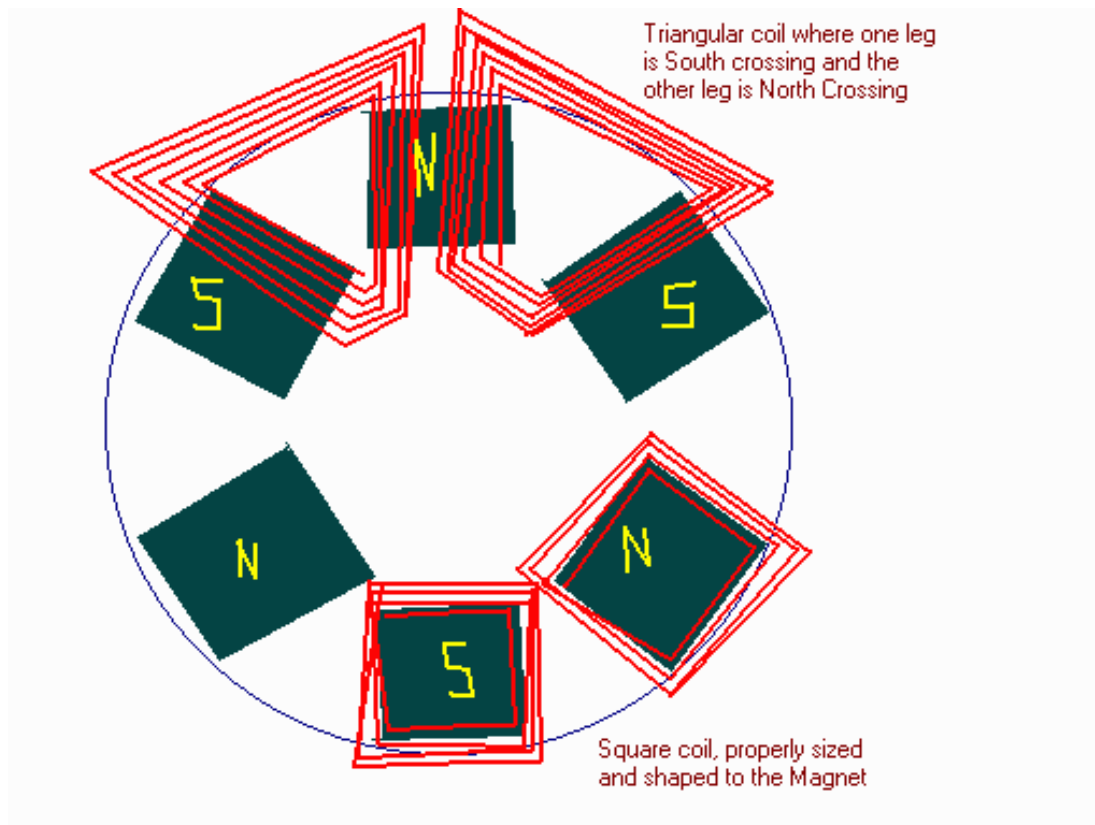
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This picture is not to scale and the real unit is much better constructed. Has anybody else tried this design where a single coil shares half of 2 separate magnets to get opposite poles on the two different Legs ?

I'm winding my coils from 19 ga magnet wire, 125 turns, 85 feet per coil, soon to be 6 coils. The triangular coils are giving me 5 volts at 240 rpm, loaded with a 6 volt 9 watt bulb. I will wind 3 coils in series, and then the other 3 in series. Two sets in parallel charging a 12 volt system.

[Untraditional Magnet/Coil Shape/Spacing](#) | 4 comments (4 topical, 0 editorial)

Re: Untraditional Magnet/Coil Shape/Spacing ([none / 0](#)) (#1)  
by Jerry on Sun Dec 7th, 2003 at 11:25:41 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Can't help you on the coil ? What are you using for blades? I've just finished a similar bearing arrangement. Guess I should post a pix. Your mill is lookin good keep us up to date on progress.

JK TAS Jerry

[Airheads Page](#)

Re: Untraditional Magnet/Coil Shape/Spacing ([none / 0](#)) (#3)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Mon Dec 8th, 2003 at 12:57:02 PM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

Well , of course I would have to use the PVC Props (Zubblades).  
Probably a 4 blade, 5 foot Diameter. My machine will only be about 100 watts,  
give or take.

} = - W o o f - = {  
[ [Parent](#) ]

Re: Untraditional Magnet/Coil Shape/Spacing ([none / 0](#)) (#2)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon Dec 8th, 2003 at 10:16:06 AM  
MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Your triangular coils will work much better as well as utilizing the space for more  
copper more efficiently. Are you building a single phase unit? Looks quite nice so  
far!!!

Have Fun  
Ed

Re: Untraditional Magnet/Coil Shape/Spacing ([none / 0](#)) (#4)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Mon Dec 8th, 2003 at  
01:12:03 PM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

It's 6 coils in all, at any instant, 3 of the coils will have North crossing them,  
these will be wired in series. At the same instant the other 3 coils will have  
South crossing them, This set will also be wired in series.

I will end up with 2 sets of 3 coils that are out of phase with each other. My  
thinking is that, at low wind speeds I will have all 6 coils switched in series to  
maximize the voltage, and past a certain wind speed switch the 2 sets to  
parallel, which will halve the voltage and double the current. Here in Alabama  
the wind isn't very good so I imagine it will spend most of it's time wired all  
6 in series...

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### [PVC Savinous Props](#)

By [wooferhound](#), Section [Homebrewed Electricity](#)  
Posted on Mon Dec 1st, 2003 at 12:22:43 PM MST

[Wind](#)

I've been cutting PVC pipe again

I mentioned making PVC Savinous blades on Chat recently. I have them hanging on my front porch and they spin almost constantly. My camera doesn't work well with moving objects, but I finally found a calm enough moment to snap some pics . . .



It's a super simple design, basidy you just cut the pipe in half (lengthwise), almost all the way to the hub, and cut away the opposing faces. I made three of these and bolted them all together with Threaded Rod. I thought about plugging up the airway through the Hub but WindStuffNow suggested that it would be better to duct the air through to the other side. . . <http://www.fieldlines.com/comments/2003/11/22/7365/5340/7#7>  
So I'm letting the air flow freely through the middle.



Sorry I don't have any data of any kind on these blades, except. Comparing to the Zubblades that I have been cutting, it starts

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▪ <a href="#">Also by wooferhound</a>



sooner but turns slower as wind speed increases.

[PVC Savinous Props](#) | 4 comments (4 topical, 0 editorial)

Re: PVC Savinous Props ([none / 0](#)) (#1)  
by TomW on Mon Dec 1st, 2003 at 04:23:18 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Woof!

Just looking the first thing I thought was they need half an "elbow" out on the ends to keep air from spilling off the end of the half tube.

Just my first thought. Kinda nice use of discard pvc hunks.

My pal in the plumbing business has a few pieces of scrap he is dropping off tomorrow. 10, 14 and 22 inch diameter short cutoffs I think he said. This gives me some options I hadn't thought of to experiment with.

Thanks for sharing.

Cheers.

TomW

[Stuff I have Online](#)  
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Re: PVC Savinous Props ([none / 0](#)) (#2)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon Dec 1st, 2003 at 05:37:51 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Hey Woof,

I've built many different types of VAWT's and some pretty odd, you've definately hit on one that is quite unique. I think tom made a good point to help increase efficiency though.

The half cylinder shape is one of the best for drag coefficient on the downwind side ( 2.3 ) but it also claims 1.2 on the up wind side which is quite high. If you added a wing shape to the front of each tube you could get this down to around 0.4 quite easy and retain a 1.9 Cd on the downwind side... If your looking to make some power with it. I have some old PVC pipe sections and might give it a shot if you don't mind me copying your design... can't help myself just gotta' tinker.

Lots of Fun!!!

Ed

Re: PVC Savinous Props ([none / 0](#)) (#3)  
by RobD on Mon Dec 1st, 2003 at 07:21:13 PM MST  
([User Info](#))



I'd like to see what they do under load. I like verticals for ease of building them but I think they are poor performers. I'd love to see these come close to horizontals though. I might try them with the thin drainage tubes just for fun.

RobD

Re: PVC Savinous Props ([none / 0](#)) (#4)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Tue Dec 2nd, 2003 at 10:31:39 AM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

I made the above Savinous blades from 3 inch thin sewer pipe. I really just wanted to see if it would spin. I thought the rounded tips would work better coming into the air on the upwind side, but I can see how some properly modified Elboes would work better.

I thought the coolest part was that these could be stacked up as high as you wanted. They don't look too bad. With a larger number of these blades stacked at 120 degree angles (as pictured above), It would make a pretty moving spiral pattern while spinning.

I got some PVC pipe from the building where I work. It is Grey and labled "Rigid Non-Metalic Electrical Conduit, underground". I cut a horizontal blade from that stuff. This is the strongest PVC pipe I've seen , Ever. Rigid is a good description.

}=- W o o f -= {

[PVC Savinous Props](#) | 4 comments (4 topical, 0 editorial)

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### [Four Blade PVC Prop](#)

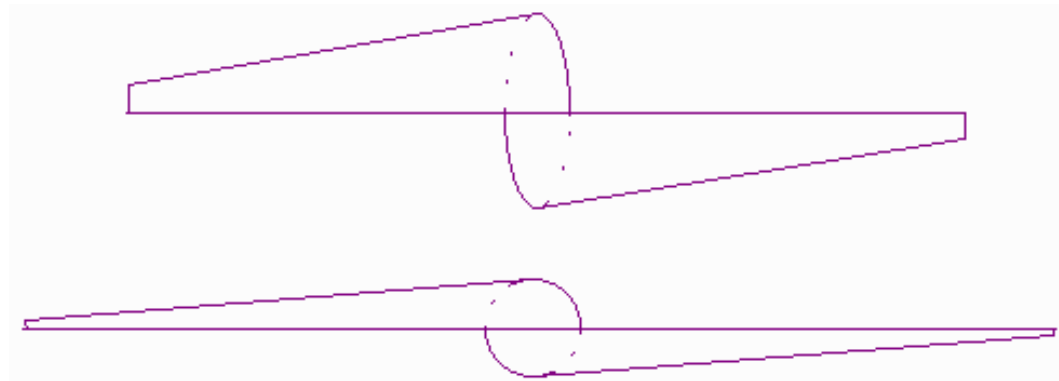
By [wooferhound](#), Section [Homebrewed Electricity](#)

Posted on Wed Oct 29th, 2003 at 05:01:44 PM MST

[Wind](#)

I figured out a way to combine 2 PVC props to make a 4 blade version

I decided to try to make an experimental PVC prop out of some small 1 1/4" PVC pipe following the last diagram that I suggested to Zubby...



I made one of them and it was working great in front of a box fan set on low speed. I kept looking at this prop and spinning it by hand and saw a way that I could combine 2 of them together to make a 4 blade prop...



So I cut another Identical prop with minor modifications and bolt them together...

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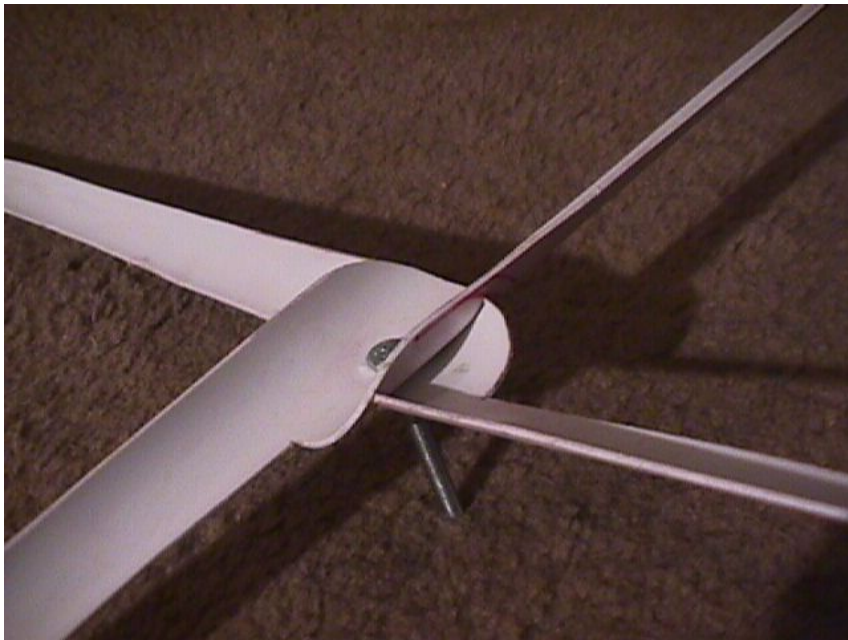
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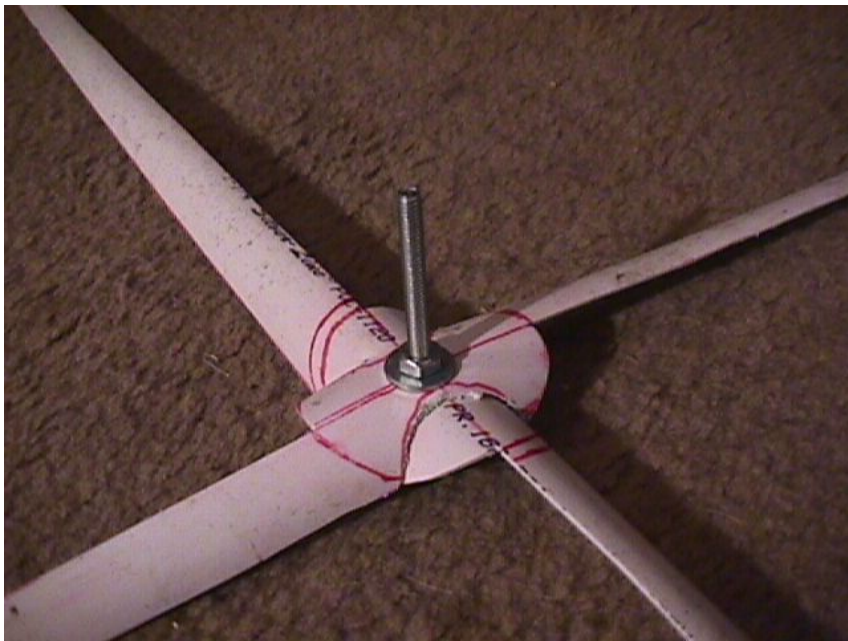
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Well it looks good, and has about twice the torque as the 2 blade version in front of the box fan.



While it's working wonderfully, I can see that the second blade is much weaker than the front blade because a large portion is cut out from the center where the strength needs to be. So the 2 sets of blades need to be further glued and/or bolted together. This is working much better than I thought it would. Making these props from 6 or 8 inch pipe would be way higher torque and much easier to make.

Thanks for the Ideas Zubby . . .

[Four Blade PVC Prop](#) | 5 comments (5 topical, 0 editorial)

Re: Four Blade PVC Prop ([none / 0](#)) ([#1](#))  
by sean on Wed Oct 29th, 2003 at 06:26:51 PM MST  
([User Info](#)) <http://homepage.ntlworld.com/s.amesbury/homepage.htm>

Im really impressed with the way these pvc props have been cut, i have been making props from buckets and plastic barrells and bins for about 2 yrs now and put any twist to them by using heat and holding the end of each blade until the desired twist is acheived. I gotta say though using the cutting techinque you use and also Zubby this has got to be a better way of doing the same job. I will certainly cut my props in a different way in the future, thanks for the tip guys.....sean

Re: Four Blade PVC Prop ([none / 0](#)) (#2)  
by zubbly on Wed Oct 29th, 2003 at 07:02:03 PM MST  
([User Info](#))

hello Woof. the only thing i can say is " I LOVE IT !!!!! "

would like to add one thing though. the thought came to me right away. Don't weaken the one blade by cutting it to fit the other. instead, cut a short, fully round piece of the same diamater pipe and round one end and concave the other end. put it between the two blades then put your bolt through it. result, one very strong blade. also, you could make a six blader with two of the spacers, but one of the spacerwould have to have one end cut ofset to the other end so you would get even spacing in the circumference.

amazing how one thing can lead to the other isn't it.

happy you are enjoying this----zubbly

Re: Four Blade PVC Prop ([none / 0](#)) (#3)  
by BrianK on Thu Oct 30th, 2003 at 06:37:56 PM MST  
([User Info](#))

Hey the 4 blade prop seems to be working real good just made one today used 4 in. sch.40 pvc its up and spinnin so fast looks like a blur LOL. I think the prop design is pretty good.

Re: Four Blade PVC Prop ([none / 0](#)) (#4)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Thu Oct 30th, 2003 at 07:30:10 PM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

While I was home for lunch today I mounted the 4 blader pictured above onto the top of a piece of pipe (without any kind of load) and set it outside where the wind goes around the house. I was surprised that it started when the wind blew the least little bit, and in the 10mph gusts, it was spinnin' so fast you could'nt see it. Now I'm look at all the construction sites for bigger pipe.

>=- W o o f -=<  
[ [Parent](#) ]

Re: Four Blade PVC Prop ([none / 0](#)) (#5)  
by Jerry on Thu Oct 30th, 2003 at 09:48:37 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

I think much of the good response from these blades has to do with the cup shape that the pipe offers.

This cup shape would be rather difficult to make in a wood blade.

My plastic blades have a slight cup and I believe in part this is why at only 49 inches total tip to tip I've seen 1200 watts from these blades.

Here are the good attributes. 23 degrees at the root to almost flat at the tip and a tapering cup from root to tip. There is also a slight rise in the trailing edge from the root and peaking about 1/3 towards the tip at this point this rise and the cup flatten out towards the tip.

I had one of these blades on a GARBOGEN on a 3 foot stand today in my parking lot. In a 10 mph breeze the blades were a blur.

JK TAS Jerry

[Airheads Page](#)

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[Four Blade PVC Prop](#) | 5 comments (5 topical, 0 editorial)

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## [Dancing Magnets in an electromagnetic field](#)

By [wooferhound](#), Section [Magnets & Magnetism](#)

[Free Energy](#)

Posted on Fri Oct 10th, 2003 at 08:21:53 PM MST

Magnet inside a 60hz field

I have been playing with magnets inside of a 60hz magnetic field. A large coil of about 750 turns of 22gauge wire is what I'm using, with a 7 volt AC transformer. The 1/4 x 1/4 rod magnet is sitting on top of the coil. But as soon as I apply the power the magnet becomes Balistic. It's unbelievable.



These are N40 magnets and it's even better if there are 2 magnets attracting together and bouncing around inside the glass (1/4 x 1/2)

[Dancing Magnets in an electromagnetic field](#) | 4 comments (4 topical, 0 editorial)

Re: [Dancing Magnets in an electromagnetic field](#) ([none / 0](#)) (#1)  
by [drdongle](#) on Sat Oct 11th, 2003 at 07:23:25 AM MST ([User Info](#))

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You think hats cool? do a search for "can crusher"

Dr.D



Re: Dancing Magnets in an electromagnetic field

([none / 0](#)) (#2)

by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Sat Oct 11th, 2003 at 11:48:27 AM MST

([User Info](#))

<http://timmythy.home.mindspring.com/timmy.htm>

I searched for magnetic can crusher  
and came up with these fairly scary sites

<http://www.powerlabs.org/pssecc.htm>

[http://members.tm.net/lapointe/Can\\_Crusher.htm](http://members.tm.net/lapointe/Can_Crusher.htm)

[http://members.tripod.com/extreme\\_skier/cancrusher/](http://members.tripod.com/extreme_skier/cancrusher/)

<http://www.sbe24.org/techdocs/Resonance/resonance5.asp>

. >=- W o o f -=<

[ [Parent](#) ]

Re: Dancing Magnets in an electromagnetic field ([none / 0](#))

(#3)

by drdongle on Sun Oct 12th, 2003 at 08:20:51 AM MST

([User Info](#))

Ant science cool!

Dr.D

Re: Dancing Magnets in an electromagnetic field

([none / 0](#)) (#4)

by bob golding ([yubba@clara.net](mailto:yubba@clara.net)) on Tue Oct 14th, 2003 at 03:00:20 PM MST

([User Info](#))

hi all,  
interesting seeing sam barros mentioned on the list. i  
kbbbnnow him fom tesla coiling. although he makes some  
amazing things his scence is, lets say a bit leading edge.  
before trying anything on his webpage it would be wise to  
get a second opinion. i met him a few months after he  
nearly blew his hand off making rocket fuel be very  
careful.

play safe  
bob

[ [Parent](#) ]

[Dancing Magnets in an electromagnetic field](#) | 4 comments (4 topical, 0  
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## [Coil Sizing Revisited](#)

By [wooferhound](#), Section [Homebrewed Electricity](#)

Posted on Sat Aug 30th, 2003 at 02:28:27 PM MST

[Alternators](#)

I am realizing that I need to include a picture of the machine if I'm going to ask about Coil Sizes

Thank you guys so much for the answers about Coil and Magnet sizes. I have realized that there are more variables in the design that just the size relationships. So I have decided to include a picture of my machine at it's halfway point. As soon as the slow setting epoxy sets I'll be assembling the rotors and start testing some coils that I have already wound.

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Being so concerned about the extra friction of 100 feet of pipe, I decided to split the flow into into 2 pipes through

Y connections so the flow would decrease to Half in these areas. If you want to follow the flow in the picture, the input to the heater is the pipe crossing to the right closest to the camera, and the output is the lefthand pipe at the open 90 degree fitting.



After constructing the unit I placed it on top of a metal shed that is adjacent to the pool. The shed is silver so any sunlight that passes through is reflected to the underside of the pipes to increase efficiency. This is not a great picture but you can find the heater on the shed because a bird is sitting on it.





I figure that in the hottest part of the year I won't need the heat so I have installed a coupla valves that will allow

[Experiment](#) | 9 comments (9 topical, editorial)

Re: Experiment ([none / 0](#)) ([#5](#))  
by Larsanderss ([larsanderss@brevet.nu](mailto:larsanderss@brevet.nu)) on Thu Aug 21st, 2003 at 04:08:59 PM MST  
([User Info](#))

Good evening !!

Not very close to Ystad i am afraid.... about 15 km from Linköping wich makes it about 427 km from here to there (according to "viamichelin"). I think You are the only Swede i have seen around here..... nice not to be alone (and also not alone using km, °C etc etc - excuse me everybody !!).

My things are coming together, i will make some kind of posting when results are here...

Good evening

Lars A

[ [Parent](#) ]

Re: Experiment ([none / 0](#)) ([#6](#))  
by Putte on Sat Aug 23rd, 2003 at 10:22:10 AM MST  
([User Info](#))

Hej igen Lars.

Thats not close to Lindköping S Sweden are a funna country in that way small and long :) And windy today my experiment went over 1kw i have put on a gearbox 2.17 and got more rev :)

[http://www.otherpower.com/images/scimages/412/V\\_xell\\_da.jpg](http://www.otherpower.com/images/scimages/412/V_xell_da.jpg)

Are you building a big windturbine ?? Nice to learn more.

Have a windy day :)

Putte.

[ [Parent](#) ]

Re: Experiment ([none / 0](#)) ([#7](#))  
by Larsanderss ([larsanderss@brevet.nu](mailto:larsanderss@brevet.nu)) on Sat Aug 23rd, 2003 at 04:28:08 PM MST  
([User Info](#))

Hej du.. Small but "tall" this country !

My turbine is being made according to Hugh Piggotts blade carving instructions (2,3 m diameter) and will have a Volvo kind of PMG (i have Volvo parts and magnets but turbine or PMG does not build themselves). Because of where and how i live today it will only be a experiment or training for future living not in a village (it will need "building permit" when bigger than 2 m diameter). Between neighbours houses, trees and probably low fascination i will not call it a device making power from the wind but just a experiment. It will keep some batteries charged wich via a old UPS unit will be a backup for my wood pellets fired boiler when grid power is out (happends about ten minutes every third year !!). When i live in a more suitable place i plan (!!) to have at least two turbines, one for higher voltage feeding some kind of water heater in a storage tank (parallell with solar heating) for hot water and heating the house and one for charging batteries..... (UPS or real inverter..).

Thats all, i am planning and doing some work on it.... very slow.

How are You going to use Your power from the windmill ?? Not just a experiment i hope ??

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Good evening LA

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Re: Experiment ([none / 0](#)) (#8)  
by Putte on Mon Aug 25th, 2003 at 02:03:29 PM MST  
([User Info](#))

Good evening :)

Well that sounds nice with your experiment :) And yes building permit is not nice at all i was planing on buliding any way my home is on the cauntryside so i hope it will blend in ??? I will absulutly find out if it dosent lol

I se that you are in need of grid power to the wood pellets boiler and a inverter is a nice solution when power i out :)

I build a induction generator if the grid fails and it contains only old parts from my bacyard exopt for the capacitors the are old scrap and the wrong volt but it works pefekt 50Hz and about 4kw of power and it kan start a big load on 2 phases its drawbac is the 8hp gasoline motor not economic to use fore longer time but thats note a problem for my Tea time :)

[http://www.otherpower.com/images/scimages/412/Min\\_induktionsgenerator01.jpg](http://www.otherpower.com/images/scimages/412/Min_induktionsgenerator01.jpg)

Well i dont know if the power i god for any bigger loads from my trubine but i am working on a 4 relay load regulator and i hopfully dont ned any thing else :)

Putte from Sweden :)

[ [Parent](#) ]

Re: Experiment ([none / 0](#)) (#9)  
by Larsanderss ([larsanderss@brevet.nu](mailto:larsanderss@brevet.nu)) on Tue Aug 26th, 2003 at 02:02:22 PM MST  
([User Info](#))

Hmmmm nice device..... Do You need it often ?? meaning do You loose the grid more often than i do (it is almost never here in the village) ??

I am not sure about the need for building permits ón the countryside but i think it is connected to if the area is in a "detail plan" if not the rules gives You much more freedom than in a city or village..... The good thing with my plan to get out on the countryside is that the horses will move close to my home but the most important thing is to get rid of "disturbing" neighbours and their houses trees and such plus the longer distance to the officials at the building authorities....!!

Your "four relay device"..... how are You going to build or construct it...?? My plan (always plans seldom any real things) is to use the kind of shunt regulator shown at "HomePower", i am drawing the PCB for it so i will be ready when i live in the right place.....

Good evening Lars

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Re: Experiment ([none / 0](#)) ([#9](#))  
by Larsanderss ([larsanderss@brevet.nu](mailto:larsanderss@brevet.nu)) on Tue Aug 26th, 2003 at  
02:02:22 PM MST  
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Good evening Lars

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Re: Important tip boys and girls! ([none / 0](#)) (#5)  
by drdongle on Sun Oct 5th, 2003 at 10:44:37 PM MST  
([User Info](#))

That is infact one of the pictures I printed for referance....  
so can I blame you?:).

Dr.D

Re: Important tip boys and girls! ([none / 0](#)) (#6)  
by Jerry on Mon Oct 6th, 2003 at 10:55:46 AM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

I belive Tom Is in a very poure wind area or his genny was  
sited in a bad wind spot. Because of this his blade pitch is  
27 degrees but his hub is a Johnstone CCW. the steaper  
pich starts sooner in low wind but has a slower top end. JK  
TAS Jerry

[Airheads Page](#)

Re: Important tip boys and girls! ([none / 0](#)) (#7)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Mon Oct  
6th, 2003 at 12:32:20 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

Why does it matter which way it spins ?  
-- W o o f

Re: Important tip boys and girls! ([none / 0](#)) (#8)  
by troy on Mon Oct 6th, 2003 at 02:20:04 PM MST  
([User Info](#))

Direction of rotation generally doesn't matter, but I  
gather that his blades are set up for one direction  
and the hub for the other direction. If he mates  
those together he'll end up with no rotation at all.

Good luck and keep having fun,

troy

[ [Parent](#) ]

Re: Important tip boys and girls! ([none / 0](#)) (#9)  
by Jerry on Mon Oct 6th, 2003 at 10:07:13 PM MST  
([User Info](#))  
<http://www.dplusv.com/Photo-03.html>

As you face the wind genny the blades spin clockwise. The Johnstone hub that works with these blades is caled counter clock wize. I gues they are oriented from behind.  
I'm hoping to build a Garbogen with a shft at both ends. To the shaft at the rear I'm going to atach a modifide distributor and conect a car tac. to this for rpm readings. All of this latter this winter I hope. JK TAS Jerry

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[ [Parent](#) ]

Re: Important tip boys and girls! ([none / 0](#)) (#10)  
by drdongle on Tue Oct 7th, 2003 at 04:48:13 PM MST  
([User Info](#))

I'd use an optical or magnetic sensor.  
Dr.D

[ [Parent](#) ]

Re: Important tip boys and girls! ([none / 0](#)) (#11)  
by troy on Wed Oct 8th, 2003 at 09:25:04 AM MST  
([User Info](#))

Electronic bike speedometer would also be an easy solution for less than 20 bucks and you only have to feed it one batter a year.

Best regards.

troy

[ [Parent](#) ]

[Important tip boys and girls!](#) | 10 comments (10 topical, 0 editorial)

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[found likely motor for conversion to PMA](#)

By [drdongle](#), Section [Homebrewed Electricity](#)

Posted on Sun Sep 28th, 2003 at 06:10:32 AM MST

[Alternators](#)

good for PMA

I was at the local flea market last weekend and saw a new GE 1/6 HP 850 RPM 120 volt induction motor for \$35.00 I think that figures out to 8 poles. I would like to find a 1 HP 120/240, 850 RPM, that would be about perfect.

Dr.D

[found likely motor for conversion to PMA](#) | 4 comments (4 topical, 0 editorial)

Re: found likely motor for conversion to PMA ([none / 0](#)) ([#1](#))  
by [wdyasq](#) on Sun Sep 28th, 2003 at 06:03:32 PM MST  
([User Info](#))

<http://www.surpluscenter.com/sort.asp?UID=2003092818564577&catname=electric&keyword=MB3D>

On this page there are two ~1100 RPM three phase electric motors. These are about as slow speed of a motor that is commonly available - I think.

HTH,  
Ron

Re: found likely motor for conversion to PMA ([none / 0](#)) ([#2](#))  
by [Jerry](#) on Sun Sep 28th, 2003 at 10:27:57 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Dr.D Harbor Freight has some good buys on 1 hp motors. Most of my conversions have been 4 pole. I've done 6 pole and 2 pole also. I prefer the garbage disposal motor. Most of these are 4 pole. There are a few brush type and PM type also. The PMs have 2 big ceramic magnets about 4 to 6 inches long depending on hp (1/3 or 1/2 hp). most 4 pole are 1/2 hp there are a few 3/4 hp and out of 300 I've collected I've found 3 1 hp. I've gotten 80 amps from the 1 hp and see 5 amps at 5 mph. JK TAS Jerry

[Airheads Page](#)

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Re: found likely motor for conversion to PMA ([none / 0](#)) ([#4](#))  
by [Reno](#) on Thu Oct 2nd, 2003 at 06:11:48 AM MST  
([User Info](#))

Make you duel  
My friend bought a garbage disposal from home Depot  
and on the side was blazen 2HP  
I said whenthat thing goes call me  
Then the heart break on the other side of the box it said  
7 YR Warranty.  
But they are out there.

[ [Parent](#) ]

Re: found likely motor for conversion to PMA ([none / 0](#)) ([#3](#))  
by [Jerry](#) on Sun Sep 28th, 2003 at 11:00:13 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

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To resume Dr.D. The pm motors also have a nice little fullwave bridge diode inside. Get these motors from your plumer cause he's just gona toss them anyway. The ac garbage disposal motor has several good atribuits. It has an unusual large bore. Larger then its equal in a standard motor. This makes for higher magnet speed passing the coils. Its built a little loose so wire reassignment is easy. Heres what I'm talking about. Lets use the 1 hp as the example. Its specs are 120 volts, 10 amps , 1725 rpm, 1 PH. This motor has 4 run windings (this is the 10 amp part) and 4 start windings. The 4 run windings are in sories. We could then say we have four 30 volt 10 amp coils in sories this equals 120 volts at 10 amps. If we wire the run windings in perelell we could now say we have a 30 volt motor at 40 amps. When converting this motor into an alt. and charging 12 volts. 30 volts is closer to 12 than 120 volts and 40 amps is a hole bunch better than 10 amps. Now another plus. We can do the same thing with the start windigs and add half again as much power. The run and the starts must have seperate bridge rectifiers. They are mechanically and electricly out of phase. They also have resistance and voltage diferances. However the dc output of there seperate diode bridge can be combined. This is then a 2 ph. alternator. This makes it work well at low rpm. We start to see carging at 5 mph, around 450 watts at 30 mph and have seen 80amps/15 volts at 40 mph. This was all done with a 49 inch prop with 4 plastic blades. Oh sorry got carried away. I think to many words this might not post? JK TAS Jerry

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[found likely motor for conversion to PMA](#) | 4 comments (4 topical, 0 editorial)

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### [More on O- Scopes](#)

By [drdongle](#), Section [Homebrewed Electricity](#)  
Posted on Tue Sep 2nd, 2003 at 07:44:38 PM MST [Electronics](#)  
O- Scopes

I want to pass on the URL for a device that those who want to use a PC or Laptop as a scope should consider. It is an adapter that connects to your computer, with it's own software and allow for a "real" O-scope with out the the inherent problems of the "sound card scope" previously covered.

[www.picotech.com/scope100](http://www.picotech.com/scope100)

Dr.D

[More on O- Scopes](#) | 4 comments (4 topical, 0 editorial)

Re: More on O- Scopes ([none / 0](#)) (#1)  
by Dave B on Wed Sep 3rd, 2003 at 12:11:10 AM MST  
([User Info](#)) <http://www.madbbs.com/users/bruggelog>

Tom,

I was able to access the website as written (copy/paste). Very interesting information and could be a future option for me. Does anyone out there have experience with these "real" PC O-scopes ? Thanks for the info. Dr. D Dave B

Re: More on O- Scopes ([none / 0](#)) (#2)  
by drdongle on Wed Sep 3rd, 2003 at 05:48:11 AM MST  
([User Info](#))

Try <http://picotech.com/scope100>

Dr.D

oops ([none / 0](#)) (#3)  
by TomW on Wed Sep 3rd, 2003 at 06:04:52 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

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Dr. D;

musta been a local thing here, sorry.

I tried it about 5 times yesterday got "page not found" errors but today its fine as written. Off to make it clickable then. Gee my first mistake, ever := > .

Cheers.

TomW

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Re: More on O- Scopes ([none / 0](#)) (#4)  
by drdongle on Wed Sep 3rd, 2003 at 07:55:05 PM MST  
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Sisss OK, no biggie.

Dr.D

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### [Magnets, how to remove?](#)

By [drdongle](#), Section [Homebrewed Electricity](#)  
Posted on Fri Aug 22nd, 2003 at 07:14:23 PM [Power Systems](#)  
MST

magnets how to remove?

I was wondering if any one had any tips on how to remove magnets from PM motors, I have one that has them glued in and I don't want to wreck them trying to take them out. I'm sure there must be something I can use as a solvent to do this. I could experiment for the next week finding the right product but why reinvent the wheel?

Dr.D

[Magnets, how to remove?](#) | 4 comments (4 topical, 0 editorial)

Re: Magnets, how to remove? ([none / 0](#)) ([#1](#))  
by TomW on Fri Aug 22nd, 2003 at 07:25:39 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Dr. D;

I had good luck with the heat gun and vise.

Put the case in the vise so one end of the case is against a vise jaw and a board presses against the end of a magnet and other vise jaw crank the vise snug heat [I used a hot air gun] the outside of the case where the magnet is glued. Pretty quick the glue lets go and the magnet slides. Once the glue bond breaks its an easy thing to slide the mags out.

Be aware too much heat can demagnetize a magnet. It did not take much heat to loosen the ones i did on the tape drive motors.

Cheers.

TomW

[Stuff I have Online](#)  
[Contact Me](#)

Re: Magnets, how to remove? ([none / 0](#)) ([#2](#))  
by drdongle on Fri Aug 22nd, 2003 at 07:43:52 PM MST  
([User Info](#))

Cool... ( or hot) I have a heat gun, now I need a vise.....

Dr.D

[ [Parent](#) ]

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No vise needed really.. ([none / 0](#)) (#4)  
by TomW on Fri Aug 22nd, 2003 at 07:49:29  
PM MST  
([User Info](#))  
<http://oneota.net/~earthsourcepowr/>

Dr. D;

You could set it on a bench or the ground and just press down on a board by hand as you thermally excite it too. The vise just made it easier.

Cheers.

TomW

[Stuff I have Online](#)

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Re: Magnets, how to remove? ([none / 0](#)) (#3)  
by JW on Fri Aug 22nd, 2003 at 07:48:55 PM MST  
([User Info](#))

It seems to me I once used paint thinner to remove some ceramic magnets from a electric radiator fan motor, for a car. They had a nice shape for the project that I was working with at the time. I'm pretty sure I put the whole thing in a bowl (outside, always outside!!!) and let it sit over night. please bear in mind I used virgin Lacqur Thinner which is dangerous to let stand in a bowl in a closed room. Since you may enter at a later time flip on the light switch and well, nevermind. It seems to me that it was very hard to get the solvent to penetrate the glue. And I did end up using a torch to heat the glue and break it down. I tried the torch on both treated with solvent and without. seems that the treated with solvent housing's came apart faster, easier, and with less incident. But I'm pretty sure I had to use the torch anyway. But when I was done with the whole affair, the magnets seemed strong enough. Worked for what I was doing and that was the end of it. Hope this helps.

-JW

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[Magnets, how to remove?](#) | 4 comments (4 topical, 0 editorial)

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[new methods of refrigeration](#)

By [drdongle](#), Section [Magnets & Magnetism](#)

Posted on Sat Aug 16th, 2003 at 08:26:52 PM MST

[Magnetism](#)

**new methods of refrigeration**

Was hunting around on the web and ran across these

[www.mycomj.co.jp/eindex/english-press/ChuCo2/chuCo2.html](http://www.mycomj.co.jp/eindex/english-press/ChuCo2/chuCo2.html)

[Editors Note]

The above link was not found so could you check it and maybe repost it in a comment so i can fix it?

TomW

<http://www.external.ameslab.gov/News/Inquiry/fall97/bigchill.html>

Dr.d

[new methods of refrigeration](#) | 2 comments (2 topical, 0 editorial)

Re: new methods of refrigeration ([none / 0](#)) (#1)  
by [troy](#) on Mon Aug 18th, 2003 at 12:22:45 PM MST  
([User Info](#))

Cool, pun intended.

On a related note, the latest issue of Homepower magazine (www.homepower.com, free for the downloading 8-) ) had a discussion of a recent high tech efficient housing competition.

Almost as an afterthought, they mentioned that one of the teams used an air conditioning system that did not depend on compressors with freon type refrigerants. What they did instead was use a fairly large amount of dessicant (eg silica gel) to suck all the humidity out of the air. In many cases, that would be enough right there. 80 is pretty comfortable if the humidity is low.

If that wasn't enough, they added evaporative cooling. This even works in humid areas since they have already pre-dried the air.

There were not many details, but I can envision a solar cooker/dryer arrangement to drive off all the absorbed humidity on day one. That dried (and now cooled overnight)batch of silica gel goes into the ductwork on day 2, while the "wet" batch of used silica gel goes out in the cooker, thus repeating the cycle.

Silica gel has basically an unlimited lifespan, and the only moving parts in the system are changing the silica gel canister and a fan.

Best regards,

troy

Re: new methods of refrigeration ([none / 0](#)) (#2)  
by [Andrew](#) ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Tue Aug 19th, 2003 at 02:37:14 AM MST  
([User Info](#))

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- [More on Magnetism](#)
- [Also by drdongle](#)

Hey,

It gets 110 here, and I just start to sweat. We have no humidity!!! We need humidifiers running 24/7 here. As for cooling, I saw a neat post here a while ago saying that if you use deep well water (which is generally pretty cold) and run it through a radiator with a fan blowing on it, and then return it to the deep well, this can cool pretty effiecently only using the water pump and the fan motors. I don't have a deep well, but this cooled my house down over 10 degrees using a couple of gallons of Icewater in the basement. (The ice water eventually warmed up a couple of hours later, but it was dark, so that was cool.)

-Andrew

[ [Parent](#) ]

[new methods of refrigeration](#) | 2 comments (2 topical, 0 editorial)

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## Shaft coupler for tape motor

By [drdongle](#), Section [Homebrewed Electricity](#)

Posted on Sat Aug 16th, 2003 at 02:05:03 PM MST

[Wind](#)

Shaft coupler for tape motor

I worked on my small tape drive motor/ generator yesterday and when I took the old tape hub off I discovered that I don't think the stock shaft is long enough to attach a set of blades to, which means that I need a shaft coupler with keyway to extend the shaft out from the motor face and the metal plate every thing is mounted to. This gives me cause for concern as I know that the angular forces involved are considerable and I can imagine the whole thing coming apart and pieces flying all over ( my wife would never forgive me if it killed one of her goats). Has any one else dealt with this problem and do you have any recommendations ?

As usual any help appreciated

Dr.D

[Shaft coupler for tape motor](#) | 4 comments (4 topical, 0 editorial)

Re: Shaft coupler for tape motor ([none / 0](#)) (#1)  
by [JB](#) on Sat Aug 16th, 2003 at 05:29:23 PM MST  
([User Info](#))

you might be able to make a hub and shaft that runs in a pillowblock. It would be a little more drag but should solve the problem . JB

Re: Shaft coupler for tape motor ([none / 0](#)) (#2)  
by [DanB](#) on Sat Aug 16th, 2003 at 06:58:55 PM MST  
([User Info](#))

Lots of the tape drive motors I've seen have pretty short shafts, and I've seen a few blades fall off them. You might use the shaft, be sure you have a key in there though and really tight set screws - a good fit, and a light weight well balanced prop.

Another problem with the tape drive motors is the front bearing, I've definitely seen a few of those fail. To solve the whole problem, get a couple pillow block bearings with a shaft. The love-joy couplers work pretty well and it's a nice way to adapt different size shafts together. The love joy coupler has a steel piece on each side that fits the shaft with "fingers" poking towards each other, and then a rubber spider fits in between. That'll make the windmill longer, the motor might wind up behind the yaw bearing, but it works out well and makes for a stronger machine.

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Re: Shaft coupler for tape motor ([none / 0](#)) (#3)  
by drdongle on Sat Aug 16th, 2003 at 07:40:08 PM  
MST  
([User Info](#))

I thought of a pillow block though I will probably need two so as avoid the turbine blades drooping, and I know about love-joy couplers. Damn more stuff to buy.

Dr.D

[ [Parent](#) ]

Re: Shaft coupler for tape motor ([none / 0](#)) (#4)  
by Demetri ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Sat Aug 16th, 2003 at 09:33:50 PM MST  
([User Info](#))

You can also use short lengths of rubber hose instead of lovejoy couplings. Use even numbers of hose clamps on each end, and make sure the screws are opposite each other, to help with balance. You can put several sizes of hose together, one inside the other, for more strength. Cheaper than lovejoys, but require more service. Good luck.

Demetri  
Always be the lead dog.

[Shaft coupler for tape motor](#) | 4 comments (4 topical, 0 editorial)

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## [Guys is it something I said?](#)

By [drdongle](#), Section [Homebrewed Electricity](#)

Posted on Mon Aug 11th, 2003 at 08:32:38 PM MST

[Alternators](#)

Something I said?

Guys I don't know if I stepped on some ones toes or what but I have had no feed back on my comment regarding my post of 8/6 or my second post of 8/9, both regarding converting induction motors to PMA's.

<http://www.fieldlines.com/story/2003/8/6/202340/1203>

<http://www.fieldlines.com/story/2003/8/9/10325/50945>

Please I need some feedback here I'm getting to a point where I have to make some decisions and I'm flying blind.  
As all ways any help is greatly appreciated.

Dr.D

[Guys is it something I said?](#) | 9 comments (9 topical, 0 editorial)

Hard to say ([none / 0](#)) (#1)

by TomW on Mon Aug 11th, 2003 at 11:55:31 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Dr D.;

I kind of wondered myself why you didn't get a response.

I think it might be multiple reasons for no response not having anything to do with you personally. First it has been discussed at some length several different times here and on the old board. Second I think it is one of those things that needs to be decided on a case by case basis. Third I don't think everyone agrees what is the holy grail on the conversion parameters.

Personally, I never did one but have read everything that has been posted here and on the old board over the past couple years and I can tell you at least 2 and possibly an even number up to as many as will fit. Probably good to have the magnets approximately the width of the legs of the coils but I am not sure and certainly no expert.

Just some thoughts.

Cheers.

TomW

[Stuff I have Online](#)  
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just start experimenting, I think ([none / 0](#)) (#2)

by hvirtane on Tue Aug 12th, 2003 at 12:52:19 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

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I don't think that it is anything you said.

Probably you only need so specific advice that nobody was able to tell it shorthand.

I'm not an expert in this conversion work.

a)

I think that you might first do a search for all the discussions on motor conversions.

b)

Then see the web-pages of the people, who have done it.

I think that iFred has done one...

It is here. His discussion is great:

<http://www.internetfred.com/induction-mot.html>

Ed Elenz is a really great engineer, who has done almost all stuff, which anybody has done.

<http://www.windstuffnow.com>

There are for sure others.

Please see as well the main page of the otherpower.com.

c)

Then make a decision, which way to go.

I think that if you start doing it and publish some data about your results here, many people will comment.

It is one of the works I wanted to do quite shortly myself at least.

- Hannu

Re: Guys is it something I said? ([none / 0](#)) ([#3](#))  
by Electric Ed on Tue Aug 12th, 2003 at 05:27:56 AM MST  
([User Info](#)) <http://www.electric-ed.com>

DrD

It is very difficult to say exactly how many magnets to use in an induction motor conversion, without seeing the motor. The number will depend on -

1. the diameter of the rotor,
2. the "span" of the stator winding coils,
3. the width of the magnets

A few observations-

[quote]"Motor two is 120 VAC single phase and 1/4 HP at 1150 RPM"

If this motor is a capacitor start type, it would have 6 poles. The 36 stator "teeth" are not poles.

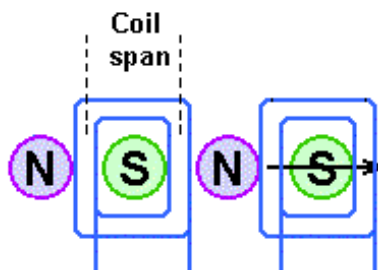
Some basic principles for a single phase machine-

## Magnet / Coil Spacing

In order to connect coils in series or parallel, so that the voltages, (or currents in parallel) will add instead of cancelling, the voltages induced in the coils must be "in phase" with each other.

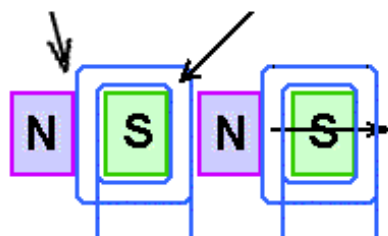
The only way to ensure that the coil voltages are in phase is by accurate magnet / coil spacing.

Magnet center-to-center spacing should equal the coil "span".



The objective is to have the leading edge of a NORTH pole reach one side of the coil - -

- - just as the leading edge of a SOUTH pole reaches the other side of the same coil.



Electric Ed

Re: Guys is it something I said? ([none / 0](#)) (#4)  
by drdongle on Tue Aug 12th, 2003 at 06:48:29 AM MST  
([User Info](#))

Now we're cooking I obviously didn't understand the relationship between coils and poles and that it is "flexable". I have done some searching of the archives and while it has been helpfull it's also been annoying for the lack of specifics in not all but many instances.

So Ed in you openion how may magnets should I have (in theory)? It would seem from the above illustration that I need 6

Dr.D

[ [Parent](#) ]

Re: Guys is it something I said? ([none / 0](#)) (#5)  
by Electric Ed on Tue Aug 12th, 2003 at 10:45:43 AM MST  
([User Info](#)) <http://www.electric-ed.com>

Is there any way that you could post a sketch or photo of the stator windings.

I am having trouble with your description. You said - "two windings what appears to be #20 wire, and a third much shorter winding with what appears to be #22,"

If it really is a capacitor start, 1150 (1200) RPM motor, the run winding should have six poles.

That would ideally require twelve magnets, but, unfortunately, there is no way to achieve the optimum magnet/coil spacing/arrangement with this winding in it's stock configuration.

Electric Ed

[ [Parent](#) ]

Re: Guys is it something I said? ([none / 0](#)) (#6)  
by drdongle on Tue Aug 12th, 2003 at 04:05:04 PM MST  
([User Info](#))

OK some more fuel for thought the rotor has a iron core 1.6 inches long and a diameter of 3.75 inches. Based on your description of the pole and coil relationship it does infact have 6 "poles". Each pole consists of two windings one surrounded by a second and seperated by a set of stator "teeth". There is also a second set of windings behind the first (closest to the rotor).

The third set of windings consists of just a few turns at various locations on the stator, this I would think is the starter winding, I have not metered it out as of yet.

Based on the info on the case and what I have doped out from the wiring it's a combo 120/240 unit.

Perhaps rewinding for 3 phase might give better results?

thanks Dr.D

[ [Parent](#) ]

Re: Guys is it something I said? ([none / 0](#)) (#8)  
by DanB on Wed Aug 13th, 2003 at 08:58:29 AM MST  
([User Info](#))

I've not messed with these in a couple years now... but I think you would get good results with 6 magnets, though 12 might work better - I never tried that. 6 magnets around the armature N S N S N S. My experience in doing that - if the magnets are of reasonable size almost always gives 12 volts at 1/10 the rated rpm in a 120 volt motor and they seem to run reasonably efficiently up to their rated current (about 10 amps or so for a 1hp motor).

They cog some, but they work OK. So in this case - you might expect 12 volts @ 120 rpm if the coils are wired in the "120 volt" configuration... and you might run well up to the rated current for 120 volts - and inefficiently above that. For lower rpm you could wire it in the 240 volt configuration and expect 12 volts at about 60 rpm.

You could rewire it I suppose, but I think you'd be in for more work than building an alternator from scratch. I never tried that... I'd probably look for a 3 phase motor before I tried rewinding a single phase.

[ [Parent](#) ]

Re: Guys is it something I said? ([none / 0](#)) (#7)  
by zubbly on Tue Aug 12th, 2003 at 06:34:39 PM MST  
([User Info](#))

hello Dr. D just read your posting about stepping on toes. my toes are fine. i wanted to comment earlier but i was having trouble with system, i could not press the comment button because it had disappeared. also the drop down section to pick a topic or section had vanished. i had to manually login, go to settings, and hit the reset key. it seemed to clear everthing up. so much for that. i wish to offer some friendly advise. i am pretty much a newbie myself. i do have a background in electrical apparatus repair, but there is not a time that i log in that i do not learn something new. i read many of the stories for weeks even before i registered to this site. i almost started a few projects on the fly, but stopped dead after asking many questions and doing much research. i believe this is the key, to do much research and carefully plan out your projects. develop as much understanding as possible first. don't be in a rush-it seldom works! one last thing, i have never before corresponded with such a great group of people from all walks of life who are willing to share whatever they know and do. the best to you and your project-----zubbly

one more link ([none / 0](#)) (#9)  
by hvirtane on Fri Aug 15th, 2003 at 02:31:12 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

Hi,

just found again this page:

<http://homepage.ntlworld.com/s.amesbury/converting%20an%20induction%20motor.html>

The home-page there is a great place for many other things, too.

- Hannu

[Guys is it something I said?](#) | 9 comments (9 topical, 0 editorial)

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## [Choice of motor for alternator mod?](#)

### [Pt 2](#)

By [drdongle](#), Section [Homebrewed Electricity](#) [Alternators](#)

Posted on Sat Aug 9th, 2003 at 10:32:05 AM MST  
motor mods?

I got around to checking out motor #2 this morning and found that it runs

(always a good sign) I opened up the case and found the following, 36 poles with two windings what appears to be #20 wire, and a third much shorter winding with what appears to be #22, I would think that this is the motor start winding.

Turns out that this is a capacitor start motor with the cap and starting cut out switch inside one of the end bells.

According to the hookup info on the side and the schematic I made of the connections and coils it's a 120/240 volt unit.

It seems to me that at 300 RPM I should be able to get 60 volts at 3 amps ( 180 watts or approximetly 1/4 HP)when done converting it to a PMA.

What I need to know is how many magnets I need to install on the rotor to achive the desired output.

Thanks

Dr.D

[Choice of motor for alternator mod? Pt 2](#) | 0 comments (0 topical, 0 editorial)

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### [Choice of motor for alternator mod?](#)

By [drdongle](#), Section [Homebrewed Electricity](#)  
Posted on Wed Aug 6th, 2003 at 08:23:40 PM MST [Alternators](#)  
**Choice of motor for Alternator mod?**

I just picked up 2 different AC induction motors as possible prospects for conversion to alternators.  
Motor one ( which is currently frozen) is a combo 110/220 VAC 3 phase and 2 HP at 3450 RPM.  
Motor two is 120 VAC single phase and 1/4 HP at 1150 RPM ( and turns freely)

Both are approximately the same size and weight.

My goal in conversion is a target speed of approximately 300 RPM and an output of about 60 volts ( for a 48 volt battery bank)either single or 3 phase is OK.

Based on my still incomplete understanding of such motors and the following formula I found elsewhere at otherpower ( 60Hz= N poles X RPM/120) I think motor one has 48 poles and motor two has 12 poles. I have not yet opened either one. I am currently soaking the shaft on # one with liquid wrench and just got # two to day.

I believe that if I rewind #one and change the rotor to 12 neo magnets I should be able to get 55 volts at 350 RPM. If there are any glaring errors in my figures please point me to the straight and true.  
While I have been in the electronics business for many years I have very little experience with motor building /rewinding etc and only the most basic knowledge of the subject.

As usual any input is appreciated

Dr.D

[Choice of motor for alternator mod?](#) | 2 comments (2 topical, 0 editorial)

Re: Choice of motor for alternator mod? ([none / 0](#))  
([#1](#))  
by Electric Ed on Thu Aug 7th, 2003 at 05:44:24 AM MST  
([User Info](#)) <http://www.electric-ed.com>

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I would take another look at the nameplates of these motors. It would be unusual for a 2 HP and a 1/4 HP motor to be the same size and weight.

If motor #1 really is a 110/220 volt, three phase motor, it must be very old.  
It is a two pole motor.

POLES = Hz x 120/RPM(synchronous speed)  
POLES = 60 x 120/3600

Motor #2 is an six pole motor. It would be more suitable for your project, if you are not going to rewind the stator.

Electric Ed

Re: Choice of motor for alternator mod? ([none / 0](#)) (#2)  
by drdongle on Thu Aug 7th, 2003 at 08:28:00 PM MST  
([User Info](#))

Went out and looked at motor #2 again and even though the ID plate said it's 120 V  
A small wiring diagram in the side suggests that it is infact a 120/240 unit which I believe makes this one look even better as a PMA. The diagram showed leads for two windings in parallel and was labled "low voltage". This suggests to me that wiring it as 240 and running it at 300 RPM would produce 60 volts. Does any one have any suggestions regarding how many magnets I will need (as many as I can cram in?).  
As all ways any input appreciated.  
Dr.D

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### [Hello I'm new and have a question](#)

By [drdongle](#), Section [Homebrewed Electricity](#)  
Posted on Tue Jul 29th, 2003 at 05:43:23 PM MST  
New with a question

[Wind](#)

Hello I'm new to the group, though I have been lurking for several months. I have had an interist in Alternative energy for many years, and recently decided i'd like to try my hand at making a small wind gennerator. I have several 24V Ametek tape drive motors I picked up a hamfest several years a go,that I want to try. I am having no luck locating any of the large "muffler clams" that I have seen some of you use to mounting generators like the one used in the Garbogen. If any one could clue me in where to buy these it would greatly appricated.

Thanks Chris snyder

[Hello I'm new and have a question](#) | 6 comments (6 topical, 0 editorial)

Re: Hello I'm new and have a question ([none / 0](#))  
(#1)  
by JB on Tue Jul 29th, 2003 at 05:54:16 PM MST  
([User Info](#))

you might try Napa Auto Parts or a truck repair shop. They usually stock them. Good Luck. JB

Re: Hello I'm new and have a question ([none / 0](#))  
(#2)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Tue Jul 29th, 2003 at 06:20:45 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Also, a threaded rod bent around the motor works well. Makes a cheap clamp...

Have Fun  
Ed

Re: Hello I'm new and have a question ([none / 0](#))  
(#3)  
by TomW on Tue Jul 29th, 2003 at 06:29:03 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

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Dr. D.;

Welcome and all that good stuff!

Car Quest, NAPA, etc [run of the mill autoparts places] very common called a 4 inch heavy duty muffler clamp \$1.85 or so each.

The arbors come from harborfreight.com [\$1.99 each] since thats the other item you have to buy.

Cheers.

TomW

[Stuff I have Online](#)  
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Re: Hello I'm new and have a question ([none / 0](#))  
(#4)  
by Jerry on Tue Jul 29th, 2003 at 10:54:30 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

And don't forget the Jerry blades only \$10 each.  
And just 2 of these have done 26 amps on this type of motor.

Sorry guys just couldn't resist?

JK TAS Jerry

[Airheads Page](#)

Re: Hello I'm new and have a question ([none / 0](#)) (#5)  
by drdogle on Wed Jul 30th, 2003 at 07:02:54 PM MST  
([User Info](#))

I have been considering your blades but with the "mike mod". would you recommend two or three blades and what about a hub?  
BTW thanks for all the great input.

Thanks  
Chris Snyder

[ [Parent](#) ]

Re: Hello I'm new and have a question ([none / 0](#))  
(#6)  
by Jerry on Wed Jul 30th, 2003 at 11:43:44 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

I use a fan blade and shaft hub from Johnstone Supply. Most large city's have these supply houses if not they are on line.

Use there part #s W88-972 \$20.66 and a 5/8 shaft hub adaptor part # W69-124 \$5.99 each. I use 2 of the fans to make a double hub for stringth. I drill the rivets out and remove the aluminumblades and cut them down to match the plastic Jerry blades. I then use stainless steal scews, nut, flate washers and lock nuts to sandich the hole thing together.

The hubs are called CCW and they match the plastic blades perfict for angle and since there 4 blade you can make the either 2 or 4 blade. 23 degrees at the root to almost flate at the tip.

The shaft hub addaptors are availible 1/4,5/16,3/8,1/2,5/8 or 3/4 and I've even bored the 3/4 a little larger to match a car alt.

Go to [www.dplusv.com](http://www.dplusv.com) and click on airheads to see how they go together.

The most power I've ever got was from this 4 blade set up (80 amps). The most power I ever got from a tape drive motor was with a 2 blade version 26 amps.

Ps I'm working on a nice aluminum hub. Its a 3 blade, maybe this winter?

JK TAS Jerry

[Airheads Page](#)

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[Tower math ?](#) | 5 comments (5 topical, 0 editorial)

Re: Tower math ? ([none / 0](#)) ([#1](#))  
 by kell on Wed Dec 31st, 2003 at 06:15:12 PM MST  
[\(User Info\)](#)

The tower in the example has attachment point(s) 10 feet from the axis of pivoting. Yours has an attachment point 5.196 feet from the axis of pivoting, if I did the geometry correctly. Now if in the example dividing by 10 gives you the total lifting force at the attachment point(s), then for your own tower, dividing by 5.196 will give the total lifting force at the attachment point. But one point (the triangle vertex) will take all the force. The example tower has two feet attached to the ground, or a ten foot connecting rod attached to the ground or however it's built. And I hope your load figures are in foot-pounds, so that when you divide by feet, the final result comes in pounds, which are a unit of force. Only way it would make sense. Foot pounds are a measure of torque. Like if you apply 50 lbs force to a lever at a point 30 feet from the fulcrum you get 1500 ft lbs of torque. If the lever sticks out 10 feet on the far side of the fulcrum you get 1500 ft lbs divided by 10 feet = 150 pounds force at the far end of the lever. Why can't I get carriage returns on this posting?

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Re: Tower math ? ([none / 0](#)) ([#2](#))  
 by TomW on Wed Dec 31st, 2003 at 07:44:46 PM MST  
[\(User Info\)](#) <http://oneota.net/~earthsourcepowr/>

Kell;  
 You asked:  
 Why can't I get carriage returns on this posting?

The answer is because you need to set your comment posting format preferences to "auto format" and you likely have it set to "html formatted".

In case your not sure where that is it is between the Preview and Post buttons just below the text entry window. You can also set it in your user preferences. Cheers.

TomW

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Re: Tower math ? ([none / 0](#)) (#3)  
by Old F on Wed Dec 31st, 2003 at 09:12:03 PM  
MST  
([User Info](#)) <http://www.oldf.homestead.com>

Thanks Kell

The force is measured in foot pounds. Should have said that in the first post.

With that snag out of the way things are starting to make sense.

And the numbers are falling in to place better than I expected.

Tho I will add an extra 15 or 20 % as a safety factor.

Looks like I am well on my way of meeting my goal

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Rated for an 8 foot diameter blade set in a 60 mph wind an supporting up to 200 pound of machinery.

Now off to gather some more data on strength of materials

Kell many thanks till your better paid

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- 2) [Re: Help with Induction Motor](#) [none / 0] Replies: 0  
posted by [kell](#) on 01/04/2004 08:18:12 PM MST  
attached to [Help with Induction Motor](#)
- 3) [Re: 2 pole vac cleaner motor, worth it?](#) [none / 0]  
Replies: 1  
posted by [kell](#) on 01/04/2004 07:49:01 PM MST  
attached to [2 pole vac cleaner motor, worth it?](#)
- 4) [Re: Automotive alternator used as motor](#) [none / 0]  
Replies: 0  
posted by [kell](#) on 01/04/2004 07:32:45 PM MST  
attached to [Automotive alternator used as motor](#)
- 5) [Re: hydro power on a marsh](#) [none / 0] Replies: 0  
posted by [kell](#) on 01/04/2004 07:11:50 PM MST  
attached to [hydro power on a marsh](#)
- 6) [Re: motor bike battery charger](#) [none / 0] Replies: 0  
posted by [kell](#) on 01/04/2004 07:05:44 PM MST  
attached to [motor bike battery charger](#)
- 7) [Re: Automotive alternator used as motor](#) [none / 0]  
Replies: 1  
posted by [kell](#) on 01/03/2004 07:48:29 PM MST  
attached to [Automotive alternator used as motor](#)
- 8) [Re: formatted re-post of more on ferrous cores...](#)  
[none / 0] Replies: 0  
posted by [kell](#) on 01/02/2004 06:31:27 PM MST  
attached to [formatted re-post of more on ferrous cores...](#)
- 9) [Re: Perpetual motion or science - have a look](#)  
[none / 0] Replies: 0  
posted by [kell](#) on 01/01/2004 03:53:47 PM MST  
attached to [Perpetual motion or science - have a look](#)
- 10) [Re: water design](#) [none / 0] Replies: 0  
posted by [kell](#) on 01/01/2004 03:41:48 PM MST  
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- 11) [Re: water design](#) [none / 0] Replies: 0  
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- 12) [Re: Magnetic Wire Question](#) [none / 0] Replies: 0  
posted by [kell](#) on 01/01/2004 10:15:33 AM MST  
attached to [Magnetic Wire Question](#)
- 13) [Re: Tower math ?](#) [none / 0] Replies: 2  
posted by [kell](#) on 12/31/2003 06:15:12 PM MST  
attached to [Tower math ?](#)
- 14) [Re: My Mini Geni isn't working very good](#) [none / 0] Replies: 2  
posted by [kell](#) on 12/30/2003 09:38:00 PM MST  
attached to [My Mini Geni isn't working very good](#)
- 15) [Re: Magnetic Brushes for Axial Flux Path](#) [none / 0] Replies: 1  
posted by [kell](#) on 12/30/2003 09:26:32 PM MST  
attached to [Magnetic Brushes for Axial Flux Path](#)
- 16) [Re: QUESTION ON MAGNETS](#) [none / 0] Replies: 1  
posted by [kell](#) on 12/29/2003 07:07:12 PM MST  
attached to [QUESTION ON MAGNETS](#)
- 17) [Re: Can I see sulfation on battery plates?](#) [none / 0] Replies: 0  
posted by [kell](#) on 12/29/2003 06:39:54 PM MST  
attached to [Can I see sulfation on battery plates?](#)
- 18) [Re: Tower wrecking](#) [none / 0] Replies: 1  
posted by [kell](#) on 12/28/2003 05:56:08 PM MST  
attached to [Tower wrecking](#)
- 19) [Re: Chemist Needed Please](#) [none / 0] Replies: 1  
posted by [kell](#) on 12/28/2003 09:13:46 AM MST  
attached to [Chemist Needed Please](#)
- 20) [Re: pass magnet inside the coils ?](#) [none / 0] Replies: 0  
posted by [kell](#) on 12/28/2003 09:06:01 AM MST  
attached to [pass magnet inside the coils ?](#)
- 21) [Re: Maintaining two batteries with one charger?](#) [none / 0] Replies: 0  
posted by [kell](#) on 12/27/2003 11:07:28 PM MST  
attached to [Maintaining two batteries with one charger?](#)
- 22) [Re: Solar Stirling opinions wanted](#) [none / 0] Replies: 0  
posted by [kell](#) on 12/27/2003 08:26:30 AM MST  
attached to [Solar Stirling opinions wanted](#)
- 23) [Re: Fun with fuel](#) [none / 0] Replies: 0  
posted by [kell](#) on 12/27/2003 08:17:18 AM MST  
attached to [Fun with fuel](#)
- 24) [Re: AGM battery-last rights?](#) [none / 0] Replies: 1  
posted by [kell](#) on 12/23/2003 08:21:37 PM MST  
attached to [AGM battery-last rights?](#)
- 25) [Re: Using different kinds of magnets on same rotor](#) [none / 0] Replies: 0

posted by [kell](#) on 12/21/2003 07:43:29 PM MST  
attached to [Using different kinds of magnets on same rotor](#)

26) [Re: Rail Gun](#) [none / 0] Replies: 0  
posted by [kell](#) on 12/20/2003 06:47:18 PM MST  
attached to [Rail Gun](#)

27) [Re: Question for Charged.](#) [none / 0] Replies: 1  
posted by [kell](#) on 12/20/2003 06:42:42 PM MST  
attached to [Question for Charged.](#)

28) [Re: Test Results](#) [none / 0] Replies: 0  
posted by [kell](#) on 12/13/2003 04:49:43 PM MST  
attached to [Test Results](#)

29) [Re: Test Results](#) [none / 0] Replies: 1  
posted by [kell](#) on 12/12/2003 07:36:02 PM MST  
attached to [Test Results](#)

30) [Re: Rectifier Question](#) [none / 0] Replies: 1  
posted by [kell](#) on 12/08/2003 07:05:22 PM MST  
attached to [Rectifier Question](#)



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2 comments

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by [DonG](#) - December 31

3 comments

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by [Old F](#) - December 26

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by [Old F](#) - December 25

1 comment

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by [Geek](#) - November 28

10 comments

#### [aerial bunch cable](#)

by [swami](#) - November 15

2 comments

#### [Up and running! \(way up\)](#)

by [marv](#) - November 8

7 comments

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by [kurt](#) - November 1

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3 comments

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What do you think is the best (as by efficiency, availability, cost, etc.) source of electricity?

- Hydro
- Wind
- Chemical Reaction
- Steam
- Bio-mass
- Fossil Fuels
- Nuclear
- Lightning
- Static
- Solar

Votes: 80 | Comments: 0  
[Results](#) | [Other Polls](#)

### Who's Online? (18)

- [signweld](#)
- [Putte](#)
- [wind pirate](#)
- [Harry Luubovv](#)
- [DanB](#)
- Anonymous Users: 13

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author search results

Find: In:

Containing:

Results: [View story summaries](#)

Found 4 results.

1. [brushless DC motor](#) ([Homebrewed Electricity, Alternators](#))  
posted by kell on 12/25/2003 05:05:27 PM MST  
3 comments
2. [Magnets for Lithuanian Schoolkids](#) ([Magnets & Magnetism, Wanted](#))  
posted by kell on 11/25/2003 08:14:59 PM MST  
5 comments
3. [switching regulator](#) ([Homebrewed Electricity, Electronics](#))  
posted by kell on 11/03/2003 09:55:42 AM MST  
5 comments
4. [obtaining magnets for generator](#) ([Magnets & Magnetism, Wanted](#))  
posted by kell on 10/13/2003 10:26:38 AM MST  
14 comments

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### Comment Ratings by kell

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comment\_by search results

Find: In:

Containing:

Results: View story summaries

Found 22 results.

- 1) [Re: Hi Admin](#) [none / 0] Replies: 1  
 posted by [TomW](#) on 01/04/2004 09:54:20 PM MST  
 attached to [Hi Admin](#)
- 2) [Re: Building a off grid home in Maine](#) [none / 0]  
 Replies: 0  
 posted by [TomW](#) on 01/02/2004 03:02:27 PM MST  
 attached to [Building a off grid home in Maine](#)
- 3) [Re: Tower math ?](#) [none / 0] Replies: 0  
 posted by [TomW](#) on 12/31/2003 07:44:46 PM MST  
 attached to [Tower math ?](#)
- 4) [Re: stator](#) [none / 0] Replies: 0  
 posted by [TomW](#) on 12/31/2003 02:03:23 PM MST  
 attached to [stator](#)
- 5) [Its so obvious I think you are joking??](#) [none / 0]  
 Replies: 1  
 posted by [TomW](#) on 12/30/2003 03:41:39 PM MST  
 attached to [My Mini Geni isn't working very good](#)
- 6) [Re: Is this possible?](#) [none / 0] Replies: 0  
 posted by [TomW](#) on 12/27/2003 10:23:32 AM MST  
 attached to [Is this possible?](#)
- 7) [Re: The 88 cent counter](#) [none / 0] Replies: 1  
 posted by [TomW](#) on 12/21/2003 05:52:27 PM MST  
 attached to [The 88 cent counter](#)
- 8) [Most of what you need to know about shunts:](#)  
[\[none / 0\]](#) Replies: 0  
 posted by [TomW](#) on 12/18/2003 10:28:14 PM MST  
 attached to [System set up ?](#)
- 9) [Re: Converting Amps to 0 - 10 volts...](#) [none / 0]  
 Replies: 0  
 posted by [TomW](#) on 12/18/2003 08:06:41 AM MST  
 attached to [Converting Amps to 0 - 10 volts for data acquisition](#)
- 10) [Re: Issues with pictures and graphics:](#) [none / 0]  
 Replies: 0  
 posted by [TomW](#) on 12/17/2003 08:32:30 AM MST  
 attached to [picture diagram area](#)

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- [wind pirate](#)
- [Harry Luubovv](#)
- [troy](#)
- [DanB](#)
- Anonymous Users: 11

5 minute interval.  
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11) [Re: A good one for Renewable Energy](#)

[FAQ's...Capaci](#) [none / 0] Replies: 1

posted by [TomW](#) on 12/16/2003 01:04:20 PM MST

attached to [A good one for Renewable Energy](#)

[FAQ's...Capacitors](#)

12) [Issues with pictures and graphics:](#) [none / 0]

Replies: 1

posted by [TomW](#) on 12/16/2003 12:17:40 PM MST

attached to [picture diagram area](#)

13) [Re: A good one for Renewable Energy](#)

[FAQ's...Capaci](#) [none / 0] Replies: 1

posted by [TomW](#) on 12/15/2003 11:40:58 PM MST

attached to [A good one for Renewable Energy](#)

[FAQ's...Capacitors](#)

14) [Re: Stovetop Heating Elements](#) [none / 0] Replies:

0

posted by [TomW](#) on 12/15/2003 03:15:12 PM MST

attached to [Stovetop Heating Elements](#)

15) [Re: DC motor to PM Gen](#) [none / 0] Replies: 1

posted by [TomW](#) on 12/13/2003 10:26:16 AM MST

attached to [DC motor to PM Gen](#)

16) [Re: Alt rotor Questions : magnets](#) [none / 0]

Replies: 1

posted by [TomW](#) on 12/12/2003 10:43:59 AM MST

attached to [Alt rotor Questions : magnets](#)

17) [speaking of older posts...](#) [none / 0] Replies: 1

posted by [TomW](#) on 12/10/2003 02:43:16 PM MST

attached to [Getting rid of the cog - re-post](#)

18) [Re: All Posts Marked "New"](#) [none / 0] Replies: 0

posted by [TomW](#) on 12/10/2003 06:42:39 AM MST

attached to [All Posts Marked "New"](#)

19) [Re: Looking for large "ring " connectors](#) [none / 0] Replies: 0

posted by [TomW](#) on 12/08/2003 11:18:08 PM MST

attached to [Looking for large "ring " connectors](#)

20) [Re: The PME Project](#) [none / 0] Replies: 0

posted by [TomW](#) on 12/07/2003 09:46:10 AM MST

attached to [The PME Project](#)

21) [Re: non electric fan](#) [none / 0] Replies: 0

posted by [TomW](#) on 12/05/2003 08:10:17 AM MST

attached to [non electric fan](#)

22) [Re: looking for non-electirc fan for wood stove](#)

[none / 0] Replies: 0

posted by [TomW](#) on 12/05/2003 08:02:06 AM MST

attached to [looking for non-electirc fan for wood stove](#)



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Diaries

**New!** [Fisher and Paykel](#)

[Tests](#)

By [TomW](#), Section [Diaries](#)

[TomW's Diary](#)

Posted on Tue Sep 23rd, 2003 at 04:10:50 PM MST

Fisher and Paykel Smart Drive motor Tests (1 Comment, 592 words in story) [FULL STORY](#)

Comments by: [EcoInnovation](#)(1)

**New!** [Don't you love engineering samples..](#)

By [TomW](#), Section [Diaries](#)

[TomW's Diary](#)

Posted on Fri Jul 18th, 2003 at 07:31:30 PM MST

DanB sent me this set of blades to play with. (3 Comments, 260 words in story) [FULL STORY](#)

Comments by: [DaveR](#)(2) , [TomW](#)(1) "Arbors:"

**New!** [Counter Rotating Dual Pinwheel Tapedrive Genny](#)

By [TomW](#), Section [Diaries](#)

[TomW's Diary](#)

Posted on Tue Jun 24th, 2003 at 06:16:34 PM MST

Counter Rotating Dual Pinwheel Tapedrive Genny (3 Comments, 198 words in story) [FULL STORY](#)

Comments by: [wiredup](#)(1) , [TomW](#)(1) , [Demetri](#)(1)

**New!** [Ponder This. \[very off topic\]](#)

By [TomW](#), Section [Diaries](#)

[TomW's Diary](#)

Posted on Tue Jun 24th, 2003 at 05:16:59 AM MST

This whole anonymous hero thing points to consider: (10 Comments, 377 words in story) [FULL STORY](#)

Comments by: [Larsanderss](#)(1) , [hvirtane](#)(2) , [TomW](#)(1) , [Gorilla Boy](#)(1) , [troy](#)(1) , [Brian](#)(1) , [Norm](#)(1) , [Andrew](#)(1) , [John](#)(1)

**New!** [Diaries... What are they good for...](#)

By [TomW](#), Section [Diaries](#)

[TomW's Diary](#)

Posted on Fri Jun 20th, 2003 at 04:01:39 AM MST

Absolutely Nothin.. Unless you use them that is... (3 Comments, 218 words in story) [FULL STORY](#)

Comments by: [Norm](#)(1) , [Wolfiel](#)(1) , [Junkie](#)(1)

**New!** [Crossflow VAWT tinkering](#)

[TomW's Diary](#)

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Recent Diaries

[A very light breeze](#)

by [Norm](#) - January 4  
2 comments

[Wincharger Rebuild](#)

by [DonG](#) - December 31  
3 comments

[Useful math to be found here.](#)

by [Old F](#) - December 26

[More Tower Fun](#)

by [Old F](#) - December 25  
1 comment

[hornet blades got about 800 watts 35 mph](#)

by [Geek](#) - November 28  
10 comments

[aerial bunch cable](#)

by [swami](#) - November 15  
2 comments

[Up and running! \(way up\)](#)

by [marv](#) - November 8  
7 comments

[renewable energy faq](#)

by [kurt](#) - November 1  
2 comments

[Fun with meters](#)

by [jimu](#) - October 31  
3 comments

[Fun with fuel](#)

by [Demetri](#) - October 28  
15 comments

By [TomW](#), Section [Diaries](#)

Posted on Mon Jun 16th, 2003 at 08:29:15 AM MST

I slapped this together over the last couple of days... (6 Comments, 241 words in story) [FULL STORY](#)  
Comments by: [RogerAS](#)(2), [hvirtane](#)(1), [TomW](#)(2), [troy](#)(1)

**New! [Just because we had to know..](#)**

By [TomW](#), Section [Diaries](#)

[TomW's Diary](#)

Posted on Fri Jun 13th, 2003 at 08:50:46 AM MST

More fooling around with different small blade stuff follows (5 Comments, 205 words in story) [FULL STORY](#)  
Comments by: [Norm](#)(2) "steam bending", [funkeytut42211](#)(1), [TomW](#)(1) "Steam Bending", [troy](#)(1)

**New! [Yet another Pinwheel.](#)**

By [TomW](#), Section [Diaries](#)

[TomW's Diary](#)

Posted on Wed Jun 4th, 2003 at 12:28:40 AM MST

Well Lane was here again and after a fun day yesterday we had to try another pinwheel spinner. (4 Comments, 135 words in story) [FULL STORY](#)  
Comments by: [Norm](#)(1), [windstuffnow](#)(2) "Sounds interesting...", [TomW](#)(1) "R&D"

**New! [Aluminum Sheet Pinwheel](#)**

By [TomW](#), Section [Diaries](#)

[TomW's Diary](#)

Posted on Mon Jun 2nd, 2003 at 05:53:05 PM MST

My friend Lane [Pythos for you IRC folks] stopped out and slapped together this pinwheel that we attached to an ac fan motor for a bearing. (4 Comments, 206 words in story) [FULL STORY](#)  
Comments by: [windstuffnow](#)(2) "Pinwheel", [TomW](#)(2) "Cool"

**New! [JerryBlade modifications and Tape Drive Motors](#)**

By [TomW](#), Section [Diaries](#)

[TomW's Diary](#)

Posted on Sun May 25th, 2003 at 04:51:43 PM MST

Another installment in the TDM genny saga. (3 Comments, 132 words in story) [FULL STORY](#)  
Comments by: [TomW](#)(1) "Observations", [Jerry](#)(2) "New blade mods"

**New! [Online Rights the myth](#)**

By [TomW](#), Section [Diaries](#)

[TomW's Diary](#)

Posted on Mon May 12th, 2003 at 08:33:42 AM MST

[More Diaries...](#)

**Poll**

What do you think is the best (as by efficiency, availability, cost, etc.) source of electricity?

- Hydro
- Wind
- Chemical Reaction
- Steam
- Bio-mass
- Fossil Fuels
- Nuclear
- Lightning
- Static
- Solar

Votes: 80 | Comments: 0  
[Results](#) | [Other Polls](#)

**Who's Online? (33)**

- [Harry Luubov](#)
- [DanB](#)
- Anonymous Users: 29
- Cloaked Users (2)

5 minute interval.  
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Ok I'm just going to address this whole censorship and "rights" thing here once so any morons or understanding challenged folks in the group should read very carefully. (9 Comments, 279 words in story) [FULL STORY](#)

Comments by: [Larsanderss](#)(1) "Also agreeing", [Dave B](#)(1) "Way to go Tom!", [TomW](#)(1) "Pretty cool...", [troy](#)(1) "'censorship'", [Old F](#)(1) "Right on Tom", [xeroid](#)(1) "Heartily Agree, and well spoken, Tom!", [elvin1949](#)(1), [Demetri](#)(1) "Well put, well put!", [Electric Ed](#)(1) "Couldn't have said it better, Tom."

---

## New! [Jerry Blades a](#)

### [Tape Drive Motor](#)

[means a mill in a day.](#)

[TomW's Diary](#)

By [TomW](#), Section [Diaries](#)

Posted on Sat Apr 12th, 2003 at 02:54:12 PM MST

This is my latest quickie project. I started on it yesterday and its spinning today in what the wind map says is a 6 mph breeze.

(7 Comments, 108 words in story) [FULL STORY](#)

Comments by: [kurt](#)(1) "mouse time is a good thing:", [TomW](#)(3) "Found uncoil link", [wiredup](#)(1) "TDM", [Techstuf](#)(1) "Liked your website", [noIredraidersfan](#)(1) "Help"

---

## New! [Tape Drive Motor](#)

### [Data](#)

By [TomW](#), Section [Diaries](#)

[TomW's Diary](#)

Posted on Thu Apr 3rd, 2003 at 07:57:19 AM MST

Well I seem to be in a go through my notes mode on this windy rainy day. So I am posting some more output data I have compiled. (7 Comments, 238 words in story) [FULL](#)

[STORY](#)

Comments by: [TomW](#)(4) "NEW.. 40 Volt TDM Data", [wiredup](#)(3) "stuff i have online"

---

## New! [Treadmill Motor Data](#)

By [TomW](#), Section [Diaries](#)

[TomW's Diary](#)

Posted on Thu Apr 3rd, 2003 at 06:59:26 AM MST

I bought one of those BG Micro Treadmill Motors some time ago for like \$20. I didn't get a chance to do any testing with it til earlier this week.

(155 words in story) [FULL STORY](#)

Comments by: *None yet*

---

## New! [Some fresh blade](#)

### [pics to look at](#)

By [TomW](#), Section [Diaries](#)

[TomW's Diary](#)

Posted on Sun Mar 30th, 2003 at 10:50:17 AM MST

Been working with bobn over on IRC designing and carving a 3 blade prop for my Tape Drive Motor gennies. (2

Comments, 84 words in story) [FULL STORY](#)

Comments by: [Dondos](#)(1) "blades", [hvirtane](#)(1) "Nice"

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1. [Mini posting Primer This is the title \[first text entry area\]](#) ([Site News](#), [Scoop](#))  
posted by TomW on 10/27/2003 06:31:28 AM MST  
0 comments

2. [NACA 0012 airfoil sections for sale](#) ([Classifieds](#), [Wind](#))  
posted by TomW on 10/19/2003 04:16:23 PM MST  
0 comments

3. [50 word limit problem](#) ([Site News](#), [Scoop](#))  
posted by TomW on 07/29/2003 05:25:37 AM MST  
5 comments

4. [Board Alterations](#) ([Rants & Opinion](#), [Scoop](#))  
posted by TomW on 06/06/2003 03:00:31 PM MST  
13 comments

5. [Step by Step Photo Uploading /Use on OP](#) ([Rants & Opinion](#), [Scoop](#))  
posted by TomW on 03/30/2003 08:19:33 AM MST  
1 comment

6. [Any way to ?](#) ([Rants & Opinion](#), [Scoop](#))  
posted by TomW on 03/29/2003 03:04:29 PM MST  
2 comments

7. [Wind Generator Parts and Excess salvage](#) ([Classifieds](#), [Wind](#))  
posted by TomW on 03/20/2003 08:40:58 AM MST  
9 comments

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- Anonymous Users: 11

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Comment Ratings by TomW

- 1) [Re: Rectifier usage](#) [1.00], by [drdongle](#), Rated: [1](#)  
 Posted on 10/30/2003 05:57:02 PM MST  
 Rated on 10/30/2003 08:44:07 PM MST
- 2) [Re: Can I charge a sealed lead acid with this?](#) [1.00], by [Andrew](#), Rated: [1](#)  
 Posted on 08/21/2003 04:48:51 PM MST  
 Rated on 08/28/2003 05:51:58 AM MST
- 3) [Re: Can I charge a sealed lead acid with this?](#) [1.00], by [Andrew](#), Rated: [1](#)  
 Posted on 08/21/2003 10:20:58 PM MST  
 Rated on 08/28/2003 05:51:06 AM MST
- 4) [Re: Can I charge a sealed lead acid with this?](#) [1.00], by [Andrew](#), Rated: [1](#)  
 Posted on 08/21/2003 10:25:45 PM MST  
 Rated on 08/28/2003 05:50:37 AM MST
- 5) [Re: Is voltage an accurate measurement](#) [1.00], by [Andrew](#), Rated: [1](#)  
 Posted on 08/23/2003 01:47:02 AM MST  
 Rated on 08/28/2003 05:49:58 AM MST
- 6) [Simple solar air collector](#) [5.00], by [windstuffnow](#), Rated: [5](#)  
 Posted on 04/13/2003 03:27:31 PM MST  
 Rated on 04/14/2003 05:19:16 PM MST
- 7) [Intro text](#) [1.00], by [Anonymous Hero](#), Rated: [1](#)  
 Posted on 03/31/2003 10:23:01 PM MST  
 Rated on 03/31/2003 10:36:39 PM MST
- 8) [Re: old board](#) [1.00], by [Anonymous Hero](#), Rated: [1](#)  
 Posted on 03/29/2003 07:04:59 PM MST  
 Rated on 03/31/2003 12:19:34 AM MST

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- [hvirtane](#)
- [ADMIN](#)
- [Harry Luubovv](#)
- [troy](#)
- [DanB](#)
- Anonymous Users: 17

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[formatted re-post of more on ferrous cores...](#) | 10 comments (10 topical, 0 editorial)

Re: formatted re-post of more on ferrous cores...  
(none / 0) (#8)  
by kell on Fri Jan 2nd, 2004 at 06:31:27 PM MST  
([User Info](#))

Rust is a very good insulator.

[formatted re-post of more on ferrous cores...](#) | 10 comments (10 topical, 0 editorial)

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- [Harry Luubovv](#)
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- [Hank](#)
- [jeanpaul](#)
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- Anonymous Users: 19

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[Perpetual motion or science - have a look](#) | 8 comments (8 topical, editorial)

Re: Perpetual motion or science - have a look ([none / 0](#)) (#2)  
by kell on Thu Jan 1st, 2004 at 03:53:47 PM MST  
([User Info](#))

They don't make claims of perpetual motion. They do claim to get more gas with less current than predicted by theory that no one has questioned for more than a hundred years or examined narrowly in this particular experimental context insofar as I am aware... and the empirical trumps the theoretical. If you're a scientist.

Also, even if they were to claim that the hydrolyzer would run on its own heat output (which they don't), that's still not "perpetual motion". It isn't a closed system.

[Perpetual motion or science - have a look](#) | 8 comments (8 topical, 0 editorial)

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### Who's Online? (30)

- [Harry Luubovv](#)
- [DanB](#)
- Anonymous Users: 26
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[Perpetual motion or science - have a look](#) | 8 comments (8 topical, 0 editorial)

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[Perpetual motion or science - have a look](#) | 8 comments (8 topical, 0 editorial)

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- [signweld](#)
- [jeanpaul](#)
- [Harry Luubovv](#)
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[Magnetic Wire Question](#) | 5 comments (5 topical, editorial)

Re: Magnetic Wire Question ([none / 0](#)) (#3)  
by kell on Thu Jan 1st, 2004 at 10:15:33 AM MST  
([User Info](#))

Some vinyl insulation has lead in it. Tell that to your employee and give him or her some gloves.

[Magnetic Wire Question](#) | 5 comments (5 topical, 0 editorial)

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- [Harry Luubovv](#)
- [DanB](#)
- Anonymous Users: 25
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[Magnetic Wire Question](#) | 5 comments (5 topical, 0 editorial)

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- [Oliver](#)
- [signweld](#)
- [Putte](#)
- [wind pirate](#)
- [Harry Luubovv](#)
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[My Mini Geni isn't working very good](#) | 18 comments (18 topical, editorial)

Re: My Mini Geni isn't working very good ([none / 0](#)) (#11)  
by kell on Tue Dec 30th, 2003 at 09:38:00 PM MST  
([User Info](#))

For each bunch of little mags fighting each other you've got a distorted multipolar field with flux lines going every which way. I think you'll do better with cheap ceramic magnets of the right size, so you know the flux lines will cut the coils where and when you want them to.

Re: My Mini Geni isn't working very good ([none / 0](#)) (#12)  
by Norm on Wed Dec 31st, 2003 at 07:06:14 AM MST  
([User Info](#))

I think you'll do better with cheap ceramic magnets of the right size, so you know the flux lines will cut the coils where and when you want them to.  
I agree ...something like Ed has would have been a lot less fuss and bother:  
[http://www.windstuffnow.com/main/builders\\_corner.htm](http://www.windstuffnow.com/main/builders_corner.htm)  
and less fuss and bother = More Fun! ( :>) Norm

[ [Parent](#) ]

Re: My Mini Geni isn't working very good ([none / 0](#)) (#14)  
by Jerry on Wed Dec 31st, 2003 at 08:30:03 AM MST  
([User Info](#))  
<http://www.dplusv.com/Photo-03.html>

I did 6 of the little Ed/Windstuff magnets on a smaller version of this motor. Didn't change a thing but machined the armature down to fit the magnets.

It dose cogg hard but I'm seeing 60 watts at 500 rpm. Just try getting 60 watts from a solar panel for 6 bux.

JK TAS Jerry

[Airheads Page](#)

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- [jeanpaul](#)
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- Anonymous Users: 20

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Re: My Mini Geni isn't working very good ([none / 0](#)) (#15)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Wed  
Dec 31st, 2003 at 11:37:33 AM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

I was reading somewhere on the board that , lining up magnets like this created a magnetic field that was the same as a bar magnet with the poles on the sides. That's why I built it this way.

Is this right or not, Many of Zubbly's designs are similar to this approach.

} = - W o o f -= {

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big gap..... ([none / 0](#)) (#16)  
by Norm on Wed Dec 31st, 2003 at 12:51:12 PM  
MST  
([User Info](#))

After taking a real close look at the pictures and especially the last ones ,I think I have the solution...a couple of the ones that replied and said about the gap were on the right track especially Electric Ed where he also referred to the width of the magnets to the width of the coil or something like that, so I'll be back with the solution as soon as I draw a couple of illustrations on one of your pictures. OK? Norm

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Re: big gap..... ([none / 0](#)) (#17)  
by Norm on Wed Dec 31st, 2003 at  
02:48:13 PM MST  
([User Info](#))



Okay...on the next one you get like this(this would be an alternative for someone with only simple handtools)after carefully unwinding each coil.....cut each pole straight down as on the red line, when you are finished it will look something like the first picture. Now center a block of wood as thick as the laminate and scribe the radius of the rotor and cut the ends of each pole off accordingly take a large half-round file and file the curve to allow clearance of the rotor. Then rewind the coils and put em back. This is far from ideal but it should work. The better way would be as Jerry suggested....Hope this helps....Have Fun! (:>) Norm.

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Re: big gap..... ([none / 0](#)) (#18)  
by Harry Luubovv on Wed Dec 31st,  
2003 at 08:30:05 PM MST  
([User Info](#))

Ok Woofer,

Why not try using square magnets to line up one after another instead of round ones ? because the rounds do give trouble to the magnetic paths, that is, pulling and distorting the flux path. Square ones should behave more "Squarely" in this regard, no pun intended. :-

Love experimenters !  
Luubovv

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[My Mini Geni isn't working very good](#) | 18 comments (18 topical, 0 editorial)



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[My Mini Geni isn't working very good](#) | 18 comments (18 topical, 0 editorial)

Re: My Mini Geni isn't working very good ([none / 0](#)) (#11)  
by kell on Tue Dec 30th, 2003 at 09:38:00 PM MST ([User Info](#))

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I think you'll do better with cheap ceramic magnets of the right size, so you know the flux lines will cut the coils where and when you want them to.

[My Mini Geni isn't working very good](#) | 18 comments (18 topical, 0 editorial)

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[Magnetic Brushes for Axial Flux Path](#) | 8 comments (8 topical, editorial)

Re: Magnetic Brushes for Axial Flux Path ([none / 0](#)) (#3)  
by [kell](#) on Tue Dec 30th, 2003 at 09:26:32 PM MST ([User Info](#))

You'll make your brushes out of some ferromagnetic material to increase permeability in the coils? Silicon steel, soft iron, ferrite, powdered iron, whatever... I can just see a ferromagnetic brush glomming onto the first mag it touches, not just cogging but mechanically locking up your genny. In other words, your brushes would have to be made of something that is not attracted to magnets. But what?

Anybody out there know: Is there some non-ferromagnetic high-permeability material?

Re: Magnetic Brushes for Axial Flux Path ([none / 0](#)) (#4)  
by [drdongle](#) on Wed Dec 31st, 2003 at 05:26:23 AM MST ([User Info](#))

Excellent point, the brushes would have to pass or channel the field but not be affected by it, can't be done.

Dr.D

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[Magnetic Brushes for Axial Flux Path](#) | 8 comments (8 topical, 0 editorial)

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[Magnetic Brushes for Axial Flux Path](#) | 8 comments (8 topical, 0 editorial)

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[QUESTION ON MAGNETS](#) | 3 comments (3 topical, 0 editorial)

Re: QUESTION ON MAGNETS ([none / 0](#)) ([#2](#))  
 by [kell](#) on Mon Dec 29th, 2003 at 07:07:12 PM MST  
[\(User Info\)](#)

What do you mean "soft material?" It has to be something that a magnet will attract, which for all practical purposes means iron or steel.

No magnet exerts the same amount of force regardless of distance. All magnets exert less force at greater distance, and you get to a point where the attraction is so small you can't even measure it, let alone make use of it. Also: four feet is way too far. If you're talking about permanent magnets you could never hope to get your hands on a permanent magnet strong enough to exert useful force at four feet. Electromagnets are another matter... if you've got the dollars to build on an industrial scale.

Also, just for the sake of argument, if you could find a permanent magnet that strong you would be risking permanent injury or death just handling it around everyday objects. Get between it and a hunk of steel and it would crush you.

Or maybe I just misunderstood your post.

Re: QUESTION ON MAGNETS ([none / 0](#)) ([#3](#))  
 by [windstuffnow](#) ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon Dec 29th, 2003 at 07:23:10 PM MST  
[\(User Info\)](#) <http://www.windstuffnow.com/main>

Kell is right, you won't find a magnet, electric or permanent that will have a force that you describe. If your looking for a magnet that has a large field, your looking for a ceramic magnet. I have some ring magnets that will affect a TV from 4 ft away. They are 8 inches in diameter with a 4 inch hole and are 3/4" thick. They aren't real strong in the sense a neo is but the field size is impressive.

Have Fun!  
 Ed

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[QUESTION ON MAGNETS](#) | 3 comments (3 topical, 0 editorial)

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- [jeanpaul](#)
- [Harry Luubovv](#)
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[QUESTION ON MAGNETS](#) | 3 comments (3 topical, editorial)

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Or maybe I just misunderstood your post.

[QUESTION ON MAGNETS](#) | 3 comments (3 topical, 0 editorial)

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[Can I see sulfation on battery plates?](#) | 7 comments (7 topical, editorial)

Re: Can I see sulfation on battery plates? ([none](#) / [0](#)) (#4)  
by [kell](#) on Mon Dec 29th, 2003 at 06:39:54 PM MST ([User Info](#))

There was a charging circuit posted here a while ago that is supposed to help freshen up a sulfated battery. I don't know how to post diagrams but I'll describe the circuit. You need a full bridge rectifier rated for at least a couple hundred volts peak inverse voltage. Basically you are running rectified line power (120 v) into the battery, but you limit current by simply feeding the ac into the bridge through a capacitor. The capacitor should have a voltage rating of at least a couple hundred volts. The capacitance determines the current. For a fairly big battery you could go for a few dozen uF (microfarads)... it's not an exact thing; just monitor current and voltage. Attach the dc output of the bridge to the battery. Keep an eye on the battery voltage so you don't overcharge it. You can do a couple of discharge/recharge cycles. The cap needs to be non-polarized. There's also a way to use polarized capacitors and diodes to pass ac, but I won't go into that here.

In effect this is a constant-current high voltage pulse charger, so the monitoring is important because it will overcharge your battery if you don't watch it.

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- [DanB](#)
- Anonymous Users: 16

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[Can I see sulfation on battery plates?](#) | 7 comments (7 topical, 0 editorial)



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[Can I see sulfation on battery plates?](#) | 7 comments (7 topical, 0 editorial)

Re: Can I see sulfation on battery plates? ([none / 0](#)) (#4)  
 by [kell](#) on Mon Dec 29th, 2003 at 06:39:54 PM MST ([User Info](#))

There was a charging circuit posted here a while ago that is supposed to help freshen up a sulfated battery. I don't know how to post diagrams but I'll describe the circuit. You need a full bridge rectifier rated for at least a couple hundred volts peak inverse voltage. Basically you are running rectified line power (120 v) into the battery, but you limit current by simply feeding the ac into the bridge through a capacitor. The capacitor should have a voltage rating of at least a couple hundred volts. The capacitance determines the current. For a fairly big battery you could go for a few dozen uF (microfarads)... it's not an exact thing; just monitor current and voltage. Attach the dc output of the bridge to the battery. Keep an eye on the battery voltage so you don't overcharge it. You can do a couple of discharge/recharge cycles. The cap needs to be non-polarized. There's also a way to use polarized capacitors and diodes to pass ac, but I won't go into that here.

In effect this is a constant-current high voltage pulse charger, so the monitoring is important because it will overcharge your battery if you don't watch it.

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**Who's Online? (18)**

- [jeanpaul](#)
- [DanB](#)
- Anonymous Users: 16

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[Can I see sulfation on battery plates?](#) | 7 comments (7 topical, 0 editorial)



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[Tower wrecking](#) | 11 comments (11 topical, editorial)

Re: Tower wrecking ([none / 0](#)) ([#1](#))  
by kell on Sun Dec 28th, 2003 at 05:56:08 PM MST  
([User Info](#))

I wonder why you intend to do this test. Do you want to see how much wind load your tower will take? Wind loading exerts external forces. The proposed test exerts internal forces.

The test you described could give you some idea how much sheer weight the tower would support, since the cable will exert a downward force on the tower at its uppermost point, as would a massive mill of some sort. But what mill is so heavy and tower so weak as to buckle in such a way?

A heavy mill poses a risk by making your tower more vulnerable to tipping!

Weakness will likely manifest itself where the sections of tower join and at the base. A tipping tower exerts the most moment (torque) at its base. Like a big lever.

The closest thing to copy wind loading and tipping would entail erecting the tower, attaching a cable to the tower somewhere between the middle and the top and pulling in a horizontal direction, insofar as possible.

Re: Tower wrecking ([none / 0](#)) ([#2](#))  
by rhud on Sun Dec 28th, 2003 at 06:04:56 PM MST  
([User Info](#))

Hello,  
New to this site, but i'll throw this in. Surplus Center has hand pumps with small oil tanks attached. i think they were used to lift the cabs of transfer trucks. seems they were around \$150. you might try one of the "power pak" sets used for auto body work (northern or harbor freight) Are you near a community college? they might have one or a hydraulics lab with pump and gauges. might be a good project for the class. forgive my spelling.

[ [Parent](#) ]

[Tower wrecking](#) | 11 comments (11 topical, 0 editorial)

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- [signweld](#)
- [Harry Luubov](#)
- Anonymous Users: 17
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[Tower wrecking](#) | 11 comments (11 topical, editorial)

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 by kell on Sun Dec 28th, 2003 at 05:56:08 PM MST  
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[Tower wrecking](#) | 11 comments (11 topical, 0 editorial)

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**Who's Online? (20)**

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- [Harry Luubovv](#)
- Anonymous Users: 17
- Cloaked Users (1)

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[Chemist Needed Please](#) | 14 comments (14 topical, editorial)

Re: Chemist Needed Please ([none / 0](#)) ([#5](#))  
by kell on Sun Dec 28th, 2003 at 09:13:46 AM MST  
([User Info](#))

Maybe it consumes the metals... somebody came up with an engine that runs by oxidizing aluminum. The aluminum sits in a container of water, and there's some way they use the energy released by oxidizing the aluminum to hydrolyze the water, then burn the hydrogen to run the engine. After a while you have a bucket of aluminum oxide sludge. As you may know, refining (reducing) aluminum takes huge amounts of energy, so there's a lot of energy in an aluminum ingot -- I think twenty pounds drives a car 500 miles, or something like that.

Re: Chemist Needed Please ([none / 0](#)) ([#13](#))  
by elvin1949 ([elvin1949@wmconnect.com](mailto:elvin1949@wmconnect.com)) on Fri Jan 2nd, 2004 at 11:06:01 PM MST  
([User Info](#))

mix salt with the water  
it works power out is not much  
compared to power in but can be made from scrap  
later  
elvin

[ [Parent](#) ]

[Chemist Needed Please](#) | 14 comments (14 topical, 0 editorial)

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#### Who's Online? (34)

- [Hank](#)
- [jeanpaul](#)
- [Harry Luubovv](#)
- [DanB](#)
- Anonymous Users: 30

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[Chemist Needed Please](#) | 14 comments (14 topical, 0 editorial)

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[Chemist Needed Please](#) | 14 comments (14 topical, 0 editorial)

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#### Who's Online? (23)

- [signweld](#)
- [jeanpaul](#)
- [Harry Luubovv](#)
- Anonymous Users: 19
- Cloaked Users (1)

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[pass magnet inside the coils ?](#) | 4 comments (4 topical, editorial)

Re: pass magnet inside the coils ? ([none / 0](#)) (#2)  
by kell on Sun Dec 28th, 2003 at 09:06:01 AM MST  
([User Info](#))

Amethyste, do a search for "linear alternator." Some of the posts are kind of jokey, some are speculative... people that want significant power haven't been building linear alternators because they would have to reciprocate (back and forth, like pistons). Much harder to engineer than something that spins.

The flashlights that you shake to charge them have a magnet on a spring that bounces back and forth inside a coil, from what I've heard.

[pass magnet inside the coils ?](#) | 4 comments (4 topical, 0 editorial)

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#### Who's Online? (31)

- [jeanpaul](#)
- [Harry Luubovv](#)
- [DanB](#)
- Anonymous Users: 27
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#### Who's Online? (23)

- [Hank](#)
- [jeanpaul](#)
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[Maintaining two batteries with one charger?](#) | 10 comments (10 topical, editorial)

Re: Maintaining two batteries with one charger?  
([none / 0](#)) (#6)  
by [kell](#) on Sat Dec 27th, 2003 at 11:07:28 PM MST  
([User Info](#))

Long term you want to float; that's even less than a trickle charge. I'd check with an ammeter.

[Maintaining two batteries with one charger?](#) | 10 comments (10 topical, 0 editorial)

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Who's Online? (18)

- [jeanpaul](#)
- [DanB](#)
- Anonymous Users: 16

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[Solar Stirling opinions wanted](#) | 7 comments (7 topical, editorial)

Re: Solar Stirling opinions wanted ([none / 0](#)) ([#5](#))  
by kell on Sat Dec 27th, 2003 at 08:26:30 AM MST  
([User Info](#))

How will you track it, any ideas yet?

[Solar Stirling opinions wanted](#) | 7 comments (7 topical, 0 editorial)

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#### Who's Online? (22)

- [hvirtane](#)
- [DanB](#)
- [ADMIN](#)
- [Harry Luubovv](#)
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[Fun with fuel](#) | 15 comments (15 topical, editorial)

Re: Fun with fuel ([none / 0](#)) ([#15](#))  
by [kell](#) on Sat Dec 27th, 2003 at 08:17:18 AM MST  
([User Info](#))

"Seafoam" is the same stuff as "Deep Creep" but a little cheaper because the Seafoam doesn't come in an aerosol can. If you're a penny-pincher like me you can just pour Seafoam into a bottle with a squirt atomizer and squirt it into your carb, instead of paying for the aerosol version.

It's also used as an additive for gas tank and crankcase. I get mine at NAPA.

In a car engine you may have to change the spark plugs after dosing the carb. It will make your car smoke like a wet campfire.

[Fun with fuel](#) | 15 comments (15 topical, 0 editorial)

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#### Who's Online? (26)

- [Harry Luubovv](#)
- [DanB](#)
- Anonymous Users: 22
- Cloaked Users (2)

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[Fun with fuel](#) | 15 comments (15 topical, 0 editorial)

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#### Who's Online? (31)

- [Hank](#)
- [jeanpaul](#)
- [DanB](#)
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[AGM battery-last rights?](#) | 17 comments (17 topical, 0 editorial)

Re: AGM battery-last rights? ([none / 0](#)) (#1)  
by kell on Tue Dec 23rd, 2003 at 08:21:37 PM MST  
([User Info](#))

Is this a lead-acid battery? Maybe you should have put battery acid in it.

Re: AGM battery-last rights? ([none / 0](#)) (#8)  
by Mike Wolak on Fri Dec 26th, 2003 at 09:02:57 PM MST  
([User Info](#))

This is a AGM battery ups12-140 dynasty.

[ [Parent](#) ]

[AGM battery-last rights?](#) | 17 comments (17 topical, 0 editorial)

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#### Who's Online? (18)

- [jeanpaul](#)
- [DanB](#)
- Anonymous Users: 16

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[AGM battery-last rights?](#) | 17 comments (17 topical, editorial)

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[Using different kinds of magnets on same rotor](#) | 17 comments (17 topical, editorial)

Re: Using different kinds of magnets on same rotor  
([none / 0](#)) (#15)  
by [kell](#) on Sun Dec 21st, 2003 at 07:43:29 PM MST  
([User Info](#))

Consider the moment the coils pass between magnets. Flux lines extend from the north pole of one magnet to the south pole of the adjacent one just as they extend from the north pole of a single magnet to its own south pole. The coil will see that. So doesn't it make sense that the north and south poles of two adjacent magnets should measure the same distance apart as the north and south poles of a single magnet, in order to optimize the functioning of your generator?

Try dangling a needle on a thread to find the exact point a pole is located at. Measure the distance between the north and south poles of one of your magnets. That should be the distance, center to center, for you to mount the magnets. You may have to adjust the distance from the center of rotation of your ring of magnets in order to make it all come out even because, in this case, you are dealing with a fixed magnet spacing. That may be why some people succeeded with HD mags and some didn't -- it might be kind of a crapshoot whether the poles are spaced evenly even if the magnets themselves are spaced evenly. Another reason all your magnets should be the same.

[Using different kinds of magnets on same rotor](#) | 17 comments (17 topical, 0 editorial)

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[Using different kinds of magnets on same rotor](#) | 17 comments (17 topical, editorial)

Re: Using different kinds of magnets on same rotor  
([none / 0](#)) (#15)  
by kell on Sun Dec 21st, 2003 at 07:43:29 PM MST  
([User Info](#))

Consider the moment the coils pass between magnets. Flux lines extend from the north pole of one magnet to the south pole of the adjacent one just as they extend from the north pole of a single magnet to its own south pole. The coil will see that. So doesn't it make sense that the north and south poles of two adjacent magnets should measure the same distance apart as the north and south poles of a single magnet, in order to optimize the functioning of your generator?

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[Using different kinds of magnets on same rotor](#) | 17 comments (17 topical, 0 editorial)

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[Rail Gun](#) | 4 comments (4 topical, editorial)

Re: Rail Gun ([none / 0](#)) ([#4](#))  
by kell on Sat Dec 20th, 2003 at 06:47:18 PM MST  
([User Info](#))

Try this link:

<http://www.angelfire.com/80s/sixmhz/coolstuff2.html>

[Rail Gun](#) | 4 comments (4 topical, 0 editorial)

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[Rail Gun](#) | 4 comments (4 topical, 0 editorial)

Re: Rail Gun ([none / 0](#)) ([#4](#))  
by kell on Sat Dec 20th, 2003 at 06:47:18 PM MST  
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[Rail Gun](#) | 4 comments (4 topical, 0 editorial)

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[Question for Charged.](#) | 25 comments (25 topical, editorial)

Re: Question for Charged. ([none / 0](#)) ([#18](#))  
by [kell](#) on Sat Dec 20th, 2003 at 06:42:42 PM MST  
([User Info](#))

Is there any way the batteries could overcharge, and how do you regulate them?

Re: Question for Charged. ([none / 0](#)) ([#19](#))  
by [wooferhound](#) ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Sat Dec 20th, 2003 at 09:57:50 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

How do you know when the batteries are fully charged ?  
How do you divert the load when you determine that the batteries are charged ?

} = - W o o f - = {  
[ [Parent](#) ]

Re: Question for Charged. ([none / 0](#)) ([#20](#))  
by [charged](#) on Sun Dec 21st, 2003 at 08:46:34 AM MST  
([User Info](#))

Ok, here's a cryptic response for you to ponder. First I'll give you a small experiment, then I'll give you a good off-loading method.

Set up a SMALL cap-discharge charging system as a TEST-BED. Start with something small like a motorcycle battery.

Use a 100ma 12v transformer feeding a large capacitance through a single rectifier (half-wave). Make sure the caps are rated for a minimum of 35v.

This way you have a good experimental input-power control mechanism.

You should end up with about 25v MAX in the caps if you don't discharge them.

Now, set up your TRIAC/TRANSISTOR discharge circuit between the caps and the battery with a 5v zener between the triac gate and the cap positive. High voltage bipolar transistors are better than mosfets for this

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application. A good IGBT is even better. For a slightly more advanced control system, use a 555 with an opto-coupled output to drive the triac gate. This way you can set your discharge voltage by changing the pulse-rate. Adjust the pulse-rate while monitoring the battery voltage. Set the 555 to work from about 1.5hz up to 50hz or so, roughly. Start with fast pulses and work your way down in frequency.

Monitor the battery electrolyte temperature during charging compared to the ambient air temperature. You might be suprised at what you see.

Anyway, let the system run until you see the battery outgassing. Make note of the battery voltage at this point. Also make note of the battery temperature at this point.

Now, take a measurement of the specific gravity of the electrolyte. Do an extended load test on the battery to deplete it. Then recharge. Note the TIME it takes for recharging. Do your load test again. Repeat this process about 10 times and you might be very suprised.

In a nutshell, your batteries will behave differently under capacitive charging than they do with direct generator connection. All the "rules" of battery charging that have been written are based on MISMATCHED IMPEDANCE, STEADY-CURRENT charging systems that directly couple the inductive generator output to the ionic charging of the batteries.

Even systems that "pulse" the inductive source directly against the battery cannot do what a capacitive discharge can do.

Essentially, use and ACOUSTIC charge controller to monitor for bubbling inside the batteries. That is the REAL indicator that the bank has reached peak charge. For a larger bank, your weakest battery will bubble first. Put the monitor there.

Your monitor should be wired to a solid-state relay to divert discharges to the following load assembly:

Ok, OFFLOADING is EASY PICKINS!

It's just a matter of making sure that the caps never get dropped below generator voltage so that the inductive spikes are the only thing coming in on the line.

Cut out 1'x1' plates from 1/16" sheet steel. Stainless is preferred. For a 12v minimum cap voltage system, use 10 plates.

Mount them in a stack using 3/8" teflon standoffs in-between. You'll end up with what looks like a stack of square pancakes with little plastic spacers to keep them from touching eachother. Each plate is electrically isolated from the next. Weld a couple of peices of steel wire to the top and bottom plates on the stack. Hold the stack together with a non-conductive

clamping assembly from either end.

Dangle this down about 10" from the bottom of a 55 gallon drum filled with tap water.

The two steel wires should be sticking up out of the water. Nothing should be making electrical contact with the drum surfaces.

This is a gassing H<sub>2</sub>/O<sub>2</sub> load for your discharge circuit. It will build up a scum layer on top of the water from minerals and such. Who cares. Just use a toilet float to keep the drum full of water. Simple stuff.

A small fan and ventilator tube can be attached to the top of the drum to discard the gasses outside the house. Don't try to pressurize this mixture since it WILL detonate at pressures exceeding 35psi.

Dangerous toys:  
For more fun, fill balloons with the mixed gas and ignite them with a 10ft "matchstick". Make sure you're wearing earplugs and safety goggles!

[ [Parent](#) ]

Re: Question for Charged. ([none / 0](#))  
([#21](#))  
by charged on Sun Dec 21st, 2003 at  
09:28:31 AM MST  
([User Info](#))

Yikes. I almost forgot something!!!  
Shame on me.

Make a light alkaline solution in the barrel using lye (red devil drain cleaner). Or for those who are more skiddish, use baking soda and push the solution to saturation.

This makes the water a bit more conductive.

DON'T USE SALT. It causes chlorine gas release. You don't want that.

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[Question for Charged.](#) | 25 comments (25 topical, 0 editorial)



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[Question for Charged.](#) | 25 comments (25 topical, 0 editorial)

Re: Question for Charged. ([none / 0](#)) (#18)  
by kell on Sat Dec 20th, 2003 at 06:42:42 PM MST  
([User Info](#))

Is there any way the batteries could overcharge, and how do you regulate them?

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- [troy](#)
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[Test Results](#) | 16 comments (16 topical, editorial)

Re: Test Results ([none / 0](#)) ([#12](#))  
by kell on Sat Dec 13th, 2003 at 04:49:43 PM MST  
([User Info](#))

I looked at one website where a guy made a tesla coil using MOSFETs. He did it so that the MOSFETs would turn on and off when they weren't conducting. Very efficient.

People burn up transistors all the time in inductive applications... That's why IGBT's are so useful. They are designed expressly for firing a coil (automotive). When I converted my old bike over from points to a homebrew solid-state setup, I ordered my IGBT's and hall effect sensors from Newark.com. I mounted a shutter disc on a bushing and slid it down over the points cam, with a set screw to hold it. I put little quarter inch neos pressed into holes in an aluminum plate above the disc, and mounted the hall sensors on the plate the points used to be on. The usual wiring scheme is to have a pull-up resistor to bias the transistor or transistors ON. When the shutter disc spins it intermittently allows the hall unit to see the magnetic field and, when it does, the hall unit shunts current to ground, turning off the transistor... shutting off current to the coil. This is when the spark fires. I think you could use a related setup for this charging circuit you're talking about. You could also wire in a voltage regulation circuit to turn the transistor off when necessary. Might even be able to work out a way to use a voltage regulator from a car alternator so you don't have to do a lot of circuit building. Instead of regulating voltage at the output of a charging system, they are designed to turn on and off the field coils (depending on the voltage measured across the battery), so you could just use it instead to control the transistor.

You don't have to use the hall effect units if it feels to complicated. A mechanical switch to turn the transistor on and off would work fine without arcing because the gate current is truly negligible with MOSFETs and IGBTs.

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- [jeanpaul](#)
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[Test Results](#) | 16 comments (16 topical, editorial)

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by kell on Sat Dec 13th, 2003 at 04:49:43 PM MST  
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[Test Results](#) | 16 comments (16 topical, 0 editorial)

Re: Test Results ([none / 0](#)) ([#9](#))  
by kell on Fri Dec 12th, 2003 at 07:36:02 PM MST  
([User Info](#))

IGBT's (insulated gate bipolar transistors) used in ignitions have built-in protection in the form of avalanche diodes to clamp overvoltage spikes, and unlike SCR's they turn off when you release the gate. The gate on an IGBT acts just like a MOSFET gate.

They're a good alternative to mechanical switching. You can use a hall effect sensor and a magnet attached to a shaft or flywheel, or use a shutter disc that interrupts the field of a stationary magnet.

Re: Test Results ([none / 0](#)) ([#11](#))  
by charged on Sat Dec 13th, 2003 at 09:17:49 AM MST  
([User Info](#))

This guy's as sharp as a tack. :)

First, SCR's definitely not the best way, in THIS application. They can float "on" longer than the commutator signal and cause genny-capacitor-load connection overlaps.

You can use mosfets, bipolar transistors, IGBT's, etc..., as long as the reverse voltage tolerance is high enough. I've destroyed many transistors that were rated too low for this system.

It's pretty strange to see a 25v capacitor discharge into a 12v battery pop the guts out of a 150v transistor. 200v rating is about minimum. Make sure the "on" state resistance of your transistor is very low.

Anyone not familiar with paralleling semiconductors to lower switching resistance and increasing amp tolerance should dig around the web a little and learn how to do it.

Capacitive discharge is much more "kinetic" than a sinewave system. It's also MUCH more effective for battery charging.

Imagine, all of Tesla's patent designs on "radiant" energy had to be done with purely mechanical switching. What could he produce with access to today's semiconductors?

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Re: Test Results ([none / 0](#)) ([#13](#))  
by drdongle on Sat Dec 13th, 2003 at  
04:50:45 PM MST  
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I suspect that the problems you describe with blowing transistors was more of a problem with a limited current handling ability than with voltage.

Dr.D

[ [Parent](#) ]

Re: Test Results ([none / 0](#)) ([#15](#))  
by charged on Mon Dec 15th, 2003 at  
04:13:12 PM MST  
([User Info](#))

Nope. The voltage peaks when breaking the circuit were popping them. I solved it when I went to higher voltage rated components.

Current is easy. That's just a matter of wiring a suitable number of parallel transistors. They were still popping. That's what threw me a little at first. I was building WAY over the wattage required and still frying the parts.

Breaking the current flow off has some strange (and useful) effects.

[ [Parent](#) ]

Re: Test Results ([none / 0](#))  
([#16](#))  
by drdongle on Sun Dec 21st,  
2003 at 07:18:33 AM MST  
([User Info](#))

Were you able to observe these "transients" that blew the transistors? Your comment leads me to think that it was inductive "kick" that produced them. If so it would be a simple matter to add a limiting circuit ( zeners, and or a triac) to clip these spikes to a safe level.

Dr.D

[ [Parent](#) ]

Re: Test Results ([none / 0](#)) ([#14](#))  
by Firefly on Sat Dec 13th, 2003 at 04:54:11  
PM MST  
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Why not trigger it right off of the ac sign wave  
as it crosses zero?

Firefly

[ [Parent](#) ]

[Test Results](#) | **16** comments (16 topical, 0 editorial)



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[Test Results](#) | 16 comments (16 topical, 0 editorial)

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 by [kell](#) on Fri Dec 12th, 2003 at 07:36:02 PM MST  
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[Test Results](#) | 16 comments (16 topical, 0 editorial)

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[stator](#) | 7 comments (7 topical, editorial)

Re: stator ([none / 0](#)) ([#1](#))  
by TomW on Wed Dec 31st, 2003 at 02:03:23 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Jon;

Sorry, but I have absolutely no idea what it is you are asking. Can you be a little more specific?

Cheers.

TomW

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[stator](#) | 7 comments (7 topical, 0 editorial)

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#### Who's Online? (26)

- [Harry Luubovv](#)
- Anonymous Users: 23
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[stator](#) | 7 comments (7 topical, 0 editorial)

Re: stator ([none / 0](#)) ([#1](#))  
by TomW on Wed Dec 31st, 2003 at 02:03:23 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Jon;

Sorry, but I have absolutely no idea what it is you are asking. Can you be a little more specific?

Cheers.

TomW

[Stuff I have Online](#)  
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[stator](#) | 7 comments (7 topical, 0 editorial)

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#### Who's Online? (22)

- [Hank](#)
- [jeanpaul](#)
- [DanB](#)
- Anonymous Users: 19

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[My Mini Geni isn't working very good](#) | 18 comments (18 topical, editorial)

Its so obvious I think you are joking?? ([none / 0](#)) (#3)  
by TomW on Tue Dec 30th, 2003 at 03:41:39 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Woofers;

You said:

The magnets are quite small and are probably the problem. They are 1/4 x 1/4 Disk Neodymium and are rated N38. They are grouped in sets of three with epoxy glue & tie wraps, the **same polarity pointing out in each set.**

Way back in alternators 101 we learned that the poles need to alternate N S N S N S etc.

That and the other drawbacks noted will produce a poor alternator.

Cheers.

TomW

[Stuff I have Online](#)  
[Contact Me](#)

Re: Its so obvious I think you are joking?? ([none / 0](#)) (#8)  
by woofershound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Tue Dec 30th, 2003 at 07:21:34 PM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

Thanks TomW

let me quote what you quoted and add the rest of the paragraph...

--Quote-----

They are grouped in sets of three with epoxy glue & tie wraps, the same polarity pointing out in each set. 12 groups are glued around the rotor alternating North-South all the way around.  
-----

Perhaps I could have described this more clearly. As they say "A picture is worth a 1000 words" so here's a pic

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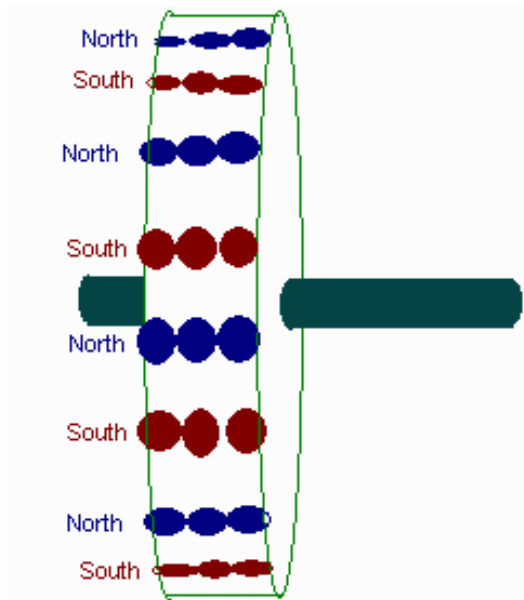
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Who's Online? (22)

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The mags are grouped in sets of 3. Each set has all North or all South pointing out. putting the magnets together this way is very difficult as the mags are trying to run away from each other and flip around and stuff. Then these Sets are glued to the stator in alternating groups.

- set of 3 Norths
- set of 3 Souths
- set of 3 Norths
- set of 3 Souths
- etc.

} = - W o o f - = {

[ [Parent](#) ]

[My Mini Geni isn't working very good](#) | 18 comments (18 topical, 0 editorial)



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[My Mini Geni isn't working very good](#) | 18 comments (18 topical, 0 editorial)

Its so obvious I think you are joking?? ([none / 0](#)) (#3)

by TomW on Tue Dec 30th, 2003 at 03:41:39 PM MST ([User Info](#)) <http://oneota.net/~earthsourcepowr/>

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TomW

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[My Mini Geni isn't working very good](#) | 18 comments (18 topical, 0 editorial)

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- [jeanpaul](#)
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[Is this possible?](#) | 8 comments (8 topical, 0 editorial)

Re: Is this possible? ([none / 0](#)) ([#1](#))  
by TomW on Sat Dec 27th, 2003 at 10:23:32 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Ed;

First let me say that nearly anything is possible but not everything is practical.

We have discussed reciprocating style generators before and while it seems it could be done that they would be fairly inefficient. Maybe a search of this site for comments with "linear alternator" or "reciprocating" in comments would turn up the discussion I found several but the link posting feature on the board seems broken so I didn't put the link in here. I seem to recall that the lack of movement on the end of each stroke when the shaft reverses direction would be a source of lost mechanical power. Just off the top of my head before my coffee.

Oh, and welcome to the board.

Cheers.

TomW

[Stuff I have Online](#)  
[Contact Me](#)

[Is this possible?](#) | 8 comments (8 topical, 0 editorial)

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[Is this possible?](#) | 8 comments (8 topical, editorial)

Re: Is this possible? ([none / 0](#)) ([#1](#))  
by TomW on Sat Dec 27th, 2003 at 10:23:32 AM MST  
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[Is this possible?](#) | 8 comments (8 topical, 0 editorial)

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[The 88 cent counter](#) | 13 comments (13 topical, 0 editorial)

Re: The 88 cent counter ([none / 0](#)) ([#5](#))  
by TomW on Sun Dec 21st, 2003 at 05:52:27 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Ed;

actually you can get to 110 using toes.

for every 10 on fingers curl one toe when all toes are curled its 100 then you still got the 10 fingers .

Cheers.

TomW

[Stuff I have Online](#)

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Re: The 88 cent counter ([none / 0](#)) ([#9](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon  
Dec 22nd, 2003 at 06:35:41 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Ok Tom, your going to have my ears smokin' if I have to count that high ;o)... I think I'll stick to Norms idea with the number device.

Have Fun!

Ed

[ [Parent](#) ]

Re: The 88 cent counter ([none / 0](#)) ([#10](#))  
by Norm on Mon Dec 22nd, 2003 at 06:52:55 AM MST  
([User Info](#))

A little fun game between you and one of your younger relatives see how fast you can click this 'counter' in a minute ...about 360 in a minute for me...(but then 'Granpa' was always slow!) ( :>) Norm.

[ [Parent](#) ]

[The 88 cent counter](#) | 13 comments (13 topical, 0 editorial)

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#### Who's Online? (18)

- [hvirtane](#)
- [troy](#)
- [DanB](#)
- [ADMIN](#)
- [Harry Luubovv](#)
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[The 88 cent counter](#) | 13 comments (13 topical, 0 editorial)

Re: The 88 cent counter ([none / 0](#)) (#5)  
by TomW on Sun Dec 21st, 2003 at 05:52:27 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

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Cheers.

TomW

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[System set up ?](#) | 5 comments (5 topical, editorial)

Most of what you need to know about shunts: ([none / 0](#)) ([#2](#))  
by TomW on Thu Dec 18th, 2003 at 10:28:14 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Here is a page I did on shunts. You do not need to get one from Rat Shack.

<http://oneota.com/~earthsourcepowr/shunts.html>

Cheers.

TomW

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[Contact Me](#)

[System set up ?](#) | 5 comments (5 topical, 0 editorial)

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#### Who's Online? (19)

- [jeanpaul](#)
- [DanB](#)
- Anonymous Users: 17

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[System set up ?](#) | 5 comments (5 topical, editorial)

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Cheers.

TomW

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[System set up ?](#) | 5 comments (5 topical, 0 editorial)

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#### Who's Online? (19)

- [jeanpaul](#)
- [DanB](#)
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[Converting Amps to 0 - 10 volts for data acquisition](#) | 2 comments  
(2 topical, editorial)

Re: Converting Amps to 0 - 10 volts... ([none / 0](#)) ([#1](#))  
by TomW on Thu Dec 18th, 2003 at 08:06:41 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

dconn;

I am doing some data logging using a PC and a RS232 meter. What I do is use optoisolators to drive relays off the parallel port set up as dpdt switches to select the source i want to sample this eliminates the common ground problems. JimU set me up with some perl scripts to read the meter output and translate to graphs. Sounds like a totally different approach from yours. There are probably one chip solutions to your problem but it seems you could simply use your low voltages to drive a transistor biased for 10X amplification or whatever you need to transform low voltage to higher values.

More details of exactly what you are using [software / hardware] would make answering the question easier.

Just off the top of my head.

Cheers.

TomW

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[Converting Amps to 0 - 10 volts for data acquisition](#) | 2 comments  
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#### Who's Online? (18)

- [hvirtane](#)
- [troy](#)
- [DanB](#)
- [ADMIN](#)
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[picture diagram area](#) | 10 comments (10 topical, editorial)

Re: Issues with pictures and graphics; ([none / 0](#)) (#8)  
by TomW on Wed Dec 17th, 2003 at 08:32:30 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Wolfie1;

I totally agree that .bmp files are the main culprit.

Cheers

TomW

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[picture diagram area](#) | 10 comments (10 topical, 0 editorial)

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#### Who's Online? (31)

- [jeanpaul](#)
- [Harry Luubovv](#)
- [DanB](#)
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[picture diagram area](#) | 10 comments (10 topical, 0 editorial)

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[picture diagram area](#) | 10 comments (10 topical, 0 editorial)

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#### Who's Online? (19)

- [Oliver](#)
- [wind pirate](#)
- [Harry Luubovv](#)
- Anonymous Users: 15
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[A good one for Renewable Energy FAQ's...Capacitors](#) | 8 comments  
(8 topical, editorial)

Re: A good one for Renewable Energy FAQ's...Capaci  
([none / 0](#)) (#6)  
by TomW on Tue Dec 16th, 2003 at 01:04:20 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Dave B;

Uh, as far as I know no one can edit a comment once it is posted.

What I did notice last nite was like 2 seconds after I posted my comment trying to explain caps your comment was there. Not sure how you could have replied before it was actually posted? Perhaps a glitch in the board software? I regularly preview my comments several times before I actually hit "post" and that comment took awhile before I felt it was ready to post. Perhaps it served you up one of my previews?

Anyway, sorry for any confusion and you are correct series caps work like parallel resistors as far as value is concerned.

Cheers.

TomW

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Re: A good one for Renewable Energy  
FAQ's...Capaci ([none / 0](#)) (#7)  
by Dave B on Tue Dec 16th, 2003 at 07:54:24 PM  
MST  
([User Info](#)) <http://www.madbbs.com/users/bruggelog>

Thanks Tom, weird stuff happening I guess. I remember fighting with the AC circuits in school and how much fun the LC combinations can be. I dabble in audio and crossover/cabinet design and have a "magic box" of caps, coils and pots I built for dialing in 2 and 3 way crossovers for different drivers. Now that is alot more fun than class ever was. Too much fun and not enough time, next project, carving a 12' diameter 3 blade set for my alternator. Thanks for the reply. Dave B.

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- [hvirtane](#)
- [ADMIN](#)
- [Harry Luubovv](#)
- [troy](#)
- [DanB](#)
- Anonymous Users: 13

5 minute interval.  
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Re: A good one for Renewable Energy  
FAQ's...Capaci ([none / 0](#)) (#8)  
by Jerry on Tue Dec 16th, 2003 at 09:34:11 PM  
MST  
([User Info](#))  
<http://www.dplusv.com/Photo-03.html>

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JK TAS Jerry

[Airheads Page](#)

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Re: A good one for Renewable Energy  
FAQ's...Capaci ([none / 0](#)) (#9)  
by Dave B on Tue Dec 16th, 2003 at  
11:51:05 PM MST  
([User Info](#))  
<http://www.madbbs.com/users/bruggelog>

Jerry,

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B.

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[A good one for Renewable Energy FAQ's...Capacitors](#) | 8 comments  
(8 topical, 0 editorial)



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[A good one for Renewable Energy FAQ's...Capacitors](#) | 8 comments (8 topical, editorial)

Re: A good one for Renewable Energy FAQ's...Capaci  
([none / 0](#)) (#6)  
by TomW on Tue Dec 16th, 2003 at 01:04:20 PM MST  
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[A good one for Renewable Energy FAQ's...Capacitors](#) | 8 comments (8 topical, 0 editorial)

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## [A good one for Renewable Energy](#)

### [FAQ's...Capacitors](#)

By [Norm](#), Section [Homebrewed Electricity](#)

[Alternators](#)

Posted on Mon Dec 15th, 2003 at 09:58:26 PM MST

I think this would be a good subject to pursue.

It seems that a lot of us aren't clear what kind of capacitor to use on various circuits like how do you use them where, why, when what size etc. Norm.

[A good one for Renewable Energy FAQ's...Capacitors](#) | 8 comments (8 topical, 0 editorial)

Re: A good one for Renewable Energy FAQ's...Capaci ([none / 0](#)) (#2)  
by Dave B on Mon Dec 15th, 2003 at 11:27:07 PM MST  
([User Info](#)) <http://www.madbbs.com/users/bruggelog>

Seems like I remember caps. to add opposite of resistors. 2 Caps. in parallel add (100mf + 100mf) = 200mf and 2 caps. in series (of the same value) would equal 1/2 of the value of one of the caps. or 50mf. I could be wrong, if so let me know, it's been along time since school days. Dave B.

Re: A good one for Renewable Energy FAQ's...Capaci ([none / 0](#)) (#3)  
by TomW on Mon Dec 15th, 2003 at 11:40:58 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Norm;

Well, I am no capacitor expert but the basics are pretty simple:

Capacitors add in capacitance [microfarads] when in parallel. So 2 40 volt 100 microfarad caps in parallel will net the equivalent of a 40 volt 200 microfarad cap.

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Within reason you can series / parallel many caps to get a value you require.

Thats the capacitors in a nutshell but it can be a very involved process understanding how they work in A.C. circuits and with RF signals.

Cheers.

TomW

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Re: A good one for Renewable Energy FAQ's...Capaci ([none / 0](#)) (#4)

by Dave B on Tue Dec 16th, 2003 at 03:15:19 AM MST  
([User Info](#)) <http://www.madbbs.com/users/bruggelog>

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Re: A good one for Renewable Energy FAQ's...Capaci ([none / 0](#)) (#5)

by kurt on Tue Dec 16th, 2003 at 03:55:38 AM MST  
([User Info](#))



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Re: A good one for Renewable Energy FAQ's...Capaci ([none / 0](#)) (#6)  
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Re: A good one for Renewable Energy FAQ's...Capaci ([none / 0](#)) (#7)  
by Dave B on Tue Dec 16th, 2003 at 07:54:24 PM MST  
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Thanks Tom, weird stuff happening I guess. I remember fighting with the AC circuits in school and how much fun the LC combinations can be. I dable in audio and crossover/cabinet design and have a "magic box" of caps, coils and pots I built for dialing in 2 and 3 way crossovers for different drivers. Now that is alot more fun than class ever was. Too much fun and not enough time, next project, carving a 12' diameter 3 blade set for my alternator. Thanks for the reply. Dave B.

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by Jerry on Tue Dec 16th, 2003 at 09:34:11 PM MST  
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[picture diagram area](#) | 10 comments (10 topical, 0 editorial)

Issues with pictures and graphics; ([none / 0](#)) (#4)  
by TomW on Tue Dec 16th, 2003 at 12:17:40 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

JB;

There have been lots of ongoing issues with pictures and diagrams on the board.

Several people have uploaded such huge pictures [file size] that they exceed their storage quota. Some have deleted some of them to get more space for their next set of uploads. To the best of my knowledge none of the admins have removed any uploaded files. Once the files are removed by the user they are no longer available for display on the board. Frankly it is almost exclusively a user problem not a board problem. It is very inconsiderate to post a picture that is much bigger than 200 or 300 kilobytes to a forum like this but some of our users regularly post several 900 kilobyte plus sized pictures and diagrams in comments & stories. One recent comment had over 3 megabytes of diagrams from one user and that takes a very long time to download for a dialup user.

Others link to external pictures they have hosted other places. In that case there could be any number of reasons they do not display that I can't begin to explain here.

Here is my suggestion for you:

When you see something you like you should simply download it to your own computer and then it will be available to you any time.

How you do that depends on your operating system and your browser.

Cheers.

TomW

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Re: Issues with pictures and graphics; ([none / 0](#)) (#7)  
by Wolfie1 on Wed Dec 17th, 2003 at 06:21:13 AM MST  
([User Info](#))

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- [wind pirate](#)
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Have you considered a ban on BMP files as they are probably the real problem. If everyone stored their diagrams as GIFs and their photos as JPEGs wouldn't the problem go away.

Unless you have a very old computer, there are programs installed with the operating system that can do the conversion.

Martin.

[ [Parent](#) ]

Re: Issues with pictures and graphics;  
([none / 0](#)) ([#8](#))  
by TomW on Wed Dec 17th, 2003 at 08:32:30  
AM MST  
([User Info](#))  
<http://oneota.net/~earthsourcepowr/>

Wolfie1;

I totally agree that .bmp files are the main culprit.

Cheers

TomW

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[A good one for Renewable Energy FAQ's...Capacitors](#) | 8 comments (8 topical, editorial)

Re: A good one for Renewable Energy FAQ's...Capaci ([none / 0](#)) (#3)  
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Norm;

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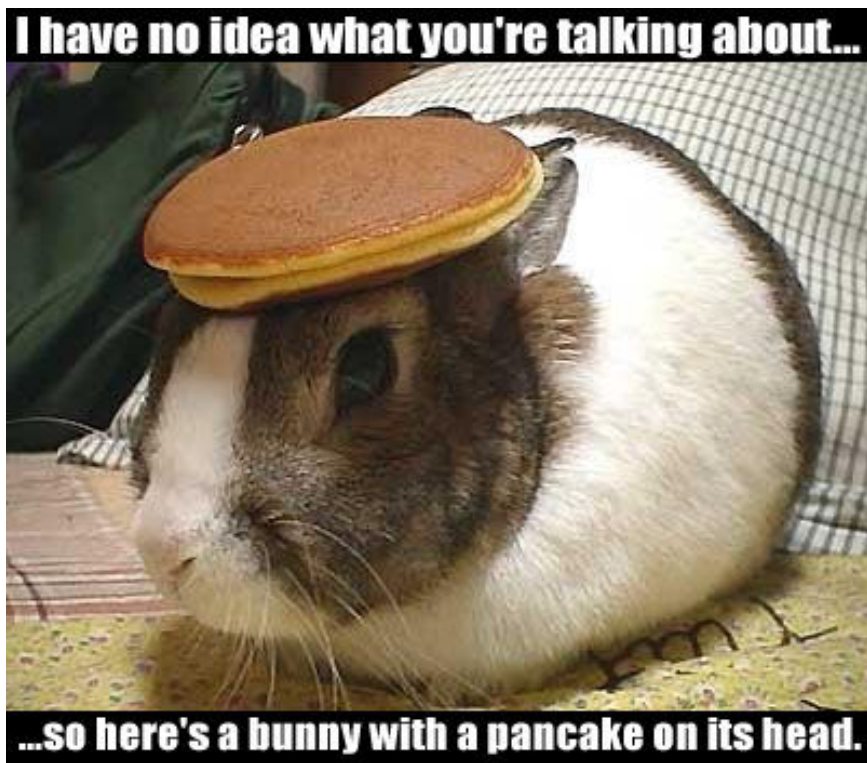
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[Stovetop Heating Elements](#) | 7 comments (7 topical, editorial)

Re: Stovetop Heating Elements ([none / 0](#)) ([#7](#))  
by TomW on Mon Dec 15th, 2003 at 03:15:12 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Instead of 'post a comment', I think I need to reply to that particular post, so it will follow that particular posting?

Yes, indeed to get it to look like a response to a specific comment you need to click "reply to this".

"Post Comment" simply sticks it in with the rest of the comments and then it displays according to how the users preferences are set. You certainly are not the only one who has been confused by this feature.

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TomW

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[Stovetop Heating Elements](#) | 7 comments (7 topical, 0 editorial)

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[Stovetop Heating Elements](#) | 7 comments (7 topical, editorial)

Re: Stovetop Heating Elements ([none / 0](#)) (#7)  
by TomW on Mon Dec 15th, 2003 at 03:15:12 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Instead of 'post a comment', I think I need to reply to that particular post, so it will follow that particular posting?

Yes, indeed to get it to look like a response to a specific comment you need to click "reply to this".

"Post Comment" simply sticks it in with the rest of the comments and then it displays according to how the users preferences are set. You certainly are not the only one who has been confused by this feature.

Cheers.

TomW

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[Stovetop Heating Elements](#) | 7 comments (7 topical, 0 editorial)

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## Stovetop Heating Elements

By [bruce1](#), Section [Homebrewed Electricity](#)

Posted on Fri Dec 12th, 2003 at 11:41:53 AM MST

[Wind](#)

Whats inside of them?

I'm unwinding the round stovetop heating elements into straight pieces, cutting them off at shorter lengths to make a heating element to draw down batteries during testing. What inside those elements? The outside is just metal, there is a very thin wire inside, and its all encased in this whitish stuff. Is it just ceramic? I dont want to be playing with an asbestos sort of material.

Thanks, Bruce

[Stovetop Heating Elements](#) | 7 comments (7 topical, 0 editorial)

Re: Stovetop Heating Elements ([none / 0](#)) ([#1](#))  
by [veewee77](#) on Fri Dec 12th, 2003 at 02:57:27 PM MST  
([User Info](#))

I am surprised they held together as you unwound them! I would have thought they would have split or bronek or something!

That is interesting. . .

Re: Stovetop Heating Elements ([none / 0](#)) ([#2](#))  
by [Electric Ed](#) on Fri Dec 12th, 2003 at 03:27:37 PM MST  
([User Info](#)) <http://www.electric-ed.com>

I believe it's magnesium oxide.

There is a type of electrical wiring cable called Mineral Insulated Cable (Tradenname - Pyrotenax) that uses magnesium oxide as an insulating material. It is used where a fire resistant wiring method is required.

[http://www.sesco-ge.com/pd\\_pyrotenax.htm](http://www.sesco-ge.com/pd_pyrotenax.htm)

Electric Ed

Re: Stovetop Heating Elements ([none / 0](#)) ([#3](#))  
by [bob golding](#) ([yubba at clara dot net](#)) on Fri Dec 12th, 2003 at 03:30:48 PM MST  
([User Info](#))

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hi bruce

it is probably magnesium oxide. havent looked up the msd but think it is pretty inert.

i wouldnt put it on your cornflakes just to be safe. the wire is nickel chome trade name nichrome. can buy it online easily enough. it is expensive but still cheaper than new resistors.

bob

Re: Stovetop Heating Elements ([none / 0](#)) (#4)  
by bruce1 on Fri Dec 12th, 2003 at 03:37:06 PM MST  
([User Info](#))

No, they unwound into one long rod, or at least these did. I hacked them into roughly 6" pieces, pulled the wire out of them about 1" on each side, attached all the wires on each side to a scrap steel bar, hooked a wire to each bar, put an ammeter inline between the battery and one bar, and hooked it to the battery. With 5 of those pieces in there, it draws 18A @12vdc. They are about the right length so that they each draw significant amperage, about 3.5A, but yet they do not glow red and get too terribly hot.

Bruce

Re: Stovetop Heating Elements ([none / 0](#)) (#5)  
by Norm on Fri Dec 12th, 2003 at 08:42:53 PM MST  
([User Info](#))

Well anyway all the electricians in all the shops I've ever worked always called it 'calrod'. . Norm

[ [Parent](#) ]

Re: Stovetop Heating Elements ([none / 0](#)) (#6)  
by bruce1 on Mon Dec 15th, 2003 at 01:48:20 PM MST  
([User Info](#))

My last comment may have come across wrong. I didnt say 'no' to the people saying it was magnesium oxide, I was replying to an earlier post that someone was surprised the stove elements didnt break up. I was saying 'no', as in 'they did not break into pieces, they unrolled rather well'. Instead of 'post a comment', I think I need to reply to that particular post, so it will follow that particular posting? I'm sorry if it came across wrong.

Anyway, thanks all for the replies. I feel better knowing its not some nasty toxic granulars.

Thanks, Bruce



[ [Parent](#) ]

Re: Stovetop Heating Elements ([none](#)  
[/ 0](#)) (#7)  
by TomW on Mon Dec 15th, 2003 at  
03:15:12 PM MST  
([User Info](#))  
<http://oneota.net/~earthsourcepowr/>

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Cheers.

TomW

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[DC motor to PM Gen](#) | 6 comments (6 topical, editorial)

Re: DC motor to PM Gen ([none / 0](#)) ([#1](#))  
 by TomW on Sat Dec 13th, 2003 at 10:26:16 AM MST  
 ([User Info](#)) <http://oneota.net/~earthsourcepowr/>

acenergydfw;

I, too, thought a golf cart motor would make a decent generator. Wrong. At least in my case the motor is a series wound DC motor. This means it uses a field coil to create the magnetic field it uses to create the electrical energy. Very problematic for several reasons not limited to figuring out how to energize the field windings only when its spinning.

Just right off the top of my head. I think this has been discussed a time or two before. Maybe a search of this site for "golf cart motor" will yield more in depth detail on the [dis]advantages of using one. Mine is a Harley Davidson and others may be designed different.

Cheers.

TomW

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Re: DC motor to PM Gen ([none / 0](#)) ([#2](#))  
 by acenergydfw on Sat Dec 13th, 2003 at 11:11:41 AM MST  
 ([User Info](#))

Yes the series wound field, which I want to replace with permanent magnets, if only I could find some NIB arcs that are curved with an ID of 4.3125" thickness of .5" and 3" long and width depending on how many poles I wanted it to be. It appears from what I've seen searching, something like this would be very cost prohibitive. Sorry I didn't do a thorough search of the site, just thought I'd toss this out there.

mel

[ [Parent](#) ]

Re: DC motor to PM Gen ([none / 0](#)) ([#3](#))  
 by Norm on Sat Dec 13th, 2003 at 03:52:21 PM MST  
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Wonder why they aren't PM motors? Maybe it's an older type motor and the newer ones have PM's ?Well at least you've got a nice little motor that you can use to power something once you have a windmill to charge some batteries to run it...would run a nice little scooter for around town or an electric riding mower....Norm.

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[DC motor to PM Gen](#) | 6 comments (6 topical, 0 editorial)



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[DC motor to PM Gen](#) | 6 comments (6 topical, editorial)

Re: DC motor to PM Gen ([none / 0](#)) ([#1](#))  
by TomW on Sat Dec 13th, 2003 at 10:26:16 AM MST  
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TomW

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## [DC motor to PM Gen](#)

By [acenergydfw](#), Section [Homebrewed Electricity](#)

Posted on Sat Dec 13th, 2003 at 09:47:42 AM MST

[Wind](#)

Need advice from the board.

I've been toying with wind power ideas for years but have never attempted any projects. I have 23yrs experience in the UPS business as a tech/fe and have been recently playing with PM motors as generators. I understand the mechanical drawbacks of them and the advantages of PM alts, but I have free a 2.1hp, 36v motor from a golf cart I am considering making a ginny out of. The stator is currently 4 pole, the commutator has 64 contacts and 4 brushes. I'm figuring that these brushes are fairly common and they can be replaced relatively easily so I would like to try replacing the EMs in the stator with PMs. The other ratings on the motor are 2800rpm and 51a. Will increasing the # of poles give any increase in voltage or will this be limited by the armature windings? Other specs are: Armature core 3"l X 4.25"dia, Stator cores 3"l x 2.25"w x .5" thick, Case is 6.75"dia x 10"l. The shaft is .75 and has a flywheel and brake, the output to the differential was with a splined shaft and it does have bearings. I'll try to up-load a picture. It appears to be in there now.

TIA

mel

[DC motor to PM Gen](#) | 6 comments (6 topical, 0 editorial)

Re: DC motor to PM Gen ([none / 0](#)) ([#1](#))  
by TomW on Sat Dec 13th, 2003 at 10:26:16 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

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Cheers.

TomW

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Re: DC motor to PM Gen ([none / 0](#)) (#2)  
by acenergydfw on Sat Dec 13th, 2003 at 11:11:41  
AM MST  
([User Info](#))

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Re: DC motor to PM Gen ([none / 0](#)) (#3)  
by Norm on Sat Dec 13th, 2003 at 03:52:21  
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Re: DC motor to PM Gen ([none / 0](#)) (#4)  
by drdongle on Sat Dec 13th, 2003 at 05:14:15 PM MST  
([User Info](#))

Hang on this motor, you might want to use it to operate a power tool from your RE system.

Dr.D

Re: DC motor to PM Gen ([none / 0](#)) (#5)  
by Chuck on Mon Dec 15th, 2003 at 10:10:02 AM MST  
([User Info](#)) <http://www.greeleynet.com/~cmorrison>



There are limitations to what you can do without rewinding the coils. While you can add magnets to your heart's content, if it doesn't match the winding on the armature, you'll probably not be able to generate anything. An armature designed for 4 poles will only work (well) with 4 poles.

What you have is set up for 36v at 2800 rpm. Since this is usually a linear relationship, if you want to get 12 volt charging from it, you'll still be looking at 933 rpm just to get 12 volts, assuming it acts similarly with PM's as it does with coils.

You can see my attempts at doing this at :  
<http://www.greeleynet.com/~cmorrison/WindMachine.html>

Re: DC motor to PM Gen ([none / 0](#)) ([#6](#))  
by filico on Mon Dec 15th, 2003 at 02:50:36 PM MST  
([User Info](#))

Hi! I did buy this good treadmill motor, attached to 4 30" diam blades, medium wind, it generate 7.5 volt 2 amp, with a full drill attached generates 60 volts and 7.5 amp i will construct blades more big. cost 20 usd plus shipping.  
<http://bgm.bgmicro.com/pdf/page20.pdf>

[DC motor to PM Gen](#) | 6 comments (6 topical, 0 editorial)

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[Alt rotor Questions : magnets](#) | 11 comments (11 topical, 0 editorial)

Re: Alt rotor Questions : magnets ([none / 0](#)) (#5)  
by TomW on Fri Dec 12th, 2003 at 10:43:59 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Ed, Dan, and others;

Thanks for clearing that up. Didn't want to argue it but could not get my mind around ifreds reasoning on it.

Cheers.

TomW

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Re: Alt rotor Questions : magnets ([none / 0](#)) (#7)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Fri Dec 12th, 2003 at 12:20:52 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

By laying them out the way iFred explained works well also but the field doesn't extend out as far as pushing them together. By allowing them to spread apart will match the field of the magnet. In turn open up the area of the field. On a dual rotor system with a fairly large gap it would be better to butt them together. Where'as a laminated stator may better use the area of the magnetic field as opposed to the concentration. It all works well in the right places.

iFred tends to think outside the normal, this is usually where new things are found. I for one like unusual and creative thinking... the stranger the better! I'd like to say I think in similar terms but there are so many rules that are in the back of my head that sometimes makes it difficult. Like a cup overflowing... there is no more room to add more... sometimes we need to empty our cup in order to get more.

More fun than my cup will hold!  
Ed

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[Alt rotor Questions : magnets](#) | 11 comments (11 topical, 0 editorial)

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[Alt rotor Questions : magnets](#) | 11 comments (11 topical, 0 editorial)

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by TomW on Fri Dec 12th, 2003 at 10:43:59 AM MST  
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Cheers.

TomW

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[Alt rotor Questions : magnets](#) | 11 comments (11 topical, 0 editorial)

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[Getting rid of the cog - re-post](#) | 14 comments (14 topical, 0 editorial)

speaking of older posts... ([none / 0](#)) ([#1](#))  
by TomW on Wed Dec 10th, 2003 at 02:43:16 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

ifred;

So what ever happened with your magnetic interruptor research?

Very curious why you just stopped talking about it?

Cheers.

TomW

[Stuff I have Online](#)  
[Contact Me](#)

Re: speaking of older posts... ([none / 0](#)) ([#6](#))  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Wed Dec 10th, 2003 at 08:26:45 PM MST  
([User Info](#)) <http://www.internetfred.com>

no reason, just have not enough time for more research.

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[Getting rid of the cog - re-post](#) | 14 comments (14 topical, 0 editorial)

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[All Posts Marked "New"](#) | 3 comments (3 topical, editorial)

Re: All Posts Marked "New" ([none / 0](#)) ([#1](#))  
by TomW on Wed Dec 10th, 2003 at 06:42:39 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Oh, yeah. Since yesterday afternoon.

Rather annoying and I flushed all my cookies n stuff too.

Cheers.

TomW

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[All Posts Marked "New"](#) | 3 comments (3 topical, 0 editorial)

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[All Posts Marked "New"](#) | 3 comments (3 topical, editorial)

Re: All Posts Marked "New" ([none / 0](#)) ([#1](#))  
by TomW on Wed Dec 10th, 2003 at 06:42:39 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Oh, yeah. Since yesterday afternoon.

Rather annoying and I flushed all my cookies n stuff too.

Cheers.

TomW

[Stuff I have Online](#)  
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[All Posts Marked "New"](#) | 3 comments (3 topical, 0 editorial)

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- [Putte](#)
- [wind pirate](#)
- [troy](#)
- Anonymous Users: 9

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[Looking for large "ring " connectors](#) | 5 comments (5 topical, editorial)

Re: Looking for large "ring " connectors ([none / 0](#)) (#1)  
by TomW on Mon Dec 8th, 2003 at 11:18:08 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Dr. D;

A possible substitute might be a piece of copper tube soldered to the cable with the end flattened and the proper hole drilled in it. Add some shrink tube if you want or some tape and you can duplicate almost any ring connector for very cheap.

Most of my battery interconnects are done this way but with larger cable and tube for ends. Basically free from the copper pipe I have salvaged over the years.

Cheers.

TomW

[Stuff I have Online](#)

[Contact Me](#)

[Looking for large "ring " connectors](#) | 5 comments (5 topical, 0 editorial)

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- [hvirtane](#)
- [troy](#)
- [DanB](#)
- [ADMIN](#)
- [Harry Luubovv](#)
- Anonymous Users: 13

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[The PME Project](#) | 3 comments (3 topical, editorial)

Re: The PME Project ([none / 0](#)) ([#2](#))  
by TomW on Sun Dec 7th, 2003 at 09:46:10 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Dr. D;

Yeah, exactly why it is over here in the 'zone. Pure and utter bull droppings.

Cheers.

TomW

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[ [Parent](#) ]

[The PME Project](#) | 3 comments (3 topical, 0 editorial)

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- [Hank](#)
- [jeanpaul](#)
- [DanB](#)
- Anonymous Users: 27

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- [signweld](#)
- [jeanpaul](#)
- [Harry Luubovv](#)
- Anonymous Users: 17
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[non electric fan](#) | 2 comments (2 topical, editorial)

Re: non electric fan ([none / 0](#)) ([#1](#))  
by TomW on Fri Dec 5th, 2003 at 08:10:17 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

erne;

Hi I dont know how to post a comment, help apriciated.

Well, erne, its as easy as [easier really] posting a story.

At the bottom of every story there is a "Post Comment" link. If you are logged in and click on that it pulls up a page where you can post a comment. Once you have that page your comment gets typed into the text window much like when posting a story. Same thing when you wish to respond to a comment except then it is a link titled "Reply to This".

Cheers.

TomW

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[non electric fan](#) | 2 comments (2 topical, 0 editorial)

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- [jeanpaul](#)
- [Harry Luubovv](#)
- [DanB](#)
- Anonymous Users: 26
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[non electric fan](#) | 2 comments (2 topical, editorial)

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Cheers.

TomW

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[non electric fan](#) | 2 comments (2 topical, 0 editorial)

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Who's Online? (23)

- [signweld](#)
- [jeanpaul](#)
- [Harry Luubovv](#)
- Anonymous Users: 19
- Cloaked Users (1)

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[looking for non-electirc fan for wood stove](#) | 3 comments (3 topical, 0 editorial)

Re: [looking for non-electirc fan for wood stove](#) ([none / 0](#)) (#2)  
by TomW on Fri Dec 5th, 2003 at 08:02:06 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Google search for calframo fan they are a bit more sophisticated than a thermocouple and use a peltier device to run it. Ours has been spinning on our stove for 3 years or more.

Cheers.

TomW

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- [hvirtane](#)
- [Putte](#)
- [troy](#)
- Anonymous Users: 8

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## [Fisher and Paykel Tests](#)

By [TomW](#), Section [Diaries](#)

Posted on Tue Sep 23rd, 2003 at 04:10:50 PM  
MST

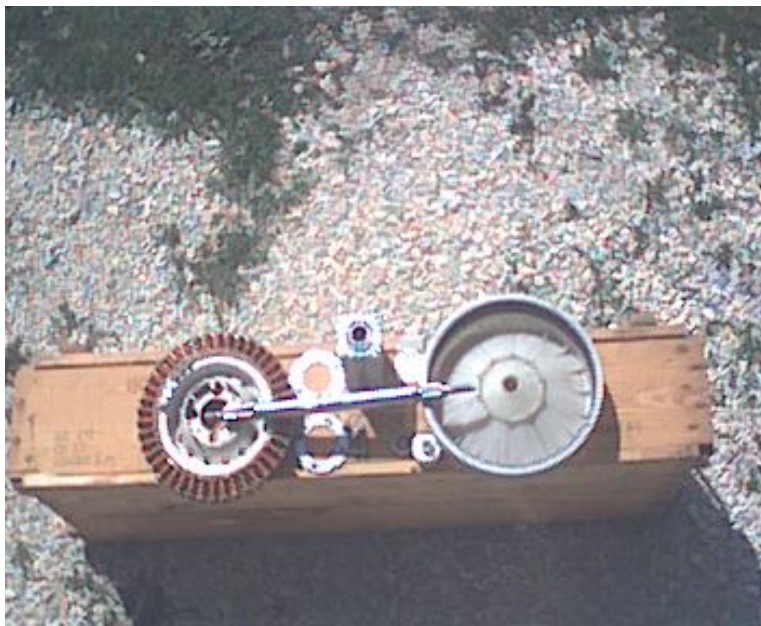
[TomW's Diary](#)

### Fisher and Paykel Smart Drive motor Tests

Well, folks, I got myself a nice F&P Smart Drive motor through my vast connections online.

I looked at lots of info on them. Well "lots" is relative since there is not a whole lot published about them just yet.

It is a radial design. Mine has 42 coils of 1.6 mm wire [thats .062 in inches or about #16]. Its 3 phase with 14 coils per phase. The coils have 42 wraps each in two layers. The rotor has 14 of what appear to be ferrite or ceramic magnets.



This picture shows the unit the way it came via UPS.

I studied it awhile and did some preliminary tests once I figured out how to assemble it. Stock it has way too much resistance in the phases for RE use. I got a box of terminal blocks like these below on EbaY to break out the coils so I could wire them as needed to get the right output levels.

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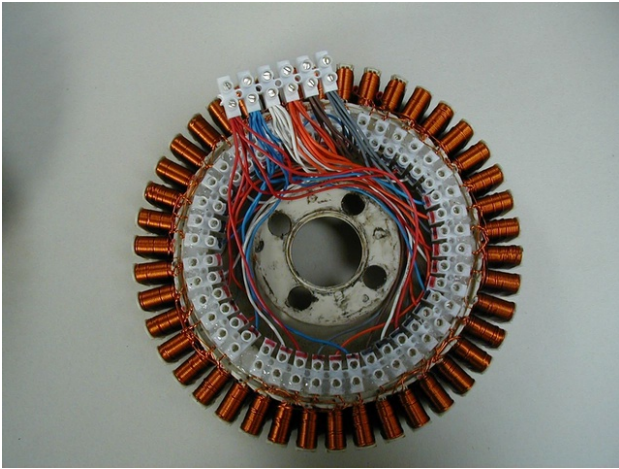
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Thats not my stator its a picture I found someplace online.  
Mine currently looks very similar.

After thinking about it awhile I decided to split the coils  
out into pairs. This gave me individual pairs that were .3  
ohms by my meter[s].

I built a test jig to hold the bearing assembly so I could  
test a coil pair in the drillpress at known RPMs. Following is  
the data I have so far:

One coil pair connected to a 35 amp bridge:

210 RPM:

No load

AC volts into bridge: 3.4 VAC

DC volts out of bridge: 2.9 VDC

1 ohm load on DC side of bridge:

AC volts into bridge: 3.1 VAC

DC volts out of bridge: 1.4 VDC

Amps into 1 ohm: 1.5 Amps DC.

305 RPM:

No load

AC volts into bridge: 5.4 VAC

DC volts out of bridge: 5.0 VDC

1 ohm load on DC side of bridge:

AC volts into bridge: 4.5 VAC

DC volts out of bridge: 2.5 VDC

Amps into 1 ohm: 2.7 Amps DC.

450 RPM:

No load

AC volts into bridge: 7.55 VAC

DC volts out of bridge: 7.0 VDC

1 ohm load on DC side of bridge:



AC volts into bridge: 5.6 VAC

DC volts out of bridge: 3.4 VDC

Amps into 1 ohm: 3.5 Amps DC.

900 RPM:

No load

AC volts into bridge: 14.3 VAC

DC volts out of bridge: 14.7 VDC

1 ohm load on DC side of bridge:

AC volts into bridge: 7.0 VAC

DC volts out of bridge: 5.0 VDC

Amps into 1 ohm: 5.5 Amps DC.

Remember, this is one pair of coils in one phase. There are 14 coils in 3 phases in this motor. It is reasonable to assume the voltage out for one phase times 7 will equal the phase output voltage if connected in series. Of course the current for an entire phase will not be more than the current from one coil.

Thats it for just now but I will update this as I get more data so check back if interested.

Cheers.

TomW

[Fisher and Paykel Tests](#) | 1 comment (1 topical, 0 editorial)

Re: Fisher and Paykel Tests ([none / 0](#)) ([#1](#))  
by EcoInnovation on Wed Sep 24th, 2003 at 02:01:25 AM  
MST  
([User Info](#))

Hi,

We tested these units about a year ago. There are 3 units in the series. I call them 100S, 80S and 60S. This relate to the approx' wire diameter in mm, 1.0mm, 0.8mm, 0.6mm. The picture is one of our my realier tries. We do it very differently today, you can make a annular copper ring and solder all the connections on, then cover in hot glue and do the necx annular ring. It is much tidier and quicker.

IF you want a copy of the test results I have then all on an excel file, just send me an email.

We get all the unit that FSP remove on their recycling line. Currently several hundred in stock. WeE sell them for around US\$150 delivered to your door including a manual on how to reconnect them. Ww include a new shaft and bearing assembly and it is machnied and fitted into a box section for easy mounting. For and extra \$50 we sell a de-cogged version which is made by machining the stator so that it is suitable for wind turbines. We have a 48 v model with a 1.5m prop upto 650 Watts aty the moment.

Regards

Michael

[Fisher and Paykel Tests](#) | 1 comment (1 topical, 0 editorial)

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Regards

Michael

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### [Don't you love engineering samples..](#)

By [TomW](#), Section [Diaries](#)

Posted on Fri Jul 18th, 2003 at 07:31:30 PM MST

[TomW's Diary](#)

DanB sent me this set of blades to play with.



This shows them pretty much as shipped except for the arbor I bolted to the hub.



That hub tube is one foot long and the center is 3/4 inch diameter with a keyway in it. I bolted a 5/8th inch arbor to it using a piece of rubber hose to shim between the bolt part of the arbor and the center hole on the hub tube.

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The blade stub mounting tube is 4.125 inches long and 1.060 inches diameter. The thickest part of the root airfoil is .450 inches and the root is 4.125 inches wide. The tip is 2 inches wide and .270 inches at its thickest. Total blade diameter is 7 feet 8 inches. The drop at the root is 1.25 inches which calculates out to 16 degrees of pitch with tips running flat.



Not sure what anyone else calls these but I have dubbed them The Fylon Blades

Too late today for much beyond the specs but I'll try to paint them tomorrow and stick them on a tape drive mill I have on my garage. We are in our lowest wind time of the year and in a low wind area anyway so I'm not expecting much until fall but will get them up anyway.

Oh, and after being painted and with an arbor installed the weigh in at slightly less than 4.5 #

Cheers.

TomW

[Don't you love engineering samples..](#) | 3 comments (3 topical, 0 editorial)



Re: Don't you love engineering samples.. ([none / 0](#)) ([#1](#))  
by DaveR on Sat Jul 19th, 2003 at 06:58:02 AM MST  
([User Info](#))

Hey Tom,

Where do you get your arbors from?

Thanks,

DaveR

Arbors: ([none / 0](#)) ([#2](#))  
by TomW on Sat Jul 19th, 2003 at 09:33:53 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

DaveR:

Well I got 1 from the local hardware store. They could not order more so I got 5 more from harbor freight.



The 5/8th inch one is here:

<http://www.harborfreight.com/cpi/ctaf/Displayitem.taf?itemnumber=46623>

The 1/2 inch one is here:

<http://www.harborfreight.com/cpi/ctaf/Displayitem.taf?itemnumber=46622>

And \$1.99 each from them and \$5 from hardware store. But after handling and shipping I think they were about \$4 each from harbor freight.

Cheers.

TomW

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Re: Arbors: ([none / 0](#)) ([#3](#))  
by DaveR on Sat Jul 19th, 2003 at 06:09:03 PM MST  
([User Info](#))

Thanks Tom. I have a Harbor Freight Store here locally...Great!

DaveR

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Re: Arbors: ([none / 0](#)) ([#3](#))  
by DaveR on Sat Jul 19th, 2003 at 06:09:03 PM MST  
([User Info](#))

Thanks Tom. I have a Harbor Freight Store here locally...Great!

DaveR

[ [Parent](#) ]

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Arbors: ([none / 0](#)) (#2)  
by TomW on Sat Jul 19th, 2003 at 09:33:53 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcespowr/>

DaveR;

Well I got 1 from the local hardware store. They could not order more so I got 5 more from harbor freight.



The 5/8th inch one is here:

<http://www.harborfreight.com/cpi/ctaf/Displayitem.taf?itemnumber=46623>

The 1/2 inch one is here:

<http://www.harborfreight.com/cpi/ctaf/Displayitem.taf?itemnumber=46622>

And \$1.99 each from them and \$5 from hardware store. But after handling and shipping I think they were about \$4 each from harbor freight.

Cheers.

TomW

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Re: Arbors: ([none / 0](#)) (#3)  
by DaveR on Sat Jul 19th, 2003 at 06:09:03 PM MST  
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## [Counter Rotating Dual Pinwheel Tapedrive Genny](#)

By [TomW](#), Section [Diaries](#)

[TomW's Diary](#)

Posted on Tue Jun 24th, 2003 at 06:16:34 PM  
MST

### Counter Rotating Dual Pinwheel Tapedrive Genny



Front view sitting on the bench fully assembled except for wiring and a tail.



Tape Drive Motor mounting and pivot detail. Yes that is an aluminum 4 foot level.

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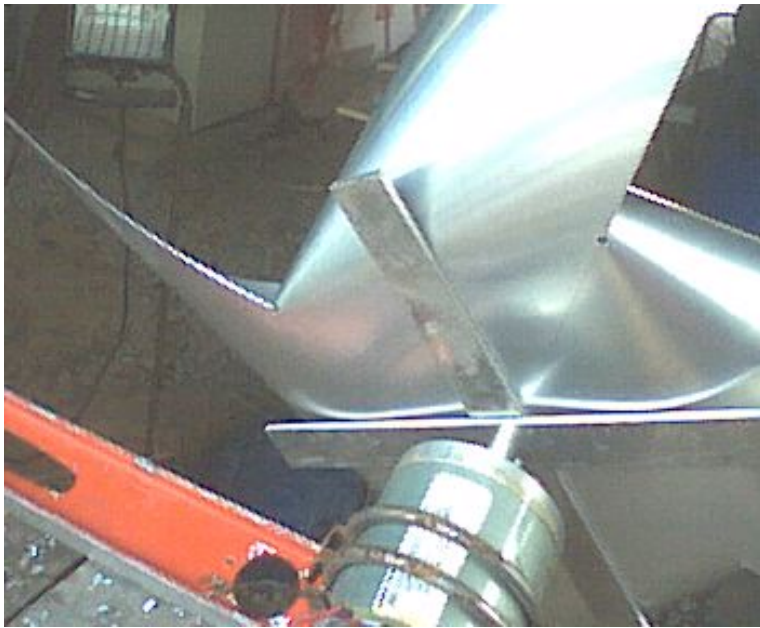
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Rear of pinwheel assembly showing the support pieces of aluminum strap.







More detail of pivot assembly attachment.



The far side which is just the same as the near side. The pinwheels rotate clockwise on the right hand one and counter clockwise on the left handed one. The side boom is 4 feet wide total with the pinwheels approximately 42 inches center to center.





Just one of the pinwheels close up.

Hopefully tomorrow I'll get the motors wired in series, a tail on it and up on the pole.

Cheers.

TomW

[Counter Rotating Dual Pinwheel Tapedrive Genny](#) | 3 comments (3 topical, 0 editorial)

Re: Counter Rotating Dual Pinwheel Tapedrive Genny ([none / 0](#)) (#1)  
by Demetri ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Wed Jun 25th, 2003 at 02:50:47 PM MST  
([User Info](#))

Just curious, why did you make them counter-rotating?  
Any special reason? I'm looking forward to the test results.

Demetri  
Always be the lead dog.

Re: Counter Rotating Dual Pinwheel Tapedrive Genny ([none / 0](#)) (#2)  
by TomW on Wed Jun 25th, 2003 at 04:24:53 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Demetri;

I think mostly because they use counter rotating shafts to keep things from getting harmonic vibration. Like in motorcycle engines and I believe props on opposite sides of a plane rotate opposite directions.

But then again, its always about the learning and I thought it would be cool.

It unscrewed one of the props due to the installer [me] not double checking nuts on the arbor. The CCW prop unscrewed itself very soon after the wind got up and I had to take it down. I was seeing some fair volts considering it was likely only half working.

Its currently on the bench getting put back together and I think in the end it will be a fair little unit.

Cheers.

TomW

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Re: Counter Rotating Dual Pinwheel Tapedrive Genny ([none / 0](#)) ([#3](#))  
by wiredup on Thu Jun 26th, 2003 at 09:59:55 AM MST  
([User Info](#))

hey tom neet idea.the work i have done with dual blade machines.says they keep good balance and look relly neet flying.have two, been up and running for ten years.no generator hooked to eaiter one just fun . pinwheels good idea adds another look.good job.....staples

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[Counter Rotating Dual Pinwheel Tapedrive Genny](#) | 3 comments (3 topical, editorial)

Re: Counter Rotating Dual Pinwheel Tapedrive Genny ([none / 0](#)) (#3)  
by [wiredup](#) on Thu Jun 26th, 2003 at 09:59:55 AM MST ([User Info](#))

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[Counter Rotating Dual Pinwheel Tapedrive Genny](#) | 3 comments (3 topical, 0 editorial)

Re: Counter Rotating Dual Pinwheel Tapedrive Genny ([none / 0](#)) (#2)  
by TomW on Wed Jun 25th, 2003 at 04:24:53 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Demetri;

I think mostly because they use counter rotating shafts to keep things from getting harmonic vibration. Like in motorcycle engines and I believe props on opposite sides of a plane rotate opposite directions.

But then again, its always about the learning and I thought it would be cool.

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Cheers.

TomW

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[Counter Rotating Dual Pinwheel Tapedrive Genny](#) | 3 comments (3 topical, editorial)

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by Demetri ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Wed Jun 25th, 2003 at 02:50:47 PM MST  
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### [Ponder This. \[very off topic\]](#)

By [TomW](#), Section [Diaries](#)

Posted on Tue Jun 24th, 2003 at 05:16:59 AM [TomW's Diary](#)  
MST

This whole anonymous hero thing points to consider:

Fellow board members:

Yes members, not the web wanderers seeking attention!

Just a few points I would like to share with you to hopefully assist you in seeing this "problem" for what it is.

Before, on the old board we had lots of non registered user posts and most were at least on topic with very few flame wars and personal attacks. The occasional piece of SPAM slipped onto the board but overall it was quite manageable.

Then we got featured in HomePower Magazine shortly after that we got mentioned on [HTTP://Slashdot.org](http://Slashdot.org) and by now I am fairly sure we are on the list of Scoop sites.

The trend I see is that we have gotten exposure from our success and that has drawn the lunatic fringe of web wanderers willing to disrupt any community type board simply for the attention it gets them. These people could care less for our passion for home brewed power but many intersperse their diatribe with cool pictures or snippets of ideas that do pertain to the community. The true reason for their [often unsigned] stories and comments has little or nothing to do with our stated purpose.

I submit that many have pulled this same stunt on many boards across the web. I, personally, have seen it on several boards. The pattern is unmistakable.

New people show up with a chip on their shoulder or at least a great desire to argue, generally off topic.

The community tries accommodation.

It does not work.

The argumentative newcomer claims censorship and call people Nazis.

The term Free Speech is thrown around without the necessary modifier responsible.

It causes a huge upheaval in the community and often the community loses good people who just don't want to hear it or be involved.

If allowed to continue the board becomes unusable to those who actually want the information it provides.

Bottom line is:

Lets not let this happen here.

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Nobody cares exactly who you are in real life but it is simply courteous to let us know who you are on this board because it contributes to the continuity of your dialog on the board.

Cheers.

TomW

[Ponder This. \[very off topic\]](#) | 10 comments (10 topical, 0 editorial)

Re: Ponder This. [very off topic] ([none / 0](#)) (#1)  
by Norm on Tue Jun 24th, 2003 at 09:56:23 AM MST  
([User Info](#))

Right on TomW, What bugs me the most when members fall for these wanderers argumenative comments or questions and answer back...feeding the flames...best way I always found was to just ignore, I've got better things to do in life, Still havin fun in NE Ohio! By the way what does that mean by Norm(on soon) (I can be kinda dense at times) :>) Norm.

Re: Ponder This. [very off topic] ([none / 0](#)) (#2)  
by TomW on Tue Jun 24th, 2003 at 10:27:35 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Norm;

Since you are me [according to some] seems redundant to reply to you but here we go:

By the way what does that mean by Norm(on soon)

I think it simply means that the timestamp is not set because you have not posted the comment or story. I could be wrong but its in the spot that would hold the date the comment was posted after you squeeze the trigger on it.

And thank you for your ongoing support in face of these disturbances. I could just as easily [oh, hell, it would be easier] let them win but while I can turn the other cheek at some point you run out and get tired of it.

You may have noticed I generally do not respond to any Anonymous posts lately which has kept me from commenting on some good stories, etc.

Hopefully we are back on an even keel with just normal disagreement over who has created the most watts feeding in, whose is bigger, better etc.



Cheers.

TomW

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Re: Ponder This. [very off topic] ([none / 0](#)) (#4)  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Tue Jun 24th, 2003 at 10:16:10 PM MST  
([User Info](#))

Is it me or does it seem like theres a lot of new people on the board?  
especially a lot of anonymous heros.  
-Andrew

[ [Parent](#) ]

Re: Ponder This. [very off topic] ([none / 0](#)) (#10)  
by Gorilla Boy ([NoSpam/gwmorris@fgisp.com](mailto:NoSpam/gwmorris@fgisp.com)) on Wed Jul 2nd, 2003 at 08:38:56 PM MST  
([User Info](#)) <http://www.livetheword.info>

It definitely seems like there are a lot of new people!

Be blessed! Gary  
[ [Parent](#) ]

Re: Ponder This. [very off topic] ([none / 0](#)) (#3)  
by Brian on Tue Jun 24th, 2003 at 05:30:15 PM MST  
([User Info](#))

I agree Tom. I'm sure you remember me as another Tom as well :-). After all the hub-bub here I decided to just ignore it as well. As others have said, it's not easy at times but it helps keep things under control. In my opinion you're doing a good job looking out for the best interests of the board. I look forward to the abolishment of the anonymous hero posts!! Have a good one, Brian.

Re: Ponder This. [very off topic] ([none / 0](#)) (#5)  
by troy on Wed Jun 25th, 2003 at 12:10:41 PM MST  
([User Info](#))

Dear TomW,

I am absolutely positively 100% with you on this one. And I have studiously aimed my nuclear powered ingnore gun on the foolish posts. Seems to be helping.

Good luck and keep having fun!

troy

Re: Ponder This. [very off topic] ([none / 0](#)) (#6)  
by Larsanderss ([larsanderss@brevet.nu](mailto:larsanderss@brevet.nu)) on Thu Jun  
26th, 2003 at 01:01:07 PM MST  
([User Info](#))

I seem to know to few words in english to say what i want..... I agree with You and am trying to ignore (not to be ignorant ??) stupidities and such. Like a lot of other people (i think) i want it all to go on in the nice and funny way without the flaming things.  
Thanks a lot to all who keep this going.

And at the end i must tell the world that my hot air solar experiment made a new record of 56°C (probably a lot of °F, who knows ??) in the air being blown into my washing machine room in the basement the other day. Just need to increase the size of the collector an the fan to have it going as something more than a experiment. This is one my wife actually likes.

Good evening

Lars A

[ [Parent](#) ]

Re: Ponder This. [very off topic] ([none / 0](#)) (#7)  
by hvirtane on Mon Jun 30th, 2003 at 07:57:17 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

I think that everybody, who posts here is looking for some kind of attention.  
Otherwise they wouldn't post at all?  
What is off limits depends on the opinions of different people.

While I'm thinking that some kind play, who makes more watts of magnets doesn't make much harm...  
I think that for developing new things limiting everything to that kind of game... will not kick much new out.

I agree that it is not an easy task to admin this kind of board.

One way to put things easy and simple would be to limit the discussion on the things, which have already been done and working.

But for visionary people that doesn't make much sense.  
Many good ideas have remained very theoretical for long times, before somebody had the resources and the interest to prove them.  
I think that visionary people, who are not doing much in practice are for these discussions important, too.

American culture is a very competitive and aggressive culture, so it is the case in my country, too.

Everybody can see, that too much competition is doing too much harm. It leads into violence easily. Concerning discussions it leads into flame wars easily. Often 'the winners' are suffering most.

I've got to know so many kinds of people that I'm tolerating quite a lot of rude behaviour, too. My English language ability is limited, so I can tolerate a lot in English. I just don't care, if people get stupid by their speaking. There are many kinds of language cultures, too. For example in India their English is often very polite even if their real behavior is very rude.

I just wanted to say that this kind of things need many kinds of people to be done.

Hannu Virtanen  
hvirtane@cc.jyu.fi

Re: Ponder This. [very off topic] ([none / 0](#)) ([#8](#))  
by John on Tue Jul 1st, 2003 at 03:35:23 AM MST  
([User Info](#))

I totally disagree with your first statement. What I see here is that most posts are:

- 1.) Asking for information,
- and,
- 2.) Freely giving information out of a sincere desire to provide accurate information to anyone who wants it.

So why do I post messages here? It certainly is not because I want attention, but rather it is to share information that I have accumulated through my life time. While I can not speak for others, I believe that many other posters feel the same way.

I'm not trying to start an argument, I just don't like being lumped into the category of "everybody".

Let's keep the knowledge flowing!

John  
[Toxin absorber/Pain reliever](#)  
[ [Parent](#) ]

Re: Ponder This. [very off topic] ([none / 0](#)) ([#9](#))  
by hvirtane on Tue Jul 1st, 2003 at 07:17:12 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

I agree with this that the main posts are:

- 
- 1.) Asking for information,
  - and,
  - 2.) Freely giving information out of a sincere desire to provide accurate information to anyone who wants it.
- 

But people, who post them want these messages to be read as well?

It is mainly a question of the definition of the concepts, if this is seeking 'attention'. My use of the English language is of course different of that of yours.

-----

I understand, I think, quite well the idea of the original author of this discussion. He is telling than in his opinion some of the users had 'a wrong attitude'.

That some users in his opinion are just trying to make themselves to be 'well-known'? And that they know too little to speak about the matters?

I think that concerning the cases, which I've seen it is not really true. I've seen that there have been many kinds of people, who post here. Some of them are young, some of them are a little bit older.

Some of them want to know something, which is already known, some of them want to invent even something new. Some of them are defending some quite crazy ideas strongly, some of them very sceptical about almost all.

I've been quite a long time involved in the fields of education. Sometimes doing research, sometimes teaching. Sometimes teaching young people, sometimes teaching old people, sometimes both of them at the same time. In my philosophy classes there have been at the same time people 75 years old and 16 years old. Some of them priests, some of them farmers, some of them school-teachers, some of them school boys. It isn't always so easy.

I've realized that different people, if we can find a way they can cooperate can do together a very good job. They can find really many viewpoints at the problems to be there for solving. I've realized that there is really many kinds of 'knowledge', which can be valuable.

I agree that administrating a website like this is a very difficult job. I've been administrating some systems myself.

In my opinion these people here administrating this site have been doing a very good job. They have found creative solutions for problems. I agree that 'Quarantine zone' is a good idea.

My opinion is that sometimes the most valuable ideas are coming out the mouths of people, who are considered to be quite crazy by conservative people. How more conservative people here can tolerate them,



I don't know, because I don't know the more conservative people here well.

I repeat here the text I've written once already:  
maybe most of the writings of Newton were about astrology, but his science wasn't that bad.  
Please don't think that everything coming from the computers of some people, who sometimes write something, which isn't so good, is stupid.

- Hannu Virtanen

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[Ponder This. \[very off topic\]](#) | 10 comments (10 topical, editorial)

Re: Ponder This. [very off topic] ([none / 0](#)) (#6)  
by Larsanderss ([larsanderss@brevet.nu](mailto:larsanderss@brevet.nu)) on Thu Jun 26th, 2003 at 01:01:07 PM MST  
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[Ponder This. \[very off topic\]](#) | 10 comments (10 topical, editorial)

Re: Ponder This. [very off topic] ([none / 0](#)) (#9)  
by hvirtane on Tue Jul 1st, 2003 at 07:17:12 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

I agree with this that the main posts are:

- 
- 1.)Asking for information,  
and,
- 2.)Freely giving information out of a sincere desire  
to provide acurate information to anyone who wants it.
- 

But people, who post them want these messages  
to be read as well?

It is mainly a question of the definition of the concepts,  
if this is seeking 'attention'. My use of the English  
language is of course different of that of yours.

-----

I understand, I think, quite well the idea of the original  
author of this discussion. He is telling than in his  
opinion some of the users had 'a wrong attitude'.

That some users in his opinion are just trying  
to make themselves to be 'well-known'?  
And that they know too little to speak  
about the matters?

I think that concerning the cases, which I've seen  
it is not really true. I've seen that there have been  
many kinds of people, who post here. Some of them are  
young, some of them are a little bit older.

Some of them want to know something, which  
is already known, some of them want to invent  
even something new. Some of them are defending  
some quite crazy ideas strongly, some of them  
very sceptical about almost all.

I've been quite a long time involved  
in the fields of education.  
Sometimes doing research, sometimes teaching.  
Sometimes teaching young people,  
sometimes teaching old people,  
sometimes both of them at the same time.  
In my philosophy classes there have been  
at the same time people  
75 years old and 16 years old.  
Some of them priests, some of them farmers,  
some of them school-teachers,  
some of them school boys.  
It isn't always so easy.

I've realized that different people, if we can find a way  
they can cooperate can do together a very good job.  
They can find really many viewpoints at the problems

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to be there for solving. I've realized that there is really many kinds of 'knowledge', which can be valuable.

I agree that administrating a website like this is a very difficult job. I've been administrating some systems myself.

In my opinion these people here administrating this site have been doing a very good job. They have found creative solutions for problems. I agree that 'Quarantine zone' is a good idea.

My opinion is that sometimes the most valuable ideas are coming out the mouths of people, who are considered to be quite crazy by conservative people. How more conservative people here can tolerate them, I don't know, because I don't know the more conservative people here well.

I repeat here the text I've written once already: maybe most of the writings of Newton were about astrology, but his science wasn't that bad. Please don't think that everything coming from the computers of some people, who sometimes write something, which isn't so good, is stupid.

- Hannu Virtanen

[Ponder This. \[very off topic\]](#) | 10 comments (10 topical, 0 editorial)



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[Ponder This. \[very off topic\]](#) | 10 comments (10 topical, 0 editorial)

Re: Ponder This. [very off topic] ([none / 0](#)) (#2)  
by TomW on Tue Jun 24th, 2003 at 10:27:35 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcespowr/>

Norm;

Since you are me [according to some] seems redundant to reply to you but here we go:

By the way what does that mean by Norm(on soon)

I think it simply means that the timestamp is not set because you have not posted the comment or story. I could be wrong but its in the spot that would hold the date the comment was posted after you squeeze the trigger on it.

And thank you for your ongoing support in face of these disturbances. I could just as easily [oh, hell, it would be easier] let them win but while I can turn the other cheek at some point you run out and get tired of it.

You may have noticed I generally do not respond to any Anonymous posts lately which has kept me from commenting on some good stories, etc.

Hopefully we are back on an even keel with just normal disagreement over who has created the most watts feeding in, whose is bigger, better etc.



Cheers.

TomW

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Re: Ponder This. [very off topic] ([none / 0](#)) (#4)  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Tue Jun 24th, 2003 at 10:16:10 PM MST  
([User Info](#))

Is it me or does it seem like theres a lot of new people on the board?  
especially a lot of anonymous heros.  
-Andrew

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Re: Ponder This. [very off topic] ([none / 0](#))  
([#10](#))  
by Gorilla Boy ([No Spam/gwmorris@fgisp.com](#)) on Wed Jul 2nd, 2003 at 08:38:56 PM MST  
([User Info](#)) <http://www.livetheword.info>

It definitely seems like there are a lot of new people!

Be blessed! Gary  
[ [Parent](#) ]

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[Ponder This. \[very off topic\]](#) | 10 comments (10 topical, editorial)

Re: Ponder This. [very off topic] ([none / 0](#)) (#10)  
by Gorilla Boy ([No Spam/gwmorris@fgisp.com](mailto:No Spam/gwmorris@fgisp.com)) on Wed  
Jul 2nd, 2003 at 08:38:56 PM MST  
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[Ponder This. \[very off topic\]](#) | 10 comments (10 topical, 0 editorial)

Re: Ponder This. [very off topic] ([none / 0](#)) (#5)  
by troy on Wed Jun 25th, 2003 at 12:10:41 PM MST  
([User Info](#))

Dear TomW,

I am absolutely positively 100% with you on this one. And I have studiously aimed my nuclear powered ingnore gun on the foolish posts. Seems to be helping.

Good luck and keep having fun!

troy

Re: Ponder This. [very off topic] ([none / 0](#)) (#6)  
by Larsanderss ([larsanderss@brevet.nu](mailto:larsanderss@brevet.nu)) on Thu Jun 26th, 2003 at 01:01:07 PM MST  
([User Info](#))

I seem to know to few words in english to say what i want..... I agree with You and am trying to ignore (not to be ignorant ??) stupidities and such. Like a lot of other people (i think) i want it all to go on in the nice and funny way without the flaming things.  
Thanks a lot to all who keep this going.

And at the end i must tell the world that my hot air solar experiment made a new record of 56°C (probably a lot of °F, who knows ??) in the air being blown into my washing machine room in the basement the other day. Just need to increase the size of the collector an the fan to have it going as something more than a experiment. This is one my wife actually likes.

Good evening

Lars A

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[Ponder This. \[very off topic\]](#) | 10 comments (10 topical, 0 editorial)

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[Ponder This. \[very off topic\]](#) | 10 comments (10 topical, editorial)

Re: Ponder This. [very off topic] ([none / 0](#)) (#3)  
by Brian on Tue Jun 24th, 2003 at 05:30:15 PM MST  
([User Info](#))

I agree Tom. I'm sure you remember me as another Tom as well :-). After all the hub-bub here I decided to just ignore it as well. As others have said, it's not easy at times but it helps keep things under control. In my opinion you're doing a good job looking out for the best interests of the board. I look forward to the abolishment of the anonymous hero posts!! Have a good one, Brian.

[Ponder This. \[very off topic\]](#) | 10 comments (10 topical, 0 editorial)

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[Ponder This. \[very off topic\]](#) | 10 comments (10 topical, editorial)

Re: Ponder This. [very off topic] ([none / 0](#)) (#1)  
by Norm on Tue Jun 24th, 2003 at 09:56:23 AM MST  
([User Info](#))

Right on TomW, What bugs me the most when members fall for these wanderers augumenative comments or questions and answer back...feeding the flames...best way I always found was to just ignore, I've got better things to do in life, Still havin fun in NE Ohio! By the way what does that mean by Norm(on soon) (I can be kinda dense at times) :>) Norm.

Re: Ponder This. [very off topic] ([none / 0](#)) (#2)  
by TomW on Tue Jun 24th, 2003 at 10:27:35 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Norm;

Since you are me [according to some] seems redundant to reply to you but here we go:

By the way what does that mean by Norm(on soon)

I think it simply means that the timestamp is not set because you have not posted the comment or story. I could be wrong but its in the spot that would hold the date the comment was posted after you squeeze the trigger on it.

And thank you for your ongoing support in face of these disturbances. I could just as easily [oh, hell, it would be easier] let them win but while I can turn the other cheek at some point you run out and get tired of it.

You may have noticed I generally do not respond to any Anonymous posts lately which has kept me from commenting on some good stories, etc.

Hopefully we are back on an even keel with just normal disagreement over who has created the most watts feeding in, whose is bigger, better etc.



Cheers.

TomW

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Re: Ponder This. [very off topic] ([none / 0](#))  
(#4)  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Tue  
Jun 24th, 2003 at 10:16:10 PM MST  
([User Info](#))

Is it me or does it seem like theres a lot of new  
people on the board?  
especially a lot of anonymous heros.  
-Andrew

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Re: Ponder This. [very off topic]  
([none / 0](#)) (#10)  
by Gorilla Boy ([No  
Spam/gwmorris@fgisp.com](#)) on Wed Jul  
2nd, 2003 at 08:38:56 PM MST  
([User Info](#)) <http://www.livetheword.info>

It definitely seems like there are a lot of  
new people!

Be blessed! Gary  
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[Ponder This. \[very off topic\]](#) | 10 comments (10 topical, editorial)

Re: Ponder This. [very off topic] ([none / 0](#)) (#4)  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Tue Jun 24th, 2003 at 10:16:10 PM MST  
([User Info](#))

Is it me or does it seem like theres a lot of new people on the board?  
especially a lot of anonymous heros.  
-Andrew

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Re: Ponder This. [very off topic] ([none / 0](#)) (#10)  
by Gorilla Boy ([No Spam/gwmorris@fgisp.com](mailto:No Spam/gwmorris@fgisp.com)) on Wed Jul 2nd, 2003 at 08:38:56 PM MST  
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Be blessed! Gary  
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[Ponder This. \[very off topic\]](#) | 10 comments (10 topical, editorial)

Re: Ponder This. [very off topic] ([none / 0](#)) (#8)  
by John on Tue Jul 1st, 2003 at 03:35:23 AM MST  
([User Info](#))

I totally disagree with your first statement. What I see here is that most posts are:

- 1.) Asking for information, and,
- 2.) Freely giving information out of a sincere desire to provide accurate information to anyone who wants it.

So why do I post messages here? It certainly is not because I want attention, but rather it is to share information that I have accumulated through my life time. While I can not speak for others, I believe that many other posters feel the same way.

I'm not trying to start an argument, I just don't like being lumped into the category of "everybody".

Let's keep the knowledge flowing!

John  
[Toxin absorber/Pain reliever](#)  
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[Ponder This. \[very off topic\]](#) | 10 comments (10 topical, 0 editorial)

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[Diaries... What are they good for...](#)

By [TomW](#), Section [Diaries](#)

Posted on Fri Jun 20th, 2003 at 04:01:39 AM MST [TomW's Diary](#)

Absolutely Nothin.. Unless you use them that is...

I know a lot of folks on the board are still getting used to this new place we have here. I have visited a lot of Scoop sites over the years so I am used to it as a web log.

Tonight I just want to pose the question:

Why don't more of you folks use the diary area?

Its a good place to post your most recent thoughts and pictures of your windmill or cat or whatever you like. If you have been reading these diary entries of mine you know I mostly share my experiments successful or not in these entries. I also have posted a lot of the data I collected here off the main page where some folks may never see it.

So I am encouraging those of you who may feel their story is not suitable for the main discussion area to post that stuff to your diary. Questions, comments, ideas, whatever you want. It is a great place to submit your thoughts and things that may not "fit" the front page.

Personally, I prefer posting to my diary rather than the front page and if you want to follow what I am doing this is the place to do it.

Cheers.

TomW

[Diaries... What are they good for...](#) | 3 comments (3 topical, 0 editorial)

Re: Diaries... What are they good for... ([none / 0](#)) (#1)  
by Junkie ([madscientist@blownup.com](mailto:madscientist@blownup.com)) on Fri Jun 20th, 2003 at 08:21:45 AM MST  
([User Info](#)) <http://www.akuma.dsl.pipex.com/chris>

When I come here I just look at the 'front page' that shows all the recent postings. I don't see any reason to post in a diary since thats just another section, same as all the others like 'Homebrewed electricity'. And a diary post will get lost the same way as all the other posts do so I dont see any reason to post a diary, unless its off topic ? -Chris

Re: Diaries... What are they good for... ([none / 0](#)) (#2)  
by Norm on Sun Jun 22nd, 2003 at 01:41:53 PM MST  
([User Info](#))

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I find it quite refreshing to come to this section and discover that we're all here to have fun sharing our successes and failures....laughing with each about our stupid mistakes...like me gluing in a starter magnet upside down (well...I thought they came in pairs! one north pole and one south pole! and some of us have dogs. then some of us have kids and wives that don't seem to understand making windmills that do something useful ( why don't you make cute little windmills like the neighbors have?We already have electricity!) Havin' fun in NE Ohio! (:>) Norm.

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Re: Diaries... What are they good for... ([none / 0](#))  
([#3](#))  
by Wolfie1 on Wed Jun 25th, 2003 at 06:46:44 AM MST  
([User Info](#))

Tom, since ADMIN call this a diary area, I would have thought that it would work like a physical diary. Each person was one diary page and they post what they are up to at the moment.

I personally think that the post that DanB has been doing with the building of the new windmill should go here while anything that is a question should go on the discussion side of the board.

If I kept a real physical diary, I would expect someone else other than me to put entries in it. Now other people may have comments, questions or just bravos about anything posted in someone else's diary but that, I think, should be kept physically separate from the diary itself.

Now to keep things practical, when you select someones diary, there should be a limit on how far back it fetches on one page but something could be worked out.

Look at the weblogs (blogs) model. That's how I would like to see the diaries work.

Martin.

[Diaries... What are they good for...](#) | 3 comments (3 topical, 0 editorial)

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[Diaries... What are they good for...](#) | 3 comments (3 topical, editorial)

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by Norm on Sun Jun 22nd, 2003 at 01:41:53 PM MST ([User Info](#))

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[Diaries... What are they good for...](#) | 3 comments (3 topical, editorial)

Re: Diaries... What are they good for... ([none / 0](#)) (#3)  
by [Wolfie1](#) on Wed Jun 25th, 2003 at 06:46:44 AM MST ([User Info](#))

Tom, since ADMIN call this a diary area, I would have thought that it would work like a physical diary. Each person was one diary page and they post what they are up to at the moment.

I personally think that the post that DanB has been doing with the building of the new windmill should go here while anything that is a question should go on the discussion side of the board.

If I kept a real physical diary, I would expect someone else other than me to put entries in it. Now other people may have comments, questions or just bravos about anything posted in someone else's diary but that, I think, should be kept physically separate from the diary itself.

Now to keep things practical, when you select someones diary, there should be a limit on how far back it fetches on one page but something could be worked out.

Look at the weblogs (blogs) model. That's how I would like to see the diaries work.

Martin.

[Diaries... What are they good for...](#) | 3 comments (3 topical, 0 editorial)

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[Diaries... What are they good for...](#) | 3 comments (3 topical, 0 editorial)

Re: Diaries... What are they good for... ([none / 0](#)) (#1)  
by Junkie ([mads scientist@blowup.com](mailto:mads scientist@blowup.com)) on Fri Jun 20th, 2003 at 08:21:45 AM MST  
([User Info](#)) <http://www.akuma.dsl.pipex.com/chris>

When I come here I just look at the 'front page' that shows all the recent postings. I don't see any reason to post in a diary since thats just another section, same as all the others like 'Homebrewed electricity'. And a diary post will get lost the same way as all the other posts do so I dont see any reason to post a diary, unless its off topic ? -Chris

Re: Diaries... What are they good for... ([none / 0](#)) (#2)  
by Norm on Sun Jun 22nd, 2003 at 01:41:53 PM MST  
([User Info](#))

I find it quite refreshing to come to this section and discover that we're all here to have fun sharing our sucesses and failures....laughing with each about our stupid mistakes...like me gluing in a starter magnet upside down (well...I thought they came in pairs! one north pole and one south pole! and some of us have dogs. then some of have us have kids and wives that don't seem to understand making windmills that do something useful ( why don't you make cute little windmills like the neighbors have?We already have electricity!) Havin' fun in NE Ohio! (:>) Norm.

[ [Parent](#) ]

[Diaries... What are they good for...](#) | 3 comments (3 topical, 0 editorial)

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### [Crossflow VAWT tinkering](#)

By [TomW](#), Section [Diaries](#)

Posted on Mon Jun 16th, 2003 at 08:29:15 AM MST [TomW's Diary](#)

I slapped this together over the last couple of days...



Above we see the frontal view showing the main components. Two 30 volt tape drive motors [TDM] as a top and bottom generator-bearing combination. Rough sawn oak frame with plywood wing ribs and 4 mm corrugated plastic skin.



This is a closeup of the high tech TDM mounting setup.

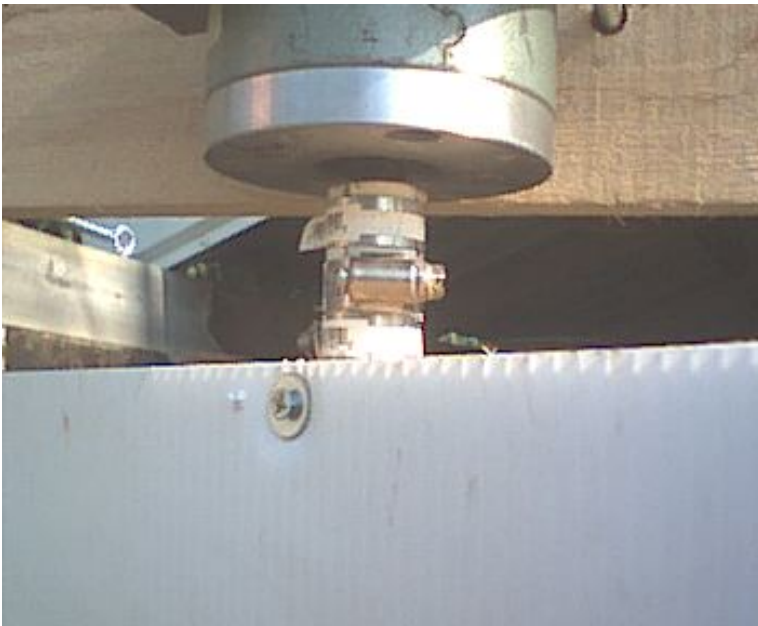
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Here you can see the 5/8th tdm shaft to 3/4" pvc coupling i made by sawing 2 cuts into the PVC and shoving the motor shaft into it with a shim of plastic flex tubing and clamping it with good old hose clamps.

I learned a lot while putting this together. For one thing the plastic does not conform well one way but does OK the other. One side is much smoother than the other. PVC is cheap and easy to work with but too flexible for a final unit.

It has an alignment issue with the 2 motor / bearings which I will look into today.

Its dimensions on the wing are 2 foot diameter by 2 foot tall. I know it needs multiple wings to self start and that is the plan eventually. Typical for me this is a mockup and test of the basic idea and to find building pitfalls before trying a full size 3 wing unit.

Cheers.

TomW

[Crossflow VAWT tinkering](#) | 6 comments (6 topical, 0 editorial)

Re: Crossflow VAWT tinkering ([none / 0](#)) ([#1](#))  
by RogerAS ([rogeras@cei.net](mailto:rogeras@cei.net)) on Mon Jun 16th, 2003 at  
09:04:18 AM MST  
([User Info](#))

Hi TomW,

Are the motors wired in series to get up to charging voltage? I mean it seems a VAWT would be spinning way too slow, or am I missing something?

I've been playing around with the idea of a VAWT for some time, but getting an RPM high enough to make useable electricity seems to be a quest.

Just curious,  
RogerAS

"Put the bunny back in the box!"

Re: Crossflow VAWT tinkering ([none / 0](#)) (#2)  
by TomW on Mon Jun 16th, 2003 at 09:29:07 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Roger;

Well those motors are just bearings now. Not wired at all. However, my plan is to wire them in series in the real unit. Furthermore I have a pair of 40 volt TDMs and they have 2 sets of brushes in parallel that are 90 degrees apart on the commutator. I was toying with the idea of rigging the 2 sets of brushes in series internally to get more volts per rpm per TDM and perhaps series the outputs of those.

These TDMs do get to charge volts about 300 RPM so it is within the realm of reality to get them going fast enough to charge with a small diameter and tall vawt.

My wind situation is so poor that I have decided that HAWTs are never going to work for me here so I have shifted from HAWT to VAWT research. There is a guy from France "trentman" who constructed the full size one from picoturbines plans and he has gotten good output from the purpose built genny on it. His is 4 feet in diameter and 6 feet tall or more. Maybe I can convince him to post about it here.

Pictures of his are available online too:

<http://op.servepics.com/cgi-bin/album.pl?album=trentman>

More info on the wing construction is available in a PDF I got from Picoturbine.com:

<http://www.picoturbine.com/pt250-blade-plan10A.pdf>

Cheers.

TomW

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Re: Crossflow VAWT tinkering ([none / 0](#)) (#3)  
by RogerAS ([rogeras@cei.net](mailto:rogeras@cei.net)) on Mon Jun 16th,  
2003 at 03:09:11 PM MST  
([User Info](#))

TomW,

I'm in the same boat with low wind speeds. Except for a few months in winter we in the Ozarks are breeze challenged!:-)

I have 6 of those plastic 55 gallon drums and a good set of pillow block bearings. Since I'm blessed with an abundance of tall straight hardwoods I think I could easily build a tower. One thing that has me sorta confused is the plates the wing (drum) halves are mounted to. How does one assure the flatness? I mean without really stiff material wouldn't the whole thing wobble pretty bad?

Anyway, I'm really interested in this project. Keep us posted!

RogerAS  
"Put the bunny back in the box!"  
[ [Parent](#) ]

Re: Crossflow VAWT tinkering ([none / 0](#))  
(#4)  
by TomW on Mon Jun 16th, 2003 at 03:24:22 PM MST  
([User Info](#))  
<http://oneota.net/~earthsourcepowr/>

Roger;

If you mean the ribs that the skin is attached to I think stiffness may be an issue but once secured the skin stiffens it a lot. I used a snug hole and cross pinned the wings to the "drive" shaft through the plywood wing ribs with screws.

The original picoturbine plans call for 4 angle brackets per rib to connect it to the shaft. I just pinned it and i think its plenty strong enough for a 2 foot unit.

You need to realize that as size increase stress on components go up exponentially too.

Cheers.

TomW

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Re: Crossflow VAWT tinkering ([none / 0](#))  
(#5)  
by hvirtane on Mon Jun 16th, 2003 at 03:41:16 PM MST  
([User Info](#))  
<http://www.cc.jyu.fi/~hvirtane/cooker/>

Hi,

there are good books available concerning Savonius rotors made of drums.

One of the best is:  
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'PicoTurbine Deluxe Windmill Plans' text is a good one. Available from  
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- Hannu

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Re: Crossflow VAWT tinkering ([none](#) / [0](#)) ([#6](#))  
by troy on Wed Jun 18th, 2003 at 09:09:44 AM MST  
([User Info](#))

A single set of 55 gal drum halves will give you good torque, but will be a little slow on RPM's. One of the main factors that affect rpms on a savonius is the aspect ratio (height/width). A tall skinny savonius will go a lot faster than a short square one of the same frontal area. Of course, if you stack three drums, your aspect ratio also goes up proportionally.

If you guys come up with a good low wind design, I'd think real hard about building one, as Indiana is also wind challenged.

Best Regards,

troy

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Re: Crossflow VAWT tinkering ([none / 0](#)) ([#4](#))  
by TomW on Mon Jun 16th, 2003 at 03:24:22 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Roger;

If you mean the ribs that the skin is attached to I think stiffness may be an issue but once secured the skin stiffens it a lot. I used a snug hole and cross pinned the wings to the "drive" shaft through the plywood wing ribs with screws.

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You need to realize that as size increase stress on components go up exponentially too.

Cheers.

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Re: Crossflow VAWT tinkering ([none / 0](#)) (#5)  
by hvirtane on Mon Jun 16th, 2003 at 03:41:16 PM  
MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

Hi,

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Savonius rotors made of drums.

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- Hannu

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(#6)  
by troy on Wed Jun 18th, 2003 at 09:09:44  
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by troy on Wed Jun 18th, 2003 at 09:09:44 AM MST  
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Re: Crossflow VAWT tinkering ([none / 0](#)) (#4)  
by TomW on Mon Jun 16th, 2003 at 03:24:22 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Roger;

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[Just because we had to know..](#)

By [TomW](#), Section [Diaries](#)

Posted on Fri Jun 13th, 2003 at 08:50:46 AM MST [TomW's Diary](#)

**More fooling around with different small blade stuff follows**

When I'm not spending my time disrupting the smooth flow of dissenting opinions here on OtherPower I actually do get in some wind power related testing and experimenting. Heres the latest unsuccessful skirmish using 4 inch cedar lap siding:



Thats 4 inch cedar lap siding mounted at 23 degrees to the hub with a bit of rounding on the leading edge. No taper and 3 feet per blade and about 6.5 feet total prop diameter.

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While it spins in a very light breeze it is another blade setup that lacks top end for charging.



Once again this is actually my buddy Lanes thing. He had been looking at a Bergey 1KW mill [XL. 1 I think] and he was curious about its apparent lack of twist. He tossed these on one of my old JerryBlade hubs to see if it worked at all. And, like I mentioned, they work at some level but have low and limited rpm.

Can anyone explain just how Bergey makes those blades work? I have never seen them myself yet but Lane says they have no twist and what looks to be a constant profile.

Cheers.

TomW

[Just because we had to know..](#) | 5 comments (5 topical, 0 editorial)

Re: Just because we had to know.. ([none / 0](#)) ([#1](#))  
by troy on Fri Jun 13th, 2003 at 10:28:02 AM MST  
([User Info](#))

Glad to know you haven't been entirely sucked into the vortex of board politics.

In a driven rotor (as opposed to a propeller) lack of twist will make the rotor hard to start with a good top end, or poor at the top end with good starting characteristics.

Or they can split the difference and get so so starting with so so top end, and definitely not as good as a set of twisted blades.

Unless of course it's some variable pitch hub or one of those magic blades that are thin in just the right places so that as wind speed goes up, they deform into a better attitude.

Good luck and especially, keep having fun.

troy

Re: Just because we had to know.. ([none / 0](#)) (#2)  
by funkeytut42211 on Sat Jun 14th, 2003 at 08:12:29 AM MST  
([User Info](#))

Always love to see a experment. I think the big problem with this blade is the 23 degree angle more than anything. Jerrys blades are now something in the area of half that and they work really well. 23 degree is great for start up but have too much drag to go very fast.

Re: Just because we had to know.. ([none / 0](#)) (#3)  
by Norm on Sat Jun 14th, 2003 at 03:56:43 PM MST  
([User Info](#))

Do you suppose you could use a reinforcing metal strap the length of each blade about 3" wide and 3/16 thick or whatever it takes, where you could twist the strap enough where it would stay twisted at the proper angle when you screwed or bolted it to the wood siding? (Actually there are a few good woodworkers out there that know how to twist and bend wood like it were plastic!) I've always thought myself that it was a lot of work to just shape a prop, let alone put a twist in it as you go along, It wouldn't have to be so thick in the first place, if you could twist it afterwards.Norm.

Steam Bending ([none / 0](#)) (#4)  
by TomW on Sun Jun 15th, 2003 at 04:38:37 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Norm;

I looked into steam bending and it might be a way to go except for the little fact that softwoods do not accept steam bending according to my research.

Tests on some pine I had on hand show that for boards that thickness about a half hour in live steam softens them enough to get a nice twist. All well and good. However, after sitting awhile after they dry the boards straighten back to near the original shape.

I did not really expect these to actually work and it was just more "what if..?" stuff.

One day I need to just get something that works for my crazy wind situation. Here I think that means a VAWT and thats my current project to get a clone of the picoturbine crossflow Vawt working using a couple tape drive motors as top and bottom bearings.

Cheers.

TomW

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steam bending ([none / 0](#)) (#5)  
by Norm on Sun Jun 15th, 2003 at 03:26:13 PM MST  
([User Info](#))

The wood has to be clamped in position and slightly overtwisted (trial and error to determine the correct amount, just like everything else in this crazy, but fun game!)then it has to remain clamped until dry, I suppose, to be truthful I'm just drawing a logical conclusion from what I've read no experience except from watching some of my plywood squares that I had get wet and seen them twist into all kinds of unwanted shapes! (:>) Norm.

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steam bending ([none / 0](#)) (#5)  
by Norm on Sun Jun 15th, 2003 at 03:26:13 PM MST  
([User Info](#))

The wood has to be clamped in position and slightly overtwisted (trial and error to determine the correct amount, just like everything else in this crazy, but fun game!) then it has to remain clamped until dry, I suppose, to be truthful I'm just drawing a logical conclusion from what I've read no experience except from watching some of my plywood squares that I had get wet and seen them twist into all kinds of unwanted shapes! (:>) Norm.

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Re: Just because we had to know.. ([none / 0](#)) (#2)  
by [funkeytut42211](#) on Sat Jun 14th, 2003 at 08:12:29 AM MST  
([User Info](#))

Always love to see a experment. I think the big problem with this blade is the 23 degree angle more than anything. Jerrys blades are now something in the area of half that and they work really well. 23 degree is great for start up but have too much drag to go very fast.

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Steam Bending ([none / 0](#)) (#4)  
by TomW on Sun Jun 15th, 2003 at 04:38:37 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Norm;

I looked into steam bending and it might be a way to go except for the little fact that softwoods do not accept steam bending according to my research.

Tests on some pine I had on hand show that for boards that thickness about a half hour in live steam softens them enough to get a nice twist. All well and good. However, after sitting awhile after they dry the boards straighten back to near the original shape.

I did not really expect these to actually work and it was just more "what if..?" stuff.

One day I need to just get something that works for my crazy wind situation. Here I think that means a VAWT and thats my current project to get a clone of the picoturbine crossflow Vawt working using a couple tape drive motors as top and bottom bearings.

Cheers.

TomW

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Re: Just because we had to know.. ([none / 0](#)) ([#1](#))  
by troy on Fri Jun 13th, 2003 at 10:28:02 AM MST  
([User Info](#))

Glad to know you haven't been entirely sucked into the vortex of board politics.

In a driven rotor (as opposed to a propeller) lack of twist will make the rotor hard to start with a good top end, or poor at the top end with good starting characteristics.

Or they can split the difference and get so so starting with so so top end, and definitely not as good as a set of twisted blades.

Unless of course it's some variable pitch hub or one of those magic blades that are thin in just the right places so that as wind speed goes up, they deform into a better attitude.

Good luck and especially, keep having fun.

troy

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### [Yet another Pinwheel.](#)

By [TomW](#), Section [Diaries](#)

Posted on Wed Jun 4th, 2003 at 12:28:40 AM MST

[TomW's Diary](#)

Well Lane was here again and after a fun day yesterday we had to try another pinwheel spinner.



Thats a 6 foot diameter blade on a 40 volt tape drive motor. It spins in very light breezes but seems lame at any high speed but no real wind to test it either. Rule #1

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- <http://www.otherpower.com/images/scimages/4/MOV01653.MPG>
- [TomW's Diary](#)



These 2 are shots of our high tech, mobile test facility.







Bottom line is it starts easy runs slow and is too flimsy. We had a good time and it was a learning experience and we have ideas on a 3 foot or so 2 blade pinwheel.

Heres an mpeg file of it actually ripping along at 3 or 4 rpm:

<http://www.otherpower.com/images/scimages/4/MOV01653.MPG>

Cheers.

TomW

[Yet another Pinwheel.](#) | 4 comments (4 topical, 0 editorial)

On to another design? ([none / 0](#)) ([#1](#))

by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Wed Jun 4th, 2003 at 04:43:00 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

I never took the pinwheel to such heights. The main reason they slow turning is because of the bulky leading edge. This causes lots of drag. If this could be worked down a bit it might make a reasonably efficient prop. One idea that came to mind ( never tried it ) was to install an aluminum tube for the main structure of the wing and wrap the aluminum sheet around the tube forming a less bulky leading edge and adding structure to the wing. Sort of forming a "," shape(comma shape- you know what it looks like if you write it). They would be vulnerable to stress cracking which there are a few of those on mine. I get antsy to build another one so if it made a couple years use without any problems there would be another in it's place shortly after. I like to see new idea's good bad or indifferent... I especially like to see the really strange ones... I have a few of those

Lots of Fun!

Ed

R&D ([none / 0](#)) ([#2](#))

by TomW on Wed Jun 4th, 2003 at 06:37:47 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Ed;

Reck n Destroy.

Well, that 2 blade one did not survive the night with the awesome 8 or 9 mph gusts we had.

Way too much flex and it actually folded forward on itself and had developed several stress cracks around rivets. A couple of spots had problems from being against a square edge a known problem I think.

I'm looking at several other options including an actual formed wing shape with foam injected but im kinda slow with limited ability and none in metal working. Plus that gets away from "pinwheel" and into "formed metal blade" territory.

The most successful version so far is the standard 4 blade pinwheel shape. I'm thinking on a way to do 3 blades. Its mostly the fun and anything learned is icing on the cake.

Cheers.

TomW

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Sounds interesting.... ([none / 0](#)) ([#3](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Wed Jun 4th, 2003 at  
06:49:26 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Foam injection sounds interesting, I've cut a few sections of foam with a homemade cutter ( basically an "E" string off a guitar stretched between a couple dowels and a battery). Cuts some nice airfoils. Keep us posted on the foam injection stuff... sounds fun!

Withdrawl's... getting weak... need... windpower..

Have Fun!  
Ed

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Re: Yet another Pinwheel. ([none / 0](#)) ([#4](#))  
by Norm on Sun Jun 8th, 2003 at 07:01:15 AM MST  
([User Info](#))

A couple of weeks ago I was thinking about the aerodynamics of a pinwheel and the feasibility of using it to drive a generator and here it is ...I should have known it's probably just a coincidence...but still seems weird, well anyhow, I'm thinking with reinforcing along the edges some epoxy and a lot of pop rivets it would really fly! Great job ! Real neat!  
Norm.

[Yet another Pinwheel.](#) | 4 comments (4 topical, 0 editorial)

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Sounds interesting.... (none / 0) (#3)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Wed Jun 4th, 2003 at 06:49:26 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

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Have Fun!  
Ed

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R&D ([none / 0](#)) (#2)  
by TomW on Wed Jun 4th, 2003 at 06:37:47 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Ed;

Reck n Destroy.

Well, that 2 blade one did not survive the night with the awesome 8 or 9 mph gusts we had.

Way too much flex and it actually folded forward on itself and had developed several stress cracks around rivets. A couple of spots had problems from being against a square edge a known problem I think.

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Cheers.

TomW

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by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Wed Jun 4th, 2003 at 06:49:26 PM MST  
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## [Aluminum Sheet Pinwheel](#)

By [TomW](#), Section [Diaries](#)

Posted on Mon Jun 2nd, 2003 at 05:53:05 PM  
MST

[TomW's Diary](#)

My friend Lane [Pythos for you IRC folks] stopped out and slapped together this pinwheel that we attached to an ac fan motor for a bearing.

---

The material is .008 inch thick [yes 8 thousandths] aluminum sheet that is 2 feet by 3 feet. He cut one sheet down to 2 foot square and cut and folded it into a pinwheel that he attached to the motor.



Here it is. The pinwheel measures about 34 inches tip to tip on the points.

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Here is Lane doing duty as a tower. This thing actually spins up pretty well and seems to zip right along.



This was simply a prototype "will it work?" exercise. The only support is a 1 & 1/8 inch diameter quarter inch plywood disc behind the center. This allows a lot of flex and the blade was tending to rub on the mounting hardware for the motor. It had a tendency to rotate from any air movement including walking with it in the air.

As you can see one of the "wings" got pretty distorted right away but we know what the problem is and have a solution.

Maybe more another day.

Cheers.

TomW

[Aluminum Sheet Pinwheel](#) | 4 comments (4 topical, 0 editorial)

Tips on the pinwheel ([none / 0](#)) (#1)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon Jun 2nd,  
2003 at 07:01:59 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Hi Tom,

Here are some tips on keeping it going. I built one 3 years ago and found it to be quite flimbsy. I added a square piece behind the pinwheel and riveted it together. Added 2 large fender washers to the front mount. Make a crease in the trailing edge of each blade ( bend it at about 3 or 4 degrees ) about 3/4 inch in.

So far mine has been up for 3 years and has been through some pretty heavy storms with 60+ mph winds. It has a threaded rod through a piece of tubing that has been greased twice now... its still going. I've attached it to a couple generators and a few homemade alternaotors for testing and you'd be surprised at the power you will get from it. Mine came out to 27 inches tip to tip. It will make 50 watts in a 30 mph wind... not super efficient but its torky. Mine runs at a TSR of just over 2... I'll have to get a picture of the old wreck. Lots of Fun!!!

Ed

Thanks, Ed ([none / 0](#)) (#2)  
by TomW on Tue Jun 3rd, 2003 at 06:38:29 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Ed;

Thanks for the feedback. I was going to try a paint can lid as a stiffener for the backside of the pinwheel mostly because I have one around.

Just curious what material and thickness yours is built from? And by "crease" you mean like the little bends they put in ductwork to stiffen the sides of a plenum? I've seen them do those with a screwdriver and "score" the piece of sheetmetal in an X shape.

Cheers.

TomW

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Pinwheel ([none / 0](#)) (#3)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Tue Jun  
3rd, 2003 at 08:17:15 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Here is a picture of the pinwheel

<http://www.otherpower.com/images/scimages/15/front.JPG>

<http://www.otherpower.com/images/scimages/15/back.JPG>

I couldn't figure out how to do the IMG SCR thing so hopefully you can click on the links

The back shows the aluminum plate I used as a stiffener and the front shows the crease in the trailing edge as well as the washers in the center. It was a fun project... quick and simple

Have Fun  
Ed

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Cool ([none / 0](#)) (#4)  
by TomW on Tue Jun 3rd, 2003 at 08:40:37 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Ed;

Funny how the simplest things can actually work.

We were thinking of a 2 blade version but it has not clarified itself just how to do it.

Thanks for the pictures.

Cheers.

TomW

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## [JerryBlade modifications and Tape Drive Motors](#)

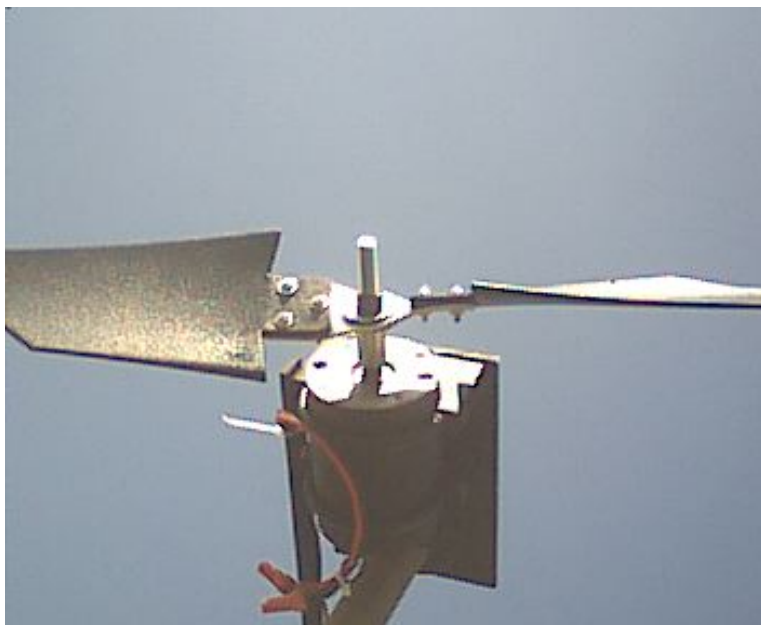
By [TomW](#), Section [Diaries](#)

[TomW's Diary](#)

Posted on Sun May 25th, 2003 at 04:51:43 PM MST

Another installment in the TDM genny saga.

This is the hub. It consists of a 5/8th motor Arbor adaptor: a piece of 1/8th inch 2 inch wide aluminum strap about 6 inches long. and 2 jerryblades. The root angle is 23 degrees and they are 48 inches in diameter.



This shows the shape i cut into the original blades:

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Preliminary results are that these run faster at a given windspeed over the stock JerryBlade or either of the other 2 mods I have tried.

The entire blade and hub assembly weighs 1.5 pounds which I like.

Cheers.

TomW

[JerryBlade modifications and Tape Drive Motors](#) | 3 comments (3 topical, 0 editorial)

New Blade Mods ([none / 0](#)) (#1)  
by Jerry on Sun May 25th, 2003 at 11:25:05 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Tom I'll try this again? I had thought about trying something like what you done in this new mod just never found the time. I was thinking about a gentle sweep from the tip and the out to the trailing edge. Kinda of an arch rather than straight back then over but I've never tryed it and it sounds like your works very well. Could you give us some dementions? size and shap of tip,width at severall station and at what point to cut over to the trailing edge? PS Tom thanks for your help getting me going here. JK TAS Jerry

[Airheads Page](#)

New blade mods ([none / 0](#)) (#2)  
by Jerry on Sun May 25th, 2003 at 11:29:42 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

PS Tom What kinda increas have you gained with these mods? JK TAS Jerry

[Airheads Page](#)

Observations ([none / 0](#)) (#3)  
by TomW on Mon May 26th, 2003 at 10:39:47 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Jerry;

So glad we could get you on the new board I know I really appreciate your input on a regular basis.

Right now its all by observation and my observations are that it runs faster than either stock or mike modded but its still rough with no knife edge on that trailing edge. I'll measure it later on for the precise dimensions of the cuts.

It was just what looked good and I free handed the first one with a razor knife and just copied it on the second.

The measurements from memory are 1.5" wide at tip with leading edge left stock. I started that radius from the root about 7" out from the point on the root section edge the radius is smooth from there to 1/2 the width of the blade at like 14 inches. then tapered to 1.5 inches on the tip.

I am fairly certain that the trailing edge being rough is impeding performance some. I don't have accurate measurement gear hooked up but we have reported 8 mph winds and mounted on my truck in the field putting out 20 volts from that 30 volt tape drive motor and will do 4 amps into a short before it slows down to a crawl. Diameter is 48" and they weigh 1.5 pounds including the arbor.

I am confident that dressing the trailing edge to a

knife edge would improve performance a lot because it wooshes while spinning. A slight radius on the tips might improve performance also.

Still got 8 blades to play with to see if these thinner blades can be gotten up to higher rpms for these tape drive motors at lower wind speeds.

Have you tried cutting these blades with a hot wire cutter or other means besides saw and razor knife?

Cheers.

TomW

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### [Online Rights the myth](#)

By [TomW](#), Section [Diaries](#)

Posted on Mon May 12th, 2003 at 08:33:42 AM MST

[TomW's Diary](#)

Ok I'm just going to address this whole censorship and "rights" thing here once so any morons or understanding challenged folks in the group should read very carefully.

Assuming you were born and raised in the USA you have grown up with a right to free speech. That right is not without limitations. You may not invoke this "right" to slander another person, yell fire in a crowded theater, stand on a street corner shouting profanity, etc. Your right to free speech is by necessity a right to responsible speech.

Also, as with any right, your rights end where mine begin.

However your freedom of speech does not apply beyond public spaces. Once you enter a private dwelling or place of business the owner of that place may enforce any rules or regulations they desire regulating behaviour or speech they feel appropriate.

Now here is the part some do not seem to understand:

The internet, and most of its component parts are operated on private equipment. bandwidth and finances. Guess what? Your freedom of speech does not exist on the internet beyond the level it is granted by the owners of the resource you are using.

So, as surprising as it may be to some, those who run this place have an absolute right to allow or disallow anything they want be it reasonable in our eyes or not. Right, wrong or indifferent thats how it is. Lucky for all of us this board is run by even tempered, laid back folks.

Well thats how it really is please feel free to show where I am wrong.

Cheers.

TomW

[Online Rights the myth](#) | 9 comments (9 topical, 0 editorial)

Way to go Tom ! ([none](#) / [0](#)) ([#1](#))  
by [Dave B](#) on Mon May 12th, 2003 at 11:14:08 AM MST  
([User Info](#)) <http://www.madbbs.com/users/bruggelog>

If "they" abuse their right to use the off topic quarantine section and you get tired of moving it there, move them right off the board. The Admin. has been more than fair. Thank you. Dave B.

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"censorship" ([none / 0](#)) (#3)  
by troy on Mon May 12th, 2003 at 04:05:04 PM MST  
([User Info](#))

Dear Tom and admin,

I really value this board for all the expertise, wisdom and humor that everyone supplies as a group. In my humble opinion, the admin has shown a great balance between allowing for the occasion interesting off topic or controversial post, but still willing to draw the line in the sand when people (not pointing any fingers at anybody in particular) get wacko.

I'm not sure if everyone realizes how good this discussion board is. There are lots of them out there that are not well regulated/edited, and it's painful to participate for very long.

Keep up the terrifically good work,

troy

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Right on Tom ([none / 0](#)) (#2)  
by Old F on Mon May 12th, 2003 at 03:48:13 PM MST  
([User Info](#)) <http://www.oldf.homestead.com>

You wont hear an argument out of me on this one Tom I agree 100% : )

That why they call it (HOSTING) a site. That makes us guests until we wear out are welcome.

Old F

Couldn't have said it better, Tom. ([none / 0](#)) (#4)  
by Electric Ed on Mon May 12th, 2003 at 09:08:03 PM MST  
([User Info](#)) <http://www.electric-ed.com>

I agree 100% with Tom and the others on this.

I have seen other discussion boards taken over by the "lunatic fringe" and hope this is not what we are seeing the beginning of here.

Ed

Well put, well put! ([none / 0](#)) (#5)  
by Demetri ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Mon May 12th, 2003 at 11:21:02 PM MST  
([User Info](#))

Always be the lead dog.

Pretty cool... ([none / 0](#)) ([#6](#))  
by TomW on Fri May 16th, 2003 at 12:55:58 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Before I posted this diary I wondered if it would set off another flamewar.

It didn't and with 5 comments in support I must admit its one of those firsts for me. First time all responders actually agree with me on my interpretation of something political in nature.

So thanks to Dave B, Troy, Old F, Demitri and Elevtric Ed for the kind words of support. And now on with the show...

Cheers.

TomW

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Also agreeing ([none / 0](#)) ([#7](#))  
by Larsanderss ([larsanderss@brevet.nu](mailto:larsanderss@brevet.nu)) on Tue May 20th, 2003 at 12:26:28 PM MST  
([User Info](#))

I see no problems with having "potentially interesting stuff" in its own zone..... I think everyone using this (or the old one) board should show some appreciation instead of beeing rude or behave like small children.....

Good evening Lars A

Heartily Agree, and well spoken, Tom! ([none / 0](#)) ([#8](#))  
by xeroid ([centurion27@lycos.com](mailto:centurion27@lycos.com)) on Thu Jun 5th, 2003 at 10:43:40 AM MST  
([User Info](#))

I really appreciate your intelligent and clear explanation of freedom of speech, in it's proper context. Too many people "claim" that right in order to belch out profanity, ignorance and nonsense. Thanks for setting the record straight, Tom.

Regards,

Xeroid.

Re: Online Rights the myth ([none / 0](#)) (#9)  
by elvin1949 ([elvin1949@wmconnect.com](mailto:elvin1949@wmconnect.com)) on Fri Jun  
13th, 2003 at 08:03:55 AM MST  
([User Info](#))

AMEN

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[Online Rights the myth](#) | 9 comments (9 topical, editorial)

Re: Online Rights the myth ([none / 0](#)) ([#9](#))  
by [elvin1949](#) ([elvin1949@wmconnect.com](mailto:elvin1949@wmconnect.com)) on Fri Jun 13th, 2003 at 08:03:55 AM MST  
([User Info](#))

AMEN

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Well put, well put! ([none / 0](#)) ([#5](#))  
by Demetri ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Mon May 12th, 2003 at 11:21:02 PM MST  
([User Info](#))

Always be the lead dog.

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Couldn't have said it better, Tom. ([none / 0](#)) (#4)  
by Electric Ed on Mon May 12th, 2003 at 09:08:03 PM  
MST  
([User Info](#)) <http://www.electric-ed.com>

I agree 100% with Tom and the others on this.

I have seen other discussion boards taken over by the "lunatic fringe" and hope this is not what we are seeing the beginning of here.

Ed

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## [Jerry Blades a Tape Drive Motor means a mill in a day.](#)

By [TomW](#), Section [Diaries](#)

[TomW's Diary](#)

Posted on Sat Apr 12th, 2003 at 02:54:12 PM MST

This is my latest quickie project. I started on it yesterday and its spinning today in what the wind map says is a 6 mph breeze.

---

### Parts needed:

3 Mike Modded JerryBlades.

some aluminum scrap.

1. 8" aluminum pulley.
1. 30 volt Ametek Tape Drive Motor [TDM].
1. 3/4 inch floor flange.
1. 6 inch 3/4 pipe nipple.
2. 4 inch muffler clamps

a small pile of 10-24 screws and washers / nuts.



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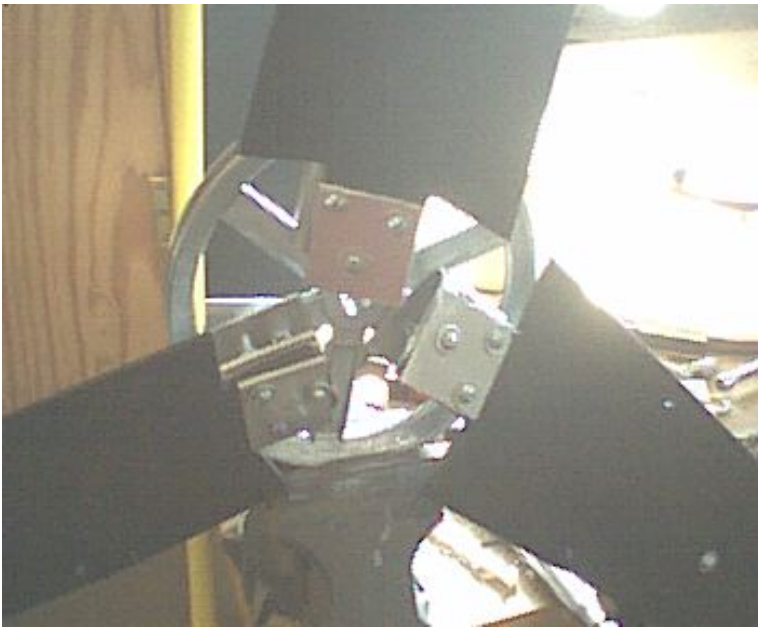
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[Jerry Blades a Tape Drive Motor means a mill in a day.](#) | 7 comments (7 topical, 0 editorial)

TDM ([none / 0](#)) (#1)

by [wiredup](#) on Tue Apr 15th, 2003 at 12:41:56 PM MST  
([User Info](#))

hi tom are you able to keep 12 volt batteries charged up and at what wind speed does it take.thanks

Charge rates ([none / 0](#)) (#2)

by [TomW](#) on Wed Apr 16th, 2003 at 10:14:23 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Wiredup;

Well I don't have an anemometer so everything is by what wind maps say was happening,

I can get 6 volt "trickle" charge at around 9 mph winds. Thats around 250 milliamps or so [.25 Amps].

In gusts reportedly to 28 MPH I was seeing bursts up into the 3 to 5 amp range into fairly charged up [12.5 volts] 400 AH of batteries @ 12 volts. It seems to be able to sustain a steady amp+ in around 15 MPH.

It is no powerhouse but it seems to do OK all things considered, price, effort, location, etc.

This particular mill is mostly "proof of concept" type stuff and I have been more concerned with mechanical function than logging charge rates.

Yesterday my improvised balancing scheme of duct taped lead bullets to the pulley shucked a weight and went violently out of balance in the 45 mph gusts we had. I shut her down, locked the prop and this morning brought it into the shop. No damage but it sounded like a jackhammer when it was unbalanced. I will be tweaking it for some other issues like pivot point balance and rebalancing the blades in a more permanent fashion today.



Output Amps VS RPM data on these motors is in one of my other diary entries if interested.

Cheers.

TomW

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Help ([none / 0](#)) (#3)

by no1redraidersfan on Fri Apr 25th, 2003 at 01:26:52 PM MST  
([User Info](#))

Do you have any suggestions on how to make a wind power generator out of raw materials, but I get the motor and gears. The fan blade is 18 inches diameter and the axis of rotation is 11 to 12 inches above table level. Please help me and if you have any web sites or suggestions (would be better) this would be great for school project not high budget. Its for a school project so not as big as yours. Thanks joe

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mouse time is a good thing:) ([none / 0](#)) (#4)

by kurt on Fri Apr 25th, 2003 at 11:02:38 PM MST  
([User Info](#))

<http://www.otherpower.com/toymill.html>

[http://www.otherpower.com/otherpower\\_experiments.html](http://www.otherpower.com/otherpower_experiments.html)



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Liked your website ([none / 0](#)) (#5)

by Techstuf on Sat Apr 26th, 2003 at 04:17:36 PM MST  
([User Info](#))

Liked the website there Tom! Some real good hands on YE going on! Your idea of the Uncoil was intriguing, I see what you mean. I recall seeing something vaguely similar in some old patents. Let me know and I will get them to you in PDF format.

Peace,

TS out

Thanks. ([none / 0](#)) ([#6](#))  
by TomW on Wed Apr 30th, 2003 at 10:00:35 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

TS;

Thanks for the compliment on my site! It is falling behind lately as I am doing more and documenting less with nice weather.

As far as the uncoil goes its one of those "looks good on paper" things that doesn't really work as expected. Marty over on IRC did some tests and it did not give much if any improvement over standard coils in his tests. I can't find the link just now but if i find it i'll post it for you.

Cheers.

TomW

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Found uncoil link ([none / 0](#)) ([#7](#))  
by TomW on Wed Apr 30th, 2003 at 10:14:55 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

TS;

Its over here:

<http://www.martysplace.bravepages.com/uncoils.htm>

Cheers.

TomW

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Found uncoil link ([none / 0](#)) (#7)  
by TomW on Wed Apr 30th, 2003 at 10:14:55 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

TS;

Its over here:

<http://www.martysplace.bravepages.com/uncoils.htm>

Cheers.

TomW

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by [wiredup](#) on Tue Apr 15th, 2003 at 12:41:56 PM MST  
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Help ([none / 0](#)) (#3)

by no1redraidersfan on Fri Apr 25th, 2003 at 01:26:52 PM MST  
([User Info](#))

Do you have any suggestions on how to make a wind power generator out of raw materials, but I get the motor and gears. The fan blade is 18 inches diameter and the axis of rotation is 11 to 12 inches above table level. Please help me and if you have any web sites or suggestions (would be better) this would be great for school project not high budget. Its for a school project so not as big as yours. Thanks joe

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mouse time is a good thing:) ([none / 0](#)) (#4)

by kurt on Fri Apr 25th, 2003 at 11:02:38 PM MST  
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<http://www.otherpower.com/toymill.html>

[http://www.otherpower.com/otherpower\\_experiments.html](http://www.otherpower.com/otherpower_experiments.html)



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by TomW on Wed Apr 30th, 2003 at 10:14:55 AM MST  
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## Tape Drive Motor Data

By [TomW](#), Section [Diaries](#)

Posted on Thu Apr 3rd, 2003 at 07:57:19 AM MST

[TomW's Diary](#)

Well I seem to be in a go through my notes mode on this windy rainy day. So I am posting some more output data I have compiled.

I bought a pair of 30 volt Ametek Tape Drive Motors [TDM] from Silicon Salvage in California. \$20 each, plus shipping, of course.

Shortly after I got them I ran output tests on one and built a quickie mill with the other.

I chucked the motor into my drill press and ran it thru a stud mount diode to 220 AH of 12 volt batteries that were at 12.9 volts.

RPM	Open Volts	Amps	Watts into 12.9 volts
210.	9.8V	0	0W
305.	13.5V	< 1A	< 12W
450.	18.2V	1.0A	13W
530.	24.6V	2.2A	28.4W
900.	41.0V	3.6A	46.4W

I didn't test above 900 RPM.

These are nice, compact motors with a 5/8" shaft and are sealed and have extremely nice bearings in them.

add a tail boom a tail a prop and a diode and you have a mill capable of up to 40 watts at attainable rpm.

Cheers.

TomW



[Tape Drive Motor Data](#) | 7 comments (7 topical, 0 editorial)

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TDM ([none / 0](#)) ([#1](#))

by wiredup on Tue Apr 15th, 2003 at 12:48:38 PM MST  
([User Info](#))

hi tom i have removed the stock magnets and replaced them with 4 #29s nearly doubled yhe volts have you ever done anything like that.if so would you post results. thanks

no, I have not ([none / 0](#)) ([#2](#))

by TomW on Wed Apr 16th, 2003 at 12:24:55 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

However, We have discussed this over on IRC more than once. I am just better off putting together off the shelf parts to do non standard things than mechanically modifying things.

I believe JimU is going to do it one of these days.

Did you realise the #29 is no longer available?

Cheers.

TomW

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#29s ([none / 0](#)) ([#3](#))

by wiredup on Thu Apr 17th, 2003 at 10:05:29 AM MST  
([User Info](#))

hi tom didnt know about the #29s glade i got 10 extra. there is no mods needed, they go right in where the old ones come outi didnt even glue mine down they held so tight and matched the curve so well. i may try the 50 volt next. have fun and thanks for all the info. P.S. those cup you have on things you keep.well they look a little to full to be catchin any wind, haha.

[ [Parent](#) ]

Sorry didn't understand ... ([none / 0](#)) ([#4](#))

by TomW on Thu Apr 17th, 2003 at 01:56:22 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>



What you meant by:

P.S. those cup you have on things you keep.well they look a little to full to be catchin any wind, haha.

But i am a bit thick today with a flu virus or ??

Cheers.

TomW

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stuff i have online ([none / 0](#)) (#5)  
by wiredup on Thu Apr 17th, 2003 at  
09:26:29 PM MST  
([User Info](#))

do you think these would make good rotor cups

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ahh.... ([none / 0](#)) (#6)  
by TomW on Fri Apr 18th, 2003 at  
05:16:15 AM MST  
([User Info](#))  
<http://oneota.net/~earthsourcepowr/>

Hah told you i was thick that day.

hmm not normal for a man to forget something like that but I have a lot of stuff out there and I am a bit of an absent minded professor type at times.

Cheers.

TomW

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NEW.. 40 Volt TDM Data ([none / 0](#)) (#7)  
by TomW on Thu Apr 24th, 2003 at 08:54:28 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Got my 40 volt TDMs in yesterday. Chucked one in the drillpress for some tests. Here are the results:

Nominal 12 volt charging into 440 AH of batteries @12.1 volts

RPM Open Volts Amps into 12.1V Watts

210.	7.5V	0	0W
305.	11.4V	0A	0W
450.	16V	1A	~12W
530.	22V	3.1A	~37W
900.	28V	5.2A	~63W

Nominal 6 volt charging into 220 AH of batteries @6.05 volts

RPM Open Volts Amps into 6.05V Watts

210.	7.5V	.25A	1.5W
305.	11.4V	1.25A	7.5W
450.	16V	3A	~18W
530.	22V	5.4A	~32W
900.	28V	7A	~42W

Well these numbers are quite interesting. I expected higher voltages at lower rpm but that was not the case.

What appears to be the case is it produces better current lower in the range and actually outperforms the 30 volt motors for 6 volt charging and has a better top end performance curve. It looks to be producing 25% more than the 30 volt motor @ 900 rpm!

Cheers.

TomW

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[Tape Drive Motor Data](#) | 7 comments (7 topical, 0 editorial)

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[Tape Drive Motor Data](#) | 7 comments (7 topical, editorial)

NEW.. 40 Volt TDM Data ([none / 0](#)) (#7)  
 by TomW on Thu Apr 24th, 2003 at 08:54:28 AM MST  
 ([User Info](#)) <http://oneota.net/~earthsourcespowr/>

Got my 40 volt TDMs in yesterday. Chucked one in the drillpress for some tests. Here are the results:

Nominal 12 volt charging into 440 AH of batteries @12.1 volts

RPM	Open Volts	Amps into 12.1V	Watts
210.	7.5V	0	0W
305.	11.4V	0A	0W
450.	16V	1A	~12W
530.	22V	3.1A	~37W
900.	28V	5.2A	~63W

Nominal 6 volt charging into 220 AH of batteries @6.05 volts

RPM	Open Volts	Amps into 6.05V	Watts
210.	7.5V	.25A	1.5W
305.	11.4V	1.25A	7.5W
450.	16V	3A	~18W
530.	22V	5.4A	~32W
900.	28V	7A	~42W

Well these numbers are quite interesting. I expected higher voltages at lower rpm but that was not the case.

What appears to be the case is it produces better current lower in the range and actually outperforms the 30 volt motors for 6 volt charging and has a better top end performance curve. It looks to be producing 25% more than the 30 volt motor @ 900 rpm!

Cheers.

TomW

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[Tape Drive Motor Data](#) | 7 comments (7 topical, editorial)

stuff i have online ([none / 0](#)) (#5)  
by wiredup on Thu Apr 17th, 2003 at 09:26:29 PM MST  
([User Info](#))

do you think these would make good rotor cups

[ [Parent](#) ]

ahh.... ([none / 0](#)) (#6)  
by TomW on Fri Apr 18th, 2003 at 05:16:15 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Hah told you i was thick that day.

hmm not normal for a man to forget something like that but I have a lot of stuff out there and I am a bit of an absent minded professor type at times.

Cheers.

TomW

[Stuff I have Online](#)

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[Tape Drive Motor Data](#) | 7 comments (7 topical, 0 editorial)

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### [Treadmill Motor Data](#)

By [TomW](#), Section [Diaries](#)

Posted on Thu Apr 3rd, 2003 at 06:59:26 AM MST

[TomW's Diary](#)

I bought one of those BG Micro Treadmill Motors some time ago for like \$20. I didn't get a chance to do any testing with it til earlier this week.

---

This is what I found by chucking it into my drillpress.

Into 440 AH of 12 volt batteries that were @ 11.9 volts:

RPM, Open Volts, Amps

210. , 4.63V     0A  
305. , 7.2V,     0A  
530. , 13.3V,    2A  
900. , 18.0V,    3.9A

All in all about the same output curve as a 30 volt Tape Drive Motor [TDM] for the same money but with an open frame motor and that funky worm drive shaft. The TDM seems better suited to outside life and has a standard 5/8 shaft.

I'll be posting the Tape Drive Motor Data I have soon too so keep looking back in.

Cheers.

TomW



[Treadmill Motor Data](#) | 0 comments (0 topical, 0 editorial)

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## [Some fresh blade pics to look at](#)

By [TomW](#), Section [Diaries](#)

[TomW's Diary](#)

Posted on Sun Mar 30th, 2003 at 10:50:17 AM MST

Been working with bobn over on IRC designing and carving a 3 blade prop for my Tape Drive Motor gennies.

These are made from 64" of 1X6 pine for each 30" blade. Thats one 30", one 22" and one 12" piece stacked as shown in ther raw blank on one side in the pics.

I'll comment them at a later time but for now some raw pics to laugh at:



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blades ([none / 0](#)) (#1)

by Dondos ([docmd@sympatico.ca](mailto:docmd@sympatico.ca)) on Wed Apr 2nd, 2003 at 12:53:20 PM MST  
([User Info](#))

New to the site, did you ever try drawing a pattern for your blades on a 45 gallon drum and cutting them out .A guy out of Peterborough Ontario told me this years ago.By gaging the thickness of the barrel you control the weight and apparently they have the almost perfect pitch.

Nice ([none / 0](#)) (#2)

by hvirtane on Wed May 7th, 2003 at 05:31:19 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

They look good.

which kind of profile did you use?

which kind of tools did you use to make them?

- Hannu

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[NACA 0012 airfoil sections for sale](#)

By [TomW](#), Section [Classifieds](#)

Posted on Sun Oct 19th, 2003 at 04:16:23 PM MST

[Wind](#)

NACA 0012 airfoil sections

My IRC pal "thefoot" pointed out this little item which might be useful to some:

Aluminum Airfoil Extrusion measuring 2.73 x .33 inches (6.93 x .84 cm). NACA 0012.

<http://www.mtmscientific.com/airfoil.html>

Just passing it on.

Cheers.

TomW

[NACA 0012 airfoil sections for sale](#) | 0 comments (0 topical, 0 editorial)

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## [Step by Step Photo Uploading /Use on OP](#)

By [TomW](#), Section [Rants & Opinion](#)

[Scoop](#)

Posted on Sun Mar 30th, 2003 at 08:19:33 AM MST

I try to demystify photo uploading and use.

First and foremost log in

Then on the right in one of those textboxes there should be one with your nickname [username] in it. In that box is an option "Your Photo Uploads".

Click on "Your Photo Uploads" and then you can follow the directions to uploiad the photo or file to your upload area.

Ok now the photo is uploaded to an area on the www.fieldlines.com server where anyone can access it from the internet.

All fine and good.

Finally we get to actually use that photo in a posting.

From the front page or perhaps others on the right again select "Submit Posting" from the menu.

Once that page loads you should see a box on the right for "user Files". Use the pulldown menu to select which of your files to use click the button to insert it into the message.

Simple as that.

Much easier to do than explain. Cheers. TomW

[Step by Step Photo Uploading /Use on OP](#) | 1 comment (1 topical, 0 editorial)

Re: Step by Step Photo Uploading /Use on OP ([none / 0](#)) ([#1](#))  
by [elvin1949](#) ([elvin1949@wmconnect.com](mailto:elvin1949@wmconnect.com)) on Thu Jun 19th, 2003 at 08:33:43 PM MST  
([User Info](#))

tomw  
thanks  
like the dummy i am  
i PRINTED IT OUT  
later  
elvin1949

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[Any way to ?](#)

By [TomW](#), Section [Rants & Opinion](#)

Posted on Sat Mar 29th, 2003 at 03:04:29 PM MST

[Scoop](#)

Make this look like the old board?

I would appreciate a method to just see the links for the stories without the intro text. Any way to do it? Kinda so it looked similar to the old board.

[Any way to ?](#) | 2 comments (2 topical, 0 editorial)

Re: old board ([1.00 / 1](#)) ([#1](#))  
by Anonymous Hero on Sat Mar 29th, 2003 at 07:04:59 PM MST

I agree. The old one wasn't broke.

I disagree ([none / 0](#)) ([#2](#))  
by TomW on Sat Mar 29th, 2003 at 07:13:29 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

The old board is seriously flawed with a crappy search setup and its going to simply burst from the load.

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## [Wind Generator Parts and Excess salvage](#)

By [TomW](#), Section [Classifieds](#)

[Wind](#)

Posted on Thu Mar 20th, 2003 at 08:40:58 AM MST

I have a fairly large [and growing] pile of salvaged components such as relays, FETs, diodes, transformers and bridge rectifiers.

Lots of stuff that has useful life in it eventually gets disposed of because i cannot use it all myself. I also get some used sealed lead acid batteries in the smaller sizes that become available sporatically.

I would be happy to send these supplies to folks who would actually use them for the cost of shipping.

The stock changes as items come in and go out. There would be no guarantee other than the parts will be shipped.

I can look for specific items in my salvage stream too.

Respond here if interested.

Sorry but i will be limiting this offer to active members of the OP board.

[Wind Generator Parts and Excess salvage](#) | 9 comments (9 topical, 0 editorial)

batterys ([none / 0](#)) (#2)

by [kurt](#) on Sun Mar 23rd, 2003 at 04:26:21 PM MST ([User Info](#))

i'm in need of a small battery to play with i will catch you on irc



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- [More on Wind](#)
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Wind Generator Parts and Excess Salvage ([none / 0](#))  
(#3)

by Gorilla Boy ([No Spam/gwmorris@fgisp.com](mailto:No Spam/gwmorris@fgisp.com)) on Sun  
Mar 30th, 2003 at 08:14:50 PM MST  
([User Info](#)) <http://www.livetheword.info>

What state do you live in?  
Be blessed! Gary

shipping? ([none / 0](#)) (#4)

by Gorilla Boy ([No Spam/gwmorris@fgisp.com](mailto:No Spam/gwmorris@fgisp.com)) on Mon  
Mar 31st, 2003 at 08:20:16 PM MST  
([User Info](#)) <http://www.livetheword.info>

I was asking because of the shipping. I live in East Texas  
and would drive a ways (100-150 miles) if it was worth it  
(shipping less or more). Gary  
Be blessed! Gary

Be a long drive ([none / 0](#)) (#5)

by TomW on Mon Mar 31st, 2003 at 09:16:06 PM  
MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Im about 300 miles from the canadian border on the  
Mississippi River 52001 zip code. Check my Contact  
link below to email me.

Tom

[Stuff I have Online](#)

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Yep! That's a fer piece! ([none / 0](#)) (#6)

by Gorilla Boy ([No  
Spam/gwmorris@fgisp.com](mailto:No Spam/gwmorris@fgisp.com)) on Mon Mar 31st,  
2003 at 09:23:21 PM MST  
([User Info](#)) <http://www.livetheword.info>

Let me see if I can come up with a wish list.  
May take a week or so.

Be blessed! Gary  
[ [Parent](#) ]

Your in Dubuque? ([none / 0](#)) (#10)

by Anonymous Hero on Sun May 11th, 2003  
at 10:35:46 PM MST

I'm in dubuque.....i went to hugh's wind workshop in April. talk to you later... Jim

[ [Parent](#) ]

parts ([none / 0](#)) (#7)  
by Ramblyr on Tue Apr 1st, 2003 at 05:53:59 AM MST  
([User Info](#)) <http://www.windgeny.com>

Is that close to Iowa?

yaep ([none / 0](#)) (#8)  
by TomW on Tue Apr 1st, 2003 at 08:15:38 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepower/>

Yaep;

Its close to Illinois, Iowa, Minnesota, Wisconsin, Missouri, Kentucky and several other states I forgot the geography of south of the Mason Dixon Line.

Cheers.

TomW

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Life ([none / 0](#)) (#9)  
by Seth on Tue Apr 1st, 2003 at 08:05:45 PM MST  
([User Info](#))

OK.. i could always use partz Love good partz.....

[Wind Generator Parts and Excess salvage](#) | 9 comments (9 topical, 0 editorial)

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[Rectifier usage](#) | 6 comments (6 topical, editorial)

Re: Rectifier usage ([1.00 / 1](#)) ([#1](#))  
by drdongle on Thu Oct 30th, 2003 at 05:57:02 PM MST  
([User Info](#))

The term Rectifier denotes a diode designed for high power applications.  
Dr.D

[Rectifier usage](#) | 6 comments (6 topical, 0 editorial)

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[Rectifier usage](#) | 6 comments (6 topical, editorial)

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by drdongle on Thu Oct 30th, 2003 at 05:57:02 PM MST  
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The term Rectifier denotes a diode designed for high power applications.  
Dr.D

Others have rated this comment as follows:

[TomW](#) 1

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[Can I charge a sealed lead acid with this?](#) | 5 comments (5 topical, editorial)

Re: Can I charge a sealed lead acid with this? ([1.00 / 1](#)) (#1)  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Thu Aug 21st, 2003 at 04:48:51 PM MST  
([User Info](#))

Probably,  
1 amp is pretty large for a 17ah. It should work. Do two things before trying. First, get a voltmeter and measure the output of the charger. It should be between 13.6 and 14 volts. Second, Is your charger current controlled? If it is, your in luck, but if not, I would not leave the battery unattended during charging. Sometimes they can force the charger much more than just an amp out.

-Andrew

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### User info for Andrew

Email: [andrew@lookingglass.com](mailto:andrew@lookingglass.com)

Bio:

I'm Andrew, I still live on grid :( I have become happily addicted to alternative energy about 4 months ago. Thats it.

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Re: Can I charge a sealed lead acid with this? ([1.00 / 1](#)) (#4)  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Thu Aug 21st, 2003 at 10:20:58 PM MST  
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Yea that's fine.  
It'll work.  
But for your question, I meant measure the voltage without the battery.

-Andrew

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Re: Can I charge a sealed lead acid with this? ([1.00 / 1](#)) (#5)  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Thu Aug 21st, 2003 at 10:25:45 PM MST  
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Wow!  
Very nice.  
I would like to exchange some emails with you sometime. I like your ideas about current based chargers. If you have the time could you send me an email at [gar4772@hotmail.com](mailto:gar4772@hotmail.com).  
I would like to hear your opinions on other aspects of battery recovery and pulsed charging.

Thanks!!!

-Andrew

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[Is voltage an accurate measurement of remaining capacity?](#) | 6  
comments (6 topical, editorial)

Re: Is voltage an accurate measurement ([1.00 / 1](#))  
(#6)  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on Sat Aug 23rd,  
2003 at 01:47:02 AM MST  
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All lead acid batteries.

-Andrew

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[Black paint on solar hot air experiment...](#) | 13 comments (13 topical, editorial)

Simple solar air collector ([5.00 / 1](#)) ([#3](#))  
 by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Sun Apr 13th, 2003 at 03:27:31 PM MST  
 ([User Info](#)) <http://www.windstuffnow.com/main>

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Below is a description of a very simple solar collector from the company that produces them. I also have a pdf. file showing the detailed breakdown of the unit if interested...

**- ADVANCED HOMEBUILT AIR-BASED SOLAR COLLECTOR - BUILDING INSTRUCTIONS**

**OVERVIEW**

The instructions below are for a homebuilt version of Sol-Air Company's air-based SHVC (Solar Heating and Ventilation Cooling) system (description at bottom). Our commercial version differs from the homebuilt in having an internal air-handler (the AutoVent automatic mode-switching control), and a proprietary absorber material that has somewhat higher surface area and selective properties.

**Homebuilt Solar Collector Output**

Like its commercial cousin, this homebuilt unit produces more energy for the money by far than other forms of solar utilization, including PV and solar DHW systems. The output for a 20 square foot unit is approximately 5,000,000 Btu per year, equal to approx. 50 gallons of heating oil (or 50 Therms of natural gas). This output is produced primarily in the spring and fall, with a decided dead spot in the middle of a cold winter.

**Mounting**

The collector is mounted vertically on the outside wall (the rule that tilt = latitude is for another type - DHW collectors, which need year-round input). The lower sun angle in winter reduces the performance penalty, and the avoidance of summertime sun is an important factor in increasing system life. Another advantage gained is ease of installation.

**House connection**

Air passes into and out of the collector through a manifold which connects it to the inside of the house. Instead of using the collector to replace a window, plan to install your homebuilt collector with the manifold passing through a hole in the wall, (you can install it beneath a window, or with the manifold passing across the window sill of a slider-type of window). That way, you will have two solar devices, the collector and the window.

**WINDOW COMPARISON**

Gain from a solar collector, as with a window, is directly proportional to

glazed area; it occurs for 5-6 hours on sunny days. Both a window and a solar collector "leak" some of the energy taken in, but there is a net gain during collecting hours on a good day. The difference between a solar collector and a window is that the window leaks energy 24 hours a day, while the solar collector leaks energy only during those 5-6 hours. People with "passive solar" homes must play an active role in reducing nighttime losses. During non-collecting hours, an active solar collector loses virtually no energy, without manual intervention. A solar collector is a large no-loss window with a virtual window plug that self-installs, whether you're home or not.

#### What's a Window Plug?

While windows have greater losses, these can be reduced if you manually insulate them at night, with "window plugs" that you make from 1" blue Styrofoam, edged with wood strips (3/4" x 1", ripped from a 1x4). Each night, or right when you come home from work, you plug your windows. As you put a window plug in, you feel immediately warmer - right now. You can put them behind a couch or door during the day. Plug north windows all winter if you like.

#### Build a Window Plug:

The monetary payback period for window plugs varies from instant (if you have spare time and materials) to six months. In winter, they have an immediate effect on room comfort.

To make one, tack together a rectangular frame of the 3/4" x 1" wood, to fit the inside of your window frame. Use one nail at each corner, through the end of one piece into the end grain of the next). Brace the frame with diagonal pieces of wood while it's in the window; remove it, lay it on top of the Styrofoam on the floor, and mark inside the wood with a pointy marker pen. Leave 1/16" clearance all the way around (1/8" overall). Use a very sharp, very thin knife to cut the foam.

Double 6" long fabric strips into loops to aid removal from the window. Slip the foam into the frame, with a loop in the joint at each side near the top. First use dots of hot glue, then sawdust-thickened wood glue.

Cover one or both sides with Contac shelf paper, muslin in glue, wallpaper, etc.

For all-winter window plugs, prevent condensation by installing 3M V-seal on the edges: Make the plugs 1/8" undersize (insert corrugated cardboard underneath and on one side of the frame as you build it in the window.

Sand and prime the wood edges with shellac before you apply the V-seal. Cut the V-seal strips to meet nicely at the corners.

Now is also the time to caulk drafts around the window trim.



## COLLECTOR FEATURES

### The Absorber

The most important characteristic for an air-cooled absorber is super-high surface area. For your home-built unit, the best solar absorber is 1" thick furnace filter media, painted flat black and located in a reflective cavity. Furnace filter media presents a surface area to the air flow that is about 50 times the filter's face area. This is a higher surface area, by an order of magnitude, than that of conventional metal absorbers, whether finned, rippled, dimpled, or screen type. The sun shines on the filter fibers which get very hot; the heat is transferred to the air passing through the filter, taking advantage of intimate contact and good turbulence.

The "inside out" outer-surface heat exchange of this type absorber means that fibers transfer their heat to the air coolant directly at or immediately adjacent to the directly sun-lit sites at which the heat is generated. Dividing the material into small fibers produces an extremely short internal path - through the fiber material - from a sunlit fiber site to an adjacent shaded site.

### Low Cost Absorber Material

A virtual doubling of the heat transfer surface area is presented via a conduction path length of one fiber diameter. Because the "doubled-area path length" is extremely short, non-metallic material may be used without any performance penalty - a significant material-cost savings. Material note: I have used both glass fiber and polyester fiber furnace filter media as a solar collector absorber for 18 years without observing significant material degradation. As a pro-active precaution, observe the "Operation Caveat" stated below.

### Low Cost Design

A liquid-cooled collector cannot take advantage of this type absorber construction, which is very light. The low weight of the absorber produces a cascade of weight and cost savings in the support structure of the collector.

### Absorber Efficiency

The absorber's high efficiency produces a low operating temperature. A collector built to these specifications was tested at Western Michigan University's Energy Learning Center - no longer operating, I understand - using the ASHRAE 93-77 procedure, yielding a greater than 72% maximum theoretical efficiency. This was the highest efficiency air collector they ever tested; it bettered all liquid collectors but one, which it virtually equaled. I know of no other non-concentrating air collector, Conserval's SolarWall included, with better full-system efficiency.

You will want furnace filter media that comes in roll form so you can customize the size and shape of the collector. See a Grainger industrial supply catalog, item 4WZ72 (roll, 36" W. x 90 ft.; 1" thick); other widths are available there. You could go to an HVAC contractor and ask them to cut you the lengths you need. Use hi-temp stove paint, and spray it at a  
45

degree angle (a "glancing" angle) from both sides, so little of the paint passes through.

#### The Reflective Cavity Enhances The Absorber

The foil-faced inside surface of the collector is left reflective (not painted black) so the black filter fibers do all the absorbing. Sunlight that passes unabsorbed from the front direction is reflected back to the absorber for another pass, doubling the effectiveness of the absorber.

--

#### MAKING THE SOLAR COLLECTOR

Build the collector case of 1" foil-faced isocyanurate (urethane) foam-board. A good final case size is 46" x 64" (the case-back is 43-1/2" x 61-1/2"). The depth of the collector case is 6". With the back material being 1" thick, this leaves 5" for air passages. The sides are 6" wide, and they overlap the edges of the back.

Use urethane construction adhesive for all joints. On heat-exposed joints

like the case-side/case-back joint, protect the joint with a fillet of silicone adhesive at the inside of the case. Apply the silicone adhesive after the urethane adhesive has set (24 hours). Use spots of hot glue to

hold temporary right-angled pieces of foam-board at three places on each

side, to keep the sides straight and to hold them square to the back while

the urethane adhesive sets overnight.

Both urethane adhesive and silicone adhesive use water (humidity) to initiate curing; speed curing by spraying a tiny bit of plain water on the edges of the seams after you put the pieces together.

To provide a surface that will hold the mounting bracket screws, glue 1/4"

plywood pieces, 6" wide and full length (short sides can overlap long sides,

or the reverse), on the sides only - no plywood is needed on the back.

You

can also use luan underlayment plywood. It's slightly lighter, thinner and

cheaper, but it's a less "green" material. Glue the pieces on the four sides of the case with a single 3"-wide wavy line of urethane adhesive.

There's no need to use 3/8" plywood - it just adds weight. Even though it

would give you a chance to screw-fasten the plastic glazing, using screws

doesn't produce an even line of pressure on the edge of the glazing, only a

point pressure at each screw. You're going to cover the case with an aluminum sheathing, so use the even pressure of the corner bend of the

aluminum sheathing to pull the glazing against the edge of the case more

evenly.

Cut an 11-1/2" square hole, centered side-to-side, in the back wall of the

case; the upper edge of the hole is 3" from the outside top surface.

#### Bend the Aluminum Sheathing

To make the box weather resistant, you need an aluminum outside skin, or

sheathing. The dimensions are shown in the illustration. Make up the pieces before you install the glazing, so you can install them immediately

after, thus holding the glazing in place.

You can do the case sheathing two ways. You could use pre-painted

#### aluminum

coil-stock (house trim material). But, the material is too thick to bend by hand, so you should have the bends made by a siding company on their trim brake. Plain aluminum flashing is satisfactory, just be sure to apply a car wax to the aluminum. Aluminum flashing can be bent by hand over the edge of a piece of plywood. Press and slide your hand along the length of the bend, "milking" it a few degrees at a time. Protect your working hand with a leather glove, and hold an old towel to press onto the work. Back up the aluminum with a backup block - a length of 1" x 3-1/2" pine ripped from a straight 2x4. Set the backup block on edge on top of the aluminum, right at the edge of the plywood, and apply a clamp at each end. Use the same backup block to make the 1/2" x 1" x 1-1/2" aluminum flashing angles to cap the edges of the inner "C" baffle. For the slight amount of over-bend specified, bend the aluminum as far as you can clamped, then unclamp it and work in some more bend by hand.

Also the flow of air through the case is guided by a "C"-shaped baffle, for which you will need two 4-foot-long pieces of aluminum cap-angle to cover the raw edges of the baffle. The dimensions are shown in the illustration.

Last, make ten aluminum flashing mounting-rail pieces, 1"x1" x 4 feet long, legs a 90 degree angle.

#### Install the "C"-shaped baffle

The center leg of the "C" baffle runs across the 11-1/2" square hole in the upper back wall of the case. The "C"-shaped baffle is glued with urethane adhesive to the inside of the case, oriented with its center horizontal, at the top, and with the two legs descending, parallel to each other. The upper passage of the manifold is above the center leg of the "C", and the lower passage is below. There is 6" vertical dimension of the hole below the center leg of the "C", and 4-1/2" above. The distance between the descending legs is 12".

Fillet all of the inside collector joints, including all around the "C" baffle, with silicone adhesive. Cap the baffle with the aluminum cap-angle you bent up earlier using a 3/8" bead of silicone inside the angle.

#### Install the Absorber Mounting-Rails

The filter absorber sits on mounting-rails aligned on a diagonal to the air flow. Air enters the collector between the absorber and the glazing. As it moves through the collector toward the outlet, the diagonal absorber placement forces air to pass through the absorber to the back side, away from the glazing. The diagonal progression starts with the absorber near to the back wall at the inlet, and moves near to the glazing at the outlet; the

progression continues all along the air flow path. This keeps the hottest air away from the glazing, reduces conductive heat loss, and increases efficiency.

Use the 1"x1" angles of aluminum flashing that you bent up earlier as mounting-rails. Install each mounting-rail so the leg touching the collector is oriented toward the back wall. Use dots of hot glue a foot apart to hold the mounting-rails in place temporarily; then run a continuous fillet of silicone adhesive along the joint between the angle and the collector wall.

#### Install the Mounting-Rails

Install horizontal mounting-rails at the top and bottom inside surfaces of the collector. Use two or your pre-bent angles pieces, overlapped by an inch, to make up the needed length. Stop the rails 3/8" short of the adjoining surfaces. The top mounting-rail has its absorber-mounting-surface spaced 1-1/2" from the glazing plane. The bottom mounting-rail has its absorber-mounting-surface spaced 2" from the back wall (3" from the glazing plane).

Install diagonal rails beginning at the inside of each "C" leg starting below the fan; at this end, the absorber-mounting-surface is spaced 1/2" from the back wall of the collector. The rails run in a straight line to overlap the rail at the bottom of the collector; that is, they run at a slight angle away from the back wall down each "C" leg, continuing past the bottoms of the "C" legs to overlap the bottom rail. Snip a small piece from the back leg of the angles so they can overlap the bottom rail.

Moving to the side bays, install diagonal mounting rails at the sides of each bay, so the rails make a continuous straight line from the bottom rail to the top rail. Again, snip a small piece from the back leg of the angles so they can overlap the bottom and top rails.

Where the four central rails of the collector cross open space, snip the back leg of each rail near the "C" baffle and fold the rail flat. This allows air to travel unimpeded between the center bay and the side bays.

#### Install the Absorbers

With the exception of the fan/intake shroud area, the entire face of the collector is covered with filter-media absorber sitting on mounting-rails. In preparation for installing the absorber, cut the pieces you will need to size, and paint them from both sides with hi-temp stove paint from a spray can, holding it at a 45 degree angle to the face of the. Work quickly, covering first the back, then the front; favor the front with the most paint. Use nearly the entire spray can, leaving enough to paint the fan shroud. At the very end, just before you put on the glazing, use the last of the paint to touch up where needed.

Working one foot at a time, glue the absorber to the mounting-rails in a continuous bead of silicone adhesive, again using occasional dots of hot glue as a temporary aid.

#### Install the Fan

Install your collector fan (Grainger, 4WT48 70 cfm, or 4WT47 105 cfm)

and a pre-set snap-disc cooling thermostat (Grainger 2E245, close at 110 degF, open at 90 degF) in a shroud of aluminum flashing or house trim.

Make a one-piece fan-and-solar-thermostat inlet shroud, or you can use a two-piece shroud. One piece, to mount the fan, is an 11-7/8" x 6" pan with 1" flanges on top and bottom (make from 11-7/8" x 8" material); it has a 4-3/4" hole at its center and a 3/8" hole at one side to pass the thermostat leads out from the collector. Mount the fan over the hole with 1/8" x 1/4" pop rivets and a fillet of silicone adhesive, and bond the assembly in place with silicone adhesive vertically in the intake, at the back wall of the collector. Make sure the fan's air-direction arrow points into the collector.

The other shroud piece is also mounted with silicone adhesive. It has a 1" horizontal leg, a 4" 45 degree surface to mount the thermostat facing the sun and to redirect the incoming air downward, and a descending 3" leg.

Mount the thermostat through a hole the size of a quarter, and fasten it with pop rivets. Bond the thermostat shroud in place so the vertical leg is spaced 1/2" away from the plane of the glazing. Pass the thermostat leads through the 3/8" hole in the fan mounting plate. Wire the fan and the thermostat in series - tie one lead from the fan to one lead from the thermostat with a #14 wiring nut, and finish with an 8" length of electrical tape. Seal the thermostat wire hole with silicone adhesive. The remaining unattached leads, one from the fan and one from the thermostat, will be wired to the power cord leads at final installation.

#### Touch-up

Use the rest of your spray paint to paint the inlet shroud (paint the nose of the thermostat) and touch up the absorber.

#### Install the Glazing

The glazing can be Plexiglas (acrylic), which does well in this application because of the vertical angle and the efficient (low) temperature at which this collector runs, or another material of your choice (Kalwall). Polycarbonate (TwinWall, etc.) is strong, but may yellow. Cut the glazing to size to match the inside line of the plywood. Install the glazing with 1/8" pop rivets (1/4" grip range), spaced every 8" along the baffles.

Install pop rivets through the glazing every 8" along the "C" baffle. Put four rivets across the center of the "C" baffle.

Lift the glazing edge slightly and put a 5/16" bead of silicone adhesive around the collector sides where the glazing will sit. Place the silicone adhesive bead near the inside edge of the surface, so that as you allow the glazing to rest on it, the adhesive squeeze-out just reaches the inside of the collector.

#### Install the Aluminum Sheathing

Press the aluminum sheathing in place using an aid made from two 2-foot-long

1. x 1-1/2's glued together to make a 90 degree angle. As you do, install
1. /8" pop rivets through the sheathing into the plywood, all around the sides

of the collector, located 1" from the front edge, and every 8".

Install the sheathing angle all around the rear of the collector with 1/8" pop rivets into the plywood spaced, located 1" from the rear edge, every 8".

Working on each side on turn, tip the collector up on the side on a flat work table, to help ensure the sheathing edge is straight and cannot slip toward the side. Install 1/8" pop rivets, through the bend line where the sheathing touches the glazing (drill these holes through both sheathing and glazing). Rivet around the collector face on the contact line using a 12" spacing.

#### Dress and Fill the Glazing Joint

Use a gentle leather-glove touch to adjust the gap where the edge of the aluminum sheathing "returns" away from the glazing. The gap should be at least 1/4". Completely fill the gap with silicone, and finish it the joint with a spoon. Allow the fillet to extend 1/4" out onto the face of the glazing. Don't try to clean up until the silicone cures.

This seal design is tough and won't be broken by shock or expansion from temperature change.

#### The Manifold

The collector connects to the house via a manifold box made using the same construction materials and gluing method you used for the case - a urethane foam-board box with an outer layer of plywood around the sides. It also has a sheathing of aluminum flashing, made from a 9" x 1-1/2" angle, 60" long (this allows an overlap). The 14" square, 9" long, two-way, over-and-under manifold connects to the house through the wall or across the window sill.

You can use plywood on just the top and bottom, or on all four sides of the manifold. The manifold is divided by a foam-board "center divider" into a lower intake and an upper exhaust passage (back to the house). The lower passage is 6" high, the top is 4-1/2" high.

On the upper surface inside the upper passage, 1" away from the front face, install an 11" length of 1" x 1" flashing angle. Use hot glue dots and silicone adhesive. Face the angle legs away from the front face. This will act as a stop and support the edge of the inlet/outlet filter. Do the same at the lower surface inside the lower passage. Cut an 11-1/2" square piece of furnace filter to use for an inlet/outlet filter. The filter will span the center divider of the manifold, and rest against the 1" x 1" stops.

Install a Grainger 2W050 three-wire power cord up through a 3/8" hole in the bottom front edge of the manifold; make an overhand knot for a strain relief. Put a ring terminal on the green ground wire. When you make



the final installation, fasten the ring terminal to the fan shroud with a 3/16" aluminum pop rivet. Note: You could install an additional room temperature thermostat (open on temperature rise) in the inlet to disable the fan on rising room temperature; this would partially limit warm weather output. But the unit will still thermosyphon slowly. To fully prevent the unit from heating in summer, without damaging it, you will have to cover it with a cloth or plywood cover. Do not close or stop up the manifold openings without also covering the collector, as this would cause very high collector temperatures and consequent material damage.

The grilles for the manifold should be split, to eliminate heat cross-over.

Don't choose moveable-louver grilles. You could use perforated metal.

The best and cheapest pre-made grilles are white painted steel, available from Hart and Cooley through your local HVAC supplier. Order one #672-steel-white, 12 x 4 for the upper air passage, and one #672-steel-white, 12 x 6 for the lower passage. These are approximately 13-3/4" long, and 5-3/4" high for the 12 x 4, 7-3/4" high for the 12 x 6.

There are two mounting holes in the grilles (one at each side). Use urethane adhesive to glue a block of wood into the foam-board to accept a screw at each mounting hole location. Install the grilles with the bottom grille's louvers angled down, and the top grille's louvers angled up, to help prevent air from crossing over from outlet to inlet (short-circuiting). The hot outlet air tends to segregate itself by rising away.

## INSTALLATION

### Plan the Installation

My preferred installation method is to cut a 14-3/8" square hole through the wall between studs (assuming a 14" square manifold). Or, if you choose, a sliding window installation is an option. Just pre-mount the manifold to the collector the day before with urethane adhesive. Give the adhesive a full 24 hours to cure. Prop the collector in place with the manifold coming across the window sill. If you have a storm sash, seal that one first. Shut the sash on the manifold and block off the gaps with 1" urethane foam-board - the same foam-board used to make the collector. Trim the foam-board edges with aluminum foil tape. Next do the same to the inside sash. Caulk only the joints at the bottom and sides of the foam-board. Use peel-and-stick foam strips on the underside of the sliding sashes so you can open them when needed. Install a security catch on the inside sash if desired.

### Preparation

In preparation for installation, make (4) brackets of 1/8" x 3/4" flat aluminum bar, 9" long, bent to give a 6" and a 3" leg. Use a 3/16" drill for #10 stainless pan head screws. Drill (3) holes in the 6" leg, (2) holes

in the 3" leg. Put (3) #10 x 3/4" stainless screws through the 6" leg into the collector, and (2) #10 x 1-1/2" stainless screws through the 3" leg into the building. Use one bracket near each corner of the collector.

### Begin the Installation

#### Wall installation:

Cut a 14-3/8" square hole through the wall between studs (assuming a 14" square manifold). Make a small hole in the center of where you think you'd like the hole to be. Probe with a coat hanger to find the studs.

#### Measure

the manifold and mark lines for a hole 3/8" bigger than the manifold dimensions. Cut the inside wall board with a utility knife. Stuff the insulation from the hole into the wall cavity. Square from the inside hole

over to the outside wall, and drill holes at the corners to the outside. From the outside mark the lines, check the dimensions, and make them plumb and square. Use a saw to cut the hole.

#### Sliding Window installation:

Pre-mount the manifold to the collector the day before with urethane adhesive. Give the adhesive a full 24 hours to cure. Prop the collector in place with the manifold coming across the window sill. If you have a storm sash, seal that one first. Shut the sash on the manifold and block off the gaps with 1" urethane foam-board - the same foam-board used to make the collector. Trim the foam-board edges with aluminum foil tape. Next do the same to the inside sash. Caulk only the joints at the bottom and sides of the foam-board. Use peel-and-stick foam strips on the underside of the sliding sashes so you can open them when needed. Install a security catch on the inside sash if desired.

#### Flash the Hole

Next, line the hole with a piece of aluminum flashing. This will be flush with the inside wall surface, with 3" wide ears bent to sit against the outside wall. To make this, cut a piece of flashing 60" long, and 3" wider than the wall thickness. Make a 90 degree, 3" wide bend down the length of the piece. Make cuts through the 3" leg, to allow you to wrap it around the outside of your 14" square manifold, making 90 degree bends at the four manifold corners. Set the manifold aside to attach to the collector later, from inside the house. Staple the pre-bent flashing into place in the hole, putting some staples inside the hole and at least four in each outside ear. Caulk under the ears (don't neglect the corners) with silicone adhesive.

#### Pre-Mount the upper Brackets

Mount the upper two mounting brackets to the collector (use (3) #10 x 3/4" stainless screws). Take care to locate the brackets so the collector will be spaced about 9/16" away from the wall (or from the clapboard bottom edges, if you have clapboards; and locate the brackets so they fall just

under a clapboard edge).

Before you place the collector against the wall, press sticky-back foam seal strips (3/16" thick x 1-1/2" wide, the type used to mount camper caps onto pickup trucks) to the back of the collector around the 11-1/2" square manifold hole. Space the foam strips 1-3/4" away from the hole edge. Build up three layers of the strips, so the seal is 9/16" thick.

Prop the collector in position

Now use short pieces of 2x6, on edge, as braces under the collector to raise it to the right height on the wall (so the foam seal rests on the flashing ears). Use a long 2x4 as a brace to keep the top brackets of the collector against the house. Use a level to get the collector plumb. Now take the manifold inside the house. To check whether the collector is aligned with the hole, insert the manifold into the hole and check that the center divider lines up with the "C" baffle in the collector case. Readjust everything until it's plumb and aligned. Outside, fasten the upper collector brackets first, then install the lower ones (keep the collector vertical, viewed from both ways. From the inside, with the manifold removed, use silicone adhesive to caulk around the perimeter of the hole against the foam seal. Completely fill the space between the collector and the flashing.

Install the Manifold

To install the manifold, lay a generous 1/2" bead of urethane adhesive around the manifold rear edges and across the center divider. Place it in the hole, and press it onto the collector. It should stay there by itself, or you can wedge it in position to cure overnight. You can immediately caulk the gap around the manifold at the inside wall with siliconized latex caulk. For a finished look, trim with quarter-round or picture frame molding.

Operation Caveat

As stated earlier, to fully stop the unit from thermosyphoning in summer without damaging the unit (due to high stagnation temperatures), you must cover it, not simply close or stop up the manifold openings. Do not close or stop up the manifold openings without covering the collector, as this will cause very high temperature and material damage.

The worst of the "new collector" smell is gone in a few hours (silicone curing smells like vinegar) and will disappear in a day or two.

To Make Larger Arrays

In scaling up, keep these points in mind:

1. The geometry shown in the accompanying illustration permits daytime thermosyphoning, and discourages nighttime thermosyphoning (the descending and rising legs of the flow circuit are both at outside temperature at night, and are of nearly equal height). If you change to a different flow layout, you may need an anti-backdraft damper.

A manifolded array would use collectors 4 feet wide by any height, and divided into left and right (rising and descending) halves by a vertical baffle, with the halves interconnected at top or bottom by a gap in the baffle, with the filter element mounted on "rails" in each half, on one long diagonal from inlet to outlet.

2. With more than 25 square feet (one good-size collector per room), room overheating becomes a concern in warm/hot weather. You will want large size, automatic or manual collector vents (without these you will need to cover the collectors in summer). In addition to collector vents (top and bottom), you may still have to cover the outlets manually in the hottest weather, and make sure the collector temperatures do not climb too high.

(This is why I invented the AutoVent control. This is what makes an SHVC (Solar Heating and Ventilation Cooling) system. It integrates two three-way valves (one at the inlet, one at the outlet), and four ports (an inlet/outlet pair at both the interior and the exterior) into a drop-in control module.)

3. A large array manifolded with a single fan should be segmented into areas (separate collectors) with a parallel-flow circuit. You might need to restrict the higher-flow collectors to get the array balanced.

You could use "in-at-the-bottom, out-at-the-bottom" collectors manifolded in parallel. These could be served by a split over-and-under manifold duct located at floor level on the inside wall, that might not be too intrusive. It might be three to four inches thick out from the wall, by two feet in height. The bottom 12 inches would be the intake manifold, with an intake grille located at one side of the room; the lower part would be divided from the top 12 inches, the outlet manifold, with a grille at the other side of the room. Or, there could be small outlet grilles located all along the top of the outlet duct and small intake grilles located all along the intake duct.

In this scheme, the entry and exit connections to the collector are all located low in the collector. This arrangement tends to thermosyphon at night, in either direction unpredictably; it will need a positive manual damper, or a timed electro-mechanical damper, that prevents nighttime flow in either direction.

An alternative scheme that needs no damper is to place the over-and-under manifold duct near the ceiling, serving "in-at-the-top, out-at-the-top" collectors manifolded in parallel. There would be an auxiliary inlet duct connecting to the inlet half of the split over-and-under manifold. It would descend to the floor at one side of the room. there would be an auxiliary outlet duct connecting to the outlet half of the manifold, descending to the floor at the other side of the room (i.e. one descending duct at the left side and one descending duct at the right side of the room, at the corners against the outside wall). The reason for the descending ducts inside the room is to receive the coolest inlet air and distribute heated air low in the room.

In this scheme, the entry and exit connections to the collector are located high in the collector. So, the descending and rising outside legs of the flow circuit are both at outside temperature at night, the inside descending

and rising legs are at inside temperature, and all are of nearly equal height, so you don't need any damper.

HAPPY BUILDING!

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Sol-Air Company makes the SHVC solar system, the world's only modular solar comfort system. In a single wall-mounted module, it provides space-heating in cold weather, ventilation cooling in warm weather, and both cool-air conservation and system safety in hot weather - all done automatically. The SHVC system offers a realistic payback and a 20-year+ working life. Its year-round capability distinguishes it from the seasonal "air panel" or "hot air collector". Its patented control shifts automatically between four operating modes, hands-off, year-round. The system is packaged for easy installation.

As the room temperature rises in warm weather, Sol-Air's AutoVent(tm) adaptive air handling control initiates room ventilation. In hot weather, the system acts conservatively by sealing the house, power-venting the collector with outside air to prevent collector damage. It thus conserves cool inside air, and even allows conventional A/C to operate normally.

You don't cover the system manually to prevent overheating, or uncover it to resume heating. The system returns to the solar heating mode automatically as the weather changes. Our breakthrough Transorber(tm) solar absorber gives the system a maximum efficiency greater than 72% - the SHVC solar system provides energy, comfort and safety, automatically and efficiently, all year!

Contact us!

Bill Kreamer

President,  
Sol-Air Company  
129 Miller St.  
Belfast, ME 04915

tel 207-338-9513  
fax 603-853-9339  
mailto:kreamer@mint.net

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Simple solar air collector (5.00 / 1) (#3)  
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5 minute interval.  
 Note: You may cloak yourself from appearing here in your Display Preferences.

Below is a description of a very simple solar collector from the company that produces them. I also have a pdf. file showing the detailed breakdown of the unit if interested...

- ADVANCED HOMEBUILT AIR-BASED SOLAR COLLECTOR - BUILDING INSTRUCTIONS

OVERVIEW

The instructions below are for a homebuilt version of Sol-Air Company's air-based SHVC (Solar Heating and Ventilation Cooling) system (description at bottom). Our commercial version differs from the homebuilt in having an internal air-handler (the AutoVent automatic mode-switching control), and a proprietary absorber material that has somewhat higher surface area and selective properties.

Homebuilt Solar Collector Output

Like its commercial cousin, this homebuilt unit produces more energy for the money by far than other forms of solar utilization, including PV and solar DHW systems. The output for a 20 square foot unit is approximately 5,000,000 Btu per year, equal to approx. 50 gallons of heating oil (or 50 Therms of natural gas). This output is produced primarily in the spring and fall, with a decided dead spot in the middle of a cold winter.

Mounting

The collector is mounted vertically on the outside wall (the rule that tilt = latitude is for another type - DHW collectors, which need year-round input). The lower sun angle in winter reduces the performance penalty, and the avoidance of summertime sun is an important factor in increasing system life. Another advantage gained is ease of installation.

House connection

Air passes into and out of the collector through a manifold which connects it to the inside of the house. Instead of using the collector to replace a window, plan to install your homebuilt collector with the manifold passing through a hole in the wall, (you can install it beneath a window, or with the manifold passing across the window sill of a slider-type of window). That way, you will have two solar devices, the collector and the window.

WINDOW COMPARISON

Gain from a solar collector, as with a window, is directly proportional to



glazed area; it occurs for 5-6 hours on sunny days. Both a window and a solar collector "leak" some of the energy taken in, but there is a net gain during collecting hours on a good day. The difference between a solar collector and a window is that the window leaks energy 24 hours a day, while the solar collector leaks energy only during those 5-6 hours. People with "passive solar" homes must play an active role in reducing nighttime losses. During non-collecting hours, an active solar collector loses virtually no energy, without manual intervention. A solar collector is a large no-loss window with a virtual window plug that self-installs, whether you're home or not.

#### What's a Window Plug?

While windows have greater losses, these can be reduced if you manually insulate them at night, with "window plugs" that you make from 1" blue Styrofoam, edged with wood strips (3/4" x 1", ripped from a 1x4). Each night, or right when you come home from work, you plug your windows. As you put a window plug in, you feel immediately warmer - right now. You can put them behind a couch or door during the day. Plug north windows all winter if you like.

#### Build a Window Plug:

The monetary payback period for window plugs varies from instant (if you have spare time and materials) to six months. In winter, they have an immediate effect on room comfort.

To make one, tack together a rectangular frame of the 3/4" x 1" wood, to fit the inside of your window frame. Use one nail at each corner, through the end of one piece into the end grain of the next). Brace the frame with diagonal pieces of wood while it's in the window; remove it, lay it on top of the Styrofoam on the floor, and mark inside the wood with a pointy marker pen. Leave 1/16" clearance all the way around (1/8" overall). Use a very sharp, very thin knife to cut the foam.

Double 6" long fabric strips into loops to aid removal from the window. Slip the foam into the frame, with a loop in the joint at each side near the top. First use dots of hot glue, then sawdust-thickened wood glue.

Cover one or both sides with Contac shelf paper, muslin in glue, wallpaper, etc.

For all-winter window plugs, prevent condensation by installing 3M V-seal on the edges: Make the plugs 1/8" undersize (insert corrugated cardboard underneath and on one side of the frame as you build it in the window.

Sand and prime the wood edges with shellac before you apply the V-seal. Cut the V-seal strips to meet nicely at the corners.

Now is also the time to caulk drafts around the window trim.

## COLLECTOR FEATURES

### The Absorber

The most important characteristic for an air-cooled absorber is super-high surface area. For your home-built unit, the best solar absorber is 1" thick furnace filter media, painted flat black and located in a reflective cavity. Furnace filter media presents a surface area to the air flow that is about 50 times the filter's face area. This is a higher surface area, by an order of magnitude, than that of conventional metal absorbers, whether finned, rippled, dimpled, or screen type. The sun shines on the filter fibers which get very hot; the heat is transferred to the air passing through the filter, taking advantage of intimate contact and good turbulence.

The "inside out" outer-surface heat exchange of this type absorber means that fibers transfer their heat to the air coolant directly at or immediately adjacent to the directly sun-lit sites at which the heat is generated. Dividing the material into small fibers produces an extremely short internal path - through the fiber material - from a sunlit fiber site to an adjacent shaded site.

### Low Cost Absorber Material

A virtual doubling of the heat transfer surface area is presented via a conduction path length of one fiber diameter. Because the "doubled-area path length" is extremely short, non-metallic material may be used without any performance penalty - a significant material-cost savings. Material note: I have used both glass fiber and polyester fiber furnace filter media as a solar collector absorber for 18 years without observing significant material degradation. As a pro-active precaution, observe the "Operation Caveat" stated below.

### Low Cost Design

A liquid-cooled collector cannot take advantage of this type absorber construction, which is very light. The low weight of the absorber produces a cascade of weight and cost savings in the support structure of the collector.

### Absorber Efficiency

The absorber's high efficiency produces a low operating temperature. A collector built to these specifications was tested at Western Michigan University's Energy Learning Center - no longer operating, I understand - using the ASHRAE 93-77 procedure, yielding a greater than 72% maximum theoretical efficiency. This was the highest efficiency air collector they ever tested; it bettered all liquid collectors but one, which it virtually equaled. I know of no other non-concentrating air collector, Conserval's SolarWall included, with better full-system efficiency.

You will want furnace filter media that comes in roll form so you can customize the size and shape of the collector. See a Grainger industrial supply catalog, item 4WZ72 (roll, 36" W. x 90 ft.; 1" thick); other widths are available there. You could go to an HVAC contractor and ask them to cut you the lengths you need. Use hi-temp stove paint, and spray it at a  
45

degree angle (a "glancing" angle) from both sides, so little of the paint passes through.

#### The Reflective Cavity Enhances The Absorber

The foil-faced inside surface of the collector is left reflective (not painted black) so the black filter fibers do all the absorbing. Sunlight that passes unabsorbed from the front direction is reflected back to the absorber for another pass, doubling the effectiveness of the absorber.

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#### MAKING THE SOLAR COLLECTOR

Build the collector case of 1" foil-faced isocyanurate (urethane) foam-board. A good final case size is 46" x 64" (the case-back is 43-1/2" x 61-1/2"). The depth of the collector case is 6". With the back material being 1" thick, this leaves 5" for air passages. The sides are 6" wide, and they overlap the edges of the back.

Use urethane construction adhesive for all joints. On heat-exposed joints

like the case-side/case-back joint, protect the joint with a fillet of silicone adhesive at the inside of the case. Apply the silicone adhesive after the urethane adhesive has set (24 hours). Use spots of hot glue to

hold temporary right-angled pieces of foam-board at three places on each side, to keep the sides straight and to hold them square to the back while

the urethane adhesive sets overnight.

Both urethane adhesive and silicone adhesive use water (humidity) to initiate curing; speed curing by spraying a tiny bit of plain water on the edges of the seams after you put the pieces together.

To provide a surface that will hold the mounting bracket screws, glue 1/4"

plywood pieces, 6" wide and full length (short sides can overlap long sides, or the reverse), on the sides only - no plywood is needed on the back.

You can also use luan underlayment plywood. It's slightly lighter, thinner and cheaper, but it's a less "green" material. Glue the pieces on the four sides of the case with a single 3"-wide wavy line of urethane adhesive.

There's no need to use 3/8" plywood - it just adds weight. Even though it would give you a chance to screw-fasten the plastic glazing, using screws doesn't produce an even line of pressure on the edge of the glazing, only a point pressure at each screw. You're going to cover the case with an aluminum sheathing, so use the even pressure of the corner bend of the aluminum sheathing to pull the glazing against the edge of the case more evenly.

Cut an 11-1/2" square hole, centered side-to-side, in the back wall of the case; the upper edge of the hole is 3" from the outside top surface.

#### Bend the Aluminum Sheathing

To make the box weather resistant, you need an aluminum outside skin, or sheathing. The dimensions are shown in the illustration. Make up the pieces before you install the glazing, so you can install them immediately after, thus holding the glazing in place.

You can do the case sheathing two ways. You could use pre-painted

#### aluminum

coil-stock (house trim material). But, the material is too thick to bend by hand, so you should have the bends made by a siding company on their trim brake. Plain aluminum flashing is satisfactory, just be sure to apply a car wax to the aluminum. Aluminum flashing can be bent by hand over the edge of a piece of plywood. Press and slide your hand along the length of the bend, "milking" it a few degrees at a time. Protect your working hand with a leather glove, and hold an old towel to press onto the work. Back up the aluminum with a backup block - a length of 1" x 3-1/2" pine ripped from a straight 2x4. Set the backup block on edge on top of the aluminum, right at the edge of the plywood, and apply a clamp at each end. Use the same backup block to make the 1/2" x 1" x 1-1/2" aluminum flashing angles to cap the edges of the inner "C" baffle. For the slight amount of over-bend specified, bend the aluminum as far as you can clamped, then unclamp it and work in some more bend by hand.

Also the flow of air through the case is guided by a "C"-shaped baffle, for which you will need two 4-foot-long pieces of aluminum cap-angle to cover the raw edges of the baffle. The dimensions are shown in the illustration.

Last, make ten aluminum flashing mounting-rail pieces, 1"x1" x 4 feet long, legs a 90 degree angle.

#### Install the "C"-shaped baffle

The center leg of the "C" baffle runs across the 11-1/2" square hole in the upper back wall of the case. The "C"-shaped baffle is glued with urethane adhesive to the inside of the case, oriented with its center horizontal, at the top, and with the two legs descending, parallel to each other. The upper passage of the manifold is above the center leg of the "C", and the lower passage is below. There is 6" vertical dimension of the hole below the center leg of the "C", and 4-1/2" above. The distance between the descending legs is 12".

Fillet all of the inside collector joints, including all around the "C" baffle, with silicone adhesive. Cap the baffle with the aluminum cap-angle you bent up earlier using a 3/8" bead of silicone inside the angle.

#### Install the Absorber Mounting-Rails

The filter absorber sits on mounting-rails aligned on a diagonal to the air flow. Air enters the collector between the absorber and the glazing. As it moves through the collector toward the outlet, the diagonal absorber placement forces air to pass through the absorber to the back side, away from the glazing. The diagonal progression starts with the absorber near to the back wall at the inlet, and moves near to the glazing at the outlet; the

progression continues all along the air flow path. This keeps the hottest air away from the glazing, reduces conductive heat loss, and increases efficiency.

Use the 1"x1" angles of aluminum flashing that you bent up earlier as mounting-rails. Install each mounting-rail so the leg touching the collector is oriented toward the back wall. Use dots of hot glue a foot apart to hold the mounting-rails in place temporarily; then run a continuous fillet of silicone adhesive along the joint between the angle and the collector wall.

#### Install the Mounting-Rails

Install horizontal mounting-rails at the top and bottom inside surfaces of the collector. Use two or your pre-bent angles pieces, overlapped by an inch, to make up the needed length. Stop the rails 3/8" short of the adjoining surfaces. The top mounting-rail has its absorber-mounting-surface spaced 1-1/2" from the glazing plane. The bottom mounting-rail has its absorber-mounting-surface spaced 2" from the back wall (3" from the glazing plane).

Install diagonal rails beginning at the inside of each "C" leg starting below the fan; at this end, the absorber-mounting-surface is spaced 1/2" from the back wall of the collector. The rails run in a straight line to overlap the rail at the bottom of the collector; that is, they run at a slight angle away from the back wall down each "C" leg, continuing past the bottoms of the "C" legs to overlap the bottom rail. Snip a small piece from the back leg of the angles so they can overlap the bottom rail.

Moving to the side bays, install diagonal mounting rails at the sides of each bay, so the rails make a continuous straight line from the bottom rail to the top rail. Again, snip a small piece from the back leg of the angles so they can overlap the bottom and top rails.

Where the four central rails of the collector cross open space, snip the back leg of each rail near the "C" baffle and fold the rail flat. This allows air to travel unimpeded between the center bay and the side bays.

#### Install the Absorbers

With the exception of the fan/intake shroud area, the entire face of the collector is covered with filter-media absorber sitting on mounting-rails. In preparation for installing the absorber, cut the pieces you will need to size, and paint them from both sides with hi-temp stove paint from a spray can, holding it at a 45 degree angle to the face of the. Work quickly, covering first the back, then the front; favor the front with the most paint. Use nearly the entire spray can, leaving enough to paint the fan shroud. At the very end, just before you put on the glazing, use the last of the paint to touch up where needed.

Working one foot at a time, glue the absorber to the mounting-rails in a continuous bead of silicone adhesive, again using occasional dots of hot glue as a temporary aid.

#### Install the Fan

Install your collector fan (Grainger, 4WT48 70 cfm, or 4WT47 105 cfm)

and a pre-set snap-disc cooling thermostat (Grainger 2E245, close at 110 degF, open at 90 degF) in a shroud of aluminum flashing or house trim.

Make a one-piece fan-and-solar-thermostat inlet shroud, or you can use a two-piece shroud. One piece, to mount the fan, is an 11-7/8" x 6" pan with 1" flanges on top and bottom (make from 11-7/8" x 8" material); it has a 4-3/4" hole at its center and a 3/8" hole at one side to pass the thermostat leads out from the collector. Mount the fan over the hole with 1/8" x 1/4" pop rivets and a fillet of silicone adhesive, and bond the assembly in place with silicone adhesive vertically in the intake, at the back wall of the collector. Make sure the fan's air-direction arrow points into the collector.

The other shroud piece is also mounted with silicone adhesive. It has a 1" horizontal leg, a 4" 45 degree surface to mount the thermostat facing the sun and to redirect the incoming air downward, and a descending 3" leg.

Mount the thermostat through a hole the size of a quarter, and fasten it with pop rivets. Bond the thermostat shroud in place so the vertical leg is spaced 1/2" away from the plane of the glazing. Pass the thermostat leads through the 3/8" hole in the fan mounting plate. Wire the fan and the thermostat in series - tie one lead from the fan to one lead from the thermostat with a #14 wiring nut, and finish with an 8" length of electrical tape. Seal the thermostat wire hole with silicone adhesive. The remaining unattached leads, one from the fan and one from the thermostat, will be wired to the power cord leads at final installation.

#### Touch-up

Use the rest of your spray paint to paint the inlet shroud (paint the nose of the thermostat) and touch up the absorber.

#### Install the Glazing

The glazing can be Plexiglas (acrylic), which does well in this application because of the vertical angle and the efficient (low) temperature at which this collector runs, or another material of your choice (Kalwall). Polycarbonate (TwinWall, etc.) is strong, but may yellow. Cut the glazing to size to match the inside line of the plywood. Install the glazing with 1/8" pop rivets (1/4" grip range), spaced every 8" along the baffles.

Install pop rivets through the glazing every 8" along the "C" baffle. Put four rivets across the center of the "C" baffle.

Lift the glazing edge slightly and put a 5/16" bead of silicone adhesive around the collector sides where the glazing will sit. Place the silicone adhesive bead near the inside edge of the surface, so that as you allow the glazing to rest on it, the adhesive squeeze-out just reaches the inside of the collector.

#### Install the Aluminum Sheathing

Press the aluminum sheathing in place using an aid made from two 2-foot-long



1. x 1-1/2's glued together to make a 90 degree angle. As you do, install
1. /8" pop rivets through the sheathing into the plywood, all around the sides

of the collector, located 1" from the front edge, and every 8".

Install the sheathing angle all around the rear of the collector with 1/8" pop rivets into the plywood spaced, located 1" from the rear edge, every 8".

Working on each side on turn, tip the collector up on the side on a flat work table, to help ensure the sheathing edge is straight and cannot slip toward the side. Install 1/8" pop rivets, through the bend line where the sheathing touches the glazing (drill these holes through both sheathing and glazing). Rivet around the collector face on the contact line using a 12" spacing.

#### Dress and Fill the Glazing Joint

Use a gentle leather-glove touch to adjust the gap where the edge of the aluminum sheathing "returns" away from the glazing. The gap should be at least 1/4". Completely fill the gap with silicone, and finish it the joint with a spoon. Allow the fillet to extend 1/4" out onto the face of the glazing. Don't try to clean up until the silicone cures.

This seal design is tough and won't be broken by shock or expansion from temperature change.

#### The Manifold

The collector connects to the house via a manifold box made using the same construction materials and gluing method you used for the case - a urethane foam-board box with an outer layer of plywood around the sides. It also has a sheathing of aluminum flashing, made from a 9" x 1-1/2" angle, 60" long (this allows an overlap). The 14" square, 9" long, two-way, over-and-under manifold connects to the house through the wall or across the window sill.

You can use plywood on just the top and bottom, or on all four sides of the manifold. The manifold is divided by a foam-board "center divider" into a lower intake and an upper exhaust passage (back to the house). The lower passage is 6" high, the top is 4-1/2" high.

On the upper surface inside the upper passage, 1" away from the front face, install an 11" length of 1" x 1" flashing angle. Use hot glue dots and silicone adhesive. Face the angle legs away from the front face. This will act as a stop and support the edge of the inlet/outlet filter. Do the same at the lower surface inside the lower passage. Cut an 11-1/2" square piece of furnace filter to use for an inlet/outlet filter. The filter will span the center divider of the manifold, and rest against the 1" x 1" stops.

Install a Grainger 2W050 three-wire power cord up through a 3/8" hole in the bottom front edge of the manifold; make an overhand knot for a strain relief. Put a ring terminal on the green ground wire. When you make

the final installation, fasten the ring terminal to the fan shroud with a 3/16" aluminum pop rivet. Note: You could install an additional room temperature thermostat (open on temperature rise) in the inlet to disable the fan on rising room temperature; this would partially limit warm weather output. But the unit will still thermosyphon slowly. To fully prevent the unit from heating in summer, without damaging it, you will have to cover it with a cloth or plywood cover. Do not close or stop up the manifold openings without also covering the collector, as this would cause very high collector temperatures and consequent material damage.

The grilles for the manifold should be split, to eliminate heat cross-over.

Don't choose moveable-louver grilles. You could use perforated metal.

The best and cheapest pre-made grilles are white painted steel, available from Hart and Cooley through your local HVAC supplier. Order one #672-steel-white, 12 x 4 for the upper air passage, and one #672-steel-white, 12 x 6 for the lower passage. These are approximately 13-3/4" long, and 5-3/4" high for the 12 x 4, 7-3/4" high for the 12 x 6.

There are two mounting holes in the grilles (one at each side). Use urethane adhesive to glue a block of wood into the foam-board to accept a screw at each mounting hole location. Install the grilles with the bottom grille's louvers angled down, and the top grille's louvers angled up, to help prevent air from crossing over from outlet to inlet (short-circuiting). The hot outlet air tends to segregate itself by rising away.

## INSTALLATION

### Plan the Installation

My preferred installation method is to cut a 14-3/8" square hole through the wall between studs (assuming a 14" square manifold). Or, if you choose, a sliding window installation is an option. Just pre-mount the manifold to the collector the day before with urethane adhesive. Give the adhesive a full 24 hours to cure. Prop the collector in place with the manifold coming across the window sill. If you have a storm sash, seal that one first. Shut the sash on the manifold and block off the gaps with 1" urethane foam-board - the same foam-board used to make the collector. Trim the foam-board edges with aluminum foil tape. Next do the same to the inside sash. Caulk only the joints at the bottom and sides of the foam-board. Use peel-and-stick foam strips on the underside of the sliding sashes so you can open them when needed. Install a security catch on the inside sash if desired.

### Preparation

In preparation for installation, make (4) brackets of 1/8" x 3/4" flat aluminum bar, 9" long, bent to give a 6" and a 3" leg. Use a 3/16" drill for #10 stainless pan head screws. Drill (3) holes in the 6" leg, (2) holes

in the 3" leg. Put (3) #10 x 3/4" stainless screws through the 6" leg into the collector, and (2) #10 x 1-1/2" stainless screws through the 3" leg into the building. Use one bracket near each corner of the collector.

### Begin the Installation

#### Wall installation:

Cut a 14-3/8" square hole through the wall between studs (assuming a 14" square manifold). Make a small hole in the center of where you think you'd like the hole to be. Probe with a coat hanger to find the studs.

#### Measure

the manifold and mark lines for a hole 3/8" bigger than the manifold dimensions. Cut the inside wall board with a utility knife. Stuff the insulation from the hole into the wall cavity. Square from the inside hole

over to the outside wall, and drill holes at the corners to the outside. From the outside mark the lines, check the dimensions, and make them plumb and square. Use a saw to cut the hole.

#### Sliding Window installation:

Pre-mount the manifold to the collector the day before with urethane adhesive. Give the adhesive a full 24 hours to cure. Prop the collector in place with the manifold coming across the window sill. If you have a storm sash, seal that one first. Shut the sash on the manifold and block off the gaps with 1" urethane foam-board - the same foam-board used to make the collector. Trim the foam-board edges with aluminum foil tape. Next do the same to the inside sash. Caulk only the joints at the bottom and sides of the foam-board. Use peel-and-stick foam strips on the underside of the sliding sashes so you can open them when needed. Install a security catch on the inside sash if desired.

#### Flash the Hole

Next, line the hole with a piece of aluminum flashing. This will be flush with the inside wall surface, with 3" wide ears bent to sit against the outside wall. To make this, cut a piece of flashing 60" long, and 3" wider than the wall thickness. Make a 90 degree, 3" wide bend down the length of the piece. Make cuts through the 3" leg, to allow you to wrap it around the outside of your 14" square manifold, making 90 degree bends at the four manifold corners. Set the manifold aside to attach to the collector later, from inside the house. Staple the pre-bent flashing into place in the hole, putting some staples inside the hole and at least four in each outside ear. Caulk under the ears (don't neglect the corners) with silicone adhesive.

#### Pre-Mount the upper Brackets

Mount the upper two mounting brackets to the collector (use (3) #10 x 3/4" stainless screws). Take care to locate the brackets so the collector will be spaced about 9/16" away from the wall (or from the clapboard bottom edges, if you have clapboards; and locate the brackets so they fall just

under a clapboard edge).

Before you place the collector against the wall, press sticky-back foam seal strips (3/16" thick x 1-1/2" wide, the type used to mount camper caps onto pickup trucks) to the back of the collector around the 11-1/2" square manifold hole. Space the foam strips 1-3/4" away from the hole edge. Build up three layers of the strips, so the seal is 9/16" thick.

Prop the collector in position

Now use short pieces of 2x6, on edge, as braces under the collector to raise it to the right height on the wall (so the foam seal rests on the flashing ears). Use a long 2x4 as a brace to keep the top brackets of the collector against the house. Use a level to get the collector plumb. Now take the manifold inside the house. To check whether the collector is aligned with the hole, insert the manifold into the hole and check that the center divider lines up with the "C" baffle in the collector case. Readjust everything until it's plumb and aligned. Outside, fasten the upper collector brackets first, then install the lower ones (keep the collector vertical, viewed from both ways. From the inside, with the manifold removed, use silicone adhesive to caulk around the perimeter of the hole against the foam seal. Completely fill the space between the collector and the flashing.

Install the Manifold

To install the manifold, lay a generous 1/2" bead of urethane adhesive around the manifold rear edges and across the center divider. Place it in the hole, and press it onto the collector. It should stay there by itself, or you can wedge it in position to cure overnight. You can immediately caulk the gap around the manifold at the inside wall with siliconized latex caulk. For a finished look, trim with quarter-round or picture frame molding.

Operation Caveat

As stated earlier, to fully stop the unit from thermosyphoning in summer without damaging the unit (due to high stagnation temperatures), you must cover it, not simply close or stop up the manifold openings. Do not close or stop up the manifold openings without covering the collector, as this will cause very high temperature and material damage.

The worst of the "new collector" smell is gone in a few hours (silicone curing smells like vinegar) and will disappear in a day or two.

To Make Larger Arrays

In scaling up, keep these points in mind:

1. The geometry shown in the accompanying illustration permits daytime thermosyphoning, and discourages nighttime thermosyphoning (the descending and rising legs of the flow circuit are both at outside temperature at night, and are of nearly equal height). If you change to a different flow layout, you may need an anti-backdraft damper.

A manifolded array would use collectors 4 feet wide by any height, and divided into left and right (rising and descending) halves by a vertical baffle, with the halves interconnected at top or bottom by a gap in the baffle, with the filter element mounted on "rails" in each half, on one long diagonal from inlet to outlet.

2. With more than 25 square feet (one good-size collector per room), room overheating becomes a concern in warm/hot weather. You will want large size, automatic or manual collector vents (without these you will need to cover the collectors in summer). In addition to collector vents (top and bottom), you may still have to cover the outlets manually in the hottest weather, and make sure the collector temperatures do not climb too high.

(This is why I invented the AutoVent control. This is what makes an SHVC (Solar Heating and Ventilation Cooling) system. It integrates two three-way valves (one at the inlet, one at the outlet), and four ports (an inlet/outlet pair at both the interior and the exterior) into a drop-in control module.)

3. A large array manifolded with a single fan should be segmented into areas (separate collectors) with a parallel-flow circuit. You might need to restrict the higher-flow collectors to get the array balanced.

You could use "in-at-the-bottom, out-at-the-bottom" collectors manifolded in parallel. These could be served by a split over-and-under manifold duct located at floor level on the inside wall, that might not be too intrusive. It might be three to four inches thick out from the wall, by two feet in height. The bottom 12 inches would be the intake manifold, with an intake grille located at one side of the room; the lower part would be divided from the top 12 inches, the outlet manifold, with a grille at the other side of the room. Or, there could be small outlet grilles located all along the top of the outlet duct and small intake grilles located all along the intake duct.

In this scheme, the entry and exit connections to the collector are all located low in the collector. This arrangement tends to thermosyphon at night, in either direction unpredictably; it will need a positive manual damper, or a timed electro-mechanical damper, that prevents nighttime flow in either direction.

An alternative scheme that needs no damper is to place the over-and-under manifold duct near the ceiling, serving "in-at-the-top, out-at-the-top" collectors manifolded in parallel. There would be an auxiliary inlet duct connecting to the inlet half of the split over-and-under manifold. It would descend to the floor at one side of the room. there would be an auxiliary outlet duct connecting to the outlet half of the manifold, descending to the floor at the other side of the room (i.e. one descending duct at the left side and one descending duct at the right side of the room, at the corners against the outside wall). The reason for the descending ducts inside the room is to receive the coolest inlet air and distribute heated air low in the room.

In this scheme, the entry and exit connections to the collector are located high in the collector. So, the descending and rising outside legs of the flow circuit are both at outside temperature at night, the inside descending

and rising legs are at inside temperature, and all are of nearly equal height, so you don't need any damper.

HAPPY BUILDING!

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Bill Kreamer

President,  
Sol-Air Company  
129 Miller St.  
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by Anonymous Hero on Sat Mar 29th, 2003 at 07:04:59 PM MST

I agree. The old one wasn't broke.

I disagree ([none / 0](#)) ([#2](#))  
by TomW on Sat Mar 29th, 2003 at 07:13:29 PM MST  
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## ENGINEERS SOLVE PROBLEMS

### Activity 5 - Student Reading: Long May It Wave

As an engineer you must design a flagpole that will withstand the forces of nature. Figure 1 shows two of the important forces: the force of the wind acting on the flag ( $F_1$ ) and the force of the wind acting on the combination of the flag and flagpole ( $F_2$ ).

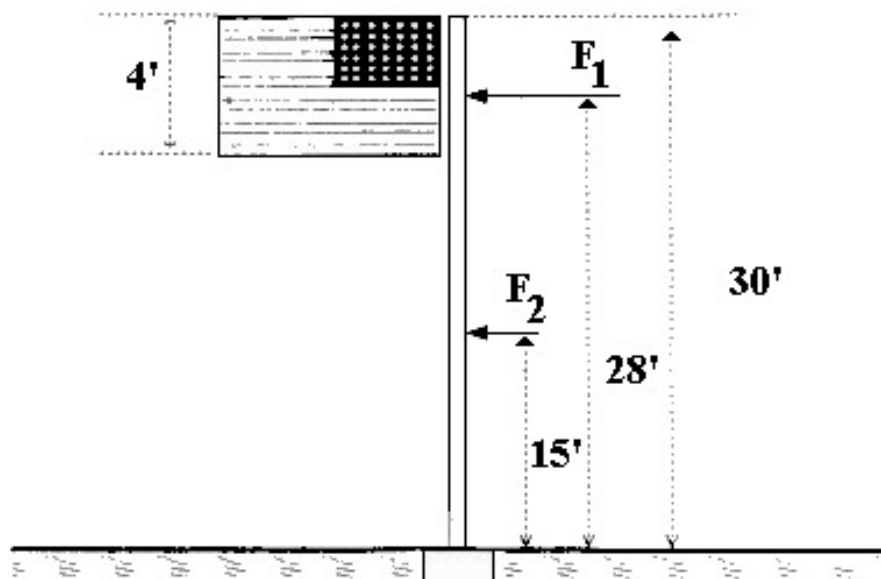


Figure 1

Given:

Elevation of site - 4000 ft

Ambient temperature - 45 degrees F

Air density in  $\text{lb}/\text{ft}^3$  at 45 degrees F - 0.0679 lb per  $\text{ft}^3$

Wind velocity - 60 miles per hour, or 5280 feet per minute, or 88 feet per second

Density of concrete - 130  $\text{lb}/\text{ft}^3$

#### EQUATIONS TO USE

Surface area for object: length times width ( $l \times w$ ) in same units

Moment: force in pounds times lever arms in feet

Volume: length times width times height in same units

#### DEFINITIONS

##### Center of mass.

Point at which a force acts upon a body. The flagpole is one body with a length and width. The flag is another body, and it, too, has length and width. The flag has width because of the wind playing on the fabric, causing it

to ripple. The width of the ripple is the width of the flag (as seen from above, not on the flat surface). The large area of the flag is parallel to the direction of the wind flow.

A wind force acts at the middle of the area of each body. The force that acts upon the flag ( $F_1$  in Figure 1) is different from the force that acts upon the flagpole ( $F_2$  in Figure 1). These forces are given in the problem. (Engineers have formulas for computing the size of these forces, but the formulas are too complicated for us to use here.)

### **Moment of force.**

A force applied to a body may produce rotation about some axis. You can easily see this if you push against an open door. Try pushing a door at the handle, at the center, and right at the hinge. The further out from the hinge you push, the less force you need to move the door. The effectiveness of a force in setting a body in rotation is known as the moment of force. It is measured by the product of the force times the length of the lever arm (here, the distance outward from the hinge.)

In order for a body to remain stationary, the moments must be equal and opposite.

### **Fulcrum.**

The support or point of support on which a lever turns in raising or moving something. On a door that's open and free to swing, the fulcrum is the hinge.

### **THE PROBLEM:**

Figure 1 shows the two forces acting upon their separate centers of area. The moment equals the forces that are acting upon the center of their areas times the distance from the base to the center of each area. There are two parts to the problem: The first is to determine the moment of force of the flag and flagpole together. The second is to make sure that the moment of force of the base is the same as that of the flag and flagpole, in order to balance the two forces.

### **STEP 1.**

Figure the moment, or force of rotation, of the flag and flagpole, which must also equal the moment of the base. Thus  $M_1$  must equal  $M_2$ , as shows in Figure 2.

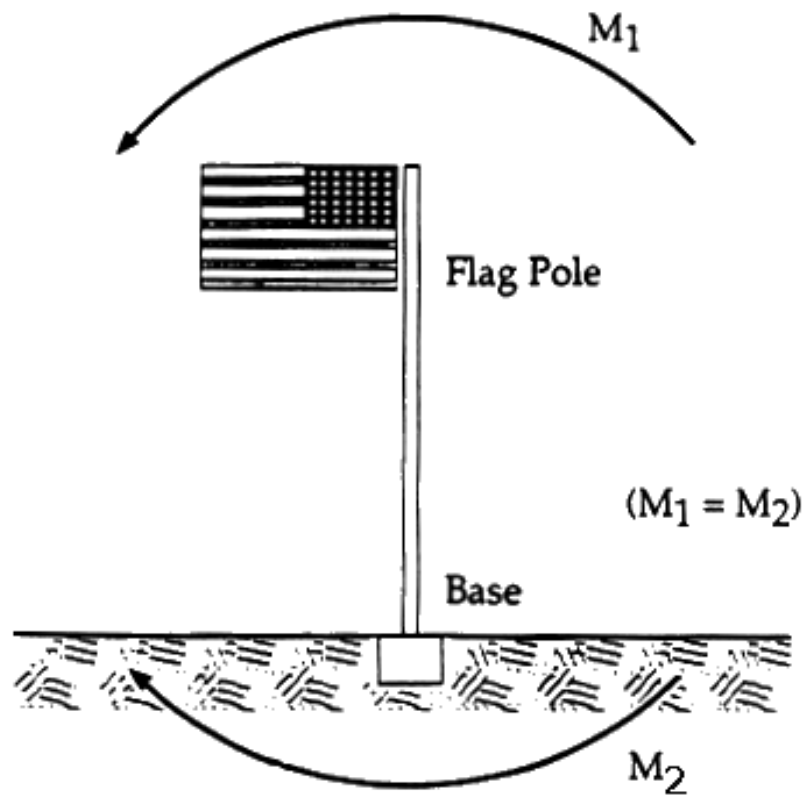


Figure 2

Thus, the moment of force of the flag and flagpole,  $(28 \text{ feet} \times F_1) + (15 \text{ ft.} \times F_2)$ , 22,832 ft-lb, must also be the moment of force of the base.

### STEP 2.

We know that the moment of force of the base ( $M_2$ ) must be 22,832 ft-lb. We are given two measures of the base, the length and width, which give us the area of the base of the block. We need to find how deep the block must be in order to balance the moment of force of the flagpole. The moment of force of the base will be the total weight of the base times the distance from the fulcrum to the base's center.

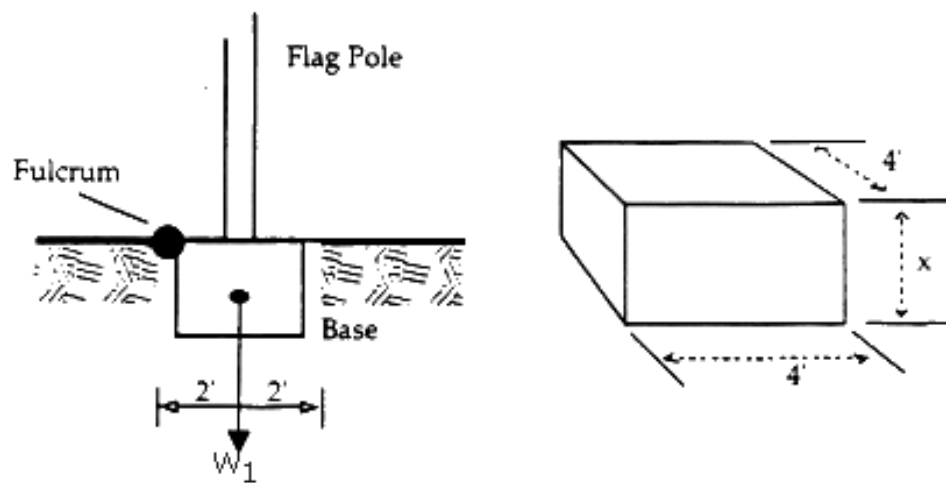


Figure 3

Remember that the density of concrete is 130 lb per cubic foot. The weight of the base will be the volume of the base times the density of concrete in pounds per cubic foot.

$$M_1 = M_2$$

$$\text{vol}_1 = (\text{length})(\text{width})(\text{height})$$

$$= 4 \cdot 4 \cdot (x) = (16x) \text{ ft}^3$$

$$w_1 = (16x)(130) = (2080x) \text{ lb}$$

$$M_1 = (2080x) \left( \frac{4}{2} \right) = (4160x) \text{ ft-lb}$$

Moment of base = moment of flagpole

$$(4160x) \text{ ft-lb} = 22,832 \text{ ft-lb}$$

$$x = \underline{5.5 \text{ ft}}$$

Therefore, the base must be at least 5.5 feet deep in order to balance a flagpole as described.

(note: lb = pounds; ft = feet)

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[22 batteries 48 volt bank.](#) | 12 comments (12 topical, 0 editorial)

Re: 22 batteries 48 volt bank. (none / 0) (#5)  
by Chuck on Wed Dec 10th, 2003 at 03:14:49 PM MST  
([User Info](#)) <http://www.greeleynet.com/~cmorrison>

Since you asked...



These are 1/2 of the 2880 AH of telco type batteries I have in the shed. There are two 24v strings in the shed. The other 1/2 is identical and located to the left of the photographer. They're about 2 feet deep and stack about 3 ft high and 4 feet wide per string. 3000 lbs per.

These are also ones that are "not recommended" for RE use. I think the main reason people shy away from them is they don't like to be deep cycled. IMHO if you have enough amp hours available, you don't have to deep cycle them.

Chuck

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[solar cell WB- 27](#) | 10 comments (10 topical, editorial)

Re: solar cell WB- 27 ([none / 0](#)) ([#10](#))  
by Chuck on Wed Dec 3rd, 2003 at 05:24:47 PM MST  
([User Info](#)) <http://www.greeleynet.com/~cmorrison>

My guess is that an mppt charger is required to get close to rated output. Even then it doesn't really make it.

I have 630 watts (rated) of panels. Even with a good mppt charger, the most I've seen go into the battery is 18.x amps @28 volts, just over 500 watts (dead of winter at noon). This would make each 105 watt panel actually 83.3 watts. Better than the example you give, but still \$4.81/watt instead of \$3.81/watt.

oh well...

Chuck

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[SLA batts](#) | 5 comments (5 topical, editorial)

Re: SLA batts ([none / 0](#)) ([#5](#))  
by Chuck on Tue Dec 2nd, 2003 at 12:07:40 PM MST  
([User Info](#)) <http://www.greeleynet.com/~cmorrison>

Hi Rob,

I picked up the batteries in Denver from a guy who was disposing of them for US West. Last I spoke with him it looked like he had made arrangements to have the rest (about 10 48v strings !) sold in mid november. If you are interested, contact me off list and I can make sure they're gone (or not). (See my web site for my email address)

Yes, it was Surplus Center of Lincoln, Neb. They might have sold them by now too.

Chuck

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[SLA batts](#) | 5 comments (5 topical, editorial)

Re: SLA batts ([none / 0](#)) ([#3](#))  
by Chuck on Mon Dec 1st, 2003 at 01:00:03 PM MST  
([User Info](#)) <http://www.greeleynet.com/~cmorrison>

I'm curious if the ones I (and Matt) have are the same type as you ask about. The ones we have are SLAs, but are specifically VRLA, or Valve Regulated Lead Acid. These are the type that Surplus Center was showing on their mail out flyer. They are huge in size, weight and capacity (1440 amp hours) and were made originally for telcos. They use a calcium paste on the plates rather than antimony that is used in most liquid lead acid type batts and should not be drawn down below 50% if you want them to last. They were designed to last 20 years and I'm hoping with care, they will.

I've been using my original set (12 2v cells strung for 24v) for the past couple years with 600 watts (rated) of solar panels and occasional wind from my homemade gennies. I use a c-40 for the wind and a Solar Boost 3048 for the PV. There is temperature compensation on both units as I don't have a constant temp where the battery is.

There are other SLAs that are completely sealed, including some car batteries. It would depend on the make and specific type as to how good they might be in RE applications.

The main thing about using SLAs, as DanF said, is to not abuse them. Never overcharge them as you would when equalizing a liquid lead acid battery, and try not to draw them down too low. Having said that, I've read a study done by East Penn (makers of the VRLA telco batts <http://www.eastpenn-deka.com/>) which shows no discernable degradation of performance after several hundred complete discharge cycles, but I don't know if I really trust tests done in idealized conditions.

Chuck(M)

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[Forklift Battery](#) | 3 comments (3 topical, editorial)

Re: Forklift Battery ([none / 0](#)) (#2)  
by Chuck on Fri Nov 21st, 2003 at 09:32:37 AM MST  
([User Info](#)) <http://www.greeleynet.com/~cmorrison>

3060Ah would only be if you're drawing at 2 volts with all the cells in parallel. Otherwise, it remains 510Ah, but at the voltage of the string of cells.

Bruce is asking about testing the cells to see if they're any good. I'd suggest finding out who manufactured them and get the specs and charging/testing instructions from them if possible. Otherwise, find someone who makes a similar battery (like trojan) and go by their recommendations.

Chuck

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Re: Forklift Battery ([none / 0](#)) (#3)  
by Budgreen on Fri Nov 21st, 2003 at 01:31:59 PM MST  
([User Info](#))

figure out the Ah rating for each cell.. let that determine for a load test  
for example a 2v 200Ah cell has a 4 hour discharge to 1.75v rating of 48A  
so putting a 48A load on that cell should drop ot's voltage to 1.75 after about 4 hours

also you can charge them and check specific gravity to get an indication

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[Forklift Battery](#) | 3 comments (3 topical, 0 editorial)

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## [High wind postmortum](#)

By [Chuck](#), Section [Homebrewed Electricity](#)

Posted on Mon Sep 15th, 2003 at 10:52:45 AM MST

[Wind](#)

windmill rides out 70 mph winds, mostly...

This weekend we had a pretty strong front come through our part of Colorado. While I didn't have an anemometer set up, I would agree with the weather people (this time) who mentioned gusts of 70mph. For a while it seemed like it was pretty sustained winds of around 50 mph.

Since I had installed a number of untested "features" on the windmill, I decided to leave it running and test them in strong winds. Afterwards I lowered the tower and examined the results. This is what I found:

1. The Pipes furling system. I had been concerned that the furling system didn't seem to do much, but that was in rather low wind, below 30mph. In the strong wind it furling well. In fact it maxed out several times while I watched it, so it does indeed furl nicely when it should.
2. 3 blade, 7' diameter rotor. I had carved these up a few months ago using fir and gluing a 1" board and a 2" board together to get enough depth for the root section twist. I used the newer type polyurethane glue for the first time. I didn't see any stress lines showing on the painted surfaces and so it appears to have held together well at pretty high rpms.
3. The 24v 194rpm DC motor as generator. I've wondered what output I could really get out of this. With my current setup it appears the answer is at least 20 amps (27 volts, so 540 watts) when the wind is really going. So far the bearings are holding up.
4. The slip rings. Here is where it fell apart. Watching the ammeter during the storm I was seeing surges to 20 + amps and then down to 0. I know the rotor was moving fast, so I was confused until I examined the slip rings. I had a joint in each ring which was slightly uneven. At some point in the evening, one joint was lined up with a brush, which straddled the (small) gap and started sparking. The heat build up in the brush melted the plastic brush holder and very effectively glued the brush into position. The ring next to the joint was heavily carbonized and some of the copper ring was melted near the joint. I used two brushes per ring. One ring getting glued off the ring shouldn't have killed output, but it did. The other brush on that ring was a little stiff in it's holder, and could have been off the ring at times. It did have a lot of carbon build up on that side of the ring too, but I didn't see any other melted copper. The other brushes appeared to have no problems.

I believe the slip ring unit would have worked fine if...

a) a thin copper lining surrounded the brushes in the plastic holder. This would make them slide easier and keep hot plastic from adhering to the brush. Leads from a lining to the terminals might have helped keep the

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resistance down and the heat lower.

b) a jointless ring had been used. I was unable to find a copper or brass pipe the right size or I would have done this in the first place. A smoothed over solder joint may have helped.

Next project ...

I have a set of two thin nylon blades (8' diameter) to try out. It should be fun to see how these work on the 24v-164rpm motor. I'm concerned about startup with only two blades and also the oft mentioned yaw jerkiness two blades are reported to have. Until I beef up the slip rings, I'll go with dangle wiring to test this one out.

Chuck

[High wind postmortum](#) | 6 comments (6 topical, 0 editorial)

Re: High wind postmortum ([none / 0](#)) ([#1](#))  
by troy on Mon Sep 15th, 2003 at 11:36:28 AM MST  
([User Info](#))

Performance testing at the outer envelope is often very informative, if perhaps destructive. Thank you for sharing this valuable insight. I love polyurathane based wood glue, eg gorilla glue. I am still a bit cautious about slip rings, though if you come up with a bulletproof design, I could be a convert.

Best regards,

troy

Re: High wind postmortum ([none / 0](#)) ([#2](#))  
by RogerAS ([rogeras@cei.net](mailto:rogeras@cei.net)) on Mon Sep 15th, 2003 at 12:38:09 PM MST  
([User Info](#))

Hi,

Great report!

Now for your brushes;  
I have an old AC generator that has brush holders made of bakelite that seem as though they would work for your application. I would look into motor rewind shops in your area and see if they have something similar you can adapt to your needs. Heck, I've been thinking of turning this into a PMA and if you want I'll send them to you. The generator won't every be used as it was again, so either send me email at [rogeras@cei.net](mailto:rogeras@cei.net) or respond to this.

RogerAS

"Put the bunny back in the box!"

Re: High wind postmortum ([none / 0](#)) ([#3](#))  
by Chuck on Mon Sep 15th, 2003 at 01:19:31 PM MST  
([User Info](#)) <http://www.greeleynet.com/~cmorrison>

Hi Roger,

Thanks for the offer. Bakelite would certainly stop the melting plastic issue. It would be nice to make the whole assembly out of it if it was easily available as a raw material.

I do have a motor shop nearby and I'll probably check them out for some metal holders. They might have some of the integrated roll spring kind which would be fun to play with. I prefer metal so the holder can help transfer current.

My main concern here is not so much to have something for my own use, but to come up with a bullet proof design that anyone can make easily if they want to go with slip rings.

Chuck

[ [Parent](#) ]

Re: High wind postmortum ([none / 0](#)) ([#4](#))  
by DanB on Mon Sep 15th, 2003 at 06:11:26 PM  
MST  
([User Info](#))

I have a freind in town who makes his own "very rare auto electric parts"... from bakelite. I don't think it's too difficult, I think it can be done in a normal oven - but searching for info on Google I've found very little.. although I did find several places that supply the materials.

I'm curious about working with it - it could have some applications.

[ [Parent](#) ]

Re: High wind postmortum ([none / 0](#)) ([#5](#))  
by RogerAS ([rogeras@cei.net](mailto:rogeras@cei.net)) on Tue Sep  
16th, 2003 at 07:15:39 AM MST  
([User Info](#))

Yep, like baking a stator, if the mag wire were able to take it!

RogerAS  
"Put the bunny back in the box!"  
[ [Parent](#) ]

Re: High wind postmortum ([none / 0](#)) ([#6](#))  
by Frank Lussier on Tue Sep 16th, 2003 at  
07:38:16 AM MST  
([User Info](#)) <http://www.fludan.com>

Hi I found this in one of my books (bakelite), please take a look below (hope it is legible)

#### 14.5b Preparation of plastics

**Bakelite.** Developed by L. H. Baekeland in the first decade of this century, Bakelite is one of the oldest of the commercial phenolic plastics. It is easy to make a black plastic similar to Bakelite. Simultaneously pour 100 cc of a saturated solution of aniline hydrochloride and 100 cc of 40 per cent formaldehyde solution (commercial formalin) into a 300-cc or larger beaker; stir with a glass rod. At first students will find that a thick dark brown mass forms. When this is allowed to harden, a black plastic similar to Bakelite is formed. While it is still viscous, it can be poured into a child's sand mold.

True Bakelite, a phenol-formaldehyde resin, is somewhat more complicated to prepare (Fig. 14-12). Combine 50 grams of pure phenol (carbolic acid—*caution*) with 80 grams of formalin in a Pyrex or metal beaker. Heat in a water bath until the phenol crystals melt and the liquid turns clear. Then add half a gram of solid sodium hydroxide and continue heating slowly. After a time students should find that the mixture thickens. If the rate of thickening is too slow, add an additional small quantity of sodium hydroxide.

14.5b / ORGANIC CHEMISTRY 291

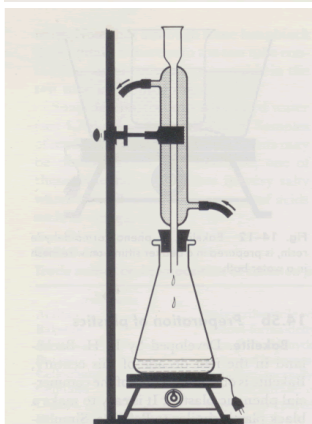


Fig. 14-13 Phenol-formaldehyde resin made from liquid phenol, formalin and ammonium hydroxide heated in a flask fitted with a reflux condenser.

When the substance becomes viscous, quickly pour it into a mold.

In some classes you may want students to prepare this variation. Into a dry beaker place 10 g resorcinol, 2 cc sodium hydroxide (10 per cent), and 10 cc 37 per cent formaldehyde. Set the beaker in a water bath (Fig. 14-12) at 50° C and stir until the crystals dissolve. Raise the temperature of the bath to 70° C (no higher) and keep the solution in the bath. After 10 minutes remove the beaker and let it cool. Remove the plastic disk from the beaker.

*Note:* Many plastics can be colored by the addition of an aniline dye to the still-liquid plastic. Students may also produce a marbled effect by mixing dyed batches of plastics.

Hope this will help

Frank

[ [Parent](#) ]

[High wind postmortum](#) | 6 comments (6 topical, 0 editorial)

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[Making a slip ring connector](#) | 7 comments (7 topical, editorial)

revisions ([none / 0](#)) ([#7](#))  
by Chuck on Mon Sep 15th, 2003 at 12:52:39 PM MST  
([User Info](#)) <http://www.greeleynet.com/~cmorrison>

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1. Use solid copper rings if possible. The use of copper sheet may be OK if you can solder the joint and sand it smooth with the curve of the ring. Size can be a problem getting appropriate copper pipe for the rings.
2. A metal sleeve between the plastic holder and the brush will keep changes to the plastic from affecting the brush's ability to move. Assuming things get too hot. A thin copper sheet might suffice for this.
3. Larger wires on the brushes should reduce the resistance and thus the heat buildup in the brushes. This unit was passing over 20 amps when it failed.

Chuck

[Making a slip ring connector](#) | 7 comments (7 topical, 0 editorial)

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## [Making a slip ring connector](#)

By [Chuck](#), Section [Diaries](#)

Posted on Fri Jul 18th, 2003 at 11:22:02 AM MST

[Chuck's Diary](#)

### Building a slip ring and brush assembly for wind generators

I've never liked the idea of letting a wire dangle directly from a wind generator, twisting as the wind shifts direction and requiring occasional untangling. A few weeks ago I purchased some old wincharger tower stubs at an auction (\$5 each). These both had ring assemblies on them and one had the original (sized) generator in place. They gave me an opportunity to seriously look into slip ring designs and how to get them to work in a homebrewed system.

The following is a quick look at how I used readily available plumbing parts to make a usable slip ring and brush assembly.

The parts:



Most of the parts are shown above. All were purchased at a local hardware store. What is missing above, and shown in a photo further down, is a sheet of copper and some electrical connectors. Missing from all photos is a small brush spring holder made from a cardboard tampon inserter.

The Brush Assembly:

The largest part is a 1 1/4" (ID) to 3" (ID) plastic pipe adapter. This has holes drilled into it and threaded to accept four smaller threaded pipe adapters (not sure of the size right now, but I think it may be 3/8"ID by 3/4"ID) which are screwed into it. These are offset by ~3/4", in pairs, to match the placement of the rings.

Each of these four adapters has a cap for each end. The inner cap is drilled out so as to fit the brush that will go through it. The larger, outside cap is drilled to size for a brass screw. Above you see the larger cap already assembled with brass screw, brass washer and rubber washer already in place.

The Brushes were the largest I could find at the hardware store. The smaller part of the 4 adapters is chiseled out (1/4" chisel) to fit the brush size and shape as shown below. This can be laborious, but using the brushes themselves to size the holes is a great help. The carbon on the brushes rubs off on the high spots of the slot showing

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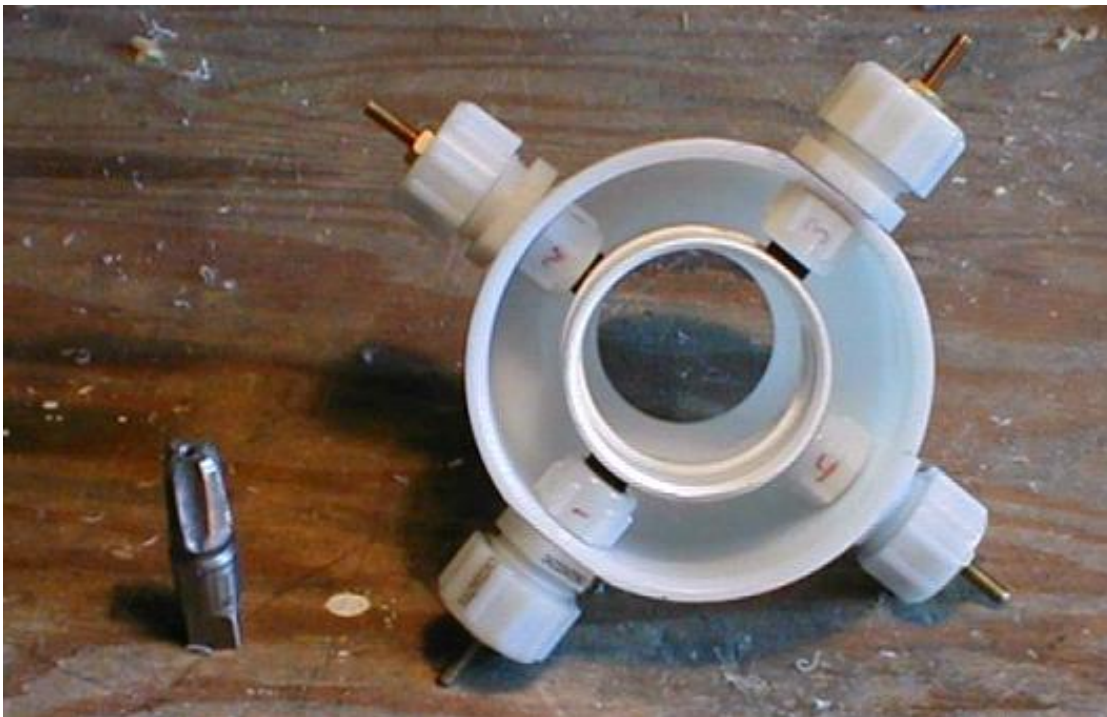
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you where to trim down more.



The following shows how the pieces fit together to hold the brushes against the ring assembly. It is preferable to have some kind of holder for the springs, which will flop about in the larger cap area. I used 5/8" sections of a super sized tampon applicator. These applicators consist of two concentric cardboard tubes. Using both extended allows the rather long springs to be easily placed in the caps and they slide together as the cap is tightened. The larger tube also fits snugly in the rubber washer and guides the spring end of the brush into strong, direct contact with the brass washer and screw end for a good connection. Without the spring holders, the brushes don't have a secure and consistent push against the rings.



The alternator/generator leads attach to the screws on the brush assembly. The opposing brushes should be linked together so two brushes carry each side of the circuit. For a 3 phase assembly, you would need to add a ring and offset another set of brushes.





The ring assembly:

The ring assembly starts out with a plastic plumbing joint. I used a 2" ID piece and eventually glued a smaller joint inside it to reduce the inside diameter to closer fit my tower mast.



It's not necessary, but I turned slots into the outside of the joint piece so there would be a plastic ridge between the two rings. These slots and the smaller inside joint are visible in the top photo.

For the rings themselves I cut 3/4" strips of copper sheet which I wrapped around the joint piece and then glued to the joint. I used a hand saw to cut a slot in each side to accept the ends of the copper sheet. I left about an inch extra length on each side of the copper strip after pulling it tight through the slots. I then cut shorter copper strips and bent them in half fitting them over the existing extra lengths of ring inside the joint piece. These become the attachment points for the wire going down the tower. The upper attachment strips are longer and to the full length of the joint plus an inch or two. I filed down the inner ridge of the joint where this longer strip goes through. Inserting the smaller joint exerts a clamping force on these strips and some epoxy makes it permanent.





On the ends of these strips I attached some brass electrical connectors. This adds rigidity to the strips so they don't short out against the tower or an opposing ring. I angled these out for the same reason.



This whole excersize was to to get a good connection for my peculiar wind turbine setup. The top (smaller) end of the brush assembly attaches to my wind generator. The ring assembly attaches to the mast of my tower, a Rohn 25G. I think this basic concept can be used all sorts of places for an inexpensive rotating power takeoff with just enough modification to fit the existing application.

[Making a slip ring connector](#) | 7 comments (7 topical, 0 editorial)

Re: Making a slip ring connector ([none / 0](#)) (#1)  
by DanB on Fri Jul 18th, 2003 at 12:09:29 PM MST  
([User Info](#))

Thats nice Chuck! Probably not an issue, but my concern would just be... the possibility of high current overheating it. Probably not an issue, especially at higher voltages, but it would be interesting to bench test the assembly with the highest possible current you'd expect from the turbine for a while and see if things heat up at all. I get surprised sometimes how even big chunks of carbon get pretty hot under fairly low current.

Someone on this board suggested using the brushes from Automobile starter motors... they seem like some kind of copper/graphite substance (or something) -but they take higher current.

I like my "dangling wire" :-)) but it might be a problem if I had to leave it for an extended period of time.

Thanks for the cool pictures and good ideas! Be fun to see how it works... bet it works fine.

Re: Making a slip ring connector ([none / 0](#)) (#2)  
by Chuck on Fri Jul 18th, 2003 at 01:35:26 PM MST  
([User Info](#)) <http://www.greeleynet.com/~cmorrison>

Dan,

Thanks for the comments.

Yes, high current is an issue I'm very concerned with, especially with plastic brush holders (I've seen plastic brush holders melted in motors). That's one reason I went with 2 brushes for each side of the circuit. It would be easy enough to make it 3 or 4 per side if need be, or just find higher capacity brushes like you suggest.

I have a 24 volt system and don't expect this generator to put out much over 20 or 30 amps, about 10 - 15 amps per brush. Still might be too much, I don't know, but I should find out soon.

Chuck  
Chuck  
[ [Parent](#) ]

How much resistance? ([none / 0](#)) (#3)  
by TomW on Fri Jul 18th, 2003 at 02:08:33 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Nice writeup, Chuck.

One question comes to mind first. How much resistance across the commutator / brush assembly?

I ask because the loss through that setup might be considerable if the resistance is much at all.

Those  $I^2 R$  losses are hard to beat.

Just with round numbers if its .1 ohm per brush pair you will see 90 watts lost in each pair of brushes at 30 amps output.  $[.1 * [30 * 30]]$  or  $.1 * 900$ .

Just curious.

Cheers.

TomW

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Re: Making a slip ring connector ([none / 0](#)) (#4)  
by wdyasq on Fri Jul 18th, 2003 at 05:37:38 PM MST  
([User Info](#))

Of course it is easier to suggest improvements to someone's inspiration than to come up with something yourself... First, Good job and fine looking craftsmanship.

I think one could use a short section of "hard copper pipe" or even just one of the little solder connectors for the slip rings. I believe there would be less to fail.

Ron

Re: Making a slip ring connector ([none / 0](#)) (#5)  
by Chuck on Mon Jul 21st, 2003 at 10:51:52 AM MST  
([User Info](#)) <http://www.greeleynet.com/~cmorrison>

Thanks Tom and Ron for the comments,

Tom, I'll have to try to measure the resistance on the whole assembly and see what it is.

Interesting thing about that formula, it doesn't hurt you as much at higher voltages.

For 12v:

- 10. amps - loose 10 watts out of 120 or 12%.
- 20. amps - loose 40 watts out of 240 or 16%.
- 30. amps - loose 90 watts out of 360 or 25%.

For 24v:

- 10. amps - loose 10 watts out of 240 or 4%.
- 20. amps - loose 40 watts out of 480 or 8%.
- 30. amps - loose 90 watts out of 720 or 12.5%.

For 48v:

- 10. amps - loose 10 watts out of 480 or 2%.
- 20. amps - loose 40 watts out of 960 or 4%.
- 30. amps - loose 90 watts out of 1440 or 6%

It makes one seriously consider higher voltage systems.

Ron, Yes, the copper pipe is a better solution in some ways. I originally did build a

prototype that used copper pipe, but I found that I couldn't get it in the size I needed for this setup from local sources. Even 2" was difficult to come by and I needed an odd size above that.

Winchargers relied on rings that weren't appreciably thicker than the copper sheeting I used, and that was for a 6 volt system. The only real difference is the joint, which I don't like. But sometimes you compromise to get something done.

Chuck

Re: Making a slip ring connector ([none / 0](#)) (#6)  
by Jerry on Tue Aug 5th, 2003 at 10:36:17 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Guys

I've been flying gennys now for about 5 years without slip rings. Just send the wire down the mast. I've never had a twist problem.

If its good enough for Hugh its good enough for me.  
Anyway I don't want to loose any power I've tryed so hard to get.

I'll be putting up a genny this winter with most of its wire exposed. This will have about 30 feet of wire visable. This will be a good chance to see what hapens to wire without slip rings. May take some befor and after pics. It will be a good study.

JK TAS Jerry

[Airheads Page](#)

revisions ([none / 0](#)) (#7)  
by Chuck on Mon Sep 15th, 2003 at 12:52:39 PM MST  
([User Info](#)) <http://www.greeleynet.com/~cmorrison>

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Chuck

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[Wind Tower Wiring](#) | 5 comments (5 topical, editorial)

Re: Wind Tower Wiring ([none / 0](#)) ([#1](#))  
by Chuck on Tue Sep 9th, 2003 at 02:42:03 PM MST  
([User Info](#)) <http://www.greeleynet.com/~cmorrison>

Welcome to the board. You have the right books to start things off with.

As far as wiring from the generator down the tower goes... Most folks here seem to go the route of letting the wires dangle and if they need to, they occasionally unhook them and untangle them.

A few others of us try various slip ring implimentations to avoid the possible problems you mention. See my diary on slip rings here:  
<http://www.fieldlines.com/story/2003/7/18/11222/7109>

This slip ring config has been working ok for the last several months, although it doesn't have to pass more than 20 amps. I intend to beef up the brushes when the next one goes up to handle 50 amps or so.

Nothing is a panacea though. There are issues with slip rings as well, losses due to resistance, weathering issues and others related to the increased complexity of the system. It takes more time to create and add this to your system.

Chuck

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## Wind Tower Wiring

By [N2Everythg](#), Section [Homebrewed Electricity](#)

Posted on Tue Sep 9th, 2003 at 12:59:38 PM MST

[Wind](#)

huh?

Newbie here. I've been lurking so far. Thanks for your patience.

Did a search of the board as well as a quick skim of my newly arrived copies of Axial Flux Plans and Windpower workshop and couldn't find a quick answer. I've been wondering.....

How do you keep the wiring coming from the generator and leading down the tower from twisting into a knot as the wind generator pivots into the wind (again, and again and again) ?

It seems as though as the wiring would possibly twist in circles until it either torqued the connectors or snapped. Am I way off base here or is there some wiring method that I havn't found yet.

I'm in a location that the wind frequently shifts E->W then W->E on a regular basis. Sometimes several times a day. If it is in the books could someone point the way or is there an easy answer?

Thanks for your replys and I appreciate all the info that I have gleaned from the board so far.

N2

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Re: Wind Tower Wiring ([none / 0](#)) ([#1](#))  
by Chuck on Tue Sep 9th, 2003 at 02:42:03 PM MST  
([User Info](#)) <http://www.greeleynet.com/~cmorrison>

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Chuck

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Re: Wind Tower Wiring ([none / 0](#)) (#2)  
by Seth on Tue Sep 9th, 2003 at 03:36:27 PM MST  
([User Info](#))

If your going to just let the wires wind up... try using a steel cable.. shorter than your wire from the mill.... it will hit tension first... before your wire dose.... stoping the mill from spinning that way any more... then it should just naturally un-wind its self....

Re: Wind Tower Wiring ([none / 0](#)) (#3)  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Tue Sep 9th, 2003 at 11:43:27 PM MST  
([User Info](#)) <http://www.internetfred.com>

I use a simple metal slot in the poles, They only allow the jenny to turn a total of 360 deg, before having to turn the other way. A simple cable can also do this. Basically a stop. It turns till it hits the stop then has no choice but to turn the other way.

Re: Wind Tower Wiring ([none / 0](#)) (#4)  
by scoraigwind ([magnet@scoraigwind.co.uk](mailto:magnet@scoraigwind.co.uk)) on Wed Sep 10th, 2003 at 12:51:37 AM MST  
([User Info](#)) <http://www.scoraigwind.co.uk>

On most sites, the simplest and most reliable solution is to drop the wires down the middle of the tower pipe, through the bearing. Use thick, single wires, with tough insulation and make them long enough to accommodate a bit of winding up. Watch out for places where they can rub/wear on the sides of the pipe.

On some sites this will twist up quite fast. You can fit a plug and socket to unwind it or you can make sliprings. (Do a good job or dont bother).

I do not recommend you restrain the machine from yawing if it has a side-facing furling system (furling tail). The restraint will interact with the furling system to give you very low output or overspeed depending on the direction of the cumulative twisting action.

Hugh Piggott <http://www.scoraigwind.co.uk>

Re: Wind Tower Wiring ([none / 0](#)) (#5)  
by Reno on Thu Sep 11th, 2003 at 08:10:57 PM MST  
([User Info](#))

What I did was use the industrial type wire not sure what its called but it has plastic outer wound steel then rubber inners then the wires. Using two wires can get it with any amount of conductors you want. The portion coming through the support pole (top of tower) I cut away the plastic outer and the wound steel. At the genny I clamped the wire down so it hangs straight no bend. When you turn the genny one full turn and let it go it spins back because the wire winds like a spring. This is in fact a function of the rubber not the conductor inside the rubber.

[Wind Tower Wiring](#) | 5 comments (5 topical, 0 editorial)

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## [battery connections](#)

By [Chuck](#), Section [Diaries](#)

Posted on Mon Aug 11th, 2003 at 10:52:55 AM MST

[Chuck's Diary](#)

Battery connections for unigy 2 batteries

The photo below shows the battery connection pattern for the Deka Unigy II batteries. They mount in steel racks, 3 cells across and stack upwards depending on voltage required. Shown is a 3000 lb. 24 volt, 1440 AH (over 8 hrs) system with four racks installed. Each white faced (and one black face) box is a 2.2v cell with six terminals. It's difficult to tell from the photo which sets of terminals are positive and which are negative, but the large chrome plate on the right is positive, the other is negative. Since they are connected in series, It should be fairly easy to follow the sequence of pos. & neg. on the cells.



These are lead-cadmium based absorbed mat, Valve Regulated Lead Acid (VRLA) batteries and not technically deep cycle. To keep the 20 year life expectancy, they should be floated at 2.25 volts per cell at a temperature of 77 deg. F. Variations of temperature should be compensated for and most good charge controllers are available with this feature. They should NEVER be equalized. It's also not a good idea (for longevity) to draw below 80% of full.

In the normal course of purchasing new RE equipment, Batteries of this type would not be a cost effective use of tight funds. However, there are enough telecom companies closing down operations that these sometimes become available in like new condition and relatively cheap prices.

[battery connections](#) | 2 comments (2 topical, 0 editorial)

Re: battery connections ([none / 0](#)) ([#1](#))  
by DanB on Mon Aug 11th, 2003 at 06:19:17 PM MST  
([User Info](#))

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Thanks Chuck! both for the delivery and the information... Im sure well be printing this page and following it to the letter! Have fun!

Re: battery connections ([none / 0](#)) (#2)  
by Chuck on Tue Aug 12th, 2003 at 09:26:55 AM MST  
([User Info](#)) <http://www.greeleynet.com/~cmorrison>

You're welcome Dan. I enjoyed the time I got to spend up there. It's nice to have so much help when moving such heavy objects, and the company was superb.

The installation and maintenance guide for these batteries is available at:

[http://www.eastpenn-deka.com/products/unigy\\_2.html](http://www.eastpenn-deka.com/products/unigy_2.html)

Chuck

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## [pipes part 2](#)

By [Chuck](#), Section [Diaries](#)

Posted on Mon Aug 4th, 2003 at 11:54:00 AM MST

[Chuck's Diary](#)

Definately not sexy

---

In my previous diary on the pipe furling system, I didn't show the generator mounting. This caused some confusion which I wanted to fix here. The photos below might help. They show two different attachment methods, but It is certainly possible to postulate others, especially for use with axial brake disk style alternators.

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Above is a view of my original generator attachment scheme viewed from the front, windward side. Note the 1/4" bolts securing the pipes on the left side.

Here the generator is attached off to the right side of the mast facing the viewer. Possible adjustments are the length of the nipple between the "T" joint and the floor flange, the angle of the generator relative to the tower (Blades parallel to the tower or tilted up a bit), and the thickness of the support block, in this case a 2x6. Due to the fact that my generator is 8" in diameter, this scheme means the generator shaft is a full 8" + from the center of the mast, which gives the wind on the rotor more leverage for furling than I want. It also puts the full weight of the generator (almost 100 lbs including the hub and rotor weight) too far from the mast for my taste.





Above is the other version. In this the elbow positions the support platform above the "T" joint and off to the right roughly 4 inches from the mast center. This is closer to where I want the center of the rotor. If at some later point I want to experiment with different positions, I can easily drill out a new 2x6 and move the generator in or out from the mast (left or right in the picture).

This placement of the generator mount leads to several possibilities in useage and support options. It could be rotated forward to support an axial alternator design instead of the motor mount style. It is an easy modification to use 1/8" thick steel strapping as additional support from the support platform to the locking bolts on the "T" joint. This would further reduce the possibility of the pipes shifting position. Since the generator mount platform (the 2x6) is an inch or so above the "T" joint, a shim could be placed

between the two pieces to relieve the strain on the elbow joint.

For the truly paranoid, the joints can be super-glued and the pipes could be filled with epoxy or fibreglass resin after the locking bolts are installed.



This shows a simple motor mount. A floor flange bolted to a 2x6 bolted to a motor mount. The motor/generator, omitted from these photos so the support details can be seen clearly, bolts to the opposite side of the 2x6 as the flange. The flange bolts are recessed so as to allow the motor to mount flush to the 2x6. The outline of the motor mount can be seen on the following photo.





This mounting apparatus is not sleek and sexy, but it is adjustable and with proper locking precautions should give a wind generator the support it needs to stay up and running with the wind for many years. Of course, who wants that when you can take it down and readjust it so easily ?

Chuck

[pipes part 2](#) | 4 comments (4 topical, 0 editorial)

Re: pipes part 2 ([none / 0](#)) ([#1](#))  
by scoraigwind ([magnet@scoraigwind.co.uk](mailto:magnet@scoraigwind.co.uk)) on Tue Aug 5th, 2003 at 03:36:41 PM MST  
([User Info](#)) <http://www.scoraigwind.co.uk>

That's very nice, chuck.

One thing you need to watch is the tendency of pipe to shear off at the threads. Use good thick pipe throughout if the loads are high, especially if there is any vibration.  
Hugh Piggott <http://www.scoraigwind.co.uk>

Re: pipes part 2 ([none / 0](#)) ([#3](#))  
by Chuck on Wed Aug 6th, 2003 at 01:41:57 PM MST  
([User Info](#)) <http://www.greeleynet.com/~cmorrison>

Thanks Hugh,

I couldn't agree more.

I haven't tested this enough to have any idea of how much stress it can take or for how long, but I'm sure the winds of eastern Colorado are going to be up to the challenge of testing it for me.

I see two options for strengthening these potential weak spots and I'm sure there are others as well.

1. Bolting on steel support straps to resist twisting at the joints. There are already bolts there, so adding the straps should be little extra work. At the very least these straps could keep the generator from falling off the tower if shearing did occur. I like this idea from a safety standpoint.
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Either or both of these steps can be done after the angles have been adjusted to one's liking. Not elegant perhaps, and it increases the complexity somewhat, but hopefully it would get the job done.

Chuck

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Re: pipes part 2 ([none / 0](#)) (#2)  
by hvirtane on Tue Aug 5th, 2003 at 10:50:22 PM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

A really good looking system.

How does the generator you intend to fix there look like?

- hvirtane@cc.jyu.fi

Re: pipes part 2 ([none / 0](#)) (#4)  
by Chuck on Wed Aug 6th, 2003 at 01:56:03 PM MST  
([User Info](#)) <http://www.greeleynet.com/~cmorrison>

Hi Hannu,

The Generator I'll be testing this with at first is the same one I rebuilt and showed on my web site. It weighs a good 40 or 50 lbs by itself. It is shown with a prototype support system (lots of wood pieces) in the photo below.



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Chuck

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[pipe based furling mechanism](#)

By [Chuck](#), Section [Diaries](#)

Posted on Mon Jul 28th, 2003 at 12:13:16 PM MST

[Chuck's Diary](#)

Non-welded furling assembly

One drawback to some of the best plans available for wind generators is a requirement for welding. I agree that this is a great way to build a sturdy platform, but many of us don't have the required tools or skills to pull it off. I've puzzled over the problem for a while now and this weekend I put some form to some of my ideas.

The idea is to create a side furling mechanism using readily available parts without having to resort to welding. Furthermore, I wanted something adjustable since I wanted to experiment with getting the right angles. The readily available parts are 1 1/4" black water pipe 45 degree and 90 degree elbows, two "T" joints, some reducers (1 1/4" to 1/2"), a 3/8"x6" black pipe with caps and a few 1/4" bolts. The tail boom is 4 feet of 3/4" square tube and there is some 1/8"x3/4" flat galvanized bar stock.



The first view shows how it looks from above. This shows the positions of the 45 and 90 degree elbows. Note that none of these photos show the 1/4" bolts inserted through the joints required to keep them from unscrewing from the weight of the tail.



The next view is from the side where the generator attaches to the hole on the left of the photo. I use a floor flange for this... I'll try later to get some photos of the whole assembly. My camera was low on batteries this weekend.

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Here is a close up of the bearing assembly. It's a 1 1/4" T pipe with reducers at each end to reduce the opening for a 1/2" pipe. This fits a 3/8" pipe quite nicely. A few 5/8" washers give it a larger bearing surface and reduces slop. Holes drilled through the caps allow 1/4" bolt connections to bar stock which holds the tail boom. The bar stock is twisted to give the tail it's vertical orientation. The hole drilled in the main "T" is intended for a thin nylon rope which can be used to pull the tail in a locked furlled position. The smooth bearing surface isn't in place in the photo.



And finally the whole thing showing the tail. The bolts locking the joints into position are not shown on any of these photos. I did that after the camera batteries gave out. It's easy to envision though. Each joint has a 1/4" hole drilled completely through the large collar and a 1/4" bolt is inserted through it with a lock washer and bolt. Super glue or loctite finishes the locking of the joints. I didn't get a chance to raise the unit yet as the new blades haven't been balanced yet and I wanted to beef up my tower raising gear first. More to follow...

[pipe based furling mechanism](#) | 7 comments (7 topical, 0 editorial)

Re: pipe based furling mechanism ([none / 0](#)) ([#1](#))  
by [windstuffnow](#) ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon Jul 28th, 2003 at 06:40:10 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>



Chuck, It looks like a pretty ingenious idea. I'm not sure how you plan to mount the generator/alternator but the way it sounds you plan to mount it center of the mast mount ( the hole on the left). This will make the gen/alt centered and the furling tail will have no effect. The gen/alt has to be mounted offset from the center of the pole pivot. You may have already figured this out but its just an observation of how it was explained. Minor detail in any case.... good work... let us know how it works out

Have Fun  
Ed

Re: pipe based furling mechanism ([none / 0](#)) (#3)  
by Chuck on Tue Jul 29th, 2003 at 09:09:59 AM MST  
([User Info](#)) <http://www.greeleynet.com/~cmorrison>

Hi Ed,

I guess the pictures and/or text are misleading. The "T" over the mast is oriented horizontally. The generator is mounted on a floor flange that is on the opposite side of the "T" from the tail assembly (flange mounted vertically). Generator on one side, tail on the other, mast inbetween them.

The closest to mast center I seem to be able to get it this way is with the prop centered at 8 inches to the left of the mast (looking from behind), while the tail is on the right. I have had this machine up before with a different tail arrangement and it worked fine. Too good actually as it furlled earlier than I wanted it to. This is probably due to the 8" off center distance. Since I can't really change that (it's a big generator) I'll have to deal with tail weight, length, angle etc. to get it to furl efficiently.

If the "T" was mounted vertically it would be as you mention with the generator on top and you could stick a tail out the rear. But of course it wouldn't be a furling setup. Envisioning this brings up some intriguing possibilities though...A dual tail arrangement could be very easy to set up this way... Much simpler, although most folks don't like the looks of a dual tail... You could also use a platform on top that allows the generator to be adjusted various distances from mast center...

Thanks Ed, a totally different angle I hadn't considered.

Chuck

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Re: pipe based furling mechanism ([none / 0](#)) (#2)  
by DanB on Tue Jul 29th, 2003 at 08:11:41 AM MST  
([User Info](#))

Neat Chuck - it's nice to simplify things like this! Be fun to see that when she's done....

Re: pipe based furling mechanism ([none / 0](#)) (#4)  
by hvirtane on Fri Aug 1st, 2003 at 03:10:10 AM MST  
([User Info](#)) <http://www.cc.jyu.fi/~hvirtane/cooker/>

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## [Tilt up triangular tower conversion ?](#)

By [Dave B](#), Section [Homebrewed Electricity](#)

Posted on Sat Nov 8th, 2003 at 02:14:28 AM MST

[Wind](#)

Tilt up triangular tower conversion ?

Anyone out there converted a triangular (Rohn) or other guyed tower for tilt up with gin pole etc ? I'm looking at 60-90' and it's either that or climb it, I'm not so sure about that. Thanks, Dave B.

[Tilt up triangular tower conversion ?](#) | 6 comments (6 topical, 0 editorial)

My thoughts ([none / 0](#)) ([#1](#))

by [wdyasq](#) on Sat Nov 8th, 2003 at 06:26:08 AM MST  
([User Info](#))

src="http://www.otherpower.com/images/scimages/284/twr\_hinge.jpg"  
width=80%>

One could use almost any style tower. I would use a worm gear type winch to raise and lower to keep everything undercontrol.

Re: Tilt up triangular tower conversion ? ([none / 0](#)) ([#2](#))

by [Scott](#) on Sat Nov 8th, 2003 at 06:45:55 PM MST  
([User Info](#))

Here's what I want to do. Thinking of 30' on the lower tower and 60 - 70 feet overall height without guys.

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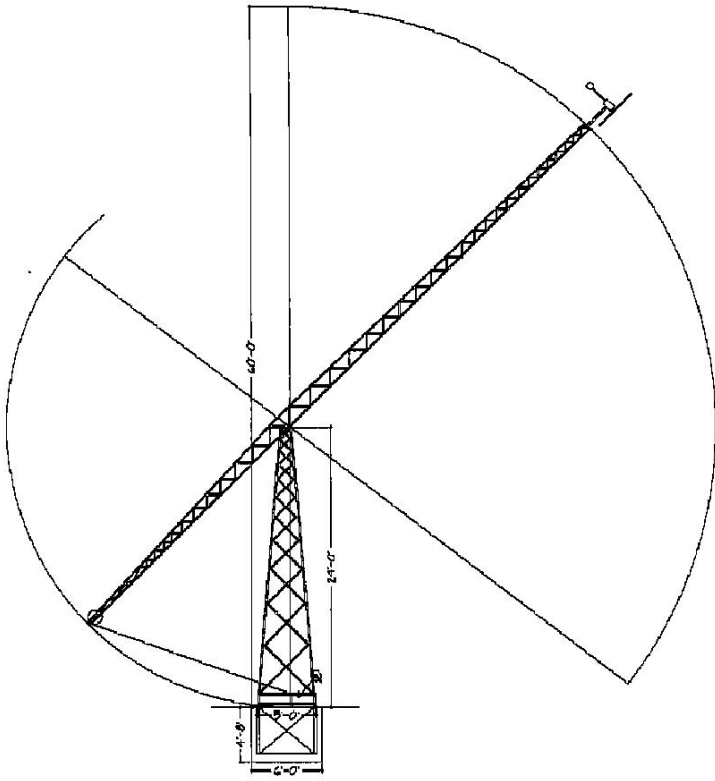
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Scott

Re: Tilt up triangular tower conversion ? ([none / 0](#)) ([#3](#))  
by Dave B on Sat Nov 8th, 2003 at 11:07:38 PM MST  
([User Info](#)) <http://www.madbbs.com/users/bruggelog>

Thinking of the simple gin pole idea and hinged base. I think Rohn may have some of this hardware available already so I'm searching it out. I agree with the worm drive for a winch, it's some serious leverage at that height and weight. Anyone with any more ideas or experience with tilt towers and or conversions I welcome your comments. Thank you, Dave B.

[ [Parent](#) ]

Re: Tilt up triangular tower conversion ? ([none / 0](#))  
([#4](#))  
by the desert rat on Sun Nov 9th, 2003 at 09:10:09 AM  
MST  
([User Info](#))

heres som pics of mine rebar for the concrete needs to be welded on the bottom yet. have to wait till spring before i can pour so its just bolted down to the patio out back as a test tower for now its pivoted on two legs with the third at 90 degrees to them. a long piece of one inch pipe slipped into this third leg will function as a gin pole as it is winched up. after it drops out it can be removed. as the tower comes over center and settles in a short piece of pipe will lock the third leg down. then tighten guys up. the hinge should control the side to side motion. three guys planned. it will be fairley short at only 40 feet. cant wait till spring.



[ [Parent](#) ]

Re: Tilt up triangular tower conversion ? ([none / 0](#)) (#5)  
by Dave B on Sun Nov 9th, 2003 at 11:17:37 AM MST  
([User Info](#)) <http://www.madbbs.com/users/bruggelog>

Beautiful. That's exactly what I had in mind, maybe on a bit of a larger scale but that's it. I'm looking for a commercially available base to fit my tower or have someone with plenty of welding experience fabricate one for me. What make is your tower and what will be on top in the Spring ? Thank you for your photos, I had been sketching things out but now I can show someone the idea. Fun stuff. Dave B

[ [Parent](#) ]

Re: Tilt up triangular tower conversion ? ([none / 0](#)) (#6)  
by BrianK on Sat Nov 15th, 2003 at 08:17:02 PM MST  
([User Info](#))

I have a older 40ft tv antenna tower that works just like the drawings you show. The only difference is that I have to raise and lower it by hand with rope

[ [Parent](#) ]

[Tilt up triangular tower conversion ?](#) | 6 comments (6 topical, 0 editorial)

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[Hot Neutral?](#) | 56 comments (56 topical, editorial)

Re: Hot Neutral? ([none / 0](#)) ([#9](#))  
by BrianK on Sat Nov 15th, 2003 at 08:43:28 AM MST  
([User Info](#))

220 hotwater heaters should have 2 elements

[ [Parent](#) ]

Re: Hot Ground ([none / 0](#)) ([#13](#))  
by storrence on Sat Nov 15th, 2003 at 11:45:16 AM MST  
([User Info](#))

Maybe in the US but not here. It has one element with points to connect 2 hot wires. I have a clothes driver from the US and it has 2 connections for each phase and a ground and a separate neutral but the hot water heater I bought here in Brazil only has the 2 hot wires and nothing for ground or neutral.

[ [Parent](#) ]

[Hot Neutral?](#) | 56 comments (56 topical, 0 editorial)

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[pvc blades](#) | 10 comments (10 topical, editorial)

Re: pvc blades ([none / 0](#)) ([#6](#))  
by BrianK on Fri Nov 14th, 2003 at 04:57:34 PM MST  
([User Info](#))

Yep the pix arent real good. I do notice the what looks to be a small hole on the pinwheel.may have to experiment. Thanks

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Re: pvc blades ([none / 0](#)) ([#8](#))  
by Jerry on Fri Nov 14th, 2003 at 10:41:03 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

I broke alot of my plastic blades in the begining.

Then I started using thin aluminum sheet metal as a support. Thin aluminum on both sides. Not so many broke. I then moved the screws further away from the edge and used 1 inch fender washers along with the aluminum.

That was it. i've tested this combo to 68 mph with no breakage. At 40 mph have seen 80 amps from a 49 inch 4 blade set.

So keep researching the power is there even on the low end also, a few amps at 5 mph. So they do start early to.

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[pvc blades](#) | 10 comments (10 topical, 0 editorial)

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[pvc blades](#)

By [BrianK](#), Section [Homebrewed Electricity](#)  
 Posted on Fri Nov 14th, 2003 at 10:42:02 AM MST  
 gotta love em, but!!!

[Wind](#)

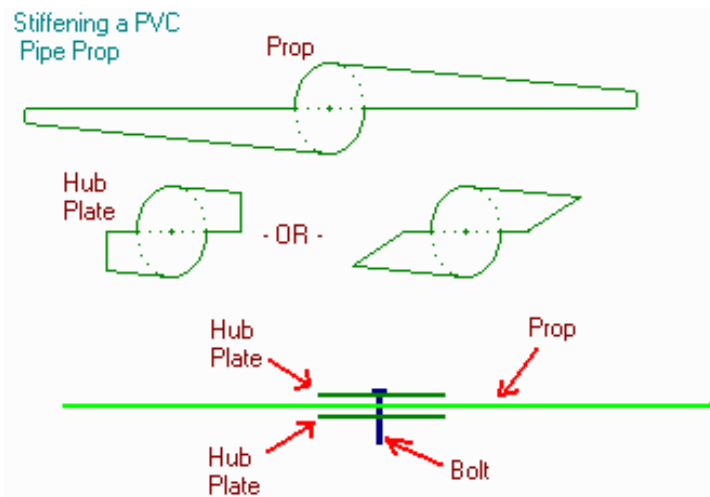
they really need to be reinforced for higher winds the nice wind storm that went through the usa this week stole the blade portion of my 4 ft prop so far I have only found 2 pieces one about 50 ft the other about 100 ft havent located the other 2 yet still searching lol

[pvc blades](#) | 10 comments (10 topical, 0 editorial)

Re: pvc blades ([none / 0](#)) (#1)  
 by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Fri Nov 14th, 2003 at 02:48:02 PM MST  
[\(User Info\)](#) <http://timmythy.home.mindspring.com/timmy.htm>

When I put the plans upfor PVC Props, everyone had questions about how strong they are. I thought the plades would be plenty strong but I forgot that all of those forces are coming down to a single point, the bolt.

Reno had suggested to cut two identical blades then glue and screw them together. I thought it was a good idea for getting thickness for forming an airfoil with. But for stiffening the whole blade, I don't think it's nessesary. But something should be added to the bolt area.



I was thinking about cutting two smaller versions like in the drawing above, then gluing and screwing that all together. This would triple the thickness in the areas that are getting the most stress.

BrianK , exactly how did the blades break ???

} = - W o o f - = {

Re: pvc blades ([none / 0](#)) (#2)  
 by [BrianK](#) on Fri Nov 14th, 2003 at 03:12:48 PM MST  
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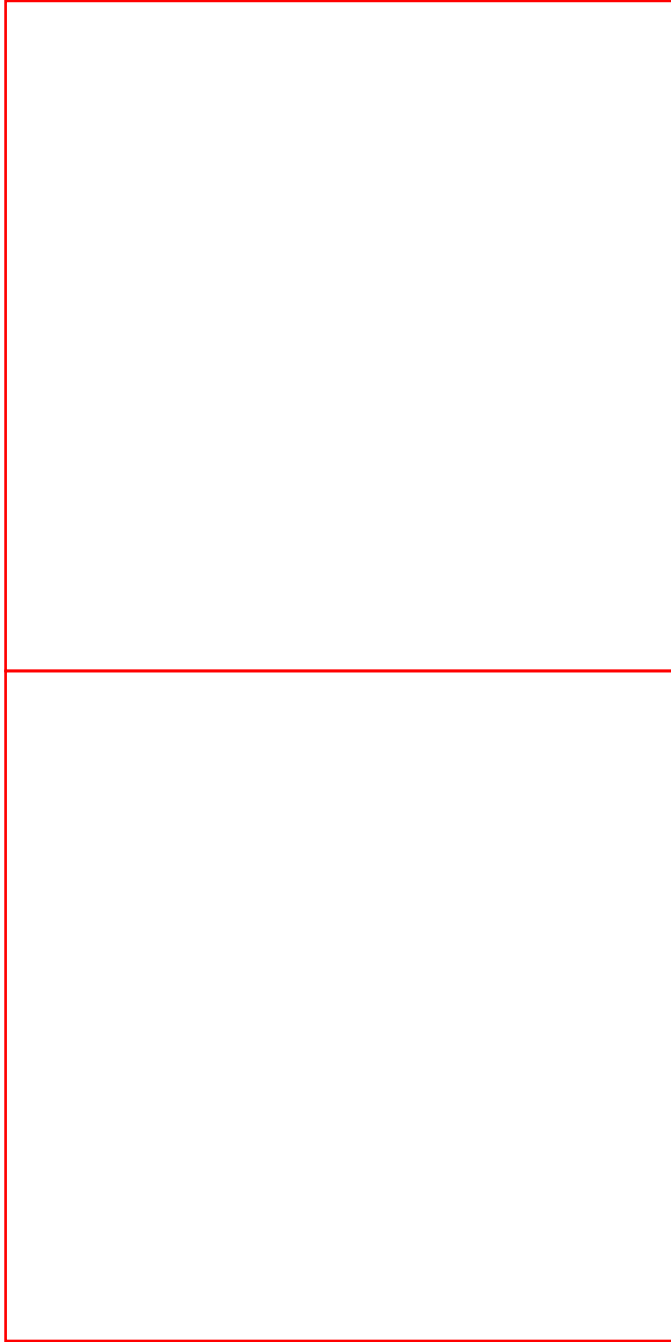
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Hi Woof

They broke off right at the start of the center circle



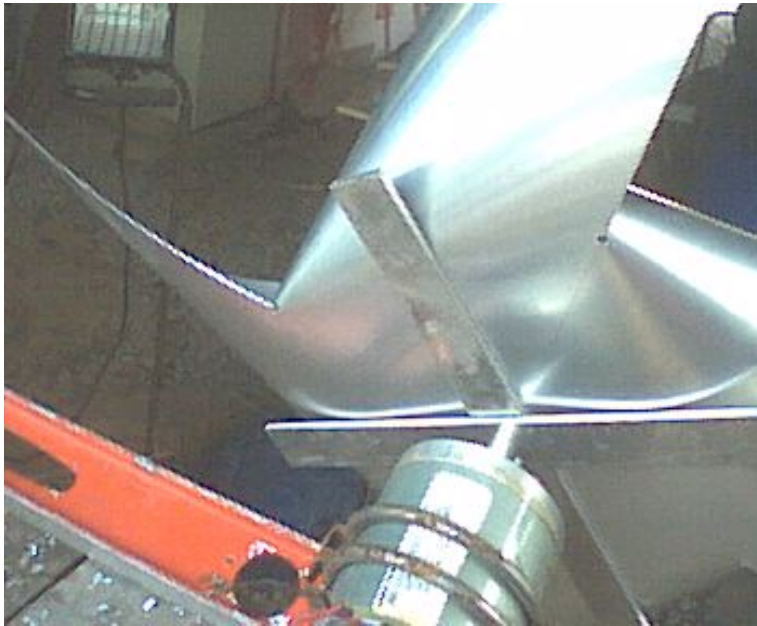
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Re: pvc blades ([none / 0](#)) ([#3](#))  
by TomW on Fri Nov 14th, 2003 at 04:03:08 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

BrianK;

I think a light aluminum strap "spar" behind that thing would have spread that stress out and perhaps kept it from fracturing.

This pinwheel is made from aluminum sheet that is thinner than an aluminum pop can so i used spars on that to help stiffen it and stop them from bending back from the wind. This pic was taken before i pop riveted the spar to the pinwheel but you can see the concept.



I did something very similar on the jerryblades on tape drive motors:



Both have worked well and the strap was cheap and a couple of pop rivets to secure the blade to the spar about half way out on the blade.

Cheers,

TomW



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Re: pvc blades ([none / 0](#)) (#4)  
by BrianK on Fri Nov 14th, 2003 at 04:23:00 PM  
MST  
([User Info](#))

Yep Tom I think that the next one I build is going to get reinforced. If you noticed in the pix it snapped all four at almost the same spot.

[ [Parent](#) ]

Re: pvc blades ([none / 0](#)) (#7)  
by TomW on Fri Nov 14th, 2003 at 05:41:05  
PM MST  
([User Info](#))  
<http://oneota.net/~earthsourcepowr/>

BrianK;

Yeah I think it couldn't hurt much beyond a touch of drag.

As someone else mentioned anytime you have a couple of lines come together like that you should drill a hole at the intersection and make your cuts into the hole. The hole redirects the stress around it rather than into the solid piece.

Actually, the spar should be rounded too as well as not have any sharp edges.

Cheers,

TomW

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Re: pvc blades ([none / 0](#)) (#5)  
by wpowokal on Fri Nov 14th, 2003 at 04:51:47 PM  
MST  
([User Info](#))

Brian K, I can't see from the "parts" pic but could I suggest making sure there are no sharp angles. By that I mean where the centreline meets the circle/hub on Woof's drawing relieve that point by drilling a hole and cutting too that hole.

In the pic of Tom's pinwheel he appears to have a small hole at the hub where the fold begins.

PVC is more prone to breaking when its cold, so that may be a factor.

regards Allan

Re: pvc blades ([none / 0](#)) (#6)  
by BrianK on Fri Nov 14th, 2003 at 04:57:34 PM MST  
([User Info](#))

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by Jerry on Fri Nov 14th, 2003 at 10:41:03 PM MST  
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Jerry

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Re: pvc blades ([none / 0](#)) (#9)  
by Bach On on Sat Nov 15th, 2003 at 07:05:54 AM MST  
([User Info](#)) [change AT: bach\\_on AT hotmail.com](mailto:bach_on@hotmail.com)

Have any of you guys considered using large diameter metal conduit to reinforce this type of blade?

Seems like it would hold up, though it would be much heavier. And it would be harder to fabricate - though not impossible. It's shape already matches the pvc stuff you're using. I'd think that using it for the highest stress areas would be a good match.

But what do I know?

Bach On

- I'm just as happy as if I had good sense! -

Re: pvc blades ([none / 0](#)) ([#10](#))  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Sat Nov  
15th, 2003 at 04:17:04 PM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

If I used metal conduit for the blades. Then I would'nt need the PVC Pipe anymore.

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[pvc blades](#) | 10 comments (10 topical, editorial)

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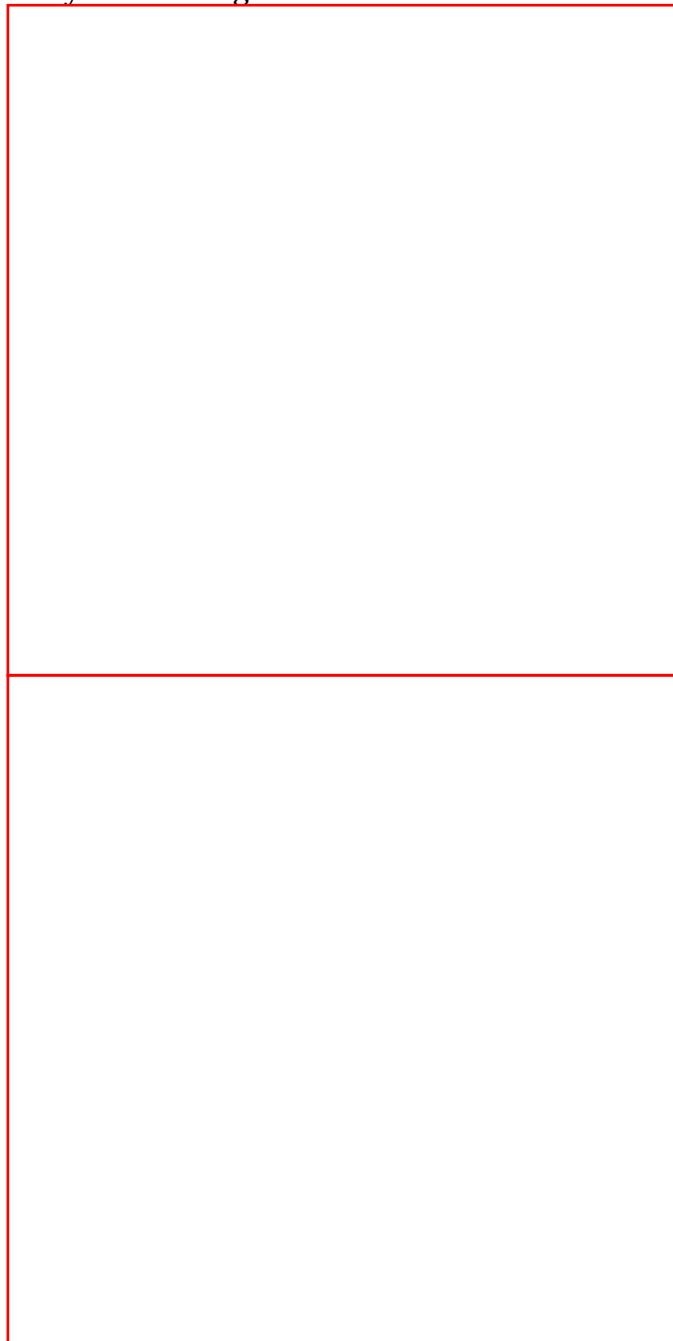
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Re: pvc blades ([none / 0](#)) ([#2](#))  
by BrianK on Fri Nov 14th, 2003 at 03:12:48 PM MST  
([User Info](#))

Hi Woof

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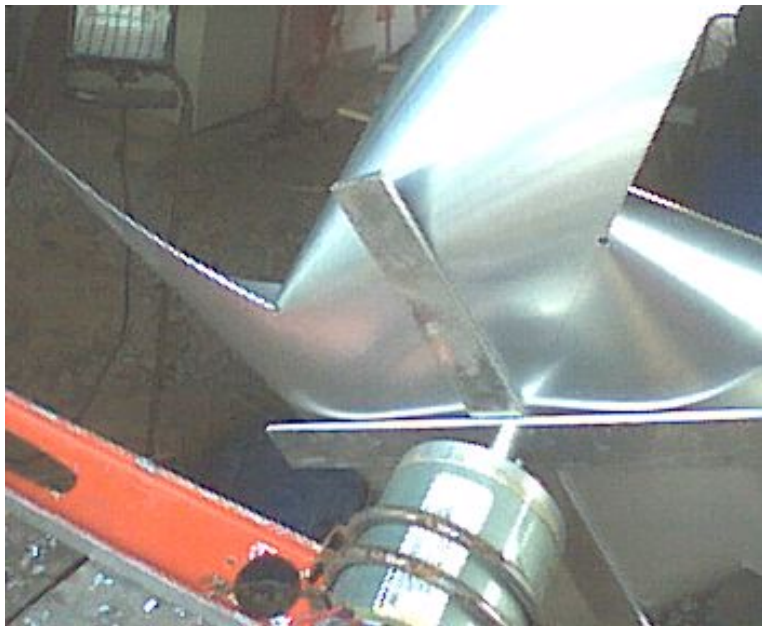


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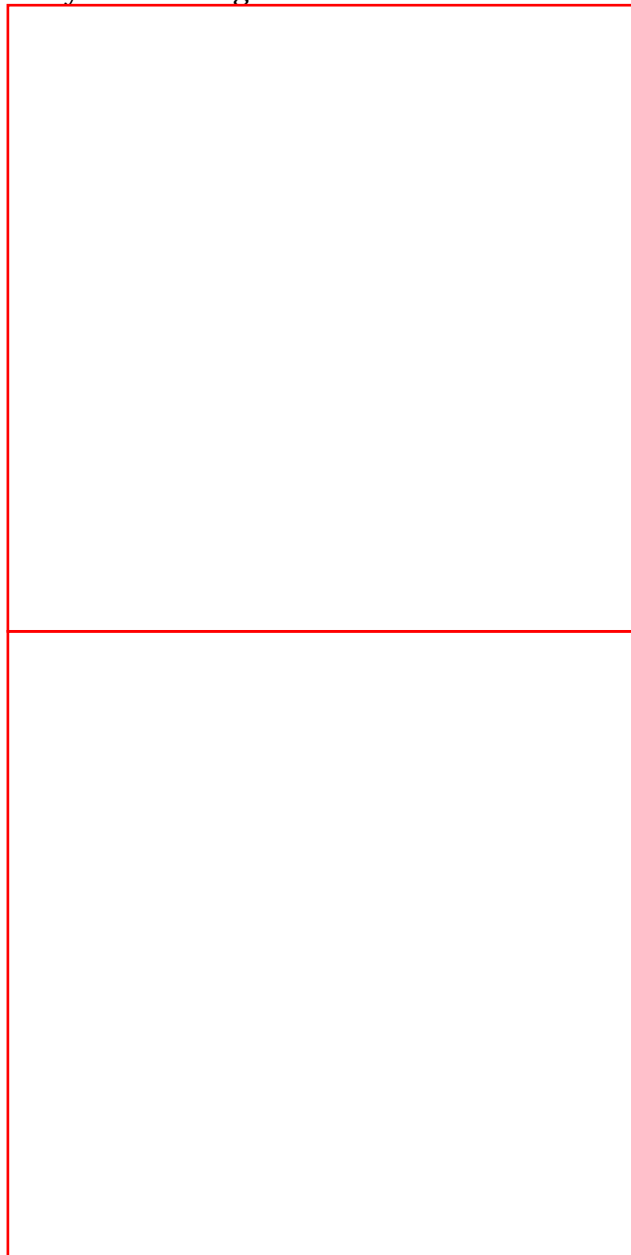
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[microwave transformer questions](#) | 5 comments (5 topical, editorial)

Re: microwave transformer questions ([none / 0](#)) (#3)  
by BrianK on Fri Nov 14th, 2003 at 10:34:36 AM MST  
([User Info](#))

Yep I found out kinda found the voltage thing out the hard way the about 6 volts gives a pretty good jolt when you dont pay attention make ya jump real quick I found that all out when I was trying to figure out the wiring to get it to work I,m still learnin i,m getting a better understanding of it all.

[ [Parent](#) ]

Re: microwave transformer questions ([none / 0](#)) (#4)  
by Norm on Fri Nov 14th, 2003 at 12:47:56 PM MST  
([User Info](#))

Yeah, a used-to-be friend would have fun tossing small charged capacitors to unsuspecting victims....(here catch!) Norm.

[ [Parent](#) ]

[microwave transformer questions](#) | 5 comments (5 topical, 0 editorial)

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[microwave transformer questions](#) | 5 comments (5 topical, editorial)

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[Heat exchanger for a residential clothes dryer?](#) | 20 comments (20 topical, editorial)

Re: Filter, then cool ([none / 0](#)) ([#19](#))  
by [BrianK](#) on Tue Nov 11th, 2003 at 05:12:17 PM MST  
([User Info](#))

If I remember correctly my mom used to hang cloths outside in the winter they would freeze but still dry

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[Heat exchanger for a residential clothes dryer?](#) | 20 comments (20 topical, 0 editorial)

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[switching regulator](#) | 5 comments (5 topical, editorial)

Re: switching regulator ([none / 0](#)) (#4)  
by BrianK on Thu Nov 6th, 2003 at 06:25:45 AM MST  
([User Info](#))

Hey on the going to the parts store thing you forgot that they also need to know what size tires LOL :) just kiddin

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[switching regulator](#) | 5 comments (5 topical, 0 editorial)

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[Blade position and sweep](#) | 4 comments (4 topical, 0 editorial)

Re: Blade position and sweep ([none / 0](#)) ([#3](#))  
by BrianK on Wed Nov 5th, 2003 at 05:18:12 PM MST  
([User Info](#))

I made one of the plastic props awhile back I really like it and I think it may be just as easy as cutting the angle line on the opposite side of the center line to make it turn the other way.

[Blade position and sweep](#) | 4 comments (4 topical, 0 editorial)

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### [Blade position and sweep](#)

By [Kemper73](#), Section [Homebrewed Electricity](#)

Posted on Tue Nov 4th, 2003 at 08:13:25 AM MST

[Wind](#)

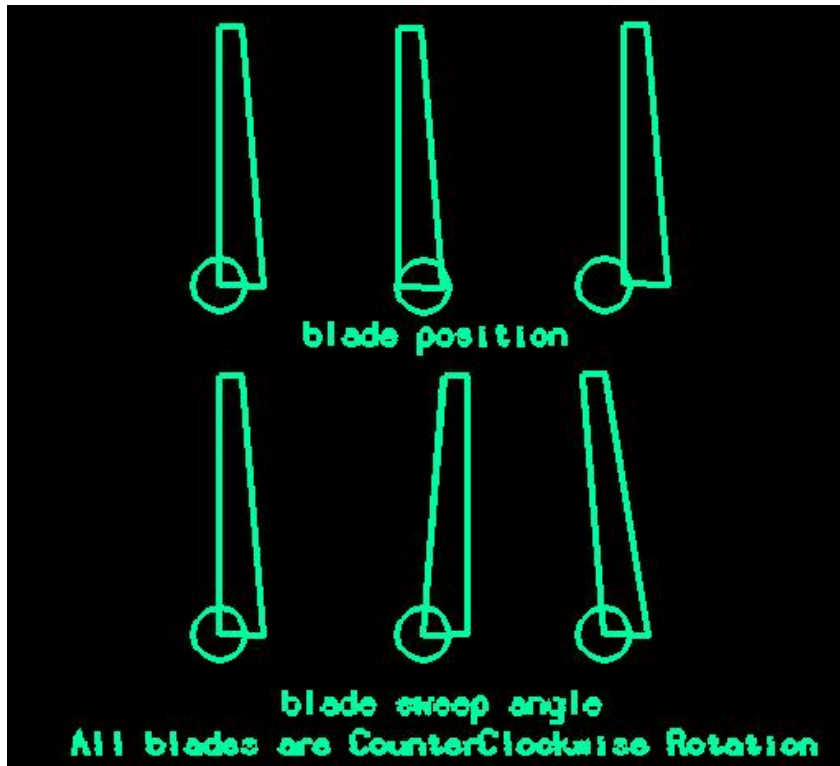
I'm about to start my first turbine but have a couple of questions

Hi everyone, I have learned alot about PM generators and wind turbines by reading this board,, I do have a couple of very important question which I have not been able to find the answer for easily..

1. - should the leading edge be straight, swept forward or swept backward for best efficiency?
2. - should the leading edge of the blade be forward, neutral or trailing from the pivot of the turbine?

The reason I ask is because I am looking at the single piece plastic pipe props. They appear to have a backward swept leading edge that is forward of the pivot point. Plus I have also seen pictures of turbines that seem to have a straight leading edge, that is centered on the pivot axis..

Here is a picture of what I am talking about



I am considering building a single piece plastic pipe turbine or a 3 blade plastic pipe turbine. I have started making some good cad drawings of the props if people are intersted.

Thanks

Jeff

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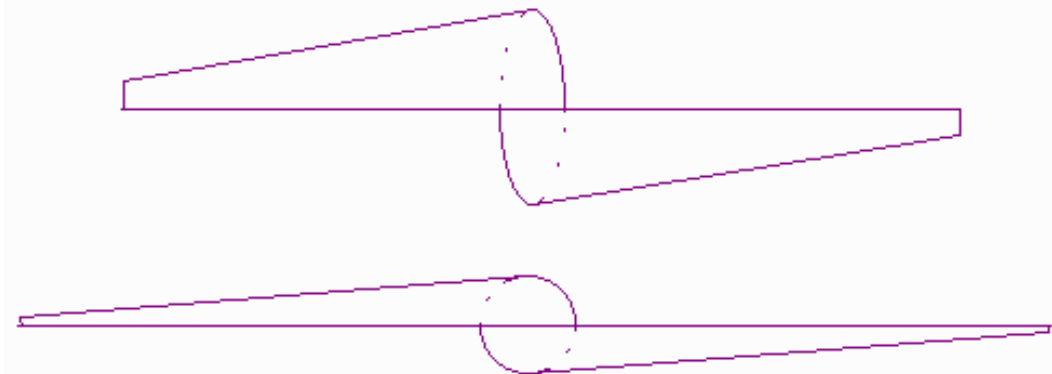
- [More on Wind](#)
- [Also by Kemper73](#)

Re: Blade position and sweep ([none / 0](#)) (#1)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Tue Nov 4th, 2003 at  
09:22:36 PM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

Me and zubby have been playing with single piece PVC Pipe Props. I was messing around last week and came up with a 4 blade PVC prop. It works great even in super gentle breezes without a load. Here's a link...

<http://www.fieldlines.com/story/2003/10/29/17144/245>

Here is the diagrams that I'm working off of ...



I like the design because it's really easy to control the angles of the blade from the Base of the blade through to the tip. The leading edge is the angled cut from the side of the circle in the middle to the tip, the trailing edge is the centerline cut. The reverse of what you are mentioning in your question above.

>=- W o o f -=

Re: Blade position and sweep ([none / 0](#)) (#2)  
by Kemper73 on Wed Nov 5th, 2003 at 04:02:38 PM MST  
([User Info](#))

Yeah,, well that is where I got the question from. From the picture you show, it has a backwards sweeping blade and the blade is forward of the centerline axis,,

I'm just trying to see what would be the difference in having forward sweeping and behind the centerline axis.

I know I can't make it in a single piece, But maybe I will be able to try to make a 2 piece blade soon.

Thanks

Jeff

[ [Parent](#) ]

Re: Blade position and sweep ([none / 0](#)) (#4)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Thu Nov 6th,  
2003 at 07:10:05 AM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

I may not understand your question then.

What do you mean by "Backward Sweeping" ?

If you want to spin the opposite way then just reverse the diagram that I posted.

If to want the centerline cut to face into the wind, I think it would give you a lot less power.

in this picture . . .



The head of the bolt in the center is facing into the wind, and the shaft of the bolt goes to the generator on the downwind side.

>=- W o o f -=  
[ [Parent](#) ]

Re: Blade position and sweep ([none / 0](#)) ([#3](#))  
by [BrianK](#) on Wed Nov 5th, 2003 at 05:18:12 PM MST  
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[spin the meter backwards](#) | 9 comments (9 topical, editorial)

Re: spin the meter backwards ([none / 0](#)) ([#9](#))  
by BrianK on Mon Nov 3rd, 2003 at 06:44:43 AM MST  
([User Info](#))

well it was made to parrallel other gens U.S. army special

[spin the meter backwards](#) | 9 comments (9 topical, 0 editorial)

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[HOMEADE CHARGER QUESTIONS](#) | 6 comments (6 topical, editorial)

Re: HOMEADE CHARGER QUESTIONS ([none / 0](#)) ([#5](#))  
by [BrianK](#) on Mon Nov 3rd, 2003 at 06:38:17 AM MST  
([User Info](#))

I'm playing around with a stock GM alt I have it producing 30+ volts dc with at the present time set up on a real crude setup runnig it with a 1/2 hp motor with a 3 in. pully. the only thong done so far is the fact that the voltage reg is bypassed full 12 volt feed.

dont know if this helps or not.

[HOMEADE CHARGER QUESTIONS](#) | 6 comments (6 topical, 0 editorial)

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## [HOMEADE CHARGER QUESTIONS](#)

By [halfcrazy](#), Section [Remote Living](#)

Posted on Tue Oct 28th, 2003 at 07:19:38 PM MST [Batteries](#)

if i have a 24 vdc battery bank what are my options for making a gm alternator charger? i know it only puts out 12vdc so that is my dilema.

[HOMEADE CHARGER QUESTIONS](#) | 6 comments (6 topical, 0 editorial)

Re: HOMEADE CHARGER QUESTIONS ([none / 0](#)) ([#1](#))  
by [zmoz](#) on Tue Oct 28th, 2003 at 07:32:59 PM MST  
([User Info](#))

Two alternators? :) They make 24v alternators for big trucks and things...you could use one of those. Also you could probably buy/make a regulator to get 24v at less amperage than at 12v. I know people turn alternators into welders and use considerably more than 12v.

Re: HOMEADE CHARGER QUESTIONS ([none / 0](#)) ([#3](#))  
by [Jerry](#) on Tue Oct 28th, 2003 at 09:52:45 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Halfcrazy  
I'm building a stock 12 volt GM alt for a hydro system.

I've replaced the stock rotor and coil with an armature from a garbage disposal motor fitted with 14 neo magnets 1/2 X 1/4 X 1 inch.

At 900 rpm in my lathe its porducing 11 amps at 26.25 volts. I changed the stock 3 phase wiring from Y. I seperated the 3 phases. I used a fullwave bridge diode on each phase on the dc out put of each diode I connected a 67,000UF/50 volt electrolytic capacitor. Now I have 3 seperate dc supplys. I've wired these in siries. This wireing scheam makes much higher voltage than the stock Y or star conection.

If your powering this from a gas engine or hydro and you only need 10 amps it should work fine. However there is no voltage regulator so some form of charge control is nessasery. If for wind and 12 volt it should work ok. This is basicly an upgraded 12 volt Hornet.

JK TAS Jerry

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Re: HOMEADE CHARGER QUESTIONS ([none / 0](#)) (#2)  
by laskey on Tue Oct 28th, 2003 at 07:38:48 PM MST  
([User Info](#))

Well, If it`s for use as a wind generator, then chances are it needs to be re-wound to operate a lower speeds, so You`d just have to make sure when you re-wind it that it produces enough voltage for 24 volt charging.

If it`s not for wind use (ie, gas gen) then get a second alternator of the same type and wire them in series and drive together from the same belt (or sprocket and chain or whatever). I don`t know if that would really work practically, but it would worth looking into. :)

Cya,  
Chris

Re: HOMEADE CHARGER QUESTIONS ([none / 0](#)) (#4)  
by jubalearly on Wed Oct 29th, 2003 at 10:34:29 AM MST  
([User Info](#))

They used to make those devices that would allow you to run 120v universal (AC or DC) motors using your automobile alternator. Those things really did work, sort of, for drills & such. As long as you didn't mind it being run on 70v - 100v @ about 300hz. Primarily they bypassed the regulator. They also required running the engine at high speed (4000 RPM?), or about 10,000 - 12,000 RPM at the alternator.

So, a 12v alternator can be made to output 24vdc, but not efficiently. It is really better to get one rewound for 24v. Better is a truck alternator originally built for 24vdc. Your local junkyard or alternator shop (rebuilder) may have a 'used' 24v at a reasonable price. The best approach is a new 48v winding with PM rotor (some new 2004 autos may have these alternators) to get 24v at lower speeds.

Re: HOMEADE CHARGER QUESTIONS ([none / 0](#)) (#5)  
by BrianK on Mon Nov 3rd, 2003 at 06:38:17 AM MST  
([User Info](#))

I'm playing around with a stock GM alt I have it producing 30+ volts dc with at the present time set up on a real crude setup runnig it with a 1/2 hp motor with a 3 in. pully. the only thong done so far is the fact that the voltage reg is bypassed full 12 volt feed.

dont know if this helps or not.

Re: HOMEADE CHARGER QUESTIONS ([none / 0](#)) ([#6](#))  
by desertratjack on Wed Nov 12th, 2003 at 06:26:04 AM  
MST  
([User Info](#))

apparently permanent magnet alternators can be wound for different voltage ranges. [hydrogenappliances.com](#) shows several different voltage models for example.

[HOMEADE CHARGER QUESTIONS](#) | 6 comments (6 topical, 0 editorial)

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[speaker magnets](#) | 3 comments (3 topical, editorial)

Re: speaker magnets ([none / 0](#)) ([#3](#))  
by BrianK on Sun Nov 2nd, 2003 at 06:43:15 PM MST  
([User Info](#))

Ok Woof thanks for the info yep I know that they are really hard to get apart it was just kinda a thought I have alot of speakers laying around.

[speaker magnets](#) | 3 comments (3 topical, 0 editorial)

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Re: speaker magnets ([none / 0](#)) ([#3](#))  
by BrianK on Sun Nov 2nd, 2003 at 06:43:15 PM MST  
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## speaker magnets

By [BrianK](#), Section [Homebrewed Electricity](#)

Posted on Wed Oct 29th, 2003 at 09:17:24 AM MST [Magnetism](#)  
are they good?

Will they work for a rotor type gen?

[speaker magnets](#) | 3 comments (3 topical, 0 editorial)

Re: speaker magnets ([none / 0](#)) ([#1](#))  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Wed Oct 29th, 2003 at 09:25:21 AM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

It's hard to get them out of the enclosure without breaking them. It's hard to get enough of them that are the same size. They are large and would require large coils with lots of wire, and very large rotors. Generally they are not strong like the neodymium magnets which give the most output.

However the speaker itself can be used to make electricity as it is...

<http://www.fieldlines.com/story/2003/10/11/204029/79>

. >=- W o o f -=<

Re: speaker magnets ([none / 0](#)) ([#2](#))  
by JW on Wed Oct 29th, 2003 at 10:29:21 AM MST  
([User Info](#))

Hi Woof,

I followed your link. very interesting I must say. I especially was intrigued with the suggestion, to utilize the exhaust power pulses, of an small IC gasoline engine. If the engine is running about 2000 rpm, then the freq will be about between, 15 and 30hz.

-JW

[ [Parent](#) ]

Re: speaker magnets ([none / 0](#)) ([#3](#))  
by BrianK on Sun Nov 2nd, 2003 at 06:43:15 PM MST  
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[speaker magnets](#) | 3 comments (3 topical, 0 editorial)

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[spin the meter backwards](#) | 9 comments (9 topical, 0 editorial)

Re: spin the meter backwards ([none / 0](#)) ([#7](#))  
by BrianK on Fri Oct 31st, 2003 at 06:10:26 AM MST  
([User Info](#))

I also have a 30kw that has parallel abilities adjustable freq.timing lights and all could that gen be able to do this task easier?

Re: spin the meter backwards ([none / 0](#)) ([#8](#))  
by troy on Sat Nov 1st, 2003 at 06:59:42 AM MST  
([User Info](#))

Nope, not unless it's specifically designed to intertie with the grid. Good frequency control is one thing, and matching the utility frequency and phase is something completely different.

Sorry again...

troy

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[spin the meter backwards](#) | 9 comments (9 topical, 0 editorial)

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[Four Blade PVC Prop](#) | 5 comments (5 topical, editorial)

Re: Four Blade PVC Prop ([none / 0](#)) (#3)  
 by BrianK on Thu Oct 30th, 2003 at 06:37:56 PM MST  
[\(User Info\)](#)

Hey the 4 blade prop seems to be working real good just made one today used 4 in. sch.40 pvc its up and spinnin so fast looks like a blur LOL. I think the prop design is pretty good.

Re: Four Blade PVC Prop ([none / 0](#)) (#4)  
 by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on  
 Thu Oct 30th, 2003 at 07:30:10 PM MST  
[\(User Info\)](#)  
<http://timmythy.home.mindspring.com/timmy.htm>

While I was home for lunch today I mounted the 4 blader pictured above onto the top of a piece of pipe (without any kind of load) and set it outside where the wind goes around the house. I was surprised that it started when the wind blew the least little bit, and in the 10mph gusts, it was spinnin' so fast you could'nt see it. Now I'm look at all the construction sites for bigger pipe.

>=- W o o f -=<  
[\[ Parent \]](#)

Re: Four Blade PVC Prop ([none / 0](#)) (#5)  
 by Jerry on Thu Oct 30th, 2003 at 09:48:37 PM MST  
[\(User Info\)](#)  
<http://www.dplusv.com/Photo-03.html>

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I think much of the good response from these blades has to do with the cup shape that the pipe offers.

This cup shape would be rather difficult to make in a wood blade.

My plastic blades have a slight cup and I believe in part this is why at only 49 inches total tip to tip I've seen 1200 watts from these blades.

Here are the good attributes. 23 degrees at the root to almost flat at the tip and a tapering cup from root to tip. There is also a slight rise in the trailing edge from the root and peaking about 1/3 towards the tip at this point this rise and the cup flatten out towards the tip.

I had one of these blades on a GARBOGEN on a 3 foot stand today in my parking lot. In a 10 mph breeze the blades were a blur.

JK TAS Jerry

[Airheads Page](#)

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[Four Blade PVC Prop](#) | 5 comments (5 topical, 0 editorial)



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[Four Blade PVC Prop](#) | 5 comments (5 topical, editorial)

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[Four Blade PVC Prop](#) | 5 comments (5 topical, 0 editorial)

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[Need circuit to switch between pump/gen turbines](#) | 4 comments (4 topical, editorial)

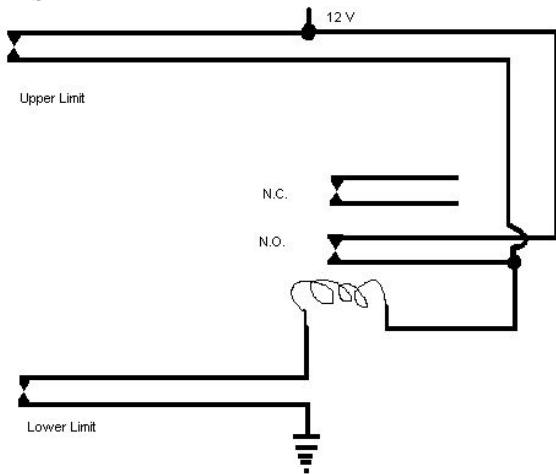
Re: Need circuit ([none / 0](#)) (#2)  
by laskey on Mon Dec 22nd, 2003 at 10:07:41 AM MST  
([User Info](#))

Despite my crude drawing. You probably could do this....

The N.C. contact would be you state changer.

The lower limit switch would unlatch the whole deal.

Cya,  
Chris



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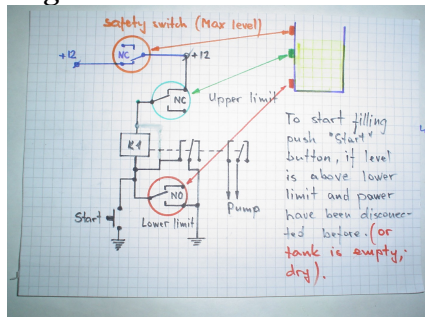
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Re: Need circuit ([none / 0](#)) (#4)  
by Virgis on Tue Dec 23rd, 2003 at 11:55:52 PM MST  
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Hi, please try this. It works perfectly.  
Virgis



[ [Parent](#) ]

[Need circuit to switch between pump/gen turbines](#) | 4 comments (4 topical, 0 editorial)



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[Need circuit to switch between pump/gen turbines](#) | 4 comments (4 topical, editorial)

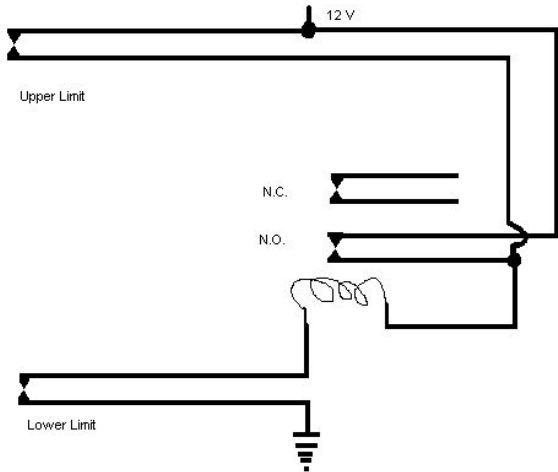
Re: Need circuit ([none / 0](#)) (#2)  
by laskey on Mon Dec 22nd, 2003 at 10:07:41 AM MST  
([User Info](#))

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Cya,  
Chris



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[Need circuit to switch between pump/gen turbines](#) | 4 comments (4 topical, 0 editorial)

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[Question for Charged.](#) | 25 comments (25 topical, editorial)

Re: Question for Charged. ([none / 0](#)) ([#6](#))  
by laskey on Wed Dec 17th, 2003 at 07:28:18 PM MST  
([User Info](#))

Yes, I think you're right. While the battery will provide self regulation in an infinite bus DC situation. I'd be concerned about pulses that are too high, since this system looks like it negates the self regulation of the battery. It's like throwing a pail of water into a pool. You don't want the pail to get too big, or the pool to small.

Another thing to watch out for is the firing frequency of the the triac (they're not designed to go terrifically high), you wouldn't want your triac to not switch off.

Here's a question...why are you using a triac anyway, you only want to pass a current one way. That sounds like a job for an SCR to me. The circuit proposed has a Zenner in it which when reversed biased would conduct like a regular diode. A constant .7V across a triac gate "might" meet the reverse turnon condition of the triac in an electrically noisy environment.

... Meaning, that when the gen is stopped, and the battery voltage is atleast .7v above the capacitors. The triac "MAY" (perhaps better said "can") lock on in the reverse direction, and discharge the battery into the caps until they reach the battery voltage. SCR..Think about it.

I think that an advantage of this charging method is that you probably would never have to desulfate your battery bank with all those nice pulses all the time.

Cya,  
Chris

Re: Question for Charged. ([none / 0](#)) ([#10](#))  
by Budgreen on Thu Dec 18th, 2003 at 06:52:05 AM MST  
([User Info](#))

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If you can get the scr to turn off! in order for that to happen the holding current needs to go quite low (usually 5ma ), it may or may not work, I will try that as I am currently building this to see how it works in the real world.

another advantage to this setup would be recovering energy slowly, like on a small genny I have, it makes a high enough voltage but not enough current to charge a battery with. using this setup I can 'pool' energy into the caps slowly and then dump it into the batteries where before i had no way to get any charge into them.

[ [Parent](#) ]

Re: Question for Charged. ([none / 0](#)) ([#15](#))  
by Budgreen on Fri Dec 19th, 2003 at  
12:53:23 PM MST  
([User Info](#))

actually I was wrong here.. grinding my gears back to basic electronics 2 things need to happen for the scr to turn off.

1. ) the gate current needs to drop below holding.. most cases < 5mA
2. ) the voltage coming in must drop below about .7v

therefore an scr based circuit will never turn off unless the caps are discharged below .7v and with incoming power will not happen. (plus I also tested it to be sure)

[ [Parent](#) ]

Re: Question for Charged. ([none / 0](#)) ([#16](#))  
by charged on Fri Dec 19th, 2003 at  
02:56:25 PM MST  
([User Info](#))

I must apologize for not being VERY clear about exactly WHAT will be charging the capacitor bank.

Unfortunately, I have explained SOME of the system without filling in all the holes. Some of those holes are pretty important.

There are TWO METHODS for charging this capacitor bank.

1. Use PURELY INDUCTIVE power transfer in the system.
2. Use an isolated FLIP-FLOP charging controller on either side of the capacitor bank. That happens to be a recently patented large-scale charging system. Not mine. I believe that you are allowed, under patent law, to build one for

YOURSELF, but not as a commercial venture. Anyway.....

For a steady-current generator as the source, the flip-flop alternately floats the capacitor bank between the incoming generator power and the battery bank. Just make sure the two don't overlap.

The triac discharge circuit works just fine. I have two running right now with a small inductive charging system on the caps.

If you have a monster capacitor bank and a heavy parallel transistor bank to apply the discharge, the pulse duration into the batteries is super short.

In any case, the triac/transistor arrangement is not for universal application, to be sure. A proper long-term system installation would be fully digital controlled.

[ [Parent](#) ]

Re: Question for Charged.  
([none / 0](#)) (#17)  
by Budgreen on Fri Dec 19th,  
2003 at 08:45:27 PM MST  
([User Info](#))

yes, triac good SCR bad :)

this is becoming a large thread and getting full of all kinds of usefull info  
we could probably make a faq just on power transfer =)

[ [Parent](#) ]

[Question for Charged.](#) | 25 comments (25 topical, 0 editorial)



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Yes, I think you're right. While the battery will provide self regulation in an infinite bus DC situation. I'd be concerned about pulses that are too high, since this system looks like it negates the self regulation of the battery. It's like throwing a pail of water into a pool. You don't want the pail to get too big, or the pool to small.

Another thing to watch out for is the firing frequency of the the triac (they're not designed to go terrifically high), you wouldn't want your triac to not switch off.

Here's a question...why are you using a triac anyway, you only want to pass a current one way. That sounds like a job for an SCR to me. The circuit proposed has a Zenner in it which when reversed biased would conduct like a regular diode. A constant .7V across a triac gate "might" meet the reverse turnon condition of the triac in an electrically noisy environment.

... Meaning, that when the gen is stopped, and the battery voltage is atleast .7v above the capacitors. The triac "MAY" (perhaps better said "can") lock on in the reverse direction, and discharge the battery into the caps until they reach the battery voltage. SCR..Think about it.

I think that an advantage of this charging method is that you probably would never have to desulfate your battery bank with all those nice pulses all the time.

Cya,  
Chris

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[Question for Charged.](#) | 25 comments (25 topical, 0 editorial)



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[What would happen...](#) | 6 comments (6 topical, editorial)

Re: What would happen... ([none / 0](#)) (#4)  
by laskey on Sat Nov 29th, 2003 at 10:27:54 PM MST  
([User Info](#))

A Battery Charger is designed to operate at 60Hz. Running it outside of that frequency will cause all kinds of nasty side-effects. Most of which are heat related.

A cheap battery charger is usually little more than a slightly refined equivalent of your wind gen set-up anyway. Power source, and bridge rectification, maybe a smoothing capacitor. A more expensive one will have a voltage detector circuit that will shut the thing off when the battery is charged.

I agree with the posts above. You want to do your own battery charging.

Cya,  
Chris

Re: What would happen... ([none / 0](#)) (#5)  
by kww on Sun Nov 30th, 2003 at 06:45:21 AM MST  
([User Info](#))

Thanks everybody.

[ [Parent](#) ]

Re: What would happen... ([none / 0](#)) (#6)  
by Harry Luubovv on Thu Jan 1st, 2004 at 12:04:49 AM MST  
([User Info](#))

Generally speaking, a transformer operated equipment will have no problem operated at line frequencies other than its own designed frequency.

Ciao  
Luubovv. H N Y !

[ [Parent](#) ]

[What would happen...](#) | 6 comments (6 topical, 0 editorial)

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[What would happen...](#) | 6 comments (6 topical, 0 editorial)

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[Low cost Data Acquisition Kit](#) | 2 comments (2 topical, editorial)

Re: Low cost Data Acquisition Kit ([none / 0](#)) ([#2](#))  
by laskey on Sat Nov 29th, 2003 at 12:51:08 PM MST  
([User Info](#))

Yeah, I got one from their Canadian distributor. With shipping and tax it was \$75 Canadian. Still a great deal. I love it.

Cya,  
Chris

[Low cost Data Acquisition Kit](#) | 2 comments (2 topical, 0 editorial)

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[Hot Neutral?](#) | 56 comments (56 topical, editorial)

Re: static electricity shocks ([none / 0](#)) ([#36](#))  
by laskey on Mon Nov 17th, 2003 at 07:28:58 AM MST  
([User Info](#))

I went to the manufacture's website, and while my spanish (I pretty sure it was spanish) isn't all that great (actually it's terrible), but a product table is still a product table.

Their 2500 watt electric water heater is indeed 220. Which means it has to be 2-phase.

And that means, you have a bad element, but if I understand the language correctly... you have a 3 year warranty.

Drain the tank, remove the element, take it back, and have it replaced.

Look around that website, you understand the language better than I do, there may just be installation instructions.

Cya,  
Chris

[ [Parent](#) ]

Re: static electricity shocks ([none / 0](#)) ([#45](#))  
by storrence on Mon Nov 17th, 2003 at 01:00:28 PM MST  
([User Info](#))

Is it possible to visually see if an element is bad once I pull it? It's new so what would I be looking for for verification? The only manual that came with it was a sticker on the side of the tank that is now turned against the wall so difficult to see. I will check their site.

I remember that when we ordered it they asked if we wanted 220 or 110 which I guess here is really 126\*2 (should it be called 152V) and 126+neutral. But it only has 1 element and some body here said a 220V has 2 elements in the US. Well I don't see why 1 element wouldn't work if you put 1 phase on each terminal and grounded it. In our case we have some defect but otherwise it seems it doesn't need 2 elements to be a 220v at least not down here.

I'm curious why you say because it's 220v it has to be 2 phase? Aren't the 220V hot water heaters in the states single phase 220v?

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- [Putte](#)
- [troy](#)
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Re: static electricity shocks ([none / 0](#)) (#49)  
by storrence on Mon Nov 17th, 2003 at 04:00:25  
PM MST  
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Actually it is Portuguese :-)

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[Hot Neutral?](#) | 56 comments (56 topical, 0 editorial)



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[Hot Neutral?](#) | 56 comments (56 topical, 0 editorial)

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Cya,  
Chris

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[Hot Neutral?](#) | 56 comments (56 topical, 0 editorial)

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[Strengthening a tv tower](#) | 2 comments (2 topical, editorial)

Re: Strengthening a tv tower ([none / 0](#)) (#1)  
by laskey on Mon Nov 17th, 2003 at 06:34:32 AM MST  
([User Info](#))

I don't understand why you removed the cross braces.  
Isn't that what gives these types of towers their strength?

Cya,  
Chris

Re: Strengthening a tv tower ([none / 0](#)) (#2)  
by Reno on Mon Nov 17th, 2003 at 06:05:52 PM MST  
([User Info](#))

the 2x10 bracing is for the horizontal loads.  
I would have liked to find a tower with triangular bracing  
but all I could find was two with the cross bracing.  
The cross bracing could not be left on as it was because  
there is no room. If they are to be reused they would have  
to be mounted inside both layers of steel.  
The tower is stiff and once attached to the hinged mount  
it should add rigidity to the gin pole which is doing all the flexing  
I intend on doing a weight test once it is ready should be able to lift  
2 people easily.

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[Strengthening a tv tower](#) | 2 comments (2 topical, 0 editorial)

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## Strengthening a tv tower

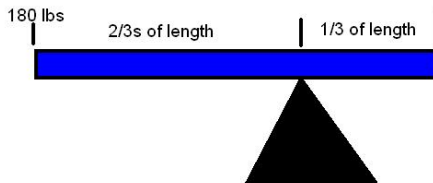
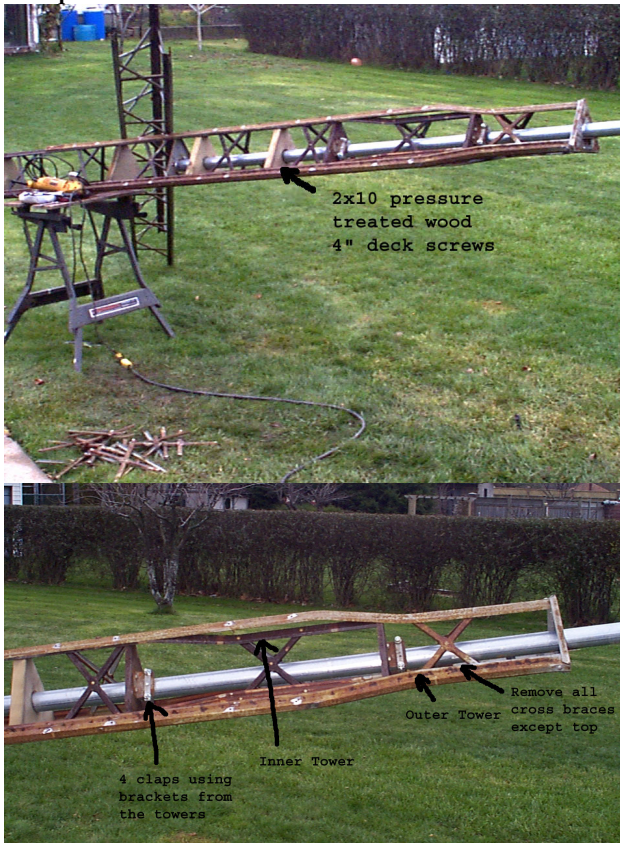
By [Reno](#), Section [Homebrewed Electricity](#)

Posted on Sun Nov 16th, 2003 at 03:34:02 PM MST

[Wind](#)

none

Here are a few modifications I made to a tv tower that require you only have a drill and a grinder and a saw. I added supports made from 2x10 pressure treated wood. I then got a second arial tower and removes all the cross braces except the last one at the top the tow towers were bolted together at the joints the bolts went through all three layers. With the 2x 10 braces I was able to lift 180 lbs with it see pics



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[Strengthening a tv tower](#) | 2 comments (2 topical, 0 editorial)

Re: Strengthening a tv tower ([none / 0](#)) (#1)  
by laskey on Mon Nov 17th, 2003 at 06:34:32 AM MST  
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[Hot Neutral?](#) | 56 comments (56 topical, 0 editorial)

Re: Hot Neutral? ([none / 0](#)) ([#10](#))  
by laskey on Sat Nov 15th, 2003 at 08:45:45 AM MST  
([User Info](#))

You may have a decayed anode rod or something like that. The heater is in need of inspection by an electrician at any rate. It is very dangerous to have a live hot water heater casing, especially if you have copper pipes.

Cya,  
Chris

[ [Parent](#) ]

Re: Hot Ground ([none / 0](#)) ([#14](#))  
by storrence on Sat Nov 15th, 2003 at 11:50:30 AM MST  
([User Info](#))

I have PVC but I agree it's dangerous. It's difficult to get an electrician to my location and even if I did, they would not consider it dangerous. You have no idea how they are with electricy here. Many people just connect wires directly to the overhead street lines so they don't have to pay but that's another story. Since I'm not so courageous to take this risk, is there any tests I can do to confirm I have a problem and what the problem would be? I have a multimeter.

I don't believe the casing is completely hot because it would have tripped the 30amp breaker when I had it's casing connected to ground.

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[Hot Neutral?](#) | 56 comments (56 topical, 0 editorial)

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[Dump Load](#) | 9 comments (9 topical, editorial)

Re: Dump Load ([none / 0](#)) (#5)  
by laskey on Fri Nov 14th, 2003 at 08:34:22 AM MST  
([User Info](#))

I assume that if it's running it's got heat to spare, and if it's in dump mode he's probably dumping to heaters which will keep it warm in there. Am I right?

Cya,  
Chris

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[Dump Load](#) | 9 comments (9 topical, 0 editorial)

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[Thermostats for solar heating panels](#) | 11 comments (11 topical, 0 editorial)

Re: Thermostats for solar heating panels ([none / 0](#)) (#8)  
by laskey on Fri Nov 14th, 2003 at 08:29:17 AM MST ([User Info](#))

A guy did an article for homepower magazine a little while ago, and it contains the schematics for the exact thing you want.

<http://www.homepower.com/files/hotairhp72.pdf>

Cya,  
Chris

Re: Thermostats for solar heating panels ([none / 0](#)) (#9)  
by pexring on Fri Nov 14th, 2003 at 12:08:05 PM MST ([User Info](#))

Great link. I can build, wire and plumb a house without even looking at a book. Yet my knowledge of this type of electronics is minimal. This website should sell this type of thermostat where I could simply run a wire inside the solar panel and adjust the dial on the wall.

Today I had another thought. Why not just buy an ordinary mercury-type thermostat and put it inside the panel. Set the t-stat on a/c so it kicks on when the temp reaches about 80. Then it would never shut off until it got cold again. With my solar panel on the wall, I could reach in through the intake vent and adjust the dial if necessary. Crude, but it may just work!

Otherwise, I'd possibly pay someone to build and send me one that worked.

Mark

[ [Parent](#) ]

[Thermostats for solar heating panels](#) | 11 comments (11 topical, 0 editorial)

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[Dump Load](#) | 9 comments (9 topical, editorial)

Re: Dump Load ([none / 0](#)) ([#2](#))  
by laskey on Thu Nov 13th, 2003 at 12:39:09 PM MST  
([User Info](#))

You could put up a bank of lights on the tower to burn off the excess, and that way you could see if your battery bank is full.

But honestly, I like the winter heating, and summer cooling idea. I suppose your shed roof is good. Maybe just use the extra to pump water onto the shed roof... maybe that would cool it off a bit in the summer?

Cya,  
Chris

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[Dump Load](#) | 9 comments (9 topical, 0 editorial)

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[Heat exchanger for a residential clothes dryer?](#) | 20 comments (20 topical, editorial)

Re: Heat exchanger and spinner ([none / 0](#)) ([#14](#))  
by [laskey](#) on Sun Nov 9th, 2003 at 09:03:54 PM MST  
([User Info](#))

Now I know this is getting low-tech, but I went to my local Canadian Tire store and found two different products for about 15 bucks (Canadian, each). One is a box you put in your dryer exhaust vent line that acts like a switch closing off the outside line and blowing through a lint trap (which you have to clean with each use) marked with the cryptic settings of summer and winter. The other is a thing for houses that have no dryer vent (and can't have one for some reason) it goes on the end of the dryer vent hose and is like a vented bowl filled with water (I guess to catch the lint) and you have to clean it with each use as well.

I was thinking of getting one (the box switch thingy), but there is only two of us, and we only do laundry once a week. It wouldn't solve my basement heating problems. I need a little bit of heat all the time... Not alot for a couple of hours a week.

I'm still thinking about what I could do with that dryer heat.

Cya,  
Chris

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[Heat exchanger for a residential clothes dryer?](#) | 20 comments (20 topical, 0 editorial)

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[Multiple generators](#) | 10 comments (10 topical, editorial)

Re: Multiple generators ([none / 0](#)) ([#4](#))  
 by laskey on Sun Nov 9th, 2003 at 08:46:28 PM MST  
[\(User Info\)](#)

You're right its called "infinite bus" synchronization. The grid is so large an powerful that the generators conform to the Grid, because they can be "forced" into sync by the grid, the main problem for you would be if the grid went down. In free running mode those two gens would fight each other and likely do damage to each other. You'd be well off to build yourself a synching setup so that you can match them to the grid and each other.

As a side note, the "infinite bus" effect is exactly the same reason that a non-grid-tie inverter will explode if you hook it straight to the grid. Inverters don't normally have the ability to synch to the grid, and if you try to force them something will burn out.

Cya,  
 Chris

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[Multiple generators](#) | 10 comments (10 topical, 0 editorial)

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[Are the diodes correct](#) | 20 comments (20 topical, 0 editorial)

Re: Are the diodes correct ([none / 0](#)) (#6)  
by laskey on Fri Nov 7th, 2003 at 07:20:42 PM MST  
([User Info](#))

I don` t think so. What you really want to do place a diode in the positive line after the caps, and eliminate the other ones. After all what do you want to do with a diode anyway... stop current from flowing backward through it to something important. You probably don` t want your batteries charging those Caps.

I don` t think you need to isolate the batteries from each other with anything other than fuses (in case of a failure).

Cya,  
Chris

[ [Parent](#) ]

Re: Are the diodes correct ([none / 0](#)) (#7)  
by Reno on Fri Nov 7th, 2003 at 08:47:36 PM MST  
([User Info](#))

I am under the impression that you should not mix different batteries in a bank ie. age, voltage..... This Marine battery is a couple of years old and some time gets pulled down pretty good also usually sits all winter. The 6 Volt bateries are brand new bought for my genny. So to combine the two I assumed that keeping them from drawing from each other with the use of diodes would be the solution. Come spring time the 12V goes back in the boat. Am I wrong in the believe not to mix batteries, I learned that here.

[ [Parent](#) ]

Re: Are the diodes correct ([none / 0](#)) (#9)  
by Jerry on Fri Nov 7th, 2003 at 09:47:35 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

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Hi Guys

I'm in an industry where large value caps are used every day. As an example one of our sterero demo vehickles has 10 farrad of caps on board. The other 16 farrad onboard. That is 16 million UF.

In both demo cars the caps are hard wired to batteries. they are allways together. The first vehickle is my daily driver 1995 chevy Astro van. We also have 4 batteries and a stock alternator inthis van. prior to this this system was in a 85 S-10. The S-10 is now my wind test truck.

Befor these 2 it was a 1977 full size chevy van. The alt was stock in in this van also. We campained this demo van for 10 years. We had 22 car batteries and 60 caps onboard this van. BTW this van was featured in the LOW RIDER mag.

My point is. Connect your caps directly to your batteries. Ever tryed to connect a dicharged cap to a voltage source. depending on state of discharge there will be anywhere from no spark to a huge spark depending also on the value in MF of the cap.

If the cap has a large enough value and is discharged at the moment of connection the cap apears as a ded short to the voltage supply in this case a wind genny. wind gennies have a hard time with startup when working into a ded short.

The benifit of the cap is still the same when connect directly to the battery. However the cap is never discharged and dose not cause a stall condition for the genny. All the caps benifit to the genny is still there.

In car audio capacitor are refured to as stiffning caps. We most frequently here complaints about customers lights dimming at night when the audio system are pounding out bass responce. The bass frequecies range from 30 hz to 100 hz.

Oddly enough our invertors are operating at 60 hz. Although these invertors have pulswidth modulated power supplys and are highly regulated the power supply puls load on the batts is at 60 hz. Caps can store and release energy many times faster than batteries. Hence when caps are added to batteries where these frequecies are involved preformance is greatly inhanced. BTW car audio amps also have the same type power supplies as invertors. When we add caps to car audio systems, most of the time the lights stop blinking. Voltage is stableized. The car audio Ind. suggest 100,00 UF for every 100 watts RMS of amp power.

If it were me I'd use only the diode of the genny and no more. If the genny is a brush type perminet magnet motor then just one diode. If its a PMA then what ever diode configuration it is designed with.

I would not seperate the batteries. I never do and never have in the 27 years i've been doing high power car audio.

Flooded lead acid batteries work fine at 14.4 volts. Thats the voltage we measure in almost every car we test in some we see 13.8 so in that range is good. This dosen't matter if its the smallest Honda battery or one were testing in a big rig. I think this is because the flooded lead acid battery cell, just one



has a chemical rest voltage of 2.1 and very comfortable with 2.4 while charging. It doesn't seem to matter the physical size of the cell. We use a 2 volt hysteresis cell on our test bench to add 2 volt to our 12 volt supply. this cell is 5X5X 16 inches tall and rest at 2.1 and charges at 2.4 same as each cell in the small garden tractor battery. So you can apply the same 13.8 volts across the honda battery or the two 6 volt golf cart batteries in series. If you want these 2 battery systems to be charged from the same charging source (wind generator) use a battery isolator just as you would do in the old PU with the camper on the back. The generator must still charge both batteries but the batteries are totally independent from each other. All a battery isolator is is 2 diodes in a pretty blue heat sink.

Voltage from the alternator flows each diode towards its battery. The diodes anodes are tied together and are connected to the alternator or in this case the generator. the cathodes are separate and each one goes to its one battery.

The ONE thing of utmost importance is fusing. We are subject to liability in car audio installations. To protect our butt and the customers as well. We never connect

any accessory to a battery without a fuse unless you like fires. A standard car battery can light up some heavy gauge power wire like a christmas tree. We always tell our customers fuses are cheaper than cars. In this case maybe houses. The battery isolator or 2 diode will have that nasty .5 volt drop. It doesn't sound like much but I worked hard to make this voltage and I don't want to give any up.

Sorry if I went long on this one guys. It's what I do all day on this one.

JK TAS Jerry

[Airheads Page](#)

[ [Parent](#) ]

Re: Are the diodes correct ( <a href="#">none / 0</a> ) ( <a href="#">#10</a> ) by Jerry on Fri Nov 7th, 2003 at 09:57:17 PM MST ( <a href="#">User Info</a> ) <a href="http://www.dplusv.com/Photo-03.html">http://www.dplusv.com/Photo-03.html</a>
--

I don't think I made the cap ded short thing clear. If you connect the caps directly to the dc output of the genny and then follow that with isolation doides. The voltage can fall to ZERO accross the caps because they will be isolated from the batteries. This fall to ZERO can ocure if enough time elapes while the genny is stoped ( no wind). When it trys to start up again the caps will appear as a ded short. This can't happen with caps in perelell with the batteries.

JK TAS Jerry

[Airheads Page](#)

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Re: Are the diodes correct ([none / 0](#)) ([#11](#))  
by Reno on Sat Nov 8th, 2003 at 07:21:06 AM  
MST  
([User Info](#))

So Jerry  
let me get this right  
your saying get rid of all the doides  
connect the 12V in parallel and that's it.  
This would be like making the Cas part of the  
battery bank

[ [Parent](#) ]

[Are the diodes correct](#) | 20 comments (20 topical, 0 editorial)



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by laskey on Fri Nov 7th, 2003 at 07:20:42 PM MST  
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Chris

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### [Are the diodes correct](#)

By [Reno](#), Section [Homebrewed Electricity](#)

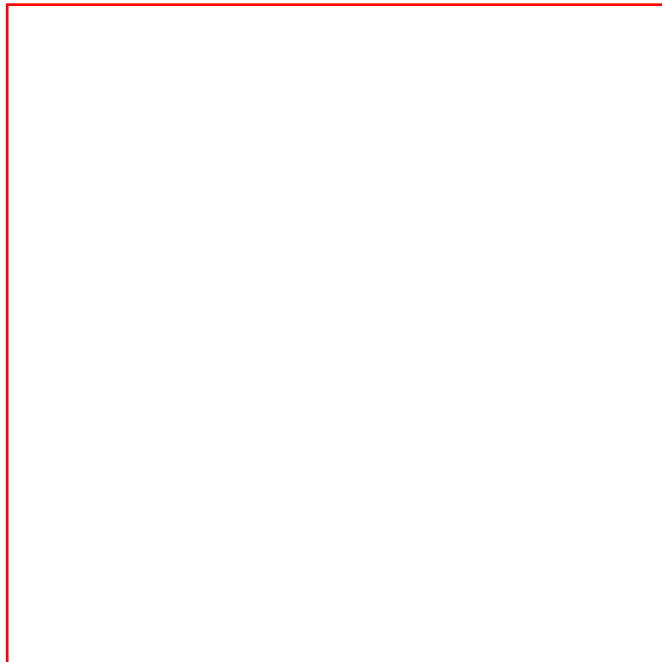
Posted on Fri Nov 7th, 2003 at 01:48:09 PM MST

[Wind](#)

none

I want to connect my 12V marine battery to the wind generator during the winter so as not to mix the two types of batteries I want to separate the two.

Have I left out any diodes thanks in advance



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[Are the diodes correct](#) | 20 comments (20 topical, 0 editorial)

Re: Are the diodes correct ([none / 0](#)) ([#1](#))  
by TomW on Fri Nov 7th, 2003 at 02:10:14 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Reno;

From that drawing it looks to me like your 2 diodes between the + post of the 6V battery and the inverter are basically wired reverse polarity to each other and will pass current both directions effectively eliminating any isolation. I could be seeing it wrong or missing something, however.

Cheers.

TomW

[Stuff I have Online](#)  
[Contact Me](#)

Re: Are the diodes correct ([none / 0](#)) (#2)  
by wpowokal on Fri Nov 7th, 2003 at 03:27:51 PM MST  
([User Info](#))

Reno I agree with Tom.  
The first diode after the caps blocks the power from motoring  
the generator.

Leave out the lower left diode and line.

Remove the diode to the 6v battery and place it forward biased  
in the line to the 12v and inverter. This will isolate the two  
batteries, the 12v in this case will be charged to around 0.6v  
less than the 6v pair, but when supplying load they will both be  
on an equal voltage footing.

regards Allan

Re: Are the diodes correct ([none / 0](#)) (#3)  
by drdongle on Fri Nov 7th, 2003 at 03:50:31 PM MST  
([User Info](#))

Good analysis of the problem, but just to put my 2 cents worth  
the first diode from the caps is not required and in fact lowers  
available voltage by .6 volts which may under low wind  
conditions reduce the voltage for charging.

Dr.D

Re: Are the diodes correct ([none / 0](#)) (#4)  
by Reno on Fri Nov 7th, 2003 at 03:57:27 PM MST  
([User Info](#))

Ok i see the first one is redundant  
thanks. so your saying leave the other two.  
I cannot see how the inverter can draw from both  
batteries 6v & 12V without the two caps to isolate  
them. Is this what you mean.

[ [Parent](#) ]

Re: Are the diodes correct ([none / 0](#)) (#5)  
by Reno on Fri Nov 7th, 2003 at 04:22:56 PM MST  
([User Info](#))

Sorry misread your post  
is this what you meant  
thanks everyone



I won't complain about 1 less diode

[ [Parent](#) ]

Re: Are the diodes correct ([none / 0](#)) ([#6](#))  
by laskey on Fri Nov 7th, 2003 at 07:20:42 PM  
MST  
([User Info](#))

I don` t think so. What you really want to do place a diode in the positive line after the caps, and eliminate the other ones. After all what do you want to do with a diode anyway... stop current from flowing backward through it to something important. You probably don` t want your batteries charging those Caps.

I don` t think you need to isolate the batteries from each other with anything other than fuses (in case of a failure).

Cya,  
Chris

[ [Parent](#) ]

Re: Are the diodes correct ([none / 0](#))  
([#7](#))  
by Reno on Fri Nov 7th, 2003 at 08:47:36  
PM MST  
([User Info](#))



I am under the impression that you should not mix different batteries in a bank ie. age, voltage..... This Marine battery is a couple of years old and some time gets pulled down pretty good also usually sits all winter. The 6 Volt bateries are brand new bought for my genny. So to combine the two I assumed that keeping them from drawing from each other with the use of diodes would be the solution. Come spring time the 12V goes back in the boat. Am I wrong in the believe not to mix batteries, I learned that here.

[ [Parent](#) ]

Re: Are the diodes correct ([none / 0](#)) (#9)

by Jerry on Fri Nov 7th, 2003 at 09:47:35 PM MST

([User Info](#))

<http://www.dplusv.com/Photo-03.html>

Hi Guys

I'm in an industry where large value caps are used every day. As an example one of our sterero demo vehickles has 10 farrad of caps on board. The other 16 farrad onboard. That is 16 million UF.

In both demo cars the caps are hard wired to batteries. they are allways together. The first vehickle is my daily driver 1995 chevy Astro van. We also have 4 batteries and a stock alternator inthis van. prior to this this system was in a 85 S-10. The S-10 is now my wind test truck.

Befor these 2 it was a 1977 full size chevy van. The alt was stock in in this van also. We campained this demo van for 10 years. We had 22 car batteries and 60 caps onboard this van. BTW this van was featured in the LOW RIDER mag.

My point is. Connect your caps directly to your batteries. Ever tryed to connect a discharged cap to a voltage source. depending on state of discharge there will be anywhere from no spark to a huge spark depending also on the value in MF of the cap.

If the cap has a large enough value and is discharged at the moment of connection the cap appears as a ded short to the voltage supply in this case a wind genny. wind gennies have a hard time with startup when working into a ded short.

The benifit of the cap is still the same when connect directly to the battery. However the cap is never discharged and dose not cause a stall condition for the genny. All the caps benifit to the genny is still there.

In car audio capacitor are referred to as stiffening caps. We most frequently here complaints about customers lights dimming at night when the audio system are pounding out bass response. The bass frequencies range from 30 hz to 100 hz.

Oddly enough our invertors are operating at 60 hz. Although these invertors have pulswidth modulated power supplies and are highly regulated the power supply puls load on the batts is at 60 hz. Caps can store and release energy many times faster than batteries. Hence when caps are added to batteries where these frequencies are involved performance is greatly enhanced. BTW car audio amps also have the same type power supplies as invertors. When we add caps to car audio systems, most of the time the lights stop blinking. Voltage is stabilized. The car audio Ind. suggest 100,00 UF for every 100 watts RMS of amp power.

If it were me I'd use only the diode of the genny and no more. If the genny is a brush type permanent magnet motor then just one diode. If its a PMA then whatever diode configuration it is designed with.

I would not separate the batteries. I never do and never have in the 27 years I've been doing high power car audio.

Flooded lead acid batteries work fine at 14.4 volts. That's the voltage we measure in almost every car we test in some we see 13.8 so in that range is good. This doesn't matter if its the smallest Honda battery or one were testing in a big rig. I think this is because the flooded lead acid battery cell, just one has a chemical rest voltage of 2.1 and very comfortable with 2.4 while charging. It doesn't seem to matter the physical size of the cell. We use a 2 volt hysteresis cell on our test bench to add 2 volt to our 12 volt supply. this cell is 5X5X 16 inches tall and rest at 2.1 and charges at 2.4 same as each cell in the small garden tractor battery. So you can apply the same 13.8 volts across the Honda battery or the two 6 volt golf cart batteries in series. If you want these 2 battery systems to be charged from the same charging source (wind genny) use a battery isolator just as you would do in the old PU with the camper on the back. The genny must still charge both batteries but the batteries are totally independent from each other. All a battery isolator is is 2 diodes in a pretty blue heat sink.

Voltage from the alt flows each diode towards its battery. The diodes anodes are tied together and are connect to the alt or in this case the genny. the cathodes are separate and each one goes to its one battery.

The ONE thing of utmost importance is fusing. We are subject to liability in car audio installations. To protect our butt and the customers as well. We never connect any accessory to a battery without a fuse

unless you like fires. A standard car battery can light up some heavy gage power wire like a christmas tree. We always tell are customers fuses are cheaper than cars. In this case maybe houses. The battery isolater or 2 diode will have that nasty .5 volt drop. It doesnt sond like much but I worked to hard to make this voltage and i don;t want to give any up.

Sorry if I went long on this one guys. Its what I do all day on this one.

JK TAS Jerry

[Airheads Page](#)

[ [Parent](#) ]

Re: Are the diodes correct ([none / 0](#)) (#10)  
by Jerry on Fri Nov 7th, 2003 at 09:57:17 PM MST  
([User Info](#))  
<http://www.dplusv.com/Photo-03.html>

I don't think I made the cap ded short thing clear. If you connect the caps directly to the dc output of the genny and then follow that with isolation doides. The voltage can fall to ZERO accross the caps because they will be isolated from the batteries. This fall to ZERO can ocure if enough time elapes while the genny is stoped ( no wind). When it trys to start up again the caps will apeare as a ded short. This can't happen with caps in perelell with the batteries.

JK TAS Jerry

[Airheads Page](#)

[ [Parent](#) ]

Re: Are the diodes correct ([none / 0](#)) (#11)  
by Reno on Sat Nov 8th, 2003 at 07:21:06 AM MST  
([User Info](#))

So Jerry  
let me get this right  
your saying get rid of all the doides  
connect the 12V in parallel and that's  
it.  
This would be like making the Cas part  
of the battery bank

[ [Parent](#) ]

Re: Are the diodes correct ([none / 0](#)) ([#8](#))  
by drdongle on Fri Nov 7th, 2003 at 08:47:53 PM  
MST  
([User Info](#))

You schematic still has two errors on it. It shows a connection between the + terminal of the 12 volt battery and the + terminal of the left most 6 volt battery. this defeats the diodes as they are actually wired in parallel. The only way to provide isolation is to have 4 diodes, two from the capacitor bank, one to each battery and a second two, from each battery to the inverter. In an ideal situation each battery group could drive it's own inverter, eliminating the second set of diodes and providing redundancy, on second thought keep one inverter but add an auto switch over relay to change it from one battery to the other when the charge drops to a predetermined level.  
This one of the reasons you should avoid mixing battery types.

Dr.D

[ [Parent](#) ]

Re: Are the diodes correct ([none / 0](#))  
([#12](#))  
by RobC on Sat Nov 8th, 2003 at 08:44:44  
AM MST  
([User Info](#))

Question? Why even bother with capacitors.  
Well maybe a small one to smooth the ripple from the bridge rectifier other than that in this appication I don't see the need. As far as seperating types of batterys I put my gell cells in one bank  
deep cycles in another used truck batterys in another. My plan is to have a dedicated inverter on each bank that way if my old truck batterys die its no big deal. However that brings us back to original question how to charge all of them at the same time.  
I think in this case one diode per battery bank would do the trick.

RobC

[ [Parent](#) ]

Re: Are the diodes correct ([none / 0](#)) (#13)  
by RobC on Sat Nov 8th, 2003 at 08:57:12 AM MST  
([User Info](#))

Hey Jerry your big caps would certainly help a small bank of batterys handle an inverter with a large surge capacity. You need to get us catalog of parts and pieces that we can buy from you.

[ [Parent](#) ]

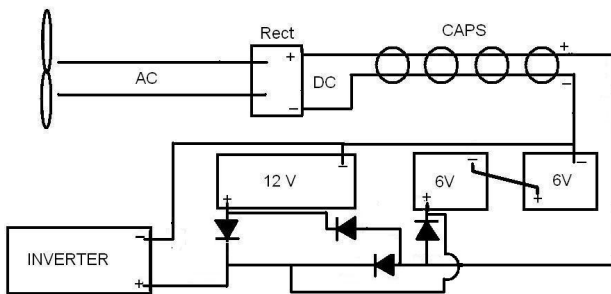
Re: Are the diodes correct ([none / 0](#)) (#14)  
by Reno on Sat Nov 8th, 2003 at 09:37:36 AM MST  
([User Info](#))

Ok  
If i may pick your brain  
Since you seem to be charging different batteries.  
You use a diode on each battery bank but the only difference is you have spererate inverters for each bank  
Am I understanding this correctly

[ [Parent](#) ]

Re: Are the diodes correct ([none / 0](#)) (#15)  
by Reno on Sat Nov 8th, 2003 at 10:11:07 AM MST  
([User Info](#))

OK this has to be it  
I cleaned it up easier to follow



Re: Are the diodes correct ([none / 0](#)) (#16)  
by drdongle on Sat Nov 8th, 2003 at 10:31:31 AM MST  
([User Info](#))

You almost have it, take the right hand horizontal diode and move the anode lead to the + terminal on the left most 6 v battery.

Dr.D

[ [Parent](#) ]

Re: Are the diodes correct ([none / 0](#)) (#17)  
by Jerry on Sat Nov 8th, 2003 at 10:40:35 AM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

In this schematic charging voltage can go into the 2 X 6 volt bank but nothing can come out. the diodes are blocking that.

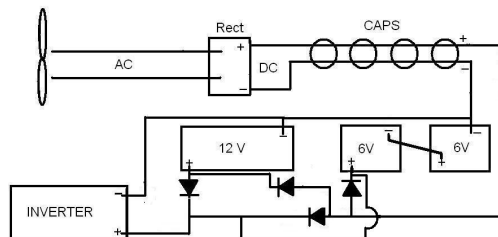
JK TAS Jerry

[Airheads Page](#)

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Re: Are the diodes correct ([none / 0](#)) (#18)  
by Reno on Sat Nov 8th, 2003 at 04:11:18 PM MST  
([User Info](#))

Ok here goes the last try  
If this isn't it the boat battery goes in the



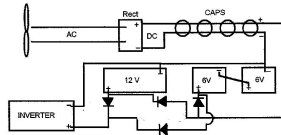
basement

[ [Parent](#) ]

Re: Are the diodes correct ([none / 0](#)) (#19)  
by Scott on Sat Nov 8th, 2003 at 07:14:27 PM MST  
([User Info](#))



Try this.



---

Scott

Re: Are the diodes correct ([none / 0](#)) (#20)  
by Jerry on Sat Nov 8th, 2003 at 10:12:38 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Scott you are our hero.  
this last one is the correct schematic. The only thing I would change. I would connect the caps directly to the inverter. The caps are still isolated from the batteries and can still cause genny stall after the genny has been idle long enough for the caps to discharge.

Caps connected directly to the inverter will have a constant voltage supply. Although this voltage will be .5 volts lower than battery voltage and 1 volt lower than genny voltage.

JK TAS Jerry

[Airheads Page](#)

[ [Parent](#) ]

[Are the diodes correct](#) | 20 comments (20 topical, 0 editorial)

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[Sine wave inverter](#) | 16 comments (16 topical, editorial)

Re: Sine wave inverter ([none / 0](#)) ([#8](#))  
by laskey on Mon Nov 3rd, 2003 at 06:33:35 PM MST  
([User Info](#))

I was thinking of doing some modifications to commercial inverter. You know smooth the steps out before they are amplified in a everyday old cheap inverter. Honestly, How hard could it be?

Cya,  
Chris

[ [Parent](#) ]

Re: Sine wave inverter ([none / 0](#)) ([#9](#))  
by Budgreen on Tue Nov 4th, 2003 at 10:57:35 AM MST  
([User Info](#))

it could be fairly hard and not worth the time.. most inverter ups systems that have non-square wave outputs normally use a microprocessor to create the waveforms and do the rest of the inverter control. if you could read the software off it and recode it would be very possible but quite time consuming :)

on another note you could start and make a dc-dc converter first say 24vin 170v out.. pwm controlled, take a recitfied 170v out and run it to an H-bridge, controll the H bridge with a 10-25khz pwm signal modulated by a 60hz stable sine wave, then filter the output of the H-bridge to remove the 10-25khz pwm frequency and your left with a nice sine wave output at a high efficiency.

I have been trying to come up with a good dc-dc converter information to try and design a 24v-170v converter (that in itself is easy, just getting it to put out 10-20A is the hard part) so if anyone could help in this arena I may have schematics available by the end of the year :)

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[Sine wave inverter](#) | 16 comments (16 topical, 0 editorial)

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[Sine wave inverter](#) | 16 comments (16 topical, 0 editorial)

Re: Sine wave inverter ([none / 0](#)) ([#8](#))  
by laskey on Mon Nov 3rd, 2003 at 06:33:35 PM MST  
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Chris

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[Rectifier usage](#) | 6 comments (6 topical, editorial)

Re: Rectifier usage ([none / 0](#)) ([#4](#))  
by laskey on Fri Oct 31st, 2003 at 01:38:00 PM MST  
([User Info](#))

If you've really got AC coming in from the gen you want a bridge rectifier rated for your maximum voltage and maximum current, any thing else and you run the risk of burning it out. Remember, a bridge rectifier has diodes pointing both directions for each half of the AC cycle, so using one in a DC application is the electrical equivalent of using nothing at all.

If you've really got DC coming from the gen then you'll only need a single rectifier, and the same voltage and current rules apply.

Cya,  
Chris

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[Rectifier usage](#) | 6 comments (6 topical, 0 editorial)

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[Rectifier usage](#) | 6 comments (6 topical, editorial)

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[2 Gennies on 1 line](#) | 6 comments (6 topical, editorial)

Re: 2 Gennies on 1 line ([none / 0](#)) (#2)  
by laskey on Tue Oct 28th, 2003 at 07:43:22 PM MST  
([User Info](#))

Mmmmm... I don` t think your tape drives are actually producing DC (I could be wrong here), so you` d probably want bridge rectifiers before transmission (as it were).

Cya,  
Chris

Re: 2 Gennies on 1 line ([none / 0](#)) (#3)  
by TomW on Tue Oct 28th, 2003 at 08:10:21 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Laskey;

The Ametecs I have experience with [30V, 40V and 50V] all produce DC voltage via a commutator and brushes.

Cheers.

TomW

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[2 Gennies on 1 line](#) | 6 comments (6 topical, 0 editorial)

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[2 Gennies on 1 line](#) | 6 comments (6 topical, editorial)

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[2 Gennies on 1 line](#) | 6 comments (6 topical, 0 editorial)

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[HOMEADE CHARGER QUESTIONS](#) | 6 comments (6 topical, editorial)

Re: HOMEADE CHARGER QUESTIONS ([none / 0](#)) ([#2](#))  
by laskey on Tue Oct 28th, 2003 at 07:38:48 PM MST  
([User Info](#))

Well, If it`s for use as a wind generator, then chances are it needs to be re-wound to operate a lower speeds, so You`d just have to make sure when you re-wind it that it produces enough voltage for 24 volt charging.

If it`s not for wind use (ie, gas gen) then get a second alternator of the same type and wire them in series and drive together from the same belt (or sprocket and chain or whatever). I don`t know if that would really work practically, but it would worth looking into. :)

Cya,  
Chris

[HOMEADE CHARGER QUESTIONS](#) | 6 comments (6 topical, 0 editorial)

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[When under load is the coil equal to the magnet in terms of uhhh power?](#) | 11 comments (11 topical, 0 editorial)

Re: ([none / 0](#)) ([#10](#))  
by laskey on Mon Oct 20th, 2003 at 06:47:03 PM MST  
([User Info](#))

You're not getting a free lunch.

Here's what happens. The permanent magnet is like a starter. The actual power is generated by the rotation of the wind mill. The magnet of any amount (as long as there is some) starts a current flowing in the stator coils. Some of the current generated, then feeds the field coils which brings up the magnetic field, generating more current in the stator coils, and up and up the magnetic field goes until you are at operating capacity. Remember, it's the rotation of the windmill (thus the wind) that is generating power. In the case of a PMG the magnet are rotated by the wind. It's the magnetic flux pass through the stator coils that causes the current to flow. More magnetic field, more current flowing.

The problem with wind gens is that they don't operate at a constant speed, and generation output, so with field coils you end up with a fluctuating magnetic field which isn't good if they were all by them selves.

Cya,  
Chris

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[When under load is the coil equal to the magnet in terms of uhhh power?](#)

By [headhunter](#), Section [Weird Science](#) [Magnetism](#)

Posted on Sat Oct 18th, 2003 at 08:04:19 PM MST

When under load is the coil equal to the magnet in terms of uhhh power?

As a coil is powered up, is that coil equal to the magnet (in terms of strength), or will it always be less?

I'm assuming it would be less.

[When under load is the coil equal to the magnet in terms of uhhh power?](#) | 11 comments (11 topical, 0 editorial)

Re: When under load is the coil equal to the magne ([none / 0](#)) (#1)  
by [laskey](#) on Sat Oct 18th, 2003 at 08:29:44 PM MST ([User Info](#))

That`s kind of a loaded question. It depend on the coil... how it`s coiled, what it`s coiled around, how many turns, the size of the wire, all that determines the magnetic flux density (how strong a magnet it is). Electro magnets (coils of wire with current flowing through them) properly made are always capable of higher flux densities than permanent magnets... ALWAYS. That`s why electric company`s grid-tied alternators always have electro-magnetic field coils instead of magnets.

Why don`t wind gens use field coils if they`re so great... because when you use them it takes some power to make power. If your alternator is a megawatt, and it uses 1000 watts to work, then it`s no problem you still have 999 kilowatts left. If your wind gen is 2000 watts, and it takes 1000 watts to work... well that`s not as good is it.

Cya,  
Chris

Re: When under load is the coil equal to the magne ([none / 0](#)) (#3)  
by [kww](#) on Sun Oct 19th, 2003 at 08:56:09 AM MST ([User Info](#))

But wouldn't a car alternator be impractical if that's the case? Wouldn't a 2000 watt windmill need maybe 10-100 watts to energize the coils sufficiently?  
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Re: When under load is the coil equal to the magne ([none / 0](#)) (#4)  
by 5kw on Sun Oct 19th, 2003 at 11:03:56 AM MST  
([User Info](#))

Hi Kevin, you are correct, wound fields are typically designed to use ~ 5% of full load power. The trouble is that 2000 watt wind turbine produces a lar ge % of its annual energy at 200 watts and less.  
Victor

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Re: When under load is the coil equal to the magne ([none / 0](#)) (#5)  
by kww on Sun Oct 19th, 2003 at 05:40:08 PM MST  
([User Info](#))

Oh, I see now. Thanks.  
Kevin

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Re: ([none / 0](#)) (#2)  
by headhunter on Sat Oct 18th, 2003 at 10:24:14 PM MST  
([User Info](#))

Ok just to confirm what ya said. If I had a generator with permanent magnets, as i spin this generator (and say the coils are done to perfection or the best possible), the coils, once under load would be more powerful than the permanent magnets that charged em up?

Correct?

Re: ([none / 0](#)) (#6)  
by laskey on Sun Oct 19th, 2003 at 07:53:44 PM MST  
([User Info](#))

It's a case of increasing return with increasing magnetic density. As you generate more power you will have more power available to generate more power with.

I've always wondered if you could use a hybrid design of a standard PMG with field coils to get a low speed starting, but higher output wind turbine, at running speed. It would be cool to see if it really practically did do better than just a regular PMG.

Cya,  
Chris

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Re: ([none / 0](#)) (#11)  
by troy on Thu Oct 23rd, 2003 at 11:32:43 AM  
MST  
([User Info](#))

Hi Chris,

Your idea is a valid one. There were some high end gennies in the old days that had two permanent magnet gennie made electricity to energize the field coils of the "real" gennie which actually produced the usable electricity.

The faster the wind blows, the more magnetic flux you get in the field coils. This sort of automatically matches the gennie to the blade size. And I think Jerry has suggested that you could use two separate windmills, using the PMA to drive the field coils of the main gennie.

There are some efficiency advantages to this method, but they are fairly complex to build. I think [www.homepower.com](http://www.homepower.com) recently ran an article about how they work.

Best regards.

troy

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Re: ([none / 0](#)) (#7)  
by headhunter on Sun Oct 19th, 2003 at 10:12:25 PM  
MST  
([User Info](#))

I understand that you can make more power with stronger magnets, but what i was asking is can the coil(under load), when charged ever be stronger than the magnet that charged it in the first place.

heres what i mean:



Re:oil equal to the magnet in terms of uhhh power?  
([none / 0](#)) (#8)  
by wpowokal on Mon Oct 20th, 2003 at 06:11:34 AM MST  
([User Info](#))

Simply, there is no such thing as a free lunch.  
More complex, there are at least 3 voltages generated in a generator, but simply no you do not get more out than you put in.

Just my humble opinion.

regards Allan

Re: ([none / 0](#)) (#9)  
by headhunter on Mon Oct 20th, 2003 at 11:28:48 AM MST  
([User Info](#))

I know there is no free lunch, just confirming that the coil generates an equal or less magnetic force than that which charges it.

Re: ([none / 0](#)) (#10)  
by laskey on Mon Oct 20th, 2003 at 06:47:03 PM MST  
([User Info](#))

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Chris

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Re: [\(none / 0\) \(#6\)](#)  
by laskey on Sun Oct 19th, 2003 at 07:53:44 PM MST  
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Re: When under load is the coil equal to the magne ([none / 0](#)) (#1)  
by laskey on Sat Oct 18th, 2003 at 08:29:44 PM MST  
([User Info](#))

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by kww on Sun Oct 19th, 2003 at 08:56:09 AM MST  
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Kevin

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Re: When under load is the coil equal to the magne ([none / 0](#)) (#4)  
by 5kw on Sun Oct 19th, 2003 at 11:03:56 AM MST  
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[Measuring Volts + Amps](#) | 2 comments (2 topical, editorial)

Re: Measuring Volts + Amps ([none / 0](#)) (#2)  
by laskey on Sat Oct 18th, 2003 at 08:12:22 PM MST  
([User Info](#))

Yep that`s it.

You should put in a fuse (in series) that matches or is less than your ampmeter`s maximum ability to read. So that if something happens you don`t damage the meter. Most meters aren`t fused on their high current range. Which is probably what you`ll be on since a 25W 12V bulb will draw just over 2 Amps. If you`ve got a gen capable of more than 25 watts, then consider putting some more bulbs in parralle to get a bigger load to see how much you can draw. Just remember not to blow up your ampmeter in the process (they can only take what they`re rate for).

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## [Measuring Volts + Amps](#)

By [Insomnian](#), Section [Homebrewed Electricity](#)

Posted on Sat Oct 18th, 2003 at 07:21:50 PM MST [Alternators](#)

Series or parallel for measuring volts/amps

Which is the proper way to measure volts and amps?

I have hooked my rectifier to a few coils (still on the lathe for testing). I then attached a 12V (25W) car bulb to the + & - terminals of the rectifier, as a test load. The bulb lights well at 450 RPM from two coils. To measure volts should the multimeter probes be in series with the bulb or parallel? Also when I measure for amps, should it be series or parallel for the probes/bulb.

Thanks for any info.

[Measuring Volts + Amps](#) | 2 comments (2 topical, 0 editorial)

Re: Measuring Volts + Amps ([none / 0](#)) (#1)  
by [richard](#) on Sat Oct 18th, 2003 at 07:49:39 PM MST  
([User Info](#))

Volts = Parallel with load . Amps. = Series with load  
richard

Re: Measuring Volts + Amps ([none / 0](#)) (#2)  
by [laskey](#) on Sat Oct 18th, 2003 at 08:12:22 PM MST  
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[diminishing returns on stator heating](#) | 4 comments (4 topical, editorial)

Re: deminishing returns on stator heating ([none / 0](#)) (#2)  
by laskey on Sat Oct 18th, 2003 at 07:57:32 PM MST ([User Info](#))

Hey guys, it`s a moot point with a wind gen. Your heat only goes up when you generate more power, you only generate more power when there is more wind, meaning you have higher cooling already. It doesn`t get any better without using your generated enegy to run a cooling system.

The text book says you only need go beyond forced air cooling in alternators larger than 10 Megawatts. (that`s a cost:benefit ratio type thing)

You are of course right about the 40-50 degree rise above ambient temp, but you have to do one of two things to get that in a wind gen. 1) Have some really, really, really, fast winds (without, of course, having your gen been torn apart by the winds.) or 2) really design your gen badly.

Whatever stator heating you may experience should be well offset, by the large number of British thermal units of air that the driving wind can remove from your stator.

Cya,  
Chris

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Re: deminishing returns on stator heating ([none / 0](#)) (#3)  
by bob golding ([yubba at clara dot net](#)) on Sun Oct 19th, 2003 at 02:38:56 AM MST ([User Info](#))

thx guys that is what i thought. the reason i asked is that i am thinking of putting the alternator on the ground to keep the weight down and therefore will lose the cooling effect from being up in air where the cooling air is. i think i will just put it in a big enough box that it wont matter and use thermal cutouts in the windings as used in microwave oven transformers and motors.

cheers  
bob

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## [diminishing returns on stator heating](#)

By [bob golding](#), Section [Homebrewed Electricity](#) [Alternators](#)

Posted on Sat Oct 18th, 2003 at 12:18:52 PM MST

hi all does anyone know the point at which trying to cool a stator

becomes uneconomic in terms of energy usage. i know you can get magnet wire that runs up to high temperatures but when does it become counter productive? i know this violates the K.I.S.S principle but that aside does anyone know?

having lots and lots of fun not enough hours in the day

bob

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Re: deminishing returns on stator heating ([none / 0](#)) (#1)

by [zubbly](#) on Sat Oct 18th, 2003 at 05:24:37 PM MST ([User Info](#))

hello Bob. i think you could use the same rating as on electric motors. generally 40-50 degree rise above the ambient surrounding temperature. hope this helps.

zubbly

Re: deminishing returns on stator heating ([none / 0](#)) (#2)

by [laskey](#) on Sat Oct 18th, 2003 at 07:57:32 PM MST ([User Info](#))

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cheers  
bob

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Re: diminishing returns on stator heating ([none / 0](#)) (#4)  
by jubalearly on Mon Oct 20th, 2003 at 08:28:56 AM MST  
([User Info](#))

Removing the generator from the 'cooling air' will also remove it from the wind. In other words, the amount of power you can generate on the ground is much less than a higher mount could give you. And that is true even when there are no obstructions - any obstructions make it worse.

The temperature that you can run the stator depends on what the insulation can take. Most magnet wire has class H insulation but the epoxy used in addition is usually class F, limited to a maximum temperature of ambient (40 deg C)+ 100 deg. (avg.) C rise - actually an internal maximum temperature of 150C. I wouldn't want it that hot. You should have plenty of cooling air provided you do not exceed the amperage rating of your winding.

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[multiple frequency on same ac line](#) | 11 comments (11 topical, editorial)

Re: multiple frequency on same ac line ([none / 0](#)) (#10)  
by laskey on Sat Oct 18th, 2003 at 07:32:08 PM MST ([User Info](#))

Yes, When you add multiple frequencies together you get strange results. If two alternators are exactly in phase at the same frequency then they add together as twice as much voltage, if they are exactly 180 degrees out of phase at the same frequency then when you add then you get nothing, they cancel each other. Being different frequencies (and varying frequencies) you get some kind of strange middle ground that`s not reliable.

When we are talking about the Grid, then alternators are forced to the right frequency by what`s called the infinite bus. Meaning the grid is so large and powerful that it forces alternators running on it to run at it`s frequency. In a smaller setup the alternators wired together will fight each other until they reach a middle ground. If they are all the same size this might not be bad, as they would all kinda smooth each other out, and find a happy middle ground. The big problem is if you have different sized Alternators, as one may very well be using it`s generated enegry to drive other ones like motors, and such.

Cya,  
Chris

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Cya,  
Chris

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[multiple frequency on same ac line](#)

By [signweld](#), Section [Homebrewed Electricity](#)  
Posted on Thu Oct 16th, 2003 at 04:09:47 PM MST  
multiple alternators, common 3ph line...

[Alternators](#)

I would like to bury 1 heavy 3 conductor line from 2 or more pm alternators to go to my batteries in house, to carry current as 3ph ac, but dont know if the different frequency and varied voltages of the individule alternators would fight each other, or cancel out each other? I have some 200 amp direct burial aluminum entrance cable and would like to run 1 "main" feeder from the units to rectifier bridge/& batteries.  
signweld

[multiple frequency on same ac line](#) | 11 comments (11 topical, 0 editorial)

Re: multiple frequency on same ac line ([none / 0](#)) ([#1](#))  
by [doubter3](#) on Thu Oct 16th, 2003 at 05:14:00 PM MST  
([User Info](#))

Signweld,

The simple answer is, yes, they will fight each other. An easy solution would be to rectify the output of each individual alternator and then parallel the D.C. outputs into your power transmission wire.

Matt

Re: multiple frequency on same ac line ([none / 0](#)) ([#2](#))  
by [laskey](#) on Thu Oct 16th, 2003 at 05:40:30 PM MST  
([User Info](#))

Yep Your right. Because they aren't synchronous, they will un-relibly fight each other.

The problem with DC into the house is that you need huge wire to run long distances. If you've got a long way to go, consider having a battery/inverter shack at a central point then run 3 phase to the shack from each gen and then have your batteries and inverter there and then run single phase AC to your house.

Cya,  
Chris

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Re: multiple frequency on same ac line ([none / 0](#)) ([#3](#))  
by [iFred](#) ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Thu Oct 16th, 2003 at 08:59:23 PM MST  
([User Info](#)) <http://www.internetfred.com>

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I agree with the other two comments posted, they interfere, best to convert everything to DC.. As for the wire, the bigger the better #2 guage is good for about 150 to 200 ft. Also the higher the voltage and lower the current the lesser the losses. Do the recification on site and filter later, caps will freeze like batteries, unless kept above freezing like a nice warm house or shack!

Good Luck!  
ifred.

Re: multiple frequency on same ac line ([none / 0](#)) (#4)  
by signweld on Fri Oct 17th, 2003 at 12:19:42 PM MST  
([User Info](#))

I can accept that it wont work. But does anybody know why" Is it the 2 different voltages that are not compatible, or the fact that you have 2 diferent frequencys.

I dont mean to dispute anyone, Im just curious. I know you can carry a AC frequency signal over a DC signal in electronics, and the electric co. runs high frequency communications over thier transmission lines ( dont know if its same voltage as line voltage) and your all telling me to run seperate 3ph AC lines to my batteries and then thru the rectifiers (I assume seperate rectifiers for each alternators output lines) and use these somewhat different and varying DC voltages to my common battery bank. So its OK to have several different voltages on same line to batteries after rectified? Maybe its the different AC voltages that are not compatible?

still confused, but I know to heed from other's experiances.

signweld

Re: multiple frequency on same ac line ([none / 0](#)) (#5)  
by signweld on Fri Oct 17th, 2003 at 12:23:47 PM MST  
([User Info](#))

CORRECTION, Should read...AC lines to close to my batterys...

sorry, signweld

[ [Parent](#) ]

Re: multiple frequency on same ac line ([none / 0](#)) (#6)  
by wooferhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Fri Oct 17th, 2003 at 03:08:55 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>



As one of your source AC voltages is rising +Positive and another of your source AC voltages is coming up to it's -Negative point. If these two sources are connected together the voltages will cancel out, or in my opinion "evaporate". This will happen whether you connect them together in series or parallel.

. >=- W o o f -=<  
[ [Parent](#) ]

Re: multiple frequency on same ac line ([none / 0](#)) (#8)  
by signweld on Fri Oct 17th, 2003 at 04:22:22 PM MST  
([User Info](#))

Woof, the way you stated it clears my mind. I got it.  
thanks,  
signweld

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Re: multiple frequency on same ac line ([none / 0](#)) (#10)  
by laskey on Sat Oct 18th, 2003 at 07:32:08 PM MST  
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Cya,  
Chris

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Re: multiple frequency on same ac line ([none / 0](#)) (#7)  
by DanB on Fri Oct 17th, 2003 at 04:05:31 PM MST  
([User Info](#))

The other problem is that one windturbie will load up the other in this situation... as one turned, it would actually be trying to motor the other one! This would always be happening, so the machines would always have a load on them and theyd have a rough time starting up Id think. Id just rectify them at the bottom of the tower.

[ [Parent](#) ]

Re: multiple frequency on same ac line ([none / 0](#)) ([#9](#))  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Fri Oct 17th, 2003 at  
09:09:40 PM MST  
([User Info](#)) <http://www.internetfred.com>

I looked at some caps, I found that some of the higher voltage types can withstand minus -40 deg c. So, depends on the cap.. So, if you can rectify and filter your alt would be perfect.

Re: multiple frequency on same ac line ([none / 0](#)) ([#11](#))  
by charged on Fri Nov 14th, 2003 at 09:10:07 AM MST  
([User Info](#))

Here's a weird but moderately simple solution.

Use half-wave rectification (1 heavy-current diode) on each output winding on the alternator. Charge a large capacitor (100,000uf+) with this output. Place a single protector diode in reverse-bias mode across the capacitor.

Do this to each alternator. Then, connect the three capacitors in series. The capacitors render the "out-of-phase" relationships of the three alternators moot.

This will give you a higher voltage DC. The protector diodes prevent the capacitors from ever getting a catastrophic reversed charge condition should one of the alternators fail.

Because of the half-wave rectification (adiabatic cap charging method) and the series wiring of the capacitors, you'll have more than 4x the original working voltage which will transfer with greater efficiency.

Here's the magical "teslian" component to the system. (diagram below)

Get a single heavy-current inductor (microwave oven transformer primary), a couple of power transistors and a couple of 555 timer circuits set to 50% duty.

The two switches in the following diagram represent the two power transistors being driven by two 555 pulse generators.

The capacitor at the battery bank should be 1F or larger and able to handle the incoming voltage plus a little.

The inductor and c.e.m.f. recovery diode are hooked up close to the triple capacitor bank at the source. Adjust the pulse rate so that the inductor is driven to about 80% saturation with each pulse (only a sawtooth, not a flat DC line on the scope). The combined inductance of the transformer winding and the long wire will probably end up in the 50-60hz range for a standard oven transformer.

The transistor and pulse circuit inside the house can be run at a relatively high frequency at 50% duty.

Mosfets are preferred over bipolar transistors since they don't present any voltage drop.

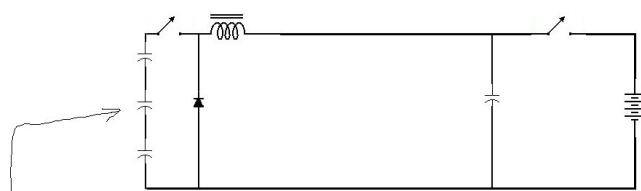
The large 1F receiver capacitance being fed with the "buck converter" pulse at the source will very efficiently step-down the high voltage and allow you to directly charge the batteries at their preferred voltage level. No transformers required.

For a more detailed explanation of basic capacitive DC-DC conversion check this out.

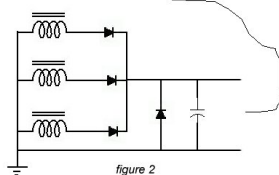
[http://www.maxim-ic.com/appnotes.cfm/appnote\\_number/710/ln/en](http://www.maxim-ic.com/appnotes.cfm/appnote_number/710/ln/en)

It's not just for application in "little chips". It works just fine at the macroscopic level too.

Enjoy!



The two switches represent two heavy-current transistors or mosfets rated for at least 200v.



Each of the three capacitors on the left of figure 1 is wired to it's respective alternator as shown in figure 2.

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Re: multiple frequency on same ac line ([none / 0](#)) (#2)  
by laskey on Thu Oct 16th, 2003 at 05:40:30 PM MST ([User Info](#))

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Cya,  
Chris

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[How efficient is an auto alternator?](#) | 13 comments (13 topical, editorial)

Re: How efficient is an auto alternator? ([none / 0](#)) (#4)  
by laskey on Wed Oct 8th, 2003 at 06:43:43 AM MST ([User Info](#))

Cumbustion engines are terrible for efficiency. the theoretical max for your 5HP motor is 3730 watts. Now you drive a 55Amp 24Volt alternator with it... so your system is capable for producing 1320watts.  $1320/3720 = .353$  which means your system is 35.3% efficient at it's theoretical maximum. And that doesn't take into account the stored energy in the gas which will make your efficiency even worse. gas gen is really not the way to efficiency.

Cya,  
Chris

[How efficient is an auto alternator?](#) | 13 comments (13 topical, 0 editorial)

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[How efficient is an auto alternator?](#) | 13 comments (13 topical, editorial)

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### [How efficient is an auto alternator?](#)

By [zmoz](#), Section [Homebrewed Electricity](#)  
Posted on Tue Oct 7th, 2003 at 09:22:18 PM MST [Alternators](#)  
**How efficient is an auto alternator?**

Can somebody tell me aproximately how efficient an auto alternator is? I mean...if I had one powered by a 3hp engine, what is the max watts I could produce?

[How efficient is an auto alternator?](#) | 13 comments (13 topical, 0 editorial)

Re: How efficient is an auto alternator? ([none / 0](#))  
(#1)  
by [wpowokal](#) on Wed Oct 8th, 2003 at 12:10:22 AM MST  
([User Info](#))

Zmos,

While I don't know how efficient auto alternators actually are your question is more relevent to other parameters.

I have a 55a Bosh 24v alternator connected to a 5hp motor 2.5" motor pully with 2" alternator pully. This allows the engine to drive it at full load. I have tried larger pullies to reduce motor revs but that is the best combination.

It is possible to use a regulator on the alternator to reduce initial current to what the engine can accomodate, Homepower has published a good one of these. With such a regulator I believe a three HP motor would drive such an alternator, 3HP is 2.25 kw, in my case 55a @ 24v = 1.32kw. Homepower also have published an artical on such a motor alternator conversion.

So in sumary its relevent pully size v motor speed and therefore power.

regards Allan

Re: How efficient is an auto alternator? ([none / 0](#))  
(#2)  
by [zmoz](#) on Wed Oct 8th, 2003 at 02:41:13 AM MST  
([User Info](#))

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Actually, I'm not trying to run an alternator off of a small engine...I just used that as an example. What I want to know, is how much HP is wasted. I'm actually planning on wiring up a switch in my truck that will turn off the alternator when I want a little extra power. I'm trying to figure out aproximately how much of a HP increase that will give me. Are they something like 80% efficient? More? Less?

Thanks :)

Re: How efficient is an auto alternator? ([none / 0](#)) (#12)  
by BT Humble ([za2bb@optusnet.com.au](mailto:za2bb@optusnet.com.au)) on Thu Oct 9th, 2003 at 04:30:10 PM MST  
([User Info](#)) <http://www.geocities.com/za2bb/>

Your horsepower gain would be 3/5 of 5/8 of bugger all. ;-)

Seriously, once you've started your engine the amps produced by your alternator will be high for a few minutes until your starter battery is brought back to full charge, then drop to maybe half an amp. Your electric fan generally only gets switched on by the thermostat when the vehicle is stationary or moving slowly, in most vehicles once you're doing 20mph or so there's more than enough airflow through the radiator and the fan isn't really needed.

Go for it if you like, but I suspect that the performance boost would only be noticeable on the dyno. If you're just looking at doing a few runs down the drag strip then you'd be better off pulling the alternator out altogether, fitting a 4ah battery to power the ignition and starting it via jumper leads - that way you'll gain the little bit of power and lose some weight at the same time. ;-)

BTH

[ [Parent](#) ]

Re: How efficient is an auto alternator? ([none / 0](#)) (#3)  
by Budgreen on Wed Oct 8th, 2003 at 06:30:57 AM MST  
([User Info](#))

I doubt you will notice any power gains at all, 1HP = 746(?)watts or thereabout, so that would be around 62A@12v I highly doubt you constntly pull 62 amps from the alterntor :)

Re: How efficient is an auto alternator? ([none / 0](#)) (#4)  
by laskey on Wed Oct 8th, 2003 at 06:43:43 AM MST  
([User Info](#))

Cumbustion engines are terrible for efficiency. the theoretical max for your 5HP motor is 3730 watts. Now you drive a 55Amp 24Volt alternator with it... so your system is capable for producing 1320watts.  $1320/3720 = .353$  which means your system is 35.3% efficient at it's theoretical maximum. And that doesn't take into account the stored energy in the gas which will make your efficiency even worse. gas gen is really not the way to efficiency.

Cya,  
Chris

Re: How efficient is an auto alternator? ([none / 0](#))

(#5)

by jubalearly on Wed Oct 8th, 2003 at 09:44:03 AM MST

([User Info](#))

Automobile alternators are only about 60% efficient at full load. At lower loads it is even less efficient because the rotor current doesn't drop off much. I figure rotor current at about 10% of output between 50% and 100% output. Below 50% load I just figure 5 amps rotor current. So changing to permanent magnets gives you 5-10 amps FREE energy! (this is the only kind of free energy I believe in).

Re: How efficient is an auto alternator? ([none / 0](#))

(#6)

by zmoz on Wed Oct 8th, 2003 at 11:53:08 AM MST

([User Info](#))

Geez...I thought it would be alot better than 60%! That really could make a big difference for me, I have replaced my belt driven fan with an electric one, so that puts more load on the alternator at all times than usual.

Re: How efficient is an auto alternator? ([none / 0](#)) (#11)

by jubalearly on Thu Oct 9th, 2003 at 01:39:49 PM MST

([User Info](#))

What's your worry? Are you looking for better gas mileage or more power? You aren't going to gain enough to make turning the alternator off worthwhile.

The new car designs (2005? 2006?) are supposed to gain about 8% by turning the entire engine off while sitting at a red light (and other methods). They will have more efficient alternators - mostly so that they can get more power for electrical goodies.

The .6 efficiencies includes friction & windage, core, and winding losses in the alternator but not belt losses:

$$\begin{aligned} 105 \text{ amps} \times 14\text{v} &= 1470 \text{ watts} \\ 1470 / 746 &= 1.97\text{HP} \\ 1.97\text{HP} / .60 &= 3.28\text{HP} \end{aligned}$$

The above are assuming the maximum output for (assumed) 105a alternator. Belt losses would put you a little over 4HP.

But you are not likely to require full output. Also, your electric fan doesn't run all of the time, assuming you have a thermostat on it. Even so it probably takes  $13.8\text{v} \times 20\text{a} = 276\text{w}$ , or about .37HP compared to 6-10HP for a belt driven fan. You can save more HP just by correctly adjusting the air in your tires.

You have to make all kinds of assumptions to estimate fuel mileage based on a HP savings. Using .5lb. fuel per HP per hr., 4HP works out to .4 gal/hr. At 60 MPH that would mean you went 60 miles using .4 gal. So you would be saving between 1/10th - 1/8th mpg by eliminating this load. And you still have to charge the battery, somehow, sometime.

[ [Parent](#) ]

Re: How efficient is an auto alternator?  
([none / 0](#)) ([#13](#))  
by zmoz on Thu Oct 9th, 2003 at 05:18:16 PM MST  
([User Info](#))

I'm not doing this for fuel mileage. As I said below, the engine is already modified in alot of other ways and is going to be even further. Every little bit of HP helps. It's not like I'm going to be driving around like this, it's only going to be for starting off at a light or doing a 1/4 mile run. Also, my electric fan runs at all times.

[ [Parent](#) ]

Re: How efficient is an auto alternator? ([none / 0](#))  
([#7](#))  
by wdyasq on Wed Oct 8th, 2003 at 06:52:09 PM MST  
([User Info](#))

Back when I was much younger - and a dollar would buy about 4 gallons of gas, someone decided they would put a cut-off switch on the A/C hooked to the vacuum of the engine. This was quite an engine. And, with the roller-cam, did not find 9k RPM an unusual sight. BTW, \$0.09 of that 4 for a \$1 gas was tax.

As I remember, the run was over when the vacuum switch allowed the AC to come back on. However, parts not designed for the operation made new ventilation openings on the hood. This also mandated replacement of many parts associated with the accessory options on the vehicle. We never found out how much time was cutoff of a 1/4 mile by this method.

It was amusing - IF you were not the one paying for the repairs.

Ron

PS: Thanks for the memory jog...

Re: How efficient is an auto alternator? ([none / 0](#)) (#8)  
by Demetri ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Wed Oct 8th, 2003 at 09:26:18 PM MST  
([User Info](#))

From what I understand, most of the power lost to an alternator (when not under heavy load) is in the friction of the belt driving the thing, even if you have a serpentine belt. I think you'd find that your ignition runs so much better on the full 14.7 volts vs. 12.7 that the extra power loss is worth the problem. Then again, there are dragsters that don't have alternators nor magneto ignitions, and do just fine. I'd look somewhere else to free up power. And even easier than freeing up or creating power is reducing weight..... What kind of vehicle?

Demetri

Always be the lead dog.

Re: How efficient is an auto alternator? ([none / 0](#)) (#9)  
by troy on Thu Oct 9th, 2003 at 12:41:52 PM MST  
([User Info](#))

Some time ago, I think www.homepower.com ran a short article about a woman who unhooked her alternator completely and screwed one of those flexible solar panels to the roof. She didn't do a lot of night driving so headlights weren't a concern, and if memory serves me correctly, she gained 3 mpg.

Best regards,

troy

[ [Parent](#) ]



Re: How efficient is an auto alternator? ([none / 0](#))

([#10](#))

by [zmoz](#) on Thu Oct 9th, 2003 at 01:33:50 PM MST

([User Info](#))

This is in a Jeep Cherokee...and I'm in the process of alot of other mods as well. Stroked to 4.7 liters from the original 4, headers, lots of porting, ect. There might be a supercharger sometime in the future too. :) When I'm done I should be able to blow the doors off of a stock sports car and get ~26mpg, with a vehicle weighing 2 tons and having the aerodynamics of a bus.

[How efficient is an auto alternator?](#) | 13 comments (13 topical, 0 editorial)

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[not smooth](#) | 11 comments (11 topical, editorial)

Re: not smooth ([none / 0](#)) ([#10](#))  
by laskey on Mon Sep 22nd, 2003 at 08:36:35 PM MST  
([User Info](#))

In this set up I'd use a Bridge Rectifier before it goes into the Caps. That way you are sure you have all positive going waveforms going into the caps so you can use big honking Electrolytic Caps without fear of them exploding, and you've got an AC genny there so a blocking diode would waste half your voltage. A bridge will flip the negative half-cycle over to positive for you and can then be used for charging as well.

Blocking didoes only work well on DC set-ups, and you should always use one to protect your electronics.

Cya,  
Chris

[ [Parent](#) ]

Re: not smooth ([none / 0](#)) ([#11](#))  
by sean on Tue Sep 23rd, 2003 at 05:10:52 AM MST  
([User Info](#))  
<http://homepage.ntlworld.com/s.amesbury/homepage.htm>

Do i use a blocking doide after the caps so the battery deosnt charge them?.....sean

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Chris

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[not smooth](#)

By [sean](#), Section [Homebrewed Electricity](#)

Posted on Sun Sep 21st, 2003 at 04:51:33 PM MST

[Wind](#)

[not smooth](#)

Been working flat out, or as much as allowed on my latest wind genny which is a motor conversion (induction). I have just got it flying today and it works fairly well considering i used ceramic magnets. But heres the big question, im using a analogue amp meter of an old battery charger. When i had my first genny up the needle would rise and fall according wind speed but now with this latest genny the needle appears to vibrate or bounce, i would say more like vibrate. Now im thinking its down to the fact that this genny hits charging voltage almost as soon as it starts to spin and its pulsing dc at its very worst. Its a 2 phase motor start and run and ive tryed both windings on there own and its still has that vibration look to the meter. Would i be better trying a faster better prop or using capacitors to smooth the dc out? Any comments mucho aprecitado, the motor is on my site under wind but it aint updated just yet thats to come.....sean

[not smooth](#) | 11 comments (11 topical, 0 editorial)

Re: not smooth ([none / 0](#)) ([#1](#))  
by [sean](#) on Sun Sep 21st, 2003 at 04:54:43 PM MST  
([User Info](#)) <http://homepage.ntlworld.com/s.amesbury/homepage.htm>

My site address dont come up for some reason but here it is  
<http://homepage.ntlworld.com/s.amesbury/homepage.html> .....sean

Re: not smooth ([none / 0](#)) ([#3](#))  
by [laskey](#) on Sun Sep 21st, 2003 at 06:22:51 PM MST  
([User Info](#))

I looked at your pictures and I think the think going on here is that 4 magnets is not enough. You have got two sets of windings, but they deliver different voltages at the same speed so when the magnetic field has passed away from one set of windings and is approaching the other the voltage does not rise as high so you get a dip in your meter then it goes back up when it reaches the high windings again. Your meter is not fast as that happens but does show it. I say hell, take out the armature, cut 4 more slots into it, fill them with magnets, and then your frequency should be fast enough your meter will not show it. The advantage is you get more power. if you do not want to do that then I say capacitors, lots and lots of capacitors, or a big in-line inductor.

Cya,  
Chris

[ [Parent](#) ]

Re: not smooth ([none / 0](#)) ([#2](#))  
by [drdongle](#) on Sun Sep 21st, 2003 at 06:07:35 PM MST  
([User Info](#))

I suspect that the out put frequency from your new generator is higher that that from the old one and the meter is reflecting that. try a filter or smoothing capacitor on the generator out put before it goes through the meter ( select one that is at least twice the voltage that will be delivered from the genny). For example 1000 Uf at 50 volts if the genny puts out 24V tops. If you have to fudge things always fudge up in value not down, so that in this example a 100 volt capacitor would be a better choice than a 35 volter.

Dr.D

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Re: not smooth ([none / 0](#)) (#4)  
by sean on Sun Sep 21st, 2003 at 06:37:26 PM MST  
([User Info](#)) <http://homepage.ntlworld.com/s.amesbury/homepage.htm>

Intereseting comments, ive measuered like 50v dc with no load in 14mph gust so i might just try some big beefy caps. Its charging a 100ah battery well but if i can improve things then i will but so far its just that bounce on the meter that im concerned about.....sean

Re: not smooth ([none / 0](#)) (#5)  
by wooferhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Sun Sep 21st, 2003 at 08:28:49 PM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

Adding capacitors will help the batteries charge a little better too

-- W o o f

Re: not smooth ([none / 0](#)) (#6)  
by mgormley on Mon Sep 22nd, 2003 at 06:54:32 AM MST  
([User Info](#))

please tell me how you arranged the mags on the armature?  
nsns nsssnss or what configuration?

also how many did you go?

can you please email me photos of your armature with the mags on  
(any body have some photos of there ind motor conversion (armatures)

Email: mgormleynospam123@tpg.com.au (remove nospam123)

Thanks all

Re: not smooth ([none / 0](#)) (#8)  
by sean on Mon Sep 22nd, 2003 at 11:14:48 AM MST  
([User Info](#)) <http://homepage.ntlworld.com/s.amesbury/homepage.htm>

<http://homepage.ntlworld.com/s.amesbury/converting%20an%20induction%20motor.html>

on this page here is the armature. the mags are n/s/n/s.....sean

[ [Parent](#) ]

Re: not smooth ([none / 0](#)) (#7)  
by jubalearly on Mon Sep 22nd, 2003 at 09:30:32 AM MST  
([User Info](#))

I think you would be pleasantly surprised how much even a small capacitor would improve your output. Rule of thumb is about 1000 microfarads per amp output. But even a couple of hundred mf will work noticeably better. If you look at an AC waveform (sinewave) you will see that it spends a lot of time lower than the charging voltage.

A capacitor will hold the voltage up for at least part of that time and increase the charging at NO COST. Well, actually it tends to pull the peak voltage down, but that usually doesn't hurt anything. Adding an 880uf capacitor to a battery charger usually makes it charge at about 130%, or about 3 hours instead of 4, in my experience.....

Re: not smooth ([none / 0](#)) ([#9](#))  
by sean on Mon Sep 22nd, 2003 at 11:22:19 AM MST  
([User Info](#)) <http://homepage.ntlworld.com/s.amesbury/homepage.htm>

interesting stuff jubalearly, did you use a blocking diode when the caps where used on the charger.....sean

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Re: not smooth ([none / 0](#)) ([#10](#))  
by laskey on Mon Sep 22nd, 2003 at 08:36:35 PM MST  
([User Info](#))

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Blocking didoes only work well on DC set-ups, and you should always use one to protect your electronics.

Cya,  
Chris

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Re: not smooth ([none / 0](#)) ([#11](#))  
by sean on Tue Sep 23rd, 2003 at 05:10:52 AM MST  
([User Info](#)) <http://homepage.ntlworld.com/s.amesbury/homepage.htm>

Do i use a blocking doide after the caps so the battery deosnt charge them?.....sean

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[How to keep water from freezing](#) | 8 comments (8 topical, editorial)

Re: How to keep water from freezing ([none / 0](#)) (#7)  
by laskey on Mon Sep 22nd, 2003 at 08:14:59 PM MST  
([User Info](#))

Alcohol non-toxic? Why don't you just dump big bricks of salt in there?

Just because it's non-toxic, doesn't stop it from being a total environmental disaster.

The air bubble thing might work. It's been known to keep harbours ice free and things like that, but it's only going to work if the stream is fast enough not to freeze solid.

Cya,  
Chris

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[How to keep water from freezing](#) | 8 comments (8 topical, editorial)

Re: How to keep water from freezing ([none / 0](#)) (#7)  
by laskey on Mon Sep 22nd, 2003 at 08:14:59 PM MST  
([User Info](#))

Alcohol non-toxic? Why don't you just dump big bricks of salt in there?

Just because it's non-toxic, doesn't stop it from being a total environmental disaster.

The air bubble thing might work. It's been known to keep harbours ice free and things like that, but it's only going to work if the stream is fast enough not to freeze solid.

Cya,  
Chris

[ [Parent](#) ]

[How to keep water from freezing](#) | 8 comments (8 topical, 0 editorial)

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[not smooth](#) | 11 comments (11 topical, editorial)

Re: not smooth ([none / 0](#)) ([#3](#))  
 by laskey on Sun Sep 21st, 2003 at 06:22:51 PM MST  
 ([User Info](#))

I looked at your pictures and I thing the think going on here is that 4 magnets is not enough. You have got two sets of windings, but they deliver different voltages at the same speed so when the magnetic field has passed away from one set of windings and is approaching the other the voltage does not rise as high so you get a dip in your meter then it goes back up when it reaches the high windings again. Your meter is not fast as that happens but does show it. I say hell, take out the armature, cut 4 more slots into it, fill them with magnets, and then your frequency should be fast enough your meter will not show it. The advantage is you get more power. if you do not want to do that then I say capacitors, lots and lots of capacitors, or a big in-line inductor.

Cya,  
 Chris

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[not smooth](#) | 11 comments (11 topical, 0 editorial)

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## Solar Tracker Homebrew

By [laskey](#), Section [Homebrewed Electricity](#)

Posted on Tue Aug 5th, 2003 at 11:23:25 AM MST

[Solar](#)

Solar Tracker Homebrew

I'm thinking of building my own small solar tracker for my 50 watt panel (you know, for fun). Anybody, have any suggestions?

Cya,  
Chris

[Solar Tracker Homebrew](#) | 4 comments (4 topical, 0 editorial)

Re: Solar Tracker Homebrew ([none / 0](#)) ([#1](#))  
by [electronbaby](#) ([electronbaby@hotmail.com](mailto:electronbaby@hotmail.com)) on Tue Aug 5th, 2003 at 11:51:05 AM MST  
([User Info](#))

I have an azimuth tray on a small tower for a large 8' satellite dish (you know the old big ones sold by Channel master). This could be used if you were to build some controller hardware. I was originally planning to use this for 4 120W Kyocera panels I have. I was thinking I could even use the original actuator. All I would have to do is make it follow the sun and reset to its original position at night. This can be done by using photo transistors placed inside of a tube as to only make the sensor receive light when its actually pointed at the sun +/- 15 degrees. If you place one sensor on either side of the panels, A comparator can be used to control the circuitry to move the actuator until both sensors have an equal amount of light hitting them (the panels then would be pointed into the sun directly. The circuitry would have to know when one sensor loses light to move the panel again to equalize the light and keep it facing the sun. This happens over and over again throughout the day till the sun sets and then when there is no more light hitting the sensors, it will reset the actuator to its starting location for the next morning. This is just a thought. :-)) have fun!!

RoyR

Re: Solar Tracker Homebrew ([none / 0](#)) ([#3](#))  
by [laskey](#) on Wed Aug 6th, 2003 at 12:17:38 PM MST  
([User Info](#))

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Do you use a tracker with your solar system?

Yes

No

Nah, I can find my solar panels no problem.

Votes: 10

[Results](#) | [Other Polls](#)

### Related Links

- [More on Solar](#)
- [Also by laskey](#)

Well... I don't have access to any old Satellite equipment. Any suggestions as to one turning mechanism type over another? How about a motor to use?

Cya,  
Chris

[ [Parent](#) ]

Re: Solar Tracker Homebrew ([none / 0](#)) ([#2](#))  
by Seth on Tue Aug 5th, 2003 at 12:03:27 PM MST  
([User Info](#))

I would think it would be more cost effective to make it time based....

But to make it track the sun.. i use this on my setup  
<http://www.redrok.com/electron.htm#paypalled3kitus>

takes a bit of tinkering to gt it to work properly... bu tit does work for me.

Re: Solar Tracker Homebrew ([none / 0](#)) ([#4](#))  
by hydrosun on Wed Aug 6th, 2003 at 10:18:13 PM MST  
([User Info](#))

I once used a car window motor to turn the platform for my solar cooker. I rigged a circuit with two photo diodes and the comparitor was a 555 chip which turned on for 1/2 second and moved the platform toward the west. It would stop until triggered again when the sun had move far enough. I had a switch that hit part of the frame at the farthest limit, that shut off the circuit. I had to manually reset it to the east for the next morning. I could have eventually work out a time delay after the switch was triggered for it to automatically turn to the east.

I'm now using the redrok.com circuit to move my solar array. After the original actuator from a satellite dish froze up I bought a replacement on ebay for \$46 including shipping. It's working fine. I've set up an identical system for someone else. The reason I went with this circuit instead of my own is this has the automatic return to the east and for \$36 it's not worth my time to try to replicate.

[Solar Tracker Homebrew](#) | 4 comments (4 topical, 0 editorial)

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[formatted re-post of more on ferrous cores...](#) | 10 comments (10 topical, editorial)

Re: formatted re-post of more on ferrous cores...  
 (none / 0) (#9)  
 by Jerry on Sat Jan 3rd, 2004 at 10:09:42 PM MST  
 (User Info) <http://www.dplusv.com/Photo-03.html>

Ok guys now you've went a done it again. And just when I thought i had to many ideas and projects you go and add another one. This board is addictive and dangerus. OK so heres my next progect idea. My brother use to work for Mead paper Corp. you know those folks that make spieral note books and stuff like that. He use to bring me large carboard tubes. We make sub woofer inclosers at the car stereo store. Some of these tubes still had a very nice varnish coated soft steel wire they used to make the spiroll spring things. However its nice and straight on these big rolls. I still have a few 100 feet. Magnets realy like this stuff. So I'm going to wind some coils with copper and this stuff in perelell. I have a zilion speaker magnets so I'll wind the coils same size and shape as the speaker magnets. This will get the magnets very close to the laminations (Mead wire) and copper coils at the same time. Very small gap. Thanks so much for this idea. I guess better get ahold of Mead or = to see about more of the soft and candy coated steel wire? JK TAS Jerry

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Re: formatted re-post of more on ferrous cores... (none / 0) (#10)  
 by bill541 on Sun Jan 4th, 2004 at 07:16:41 PM MST  
 (User Info)

I would have to agree with Ed on this one. The steel wire will make an inductor, not unlike your copper wire does. This steel inductor will have voltage induced on it, so it must be insulated from itself just as the copper magnet wire is. If you could wind a full layer of the steel wire and bond it to itself so that it did not form and inductor, then I think you would get it to work. Otherwise it should be insulated steel wire. You may be able to wind the coil so that the copper insulated wire always keeps the steel wire separated, but you would need to put a layer of insulating material between each winding layer... Just my thoughts, Bill

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[formatted re-post of more on ferrous cores...](#) | **10** comments (10 topical, 0 editorial)



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[formatted re-post of more on ferrous cores...](#) | 10 comments (10 topical, 0 editorial)

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 (none / 0) (#9)  
 by Jerry on Sat Jan 3rd, 2004 at 10:09:42 PM MST  
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- [jeanpaul](#)
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- [DaveR](#)
- [electronbaby](#) (3)
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[144,000 pulses and counting.](#) | 15 comments (15 topical, 0 editorial)

Re: 144,000 pulses and counting. ([none / 0](#)) (#15)  
by Jerry on Sat Jan 3rd, 2004 at 09:42:26 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

PS. Thanks to Reno, Bsparky and Dualsporter I didn't mean to not thank you guys to. And another ? for you guys. I use an audio generator at work. These things are small and work from 9 v to 15 v. They have square, tryangle and sign wave output from 1 HZ to 1 meg HZ. I guess that would be 60 pulses per min. Could I use this unit to sequence the FETs instead of the 30 pulses per min. flasher unit. You know make this hole thing solid state? JK TAS Jerry

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[144,000 pulses and counting.](#) | 15 comments (15 topical, 0 editorial)

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- [Harry Luubovv](#)
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Re: 144,000 pulses and counting. ([none / 0](#)) (#14)  
 by Jerry on Sat Jan 3rd, 2004 at 09:31:27 PM MST  
 ([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Thanks Budgreen. I'm using a 13.8 volt 3 amp regulated power supply to supply power for the 12 volt flasher unit and the Bosch relay. I would very much like to remove the Bosch relay and replace it with an FET. What FET would I use if I increase voltage to 100 and amperge to 50? Or is that combination not doable or recimended? I did the load test on the battery today. Its a 10 second test and the tester said the battery is a good 770 cold cranking battery. I was surprizes because Optima calls this battery a 750 CCA battery. And this was after burning the end off that old screwdriver a few times. (REDNECK battery tester burning the end off old screwdrivers.) Looking forward to the schimatic. I'll try to hook up the 100 amp relays inplace of the 40 amp Bosch tommorow. This will be to see if I can bring the other Optima battery back to life. Thanks again Budgreen and Charged. You guys are an insperation. JK TAS Jerry

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[144,000 pulses and counting.](#) | 15 comments (15 topical, editorial)

Re: 144,000 pulses and counting. ([none / 0](#)) (#11)  
by Jerry on Fri Jan 2nd, 2004 at 09:39:41 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Dualsporter I'm not sure if gell batteries have sludge that settels to the bottom. I've opened one up and the gell guu stuff seems prety stiff. I has a pie dough consistancy but its almost clear. Can't see how much stteling could happin? This is 24 hrs latter and the voltage is still 12.6 v and it still burns the end off the old screwdriver. I hope this works this good on the other battery. JK TAS Jerry

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[144,000 pulses and counting.](#) | 15 comments (15 topical, editorial)

Re: 144,000 pulses and counting. ([none / 0](#)) (#11)  
by Jerry on Fri Jan 2nd, 2004 at 09:39:41 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Dualsporter I'm not sure if gell batteries have sludge that settels to the bottom. I've opened one up and the gell guu stuff seems prety stiff. I has a pie dough consistancy but its almost clear. Can't see how much stteling could happin? This is 24 hrs latter and the voltage is still 12.6 v and it still burns the end off the old screwdriver. I hope this works this good on the other battery. JK TAS Jerry

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[144,000 pulses and counting.](#) | 15 comments (15 topical, editorial)

Re: 144,000 pulses and counting. ([none / 0](#)) ([#10](#))  
by Jerry on Fri Jan 2nd, 2004 at 09:29:27 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

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Re: 144,000 pulses and counting. ([none / 0](#)) ([#12](#))  
by charged on Fri Jan 2nd, 2004 at 09:49:50 PM MST  
([User Info](#))

At 21v you're at just about optimum. For desulfating you can use smaller capacitors at higher voltage(100v) for short periods. This "cracks" the sulfate barrier. THEN you discharge to help dissolve the crystals in an orderly manner. Once you fully discharge, then start applying you're standard 21v pulsing.

You might want to build a dedicated charger with two voltage settings specifically for desulfating/reclaiming old batteries. That way you can scavenge batteries here and there and see if they'll come back to life. Some will, some won't, so what.

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[4 foot blades](#) | 2 comments (2 topical, 0 editorial)

Re: 4 foot blades ([none / 0](#)) ([#2](#))  
by Jerry on Thu Jan 1st, 2004 at 10:36:45 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi John. Could you discribe your blades. Size at the root, size at the tip, any twist, how thick, profile, cup, leading edge, degrees of attac tip and root, trailing edge and how many? I've not built a working disc genny yet. Although I've started a couple. I have mostly been doing AC motor conversions. I have seen 1200 watts from my 22 inch plastic blades (49 inches tip to tip) so at least that part is similar to yours? JK TAS Jerry

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[4 foot blades](#) | 2 comments (2 topical, 0 editorial)

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- [Harry Luubovv](#)
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[144,000 pulses and counting.](#) | 15 comments (15 topical, 0 editorial)

Re: 144,000 pulses and counting. ([none / 0](#)) (#7)  
by Jerry on Thu Jan 1st, 2004 at 09:46:11 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Reno Yep this is just playing with caps for fun. Since I have a zillion caps I'll be trying higher voltages and higher UF also. What I really need to do is get the solid state swiching thing working. But I like the idea of charging the caps to 20 to 60 volts or higher and then dumping that voltage onto the 12 volt batteries. I guess you could do the same with 24v or 48v also. The battery never got even slightly warm and the charger stayed prety cool also. The caps were cold. I think however the relay was taking a beeting. This is were solid state swiching would help. Reno your right about helping the genny in low wind. And then maybe swich over to normal genny operation when the wind speed gose up? Atleast this will help the genny to make some power in low wind. JK TAS Jerry

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Re: 144,000 pulses and counting. ([none / 0](#)) (#8)  
by dualsporter on Fri Jan 2nd, 2004 at 12:15:23 AM MST  
([User Info](#))

Experimenting for fun is good. Pulse circuits are very entertaining. In your case it sounds like you have all the parts setting around which is the perfect situation for playing with an idea any time you want. That's got to be great. I don't have enough room to be able to collect much "stuff".

The life expectancy of any component (relay, SCR, etc.) is directly related to loading. The more energy it has to move, the shorter it's life. (The candle that burns twice as bright, burns half as long.) Things also pretty much work the other way around too. If a component is surviving well beyond it's rated life, then it's not being required to move a heavy energy load. It's also possible you just have a very good quality relay that has not yet met it's rated life expectancy.

Designing and building a circuit to last for 40 years of non-stop operation is not a problem as long as it is designed with an appropriate margin of safety for the components.

The interesting question is how well this circuit

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transfers energy from your mill as compared to just running a heavy cable and sending low voltage.

A standard heavy copper cable system is somewhat expensive. For that reason, if the pulse concept only moves energy, maybe 2/3 as efficiently as copper cable, it might still have merit because of the comparative prices of the two systems. That's why knowing how well the pulse system transfers energy is the key bit of information someone needs to have before deciding whether it is worth investing in for their final, permanent system.

Also knowing the circuit's efficiency is what tells you if it's worth investing in even for a "starter" circuit for your mill. (followed by switching over to standard cables when wind speed is up) The fact that it's not loading your mill and allowing it to start up in low wind should be telling you something. (The loading on the mill is a direct relationship to how much energy it's trying to move.) "Does the little bit of energy it moves in a low wind condition justify purchasing the parts required?" Also, if it's not loading the mill significantly in lower wind conditions it probably won't in higher wind conditions either setting you up for a runaway self-destruct.

Regarding pulse charging your batteries... Pulse charging borderline batteries does rejuvenate them somewhat. The higher voltage spikes blast the sulfate bridges shorting the plates together. These sulfate bridges form in the sulfate sludge at the bottom of the battery that forms when they are allowed to set uncharged for extended periods of time. The bridges will begin to set up again within a short period of time because the pulse charge does not destroy the sulfate. It just moves it temporarily. It's possible, if you could remove the sludge layer, your battery's life would be pretty much restored.

For all experiments, if it was fun, it was worth the investment.

Dualsporter

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Re: 144,000 pulses and counting. ([none / 0](#)) (#11)  
by Jerry on Fri Jan 2nd, 2004 at 09:39:41 PM MST  
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Re: 144,000 pulses and counting. ([none / 0](#)) (#6)  
 by Jerry on Thu Jan 1st, 2004 at 09:31:47 PM MST  
 ([User Info](#)) <http://www.dplusv.com/Photo-03.html>

The 80 hr test was for Relay longevity. I wanted to see how the relays held up in continuous duty. Also the battery I was charging appeared to be no good. That is after charging it in a normal fashion it would lose voltage in just a few hrs. Its been holding 12.67 for 1 1/2 days now. I haven't done a load test yet. But it did burn the end off an old screw driver and after a short time the voltage was still at 12.6. I don't know what the pulse charging did but the battery seems to be back to full capacity. I have a 125 amp load tester at the store shop so I'll load it down tomorrow and see if the battery is still good. I hooked up the other battery it was worse than I thought. It was down to 2.5 volts and the 40 Bosch relay stop working after a couple hrs. I'm going to replace the Bosch with some 100 amp relays and place some 2 uf/ 400 volt mylar caps across there terminals to stop the arcing and pitting. I'll see how long they last. If they hold up this system might just bring this other battery back to life also. Hey Charged could you explain again how this pulse charge helped this otherwise junk battery? If it did? Or maybe this battery wasn't junk? I da no? I guess I'll find out with the really dead battery? JK TAS Jerry

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Re: 144,000 pulses and counting. ([none / 0](#)) (#9)  
 by BSparky on Fri Jan 2nd, 2004 at 07:59:33 PM MST  
 ([User Info](#))

Jerry about the supply voltage ac or dc? Look for it on your Cap pulse testing posting. Maybe I've miss it.  
 Bob

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Re: 144,000 pulses and counting. ([none / 0](#)) (#10)  
 by Jerry on Fri Jan 2nd, 2004 at 09:29:27 PM MST  
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by charged on Fri Jan 2nd, 2004 at  
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[My Mini Geni isn't working very good](#) | 18 comments (18 topical, editorial)

Re: My Mini Geni isn't working very good ([none / 0](#)) (#14)  
by Jerry on Wed Dec 31st, 2003 at 08:30:03 AM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

I did 6 of the little Ed/Windstuff magnets on a smaller version of this motor. Didn't change a thing but machined the armature down to fit the magnets.

It dose cog hard but I'm seeing 60 watts at 500 rpm. Just try getting 60 watts from a solar panel for 6 bux.  
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[Miniature Axial Flux Generator Experiments](#) | 17 comments (17 topical, 0 editorial)

Re: Miniature Axial Flux Generator Experiments  
([none / 0](#)) (#12)  
by Jerry on Mon Dec 29th, 2003 at 06:58:22 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Bill

Very nice drawing. It looks as though this design would reduce cogging a bunch.

I'm not sure what effects there would be on flux path or efficiencies? your drawing is now resembling an ac motor. Coils and narrow slots. Very efficient and reduces cogging. But dose away the need for curved magnets.

I do hope you build and test your idea. JK TAS Jerry

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[Miniature Axial Flux Generator Experiments](#) | 17 comments (17 topical, editorial)

Re: Miniature Axial Flux Generator Experiments  
([none / 0](#)) (#12)  
by Jerry on Mon Dec 29th, 2003 at 06:58:22 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Bill

Very nice drawing. It looks as though this design would reduce cogging a bunch.

I'm not sure what effects there would be on flux path or efficiencies? your drawing is now resembling an ac motor. Coils and narrow slots. Very efficient and reduces cogging. But dose away the need for curved magnets.

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[Cap pulse charge test.](#) | 8 comments (8 topical, editorial)

Re: Cap pulse charge test. ([none / 0](#)) ([#3](#))  
by Jerry on Mon Dec 29th, 2003 at 06:47:53 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

I guess next time I test I should use the peak hold button?  
I was in a hurry last night. The desulphating thing sounds like another plus.

I'm thinking this system may help low powered gennies or gennies that have low wind startup problems?

JK TAS Jerry

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Re: Cap pulse charge test. ([none / 0](#)) ([#8](#))  
by Budgreen on Tue Dec 30th, 2003 at 10:45:09 AM MST  
([User Info](#))

peak hold feature would just lock the highest reading on the screen :)

this would be like a sample system that keeps a running check of the voltage peaks

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[Cap pulse charge test.](#) | 8 comments (8 topical, 0 editorial)

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[Question for blade experts.](#) | 7 comments (7 topical, editorial)

Re: Question for blade experts. ([none / 0](#)) (#6)  
by Jerry on Mon Dec 29th, 2003 at 06:41:21 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Ed  
Thanks these are the #s I was looking for. Now all I have to do is put it on a genny and wind test it in my S-10 pu. We got about a foot of snow last night so I gotta wait till it melts and things warm up a bit.

JK TAS Jerry

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Re: Question for blade experts. ([none / 0](#)) (#7)  
by Dave B on Mon Dec 29th, 2003 at 08:27:48 PM MST  
([User Info](#))  
<http://www.madbbs.com/users/bruggelog>

Ed,  
Thanks again for all the help. I'll start crunching some numbers and post my results to further narrow in on the blade design. I sure appreciate all the trial & error out there behind your experience that has saved me much time. Believe me if I had the time I would like nothing more than to help pave the way for others through experimenting. I'll keep in mind you will have the steel also, I'm already thinking about maybe bigger and better, that's what happens when you're addicted. Thanks, Dave B.

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[Question for blade experts.](#) | 7 comments (7 topical, 0 editorial)

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[Miniature Axial Flux Generator Experiments](#) | 17 comments (17 topical, editorial)

Re: Miniature Axial Flux Generator Experiments  
([none / 0](#)) (#6)  
by Jerry on Sun Dec 28th, 2003 at 09:37:50 AM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

PS and you want to talk about narrow gap. I set my gap at 1/16 inch but it could be 1/32 inch. Because of the motor lamination efficiency I've done 1/2 inch gaps with surprising output.

JK TAS Jerry

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[Miniature Axial Flux Generator Experiments](#) | 17 comments (17 topical, editorial)

Re: Miniature Axial Flux Generator Experiments  
([none / 0](#)) (#5)  
by Jerry on Sun Dec 28th, 2003 at 09:33:11 AM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

The only problem I see is sevier cogging. When the magnet is centered over the steel spool it will be very hard to move it.

This is a very efficient way though to increase magnetic flux through the coils. This is why I prefur ac motor conversion. The ac motors I most commonly convert have 36 slots so its very easy to move the magnets past these narrow slots. AND you want to talk about awsome laminations. Motors have the best steel lamination posable and your coils are allready wound.

Some people say the small diameter of the motor is a limiting factor but as deminstrated above the increased output more than compensates for this. This is why I see charging start at 5 mph on motor conversions whith 49 inch tip to tip blades.

WE gave up on the curved neo,s way to soon. JK TAS Jerry

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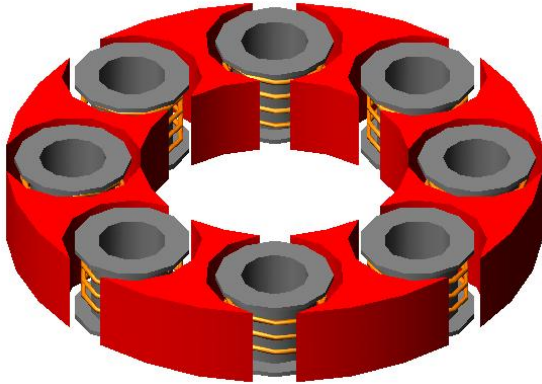
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Re: Miniature Axial Flux Generator Experiments ([none / 0](#)) ([#10](#))  
by bill541 on Sun Dec 28th, 2003 at 05:12:07 PM MST  
([User Info](#))

Thanks Jerry,

I didn't really think about cogging being much of a problem, but it sure could be in low winds. It might turn into a magnetic brake of sorts.

What do you think of the following solution? The red indicates more ferrous material.



By providing a few more paths for the flux when the cores are off center of the magnets, wouldn't this smooth things out? The trick would be to balance the flux out so that there was an even pull at every degree of rotation.

This may be easier to provide on a rectangular magnet set up. This way you would only need pie shaped pieces around the perimeter.

-Bill-

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Re: Miniature Axial Flux Generator Experiments ([none / 0](#)) ([#12](#))  
by Jerry on Mon Dec 29th, 2003 at 06:58:22 PM MST  
([User Info](#))  
<http://www.dplusv.com/Photo-03.html>

Hi Bill

Very nice drawing. It looks as though this design would reduce cogging a bunch.

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Re: Miniature Axial Flux Generator Experiments ([none / 0](#)) ([#13](#))  
by RobD on Mon Dec 29th, 2003 at 08:01:19 PM MST  
([User Info](#))

To smooth things out use a gap in the spacing of one magnet or use an odd number of magnets.  
This looks very much like a standard alternator with the exception of the ferrites.  
RobD

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[caps voltage rating for pulse charging](#) | 3 comments (3 topical, editorial)

Re: caps voltage rating for pulse charging ([none / 0](#)) (#3)  
by Jerry on Thu Dec 25th, 2003 at 08:43:51 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

PS the 1 farrad caps are brand new. We sell them at our car stereo store.

JK TAS Jerry

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[caps voltage rating for pulse charging](#) | 3 comments (3 topical, editorial)

Re: caps voltage rating for pulse charging ([none / 0](#)) (#2)  
 by Jerry on Thu Dec 25th, 2003 at 08:40:42 PM MST  
 ([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Charged and all happy holidays.

Charged what would be a recommended value for the diode across the caps and the polarity of the diode in relation to the caps. I'm referring to the shottky across each 1 farad cap.

Speaking of caps I took a brief inventory of some of my caps. These were the caps that I could reach or find in my messy shop without renting a backhoe to dig them out.

Cap value in UF price each	voltage/surge V.	count	
2,200 uf	400v/475v	1	\$10
400 uf	350v/v?	1	\$10
60 uf	350v/v?	12	\$1
100 uf	350v/v?	9	\$1
4,500 uf \$6.50	200v/250v	4	
2,000 uf	200v/250v	14	\$5
1,400 uf	200v/v?	1	\$3
1,000 uf \$2.50	200v/v?	4	
640 uf	200v/v?	3	\$2
500 uf	200v/v?	2	\$2
7,300 uf \$6.50	150v/175v	4	
1000 uf	150v/v?	14	\$3
15,000 uf \$7.50	100v/v?	240	
40,000 uf \$10	90v/110v	40	
26,000 uf	75v/95v	40	\$10
12,000 uf \$6.50	75v/100v	10	

This is a sample list I have many more in voltage down to 6.3v and uf from a few 100 to 650,000 uf plus the 1 farad 24v special at \$59.95. Some of these are take outs and

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some are old new stock.

Caps can be siriesed to increase voltage, this will reduce uf  
or perelelled to increase uf and voltage stays the same.

If you need one cap or more just e-mail my at  
audiosourcesalem@aol.com.

JK TAS Jerry

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[caps voltage rating for pulse charging](#) | 3 comments (3 topical, editorial)

Re: caps voltage rating for pulse charging ([none / 0](#)) (#2)  
 by Jerry on Thu Dec 25th, 2003 at 08:40:42 PM MST  
 ([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Charged and all happy holidays.

Charged what would be a recommended value for the diode across the caps and the polarity of the diode in relation to the caps. I'm referring to the shottky across each 1 farad cap.

Speaking of caps I took a brief inventory of some of my caps. These were the caps that I could reach or find in my messy shop without renting a backhoe to dig them out.

Cap value in UF price each	voltage/surge V.	count	
2,200 uf	400v/475v	1	\$10
400 uf	350v/v?	1	\$10
60 uf	350v/v?	12	\$1
100 uf	350v/v?	9	\$1
4,500 uf \$6.50	200v/250v	4	
2,000 uf	200v/250v	14	\$5
1,400 uf	200v/v?	1	\$3
1,000 uf \$2.50	200v/v?	4	
640 uf	200v/v?	3	\$2
500 uf	200v/v?	2	\$2
7,300 uf \$6.50	150v/175v	4	
1000 uf	150v/v?	14	\$3
15,000 uf \$7.50	100v/v?	240	
40,000 uf \$10	90v/110v	40	
26,000 uf	75v/95v	40	\$10
12,000 uf \$6.50	75v/100v	10	

This is a sample list I have many more in voltage down to 6.3v and uf from a few 100 to 650,000 uf plus the 1 farad 24v special at \$59.95. Some of these are take outs and

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some are old new stock.

Caps can be siriesed to increase voltage, this will reduce uf  
or perelelled to increase uf and voltage stays the same.

If you need one cap or more just e-mail my at  
audiosourcesalem@aol.com.

JK TAS Jerry

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[caps voltage rating for pulse charging](#) | 3 comments (3 topical, 0  
editorial)



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[PM motor ?](#) | 3 comments (3 topical, editorial)

Re: PM motor ? ([none / 0](#)) (#2)  
by Jerry on Mon Dec 22nd, 2003 at 09:15:10 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Hank  
Well it took me 2 days but I got the 200 lb genny in the test truck.  
That was a scary addventure?

Charging started at 10 mph at 5 amps, at 15 it hit 10 amps at 25 mph the amp meter was showing 20 amps.

The blade was a littel out of balance so i'm going to try a diferant blade.  
This blade was my plastic blades at 5 1/2 ft tip to tip.

I'm going to try a smaller blade. One of my 49 inchers.  
Thanks for your help I'll keep working on it.

JK TAS Jerry

[Airheads Page](#)

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Re: PM motor ? ([none / 0](#)) (#3)  
by Hank on Tue Dec 23rd, 2003 at 08:03:22 AM MST  
([User Info](#))

Sounds great,

Boy, my guess was off by a bit. Do you know what rpm you were getting at the various speeds?

Have fun and be carefull,

Hank

[ [Parent](#) ]

[PM motor ?](#) | 3 comments (3 topical, 0 editorial)

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[pipe genny with servo motor](#) | 4 comments (4 topical, 0 editorial)

Re: pipe genny with servo motor ([none / 0](#)) ([#1](#))  
by Jerry on Wed Dec 17th, 2003 at 08:57:28 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Bill

Looks like a real hevvy duty genny do you know how much it weighs?

I used the same motor to build a genny for a sail boat. I think this guy was crazy cause the sail boat was small and he was sailing from Oregon to Mexico.

I built him the genny. It weighed 24 lbs. He returned and said it was too heavy for his small sail boat. I'm thinking your going out in the ocean and a 24 lb genny is too heavy. I wouldn't go any where in that boat and for sure not to sea.

So I did my best to lightin it up. It ended up at 18 lbs and pretty rugged too.

I used 2 of my Jerry blades 49 inches tip to tip. These blades are \$15 each. They weigh 9 oz. each. plus homemade hub and yaw system. The blades handled 68 mph winds just fine. No furling on this genny. In high winds its making over 360 watts and seems to work great.

I'm flying 3 of these small gennies on my shop. They sure are cheap and easy.

All the yaw and tail boom and wing stuff was less than \$25 and light as a feather.  
Since this genny is so light I fly them on 1.5" EMT electrical conduit. The big box home improvement stores sell this conduit for around \$7 for a 10 ft pice.

JK TAS Jerry

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[pipe genny with servo motor](#) | 4 comments (4 topical, 0 editorial)

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- [signweld](#)
- [Harry Luubovv](#)
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[Question for Charged.](#) | 25 comments (25 topical, editorial)

Re: Question for Charged. ([none / 0](#)) ([#8](#))  
by Jerry on Wed Dec 17th, 2003 at 08:36:47 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Charged YoudaMan

The 1 puls per second sound great for a manual relay swither im going to try.

We sell a heavy duty electronic flasher that is progarable for 1 puls per second or 1 puls every 2 seconds. It draws very little curent and I may either use it to trip larger relays or solid state devices. Just expirementing here?

JK TAS Jerry

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Re: Question for Charged. ([none / 0](#)) ([#9](#))  
by Budgreen on Thu Dec 18th, 2003 at 06:42:49 AM MST  
([User Info](#))

if you are going to 1 pulse per second, do not use a relay, they do have ratings such as 1,000,000 cycles at half load or similar, if you discharge a cap through it I can gaurentee that it will not last, you will end up with melted,fused,or burnt contacts.

I would suggest setting up your pulsing circuit to trigger a FET to dump the load. these are usually very cheap, last quite awhile and can be paralleled quite easily.

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[Question for Charged.](#) | 25 comments (25 topical, 0 editorial)

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[Question for Charged.](#) | 25 comments (25 topical, editorial)

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[Question for Charged.](#) | 25 comments (25 topical, editorial)

Re: Question for Charged. (none / 0) (#7)  
by Jerry on Wed Dec 17th, 2003 at 08:26:12 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Bob  
The price all depends on the UF and voltage of the caps.

To day we got a deal and here it is.

20 volt with 24 volt surge 1 farrad caps \$59.95 plus shipping and hadeling.

This as thet say while supply last. If you don't mind these are a kinda pail yellow and if you don't like the color just peal of the plastic jacket and they are aluminum color.

Just let me know the UF/volt rating you want and I'll get you the price. I have many big caps starting at \$5.

JK TAS Jerry

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[Question for Charged.](#) | 25 comments (25 topical, editorial)

Re: Question for Charged. ([none / 0](#)) (#1)  
by Jerry on Tue Dec 16th, 2003 at 10:30:28 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

PS.  
Another thought I had has to do with the curved neo magnets. You told Norm to use magnets of the same pole.

AC motor conversion consideration?

The old #29 curved neo is hard to find in NS pairs but they are still available ungaranteed pairs. This means if you buy 10 they may all be Ns. With the system you've discribed this would not matter. You could treet each pole as an indeividual coil and puls charge caps from each pole. Or would the common lamination of the poles cause phase cancelation? More thinking?

JK TAS Jerry

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[A good one for Renewable Energy FAQ's...Capacitors](#) | 8 comments (8 topical, editorial)

Re: A good one for Renewable Energy FAQ's...Capaci  
([none / 0](#)) (#8)  
by Jerry on Tue Dec 16th, 2003 at 09:34:11 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hey Dave  
Have you ever built a 12 per octive 5k hi pass exover for tweeters plus a small incandesent lightbulb in siries with the + input side of the exover.

We build and sell these at my car stereo store. Primarily for our more out of control customers.

This crossover format is also used comercially but we prefur to build our own.  
The addition of the bulb deals nicely with exssesive power and distortion very nicely with no colorization or SQ degridation. In short save your tweeters but and sounds good to.

JK TAS Jerry

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Re: A good one for Renewable Energy FAQ's...Capaci  
([none / 0](#)) (#9)  
by Dave B on Tue Dec 16th, 2003 at 11:51:05 PM MST  
([User Info](#))  
<http://www.madbbs.com/users/bruggelog>

Jerry,  
I built small 2 ways (5" full range & 1" soft dome tweeters) sealed enclosures 20 years ago that used moocho power to sound great so I designed a very small pc board that was a single LED used as an adjustable peak power indicator. This was for show and/or as a warning to blowing things up depending on the level it was set. This was a simple rectifier, transistor, pot, LED circuit and was mounted behind the grille with just the LED showing. Many of these are still cranking in bars and cars (pat on the back). The attached photo shows my variable 12db-6db 2 or 3 way crossover. It has independent driver control and A-B comparison of 2 separate crossovers dialed in. I personalized alot of older speaker sysyems with this for those tired or worn out rock & roll ears out there and if out of the tweaking range it's pretty easy to customize new systems so there is headroom in the upper and lower range depending on the

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individuals listening tastes. We could talk for hours on this fun stuff I'm sure. This is a diversified group for sure, I'm glad to have found it. Dave B.



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[A good one for Renewable Energy FAQ's...Capacitors](#) | 8 comments (8 topical, editorial)

Re: A good one for Renewable Energy FAQ's...Capaci  
([none / 0](#)) (#8)  
by Jerry on Tue Dec 16th, 2003 at 09:34:11 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hey Dave  
Have you ever built a 12 per octive 5k hi pass exover for tweeters plus a small incandesent lightbulb in siriies with the + input side of the exover.

We build and sell these at my car stereo store. Primarily for our more out of control customers.

This crossover format is also used comercially but we prefur to build our own.  
The addition of the bulb deals nicely with exssesive power and distortion very nicely with no colorization or SQ degridation. In short save your tweeters but and sounds good to.

JK TAS Jerry

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[A good one for Renewable Energy FAQ's...Capacitors](#) | 8 comments (8 topical, 0 editorial)

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[For Jerry!](#) | 4 comments (4 topical, editorial)

Re: For Jerry! ([none / 0](#)) (#4)  
by Jerry on Tue Dec 16th, 2003 at 09:56:15 AM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hey Thanks Ed.

I built a small lamination wyinding machine. There are 3 spools. 1 to supply the lamination (plummers tape), 1 to supply masking tape and the 3rd to roll these 2 up on.

I do have lots of the glue at the stereo shop. May try that next time?

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[Help with Alternator modification](#) | 9 comments (9 topical, editorial)

Re: Help with Alternator modification ([none / 0](#)) ([#8](#))  
by Jerry on Mon Dec 15th, 2003 at 11:08:02 PM MST  
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I have 4 of the TDMs flying using my blades. The most I've seen from these gennies is 364 watts each. This was in a very strong wind. However my \$550 SW-403 is rated 400 watts at 28.8 mph.

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[Help with Alternator modification](#)

By [sleccain](#), Section [Homebrewed Electricity](#)

Posted on Sun Dec 14th, 2003 at 03:54:10 PM MST

[Alternators](#)

No Juice from my alternator

Hello,  
This is my first post to this board. I'm sure you guys are going to have my answer.

I'm building a gennie.

I have purchased an alternator on ebay for my prototypes.  
I'm getting no juice.

<http://cgi.ebay.com/ebaymotors/ws/eBayISAPI.dll?ViewItem&item=2446139113>

It has four connections on the back a)ground b)positive and c,d)a two prong connector.

From what I've read on this board I need to supply 12v to the two prong connector to charge the windings. Is this correct?

The posts I have read however say I have to do this to an unmodified alternator. So How do I modify/override it to not need this 12v. at the prongs.

Thanks in advance  
Steve

[Help with Alternator modification](#) | 9 comments (9 topical, 0 editorial)

Re: Help with Alternator modification ([none / 0](#)) (#1)  
by [drdongle](#) on Sun Dec 14th, 2003 at 04:20:51 PM MST  
([User Info](#))

First of all an auto alternator is a less than ideal device to use for a wind system as they generally require a very high RPM to deliver any usable power, this leads to belts, pulleys and such complicating the device and reducing efficiency. That being said an auto alternator requires that the field coil ( on the armature) to be "excited" by a DC voltage from a regulator. The regulator is also connected to the main 12 buss from the alternators output to the battery. It provides a start up voltage to the field coil so the alternators start to produce an out put. when that output reaches a predetermined voltage ( generally about 13.8 V) the current to the field is leveled off so as to keep the the output constant ( in theory), in reality the voltage may reach 18 V in the typical vehicle. Many of the folks here have replaced the field coil and field poles with Neodymium magnets so as to eliminate the whole coil/ regulator issue. Some even go so far as to rewind the 3 phase stator coils to produce a higher voltage output at lower speed. I know that this doesn't solve the problem but at least you know your options.

Dr.D

Re: Help with Alternator modification ([none / 0](#)) (#2)  
by [sleccain](#) on Sun Dec 14th, 2003 at 04:46:26 PM MST  
([User Info](#))

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Related Links

- <http://cgi.ebay.com/ebaymotors/ws/eBayISAPI.dll?ViewItem&item=2446139113>
- [More on Alternators](#)
- [Also by sleccain](#)



Thanks for the response,

I've been trying to keep my costs down and thus bought this \$10 alternator.

Problem is I have a room full of cheap stuff, alternators, 8ft wind mills, Bike dynamos of all flavors and ages, whirligigs, ceramic and neodymium magnets (having a blast with the neo's buy the way). Looks like I've spent \$100+ on garbage.

What should I be using? I don't have the patience or the expertese to actually build and alternator. I bought the Neo's for perpetually motion experiments, or at least 99% efficiency. (We'll See, HA HA)

How about the Ametek's tape drive motors I see on Ebay all the time.

I'm sure your going to laugh but I have a ceiling fan bolted onto and alternator outside and have attached the 8ft windmill blades as well. Its a Blazing NewEngland winter outside and its holding up, but no Juice and many wasted hours from what your telling me. (yes I know, I'll probably be pulling one of these blade out of my neighbors windows tomorrow).

Back to the topic, What should I invest in for a Motor/ Generator/ Dynamo.

Thanks Again.

Steve

P.S.

On The Lighter side

Have you guys seen this page, from what I've read on this board your gonna love it.

The Museum of Unworkable Devices

<http://www.lhup.edu/~dsimanek/museum/unwork.htm>

[ [Parent](#) ]

Re: Help with Alternator modification ([none / 0](#)) ([#6](#))  
by drdongle on Mon Dec 15th, 2003 at 05:55:54 AM MST  
([User Info](#))

The tape drive motors are an excellent way to get started, so much is already done for you. Basically just add blades and a yaw bearing. In fact my first one is is a TDM which I'm trying to finish up, and get flying soon. I can highly recommend Jerrys blades, you can't beat the price \$10.00 each or \$15 for the modded units.

Don't through out your treasure yet, you may yet find a use for some of it.

Dr.D

[ [Parent](#) ]

Re: Help with Alternator modification ([none / 0](#)) ([#3](#))  
by Norm on Sun Dec 14th, 2003 at 05:24:21 PM MST  
([User Info](#))

This might help you to understand the difficulties you might encounter with modifying an alternator....[http://www.windstuffnow.com/main/gm\\_alt\\_mod.htm](http://www.windstuffnow.com/main/gm_alt_mod.htm) to get juice from your alternator in its present state you have to connect the + wire to the field now when you turn the alternator the slight residual magnetism will cause it to gradually self-excite the field (this may or may not work with yours) if this doesn't work someone on the board does know exactly what you have and how to hook it up. Also as it is some individuals take the simplest way out and employ a chain drive to gear it up. Good luck with your project you're starting out on a fun filled adventure! Norm.

Re: Help with Alternator modification ([none / 0](#)) ([#4](#))  
by slecain on Sun Dec 14th, 2003 at 06:18:15 PM MST  
([User Info](#))

Amazed,  
Aside from the useful info, this looks almost exactly like the alternator I  
have.  
I knew I cam to the right place.  
Thanks,  
Steve

[ [Parent](#) ]

Re: Help with Alternator modification ([none / 0](#)) (#5)  
by kurt on Sun Dec 14th, 2003 at 09:03:43 PM MST  
([User Info](#))

as the links below hopefully illustrate the Ametek tape drive motor is a fast cheep  
way to get a genny in the air.

<http://www.fieldlines.com/story/2003/4/12/145412/001>

<http://www.fieldlines.com/story/2003/5/25/165143/055>

<http://www.fieldlines.com/story/2003/4/3/75719/71862>

<http://www.fieldlines.com/story/2003/4/14/211836/567>

<http://www.dplusv.com/Photo-03.html>



Re: Help with Alternator modification ([none / 0](#)) (#7)  
by slecain on Mon Dec 15th, 2003 at 05:19:56 PM MST  
([User Info](#))

Thanks,  
Thats A ton of info.  
I'll read it all and get back.  
Steve

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Re: Help with Alternator modification ([none / 0](#)) (#8)  
by Jerry on Mon Dec 15th, 2003 at 11:08:02 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

I have 4 of the TDMs flying using my blades. The most I've seen from these gennies is 364 watts each. This was in a very strong wind. However my \$550 SW-403 is rated 400 watts at 28.8 mph. My 4 TDM gennies cost me \$200 to totaly equipt and fly produce 850 watts at 28.8 mph and they start charging at 5 mph and never make any noise. My 403 starts at 13 mph and is very noisy. The most I've seen out of the 403 is 600 watts at 50 mph. These TDM gennies will poroduce almost 1500 watts under those coditions.

What I'm saying is don't overlook the TDM genny

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Re: Help with Alternator modification ([none / 0](#)) ([#9](#))  
by jubalearly on Tue Dec 16th, 2003 at 02:59:12 PM MST  
([User Info](#))

Take a look at the technical articles on this page:

<http://www.duboismarketing.com/>

This looks like one of the older Delco alternators & should be just like the 37 amp one on the otherpower page. I believe this style went up to 55 amps, then the newer 10SI (internal regulator) went up to 65 amps, IIRC. But most of the parts will interchange.

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[What size and voltage](#) | 8 comments (8 topical, editorial)

Re: What size and voltage ([none / 0](#)) ([#7](#))  
by Jerry on Mon Dec 15th, 2003 at 09:03:43 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Bob

I've mentioned here B-4 that I will sell you guys car stereo stuff cheaper. This is easy for me since I've owned and operated my own store since 1986. I started as an installer in 1976 I've been involved with audio & electronics since 1958.

Now that I've patted myself on the back heres the deal. That \$180 1 farrad cap you mentioned. I'll sell that to my wind freinds here for \$75 + shipping & hadling.

Plus I have I have a 1000 or 2 of caps with voltages and UFs all over the map. Many of these start at \$5 depending on UF and voltage rating. All or computer grade, many are take outs.

JK TAS Jerry

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[For Jerry!](#) | 4 comments (4 topical, editorial)

Re: For Jerry! ([none / 0](#)) ([#2](#))  
by Jerry on Mon Dec 15th, 2003 at 08:47:42 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Thanks Zubbly  
I understand the time thing. It is a raer commodity. I think the text is still there where you originally posted it. I will refer to it when I try this magnet style of motor conversion.

Again thanks very much for taking the time. Right now I'm winding coils for my small disc alt. 100 turns of #20 wire on a 1/2 X 1 inch form to match the 12 small neos I'm using. I'm using unmodifide plumers tape as lamination. Disc is 5 inches in dia.

I don't expect much from this little alt all though I would like to see 100 watts at least. Maybe around 750 rpm?

Now I'm speculating on how to glue down the laminations?

I'll post after testing this little toy. JK TAS Jerry

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Re: For Jerry! ([none / 0](#)) ([#3](#))  
by Electric Ed on Tue Dec 16th, 2003 at 05:25:18 AM MST  
([User Info](#)) <http://www.electric-ed.com>

[quote]"Now I'm speculating on how to glue down the laminations?"

Try spraying both sides of the metal strip with spray-on contact cement. It insulates the laminations as well as holding them together.

Electric Ed

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Re: For Jerry! ([none / 0](#)) ([#4](#))  
by Jerry on Tue Dec 16th, 2003 at 09:56:15 AM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

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[hornet blades got about 800 watts 35 mph](#) | 10 comments (10 topical, editorial)

Re: hornet blades got about 800 watts 35 mph ([none / 0](#)) ([#9](#))  
by Jerry on Sat Dec 13th, 2003 at 07:31:45 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Yep Thats the address I sent it to as you suggested but it didn't work.

Sorry. JK TAS Jerry

[Airheads Page](#)

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Re: hornet blades got about 800 watts 35 mph ([none / 0](#)) ([#10](#))  
by desertratjack on Thu Dec 18th, 2003 at 05:42:05 PM MST  
([User Info](#))

send it again

jacknl7s@hotmail.com

[ [Parent](#) ]

[hornet blades got about 800 watts 35 mph](#) | 10 comments (10 topical, 0 editorial)

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[hornet blades got about 800 watts 35 mph](#) | 10 comments (10 topical, editorial)

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- [jeanpaul](#)
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### [Switching power supply experiment.](#)

By [Jerry](#), Section [Homebrewed Electricity](#)

Posted on Sun Dec 7th, 2003 at 11:15:08 PM MST [Alternators](#)

Pedle power + shiching supply voltage range test.

This idea was kicked around here a while back. I don't think anyone has tryed it yet?  
I did tonight.

Varible voltage source, pedle powered pma. This pma is a 3/4 hp, 1075 rpm, 6 pole, 120 volt ac, 10 amp furnace blower motor. It has been fitted with 6 old # 29 curved neo magnets. This unit has done 1200 watts as a wind genny but not on the exersize bike.

I've hit about 150 watts on the bike. No load I can pedle 0 to 160 volts. Did a 142 volts with a 100 watt light bulb. My grandson was pedling today and we drilled a 1/2 hole in a pice of 3/4 in. plywood with a big 1/2 drill plugged into the bike.

Tonights expirement was with a high speed switching power supply. I purchased this supply from All Electronics for \$8.50. It has 3 voltage outputs.

- 3. volts at 25 amps
- 5. volts at 15 amps
- 12. volts at 1 amp

I used a 25 watt 12 volt bulb as a load and connected it to the 5 volt tap. The bulb drew to many amps for the 12 volt tap and it was bright enough for this experiment.

I started pedeling and tracking the ac voltage going into the supply. I went up in 5 volt increments. At 65 volts the bulb lit. I kept pedeling up to 146 volts. The bulbs brightness did not change. These power supplies are highly regulated.

Conclusion at this point. This may be a way to generate a regulated power source with varying wind speed. I it could posable bypass battery use during adiqute wind speed do to the high level of regulation. Depending on wind genny wattage, power supplies amperage and load amperage rquierment.

This supply says each voltage output can be vairyed. 5 volt range is 4.95 to 5.25 volts at 15 amps. If 3 supplies were wired in siries the voltage could be 14.85 volts at 15 amps. You could do siries perelell supllies for higher amperage

These supplies come in much higher amperage. I have cofigured 9 of the big supplies at my stereo store. We use this supply for demos and benching. It produses 15 volts at 1120 amps, thats 16,800 watts and we use every bit of it.

This would work very well with 3 phase also. the outputs are very well isolated from the ac input. Another thing I notice there was no load untill voltage was high enough to turn the power supply on.

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Before I tried this supply I connect a normal battery charger to the pma. There was severe load and cogging from the get go. I think this is because the frequency of the pma is very low at startup and the transformer presented a very low impedance load until a higher frequency was reached.

That's what is so nice about the high speed switching power supply. There is virtually no load on the gen until it spins up to turnon voltage. This lets the gen startup easier. And helps it reach turnon voltage sooner.

Another plus, small wire with long runs are possible. I'll be trying 3 power supplies on a 3 phase motor conversion. There's most likely a good voltage combination for battery charging as well.

Another use could be. Use this system only while your away from home. Adjust the voltage to a safe point for your batteries and not worry about over charging. Then go back to the possibly more powerful charging system when you return home. The input voltage on this supply is listed at 100v to 240 v. These supplies simply change the line voltage to dc so frequency is not critical. you could maybe even power them with dc if the polarity was correct? Not sure about that one though.

Sorry about rambling on here.

Any other thoughts here. Good or bad lets hear it.

JK TAS Jerry

[Switching power supply experiment.](#) | 7 comments (7 topical, 0 editorial)

Re: Switching power supply experiment. ([none / 0](#))  
([#1](#))

by Jerry on Sun Dec 7th, 2003 at 11:56:35 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Just a note. The input amperage on this supply is listed at 2.1 amps. Not bad consumption for the output it's rated.  
JK TAS Jerry

[Airheads Page](#)

Re: Switching power supply experiment. ([none / 0](#))  
([#2](#))

by kell on Mon Dec 8th, 2003 at 11:22:27 AM MST  
([User Info](#))

Sure you can run DC into it. If the supply has a full bridge (four diodes) at its input, it won't even matter what polarity.



Re: Switching power supply experiment. ([none / 0](#))

([#7](#))

by Nando on Sun Dec 28th, 2003 at 02:20:17 PM MST

([User Info](#))

JT Tas Jerry:

By the way: Human power, long term, is defined as a 75 watts source with about 150-200 watts short time power peaks.

For wind mills that have high variable generated voltage, a converter is the ideal case, basically like yours.

The Switching power supplies, most of them that have wide AC voltage range ( 85 to 240 AC ) are designed to operate at high voltage -- 230 to 340 volts DC.

So the input has a switch ( some are automatic) for voltage range 120 or 230 input AC Voltage.

This AC voltage is then doubled rectified for the low range or and for the high range, full wave rectified and filtered then the high frequency converter does the rest.

For this type of converter to operate with the wind mill several things are needed>

The best is to have a converter with PFC ( Power Factor Correction) to accept all the voltage range directly without problems, and if you can furnish DC or rectified DC single or 3 phases ( 230 to 360 volts DC).

Mouser and/or Digikey may sell some of those chargers at low price, like a non-PFC converter, 250 watts for around 80 USA dollars. ( for single 12, 24 & 48 outputs)

The system should, as well, have a Controller for overvoltage and over-RPM protection to present a dump load to the generator, the best is a duty cycle controller to present a variable load to the generator to maintain accurate regulated output voltage under wide wind and load variations.

This duty Cycle controller, that I have designed is just a power MOSFET with a Mosfet driver and a LM339 that produces a triangular low frequency ( ~ 200 Hertz) and a comparator to duty cycle the MosFet ON/OFF times.

In some cases an amplifier is needed to insure proper operation

Regards

Nando

[Switching power supply experiment.](#) | 7 comments (7 topical, 0 editorial)

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Re: Switching power supply experiment. ([none / 0](#)) (#3)  
by Seth on Mon Dec 8th, 2003 at 04:48:42 PM MST  
([User Info](#))

I must of missed it.... where did u get this thing??

Re: Switching power supply experiment. ([none / 0](#)) (#4)  
by Jerry on Mon Dec 8th, 2003 at 06:20:43 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Seth  
The co is All Electronics and there many other suppliers as well. These supplies are very common.

Your using one right now. Its in your computer.

JK TAS Jerry

[Airheads Page](#)

[ [Parent](#) ]

Re: Switching power supply experiment. ([none / 0](#)) (#5)  
by Seth on Tue Dec 9th, 2003 at 11:25:47 AM MST  
([User Info](#))

Ahhh .... didnt realise that these computer supply's were adjustable....

;) )

[ [Parent](#) ]

Re: Switching power supply experiment. ([none / 0](#)) (#6)  
by Jerry on Fri Dec 12th, 2003 at 09:05:04 PM MST  
([User Info](#))  
<http://www.dplusv.com/Photo-03.html>

Some are and mostly the 5 volt section.  
JK TAS Jerry

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## [200 LB PMA](#)

By [Jerry](#), Section [Homebrewed Electricity](#)

Posted on Thu Nov 27th, 2003 at 09:57:56 PM MST [Alternators](#)

I keep trying hope this pix works?

To many steps? I must be forgetting. If this works Its a pix of the 200 LB DC pm motor/pma. It came from Boeing Aircraft. It is 24 inches long and 9 inches in diameter. Weighs 185 lb. After adding the mouting base, tail wing and boon, yaw bearing and 8 blade prop it will weigh over 200 lbs. its fun to spin by hand and lite up a 100 watt bulb. I have a big 48 volt battery bank. JK TAS Jerry



[200 LB PMA](#) | 2 comments (2 topical, 0 editorial)

Re: 200 LB PMA ([none / 0](#)) ([#1](#))  
by Norm on Fri Nov 28th, 2003 at 08:27:04 AM MST  
([User Info](#))

I've been wondering, since I've never had a motor/generator near that big to try it out on....would it be easier to 'pedal power' something like this to charge a battery? It could be 1:1 ratio chain drive using something like your flywheel exercise bicycle...yeah I know it would be kind of overkill but just out of curiosity....Well maybe not quite that big big...but big enough to put out some charging current at 80-90 rpm 1:1 ratio...foot power?

Re: Jerry's pics ([none / 0](#)) ([#2](#))  
by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Fri Nov 28th, 2003 at 10:34:01 AM MST  
([User Info](#))

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BTW Jerry, your pics are looking great from here! Keep 'em coming.  
ADMIN

[200 LB PMA](#) | 2 comments (2 topical, 0 editorial)

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## [One more time](#)

By [Jerry](#), Section [Homebrewed Electricity](#)

Posted on Thu Nov 27th, 2003 at 09:19:52 PM MST

[Wind](#)

See if this one works?

A little diferant angle of the same thing. JK TAS Jerry



[One more time](#) | 1 comment (1 topical, 0 editorial)

Re: One more time ([none / 0](#)) ([#1](#))  
by [Jerry](#) on Thu Nov 27th, 2003 at 09:25:48 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

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Oh sorry BIG goof this time. This is a picture of my pump power supply. Or some would call it my mechanical inverter.

There are 2 two HP dc motors. One on each side of a 5500 watt 240 ac generator. This was powered by 20 12 volt batteries. They went bad last winter and I've not replaced them yet. This combo runs my well pump great. No load 260 volts and while pumping 242 volts. Just right.

JK TAS Jerry

[Airheads Page](#)

[One more time](#) | 1 comment (1 topical, 0 editorial)

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### [Trying Pix again?](#)

By [Jerry](#), Section [Homebrewed Electricity](#)

Posted on Thu Nov 27th, 2003 at 09:12:37 PM MST

[Wind](#)

This is my 200 lb wind genny.

If this pix works it my 200 lb wind genny setting on the pick nick table. I had just completed the 8 blade prop. I've got a big domed metal bowl to install as a nose cone. Will try to fly it soon? JK TAS Jerry



[Trying Pix again?](#) | 4 comments (4 topical, 0 editorial)

Re: Trying Pix again? ([none / 0](#)) ([#1](#))  
by [drdongle](#) on Fri Nov 28th, 2003 at 06:07:22 AM MST  
([User Info](#))

Very cool, but whats the story on the secons picture, use and specifications?

Dr.D

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- [Also by Jerry](#)

Re: Trying Pix again? ([none / 0](#)) ([#2](#))  
by Norm on Fri Nov 28th, 2003 at 09:20:04 AM MST  
([User Info](#))

Are those Jerry blades or Mikemods? Norm.

[ [Parent](#) ]

Re: Trying Pix again? ([none / 0](#)) ([#3](#))  
by TomW on Fri Nov 28th, 2003 at 09:33:55  
AM MST  
([User Info](#))  
<http://oneota.net/~earthsourcepowr/>

Norm;

They appear to be the Mike Mods on the Jerry  
Blades.

Stock blades on the left Mike Mods on the  
right:



Cheers.

TomW

[Stuff I have Online](#)

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Re: Trying Pix again? ([none / 0](#)) ([#4](#))  
by Jerry on Fri Nov 28th, 2003 at 10:34:37 AM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Dr D

I'm not to good with this computer stuff and i goofed last night.

There is a brief description in a post just above somewhere.

I couldn't aford the big inverter that could run my well pump in emergency power outs.

This was my sollution. If power goes out we would use watter spairingly. And this power source will cover are needs. I do have a 5500 Generac gas gen if power is out long term.

It was also one of those , can I do this, kinda things.

I have a few of these 2 hp dc motors left if someone is in need. They are Magnatek. I bought surpplus locally.

I don't think the surplus guy knew what he had. When I called Magnatek the factory guy said these are \$1000 motors. I'm asking \$100 each.

Its amazing how 2 two HP dc motors can easley replace a 10 hp gas motor.

JK TAS Jerry

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## [Response to the drill ?](#)

By [Jerry](#), Section [Homebrewed Electricity](#)  
Posted on Thu Nov 27th, 2003 at 02:21:46 PM MST [Alternators](#)  
This is a response to the drill question below.

The post rules thing said I used to many words in my title. I say what title this is a response. Any way.

I do this mod or conversion all the time. Works great. Dc motors can tolerate more voltage than their name plate states. You'll get a stronger drill.

JK TAS Jerry

[Response to the drill ?](#) | 2 comments (2 topical, 0 editorial)

Re: Response to the drill ? ([none / 0](#)) ([#1](#))  
by [kurt](#) on Thu Nov 27th, 2003 at 06:59:49 PM MST  
([User Info](#))

when you post a response the title of the post becomes the "subject" of the response and can be changed in the box under your name when you post a response.

when a story has a long title sometimes it causes problems with responses and you need to shorten it or change it to something shorter when you reply



Re: Response to the drill ? ([none / 0](#)) ([#2](#))  
by [hydrosun](#) on Fri Nov 28th, 2003 at 06:37:53 PM MST  
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10 years ago I bought an old craftsman 6 volt cordless with built in batteries which soon died. I pulled the batteries and ran a cord out to plug into my 12 volt house system. Used it for years for light duty work. It just ran faster than with the batteries. If the gearing can handle the load and you don't push it harder than before the only problem would be heat in the motor coils. I didn't have to worry about how much the voltage dropped in the long cord and thin extension cord because I could lose half the voltage and still use the drill.

[Response to the drill ?](#) | 2 comments (2 topical, 0 editorial)

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### [More Lamination Dialog?](#)

By [Jerry](#), Section [Homebrewed Electricity](#)  
Posted on Wed Nov 26th, 2003 at 10:40:45 PM MST [Alternators](#)  
I asked this ? on the old board. Time to ask again?

Now that the disc alt group has advanced to the dual rotor this ? about lamination may not be as pertinent. However I have yet to finish my first disc alt/pma and the first few I'll build will most likely have lamination.

You see I'm a year or 2 behind in disc alt building.

? about car ignition coils? wrecking yards must have tons of these things in a pile out back somewhere that they will never sale?

I've taken several apart and they have lamination material about 1/2 to 3/4 inch wide and 4 to 5 inches long. Thin metal strips. I'm sure you could form a circle of this stuff as you would a continuous strip of metal and this has to be the best possible lamination material.

BIG QUESTION question. Is the oil in these old coils PCB. If it is then you don't want to mess with this stuff.

Does anyone know if these things are poison or not?

I found a few that don't use any oil at all they were just dry inside. Lot of wire in there to. easy to unroll.

JK TAS Jerry

[More Lamination Dialog?](#) | 3 comments (3 topical, 0 editorial)

Re: More Lamination Dialog? ([none / 0](#)) ([#1](#))  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Wed Nov 26th, 2003 at 11:43:52 PM MST  
([User Info](#)) <http://www.internetfred.com>

Hi Jerry.

A couple years ago I had a bunch and can also get hold of a lot of these coils, I remember the oil that was in them, I do not believe that there were pcb's in them, I did do extensive google search and nothing popped up. Mostly what I do remember was that pcb's were found in larger transformers used in street lighting, you might also find them in old neon sign transformers and most of that looked like liquid black tar, very dark in color. As for the wire, there is lot's of #20 I think for the primary and #30 for the secondary, very easy to remove the windings. Good resource for wire now that you mention it. maybe others could shed some light on the pcb issue, I'm interested in this question as well.

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- [Also by Jerry](#)



On PCBs ([none / 0](#)) (#2)  
by wdyasq on Thu Nov 27th, 2003 at 06:18:41 AM MST  
([User Info](#))

One would think there is a particular year where PCB's were banned from use. If one used a coil built after that year, one should be OK. BUT, car companies had a lot of exemptions from enviromental rules so that may not be true.

Ron

Identifying PCBs ([none / 0](#)) (#3)  
by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Thu Nov 27th, 2003 at 09:24:21 AM MST  
([User Info](#))

From a university of toronto website.....might help. Looks like you only need to worry about anything made before 1980, and only high voltage transformers. The part about ballast capacitors in old flourescent lights was new to me though.

\*\*\*\*\*

#### 4.2 TRANSFORMERS

Since the 1930's, a generic fluid called "askarel" containing 40-70% PCBs were used in high voltage transformers. Commercial Aroclors were blended with trichlorobenzene. Askarel is the genetic term used to identify the combination of Aroclor and trichlorobenzene. A typical Askarel transformer may contain 30-40% PCBs and as high as 65%. Contaminated mineral oil usually contains < 1% PCBs.

PCB-contaminated transformers can usually be distinguished by the nameplate on the transformer located on the outside casing. If the following brand names appears on the nameplate, the transformer contains PCBs:

TABLE 1: TRADE NAMES OF PCB-CONTAMINATED TRANSFORMERS

Apirolio [Italian]	Kaneclor [Japan]
Aroclor	Montar
Asbestol	NoFlamol
Chorextol	Phenoclor [France]
Chorinol	Pydraul
Clophen [German]	Pyralene
Diaclor	Pyroclor
DK (decachlorodiphenyl) [Italy]	Saf-T-Kuhl
Dykanol	Santotherm FR [Japan]
Elemex	Sorol
Eucarel	Therminol FR

Fenclor [Italy]

Hyvol

Inerteen

In addition, the "Type Number" also indicates if the transformer contains PCBs. Any Type Number beginning with "L" indicates that the transformer is PCB-contaminated. Some Type Numbers are: LFAF, LFAN, LFWN, LNAF, LNP, LNS, LNW, and LNWN.

#### 4.3 CAPACITORS

Almost every capacitor manufactured between 1930-1980 contains PCB dielectric liquids. Capacitors in electrical equipment vary in sizes from ice cubes to larger than refrigerators. Capacitors are classified as large when they contain > 0.5 kg of PCBs. Small capacitors are generally associated with electronic or lighting equipment. Fluorescent light ballasts also contain capacitors. Light ballasts are discussed below.

Capacitors may be found in a variety of locations within a building for example connected to A.C. motors > 30 hp wired to the electrical terminals. A capacitor often can be recognized by the letters KVAR stamped on its nameplate. Capacitors may vary in size from 5 KVAR to 200 KVAR range. Capacitors are hermetically sealed to reduce leakage. Unless clearly indicated on the equipment, or the date of purchase can be confirmed to be after 1980, most capacitors in use must be assumed to be contaminated with PCBs unless tests have verified their absence.

##### 4.3.1. BALLASTS

Fluorescent light fixtures may contain several ballasts. Fluorescent lighting ballasts are easily identifiable containing PCBs or non PCB. The small capacitors inside the ballasts are contaminated with high levels of PCB liquid if they were manufactured prior to 1980. At the University over the years, these ballasts have been used from a wide variety of manufacturers. The Office of Environmental Health and Safety maintains a list of models from various manufacturers that are PCB-contaminated.

[More Lamination Dialog?](#) | 3 comments (3 topical, 0 editorial)

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## [Peddle Power](#)

By [Jerry](#), Section [Homebrewed Electricity](#)

Posted on Mon Nov 24th, 2003 at 10:57:11 PM MST [Alternators](#)

Here are some early results from an exsersizes bike conversion.

I don't know what brand it is. It was headed for the dumpster. I saved it. It has a very heavy very well balanced flywhell. The flywheel is 16 inches in diameter. Its 1.5 inches thick. Its all solid steel and very heavy.

I machined a gruve in the flywheel to accept a V-belt. The peddle sproket is 8.5 in. dia. the chain sproket on the flywheel 3 in. dia. The belt pully on the PMA is 7 in. dia.

PMA is a 3/4 hp furnace blower motor, 1075 rpm, 6 pole, 9 amps single phase. I'm curenly only using the run windings. I may use the starts also latter.

I've insatlld 6 of the old # 29 curved neo magnets on the armature.

No load its easy to crank out 160 volts. I conected a 100 watt incandesent bulb and for a short burst I can pump 140 volts accross that bulb. The bulb gets very bright and I get very pooped very fast. I did out do my 12 year old grandsun. He topped out at 119 volts. But he didn't have any akes or pains after that exabition. I'm still sore.

I will try to count rpm. I think I can see how many rpm the pma dose for 1 peddle revolution? and do the math for 120 volts. The flywhell realy smooths out peddle pulses.

Hey DanF how many hamster power am I worth? But they can go all day I'm only good for a few mins.

JK TAS Jerry

[Peddle Power](#) | 4 comments (4 topical, 0 editorial)

Re: Peddle Power ([none / 0](#)) ([#1](#))  
by Norm on Tue Nov 25th, 2003 at 03:12:15 AM MST  
([User Info](#))

It really makes you appreciate what power just one of your smallest windmills put out don't it Jerry? I just rode a bicycle around the block yesterday and I was out of breath. I've been thinking of making one of those myself but with a flywheel made from a 36inch diameter disk of particleboard like David Butcher made...<http://www.los-gatos.ca.us/davidbu/davidbu.html>  
Norm.

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Re: Peddle Power ([none / 0](#)) (#4)  
by Jerry on Wed Nov 26th, 2003 at 09:56:49 PM  
MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Norm

I read brifly through David Buchers page. He stated "maybe" the average human can peddle between 40 to 120 rpm.

I just looked at the peddle to pma gear ratio on my bike. Its aprox. 8 to 1. If Davids #s are right the rpm range on this bike of mine would be 320 rpm to 960 rpm?

However I was geting 140 volts with a 100 watt plus load from a motor/pma rated 1075 rpm as a motor.

How could I deturmin the rpm of the pma? Could I measure the frequency and do some math? Its a 6 pole with 6 magnets. All 6 poles are wired in sories, stock wireing.

woud I have to seperate and measure on just one coil?

This has got my curiosity going now?

JK TAS Jerry

[Airheads Page](#)

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Re: Peddle Power ([none / 0](#)) (#2)  
by zbotrobot on Tue Nov 25th, 2003 at 08:06:35 PM MST  
([User Info](#))

considering the windmill without use of batteries, a flywheel gives me an idea. My first thought was to to store the winds energy by filling a tank of water. Ha - a spinning tank of water that winds up on a cable too. Missoula Montana has a lot of bikes! Partly because people are too poor to drive and because its flat in the valley. Get rid of the car and stay in shape:)

Re: Peddle Power ([none / 0](#)) (#3)  
by RobD on Wed Nov 26th, 2003 at 03:37:09 PM MST  
([User Info](#))

Ladies and gentlemen, I give you BobFlex.  
This is my computer and TV riding bike and SLA battery charger. I made the Alternator out of old magnets and oil burner casing parts. It will put out decent power. The bike was a throw away but it has a good heavy flywheel. It does 'cog' a little at low rpm so the next one I'll skew the magnets.



RobD

[Peddle Power](#) | 4 comments (4 topical, 0 editorial)

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### [10th Genny flying](#)

By [Jerry](#), Section [Homebrewed Electricity](#)

Posted on Sun Nov 23rd, 2003 at 08:53:34 AM MST

[Wind](#)

Put up the 10 genny.

We now have 10 genny's on the roof of my stereo store shop roof.

I had hoped to have 20 up there by now. However last sommer kept me to busy. We are charging 2 systems, a 12 volt and a 156 volt system for lites, heat and power tools.

Maybe I should post some pix of these two.

JK TAS Jerry

[10th Genny flying](#) | 4 comments (4 topical, 0 editorial)

Re: 10th Genny flying ([none / 0](#)) (#1)  
by [Tahino](#) on Sun Nov 23rd, 2003 at 09:41:06 AM MST  
([User Info](#))

Hi Jerry:  
Can you describe that 156 volt system you are charging for lights, tools and heating please? How it works?  
Thanks

Re: 10th Genny flying ([none / 0](#)) (#3)  
by [Jerry](#) on Sun Nov 23rd, 2003 at 10:13:56 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Tahino  
It just turned out that way. I freind of mine is a retiered electronic transportation enginier. He designed electric things that move. He has a hybred vehicle gas/electric of his own design. This van had 12 very large 12 volt batteries. The are about the size of 2 six volt golf cart batteries.  
He was given a grant from Optima Battery Co. They fixed him up with some large deep cycle gell batteries.

I bought his old batteries real cheap. I got 13 of them, thats what he had. I use 12 of them in my 48 volt home system for a while till I picked up 22 aircraft batteries. they are 24 volt.

I decided to take all 13 of the old big ones to my store/shop. We wired them in sories. We've tapped of at 130 volts for our power tools. All of our power tools with high rpm motors with brushes work very well at 130 volts dc. This includes big shopvac, drills, chop saw, skill saw, router, rotozip and a few more I

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can't remember. Also a few incandescent bulbs.

These power tool run faster, stronger, much smoother. We've decided even if we wern't do the wind power thing that we would make dc volts for these tools. We're spoiled now.

The 156 volt tapp gose to a 240 volt electric furnace. this furnace has three 5000 watt elemets. We can swich on 1,2 or 3 of them. I'll be chaging the blower motor to dc soon but for now we use the ac blower motor.

Its amazing how much heat this thing makes at just 156 volts. We only run it for 1/2 hr. to 45 min. just to warm the shop up in the morn. After that we still have plenty of power left all day for the tools.

I only have 4 gennys on this battery bank so far. fist 2 batts are on one genny the next 1 batt. has 1 genny the next 2 have a genny and the next 3 I've got my 48 volt SW-403. I've got my 48 volt 403 charging at 36 volts. I dosen't do much at 48 v. it does a little better at 36 but its still prety lazy compaired to the homebrew stuff.

The other system uses 14 six volt golf cart batteries wired as a 12 volt bank. I have 5 gennies chagreing this group right now. We've seen 150 amps comming into this bank on very windy days. Thats awsome cause we use this bank for are shop lights. We have 60 four ft. florecents that are power by a 2500 watt square wave inveter.

We also use at the same time from this system a small bench grinder and a small drillpress. We also run test equipment and charge our Makita's.

We're going to take the 220 v. ac motor (grid powered) of our air compresor and replace it with a 2 hp 100 volt dc motor and power it from the 156 volt bank.

Our goal is to power out install bays/shop from the wind as much as possible. Hopefully everyday. To do this I want to build and put on the roof 10 more gennys. Also icrease the battery banks. Double or triple there size.

We have kept the store operational during power outages. This while our business neighbors were in the dark.

They only think your crazy when the powers on. When its off they are envious.

Right now I'm building stuff for other people so its hard to get these projects going

JK TAS Jerry

[Airheads Page](#)

[ [Parent](#) ]

Re: 10th Genny flying ([none / 0](#)) (#2)  
by [cevonk \(cevonk\(at\)signhere\(aol.com\)\)](#) on Sun Nov 23rd,  
2003 at 11:50:49 AM MST  
([User Info](#))

Boy, talk about "walking the walk"! :-)

Congratulations!

What portion of your electrical needs do these generators satisfy?

Re: 10th Genny flying ([none / 0](#)) (#4)  
by Jerry on Sun Nov 23rd, 2003 at 10:30:44 PM  
MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Cevonk

I may have answered your question in my previous post. We are trying to get the shop prortion of our store as grid free as possible. Not there yet but we have ran the shop for several hrs grid free a few times. Just depends how generus the wind has been. Thats why we need more genny's and batteries.

I forgot to mention above. When all the lights are on in the shop the inverter is drawing 120 amps so on those very windy days when the genny's are delivering 150 amps we are 30 amps ahead of the game. I'm confident that after we add batts/gens the shop will be grid free. But wow we suck up alot of power in that shop. We also powewr up several multy 1000 watt demo systems from this power also.

JK TAS Jerry

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[10th Genny flying](#) | 4 comments (4 topical, 0 editorial)

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### [Yaw Bearing pix](#)

By [Jerry](#), Section [Homebrewed Electricity](#)

Posted on Wed Nov 12th, 2003 at 10:09:26 AM MST

[Alternators](#)

Yaw bearing and genny mount pix.

Thought I'd try a few more pix. If this doesn't work Kurt may have to help me again. I'm trying to learn this pix posting thing.

The picture is the mounting brackets, base, yaw bearing and complete Garbogen. This system will work on other types of genny/alt also. I'll be using this system on my small disc genny also.

This bearing is very smooth and turns very easy. With the set screws the genny is locked securely to the mast and the wires go down the center of the bearing and mast.

The thick base is 1.25 inch thick plexi but I've used metal and I'm building one now from some left over composite decking material. This stuff is a combination of wood fiber and plastic mix. It won't crack, split, peel, rot, or twist.

I'll be using it instead of plywood for disc genny project. Its very strong and needs no coatings for weather protection. Neat stuff, cuts like wood.

JK TAS Jerry



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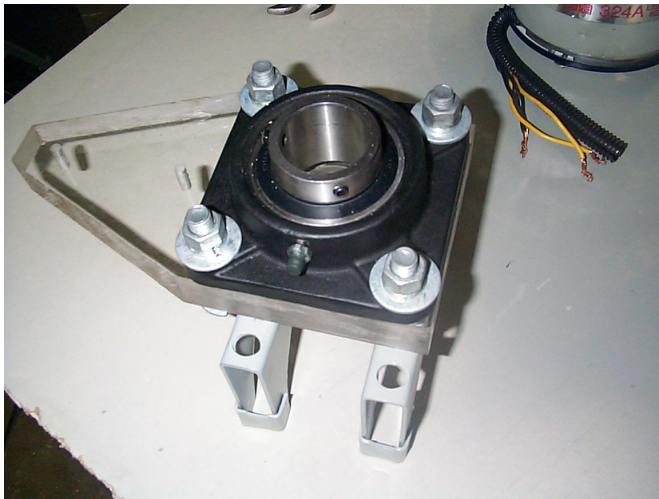
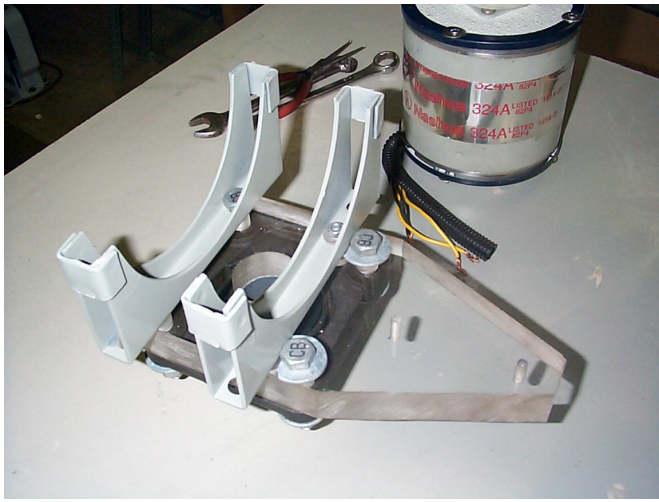
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[Yaw Bearing pix](#) | 10 comments (10 topical, 0 editorial)

Re: Yaw Bearing pix ([none / 0](#)) ([#1](#))  
by Jerry on Wed Nov 12th, 2003 at 10:16:07 AM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

OK Kurt or Tom help me out here. I'm going by the instruction but it still doesn't work but I don't mind if you guys do all my pix posting for me. However I'm sure you have better things to do.

To bad these things only work for computer savy people. I'll keep being a pest till I figure it out. Sorry I'm so slow at learning this stuff. If you want to know how hard it is for me just take 6 marbles and stack them one on top the other.

JK TAS Jerry

[Airheads Page](#)

Re: Yaw Bearing pix ([none / 0](#)) ([#2](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Wed  
Nov 12th, 2003 at 11:11:21 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Definitely a slick uncomplicated system you have there Jerry. Very nice!

Looks like your having fun!  
Ed

[ [Parent](#) ]

Re: Yaw Bearing pix ([none / 0](#)) ([#6](#))  
by Norm on Thu Nov 13th, 2003 at 01:58:32 PM MST  
([User Info](#))

Hi Jerry,

from some left over composit decking material. This stuff is a combination of wood fiber and plastic mix. It won't crack, split, peel, rot, or twist.

Would you happen to know what this stuff is called or maybe someone else reading this? Been wanting to make a few things out of something just a little more durable than particle board like a flywheel for an pedal powered generator for instance and the base....etc. Don't worry so much about pic size...for anyone that really is interested in reading your posting there are ways...for instance I just drag n drop stuff like that onto a html editor...size the pics to what the author probably had in mind...and save it to a special folder on my hard drive. I know the frustration of computers tho' I have a nephew...I knew him as an 8yr.old brat....now he's 22 or so and troubleshoots my computer goes to DOS and types something in and fixes it easier than I can say WOW! How'd you do that?(>) Norm.

[ [Parent](#) ]

Re: Yaw Bearing pix ([none / 0](#)) ([#8](#))  
by Jerry on Thu Nov 13th, 2003 at 09:33:30 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Norm

Ya its called Choice Deck. I got mine at lowes. This matereal comes in a few diferant widths and thicknesses. The scrap i made a genny base out of was a 1 X 6 ".

I've got some 1 X 12" scraps also. I spent most of this last sommer building this deck. Thats why I'm so behind on wind projects. This deck measures 22 ft X 24 ft. with a roof and a lower area with a roof measuring 20 ft X 24 ft.

There are sevearl brands making this compisitiom matereal. I've been told its made of wood fiber and recycled plastic milk jugs or plastic Wall Mart bags.

Today I tryed another bearing. This one is not a pivoting flange bearing. It was just a bearing with no housing. The outer diameter of the race

measured 3 1/8 inch and the bore is the same as the bearing in the above pix. I cut a hole into a pice of Choice Deck 3 1/8 in. and presed the bearing in. There is a narrow stop type snap ring on the outer bearing race for mounting purpuses. I pressed the bearing in till it hit this stop. I'll make a small metal retainer ring to keep this in place.

This bearing can't pivot and its realy smaller and lighter and cheaper than the big pivoting flange bearing of the same diameter. I think this is it. Any way this is what i'll be doing for yaw bearings and genny mounts.

I'll try to get some pix. The only draw back is its not as prety as the flange bearing and plexi but it is cheaper and lighter. Might even be stronger.

JK TAS Jerry

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Re: Yaw Bearing pix ([none / 0](#)) ([#3](#))  
by RobC on Wed Nov 12th, 2003 at 08:19:42 PM MST  
([User Info](#))

Nice job Jerry. Only one thing bothers me this bearing looks like a self aligning type which means that the bearing can move wherever it wants to in its housing possibly allowing the blades to srike the the tower. But I could be wrong let me know. As usual great work. I hope to drive by your shop one of these days. Maybe with a little luck.  
RobC

Re: Yaw Bearing pix ([none / 0](#)) ([#4](#))  
by Jerry on Wed Nov 12th, 2003 at 11:16:33 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Rob C.  
Are you in the Salem area?

The bearing can pivot and if I let it do that it would be a problem.  
This is why I use 1 1/8 inch thick plexi. This bearing accepts 1.5 inch diameter EMT conduit. I have a hole saw blade that cuts a hole just the right size to let the conduit spin free. There is a hole in the plexi that the mast (1.5" EMT) slides into after passing through the bearing. This stops the bearing from pivoting. I grease the hole in the plexi with a generus glob of copper never size. I've got several gennies using this yaw system. They've been through several storms, the bearings yaw so easy and don't loose alignment. There was one more picture that didn't come through on my post and the top one came out blurry. It was supozed to come out last? I'll try to post pix of this yaw system when I put it on my small disc alt.



JK TAS Jerry

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Re: Yaw Bearing pix ([none / 0](#)) ([#5](#))  
by RobC on Thu Nov 13th, 2003 at 08:24:42 AM  
MST  
([User Info](#))

Jerry we live here in southwest Idaho but we may make it out to the coast next year if we I would like to swing by. Ater I made my comment about the bearing I realized what you were doing. Boy, do I feel dumb. Anyway, talk to you later.  
RobC

[ [Parent](#) ]

Re: Yaw Bearing pix ([none / 0](#)) ([#7](#))  
by kurt on Thu Nov 13th, 2003 at 05:45:52 PM  
MST  
([User Info](#))

is this the missing picture jerry?



[ [Parent](#) ]

Re: Yaw Bearing pix ([none / 0](#)) ([#9](#))  
by Jerry on Thu Nov 13th, 2003 at 09:40:47  
PM MST  
([User Info](#))  
<http://www.dplusv.com/Photo-03.html>

Thanks Kurt

I wish I had some one to do my home work  
for my when I was in school. Oh but then I  
wouldn't learn nuthin.

I'll keep tryin to post pix. I may learn some  
day but if your there to bail me out we  
shouldn't miss any.

PS this pic is a 3 phase conversion, 48 volt.

JK TAS Jerry

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Re: Yaw Bearing pix ([none / 0](#))  
([#10](#))  
by Jerry on Thu Nov 13th, 2003 at  
09:45:23 PM MST  
([User Info](#))  
<http://www.dplusv.com/Photo-03.html>

The heat sink on the back of this one is  
from a GM car alt. It is the diode  
package. Small premade and its a 6  
pack, a 3 phase diode pkg.

JK TAS Jerry

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[Yaw Bearing pix](#) | 10 comments (10 topical, 0 editorial)

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[Six inch disc](#)

By [Jerry](#), Section [Homebrewed Electricity](#)  
 Posted on Tue Nov 11th, 2003 at 10:27:09 PM MST [Alternators](#)  
 Six inch disc with neo's

Hope this works. Trying to post pics of a 6 inch disc with 8 small neo's made from speaker backing plate. I have a few 8" backing plates also. I will try making slightly larger disc alt if this one works. The disc is 3/8" thick. The pole piece in the center is 1.5" diameter. This disc had a 1/2" vent hole. I enlarged it to 5/8" and tapped it on the side for a shaft set screw. These things are very thick and strong.



JK TAS Jerry



[editor's note, by kurt] i fixed your pics jerry

[Six inch disc](#) | 4 comments (4 topical, 0 editorial)

Re: Six inch disc ([none / 0](#)) ([#1](#))  
 by Jerry on Tue Nov 11th, 2003 at 11:30:59 PM MST  
[\(User Info\)](#) <http://www.dplusv.com/Photo-03.html>

Hey Kurt thanks for the help. If I keep having troubles you might get tierd of fixing my mistakes. Now all i gota do is shrink this screen down. Its been to wide since I posted a picture last week and I can't shrink it.

Computers are not yet made for old guy,s.

JK TAS Jerry

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Re: Six inch disc ([none / 0](#)) ([#3](#))  
 by Jerry on Tue Nov 11th, 2003 at 11:49:54 PM MST  
[\(User Info\)](#) <http://www.dplusv.com/Photo-03.html>

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I got the lamination metal from Ed. Now just got to figure out what to do for coils. These magnets are 1/4" X 1/2" X 1" Neo's. The lamination metal will also be 1 inch wide when inplace.

I plan on a 48 inch 3 blade for this one. OH ya 8 magnets 8 coils single phase. Its my first disc alt.

JK TAS Jerry

[Airheads Page](#)

Re: Six inch disc ([none / 0](#)) (#4)  
by troy on Thu Nov 13th, 2003 at 01:37:25 PM MST  
([User Info](#))

Hey Jerry,

Looks like things are coming along nicely. Can't wait to see how the new one compares to the tried and true garbogen.

Best regards,

troy

[ [Parent](#) ]

Re: Six inch disc ([none / 0](#)) (#5)  
by Jerry on Thu Nov 13th, 2003 at 10:03:39 PM MST  
([User Info](#))  
<http://www.dplusv.com/Photo-03.html>

Hi Troy

I don't think this one will match up to the GARBOGEN but I've wanted to do a disc alt for a long time.

It all started when I saw DanB's first units. Since I've been so slow the desing of the disc alt has been improving almost weekly. If I keep letting all the others do the research I'll save a bunch of time saved.

I think the AX-300 is the 6 inch DanB did with the gear. If I remember right I think it did around 200 watts? Correct me Dan if I'm wrong?

Ofcourse I would like to better Dan's #s a little. Must be a chalinge thing. If it works then on to the bigger units.

I'm still shooting for 2 KW out of my plstic blades? On the bigger genny.

JK TAS Jerry

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## [Poured Stator ?](#)

By [Jerry](#), Section [Homebrewed Electricity](#)

Posted on Mon Nov 10th, 2003 at 11:02:25 PM MST

Poured Stator ? for I-fred and Ed/winstuff

[Alternators](#)

I-Fred.

How did you make the form to poure the stator? How is this project comming? How is the efficientcy of your poured stator?

Ed

You said in your report on your web page that the efficientcy wasc down abit on your poured stator. How dose this difer from I-Freds?

I've notice that I-Freds stator most resembles an AC induction motor. This type of stator may have benifits from both the disc design as well as AC motor coverson.

I see the higher pole and magnet count as one over the AC motor.

And I see a reduced air-gap problem of the disc alt since the coils are imbebed within the laminations and therefor more involved with the magnetic circut.

Give me your thoughts guys cause I realy like the looks of these things and want to try one.

JK TAS Jerry

[Poured Stator ?](#) | 16 comments (16 topical, 0 editorial)

Re: Poured Stator ? ([none / 0](#)) ([#1](#))

by [windstuffnow](#) ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Tue Nov 11th, 2003 at 06:07:07 AM MST

([User Info](#)) <http://www.windstuffnow.com/main>

Hi Jerry,

I believe iFreds is using a non metallic version as I posted some time back for the dual rotor alternator. My attempt that's posted on my site was for a "quickie" laminated stator by adding iron powder to the plastic mix. The end result is very inefficient. It does make it very easy to put together a slotted stator but there are alot of losses. The steel laminates either using 1018 strips to form a stator and either slotting them or laying coils over them is far better than the poured iron powder. The silicon steel is far superior. For a quickie project the poured core unit is quite fun, quick and simple and you can usually put an alternator together in a day or two using the poured methods.

Have Fun

Ed

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Re: Poured Stator ? ([none / 0](#)) ([#2](#))

by Jerry on Tue Nov 11th, 2003 at 09:46:59 AM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Thanks Ed

I noticed your design and iFred's are different. I was thinking of using the steel lamination as normal and pouring the iron/epoxy mix on the steel.

The idea here is to have the good performance of the steel and use the mix as a medium as a path for the flux to follow. This to enhance the flux strength in what otherwise is just open air, the gap between the coils and the laminations. Surely the iron mix will be more conductive to the magnetic flux than air would be. I see the iron past mix as a much better path than just air.

I would use iFred's design and simply mold the stator on top of the steel laminations. The holes for the coils would just touch the top of the steel.

If this worked the gap could be wider with more wire with the mix in the gap. Also the magnets could be placed very close to this hybrid stator.

Just a thought? Could be all wrong?

JK TAS Jerry

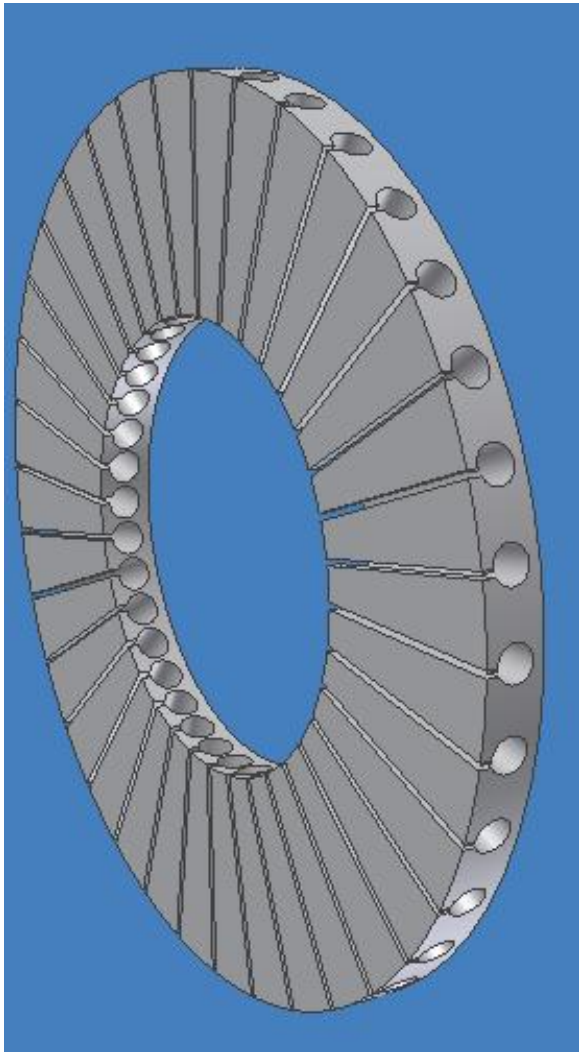
[Airheads Page](#)

[ [Parent](#) ]

Re: Poured Stator ? ([none / 0](#)) ([#6](#))

by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Tue Nov 11th, 2003 at 02:11:00 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

If your coils are going to be thin it may be better to simply pour the plastic and either drill or machine the plastic on top of the steel core. I think the iron powder will lower the efficiency. You could drill the steel for the coils similar to my original idea of drilling a plastic form for the dual rotor machine. This works quite well although it takes a bit more time



This is one of the cores from the 2500 watt machine I did last summer. It has a plastic overlay on the silicon steel and the plastic was machined to hold the wires in place...



[ [Parent](#) ]

Re: Poured Stator ? ([none / 0](#)) ([#7](#))  
by [kmitchel](#) on Tue Nov 11th, 2003 at 02:38:16 PM MST  
([User Info](#))

Can u provide more details about this 2500 watt monster, please? More pictures the better.

[ [Parent](#) ]

Re: Poured Stator ? ([none / 0](#)) (#8)

by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Tue Nov 11th, 2003 at 03:53:04 PM MST

([User Info](#)) <http://www.windstuffnow.com/main>

I tried to do a search on the unit as I posted it sometime ago but couldn't find it. It was actually suppose to be a higher wattage but fell short of my goal. It was meant to produce 1000 watts at a very low rpm and up to 5kw. It ended up being around 1/2 of my intended goal. Its in the corner waiting for some alterations. Here are the pics I posted from before....





[ [Parent](#) ]

Re: Poured Stator ? ([none / 0](#)) (#13)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Wed Nov 12th, 2003 at 05:52:23 AM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

Here are all the stories you have posted  
<http://www.fieldlines.com/user/windstuffnow/stories>  
I think the one you are talking about is titled "MultiDisk Alternator Preview"

} = - W o o f - = {  
[ [Parent](#) ]

Re: Poured Stator ? ([none / 0](#)) (#14)  
by Reno on Thu Nov 13th, 2003 at 12:16:01 PM MST  
([User Info](#))

Hey Ed where would one find silicon steel.  
I was thinking if a mandrel was made of steel lams  
and then the mag wire wound around it then mounted to the mold  
Then resin poured around everything.

[ [Parent](#) ]

Re: Poured Stator ? ([none / 0](#)) (#15)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Thu Nov 13th, 2003 at 03:38:53 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Hi Reno,  
I usually keep a little bit in stock for my own projects but occasionally I get requests for some. Let me know what size ( OD and ID ) and I'll see if I have enough to fill your needs.

Have Fun  
Ed

[ [Parent](#) ]

Re: Poured Stator ? ([none / 0](#)) (#3)  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Tue Nov 11th, 2003 at 10:02:31 AM MST  
([User Info](#)) <http://www.internetfred.com>

Hi Jerry.  
My stator core is a composite of 90% iron grindings and 10% fiberglass resin. Ed is correct, you would get much much more output from thin metal laminations then from a poured core form, however there is major fun that comes from putting together a pour core mold. The intial tests show that it is working well, and I beleive it could be enhanced further, which I am attempting to do. I beleive with embedding some laminations into the pour code as well (esp; in the poles) the output could go much higher. I am presently working on a 13 inch disk with this idea as well.

Take a look at the wood form that I make on this page of my web site. I used wood dowels and a simple form.  
<http://www.internetfred.com/newgen/newgen.html>  
this produced the mold.

The idea for the poured core form came from Ed, I got it from him. He's a master at building things!! Amazing some of the stuff he comes up with.

My suggestions on to building one are, increase the width of the core and thus longer wire per pole. Longer and more magnets, thinner poles. larger slots for more wire.



Good Luck!

Re: Poured Stator ? ([none / 0](#)) (#4)  
by ibedonc on Tue Nov 11th, 2003 at 10:56:32 AM MST  
([User Info](#))

were are you getting your iron filings from , ? are you grindings your own ?

[ [Parent](#) ]

Re: Poured Stator ? ([none / 0](#)) (#5)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Tue Nov 11th, 2003 at 02:01:07 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

I bought some from a "Teacher Center" but later robbed them from the local brake shops. They have tons of shavings and their more than happy to let you have them.

Have Fun  
Ed

[ [Parent](#) ]

Re: Poured Stator ? ([none / 0](#)) (#9)  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Tue Nov 11th, 2003 at 04:05:13 PM MST  
([User Info](#)) <http://www.internetfred.com>

A local brake shop, when they grind the breaks it leaves a nice grinding power material, I semi clean it and sift it. I wear a mask for this because it might contain some hazerdous materials, but it's just a percation. They have lots and are more then willing to give it.

Re: Poured Stator ? ([none / 0](#)) (#10)  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Tue Nov 11th, 2003 at 04:19:11 PM MST  
([User Info](#)) <http://www.internetfred.com>

To Ed.

I gotta tell you Ed, I have been reading alot of electrical power technology books lately, and some of your designs on the mathematics end are pretty close to near specs on the practical side. Your good dude! real good! Keep it up, or I'll catch up soon...LOL

above all...Have FUN!!  
And have a GREAT DAY!

Re: Poured Stator ? ([none / 0](#)) ([#11](#))  
by Jerry on Tue Nov 11th, 2003 at 08:50:50 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

iFred did you just pull the wood dowls out after the resin set or did you drill them out? What was the outside form in your mold. OH the inside to? I would think if you kept the slots narrow were you slip the coil wire through, the cogging would not be to bad?

Did you wind the coils first and then drop them in place or did you wind in place around each pole or did you do wave winding? I think thats 3 ?

Thanks guys.

JK TAS Jerry

[Airheads Page](#)

[ [Parent](#) ]

Re: Poured Stator ? ([none / 0](#)) ([#12](#))  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Tue Nov 11th, 2003 at 11:22:22 PM MST  
([User Info](#)) <http://www.internetfred.com>

Hi Jerry

Glad I can help and answer your questions.

The bottom of the form is plywood, to this I glued a paper template that was filled with guidelines 22.7 deg apart. to the outside of the mold I cut some sheet metal (duct metal) and wrapped it around wood base and used some wood screws to hold everything in place. (i used some duct tape in the bottom to prevent spillage. The center was also made of wood. I then gave this part of the mold a coat of varnish.

When I finished the build, I cut the dowels to a single length, then I sanded them (ends) individually to fit for each position. I did this 32 times, once for each dowel. I then marked each position on the dowels, just in case. I then greased everything down very well including each dowel individually. Everything was a tight fit, it's critical to get a tight fit.

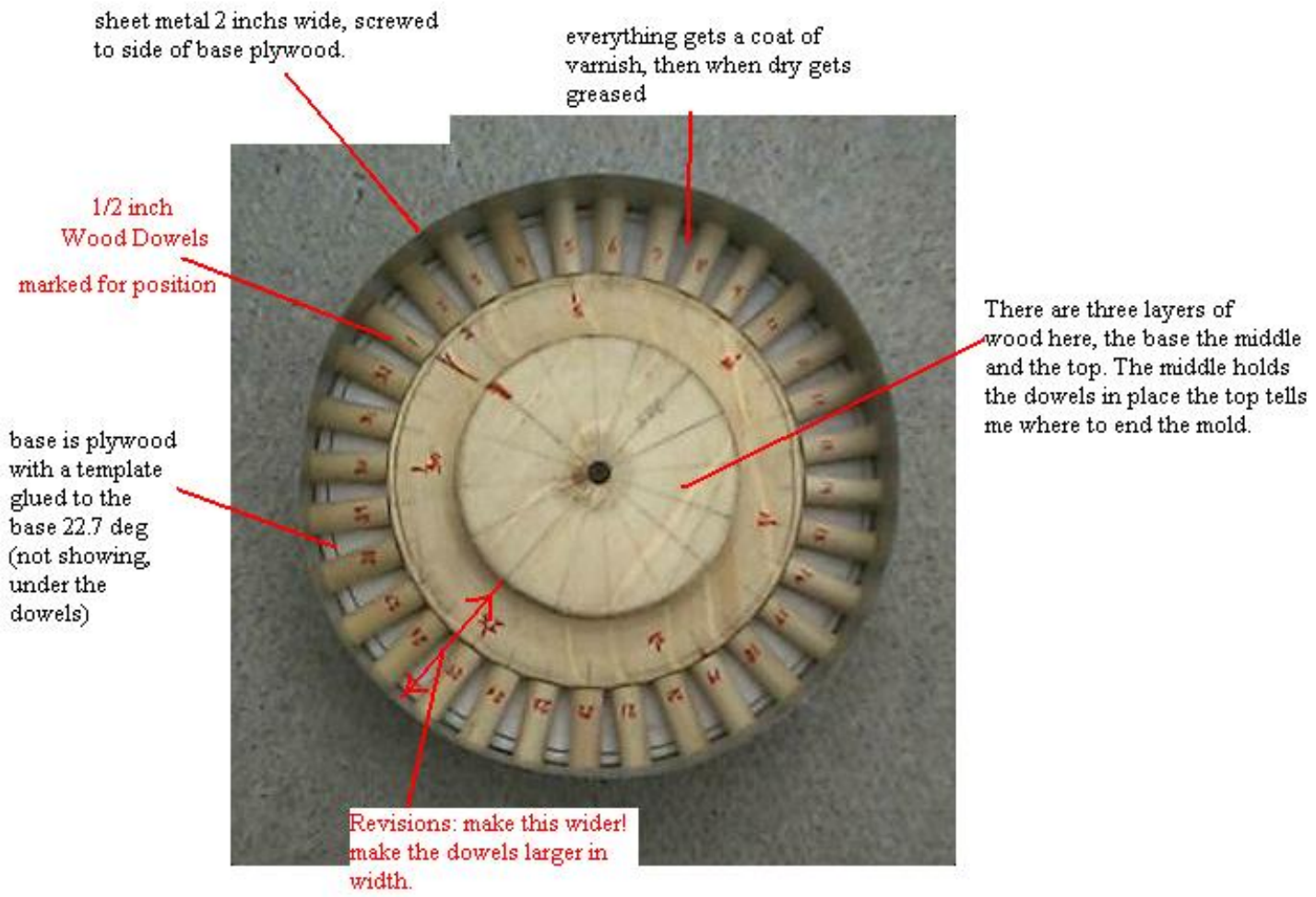
I measured everything and mixed the iron grindings and resins together, had to work quickly.. ... (resin went around and under the dowels when packed in slightly, but not enough to jar the dowels(the tight fit-:)). Also: To prevent bubbles and stuff I continually shook, rotated and gently slapped down the mold to make sure the stuff got into all areas of the mold. and continued to pack as much as possible up to the top of the third layer of the mold. The third layer tells where to end.

When completed the dowels popped out with very little problems, only one gave me an problem and I had to drill it out. But all in all the dowels came out smooth. Next I used my dermal to cut out the centers in the top between the poles. The slots where narrow to allow the wire to go through and just a little extra. Dermal with a cutting blade works great on this material!

The cogging is minimal. I used a metal plate made of multi sheets (not suggested) of sheet metal (in order to get thickness). I am still experimenting but I have 32 mags x 3 for width. YUP! you read correct.. 3 magnets per pole in length! 96 small mags 1/2 x 1/8 each.. Got a ton of them, don't ask ;-)

I wound each wire around each pole by hand, 25 times per pole. Man my fingers where killing me, I was shaking after doing 15 poles! LOL... Oh and... they where tightly wound and pressed into each pole with a peice of small hardwood I carved so i could fit in the most wire as I was winding each pole. It's very tighly wound ;->

Hope this helps!!





[ [Parent](#) ]

Re: Poured Stator ? ([none / 0](#)) ([#16](#))  
by Jerry on Thu Nov 13th, 2003 at 10:19:42 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Thanks iFred

This helps a buch.

I thought someone mentioned on this board about a powdered iron food suppliment use to feed young pigs and you can get it at the farm store.

Is there any truth to this? JK TAS Jerry

[Airheads Page](#)

[ [Parent](#) ]

[Poured Stator ?](#) | 16 comments (16 topical, 0 editorial)

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## [Stepper motor ?](#)

By [Jerry](#), Section [Homebrewed Electricity](#)

Posted on Mon Nov 3rd, 2003 at 11:07:00 PM MST

[Alternators](#)

What can I expect from this stepper?

Hi Group

I was at the scrap metal place today. Looking for some mast pipe for my 200 lb PMA/genny.

I found this little stepper motor. Paid \$5.

Specs amps 4, .75 ohms, 2 phase, 1.8 degrees/step. It has 8 wires comming out. It has 8 coils inside so I think 2 coils in sories so 2 wires for each 2 coils?

It about 3.5 inches long and 3 inches dia. The shaft is 5/8 inch long.

What kinda power could I expect at say 500 rpm?

Never had one of these motors. Its realy clean with very nice bearings. Very well built. I could see why the big ones make nice gennys. The coils look identicle to the GE ECM motors pictured on airheads.

JK TAS Jerry

[Stepper motor ?](#) | 5 comments (5 topical, 0 editorial)

Re: Stepper motor ? ([none / 0](#)) ([#1](#))  
by [Tommy L](#) on Tue Nov 4th, 2003 at 12:04:20 AM MST  
([User Info](#))

Hi !

Look at this site, maybe it give you something.  
<http://www.bioelectrifier.com/mini.htm>

/ Tommy L

Re: Stepper motor ? ([none / 0](#)) ([#2](#))  
by [Jerry](#) on Tue Nov 4th, 2003 at 10:39:00 AM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

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Thanks Tommy L

I'm surprized Mike did't round the tip of his blades as he did in the Mike mod Jerry blades.

He said his stepper motor was rated 4 amps and so is mine. He didn't say how many phases.

I'm going to use 2 of my plastic blades and then compair results with Mike,s genny.

JK TAS Jerry

[Airheads Page](#)

[ [Parent](#) ]

Re: Stepper motor ? ([none / 0](#)) (#3)  
by Jerry on Tue Nov 4th, 2003 at 10:55:51 PM  
MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Well I ran the little stepper in the lathe. 500, 900 and 1600 rpm. No load saw 14.7, 25.6 and 47.6 volts. But I could only get about 1/2 amp out of this motor.

I think the magnets used in these must be ceramics. I'm thinking of a neo upgrade.

JK TAS Jerry

[Airheads Page](#)

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Re: Stepper motor ? ([none / 0](#)) (#4)  
by TomW on Fri Nov 7th, 2003 at 07:49:27 AM MST  
([User Info](#))  
<http://oneota.net/~earthsourcepowr/>

Jerry;

It may just be the wire size is far too small to pump more than an amp or so.

I want to pass on that I upgraded a 30 volt Ametek to neos with very little increase in amps out but with a slight voltage increase. In other words it was a huge pain in the posterior to reassemble it with neos for a dismal return in power plus it cogged a LOT more. It just seems like adding more flux would increase power but it did not work that way with the Ametek tape drive motor. I think it was at the limits of its windings current ability as stock from the factory

Just my experience and your experience may vary.

Cheers.

TomW

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Re: Stepper motor ? ([none / 0](#)) (#5)  
by Jerry on Fri Nov 7th, 2003 at  
10:01:28 AM MST  
([User Info](#))  
<http://www.dplusv.com/Photo-03.html>

Hey Tom  
Thanks for the heads up. Its nice to  
take advantage of other peoples  
experiance and save yourself some  
truble.

It was one of those little back of the  
mind projects anyway.

JK TAS Jerry

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[Stepper motor ?](#) | 5 comments (5 topical, 0 editorial)

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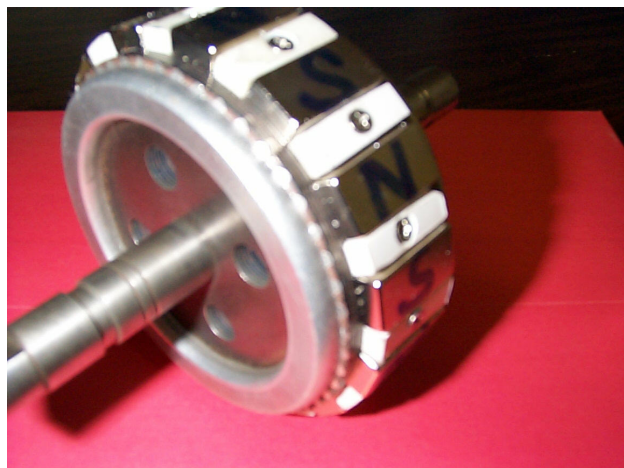
[Pic test](#)

By [Jerry](#), Section [Homebrewed Electricity](#)

Posted on Sat Nov 1st, 2003 at 10:11:23 PM MST

[Alternators](#)

Picture Test



Hi group

If this works its a picture of a garbage disposal motor armature with 14 neo magnets.

This is the replacement rotor I use in GM alts.

If it doesn't I'm not a bit surprized. I unerstand posting pics here as good as most of you speak fluent Chineez.

JK TAS Jerry

[Pic test](#) | 4 comments (4 topical, 0 editorial)

Glad it worked!! ([none](#) / [0](#)) ([#1](#))

by [TomW](#) on Sat Nov 1st, 2003 at 10:22:15 PM MST

([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Jerry;

Next thing you know you will be running your own webserver. None of this stuff is that hard just finicky.

Bravo.

Cheers.

TomW

[Stuff I have Online](#)

[Contact Me](#)

Re: Pic test ([none](#) / [0](#)) ([#2](#))

by [Jerry](#) on Sat Nov 1st, 2003 at 10:25:08 PM MST

([User Info](#)) <http://www.dplusv.com/Photo-03.html>

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Hi Guys

On Oct 5th I tried to post a pic. and it didn't work.  
Norm answered back and made some helpfull sugjestions.  
Thanks Norm.

Then Electric Ed, Tom W, Norm again, zubbly, ADMIN,  
Woof and John talked in lighth about sizing.

They were speaking that Chinese again. The closest  
translation book I have is Tazmainion. So please bear with  
me until I get the hang of it.

You may see a few big pictures from me for awhile. You  
goota crawl befor you can walk.

JK TAS Jerry

[Airheads Page](#)

Re: Pic test ([none / 0](#)) ([#3](#))  
by Norm on Sun Nov 2nd, 2003 at 09:55:48 PM  
MST  
([User Info](#))

Glad to see you're getting the hang of it...you  
mean that armature actually fits into an altenator?  
probably have to machine it down just a little? That is  
a pretty picture with the red background. We'll have  
to talk a little more about pic's one of these days,  
and I'm glad to have been of help. (:>) Norm.

[ [Parent](#) ]

Re: Pic test ([none / 0](#)) ([#4](#))  
by Jerry on Mon Nov 3rd, 2003 at 11:07:51  
AM MST  
([User Info](#))  
<http://www.dplusv.com/Photo-03.html>

Hi Norm

Ya that armature is actully a little smaller than  
the GM alt. Just a little machineing and the  
little magnets drop into the groove. I used  
some thick wall plastic pipe of the same dia. as  
the armature to make the little spacers. I  
screwed these little spacers down with little  
stainless steel wood screws and the glude the  
magnets on.

The GM alt has a 17 MM dia. shaft. This  
armature has a 5/8 in. shaft. This makes it  
easier to find standerd pullys and hubs and  
such.

Hornet has used a sigle large doughnut shaped  
neo magnet in there GM alt PMAs.  
I think they looked at my pictures on aireheads  
of this one and copyyed it in there new style alt  
PMA.  
I think this is a cheaper conversion. I makes  
more power but it dose cog more.

Hornet claims low cogging but in the same add they say it needs a bigger prop to get started.

I use the fronts of 2 GM alts because you can replace the bearings to mach the new armature in the front part but not the back part of the GM alt.

This alt with these mods, some wireing changes and some caps will make a few hundred watts with a direct mouted blade at around 4 ft.

JK TAS Jerry

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[Pic test](#) | 4 comments (4 topical, 0 editorial)

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## [Lamination ?](#)

By [Jerry](#), Section [Homebrewed Electricity](#)  
 Posted on Sat Nov 1st, 2003 at 08:43:30 AM MST [Alternators](#)  
 Yet another lamination ?

For a couple of small low budget disc alts I'm going to use metel plumers tape as lamination matereal. This stuff is soft so I don't think it will have a magnetic memory?

Will the holes in this stuff hinder its preformance as a lamination? I plan on using masking tape as an insulator as I roll it to reduce eddy currents.

JK TAS Jerry

[Lamination ?](#) | 2 comments (2 topical, 0 editorial)

Re: Lamination ? ([none / 0](#)) ([#1](#))  
 by [DanB](#) on Sun Nov 2nd, 2003 at 10:03:59 AM MST  
[\(User Info\)](#)

Hi Jerry - I think it would work allright....

Not ideal though, you'd see a big improvment if you used old transformer laminates or something. I used cold rolled steel for a while....

I did a test once and these were approx the results.  
 Basicly I built up a 1/2" thick block of diff. steel material and rubbed a Neo magnet on it to get an idea how bad hystoresis losses might be.

Bandsaw blades would retain a magnetic field density of around 110 Gauss!

Plumbers strapping would retains about 25 Gauss.

The cold rolled sheet metal I was using would retain about 13 Gauss.

Transformer laminates would retain about 7 Gauss.

Ive not tried that silicon steel from Ed at [Windstuffnow.com](#).

From the softness of the plumbers strapping I was a bit surprised just how good a permanent magnet it was. I wonder if perhaps it was the galvanized coating that sets up magnetic domains or something.... I believe rust can also setup magnetic domains to a small degree.

Regarding your question about the holes... I don't think they would affect things significantly. I suspect it would work allright with the plumbers strap, but there would be some drag, probably 3X more iron losses at least than if you used good silicon steel.

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- [Also by Jerry](#)

Re: Lamination ? ([none / 0](#)) (#2)  
by RayW on Sun Nov 2nd, 2003 at 07:09:10 PM MST  
([User Info](#))

Has anyone tried mobile-home tie-down strapping for laminations?????  
RayW

[Lamination ?](#) | 2 comments (2 topical, 0 editorial)

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## [Blade ?](#)

By [Jerry](#), Section [Homebrewed Electricity](#)

Posted on Sat Nov 1st, 2003 at 12:19:38 AM MST

[Wind](#)

Blade count and size ?

OK blade Gurus help me out here.

I machined the blade hub tonight for my 200 lb PM dc motor. This is the one that lights a 50 watt 120v bulb with a hand spin of the shaft. shaft 1 3/8 inches dia.

I'm going to use it for 48 volt charging. I have a power pole 24 ft tall nothing on this pole. I've a freind works for a utility CO. this pole is possioned around trees and out buildings but most times the wind will come through a channel between all these obstacles. This pole is fairly fat and I don't want to take this monster up high. Since low rpm works well on the pm motor I'm thinking a very high tourque low rpm blade. The location some what demands a low wind blade also.

I'm building an 8 blade 6 and 1/2 ft. tip to tip. The blades will be pitched at 25 degrees at the root and just a couple degrees at the tip.

What diamiter 2 or 3 blade dose this blade equal. 10 foot, 12 foot or does it work that way?

JK TAS Jerry

[Blade ?](#) | 4 comments (4 topical, 0 editorial)

Re: BLade ? ([none / 0](#)) (#1)

by scoraigwind ([magnet@scoraigwind.co.uk](mailto:magnet@scoraigwind.co.uk)) on Sat Nov 1st, 2003 at 02:46:06 AM MST

([User Info](#)) <http://www.scoraigwind.co.uk>

The power you can get will depend on the diameter, not the number of blades.

More blades will give you more torque, but less speed.

Small diameter gives more speed and less torque and less power. For example your 6.5' diameter will catch only 42% of the power that a 10' diameter rotor will catch. If it is a standards shape (scaled down), then it will give about 27% of the torque of the larger blade. But if you use more, wider blades you can correct this to an extent.

When designing blades I usually look at the cut in speed of the alternator at the desired voltage. I then aim to build a blade that will be very happy at this rpm at about 7mph windspeed (3 metres per second).

You don't give us much help as far as the cut in speed goes. If the blade tips are slender (2" wide) then tip speed ratio could be about 5.5. Circumference is about 6.2 metres. Tip speed is about  $3 \times 5.5 = 16.5$  metres per second at cut-in. That's 160 rpm ( $16.5 \times 60/6.2$ )

Does that makes sense?

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- [Also by Jerry](#)

Hugh Piggott <http://www.scoraigwind.co.uk>

Re: BLade ? ([none / 0](#)) (#2)  
by Jerry on Sat Nov 1st, 2003 at 08:01:40 AM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Thanks Hugh  
I know this thing won't need much rpm but it will need alot of tourque.

Off topic here but are you doing a work shop in Washington state next spring?

Would like you to see and evaluate the plastic blades. I'm working on a new 3 blade. I've got high hopes for this one. If this is out of line I understand no problem. Just curius?

JK TAS Jerry

[Airheads Page](#)

[ [Parent](#) ]

Re: BLade ? ([none / 0](#)) (#3)  
by scoraigwind ([magnet@scoraigwind.co.uk](mailto:magnet@scoraigwind.co.uk))  
on Sun Nov 2nd, 2003 at 05:23:05 AM MST  
([User Info](#)) <http://www.scoraigwind.co.uk>

You can get a bit more torque by adding blades (provided you get the angles right) but not more power. You can get much more torque and power by increasing the diameter of the rotor (scaling it up).

If you double the diameter you get four times the power and 8 times the torque.

Yes, I will be coming back to Washington state (Guemes island) next year to run another workshop course. April 12-17, 2004

Contact [ian.woofenden@homepower.com](mailto:ian.woofenden@homepower.com) for details of how to come.

I have put pictures of my previous courses at <http://www.scoraigwind.co.uk/buildyo>

I'd be very interested to learn more about how you make the blades. I saw lots of pics on the airhead site but not much discussion. It would be great if you could share some of your experiences with the group at Guemes Island.

Hugh Piggott <http://www.scoraigwind.co.uk>  
[ [Parent](#) ]

Re: BLade ? ([none / 0](#)) (#4)  
by Jerry on Mon Nov 3rd, 2003 at  
11:22:57 AM MST  
([User Info](#))  
<http://www.dplusv.com/Photo-03.html>

Thanks Hugh

I'm not sure if I can make the trip but I will send a set of blades up any way.

Not sure how you could test them they are set up on a hub that fits most ac motor shafts. any where from 1/4 inch to 3/4 inch shaft. I'll send a 3 blade in the 4 foot size.

I think this would be good for that small 48 inch genny you guys built last time. If you had some hub design specs I could posably do a one off for your next seminar up there.

I may be able to stop by for one day to discus the hole story behind and preformance details for the plastic blades.

Only if this does not interfear with your workshop.

Jerry

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[Blade ?](#) | 4 comments (4 topical, 0 editorial)

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### [Blades for sale](#)

By [Jerry](#), Section [Classifieds](#)

Posted on Thu Oct 30th, 2003 at 11:02:27 PM MST

[Wind](#)

Blades \$10 to \$15 each.

These are the blades used on the 1200 watt GARBOGEN.  
I've used these blades on tape drive motors, ac motor to pma conversions, direct mount car  
alts. Many pepole on OPs board have used these blades with excelant results.

These are my plastic blades. Here are some specs.  
Stock unmodifide blade. 22 3/4 inches long tip to root Part of this is a 2X2 in. mounting tab, 5  
inches wide at the root, 3 1/2 in. wide at the tip, 5/16 inch thick at the root, 1/8 in. thick at the  
tip. Blade should be mounted 21 to 23 degrees pitch at the root. This will make the blade  
almost flat at the tip. The blade has a slight cup at the root that ends at a 1/3 rd point towards  
the tip. Blade has a twist from root to tip.

Best preformance is had with the Mike mods. To do this I use a pencele and draw a 2 in. diam.  
circle at the tip starting at the tip and the leading edge. On the trailing edge of the circle I  
draw a line to extend to a point 11 inches from the tip to the trailing edge. Then sand a knife  
edge around the tip and down the new trailing edge.

This makes the blade very fast and quiet.

VERY IMPORTANT OR THEY WILL BREAK. Use aluminumsheet metal to form a support from  
the very edge of the mounting tab 6 inches toward the tip. This is what I call the sanwich trick.  
The blade is the bologna and the alumiun is the bread. Then I use #10 stainless steel machine  
screws and 1/2 fender washer. On the tip end keep these 1 inch away from all sides.

Stock blades \$10 each Mike mod blades \$15 each.  
PS I've made blades as small as 46 inches to as large as 62 inches and 2,3,4,7 blades.

E-mail me at [audiosourcesalem@aol.com](mailto:audiosourcesalem@aol.com) Thanks Jerry

Jerry, I took the liberty of adding this pic I got from Mike on the modification. Stock on the left  
moded on the right. TomW

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- [audiosourcesalem@aol.com](mailto:audiosourcesalem@aol.com)
- [More on Wind](#)
- [Also by Jerry](#)





[Blades for sale](#) | 6 comments (6 topical, 0 editorial)

To Jerry ([none / 0](#)) (#1)  
by TomW on Thu Oct 30th, 2003 at 11:20:37 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Jerry;

I think i fixed it all up and removed the other posts.

Cheers.

TomW

[Stuff I have Online](#)  
[Contact Me](#)

Re: To Jerry ([none / 0](#)) (#2)  
by Jerry on Fri Oct 31st, 2003 at 07:48:05 AM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Thanks TomW

Your awsum dood. I wish I was more computer savy? I thought I was just posting on the clasifides. I didn't want to post this add here. I didn't think this was the right place to sell stuff. Anyway thanks a bunch for the help Tom.

JK TAS Jerry

[Airheads Page](#)

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Re: To Jerry ([none / 0](#)) (#3)  
by TomW on Fri Oct 31st, 2003 at 08:34:36 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Jerry;

Well we don't really have any "rules" as such for classified ads but they do display on the front page by default.

We have had a few where the account to post the ad was made immediately before it was posted and those type get set to display only on the classifieds page[s].

Long term members such as you get a lot more slack on the classifieds than those that apparently just join to post an ad.

As always, I am here to help. I wish I was more construction savvy but I'm better with these silly computers and dreaming up bizarre ways to do stuff than wrenches and building things.

And, by the way, glad to see you are using caps for that added voltage bump on mills. I bet you get some monsters in the car audio business.

Cheers.

TomW

[Stuff I have Online](#)

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Re: To Jerry ([none / 0](#)) (#4)  
by Jerry on Fri Oct 31st, 2003 at 07:24:55 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi TomW

YA, We sell lots of 1 farrad caps 1,000,000UF/ 20 volt at \$99.95 ea. I'll sell these caps to OP board members for \$75. They come in red, blue, yellow, silver, green.

We also have 1.5 farrad, 2.5, 35 and 100 farrad caps. WE have a vehicle that holds the NW IASCA SPL record at 168.8 DB. This truck has 54,000 watts onboard. Lots of caps lots of batteries.

I also have caps in the  
6,10,12,15,18,20,25,30,35,40,50,60,75,80,90,100,110,150,200,250,300,400  
volt range with UF rating from 1 UF to 1 farrad. Cap prices from \$2 to \$100 depending on volts/UF rating. Have some non pollar caps as well also some large oil filds, motor start ,motor runs and ect.

Yep caps make a diferance. JK TAS Jerry

PS we also have plenty of gold distribution blocks, fuse blocks and holders, power wire from 10 ga. to 4/0 ga., split loom many sizes. All kinds of car stereo install hardware that realy works great for RE installs.

All this stuff shure is handy for our small wind genny farm on our store roof.

I guse I should make a list and post here and give all my RE buddies here the brotherinlaw discount. That is if its ok with the ADMIN and I don't step on any toes.

Thanks again Tom. Jerry

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Re: To Jerry ([none / 0](#)) (#5)  
by TomW on Fri Oct 31st, 2003 at 11:37:17 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Jerry;

I see no problem with listing your stuff at all.

Thats what classy fried ads are for. Giving our users a place to list stuff they have to sell to others in this RE thing that can supply a need. Especially if there is a discount to be had.

Lots of folks need blades and those high value caps don't exactly grow on trees and good connectors are nice to have available.

Another thought is go ahead and make up a list of stuff you have to sell send it to me and I will make a webpage out of it we can stick somewhere people can get to it online. Then include a link in your signature like the airheads link i did for you.

Cheers.

TomW

[Stuff I have Online](#)

[Contact Me](#)

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Re: To Jerry ([none / 0](#)) (#6)  
by Jerry on Sat Nov 1st, 2003 at 08:10:05 AM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Thanks Tom

Thats great now all I need is time?

I bet those guys that build those perpetual motion machines can also build us a time machine? Those something for nuthing ideas sound good to bad mother nature and the laws of physics don't agree.

JK TAS Jerry

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[Blades for sale](#) | 6 comments (6 topical, 0 editorial)

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[what type of motors will have curved or cupped neos](#) | 6 comments  
(6 topical, editorial)

long bars (1.00 / 1) (#1)  
by troy on Fri Sep 19th, 2003 at 09:43:00 AM MST  
([User Info](#))

As noted by others (Rodger maybe...) the long bar magnet idea will probably work fine if the entire top face of the magnet is a single pole (N or S) and probably won't work at all if one end of the bar is N and the other end S.

Clamping/gluing magnets cheek to cheek like that can be something of a trick. You may need to glue them one at a time until the glue completely sets up for each one.

Best regards and have fun!

troy

Re: long bars (none / 0) (#5)  
by Jerry on Fri Sep 19th, 2003 at 10:44:12 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Richard This is the 6th time I've tried to respond to your ? This thing won't let me respond to your ? It says I've used more than 50 words. This is 36 Jerry

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Re: long bars (none / 0) (#6)  
by Jerry on Fri Sep 19th, 2003 at 10:59:37 PM MST  
([User Info](#))  
<http://www.dplusv.com/Photo-03.html>

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- [electronbaby](#) (3)
- [hvirtane](#)
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- [dconn](#)
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OK well lets try it again? HI Richard. I've had a thought about this curved magnet problem. There are curved ceramic magnets galor in pm motors. Many have 2 but you need 4. And ceramics are weak. This might be a little better than ceramics? Take a thick wall steel tube the same diamter as your motors armature. Since your motor is 4 pole. Cut this tube into 4 pices like a pie. cut it so there is a gap between the pices. Glue the magnets to the under side of the tubing pices then glue the magnets to the greatly redused in size armature. This would get the flux closer to the laminations and cover the pole more thouroughly. There will be a reduction in flux travel. But the 2 surfaces will be better mated together and hopefully overcome some of the square surface losses.  
JK TAS Jerry

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[what type of motors will have curved or cupped neos](#) | 6 comments

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Others have rated this comment as follows:

[Jerry](#) 1

[what type of motors will have curved or cupped neos](#) | 6 comments  
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[Question for blade experts.](#) | 7 comments (7 topical, editorial)

Re: Question for blade experts. ([none / 0](#)) ([#1](#))  
by Dave B on Mon Dec 29th, 2003 at 01:47:46 AM MST  
([User Info](#)) <http://www.madbbs.com/users/bruggelog>

Jerry,

You beat me to the punch, I hope you don't mind me riding along with a similar request to the "blade experts". I need as much torque (power) as I can get from 0-400 rpm up to 30 mph from a 12' diameter 3 blade set. This looks like about tsr-7. Is the blade design program geared more toward "high speed efficiency" or would this be the best all around design for torque also ? I plan to heat water direct with my variable load controller NO BATTERIES. Thanks Jerry and to anyone who responds on this subject. Dave B.

[Question for blade experts.](#) | 7 comments (7 topical, 0 editorial)

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- [signweld](#)
- [wind pirate](#)
- [Harry Luubovv](#)
- Anonymous Users: 17
- Cloaked Users (1)

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Re: Question for blade experts. ([none / 0](#)) ([#3](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon Dec 29th, 2003 at 09:09:45 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Dave,

It's difficult to match the full torque range because of the cubed power coming through the blade at different wind speeds. It would probably be best to match the average winds in your area. For instance we have a relatively low average 6-12mph I typically set them up to perform best in that range. We quite often have higher winds in the range of 12 - 20 mph so anything extra is a bonus although they tend to drop efficiency as wind increases.

The blade designer program will work with all efficiencies, simply change the efficiency number in the efficiency box. I use an overall efficiency based on the alternator and expected blade efficiency so if your expecting say a 40% blade and a 70% alternator then the number to plug in would be  $(.4 \times .7 = .28)$  28% overall.

Have Fun  
Ed

[ [Parent](#) ]

[Question for blade experts.](#) | 7 comments (7 topical, 0 editorial)

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[144,000 pulses and counting.](#) | 15 comments (15 topical, editorial)

Re: 144,000 pulses and counting. ([none / 0](#)) ([#1](#))  
by RobD on Thu Jan 1st, 2004 at 08:23:16 AM MST  
([User Info](#))

Jerry, Make sure you don't over heat the batts. They have a one way valve allowing gas buildup to escape and prevent explosion. If the gas escapes the batteries will dry out and be unuseable. RobD

[144,000 pulses and counting.](#) | 15 comments (15 topical, 0 editorial)

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- [Harry Luubovv](#)
- [troy](#)
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- [Harry Luubovv](#)
- Anonymous Users: 24
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[144,000 pulses and counting.](#) | 15 comments (15 topical, 0 editorial)

Re: 144,000 pulses and counting. ([none / 0](#)) (#2)  
by Reno on Thu Jan 1st, 2004 at 09:19:04 AM MST  
([User Info](#))

Great job Jerry Can i assume you a producing AC and the pulse charge circuit is after the rectifier(s). keep the info coming. Would this idea of Charges be usable as a low wind device and when the wind is strong it can be taken out of circuit or would the high voltage cap bank have to be designed for the highest input foreseeable.

[144,000 pulses and counting.](#) | 15 comments (15 topical, 0 editorial)

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- [Harry Luubovv](#)
- [troy](#)
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[144,000 pulses and counting.](#) | 15 comments (15 topical, 0 editorial)

Re: 144,000 pulses and counting. ([none / 0](#)) (#4)  
by dualsporter on Thu Jan 1st, 2004 at 02:06:41 PM MST  
([User Info](#))

"So 80 hrs ago I hooked one of these batteries up to the capacitor pulse charging experiment."

80 hours to recharge 1 battery?!!

Dualsporter

[144,000 pulses and counting.](#) | 15 comments (15 topical, 0 editorial)

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[144,000 pulses and counting.](#) | 15 comments (15 topical, editorial)

Re: 144,000 pulses and counting. ([none / 0](#)) (#4)  
by dualsporter on Thu Jan 1st, 2004 at 02:06:41 PM MST  
([User Info](#))

"So 80 hrs ago I hooked one of these batteries up to the capacitor pulse charging experiment."

80 hours to recharge 1 battery?!!

Dualsporter

Re: 144,000 pulses and counting. ([none / 0](#)) (#5)  
by Reno on Thu Jan 1st, 2004 at 05:13:26 PM MST  
([User Info](#))

I think Jerry is doing an experiment. Of course it must be scaleable to be of use but the preliminary results look good. If we can turn thaose 5 and 10 mph winds into stored energy that would be great. I know my mill without the resistance of the battery spins up past charging voltage no problem.

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Re: 144,000 pulses and counting. ([none / 0](#)) (#7)  
by Jerry on Thu Jan 1st, 2004 at 09:46:11 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Reno Yep this is just playing with caps for fun. Since I have a zillion caps I'll be trying higher voltages and higher UF also. What I really need to do is get the solid state swiching thing working. But I like the idea of charging the caps to 20 to 60 volts or higher and then dumping that voltage onto the 12 volt batteries. I guess you could do the same with 24v or 48v also. The battery never got even slightly warm and the charger stayed pretty cool also. The caps were cold. I think however the relay was taking a beating. This is were solid state swiching would help. Reno your right about helping the genny in low wind. And then maybe swich over to normal genny operation when the wind speed gose up? Atleast this will help the genny to make some power in low wind. JK TAS Jerry

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Re: 144,000 pulses and counting. ([none / 0](#)) (#8)  
by dualsporter on Fri Jan 2nd, 2004 at 12:15:23 AM MST  
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Experimenting for fun is good. Pulse circuits are very entertaining. In your case it sounds like you have all the parts setting around which is the perfect situation for playing with an idea any time you want. That's got to be great. I don't have enough room to be able to collect much "stuff".

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Designing and building a circuit to last for 40 years of non-stop operation is not a problem as long as it is designed with an appropriate margin of safety for the components.

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For all experiments, if it was fun, it was worth the investment.

Dualsporter

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Re: 144,000 pulses and counting. ([none / 0](#)) (#11)  
by Jerry on Fri Jan 2nd, 2004 at 09:39:41 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Dualsporter I'm not sure if gell batteries have sludge that settels to the bottom. I've opened one up and the gell guu stuff seems prety stiff. I has a pie dough consistancy but its almost clear. Can't see how much stteling could happin? This is 24 hrs latter and the voltage is still 12.6 v and it still burns the end off the old screwdriver. I hope this works this good on the other battery. JK TAS Jerry

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Re: 144,000 pulses and counting. ([none / 0](#)) (#6)  
by Jerry on Thu Jan 1st, 2004 at 09:31:47 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>



The 80 hr test was for Relay longevity. I wanted to see how the relays held up in continuous duty. Also the battery I was charging appeared to be no good. That is after charging it in a normal fashion it would lose voltage in just a few hrs. It's been holding 12.67 for 1 1/2 days now. I haven't done a load test yet. But it did burn the end off an old screw driver and after a short time the voltage was still at 12.6. I don't know what the pulse charging did but the battery seems to be back to full capacity. I have a 125 amp load tester at the store shop so I'll load it down tomorrow and see if the battery is still good. I hooked up the other battery it was worse than I thought. It was down to 2.5 volts and the 40 Bosch relay stop working after a couple hrs. I'm going to replace the Bosch with some 100 amp relays and place some 2 uf/ 400 volt mylar caps across their terminals to stop the arcing and pitting. I'll see how long they last. If they hold up this system might just bring this other battery back to life also. Hey Charged could you explain again how this pulse charge helped this otherwise junk battery? If it did? Or maybe this battery wasn't junk? I da no? I guess I'll find out with the really dead battery? JK TAS Jerry

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Re: 144,000 pulses and counting. ([none / 0](#))  
(#9)  
by BSparky on Fri Jan 2nd, 2004 at 07:59:33 PM  
MST  
([User Info](#))

Jerry about the supply voltage ac or dc? Look for it on your Cap pulse testing posting. Maybe I've miss it.  
Bob

[ [Parent](#) ]

Re: 144,000 pulses and counting. ([none / 0](#)) (#10)  
by Jerry on Fri Jan 2nd, 2004 at 09:29:27  
PM MST  
([User Info](#))  
<http://www.dplusv.com/Photo-03.html>

Sorry if I left that out Bob. The power supply is 21 volts DC. I'll be trying higher voltage caps and higher power supply voltage. But first I must upgrade the relays. JK TAS Jerry

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Re: 144,000 pulses and counting.  
([none / 0](#)) ([#12](#))  
by charged on Fri Jan 2nd, 2004 at  
09:49:50 PM MST  
([User Info](#))

At 21v you're at just about optimum. For desulfating you can use smaller capacitors at higher voltage(100v) for short periods. This "cracks" the sulfate barrier. THEN you discharge to help dissolve the crystals in an orderly manner. Once you fully discharge, then start applying you're standard 21v pulsing.

You might want to build a dedicated charger with two voltage settings specifically for desulfating/reclaiming old batteries. That way you can scavenge batteries here and there and see if they'll come back to life. Some will, some won't, so what.

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[144,000 pulses and counting.](#) | 15 comments (15 topical, 0 editorial)



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- [Harry Luubovv](#)
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[144,000 pulses and counting.](#) | 15 comments (15 topical, editorial)

Re: 144,000 pulses and counting. ([none / 0](#)) (#5)  
by Reno on Thu Jan 1st, 2004 at 05:13:26 PM MST  
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Re: 144,000 pulses and counting. ([none / 0](#)) ([#8](#))  
by dualsporter on Fri Jan 2nd, 2004 at 12:15:23 AM MST  
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Dualsporter

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At 21v you're at just about optimum. For desulfating you can use smaller capacitors at higher voltage(100v) for short periods. This "cracks" the sulfate barrier. THEN you discharge to help dissolve the crystals in an orderly manner. Once you fully discharge, then start applying you're standard 21v pulsing.

You might want to build a dedicated charger with two voltage settings specifically for desulfating/reclaiming old batteries. That way you can scavenge batteries here and there and see if they'll come back to life. Some will, some won't, so what.

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[144,000 pulses and counting.](#) | **15** comments (15 topical, 0 editorial)



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- [Harry Luubovv](#)
- [DanB](#)
- Anonymous Users: 28
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[144,000 pulses and counting.](#) | 15 comments (15 topical, 0 editorial)

Re: 144,000 pulses and counting. ([none / 0](#)) (#13)  
by Budgreen on Sat Jan 3rd, 2004 at 02:43:07 PM MST  
([User Info](#))

here is also something to check, when you start the next battery pulsing take a voltage reading of the pulses at the battery, I would imagine them to be a higher voltage untill the battery starts to reach a full charge then being around 14.5v. the relays should last upwards of 1 million pulses if the pulse is not near the full current rating of the relay but I would suggest a FET to do the switching, if you let me know what kind of voltage/current source you have available to trigger the relay I could draw up a very simple fet switch for you to use. FET's are much cheaper than relays in the long run unless you have an unlimited supply of course.

[144,000 pulses and counting.](#) | 15 comments (15 topical, 0 editorial)

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- [Putte](#)
- [wind pirate](#)
- [Harry Luubovv](#)
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Re: 144,000 pulses and counting. ([none / 0](#)) (#14)  
by Jerry on Sat Jan 3rd, 2004 at 09:31:27 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Thanks Budgreen. I'm using a 13.8 volt 3 amp regulated power supply to supply power for the 12 volt flasher unit and the Bosch relay. I would very much like to remove the Bosch relay and replace it with an FET. What FET would I use if I increase voltage to 100 and amperge to 50? Or is that combination not doable or recimended? I did the load test on the battery today. Its a 10 second test and the tester said the battery is a good 770 cold cranking battery. I was surprizes because Optima calls this battery a 750 CCA battery. And this was after burning the end off that old screwdriver a few times. (REDNECK battery tester burning the end off old screwdrivers.) Looking forward to the schimatic. I'll try to hook up the 100 amp relays inplace of the 40 amp Bosch tommorow. This will be to see if I can bring the other Optima battery back to life. Thanks again Budgreen and Charged. You guys are an insperation. JK TAS Jerry

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Re: 144,000 pulses and counting. ([none / 0](#)) (#15)  
by Jerry on Sat Jan 3rd, 2004 at 09:42:26 PM MST  
([User Info](#))  
<http://www.dplusv.com/Photo-03.html>

PS. Thanks to Reno, Bsparky and Dualsporter I didn't mean to not thank you guys to. And another ? for you guys. I use an audio generator at work. These things are small and work from 9 v to 15 v. They have square, tryangle and sign wave output from 1 HZ to 1 meg HZ. I guess that would be 60 pulses per min. Could I use this unit to sequence the FETs instead of the 30 pulses per min. flasher unit. You know make this hole thing solid state? JK  
TAS Jerry

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[Cap pulse charge test.](#) | 8 comments (8 topical, editorial)

Re: Cap pulse charge test. ([none / 0](#)) ([#1](#))  
by bob golding ([yubba at clara dot net](#)) on Mon Dec 29th, 2003 at 06:25:09 AM MST  
([User Info](#))

well done jerry, as i said in a previous post i will hold off on the caps until you have done some more tests. sounds excellent so far. keep up the good work. might be able to do a deal on some very cheap igbt's. will ask the guy if he has any left. not too sure about exporting electronics to the states anymore, those homeland security guys are real paranoid about imports.

bob

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[Cap pulse charge test.](#) | 8 comments (8 topical, editorial)

Re: Cap pulse charge test. ([none / 0](#)) (#2)  
by Budgreen on Mon Dec 29th, 2003 at 10:31:31 AM MST  
([User Info](#))

you could also construct a peak reading volt meter to watch the batteries voltage if you so please, I will be doing this to test the merits of pulse voltage change vs. state of charge when I have some free time.  
from what I understand when you use a desulphator (similar to this setup of pulse charging) the batteries will start out with a high pulse voltage and gradually return to normal. If a dead battery has a higher internal resistance than a charged battery (not sure) this would be a very usefull circuit.

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Re: Cap pulse charge test. ([none / 0](#)) (#3)  
by Jerry on Mon Dec 29th, 2003 at 06:47:53 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

I guess next time I test I should use the peak hold button? I was in a hurry last night. The desulphating thing sounds like another plus.

I'm thinking this system may help low powered gennies or gennies that have low wind startup problems?

JK TAS Jerry

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Re: Cap pulse charge test. ([none / 0](#)) (#8)  
by Budgreen on Tue Dec 30th, 2003 at 10:45:09 AM MST  
([User Info](#))

peak hold feature would just lock the highest reading on the screen :)

this would be like a sample system that keeps a running check of the voltage peaks

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Re: Cap pulse charge test. ([none / 0](#)) ([#8](#))  
by Budgreen on Tue Dec 30th, 2003 at 10:45:09 AM MST  
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[Cap pulse charge test.](#) | 8 comments (8 topical, editorial)

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by Budgreen on Tue Dec 30th, 2003 at 10:45:09 AM MST  
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[Cap pulse charge test.](#) | 8 comments (8 topical, 0 editorial)

Re: Cap pulse charge test. ([none / 0](#)) (#6)  
by Electric Ed on Tue Dec 30th, 2003 at 07:52:46 AM MST  
([User Info](#)) <http://www.electric-ed.com>

[quote]"read this and you'll understand a bit better.  
[www.energenx.com](http://www.energenx.com)"

I don't think I'll invest in anything powered by vacuum energy just yet.

[quote] (emphasis mine)  
"Toulouse - Nov 25, 2003

New results from a study of distant galaxy clusters, observed as they were when the universe was only half as old as it is today, lead to some surprising conclusions. The observations were obtained by the European Space Agency's (ESA) satellite XMM in the context of an international collaboration involving researchers from two laboratories (the Laboratoire d'Astrophysique and the Centre d'Etude Spatiale des Rayonnements (CESR) at the Observatoire Midi-Pyrénées (OMP) in Toulouse, the Institut d'Astrophysique Spatiale (IAS) in Paris, the Collège de France, the Service d'Astrophysique (SAp) in Saclay, and the ESA center ESTEC in Holland. The scientific interpretation of these observations will soon appear as a letter in Astronomy and Astrophysics. The observations indicate that the abundance of X-ray luminous galaxy clusters was much lower at this ancient epoch, which suggests that the matter density of the Universe is significantly larger than what has been commonly assumed since the observations of the cosmic background radiation reported by NASA's WMAP satellite. This new result could call into question the need for vacuum energy!  
In any case, the results indicate that certain basic assumptions adopted by cosmologists will have to be modified: If galaxy clusters behave as commonly assumed, then one must abandon the ideal of a universe dominated by vacuum energy -- a radical change relative to recent ideas in the field; otherwise, one will have to understand the physical processes operating to make galaxy clusters more complicated objects than expected."

Electric Ed

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Electric Ed

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Re: Cap pulse charge test. ([none / 0](#)) (#7)  
by charged on Tue Dec 30th, 2003 at 09:03:53 AM MST  
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"Investment" was not why I provided the link. What he has there is an excellent description of the two disparate energy flows between an external circuit and the ion flow inside the battery. Electrons are many orders of magnitude faster than ions.

I tend to go with empirical data (up close) rather than magazine articles that reflect only the opinions of people that have never seen what I'm looking at. By basing my own experiments on other people's system claims I've verified enough "odd" processes to realize that the "best mousetrap" isn't usually on the shelf at Wal-mart.

Commercial obstruction? Maybe. Who knows for sure?

Drop one of those "magazine physicists" in the middle of the Adirondack mountains with nothing but a bowie knife and see how well they survive, alone in the woods, for two weeks. They're mostly self-aggrandizing paper-pushers that spend their lives patting each other on the back and collecting elitest awards. They have no practical skills. I know quite a few engineers where I work that are just the same. School made them all-knowing and flawless in their perceptions. ;) They're also so well paid that they gladly fork over every penny they must to the power company without batting an eyelash. Wealth can offer false-security and it almost always breeds intellectual decadence.

What I'm saying here is that REGARDLESS of where this energy comes from the enters the system, it DOES enter. Why do the ions keep moving in a charge mode between capacitive pulses? Don't know for sure. But, they do it anyway, regardless of the operator's disbelief.

Electrical engineering texts have never been updated to reflect current known processes in quantum mechanics. It's not that the texts are "wrong", as such. It's just that they are sorely incomplete.

<http://www.cheniere.org/techpapers/vanflandern.htm>

These flaws in standard EM theory are already being exploited by quite a few people. Many of these processes have been patented. The real comedy is that most "learned" people just pass them by, saying "That won't work", instead of simply building something to find the truth.

There are those that disparage what they cannot understand. There are those that learn the basics and never do anything with it. And then there are those that don't worry as much about WHY something works, they just build it and use it, learning the "why" as they go.

That last sentence most closely reflects my philosophy.

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[Question for Charged.](#) | 25 comments (25 topical, editorial)

Re: Question for Charged. ([none / 0](#)) ([#2](#))  
by bob golding ([yubba at clara dot net](#)) on Wed Dec 17th, 2003 at 06:58:55 AM MST  
([User Info](#))

hi jerry i am thinking of doing the same thing. how much do you charge for big caps? i havent really looked very hard yet but new they cost a fortune. i am in the UK so postage is a bit of an issue. as regards the relay i would go for solid state everytime. not a high duty cycle and very easy on the relays. can get them used quite chaeply and much more reliable. they either work or they dont. if they stop just plug another one in. solid state relays and triacs go up to 3000 amps or so.

bob

[Question for Charged.](#) | 25 comments (25 topical, 0 editorial)

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Re: Question for Charged. (none / 0) (#2)  
by bob golding ([yubba at clara dot net](#)) on Wed Dec 17th, 2003 at 06:58:55 AM MST  
([User Info](#))

hi jerry i am thinking of doing the same thing. how much do you charge for big caps? i havent really looked very hard yet but new they cost a fortune. i am in the UK so postage is a bit of an issue. as regards the relay i would go for solid state everytime. not a high duty cycle and very easy on the relays. can get them used quite cheaply and much more reliable. they either work or they dont. if they stop just plug another one in. solid state relays and triacs go up to 3000 amps or so.

bob

Re: Question for Charged. (none / 0) (#7)  
by Jerry on Wed Dec 17th, 2003 at 08:26:12 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Bob

The price all depends on the UF and voltage of the caps.

To day we got a deal and here it is.

20 volt with 24 volt surge 1 farrad caps \$59.95 plus shipping and hadeling.

This as thet say while supply last. If you don't mind these are a kinda pail yellow and if you don't like the color just peal of the plastic jacket and they are aluminum color.

Just let me know the UF/volt rating you want and I'll get you the price. I have many big caps starting at \$5.

JK TAS Jerry

[Airheads Page](#)

[ [Parent](#) ]

[Question for Charged.](#) | 25 comments (25 topical, 0 editorial)

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[Question for Charged.](#) | 25 comments (25 topical, editorial)

Re: Question for Charged. ([none / 0](#)) (#3)  
by charged on Wed Dec 17th, 2003 at 07:47:04 AM MST  
([User Info](#))

This is about the simplest method I've worked with. The key with this particular circuit is that the LOAD (your battery bank) must have a very low impedance for it to work right. It just so happens that your battery-bank is such a load. Go figure.

Get yourself a HEAVY CURRENT TRIAC and a good 5v zener diode. Use about a 400v rating, minimum. The sudden on-rush does some funny things, in electrostatic terms, when the capacitor bank voltage faces off with the battery voltage. Stick with HV components.

Connect the triac between the capacitor positive and the battery positive.

Connect the zener ANODE to the TRIAC GATE and the zener CATHODE to the capacitor positive.

Now, whenever you capacitor bank reaches 5v above battery voltage, the TRIAC switches on the dumps the charge into the bank in a very sudden burst of high current. Your capacitors have nearly zero internal resistance and the battery bank is also nearly zero (for our purposes). The only bottlenecks are the wires and the TRIAC itself. The lower the on-state resistance of the TRIAC the shorter the pulse duration will be.

Make sure all the leads between the cap bank and the battery bank are very heavy gauge so that each pulse duration will be as short as possible and as high a current as possible.

If your TRIAC starts sticking in the "ON" position, it means that your cap bank needs more capacitance, OR the wires you chosen to use are not heavy enough. Or maybe both.

Since you know the amount of charge (coulombs) that is contained in a 5v pulse from your known capacitance, you can make pretty accurate rough estimates of the incoming power by watching the pulse rate. Just put a high-impedance analog volt meter across the cap bank. Don't skimp. Make it pretty.

A 1 Farad bank at 5v is 5 Coulombs. At 1 pulse per second, that's 5 amps average input current. 10 pps would be 50amps, and so on. The frequency will vary based on the amount of generator power coming in.

The best part of this setup is that you never need to screw around with energy-wasting regulators between your generators and your batteries. Sudden-discharge capacitive pulse charging usually keeps the batteries ICE COLD while they charge. Just keep an eye on the electrolyte levels and you'll be fine.

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Re: Question for Charged. ([none / 0](#)) (#4)  
by charged on Wed Dec 17th, 2003 at 11:15:07 AM  
MST  
([User Info](#))

Ok, here's a simple circuit that will allow you to use your local Radio Shack triac and a good power mosfet or a bipolar transistor. This will prevent the triac from having to handle any major current directly.

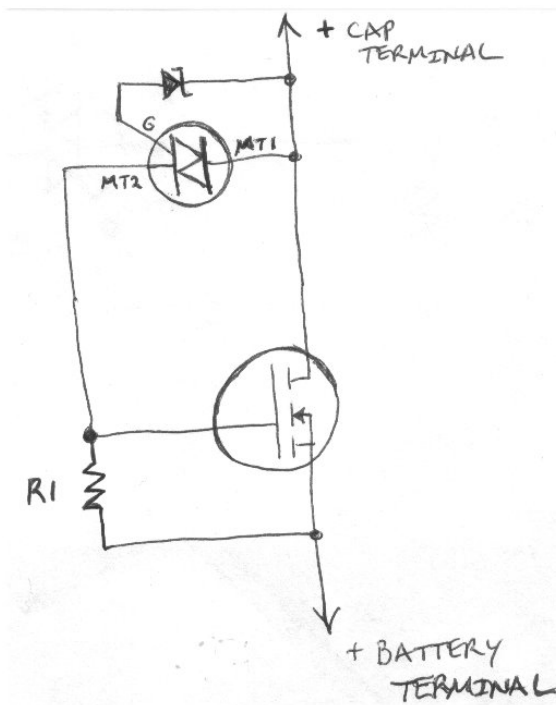
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You can parallel more mosfets for greater current handling. All the drain leads are directly paralleled AND all the gate leads are directly paralleled. BUT, EACH mosfet source get's a non-inductive .05ohm resistor (digikey TBH25PR050J-ND). This will prevent overcurrent in any single mosfet in the array.

You CAN do it with just the single mosfet if you purchase one of sufficient overall wattage handling capability. Get one rated for at least 200v and VERY LOW on-state resistance.

**DO NOT USE A LOWER VOLTAGE TRANSISTOR BY ADDING TRANSIENT SUPPRESSION.** The batteries like the transients too! Don't deprive them of what they love so dearly.



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Re: Question for Charged. ([none / 0](#)) (#8)  
by Jerry on Wed Dec 17th, 2003 at 08:36:47 PM  
MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Charged YoudaMan

The 1 puls per second sound great for a manual relay swither im going to try.

We sell a heavy duty electronic flasher that is progarable for 1 puls per second or 1 puls every 2 seconds.

It draws very little curent and I may either use it to trip larger relays or solid state devices. Just expirementing here?

JK TAS Jerry

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Re: Question for Charged. ([none / 0](#)) (#9)  
by Budgreen on Thu Dec 18th, 2003 at  
06:42:49 AM MST  
([User Info](#))

if you are going to 1 pulse per second, do not use a relay, they do have ratings such as 1,000,000 cycles at half load or similar, if you discharge a cap through it I can gaurentee that it will not last, you will end up with melted,fused,or burnt contacts.

I would suggest setting up your pulsing circuit to trigger a FET to dump the load. these are usually very cheap, last quite awhile and can be paralleled quite easily.

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by charged on Wed Dec 17th, 2003 at 11:15:07 AM MST  
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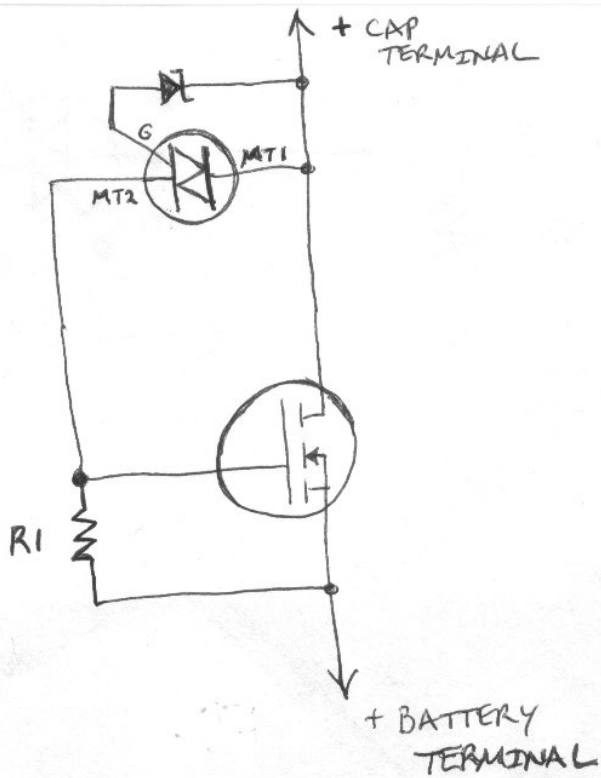
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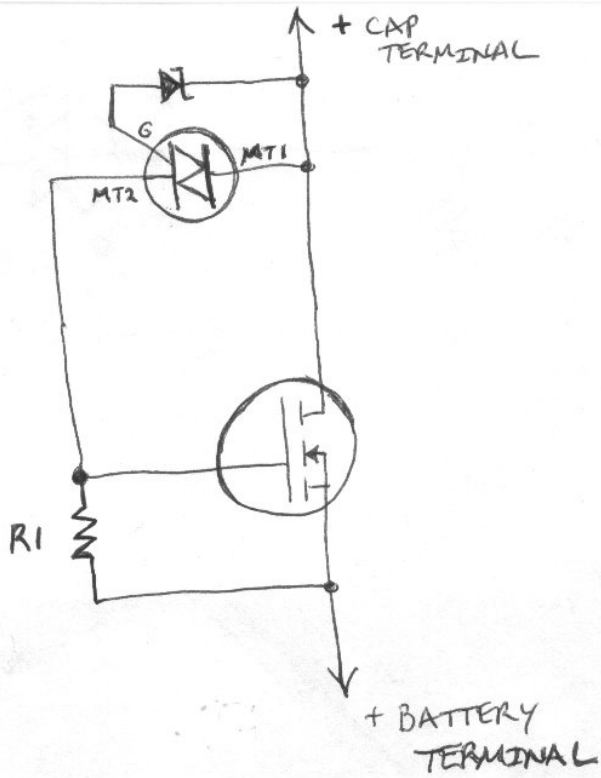
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[Question for Charged.](#) | 25 comments (25 topical, editorial)

Re: Question for Charged. ([none / 0](#)) (#9)  
by Budgreen on Thu Dec 18th, 2003 at 06:42:49 AM MST  
([User Info](#))

if you are going to 1 pulse per second, do not use a relay, they do have ratings such as 1,000,000 cycles at half load or similar, if you discharge a cap through it I can gaurentee that it will not last, you will end up with melted,fused,or burnt contacts.

I would suggest setting up your pulsing circuit to trigger a FET to dump the load. these are usually very cheap, last quite awhile and can be paralleled quite easily.

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[Question for Charged.](#) | 25 comments (25 topical, 0 editorial)

Re: Question for Charged. ([none / 0](#)) (#5)  
by Budgreen on Wed Dec 17th, 2003 at 02:03:52 PM MST  
([User Info](#))

ok, I understand the principal of this quite well, but I have one point to make regarding the mosfets. The mosfets (if paralleled) should not hog current as a bipolar device would, so the 1 resistor across all of them should suffice with the proper wattage. I also have a question, why 5v above battery voltage? just because it's a common zener rating? it would seem that pulse charging a 13.8v system at 18.8v could do damage, or am I missing something.

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[Question for Charged.](#) | 25 comments (25 topical, editorial)

Re: Question for Charged. (none / 0) (#10)  
by Budgreen on Thu Dec 18th, 2003 at 06:52:05 AM MST  
([User Info](#))

If you can get the scr to turn off! in order for that to happen the holding current needs to go quite low (usually 5ma ), it may or may not work, I will try that as I am currently building this to see how it works in the real world.

another advantage to this setup would be recovering energy slowly, like on a small genny I have, it makes a high enough voltage but not enough current to charge a battery with. using this setup I can 'pool' energy into the caps slowly and then dump it into the batteries where before i had no way to get any charge into them.

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Re: Question for Charged. ([none / 0](#)) (#15)  
by Budgreen on Fri Dec 19th, 2003 at 12:53:23 PM MST  
([User Info](#))

actually I was wrong here.. grinding my gears back to basic electronics 2 things need to happen for the scr to turn off.

1. ) the gate current needs to drop below holding.. most cases < 5mA
2. ) the voltage comming in must drop below about .7v

therefore an scr based circuit will never turn off unless the caps are discharged below .7v and with incomming power will not happen. (plus I also tested it to be sure)

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Re: Question for Charged. ([none / 0](#)) (#16)  
by charged on Fri Dec 19th, 2003 at 02:56:25 PM MST  
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I must apologize for not being VERY clear about exactly WHAT will be charging the capacitor bank.

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Re: Question for Charged. ([none / 0](#))  
([#17](#))  
by Budgreen on Fri Dec 19th, 2003 at  
08:45:27 PM MST  
([User Info](#))

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[Question for Charged.](#) | 25 comments (25 topical, editorial)

Re: Question for Charged. ([none / 0](#)) (#15)  
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Re: Question for Charged. ([none / 0](#)) (#11)  
by charged on Thu Dec 18th, 2003 at 08:30:16 AM MST  
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Here's some simple DC-DC circuit info. It works just fine inside small IC's and it also works GREAT up here in the land of big power transfer.

[http://www.maxim-ic.com/appnotes.cfm/appnote\\_number/710/ln/en](http://www.maxim-ic.com/appnotes.cfm/appnote_number/710/ln/en)

Look at figure 5 on that webpage, "Inverting topology".

The transformer chosen should be able to handle a full generator current pulse without flinching.

Scavenge a couple of microwave oven transformers. Remove the two windings and put both primary windings on the same core. Now you have a 1:1 transformer.

This is HOW TO handle your generator AT THE TOWER or AT THE GENERATOR SOURCE, wherever it may be. The only difference that I would apply would be a full-wave bridge across the inverting x-former secondary. The transformer should be a 1:1 HEAVY DUTY isolation transformer. The transformer, rectifier and pulse-width controller are at the generator tower. Set the pulse width to about 80% of the field moment of the transformer. All the genny power goes into that transformer circuit. The capacitor portion of the circuit is IN THE HOUSE at the battery bank. The very first capacitor on the wire should be an HV photoflash capacitor of about 1000uf or so. This takes the highest voltage peaks without damage. Then run a heavy twin-lead from that cap to the large bank.

This turns all your generator power into transient or "radiant" spikes with little or no current component. Your line losses between generator and house will virtually disappear since you've changed all the power into "transient" pulses before it goes down the lines. The caps at the house receive and translate the spikes back to usable current. This step-charges the capacitor bank.

A 5v pulse is NOT going to hurt your batteries.

I run my discharges at about 20v above battery voltage with no problems at all.

Take a much closer look at that simple zener/triac/mosfet circuit.

1. The voltage on the cap bank rises to 5v above battery.
2. The zener begins to conduct.
3. The "threshold" gate current is reached and the TRIAC conducts. The maximum current is determined by the resistor between the mos gate and source leads.
4. The mosfet gate goes positive and it switches on FULLY. The mosfet "ON" state is a PURE RESISTANCE. The TRIAC current drops to 0 the instant(well, almost) that the mosfet begins to

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Re: Question for Charged. ([none / 0](#)) ([#12](#))  
by Budgreen on Thu Dec 18th, 2003 at 09:04:27 AM MST  
([User Info](#))

right. as I have just built it and am playing with it now :)

the trick seems to be getting a large enough cap bank to pulse the batteries with and having it charge somewhat slowly, I don't have a large bank here at work, but with some small caps and a power supply it appears to work correctly but once it turns on the power from the supply is enough to keep it on (no ramp up of the cap) turns on about 5.5v above the batt voltage and dumped 15A at 14.5 volts into it, gotta wait till I can get home and throw it on the big caps.

only problem I could see is if the genny is making enough power to keep the caps charged thus keeping he circuit on. if not built to withstand your full current output could end up in a molten pile ;)

[ [Parent](#) ]

Re: Question for Charged. ([none / 0](#)) ([#13](#))  
by charged on Fri Dec 19th, 2003 at 07:38:30 AM MST  
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Yup. But, I did say this was a "simple" circuit. heh. A LARGE capacitance and a very LOW IMPEDANCE discharge circuit are the keys. The total capacitance would be over-engineered for the system ahead of time.

In my utopian world, all wind machines would be reconfigured to operate as 1:1 "magneto" systems. HV inductive impulses are the only thing that is used. You can literally run a single wire to the house and use a 6' copper ground spike on both ends as the second lead. Inductive discharge power transfer is FAR superior to standard AC or DC generator output. THIS is why Tesla said, in his autobiography, that he considered all of this AC systems to be a FAILURE. His later impulse systems were much better. BUT, he'd already gotten everyone using AC, essentially burying himself commercially. Then the systems were simply forgotten. Look at the patents after 1890.

I'm working on a wind generator design that has all this built in so that you don't need to have any heavy transformers and such out at your tower. If I get it worked out to my satisfaction, I'll post the plans for everyone to play with.

Here's the basic gist of how this operates. Those skilled in the art of pulse-width-modulation will be able to whip up a test unit, post haste.

Tesla loved using capacitance on both ends of his impulse systems.

Put a LARGE capacitance across the genny output RIGHT AT the tower. If it's an AC machine, use a high-current full-wave bridge and then the capacitors.

Use a simple pulse-width modulator to control a heavy IGBT to pulse the capacitor into the primary of a HEAVY CURRENT 1:1 transformer. First, turn the pulse frequency down and then widen the pulse-width until you JUST start to see a DC line at the end of the ramp pulse. Then back off to about 80% of the ramp, so that no pure DC can flow. Now, turn up the frequency until you have a 50% duty-cycle. This is what I consider the optimum setting.

The transformer SECONDARY now gets a 1kv full-wave bridge rectifier. The negative output is fed into a deep earth ground. The positive goes down the long-wire to the house.

The PWM uses very little power. You can use a couple of 555 timers to build it. There are schematics all over the place for that chip. Put a 9v regulator and a 1000uf across the power leads, then power it from the capacitor bank at the tower. Use an opto-isolator between the PWM and the IGBT.

Whenever the generator puts out enough power to run the PWM, the system will start transferring power to the house as a buzzing HV spike train.

OK, back to the house.

Where the wire meets the house, drive another deep earth ground rod. Put a 400v 1500uf capacitor(s) between the wire and the ground connection. Run your jumpers from this capacitor down to the large cap bank.

The inductive spikes will collect in a 1:1 POWER ratio with the generator. BUT, the system now has the capability to go much higher than the straight generator voltage, as needed.

Make sure your BATTERY bank is configured to be AT or ABOVE the normal generator voltage output. If you pull the house capacitors LOWER than the normal generator voltage, you'll start to see CURRENT on the wire from the generator, instead of just the radiant (impulse RF???) spikes. You don't want CURRENT since it defeats the purpose of this system.

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[POWER-SUPPLY CIRCUITS](#)

APP 710: Oct 19, 2000

Keywords: DC-DC converter, switching regulators, control techniques, step-down, step-up, buck, boost, inverter, current mode, voltage mode, PWM, PFM, pulse width modulation, pulse frequency modulation, synchronous buck regulator, flyback, converters, convertors, dc

Related Parts: [MAX1636](#) [MAX1653](#)

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## DC-DC Converter Tutorial

*Switching regulators offer higher efficiency than linear regulators. In addition, they can step-up, step-down and invert the input voltage. This article outlines the different types of switching regulators used in DC-DC conversion. It also reviews and compares the various control techniques for these converters.*

### ALSO SEE:

- [Building a Power Supply That Works](#)
- [Power Supply Cookbook](#)

## What Is a Switching Regulator?

A switching regulator is a circuit that uses an inductor, a transformer, or a capacitor as an energy-storage element to transfer energy from input to output in discrete packets. Feedback circuitry regulates the energy transfer to maintain a constant voltage within the load limits of the circuit.

The basic circuit can be configured to step up (boost), step down (buck), or invert output voltage with respect to input voltage.

## Why Use a Switching Regulator?

For battery management, the only other choice is a linear regulator. Linear regulators only step down, and efficiency is equivalent to the output voltage divided by the input voltage. On the other hand, switching regulators operate by passing energy in discrete packets over a low-resistance switch, so they can step up, step down, and invert. In addition, they offer higher efficiency than linear regulators.

Using a transformer as the energy-storage element also allows the output voltage to be electrically isolated from the input voltage.

The one disadvantage of the switching regulator is noise. Any time you move charge in discrete packets, you create noise or ripple. But the noise can often be minimized using specific control techniques and through careful component selection.

## Charge Phase

A basic boost configuration is depicted in Figure 1. Assuming that the switch has been open

for a long time, the voltage across the capacitor is equal to the input voltage. During the charge phase, when the switch closes the input voltage is impressed across the inductor and the diode prevents the capacitor from discharging to ground. Because the input voltage is DC, current through the inductor rises linearly with time at a rate that is proportional to the input voltage divided by the inductance. The energy stored in the inductor for the duration shown is equal to one-half the inductance times the square of the peak current.

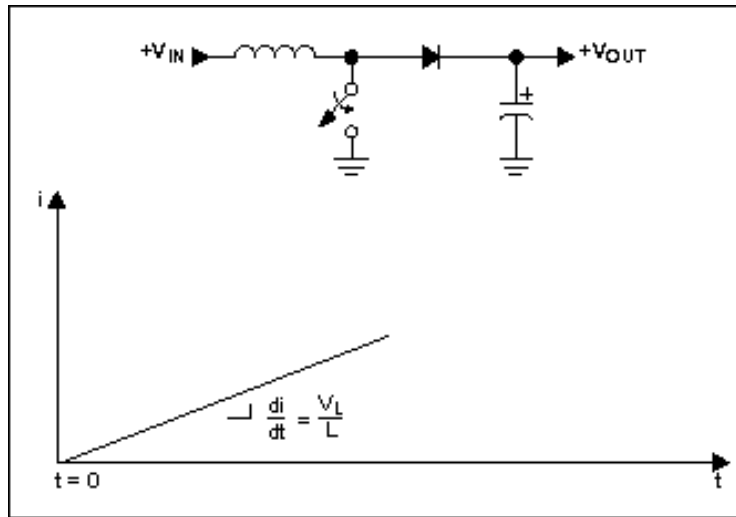


Figure 1. Charge phase: When the switch closes, current ramps up through the inductor.

## Discharge Phase

Figure 2 shows the discharge phase. When the switch opens again, the voltage across the inductor changes instantaneously to whatever is required to maintain current flow, because the inductor current can't change instantly. In order for current to continue flowing, the inductor voltage must change enough to forward-bias the diode. The voltage on top of the switch (at the diode anode) is equal to a diode forward voltage ( $V_D$ ) above the voltage on the capacitor, and the voltage across the inductor actually switches polarity relative to the charge phase. In this initial cycle,  $V_{\text{switch}}$  is equal to  $V_{\text{IN}}$  plus  $V_D$ . If we assume that the capacitor is relatively large such that the  $dV/dt$  for the resulting inductor peak current is negligibly small, then  $V_{\text{OUT}}$  remains relatively constant during the second half of the cycle. As  $V_{\text{switch}}$  remains at a diode drop above  $V_{\text{OUT}}$ , the voltage across the inductor also remains relatively constant. This results in a linear  $di/dt$  opposite in polarity from the charge phase and proportional to the inductor voltage divided by the inductance,  $-V_D$  over  $L$  in this initial cycle.

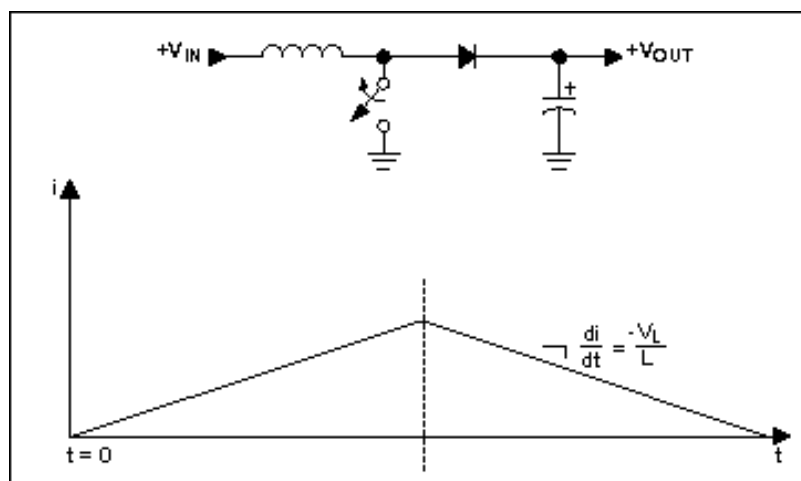


Figure 2. Discharge phase: When the switch opens, current flows to the load.

If we continue this process over and over, the voltage across the capacitor ( $V_{OUT}$ ) will rise with every cycle. If we then employ some feedback and control (see Figure 7), the output voltage can be regulated at any value within the breakdown tolerance of the selected components.

If we take the same basic elements and rearrange their positions, we can create the other configurations such as the buck converter topology (see Figure 3). Here, when the switch closes, the voltage across the inductor is equal to  $V_{IN}$  minus  $V_{OUT}$ . Initially this is  $V_{IN}$ , because  $V_{OUT}$  is zero at startup. Current will ramp up linearly, as in the boost case (Figure 4), and flow into the output capacitor. When the switch opens, the voltage across it will change instantaneously to allow current to flow through the diode and the inductor, and into the output capacitor. Because energy is gated to the output capacitor in each half of the cycle, the buck topology typically offers the greatest efficiency.

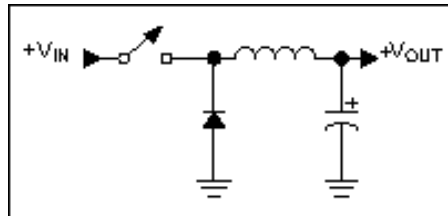


Figure 3. Buck converter topology

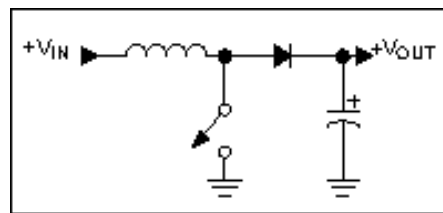


Figure 4. Simple boost converter

Keeping the switch in the same place and swapping the inductor and diode positions in the circuit yields the inverting topology (Figure 5). When the switch closes,  $V_{IN}$  is impressed across the inductor and the current ramps up as before. When the switch opens again, the current wants to continue to flow in the same direction. Thus, it flows through the diode and charges the output capacitor in the reverse direction, creating an output voltage with the opposite polarity to the input voltage.

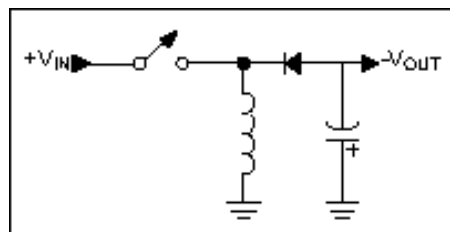


Figure 5. Inverting topology

Using a transformer, you can realize boost, buck, or inverting topologies and isolate the output voltage from the input voltage. The circuit shown in Figure 6 is a boost transformer flyback topology.

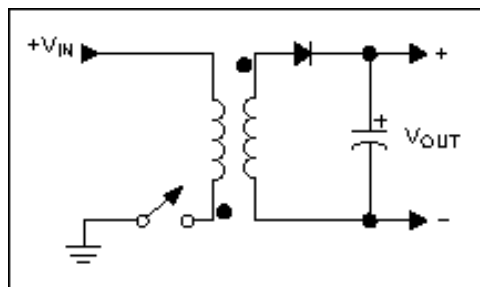


Figure 6. Transformer flyback topology

## Control Techniques

Popular control techniques include *pulse-frequency modulation*, where the switch is cycled at a 50% duty cycle until the output voltage comes into regulation; *current-limited pulse-frequency modulation*, where the charge cycle terminates when a predetermined peak inductor current is reached; and *pulse-width modulation*, where the switch frequency is constant and the duty cycle varies with the load. Each of these control techniques has advantages and disadvantages.

Clocked pulse-frequency modulation, or PFM, is the simplest control technique. With this method, when the output voltage is below the regulation point the control circuit gates a free-running oscillator to the switch. The inductive charge pumping action boosts the output voltage back up to the regulation point. However, the inductor selection is complicated, the peak-to-peak voltage ripple can be quite high, and the noise/ripple spectrum will vary greatly with the load.

Current-limited pulse-frequency modulation is similar to standard PFM; but instead of using a 50% duty cycle oscillator, this control scheme employs a peak inductor current limit and a one shot. As soon as the output voltage goes out of regulation, the switch turns on until the inductor current reaches the programmed current limit, usually set with a current sense resistor in the inductor-current path. Once the inductor current reaches the programmed limit, the switch turns off for a time constant set by an internal one shot, generally on the order of a microsecond. At the end of the one-shot time constant, the feedback circuit compares  $V_{OUT}$  to the regulation voltage and either turns the switch on again if  $V_{OUT}$  remains out of regulation or holds the switch off until  $V_{OUT}$  falls out of regulation. Because the inductor peak current is fixed, this control scheme makes inductor selection easier; you only need to size the inductor core to meet the fixed limit. Also, because the peak current is fixed, the peak-to-peak ripple is reduced over the standard PFM, although the noise spectrum still varies with the load.

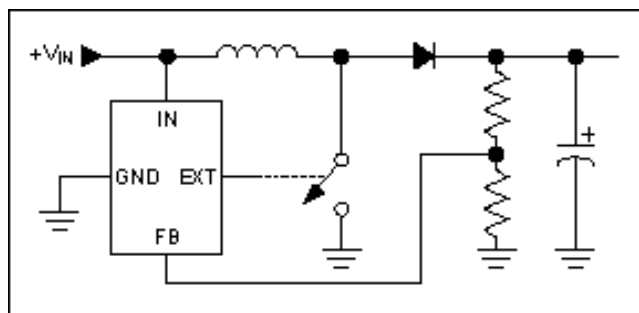


Figure 7. Adding feedback and control

The pulse-width modulation, or PWM, control technique maintains a constant switching frequency and varies the ratio of charge cycle to discharge cycle as the load varies. This technique affords high efficiency over a wide load range. In addition, because the switching frequency is fixed, the noise spectrum is relatively narrow, allowing simple low-pass filter techniques to greatly reduce the peak-to-peak voltage ripple. For this same reason, PWM is



popular with telecom applications where noise interference is of concern.

Figure 8 shows an example of the clocked PFM control scheme.  $V_{OUT}$  is fed back through a voltage divider to one input of a comparator whose other input is connected to a reference voltage. When the divided-down  $V_{OUT}$  falls below  $V_{REF}$ , the comparator gates the square-wave oscillator to the switch. This causes it to rapidly open and close, storing energy in the inductor and transferring it to the output capacitor in each cycle.

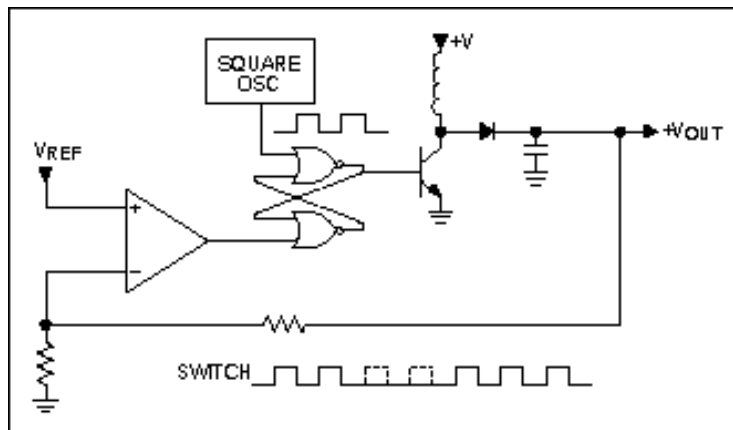


Figure 8. Clocked pulse-frequency modulation

The current-limited minimum-off-time PFM scheme, depicted in Figure 9, is a bit more complicated. As with the clocked PFM,  $V_{OUT}$  is fed back through a voltage divider to one input of a comparator whose other input is connected to a reference. The output of this comparator controls the trigger of a one-shot multivibrator. Another comparator looks at the peak inductor current as a voltage across a current sense resistor in the source of the N-channel MOSFET switch. When the output is out of regulation, the SR flip-flop turns the NMOS switch on until the voltage across the current sense resistor is equal to the reference voltage. The flip-flop resets, turning off the NMOS switch, the one-shot timer is triggered, and the switch remains off for the duration of the one shot, usually 1 microsecond. If the output voltage limiting comparator is still indicating an out-of-regulation condition, the flip-flop sets again and the cycle repeats itself.

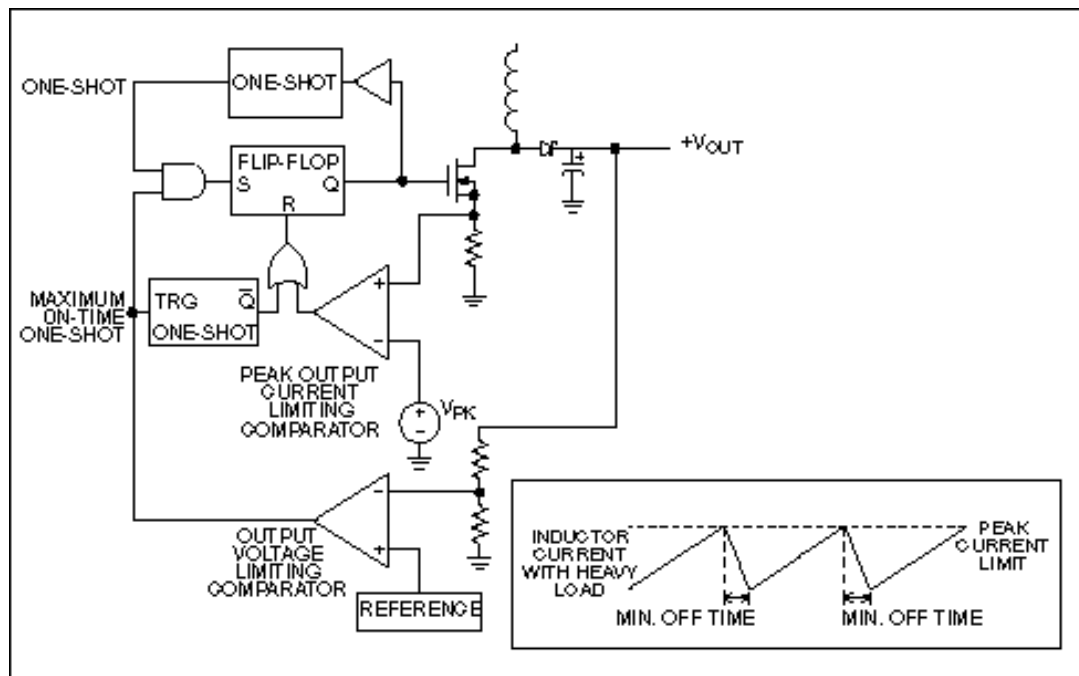


Figure 9. Current-limited minimum-off-time pulse-frequency modulation

Pulse-width modulation comes in a couple of different flavors. In voltage-mode PWM, shown in Figure 10, the divided-down output voltage is fed to an amplifier whose output is the difference between a voltage reference and the divided-down output voltage. This "error voltage" sets the threshold of a comparator whose other input is connected to a ramp generator. The output of the comparator drives the main switch. On a cycle-by-cycle basis, the greater the error voltage, the higher the comparator threshold on the comparator, and the longer the switch is held on. As the switch is held on longer, the peak current in the inductor is allowed to climb higher, storing more energy to serve the load and maintain regulation.

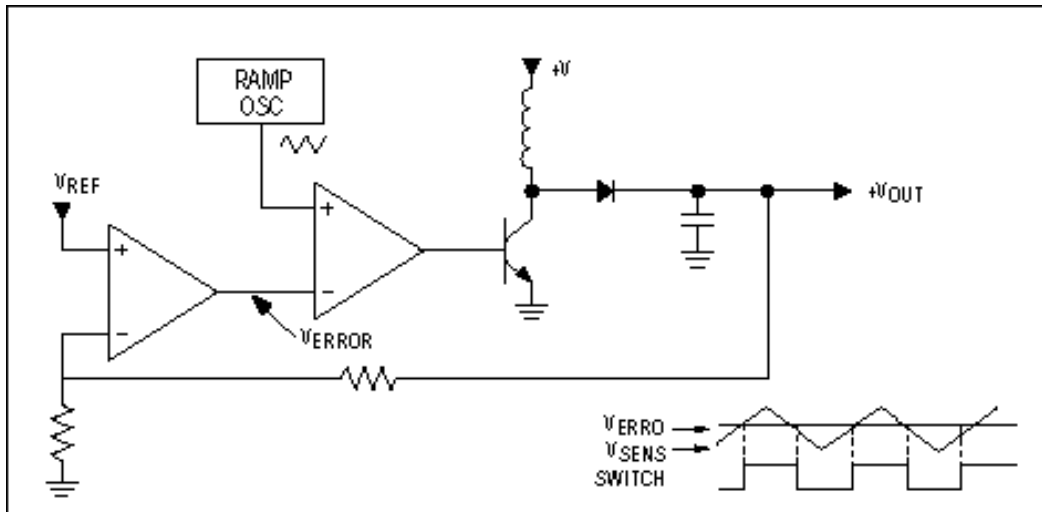


Figure 10. Voltage-mode pulse-width modulation

Current-mode pulse-width modulation (Figure 11) works in a similar fashion but with a key difference. As with the voltage-mode PWM, the divided-down V<sub>OUT</sub> is fed to a different amplifier whose output is the difference between the fed-back V<sub>OUT</sub> and a voltage reference. However, instead of setting the threshold on a ramp generator, this scheme employs a current sense resistor to sense the inductor current and flip-flop to control the switch. With each cycle, the switch is turned on by a pulse oscillator and the current in the inductor ramps up to the threshold set by the error voltage. This control scheme tends to be a bit easier to stabilize than the voltage-mode PWM.

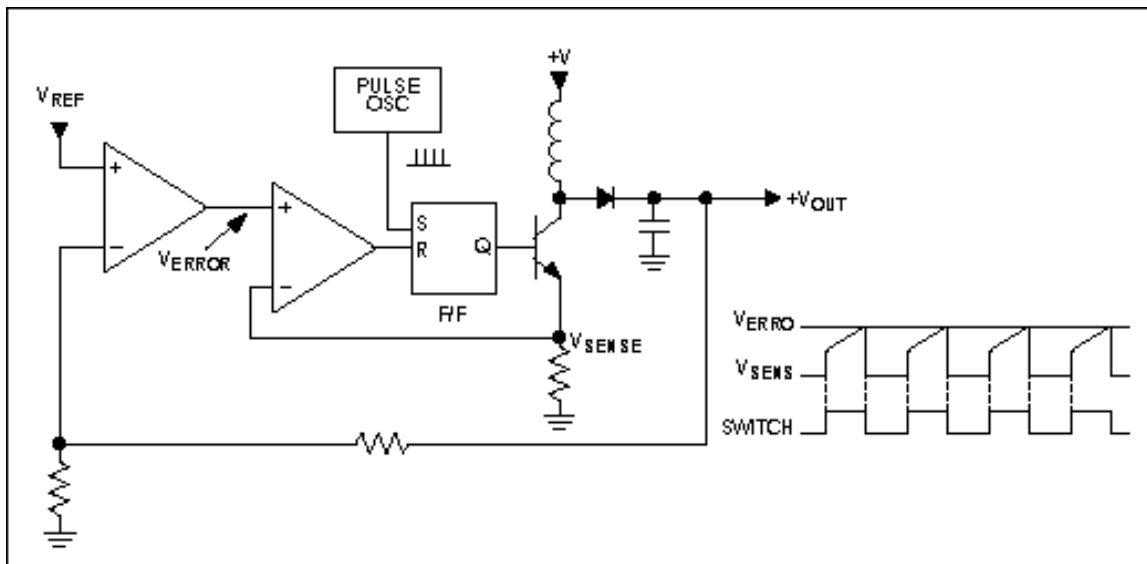


Figure 11. Current-mode pulse-width modulation

In striving for maximum efficiency, one of the largest power-loss factors to consider is that through the diode. The power dissipated is simply the forward voltage drop multiplied by the current going through it. This power dissipation (loss) reduces overall efficiency. To minimize

this loss, most DC-DC switching regulator circuits use Schottky-type diodes whose relatively low forward voltage drop and high speed minimize losses. However, for maximum efficiency, you can use a switch in place of the diode. This is known as "synchronous rectification" (see Figures 12 and 13). The synchronous rectifier switch is open when the main switch is closed, and the same is true conversely. To prevent "crowbar" current that would flow if both switches were closed at the same time, the switching scheme must be break-before-make. Because of this, the diode is still required to conduct the first bit of current during the interval between the opening of the main switch and the closing of the synchronous rectifier switch.

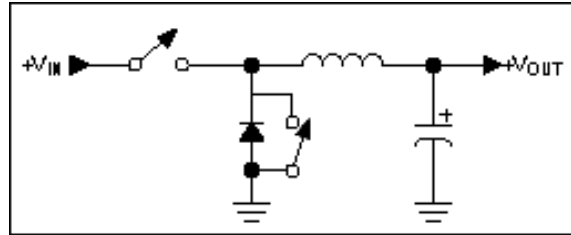
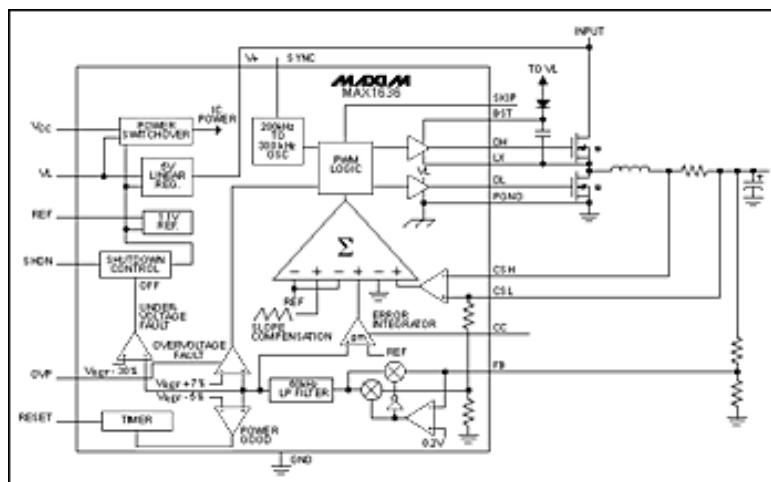


Figure 12. Synchronous rectification



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Figure 13. Example: Synchronous rectified buck regulator

Another variant of PWM is the Idle-Mode™ PWM scheme (Figure 14). This technique combines the best of PFM's efficiency at light loads and PWM's efficiency and low-noise characteristics at higher loads. Thus, at light loads it acts similar to a PFM, skipping pulses as necessary, and at higher loads it acts as a PWM, affording the maximum efficiency over the widest possible load range.

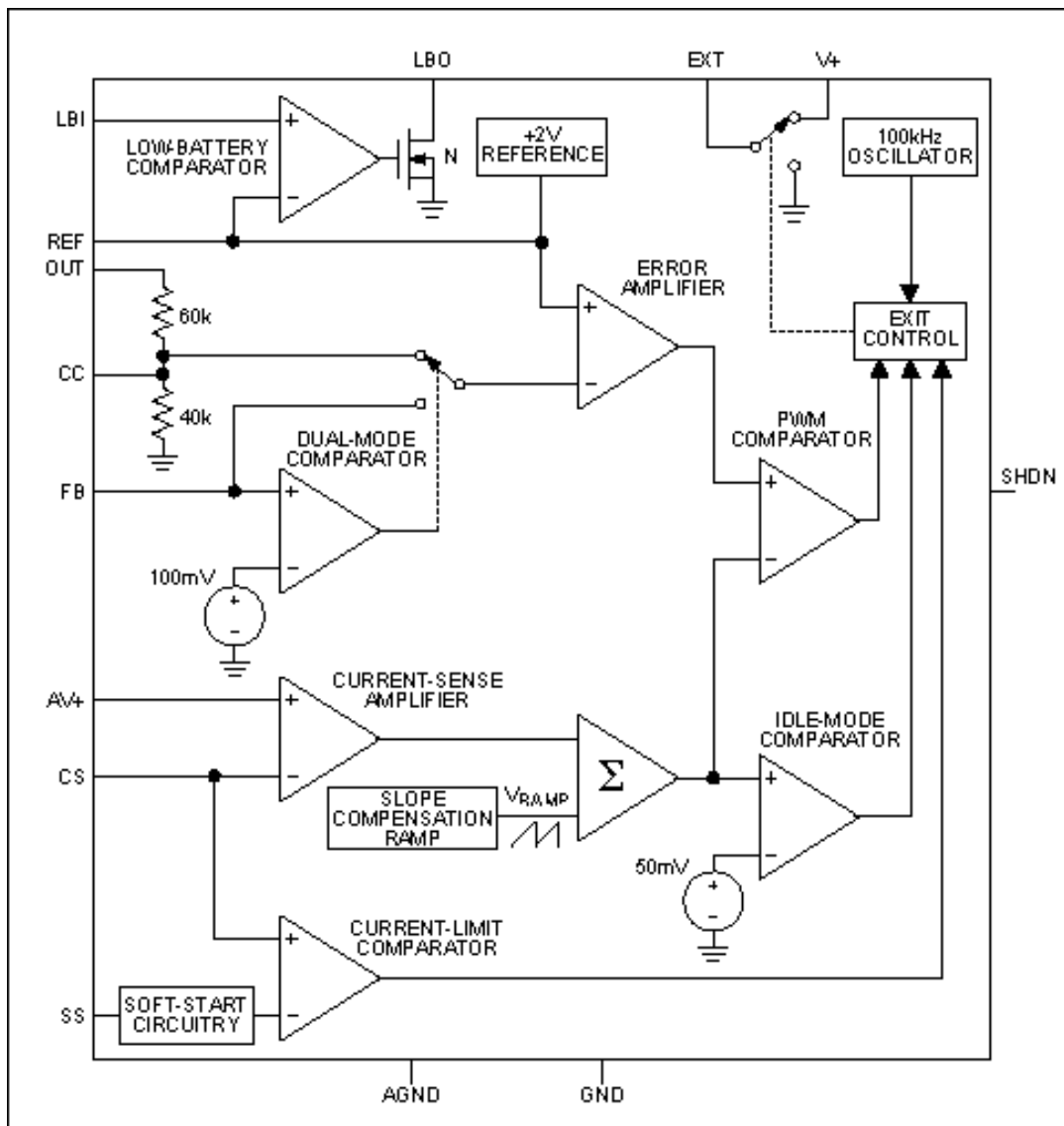


Figure 14. Idle Mode™ PWM

In Figure 15, we see that the efficiency with Idle-Mode PWM is greater than 90% with V<sub>+</sub> = 6V from 20mA or to just over 5A!

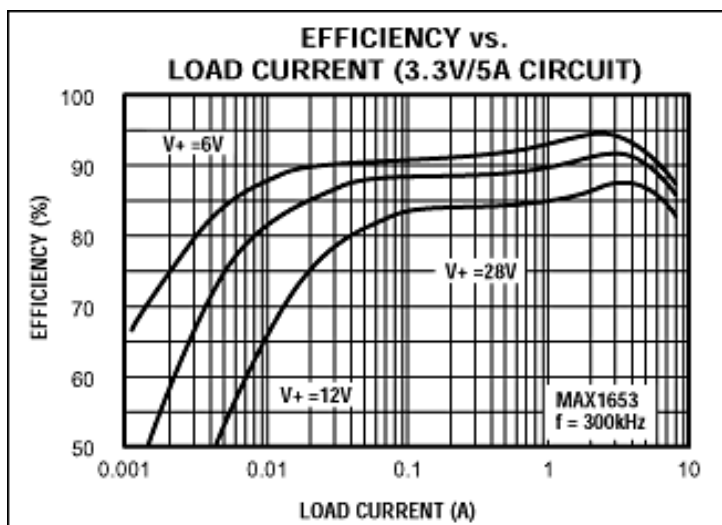


Figure 15. Efficiency with Idle Mode

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by Budgreen on Thu Dec 18th, 2003 at 09:04:27 AM MST  
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Whenever the generator puts out enough power to run the PWM, the system will start transferring power to the house as a buzzing HV spike train.

OK, back to the house.

Where the wire meets the house, drive another deep earth ground rod. Put a 400v 1500uf capacitor(s) between the wire and the ground connection. Run your jumpers from this capacitor down to the large cap bank.

The inductive spikes will collect in a 1:1 POWER ratio with the generator. BUT, the system now has the capability to go much higher than the straight generator voltage, as needed.

Make sure your BATTERY bank is configured to be AT or ABOVE the normal generator voltage output. If you pull the house capacitors LOWER than the normal generator voltage, you'll start to see CURRENT on the wire from the generator, instead of just the radiant (impulse RF???) spikes. You don't want CURRENT since it defeats the purpose of this system.

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[Question for Charged.](#) | 25 comments (25 topical, 0 editorial)



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[Question for Charged.](#) | 25 comments (25 topical, editorial)

Re: Question for Charged. (none / 0) (#14)  
by charged on Fri Dec 19th, 2003 at 10:27:06 AM MST  
([User Info](#))

Another tidbit on the TRIAC/TRANSISTOR pulse circuit.

You could also use a solid-state pulse circuit to drive the triac gate at whatever rate you choose. You can even set up a few separate pulse-circuit pathways. One goes DIRECTLY to the battery from the caps. The other(s) can be wired with a WORKING LOAD in series between the cap bank and the batteries.

The capacitor bank can be used to drive certain types of loads DIRECTLY. BUT, you must place the load IN SERIES with the POSITIVE BATTERY BANK TERMINAL.

This prevents the capacitor bank from falling any lower than battery voltage, thus preventing heavy current-loading of your otherwise pristine incoming radiant pulses.

The discharge will simply be SLOWER, because the load resistance SLOWS DOWN the CHARGE TRANSFER.

Remember, your battery bank is a super-low impedance. You can drive heating elements, lights, DC motors, whatever, just by firing a controlled pulse-train from the caps, through the load, and through the batteries. This also ABSORBS load inefficiency since there is still REAL CURRENT pushed through the batteries in CHARGE MODE while the load is being powered.

Try it. Charge a large electrolytic cap to 25v. Discharge it into a 12v battery IN SERIES with a 12v signal-lamp bulb. Put an ammeter in series also. The discharge is SLOWER. But, all the charge above the battery voltage still passes through the battery as a charging current.

You just powered a bulb with Tesla's "radiant" energy and imparted some charge to your batteries at the same time. This is analogous to the way a reactive load works against an AC signal. The same process can work on DC circuits in this specific arrangement.

Enjoy!

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[Question for Charged.](#) | 25 comments (25 topical, 0 editorial)

Re: Question for Charged. ([none / 0](#)) (#20)  
by charged on Sun Dec 21st, 2003 at 08:46:34 AM MST  
([User Info](#))

Ok, here's a cryptic response for you to ponder. First I'll give you a small experiment, then I'll give you a good off-loading method.

Set up a SMALL cap-discharge charging system as a TEST-BED. Start with something small like a motorcycle battery.

Use a 100ma 12v transformer feeding a large capacitance through a single rectifier (half-wave). Make sure the caps are rated for a minimum of 35v.

This way you have a good experimental input-power control mechanism.

You should end up with about 25v MAX in the caps if you don't discharge them.

Now, set up your TRIAC/TRANSISTOR discharge circuit between the caps and the battery with a 5v zener between the triac gate and the cap positive. High voltage bipolar transistors are better then mosfets for this application. A good IGBT is even better.

For a slightly more advanced control system, use a 555 with an opto-coupled output to drive the triac gate. This way you can set your discharge voltage by changing the pulse-rate. Adjust the pulse-rate while monitoring the battery voltage. Set the 555 to work from about 1.5hz up to 50hz or so, roughly. Start with fast pulses and work your way down in frequency.

Monitor the battery electrolyte temperature during charging compared to the ambient air temperature. You might be suprised at what you see.

Anyway, let the system run until you see the battery outgassing. Make note of the battery voltage at this point. Also make note of the battery temperature at this point.

Now, take a measurement of the specific gravity of the electrolyte. Do an extended load test on the battery to deplete it. Then recharge. Note the TIME it takes for recharging. Do your load test again. Repeat this process about 10 times and you might be very suprised.

In a nutshell, your batteries will behave differently under capacitive charging than they do with direct generator connection. All the "rules" of battery charging that have been written are based on MISMATCHED IMPEDANCE, STEADY-CURRENT charging systems that directly couple the inductive generator output to the ionic charging of the batteries.

Even systems that "pulse" the inductive source directly against the battery cannot do what a capacitive discharge can do.

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Your monitor should be wired to a solid-state relay to divert discharges to the following load assembly:

Ok, OFFLOADING is EASY PICKINS!

It's just a matter of making sure that the caps never get dropped below generator voltage so that the inductive spikes are the only thing coming in on the line.

Cut out 1'x1' plates from 1/16" sheet steel. Stainless is preferred. For a 12v minimum cap voltage system, use 10 plates.

Mount them in a stack using 3/8" teflon standoffs in-between. You'll end up with what looks like a stack of square pancakes with little plastic spacers to keep them from touching each other. Each plate is electrically isolated from the next. Weld a couple of pieces of steel wire to the top and bottom plates on the stack. Hold the stack together with a non-conductive clamping assembly from either end.

Dangle this down about 10" from the bottom of a 55 gallon drum filled with tap water.

The two steel wires should be sticking up out of the water. Nothing should be making electrical contact with the drum surfaces.

This is a gassing H<sub>2</sub>/O<sub>2</sub> load for your discharge circuit. It will build up a scum layer on top of the water from minerals and such. Who cares. Just use a toilet float to keep the drum full of water. Simple stuff.

A small fan and ventilator tube can be attached to the top of the drum to discard the gasses outside the house. Don't try to pressurize this mixture since it WILL detonate at pressures exceeding 35psi.

Dangerous toys:  
For more fun, fill balloons with the mixed gas and ignite them with a 10ft "matchstick". Make sure you're wearing earplugs and safety goggles!

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Re: Question for Charged. ( <a href="#">none / 0</a> ) ( <a href="#">#21</a> ) by charged on Sun Dec 21st, 2003 at 09:28:31 AM MST ( <a href="#">User Info</a> )
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Yikes. I almost forgot something!!! Shame on me.

Make a light alkaline solution in the barrel using lye (red devil drain cleaner). Or for those who are more skiddish, use baking soda and push the solution to saturation.

This makes the water a bit more conductive.

DON'T USE SALT. It causes chlorine gas release. You don't want that.

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[Question for Charged.](#) | 25 comments (25 topical, 0 editorial)

Re: Question for Charged. ([none / 0](#)) (#22)  
 by dualsporter on Sun Dec 21st, 2003 at 01:03:55 PM  
 MST  
 ([User Info](#))

I posted this in another thread.

[4 component load control system](#)

Thought I should post it here too.

A cautionary note about this type of energy transfer.

Accurately measuring energy actually being transferred with this kind of circuit is difficult. DC ammeters are not capable of correctly measuring pulsed currents and an AC ammeter is calibrated to a 60 cycle, true sine current and would return an incorrect reading.

The only proper method is via an oscilloscope across an appropriate current shunt and is a little subjective as to how to read it. The energy in a pulse is interpreted as the "area" above/below the zero threshold and contained within the displayed waveform. (inside the trace) Pulsed energy delivery systems are notorious for getting people excited about what actually is a less than stellar performance.

True energy transfer is measured not just in "watts" but in "watt time". (WattSeconds, KilowattHours, etc.) Kevin (kww - from previously mentioned thread) made note that his triac can handle 6 amps at 400 volts for a wattage of 2400 watts. My question would then be "What is the duration of that pulse and how often does it refire?" A 2400 watt pulse that lasts only 10 milliseconds (typical heavy current squarewave pulse) is only 24 wattseconds. If this circuit were pulsing once per second, the time averaged energy transfer would only be 24 watts.

Also, the 400 volts of the specified pulse is only the peak instantaneous voltage of the pulse and is preceded and followed by the ramping voltages which compose the majority of the pulse. These ramping voltages are obviously lower and therefore these areas of the pulse carry wattage that is correspondingly lower.

Just a couple of notes of caution regarding getting overly excited before the numbers are in. I admit that the concept of transferring full mill energy via a small gauge feed line has me interested.

Dualsporter

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Re: Question for Charged. ([none / 0](#)) (#23)  
by charged on Sun Dec 21st, 2003 at 01:49:07 PM MST  
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Also responded to in other thread.

<http://www.fieldlines.com/story/2003/12/20/94735/814>

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Re: Question for Charged. ([none / 0](#)) (#24)  
by dualsporter on Sun Dec 21st, 2003 at 06:13:41 PM MST  
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Ditto

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by charged on Mon Dec 22nd, 2003 at 07:03:59 AM  
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Here's the basics of how I've tested the system for power transmission. This is not the test for flyback efficiency. It's ONLY to prove the transmission efficiency of this process. Nothing more. Flyback efficiency is another issue based on transformer engineering. In a nutshell, whip up a GOOD 1:1 transformer that can handle the FULL current of your generator through it's primary and you'll have the best results.

I start out with the basic driver and a current source. I put a VERY large capacitance across the driver circuit and the LARGE inductance in series between the battery and that capacitor. My analog ammeter goes in series between the battery positive and the inductor. The scope shows a slight ripple down in the mv range. My digital VOM also shows a slight AC ripple in the mv range. The analog meter just reads a steady current when the flyback is operating.

With just a short lead, a 12" #18 alligator jumper pair, I charge a 400,000uf capacitor bank from the flyback emf.

Using a 10v zener triggered triac that drives a power transistor base in a darlington type arrangement, The cap discharges into another 12v battery at about 22v, plus or minus a little depending on the actual battery voltage.

This is a 4 Coulomb discharge (10v x .4F). By counting the number of discharges per second, you get your baseline for what's coming out of the flyback.

NEXT, run about 500 ft of #24 twin-lead out in a big loop.

Disconnect the short jumpers and connect the flyback to one end of the twin-lead. Connect your cap to the other end.

The cap charges as the same rate, UNLESS you discharge the caps to a voltage LOWER than the primary source voltage. Then you're below the 1:1 emf ceiling and you're drawing more primary current. You CAN

lower this ceiling by putting more turns on the primary and fewer turns on the secondary.

If you discharge the caps to 0v, it takes a while for them to come up to battery voltage (resistance on the line to the current). Once they've reached that point, the charging speeds up again.

This is Tesla's post-1890 methodology. He declared his own AC systems to be a failure because of the later discoveries dealing with short-duration UNIDIRECTIONAL impulses.

Many have treated his later inventions as some sort of insane mystical enterprise. In fact, the impulse power transmission methods work very well, once you understand how to apply them. Tesla patented the processes. But, he didn't include a full tutorial in his patents. Someone else explained to me how to apply it. I, in turn, hand it over to the home-power crowd. Hopefully, someone will get some use out of it.

There's the full autobiography text. Good reading for those interested in what floated through Tesla's mind.

<http://www.lucidcafe.com/library/96jul/teslaautobio.html>

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This is a 4 Coulomb discharge (10v x .4F). By counting the number of discharges per second, you get your baseline for what's coming out of the flyback.

NEXT, run about 500 ft of #24 twin-lead out in a big loop.

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Disconnect the short jumpers and connect the flyback to one end of the twin-lead. Connect your cap to the other end.

The cap charges at the same rate, UNLESS you discharge the caps to a voltage LOWER than the primary source voltage. Then you're below the 1:1 emf ceiling and you're drawing more primary current. You CAN lower this ceiling by putting more turns on the primary and fewer turns on the secondary.

If you discharge the caps to 0v, it takes a while for them to come up to battery voltage (resistance on the line to the current). Once they've reached that point, the charging speeds up again.

This is Tesla's post-1890 methodology. He declared his own AC systems to be a failure because of the later discoveries dealing with short-duration UNIDIRECTIONAL impulses.

Many have treated his later inventions as some sort of insane mystical enterprise. In fact, the impulse power transmission methods work very well, once you understand how to apply them. Tesla patented the processes. But, he didn't include a full tutorial in his patents. Someone else explained to me how to apply it. I, in turn, hand it over to the home-power crowd. Hopefully, someone will get some use out of it.

There's the full autobiography text. Good reading for those interested in what floated through Tesla's mind.

<http://www.lucidcafe.com/library/96jul/teslaautobio.html>

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[Question for Charged.](#) | 25 comments (25 topical, 0 editorial)



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## My Inventions The Autobiography of Nikola Tesla

---

### Introduction

Nikola Tesla was born in Croatia (then part of Austria-Hungary) on July 9, 1856, and died January 7, 1943. He was the electrical engineer who invented the AC (alternating current) induction motor, which made the universal transmission and distribution of electricity possible. Tesla began his studies in physics and mathematics at Graz Polytechnic, and then took philosophy at the University of Prague. He worked as an electrical engineer in Budapest, Hungary, and subsequently in France and Germany. In 1888 his discovery that a magnetic field could be made to rotate if two coils at right angles are supplied with AC current 90° out of phase made possible the invention of the AC induction motor. The major advantage of this motor being its brush less operation, which many at the time believed impossible.

Tesla moved to the United States in 1884, where he worked for Thomas Edison who quickly became a rival Edison being an advocate of the inferior DC power transmission system. During this time, Tesla was commissioned with the design of the AC generators installed at Niagara Falls. George Westinghouse purchased the patents to his induction motor, and made it the basis of the Westinghouse power system which still underlies the modern electrical power industry today. He also did notable research on high-voltage electricity and wireless communication; at one point creating an earthquake which shook the ground for several miles around his New York laboratory. He also devised a system which anticipated worldwide wireless communications, fax machines, radar, radio- guided missiles and aircraft.

Nikola Tesla is the true unsung prophet of the electronic age; without whom our radio, auto ignition, telephone, alternating current power generation and transmission, radio and television would all have been

impossible. Yet his life and times have vanished largely from public access. This autobiography is released to remedy this situation.

---

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### Purchase These Books By Nikola Tesla

- **My Inventions: The Autobiography of Nikola Tesla** - Author: Nikola Tesla, Ben Johnston (Editor)

Tesla's autobiography, the text of which is included in these pages, is available in paperback. This autobiography was originally printed as a series of six magazine articles in "The Electrical Experimenter" magazine. This edition is complete with illustrations.

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- **Colorado Springs Notes 1899-1900** - Author: Nikola Tesla

This reprint of Tesla's working journal during the period of his Colorado experiments provides insight into his thought processes and methods of working.

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Re: Question for Zubbly ([none / 0](#)) (#2)  
by Jerry on Wed Dec 10th, 2003 at 10:17:14 AM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Thanks Zubbly

I'll be making considerations of what magnet arrangement to use. I like what you did with the small magnets and the cage thing. I'm not sure I'm skilled enough to try that however. I do like the idea of low cogging. Have you considered a prop for this one. I'm sure it will be larger than the props I've been building.

This motor is quite abit lighter than my 200 lb. genny so the yaw bearing system shouldn't be to hard to build?

I've got the yaw system together for the 200 lb. genny but wieghting for free time and a break in the weather to put it up. It will be a heavy chalange.

Would you conider building a cage for my 7.5 hp motor if I shipped you the armature?

E-mail me with your descusion on this last ? Thanks.

JK TAS Jerry

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Re: Question for Zubbly ([none / 0](#)) (#3)  
by zubbly on Thu Dec 11th, 2003 at 07:46:22 PM MST  
([User Info](#))

Hi Jerry!

sorry i did not post the pics you wanted yet. i shall get it done this weekend.

i am flattered that you would consider having me build your rotor for you. as it is i am extremely pressed for time for my own projects, as well as getting time for the family things. at this time Jerry, i would not be able to consider it. however, i will try to get a post up for you giving all the detail on just exactly how to do it.

it does not take a lot of skill. i have ironed out all the bugs ofdoing it and will gladly share all the info with you. i know you can do it!

have fun-zubbly

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[22 batteries 48 volt bank.](#) | 12 comments (12 topical, editorial)

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Re: 22 batteries 48 volt bank. ([none / 0](#)) ([#2](#))  
by RobD on Wed Dec 10th, 2003 at 07:57:41 AM MST  
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by Jerry on Wed Dec 10th, 2003 at 10:28:09 AM MST  
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They are a sealed gell cell. They were used in helicopters. Because of this they are very rigid and reliable. The guy I got these from siad the first time he saw one a guy was welding with it. I belive that cause when I acceadentially shorted the termanels there was quite a fire ball.

I think some folks here have said this type of battery is not good for RE use but I got them cheap and they've been working great for me.

JK TAS Jerry

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Re: 22 batteries 48 volt bank. ([none / 0](#)) ([#6](#))  
by Budgreen on Wed Dec 10th, 2003 at 07:31:32 PM MST  
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well, here we go (beware dialup)  
to many batteries



to few racks



these racks will hold 24 of the 60 cells I have, each is rated at 2v200AH so the total in my basement when i finish getting it hooked up will be 24v@400Ah

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by Jerry on Wed Dec 10th, 2003 at 08:37:39 PM MST  
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Re: 22 batteries 48 volt bank. ([none / 0](#)) ([#9](#))  
by Budgreen on Thu Dec 11th, 2003 at 06:43:46 AM  
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oops, what I meant to say was my total system will eventually be 24v@1000Ah when i find the space to mount it all. gotta love the work in progress stuff

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Re: 22 batteries 48 volt bank. ([none / 0](#)) ([#9](#))  
by Budgreen on Thu Dec 11th, 2003 at 06:43:46 AM MST  
([User Info](#))

oops, what I meant to say was my total system will eventually be 24v@1000Ah when i find the space to mount it all. gotta love the work in progress stuff

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[22 batteries 48 volt bank.](#) | 12 comments (12 topical, 0 editorial)

Re: 22 batteries 48 volt bank. ([none / 0](#)) ([#8](#))  
by BT Humble ([za2bb@optusnet.com.au](mailto:za2bb@optusnet.com.au)) on Wed Dec 10th, 2003 at 10:54:18 PM MST  
([User Info](#)) <http://www.geocities.com/za2bb/>

1100Ah @ 24VDC (at the 10 hour rate).



You can see the rest of the system at <http://www.geocities.com/za2bb/solar/>

BTH

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# B.T. Humble's home page

This is just a small photo gallery, mostly motorcycle related.

[My garage](#)

[The prangs I've had](#)

[Some of my favourite photos \(not all motorcycle related\)](#)

[A 525km day trip \(May 2002\)](#)

[My 2002 Odyssey \(July-September 2002\)](#)

[The Snowy Ride \(November 2002\)](#)

[My view of the aus.moto Eclipse Run \(December 2002\)](#)

[A week with Minx \(December 2002\)](#)

[My old bike is reborn \(January 2003\)](#)

[My new farmlet!](#)

[Canberra Bushfires \(January 2003\)](#)

[Superbikes \(March 2003\)](#)

[The aus.moto Tarago rally #1 \(April 2003\)](#)

[My solar power system. \(July 2003\)](#)

[Kel's party \(August 2003\)](#)

[MS Tech Ed, or Your Tax Dollars At Work \(August 2003\)](#)

[How to build a GPX250 luggage rack \(November 2003\)](#)

If you want to contact me for some reason, you can email me at [za2bb@optusnet.com.au](mailto:za2bb@optusnet.com.au)

## My Solar Power System



The switchboard consists of a charge controller (yellow box), inverter (blue box) and a Real Big Switch.



Half of the battery bank.



The whole battery bank - 1100Ah at 24V. Total weight ~ 1500kg.



The solar panels on my roof. There are 2 more to come, for a total of 560 Watts.



The rear of the solar panels, showing my homebrew rack. The timber is to prevent scratches on the colourbond roofing.

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Re: 22 batteries 48 volt bank. ([none / 0](#)) ([#10](#))  
by wpowokal on Thu Dec 11th, 2003 at 07:12:16 AM MST  
([User Info](#))

24v system, 8 banks of 660 ah Excide flouded lead acid.  
[http://66.140.203.100/gallery/allan/power\\_in\\_out\\_small](http://66.140.203.100/gallery/allan/power_in_out_small)

regards Allan

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by wpowokal on Thu Dec 11th, 2003 at 07:15:42 AM MST  
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Ops wrong pic, try this.  
<http://66.140.203.100/gallery/allan/batteries2>

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by BT Humble ([za2bb@optusnet.com.au](mailto:za2bb@optusnet.com.au)) on Thu Dec 11th, 2003 at 07:14:04 PM MST  
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Allan's Album

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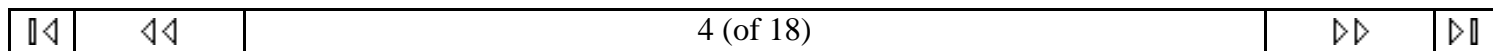


## power in out small

**Description:** Digie metre is reading sys volts, L/H metre is wind genie output around 14A, centre KW load on inverter 0-5Kw, right is sola input around 55A. Currently working on digital metres but I still love my anolouge metres.

This was a greate power day, big wind and full sun, wind amps were often peaking off scale.

[\[add comment\]](#)



Gallery: [Welcome to the Otherpower IRC Photo Gallery](#) ↗ Album: [Allan's Album](#) ↗

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Nice Exide Faure-X collection! (I thought I was the only guy using them!)

That's a nice shelving system too. I've been thinking about how to arrange mine once I move, and you've given me a few ideas. ;-)

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## My batteries

**Description:** 8 banks at 24v 650ah Excide failure X

These were second hand from the power station I retired from, in their past life they were on trickle charge, to the best of my 22 years there never used in anger.

I don't know the exact age of this set, but they are not 22 years old.

[\[add comment\]](#)

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[Small Disc Alt](#) | 4 comments (4 topical, editorial)

Re: Small Disc Alt ([none / 0](#)) ([#3](#))  
by Jerry on Wed Dec 10th, 2003 at 10:42:13 AM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Ted  
You and Charged are responsible for my trying this. After seeing your posts.  
I have a few hundred of these little transformers. They are audio isolatin trans. with a 1 to 1 ratio. When both coils are siriased it measures 2 ohm,s DC. I cut the laminations so there are a "T". I place the top of the "T" in the round slot where normally a circle of lamination matereal would go. This alowed the "T" part to almost tuch. I filled the small void between each "T" with JB Weld. It has steel in it so it bridged the magnetic gap between transformers. The cogging was bad until rpm was up.

JK TAS Jerry

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[Small Disc Alt](#) | 4 comments (4 topical, editorial)

Re: Small Disc Alt ([none / 0](#)) ([#2](#))  
by Old F on Wed Dec 10th, 2003 at 08:45:59 AM MST  
([User Info](#)) <http://www.oldf.homestead.com>

Jerry

Here is a inductor coil I found at a Ham swap meet I got 32 of them at 50 cents each.

The guy that I got them from said they were for speaker cross overs.

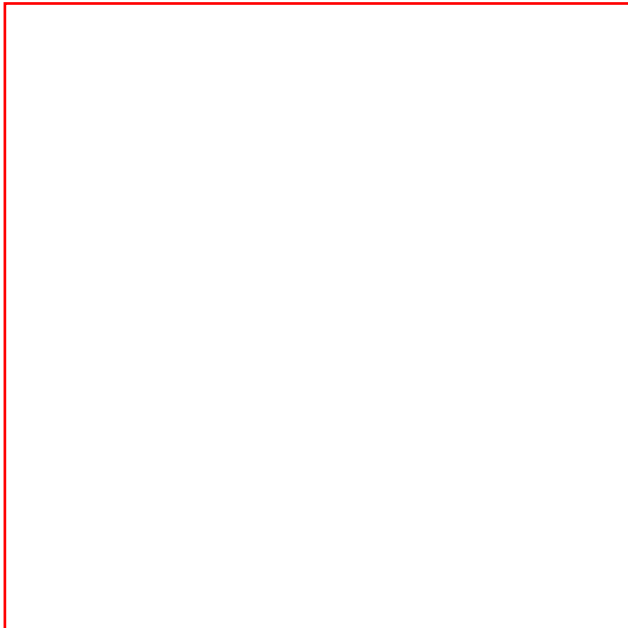
I tested one with eight neos 3/4 by3/4 by1/4 on the 6 inch face plate on my lathe.

I got 3.4 voltes at 138 rpm with a 1/4 inch air gap. This is as slow as the lathe would go.

Cogging has been my main worry for not going any farther than this the tool post that I had clamped the coil in had some play in it and shook like the devil.

Keep them flying

Old F



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Re: Small Disc Alt ([none / 0](#)) ([#4](#))  
by Jerry on Wed Dec 10th, 2003 at 10:53:12 AM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

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Hi Old F

Yes these are subwoofer crossover coils. We don't use these at our stereo shop because you loose 36 watts out of 100 watts in this coil. We do use them as part of a hipass xover for midrange speakers some times however. I have these also.

Dan B did an expiriment with a simular coil arangement befor he discovered the disc alt. I think preformance was poor however so the idea was not persude.

I'm getting the same voltage from the small disc alt no load per coil but very low amperage. In thirory it should have worked but in reality I'm moveing on to the normal laminations and coils. I am however going to use small gage wire and do a diode bridge for each coil.

Its that large # of small things working together?

JK TAS Jerry

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[Small Disc Alt](#) | 4 comments (4 topical, 0 editorial)



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[Small Disc Alt](#) | 4 comments (4 topical, editorial)

Re: Small Disc Alt ([none / 0](#)) ([#4](#))  
by Jerry on Wed Dec 10th, 2003 at 10:53:12 AM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

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[Switching power supply experiment.](#) | 7 comments (7 topical, 0 editorial)

Re: Switching power supply experiment. ([none](#) / [0](#)) (#1)  
by Jerry on Sun Dec 7th, 2003 at 11:56:35 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Just a note. The input amperage on this supply is listed at 2.1 amps. Not bad consumption for the out put its rated.  
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Re: Switching power supply experiment. ([none / 0](#)) (#2)  
by [kell](#) on Mon Dec 8th, 2003 at 11:22:27 AM MST ([User Info](#))

Sure you can run DC into it. If the supply has a full bridge (four diodes) at its input, it won't even matter what polarity.

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Re: Switching power supply experiment. ([none / 0](#)) (#3)  
by Seth on Mon Dec 8th, 2003 at 04:48:42 PM MST ([User Info](#))

I must of missed it.... where did u get this thing??

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Your using one right now. Its in your computer.

JK TAS Jerry

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Re: Switching power supply experiment. ([none / 0](#)) (#5)  
by Seth on Tue Dec 9th, 2003 at 11:25:47 AM MST ([User Info](#))

Ahhh .... didnt realise that these computer supply's were adjustable....

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Re: Switching power supply experiment. ([none / 0](#)) (#6)  
by Jerry on Fri Dec 12th, 2003 at 09:05:04 PM MST ([User Info](#)) <http://www.dplusv.com/Photo-03.html>

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Re: Switching power supply experiment. ([none / 0](#)) (#7)  
by Nando on Sun Dec 28th, 2003 at 02:20:17 PM MST ([User Info](#))

JT Tas Jerry:

By the way: Human power, long term, is defined as a 75 watts source with about 150-200 watts short time power peaks.

For wind mills that have high variable generated voltage, a converter is the ideal case, basically like yours.

The Switching power supplies, most of them that have wide AC voltage range ( 85 to 240 AC )are designed to operate at high voltage -- 230 to 340 volts DC.

So the input has a switch ( some are automatic) for voltage range 120 or 230 input AC Voltage.

This AC voltage is then doubled rectified for the low range or and for the high range, full wave rectified and filtered then the high frequency converter does the rest.

For this type of converter to operate with the wind mill several things are needed>

The best is to have a converter with PFC ( Power Factor Correction) to accept all the voltage range directly without problems, and if you can furnish DC or rectified DC single or 3 phases ( 230 to 360 volts DC).

Mouser and/or Digikey may sell some of those chargers at low price, like a non-PFC converter, 250 watts for around 80 USA dollars. ( for single 12, 24 & 48 outputs)

The system should, as well, have a Controller for overvoltage and over-RPM protection to present a dump load to the generator, the best is a duty cycle controller to present a variable load to the generator to maintain accurate regulaed output voltage under wide wind and load variations.

This duty Cycle controller, that I have designed is just a power MOSFET with a Mosfet driver and a LM339 that produces a triangular low frequency ( ~ 200 Hertz) and a comparator to duty cycle the MosFet ON/OFF times. In some cases an amplifier is needed to insure proper operation

Regards

Nando

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The Switching power supplies, most of them that have wide AC voltage range ( 85 to 240 AC )are designed to operate at high voltage -- 230 to 340 volts DC.

So the input has a switch ( some are automatic) for voltage range 120 or 230 input AC Voltage.

This AC voltage is then doubled rectified for the low range or and for the high range, full wave rectified and filtered then the high frequency converter does the rest.

For this type of converter to operate with the wind mill several things are needed>

The best is to have a converter with PFC ( Power Factor Correction) to accept all the voltage range directly without problems, and if you can furnish DC or rectified DC single or 3 phases ( 230 to 360 volts DC).

Mouser and/or Digikey may sell some of those chargers at low price, like a non-PFC converter, 250 watts for around 80 USA dollars. ( for single 12, 24 & 48 outputs)

The system should, as well, have a Controller for overvoltage and over-RPM protection to present a dump load to the generator, the best is a duty cycle controller to present a variable load to the generator to maintain accurate regulaed output voltage under wide wind and load variations.

This duty Cycle controller, that I have designed is just a power MOSFET with a Mosfet driver and a LM339 that produces a triangular low frequency ( ~ 200 Hertz) and a comparator to duty cycle the MosFet ON/OFF times. In some cases an amplifier is needed to insure proper operation

Regards

Nando

[Switching power supply experiment.](#) | 7 comments (7 topical, 0 editorial)

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[200 LB PMA](#) | 2 comments (2 topical, editorial)

Re: 200 LB PMA ([none / 0](#)) ([#1](#))  
by Norm on Fri Nov 28th, 2003 at 08:27:04 AM MST  
([User Info](#))

I've been wondering, since I've never had a motor/generator near that big to try it out on....would it be easier to 'pedal power' something like this to charge a battery? It could be 1:1 ratio chain drive using something like your flywheel exercise bicycle...yeah I know it would be kind of overkill but just out of curiosity....Well maybe not quite that big big...but big enough to put out some charging current at 80-90 rpm 1:1 ratio...foot power?

[200 LB PMA](#) | 2 comments (2 topical, 0 editorial)

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[200 LB PMA](#) | 2 comments (2 topical, editorial)

Re: Jerry's pics ([none / 0](#)) ([#2](#))  
by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Fri Nov 28th, 2003 at 10:34:01 AM MST  
([User Info](#))

BTW Jerry, your pics are looking great from here! Keep 'em coming.  
ADMIN

[200 LB PMA](#) | 2 comments (2 topical, 0 editorial)

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[One more time](#) | 1 comment (1 topical, editorial)

Re: One more time ([none / 0](#)) ([#1](#))  
by Jerry on Thu Nov 27th, 2003 at 09:25:48 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Oh sorry BIG goof this time. This is a picture of my pump power supply. Or some would call it my mechanical inverter.

There are 2 two HP dc motors. One on each side of a 5500 watt 240 ac generator. This was powered by 20 12 volt batteries. They went bad last winter and I've not replaced them yet. This combo runs my well pump great. No load 260 volts and while pumping 242 volts. Just right.

JK TAS Jerry

[Airheads Page](#)

[One more time](#) | 1 comment (1 topical, 0 editorial)

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- [hvirtane](#)
- [DanB](#)
- [Gordy](#)
- [electronbaby](#) (3)
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[Trying Pix again?](#) | 4 comments (4 topical, editorial)

Re: Trying Pix again? ([none / 0](#)) ([#1](#))  
by drdongle on Fri Nov 28th, 2003 at 06:07:22 AM MST  
([User Info](#))

Very cool, but whats the story on the secons picture, use and specifications?

Dr.D

[Trying Pix again?](#) | 4 comments (4 topical, 0 editorial)

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Re: Trying Pix again? ([none / 0](#)) ([#2](#))  
by Norm on Fri Nov 28th, 2003 at 09:20:04 AM MST  
([User Info](#))

Are those Jerry blades or Mikemods? Norm.

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Re: Trying Pix again? ([none / 0](#)) ([#3](#))  
by TomW on Fri Nov 28th, 2003 at 09:33:55 AM MST  
([User Info](#))  
<http://oneota.net/~earthsourcepowr/>

Norm;

They appear to be the Mike Mods on the Jerry Blades.

Stock blades on the left Mike Mods on the right:

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- [Harry Luubovv](#)
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Cheers.

TomW

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Re: Trying Pix again? ([none / 0](#)) ([#4](#))  
by Jerry on Fri Nov 28th, 2003 at 10:34:37 AM MST  
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[Trying Pix again?](#) | 4 comments (4 topical, 0 editorial)



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[Exersize bike pix.](#) | 3 comments (3 topical, editorial)

Re: Exersize bike pix. ([none / 0](#)) (#1)  
by Jerry on Thu Nov 27th, 2003 at 09:06:45 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

I realy need to use this after eating to much turkey today?

JK TAS Jerry

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[Exersize bike pix.](#) | 3 comments (3 topical, 0 editorial)

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- [hvirtane](#)
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[Exersize bike pix.](#) | 3 comments (3 topical, editorial)

Re: Exersize bike pix. ([none / 0](#)) (#1)  
by Jerry on Thu Nov 27th, 2003 at 09:06:45 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

I realy need to use this after eating to much turkey today?

JK TAS Jerry

[Airheads Page](#)

Re: Excersize bike pix. ([none / 0](#)) (#2)  
by TomW on Thu Nov 27th, 2003 at 10:53:35 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Jerry;

Great pics. I fixed things up hope all the pics are there you wanted.

Your biggest problem posting for proper size is you must hit the enter key after you finish typing the text and before you click that add photo button. It ensures the pic is on its own line and works like a charm.

Cheers.

TomW

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Re: Exersize bike pix. ([none / 0](#)) (#3)  
by Norm on Fri Nov 28th, 2003 at 09:14:57 AM MST  
([User Info](#))

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by Norm on Fri Nov 28th, 2003 at 09:14:57 AM MST  
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[Response to the drill ?](#) | 2 comments (2 topical, editorial)

Re: Response to the drill ? ([none / 0](#)) ([#1](#))  
by kurt on Thu Nov 27th, 2003 at 06:59:49 PM MST  
([User Info](#))

when you post a response the title of the post becomes the "subject" of the response and can be changed in the box under your name when you post a response.

when a story has a long title sometimes it causes problems with responses and you need to shorten it or change it to something shorter when you reply



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[Response to the drill ?](#) | 2 comments (2 topical, editorial)

Re: Response to the drill ? ([none / 0](#)) ([#2](#))  
by hydrosun on Fri Nov 28th, 2003 at 06:37:53 PM MST  
([User Info](#))

10 years ago I bought an old craftsman 6 volt cordless with built in batteries which soon died. I pulled the batteries and ran a cord out to plug into my 12 volt house system. Used it for years for light duty work. It just ran faster than with the batteries. If the gearing can handle the load and you don't push it harder than before the only problem would be heat in the motor coils. I didn't have to worry about how much the voltage dropped in the long cord and thin extension cord because I could lose half the voltage and still use the drill.

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- [signweld](#)
- [jeanpaul](#)
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[More Lamination Dialog?](#) | 3 comments (3 topical, editorial)

Re: More Lamination Dialog? ([none / 0](#)) ([#1](#))  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Wed Nov 26th, 2003 at 11:43:52 PM MST  
([User Info](#)) <http://www.internetfred.com>

Hi Jerry.

A couple years ago I had a bunch and can also get hold of a lot of these coils, I remember the oil that was in them, I do not beleive that there where pcb's in them, I did do extensive google search and nothing popped up. Mostly what I do remember was that pcb's where found in larger transformers used in street lighting, you might also find them in old neon sign transformers and most of that looked like liquid black tar, very dark in color. As for the wire, there is lot's of #20 I think for the primary and #30 for the secondary, very easy to remove the windings. Good resource for wire now that you mention it. maybe others could shed some light on the pcb issue, I'm interested in this question as well.

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On PCBs ([none / 0](#)) ([#2](#))  
by wdyasq on Thu Nov 27th, 2003 at 06:18:41 AM MST  
([User Info](#))

One would think there is a particular year where PCB's were banned from use. If one used a coil built after that year, one should be OK. BUT, car companies had a lot of exemptions from enviromental rules so that may not be true.

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Identifying PCBs ([none / 0](#)) ([#3](#))  
 by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Thu Nov 27th, 2003 at 09:24:21 AM MST  
[\(User Info\)](#)

From a university of toronto website.....might help. Looks like you only need to worry about anything made before 1980, and only high voltage transformers. The part about ballast capacitors in old flourescent lights was new to me though.

\*\*\*\*\*

#### 4.2 TRANSFORMERS

Since the 1930's, a generic fluid called "askarel" containing 40-70% PCBs were used in high voltage transformers. Commercial Aroclors were blended with trichlorobenzene. Askarel is the genetic term used to identify the combination of Aroclor and trichlorobenzene. A typical Askarel transformer may contain 30-40% PCBs and as high as 65%. Contaminated mineral oil usually contains < 1% PCBs.

PCB-contaminated transformers can usually be distinguished by the nameplate on the transformer located on the outside casing. If the following brand names appears on the nameplate, the transformer contains PCBs:

TABLE 1: TRADE NAMES OF PCB-CONTAMINATED TRANSFORMERS

Apirolio [Italian]	Kaneclor [Japan]
Aroclor	Montar
Asbestol	NoFlamol
Chorextol	Phenoclor [France]
Chorinol	Pydraul
Clophen [German]	Pyralene
Diaclor	Pyroclor
DK (decachlorodiphenyl) [Italy]	Saf-T-Kuhl
Dykanol	Santotherm FR [Japan]
Elemex	Sorol
Eucarel	Therminol FR
Fenclor [Italy]	
Hyvol	
Inerteen	

In addition, the "Type Number" also indicates if the

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#### Who's Online? (18)

- [signweld](#)
- [Putte](#)
- [wind pirate](#)
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transformer contains PCBs. Any Type Number beginning with "L" indicates that the transformer is PCB-contaminated. Some Type Numbers are: LFAF, LFAN, LFWN, LNAF, LNP, LNS, LNWN, and LNWN.

#### 4.3 CAPACITORS

Almost every capacitor manufactured between 1930-1980 contains PCB dielectric liquids. Capacitors in electrical equipment vary in sizes from ice cubes to larger than refrigerators. Capacitors are classified as large when they contain > 0.5 kg of PCBs. Small capacitors are generally associated with electronic or lighting equipment. Fluorescent light ballasts also contain capacitors. Light ballasts are discussed below.

Capacitors may be found in a variety of locations within a building for example connected to A.C. motors > 30 hp wired to the electrical terminals. A capacitor often can be recognized by the letters KVAR stamped on its nameplate. Capacitors may vary in size from 5 KVAR to 200 KVAR range. Capacitors are hermetically sealed to reduce leakage. Unless clearly indicated on the equipment, or the date of purchase can be confirmed to be after 1980, most capacitors in use must be assumed to be contaminated with PCBs unless tests have verified their absence.

##### 4.3.1. BALLASTS

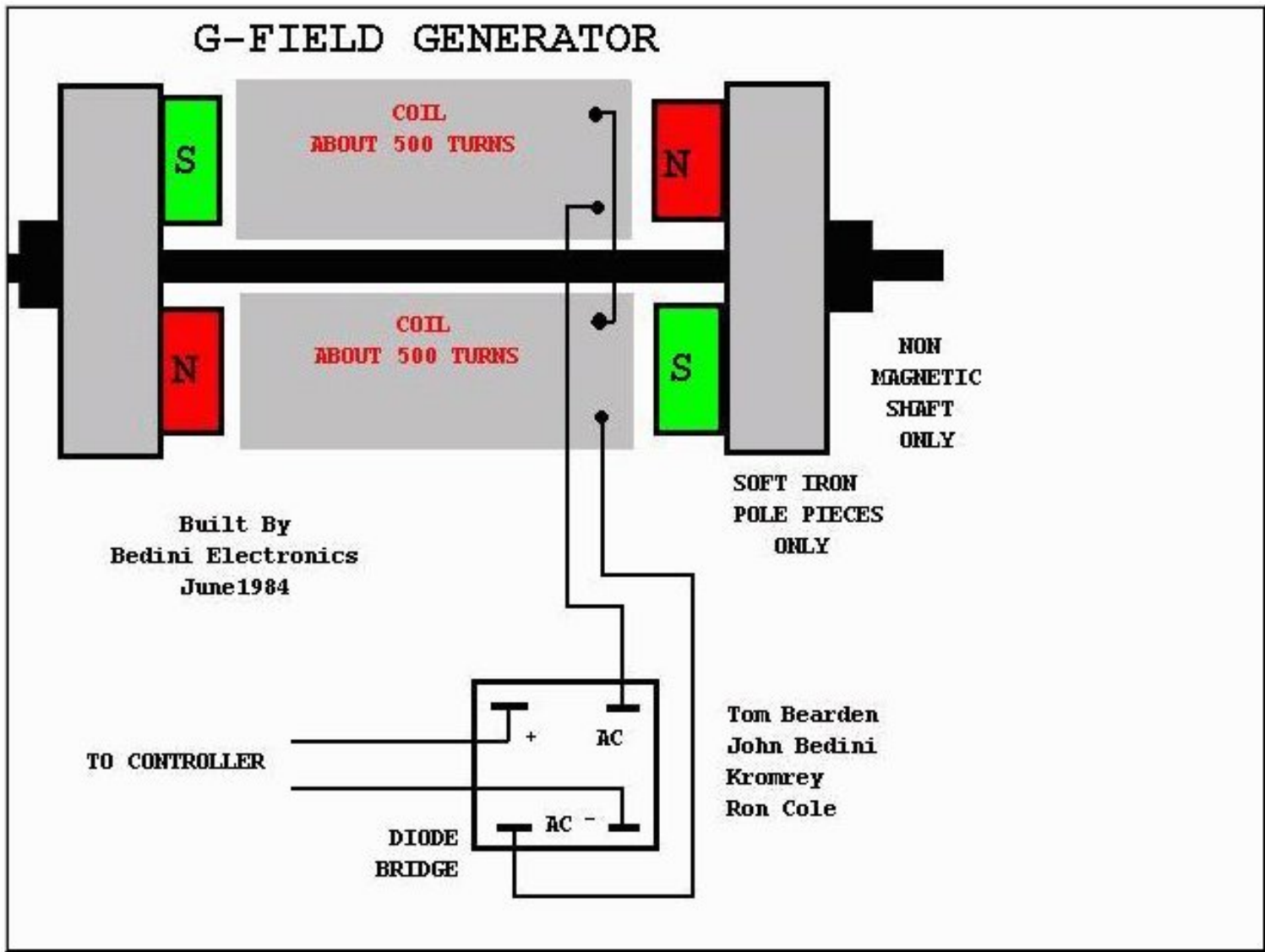
Fluorescent light fixtures may contain several ballasts. Fluorescent lighting ballasts are easily identifiable containing PCBs or non PCB. The small capacitors inside the ballasts are contaminated with high levels of PCB liquid if they were manufactured prior to 1980. At the University over the years, these ballasts have been used from a wide variety of manufacturers. The Office of Environmental Health and Safety maintains a list of models from various manufacturers that are PCB-contaminated.

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Identifying PCBs ([none / 0](#)) ([#3](#))  
 by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Thu Nov 27th, 2003 at 09:24:21 AM MST  
 ([User Info](#))

From a university of toronto website.....might help. Looks like you only need to worry about anything made before 1980, and only high voltage transformers. The part about ballast capacitors in old flourescent lights was new to me though.

\*\*\*\*\*

#### 4.2 TRANSFORMERS

Since the 1930's, a generic fluid called "askarel" containing 40-70% PCBs were used in high voltage transformers. Commercial Aroclors were blended with trichlorobenzene. Askarel is the genetic term used to identify the combination of Aroclor and trichlorobenzene. A typical Askarel transformer may contain 30-40% PCBs and as high as 65%. Contaminated mineral oil usually contains < 1% PCBs.

PCB-contaminated transformers can usually be distinguished by the nameplate on the transformer located on the outside casing. If the following brand names appears on the nameplate, the transformer contains PCBs:

TABLE 1: TRADE NAMES OF PCB-CONTAMINATED TRANSFORMERS

Apirolio [Italian]	Kaneclor [Japan]
Aroclor	Montar
Asbestol	NoFlamol
Chorextol	Phenoclor [France]
Chorinol	Pydraul
Clophen [German]	Pyralene
Diaclor	Pyroclor
DK (decachlorodiphenyl) [Italy]	Saf-T-Kuhl
Dykanol	Santotherm FR [Japan]
Elemex	Sorol
Eucarel	Therminol FR
Fenclor [Italy]	
Hyvol	
Inerteen	

In addition, the "Type Number" also indicates if the

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[Peddle Power](#) | 4 comments (4 topical, editorial)

Re: Peddle Power ([none / 0](#)) ([#1](#))  
by Norm on Tue Nov 25th, 2003 at 03:12:15 AM MST  
([User Info](#))

It really makes you appreciate what power just one of your smallest windmills put out don't it Jerry? I just rode a bicycle around the block yesterday and I was out of breath. I've been thinking of making one of those myself but with a flywheel made from a 36inch diameter disk of particleboard like David Butcher made...<http://www.los-gatos.ca.us/davidbu/davidbu.html>  
Norm.

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Re: Peddle Power ([none / 0](#)) ([#4](#))  
 by Jerry on Wed Nov 26th, 2003 at 09:56:49 PM MST  
[\(User Info\)](#) <http://www.dplusv.com/Photo-03.html>

Hi Norm  
 I read brifly through David Buchers page. He stated "maybe" the average human can peddle between 40 to 120 rpm.  
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# David Butcher

Have you ever wished you could create useful power solely with your own body? To be able to travel, move heavy loads, perform machine work, and generate electricity with your legs, arms, etc? I went beyond wishing. I imagined, designed, and built what I needed to achieve my dreams.

---

Note: My ex employer, [Novell](#), has eliminated my position, Director of Web Marketing and Corporate Webmaster. I am actively looking for a job which would combine those talents with the creative engineering approach embodied in the projects found on this page. My [resume \(MS Word version\)](#) spells it out. In the meantime, I may finally have some time to update this page, and perhaps even to bring some of the projects back to life. Never abandon your dreams.

I have always been a mad scientist at heart. Three projects from the past that I am particularly fond of are a [pedal generator](#), a [pedal-powered "pickup truck"](#) and a [pedal-powered canoe](#).

My most recent project is a [Micro Solar Lighting System](#).

I have a voice synthesizer waiting to help you say 'Hi' if you like.

And on very rare occasions, you can [see me](#).

A [Datsun Roadster Fuse Box Diagram](#) is here in a small (9k) postscript file.

If you have a Datsun Roadster, you may be interested in the details of [rebuilding the heater](#), a project I finished in the summer of 1995. In 1996, I tackled the [SU Carburetors](#). My latest project (1997) was to [enhance the ignition system](#) before the cold weather sets in. With summer on the way, you may be interested in the [cooling system enhancements](#) I designed.

I recently replaced the wheel bearings in the left front hub of the roadster. If you would like a write-up of the activity, please mail davidbu"at"www.los-gatos.ca.us and ask. If enough people write I will create the write-up.

This is my [Datsun Theft Deterrent System](#).

In the summer of 2000, we decided to go green, and we signed up for both [Green Mountain Energy](#) and [Corbin Motors Sparrow #95](#), an electric vehicle. The Sparrow is here and it is a blast! If you like reading about other folk's experiences with things, you may enjoy my [Sparrow diary](#).

Of course, my autobiography would not be complete without mentioning ["hal"](#), a program I wrote in 1983 and ported to the WWW.

P.S. My wife owned [Nine Lives](#), one of the first "Electronic Storefronts" on the Internet. The physical store is now closed, and I am in the process of archiving the online store.

And last but not least, here are some totally obscure pages:

[Connecting my Linux system to DSL.](#)

[Radio Shack Model P Video Repair.](#)

[The world's first solar calculator, which I invented.](#)

[Faster UNIX Bourne Shell Scripts.](#)

[A Linux or Unix shell script for printing Avery 5266 labels.](#)

[A Music Link and Resource page for Linux users.](#)

[Magazine Sales Scams to Avoid](#)

---

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First and Last Name:

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Please enter any questions or suggestions you have in the area below:

To send your comments to David Butcher, press this button:

David Butcher davidbu"at"www.los-gatos.ca.us Tel (408) 978-5495 [Los Gatos](#), California 95030

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[Peddle Power](#) | 4 comments (4 topical, editorial)

Re: Peddle Power ([none / 0](#)) ([#4](#))  
by Jerry on Wed Nov 26th, 2003 at 09:56:49 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Norm  
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[Peddle Power](#) | 4 comments (4 topical, editorial)

Re: Peddle Power ([none / 0](#)) ([#2](#))  
by zbotrobot on Tue Nov 25th, 2003 at 08:06:35 PM MST  
([User Info](#))

considering the windmill without use of batteries, a flywheel gives me an idea. My first thought was to store the winds energy by filling a tank of water. Ha - a spinning tank of water that winds up on a cable too. Missoula Montana has a lot of bikes! Partly because people are too poor to drive and because its flat in the valley. Get rid of the car and stay in shape:)

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[Peddle Power](#) | 4 comments (4 topical, editorial)

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by RobD on Wed Nov 26th, 2003 at 03:37:09 PM MST  
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Ladies and gentlemen, I give you BobFlex.  
This is my computer and TV riding bike and SLA battery charger. I made the Alternator out of old magnets and oil burner casing parts. It will put out decent power. The bike was a throw away but it has a good heavy flywheel. It does 'cog' a little at low rpm so the next one I'll skew the magnets.



RobD

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[10th Genny flying](#) | 4 comments (4 topical, editorial)

Re: 10th Genny flying ([none / 0](#)) ([#1](#))  
by Tahino on Sun Nov 23rd, 2003 at 09:41:06 AM MST  
([User Info](#))

Hi Jerry:  
Can you describe that 156 volt system you are charging for lights, tools and heating please? How it works?  
Thanks

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([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Tahino  
It just turned out that way. I freind of mine is a retired electronic transportation engineer. He designed electric things that move. He has a hybrid vehicle gas/electric of his own design. This van had 12 very large 12 volt batteries. They are about the size of 2 six volt golf cart batteries. He was given a grant from Optima Battery Co. They fixed him up with some large deep cycle gell batteries.

I bought his old batteries real cheap. I got 13 of them, that's what he had. I use 12 of them in my 48 volt home system for a while till I picked up 22 aircraft batteries. they are 24 volt.

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- [dburt](#)
- [Harry Luubovv](#)
- [DanB](#)
- Anonymous Users: 12

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The other system uses 14 six volt golf cart batteries wired as a 12 volt bank. I have 5 gennies chagreing this group right now. We've seen 150 amps comming into this bank on very windy days. Thats awsome cause we use this bank for are shop lights. We have 60 four ft. florecents that are power by a 2500 watt square wave inveter.

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[10th Genny flying](#) | 4 comments (4 topical, 0 editorial)



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- [electronbaby](#) (3)
- [hvirtane](#)
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[10th Genny flying](#) | 4 comments (4 topical, editorial)

Re: 10th Genny flying ([none / 0](#)) (#3)  
 by Jerry on Sun Nov 23rd, 2003 at 10:13:56 PM MST  
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[10th Genny flying](#) | 4 comments (4 topical, editorial)

Re: 10th Genny flying ([none / 0](#)) ([#2](#))  
by [cevonk \(atsignhere\)aol.com](#) on Sun Nov 23rd, 2003 at 11:50:49 AM MST  
([User Info](#))

Boy, talk about "walking the walk"! :-)

Congratulations!

What portion of your electrical needs do these generators satisfy?

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Re: 10th Genny flying ([none / 0](#)) ([#4](#))  
by [Jerry](#) on Sun Nov 23rd, 2003 at 10:30:44 PM MST  
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Hi Cevonk

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I forgot to mention above. When all the lights are on in the shop the inverter is drawing 120 amps so on those very windy days when the genny's are delivering 150 amps we are 30 amps ahead of the game. I'm confident that after we add batts/gens the shop will be grid free. But wow we suck up alot of power in that shop. We also powewr up several multy 1000 watt demo systems from this power also.

JK TAS Jerry

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[Turns Counter](#) | 5 comments (5 topical, editorial)

Re: Turns Counter ([none / 0](#)) (#2)  
by [ibedonc](#) on Tue Nov 18th, 2003 at 04:52:31 PM MST  
([User Info](#))

I would like one , let me know how to get one from you

[Turns Counter](#) | 5 comments (5 topical, 0 editorial)

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#### Who's Online? (16)

- [Putte](#)
- [wind pirate](#)
- [Harry Luubovv](#)
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#### Who's Online? (32)

- [Harry Luubovv](#)
- [DanB](#)
- Anonymous Users: 28
- Cloaked Users (2)

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- [signweld](#)
- [jeanpaul](#)
- [Harry Luubovv](#)
- [DanB](#)
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- [Harry Luubovv](#)
- [DanB](#)
- Anonymous Users: 28
- Cloaked Users (2)

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[Turns Counter](#) | 5 comments (5 topical, 0 editorial)

Re: Turns Counter ([none / 0](#)) (#4)  
 by NJ JOHN on Wed Nov 19th, 2003 at 06:45:56 AM MST  
 ([User Info](#))

Hi  
 New to this board and this is my first comment. Here's a way I made a counter/tach with a Dollar Store calculator. What I did was soldered 2 wires to the leads going to the EQUAL key and the other ends to an earphone jack and mounted this to the case of the calculator. To make a sensor I connected a normally open micro switch (or magnetic switch) through a toggle switch in parallel with a normally open pushbutton switch. This was then wired to a jack.

To use this setup just plug the jack in when needed and remove when being used as a calculator.

To use as a counter just turn on the calculator enter + 1 on the keypad and each time the switch is closed the calculator increases by 1 until you reach your desired count. If you put in a starting number and enter - 1 on the keyboard and when the display reads -1 you have completed your count.

To use as a tach open the toggle switch and push the push button switch for 15 seconds then multiply by 4 for RPM.

I hope this helps.

John

[Turns Counter](#) | 5 comments (5 topical, 0 editorial)

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- [Putte](#)
- [wind pirate](#)
- [Harry Luubovv](#)
- [troy](#)
- Anonymous Users: 12

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[Yaw Bearing pix](#) | 10 comments (10 topical, editorial)

Re: Yaw Bearing pix ([none / 0](#)) (#1)  
by Jerry on Wed Nov 12th, 2003 at 10:16:07 AM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

OK Kurt or Tom help me out here. I'm going by the instruction but it still doesn't work but I don't mind if you guys do all my pix posting for me. However I'm sure you have better things to do.

To bad these things only work for computer savy people. I'll keep being a pest till I figure it out. Sorry I'm so slow at learning this stuff. If you want to know how hard it is for me just take 6 marbles and stack them one on top the other.

JK TAS Jerry

[Airheads Page](#)

[Yaw Bearing pix](#) | 10 comments (10 topical, 0 editorial)

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[Airheads Page](#)

Re: Yaw Bearing pix ([none / 0](#)) ([#2](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Wed Nov 12th, 2003 at 11:11:21 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Definitely a slick uncomplicated system you have there Jerry. Very nice!

Looks like your having fun!  
Ed

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Re: Yaw Bearing pix ([none / 0](#)) ([#6](#))  
by Norm on Thu Nov 13th, 2003 at 01:58:32 PM MST  
([User Info](#))

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Hi Jerry,

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Would you happen to know what this stuff is called or maybe someone else reading this? Been wanting to make a few things out of something just a little more durable than particle board like a flywheel for an pedal powered generator for instance and the base....etc.

Don't worry so much about pic size...for anyone that really is interested in reading your posting there are ways...for instance I just drag n drop stuff like that onto a html editor...size the pics to what the author probably had in mind...and save it to a special folder on my hard drive. I know the frustration of computers tho' I have a nephew...I knew him as an 8yr.old brat....now he's 22 or so and troubleshoots my computer goes to DOS and types something in and fixes it easier than I can say WOW! How'd you do that?(>) Norm.

[ [Parent](#) ]

Re: Yaw Bearing pix ([none / 0](#)) (#8)  
by Jerry on Thu Nov 13th, 2003 at 09:33:30  
PM MST  
([User Info](#))  
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Hi Norm

Ya its called Choice Deck. I got mine at lowes. This matereal comes in a few diferant widths and thicknesses. The scrap i made a genny base out of was a 1 X 6 ".

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Re: Yaw Bearing pix ([none / 0](#)) ([#6](#))  
by Norm on Thu Nov 13th, 2003 at 01:58:32 PM MST  
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Re: Yaw Bearing pix ([none / 0](#)) ([#3](#))  
by RobC on Wed Nov 12th, 2003 at 08:19:42 PM MST  
([User Info](#))

Nice job Jerry. Only one thing bothers me this bearing looks like a self aligning type which means that the bearing can move wherever it wants to in its housing possibly allowing the blades to strike the tower. But I could be wrong let me know. As usual great work. I hope to drive by your shop one of these days. Maybe with a little luck.  
RobC

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- [hvirtane](#)
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Nice job Jerry. Only one thing bothers me this bearing looks like a self aligning type which means that the bearing can move wherever it wants to in its housing possibly allowing the blades to strike the tower. But I could be wrong let me know. As usual great work. I hope to drive by your shop one of these days. Maybe with a little luck.  
RobC

Re: Yaw Bearing pix ([none / 0](#)) ([#4](#))  
by Jerry on Wed Nov 12th, 2003 at 11:16:33 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Rob C.  
Are you in the Salem area?

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JK TAS Jerry

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Re: Yaw Bearing pix ([none / 0](#)) ([#5](#))  
by RobC on Thu Nov 13th, 2003 at 08:24:42 AM MST  
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[Yaw Bearing pix](#) | 10 comments (10 topical, 0 editorial)



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[Six inch disc](#) | 4 comments (4 topical, editorial)

Re: Six inch disc ([none / 0](#)) ([#1](#))  
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[Six inch disc](#) | 4 comments (4 topical, 0 editorial)

Re: Six inch disc ([none / 0](#)) ([#3](#))  
by Jerry on Tue Nov 11th, 2003 at 11:49:54 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

I got the lamination metal from Ed. Now just got to figure out what to do for coils. These magnets are 1/4" X 1/2" X 1" Neo's. The lamination metal will also be 1 inch wide when inplace.  
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[Airheads Page](#)

Re: Six inch disc ([none / 0](#)) ([#4](#))  
by troy on Thu Nov 13th, 2003 at 01:37:25 PM MST  
([User Info](#))

Hey Jerry,

Looks like things are coming along nicely. Can't wait to see how the new one compares to the tried and true garbogen.

Best regards,

troy

[ [Parent](#) ]

Re: Six inch disc ([none / 0](#)) ([#5](#))  
by Jerry on Thu Nov 13th, 2003 at 10:03:39 PM MST  
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[Poured Stator ?](#) | 16 comments (16 topical, editorial)

Re: Poured Stator ? (none / 0) (#1)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Tue Nov 11th, 2003 at 06:07:07 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

Hi Jerry,

I believe iFred's is using a non metallic version as I posted some time back for the dual rotor alternator. My attempt that's posted on my site was for a "quickie" laminated stator by adding iron powder to the plastic mix. The end result is very inefficient. It does make it very easy to put together a slotted stator but there are a lot of losses. The steel laminates either using 1018 strips to form a stator and either slotting them or laying coils over them is far better than the poured iron powder. The silicon steel is far superior. For a quickie project the poured core unit is quite fun, quick and simple and you can usually put an alternator together in a day or two using the poured methods.

Have Fun  
Ed

[Poured Stator ?](#) | 16 comments (16 topical, 0 editorial)

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Re: Poured Stator ? ([none / 0](#)) (#2)  
by Jerry on Tue Nov 11th, 2003 at 09:46:59 AM MST  
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Thanks Ed

I noticed your design and iFred's are different. I was thinking of using the steel lamination as normal and pouring the iron/epoxy mix on the steel.

The idea here is to have the good performance of the steel and use the mix as a medium as a path for the flux to follow. This to enhance the flux strength in what otherwise is just open air, the gap between the coils and the laminations. Surely the iron mix will be more conductive to the magnetic flux than air would be. I see the iron past mix as a much better path than just air.

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Just a thought? Could be all wrong?

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[Airheads Page](#)

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Re: Poured Stator ? ([none / 0](#)) (#6)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Tue Nov 11th, 2003 at 02:11:00 PM MST  
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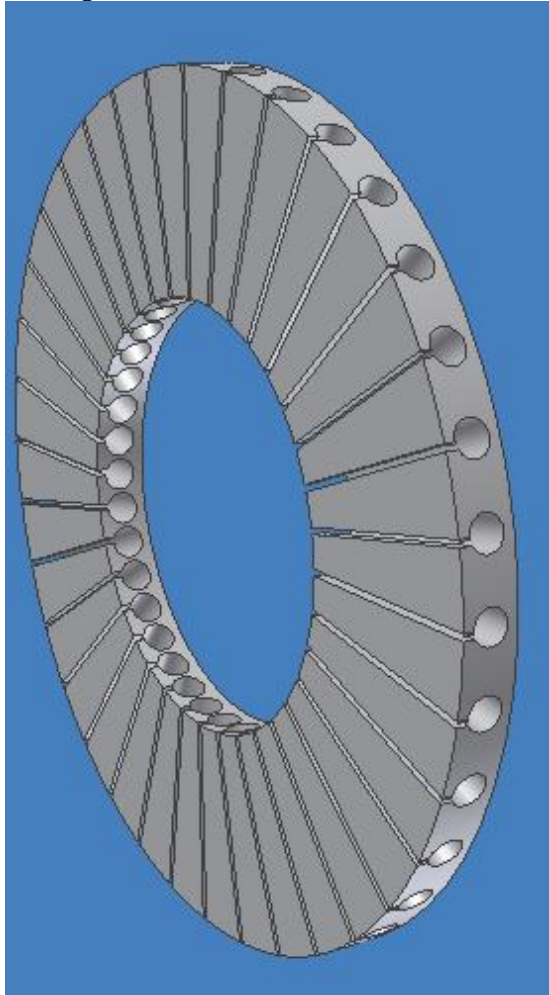
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This is one of the cores from the 2500 watt machine I did last summer. It has a plastic overlay on the silicon steel and the plastic was machined to hold the wires in place...



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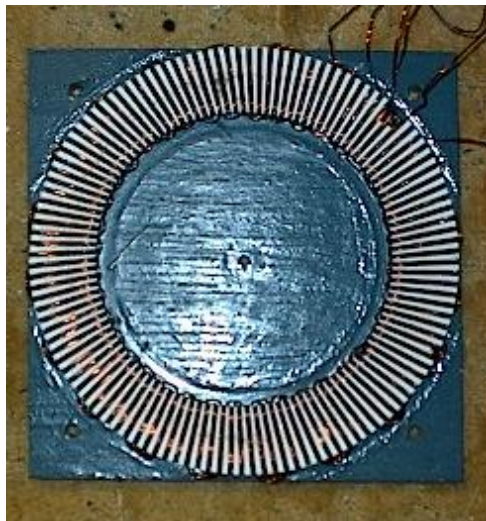
Re: Poured Stator ? ([none / 0](#)) ([#7](#))  
by kmitchel on Tue Nov 11th, 2003 at 02:38:16 PM MST  
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Can u provide more details about this 2500 watt monster, please? More pictures the better.

[ [Parent](#) ]

Re: Poured Stator ? ([none / 0](#)) ([#8](#))  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Tue Nov 11th, 2003 at 03:53:04 PM MST  
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Re: Poured Stator ? (none / 0) (#13)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Wed Nov 12th,  
2003 at 05:52:23 AM MST  
([User Info](#)) <http://timmythy.home.mindspring.com/timmy.htm>

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I think the one you are talking about is titled "MultiDisk Alternator  
Preview"

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Re: Poured Stator ? ([none / 0](#)) ([#14](#))  
by Reno on Thu Nov 13th, 2003 at 12:16:01 PM MST  
([User Info](#))

Hey Ed where would one find silicon steel.  
I was thinking if a mandrel was made of steel lams  
and then the mag wire wound around it then mounted to the mold  
Then resin poured around everything.

[ [Parent](#) ]

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by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Thu Nov 13th, 2003 at 03:38:53  
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Hi Reno,  
I usually keep a little bit in stock for my own projects but occasionally I get  
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[Poured Stator ?](#) | 16 comments (16 topical, 0 editorial)



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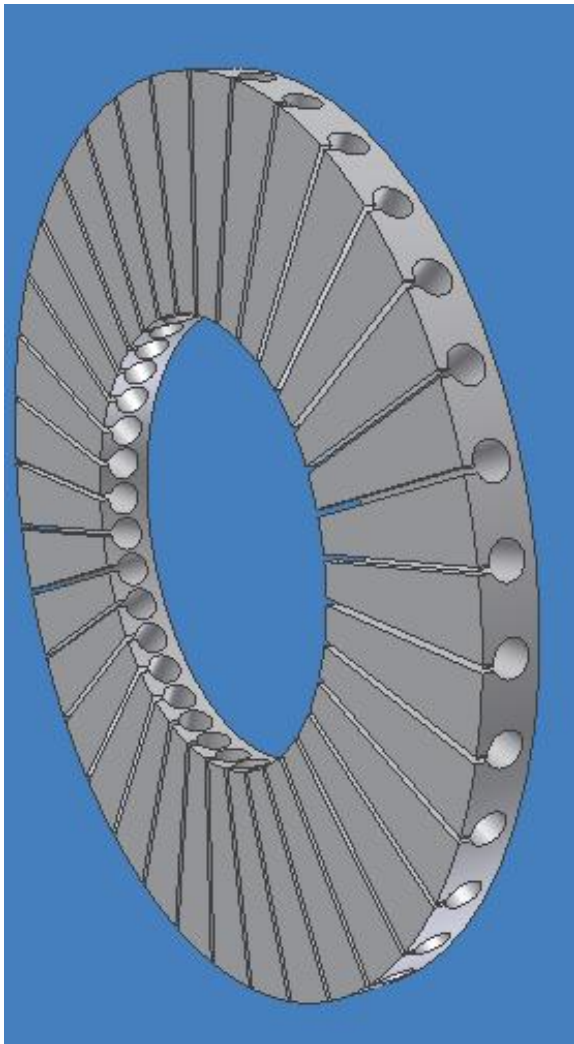
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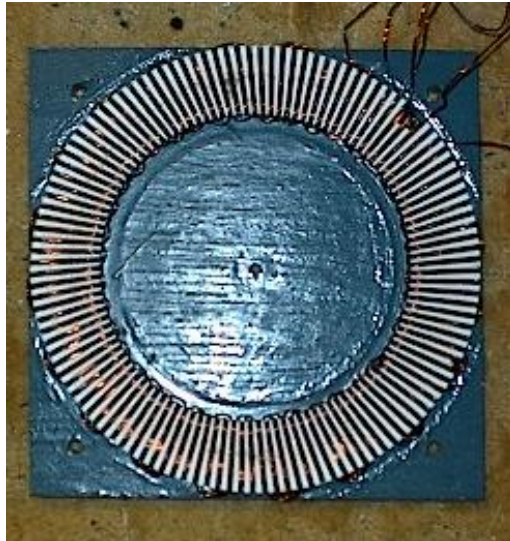
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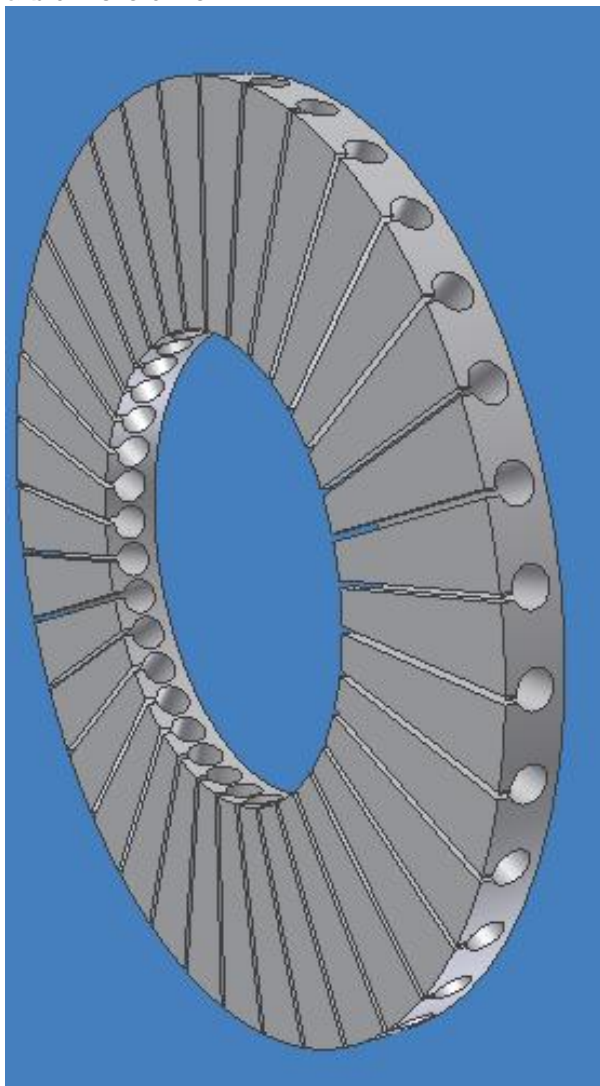
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[Poured Stator ?](#) | 16 comments (16 topical, 0 editorial)

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 by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Tue Nov 11th, 2003 at 02:11:00 PM MST  
 ([User Info](#)) <http://www.windstuffnow.com/main>

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This is one of the cores from the 2500 watt machine I did last summer. It has a plastic overlay on the silicon steel and the plastic was machined to hold the wires in place...

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- [dburt](#)
- [Harry Luubovv](#)
- [DanB](#)
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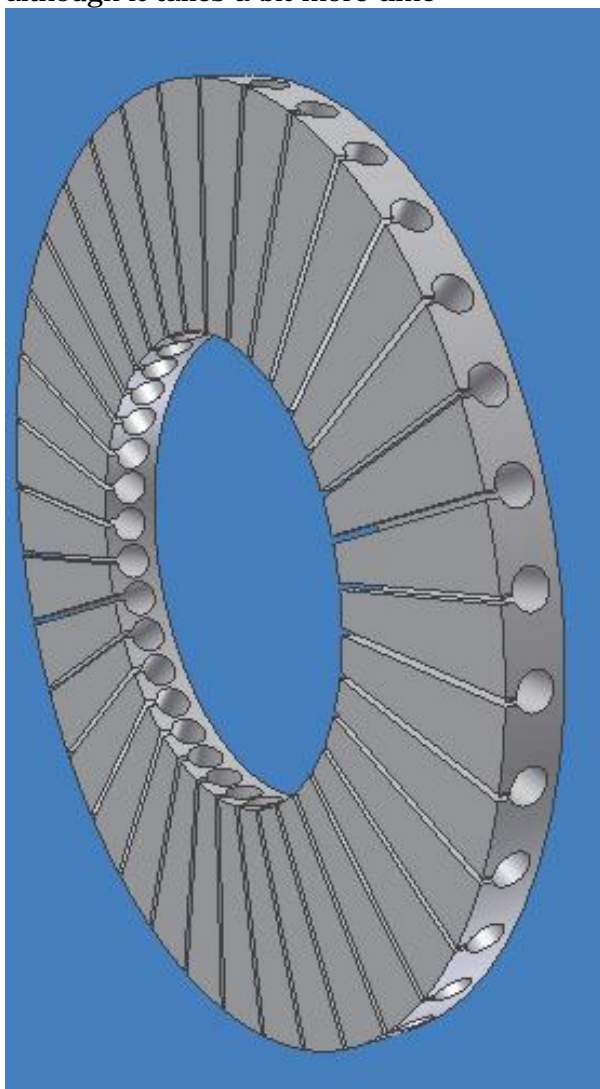
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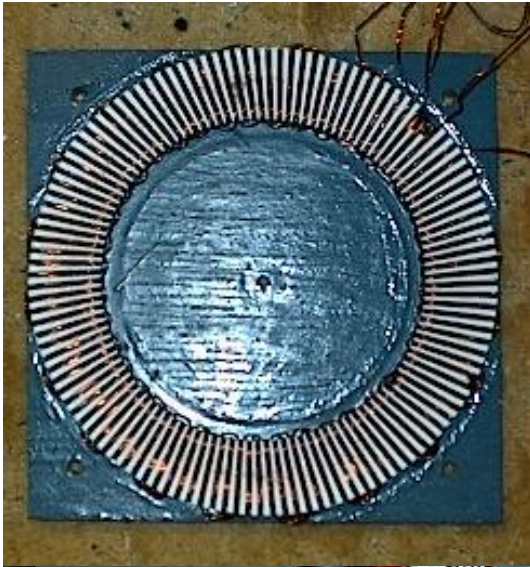
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by kmitchel on Tue Nov 11th, 2003 at 02:38:16 PM MST  
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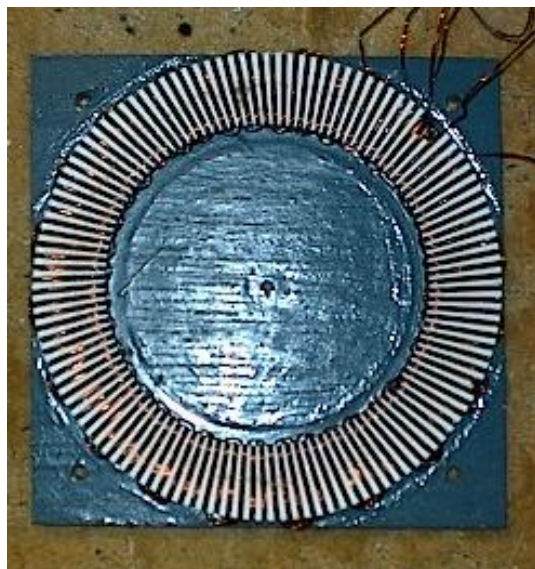
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- [wind pirate](#)
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- [electronbaby](#)
- [hvirtane](#)
- [ADMIN](#)
- [Harry Luubovv](#)
- [Junkie](#)
- [troy](#)
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#### Who's Online? (25)

- [hvirtane](#)
- [DanB](#)
- [Gordy](#)
- [electronbaby](#) (3)
- Anonymous Users: 18
- Cloaked Users (1)

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by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Tue Nov 11th, 2003 at 10:02:31 AM MST  
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Hi Jerry.

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[Poured Stator ?](#) | 16 comments (16 topical, 0 editorial)

Re: Poured Stator ? ([none / 0](#)) ([#3](#))  
 by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Tue Nov 11th, 2003 at 10:02:31 AM MST  
 ([User Info](#)) <http://www.internetfred.com>

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Re: Poured Stator ? ([none / 0](#)) ([#4](#))  
 by ibedonc on Tue Nov 11th, 2003 at 10:56:32 AM MST  
 ([User Info](#))

were are you getting your iron filings from , ? are you grinding your own ?

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Re: Poured Stator ? ([none / 0](#)) ([#5](#))  
 by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Tue Nov 11th, 2003 at 02:01:07 PM MST  
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<http://www.windstuffnow.com/main>

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I bought some from a "Teacher Center" but later robbed them from the local brake shops. They have tons of shavings and their more than happy to let you have them.

Have Fun  
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[Poured Stator ?](#) | 16 comments (16 topical, editorial)

Re: Poured Stator ? (none / 0) (#9)  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Tue Nov 11th, 2003 at 04:05:13 PM MST  
([User Info](#)) <http://www.internetfred.com>

A local brake shop, when they grind the breaks it leaves a nice grinding power material, I semi clean it and sift it. I wear a mask for this because it might contain some hazerdous materials, but it's just a percation. They have lots and are more then willing to give it.

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Re: Poured Stator ? (none / 0) (#10)  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Tue Nov 11th, 2003 at 04:19:11 PM MST  
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To Ed.

I gotta tell you Ed, I have been reading allot of electrical power technology books lately, and some of your designs on the mathematics end are pretty close to near specs on the practical side. Your good dude! real good! Keep it up, or I'll catch up soon...LOL

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Re: Poured Stator ? ([none / 0](#)) ([#11](#))  
by Jerry on Tue Nov 11th, 2003 at 08:50:50 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

iFred did you just pull the wood dowls out after the resin set or did you drill them out? What was the outside form in your mold. OH the inside to? I would think if you kept the slots narrow were you slip the coil wire through, the cogging would not be to bad?

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JK TAS Jerry

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Re: Poured Stator ? ([none / 0](#)) (#12)

by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Tue Nov 11th, 2003 at 11:22:22 PM MST

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Hi Jerry

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The bottom of the form is plywood, to this I glued a paper template that was filled with guidelines 22.7 deg apart. to the outside of the mold I cut some sheet metal (duct metal) and wrapped it around wood base and used some wood screws to hold everything in place. (i used some duct tape in the bottom to prevent spillage. The center was also made of wood. I then gave this part of the mold a coat of varnish.

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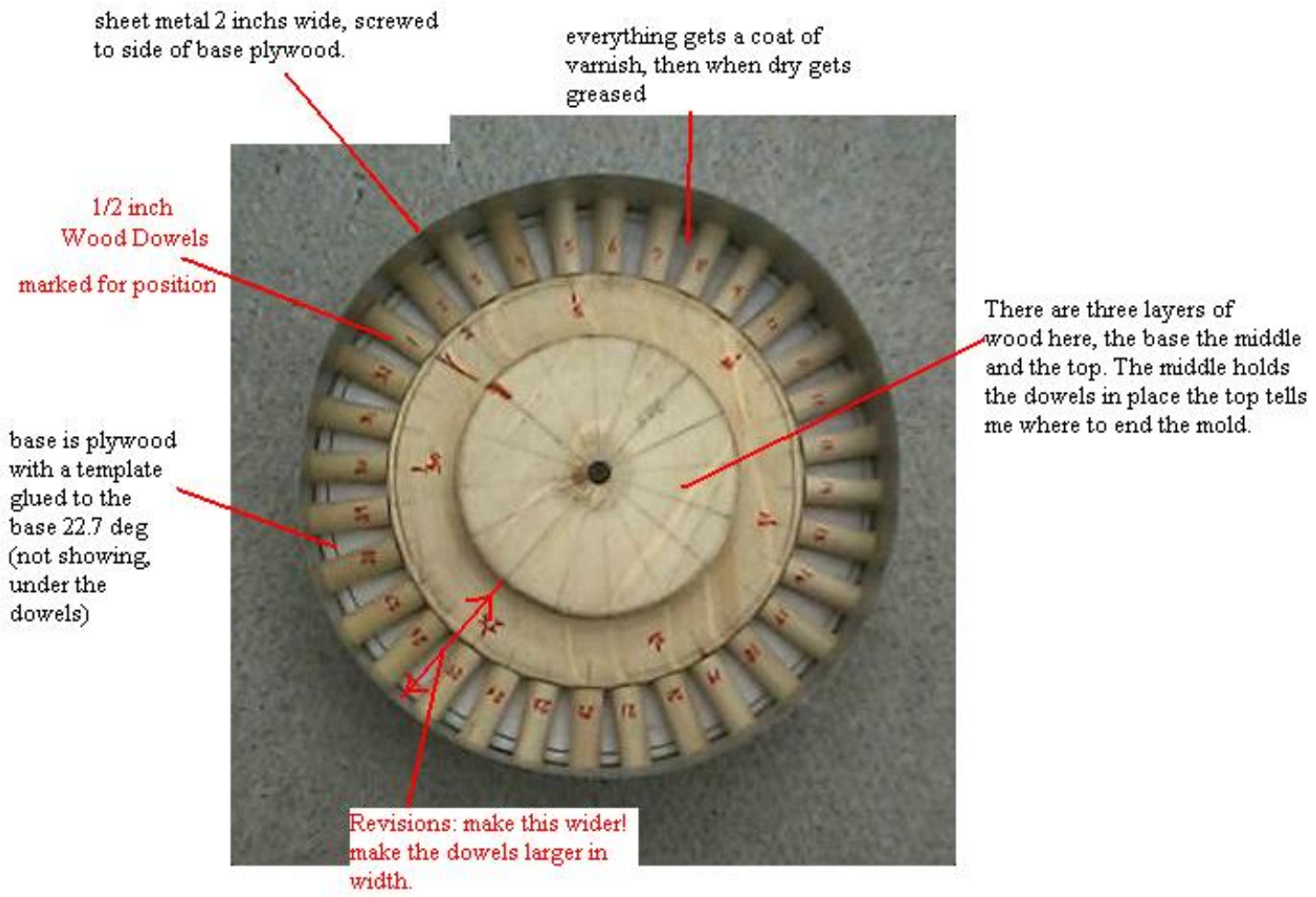
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Re: Poured Stator ? ([none / 0](#)) ([#16](#))  
by Jerry on Thu Nov 13th, 2003 at 10:19:42 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Thanks iFred

This helps a buch.

I thought someone mentioned on this board about a powdered iron food suppliment use to feed young pigs and you can get it at the farm store.

Is there any truth to this? JK TAS Jerry

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Hope this helps!!



sheet metal 2 inchs wide, screwed to side of base plywood.

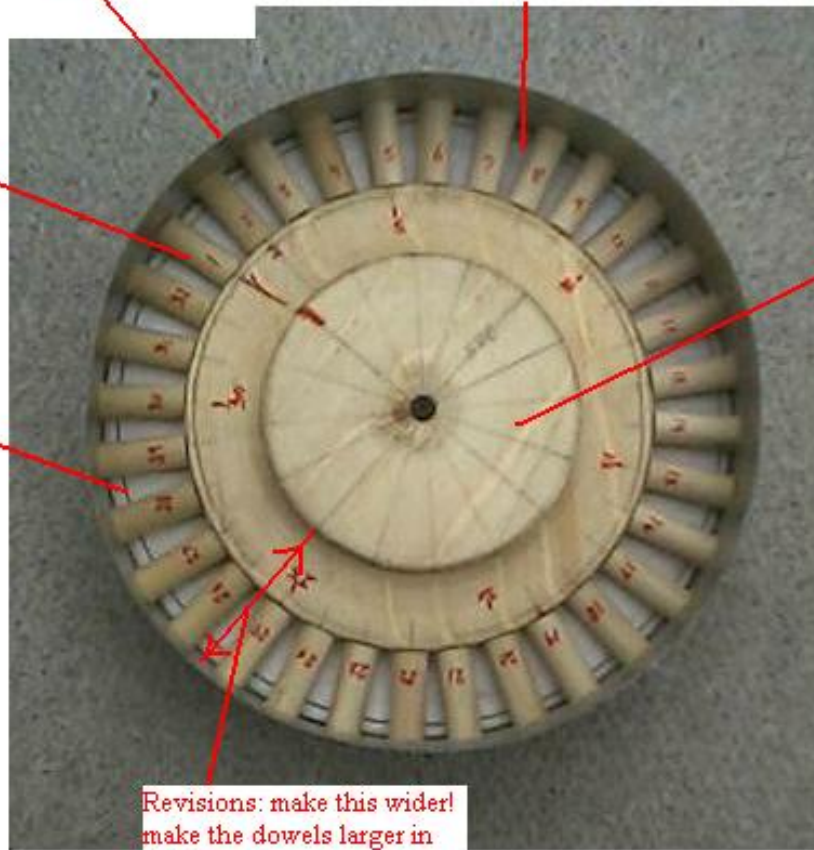
everything gets a coat of varnish, then when dry gets greased

1/2 inch Wood Dowels  
marked for position

base is plywood with a template glued to the base 22.7 deg (not showing under the dowels)

There are three layers of wood here, the base the middle and the top. The middle holds the dowels in place the top tells me where to end the mold.

Revisions: make this wider!  
make the dowels larger in width.







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[Poured Stator ?](#) | 16 comments (16 topical, 0 editorial)



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[Poured Stator ?](#) | 16 comments (16 topical, editorial)

Re: Poured Stator ? ([none / 0](#)) (#12)  
by iFred ([retrodude123@yahoo.com](mailto:retrodude123@yahoo.com)) on Tue Nov 11th, 2003 at 11:22:22 PM MST  
([User Info](#)) <http://www.internetfred.com>

Hi Jerry

Glad I can help and answer your questions.

The bottom of the form is plywood, to this I glued a paper template that was filled with guidelines 22.7 deg apart. to the outside of the mold I cut some sheet metal (duct metal) and wrapped it around wood base and used some wood screws to hold everything in place. (i used some duct tape in the bottom to prevent spillage. The center was also made of wood. I then gave this part of the mold a coat of varnish.

When I finished the build, I cut the dowels to a single length, then I sanded them (ends) individually to fit for each position. I did this 32 times, once for each dowel. I then marked each position on the dowels, just in case. I then greased everything down very well including each dowel individually. Everything was a tight fit, it's critical to get a tight fit.

I measured everything and mixed the iron grindings and resins together, had to work quickly... (resin went around and under the dowels when packed in slightly, but not enough to jar the dowels(the tight fit-:)). Also: To prevent bubbles and stuff I continually shook, rotated and gently slapped down the mold to make sure the stuff got into all areas of the mold. and continued to pack as much as possible up to the top of the third layer of the mold. The third layer tells where to end.

When completed the dowels popped out with very little problems, only one gave me an problem and I had to drill it out. But all in all the dowels came out smooth. Next I used my dermal to cut out the centers in the top between the poles. The slots were narrow to allow the wire to go through and just a little extra. Dermal with a cutting blade works great on this material!

The cogging is minimal. I used a metal plate made of multi sheets (not suggested) of sheet metal (in order to get thickness). I am still experimenting but I have 32 mags x 3 for width. YUP! you read correct.. 3 magnets per pole in length! 96 small mags 1/2 x 1/8 each.. Got a ton of them, don't ask ;-)

I wound each wire around each pole by hand, 25 times per pole. Man my fingers were killing me, I was shaking after doing 15 poles! LOL... Oh and... they were tightly wound and pressed into each pole with a piece of small hardwood I carved so i could fit in the most wire as I was winding each pole. It's very tightly wound ;->

Hope this helps!!

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- [dburt](#)
- [Harry Luubov](#)
- [DanB](#)
- Anonymous Users: 11

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sheet metal 2 inches wide, screwed to side of base plywood.

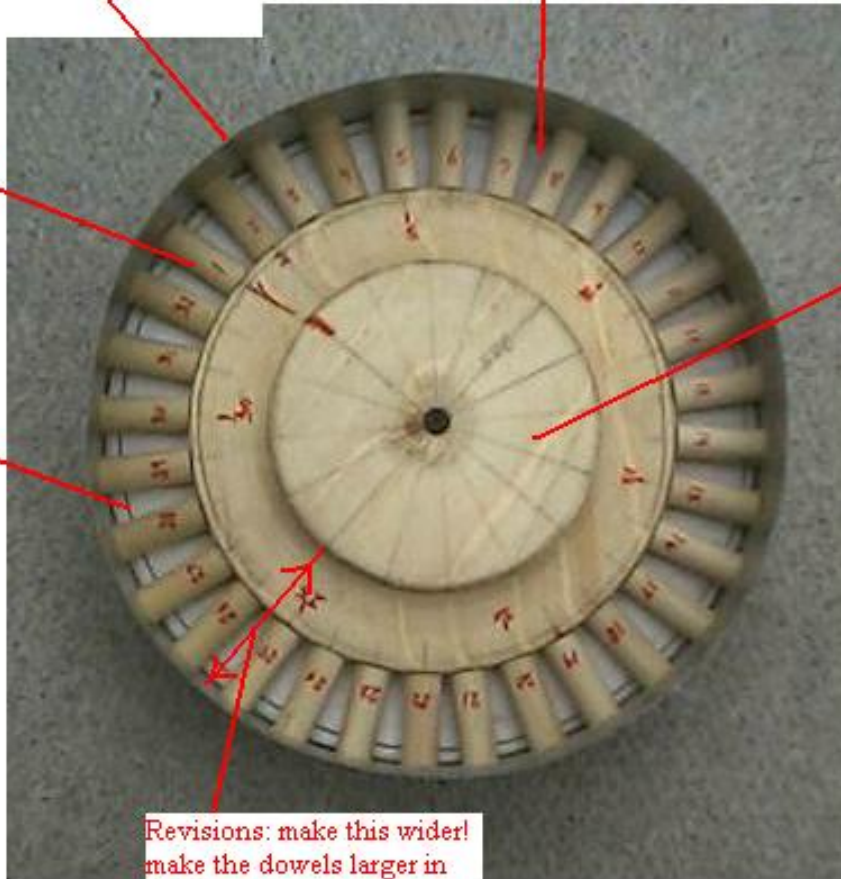
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marked for position

base is plywood with a template glued to the base 22.7 deg (not showing, under the dowels)

There are three layers of wood here, the base the middle and the top. The middle holds the dowels in place the top tells me where to end the mold.

Revisions: make this wider!  
make the dowels larger in width.





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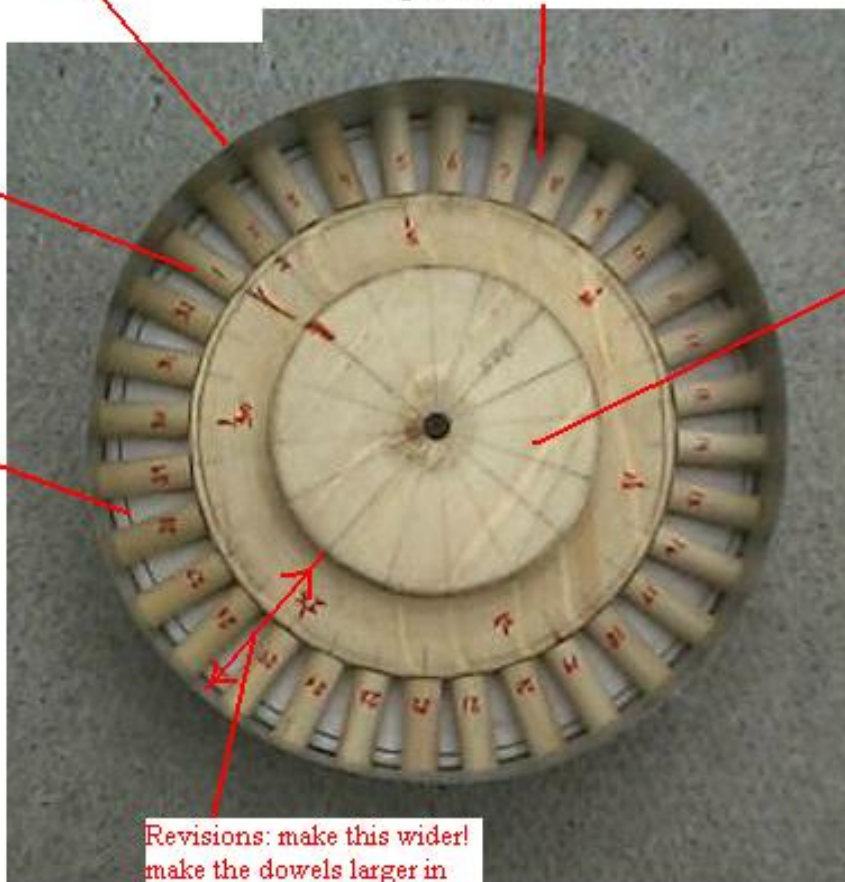
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Re: Poured Stator ? ([none / 0](#)) ([#16](#))  
by Jerry on Thu Nov 13th, 2003 at 10:19:42 PM MST  
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[Big fat hub ?](#) | 13 comments (13 topical, editorial)

Re: Big fat hub ? ([none / 0](#)) ([#1](#))  
by Norm on Wed Nov 5th, 2003 at 06:50:29 AM MST  
([User Info](#))

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Re: Big fat hub ? ([none / 0](#)) ([#2](#))  
by DanB on Wed Nov 5th, 2003 at 08:23:20 AM MST  
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Re: Big fat hub ? ([none / 0](#)) ([#5](#))  
by DanB on Wed Nov 5th, 2003 at 05:31:13 PM MST  
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by Norm on Wed Nov 5th, 2003 at 05:59:25  
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by Norm on Thu Nov 6th, 2003  
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Re: Big fat hub ? ([none / 0](#)) (#7)  
by kww on Wed Nov 5th, 2003 at 07:40:22  
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- [Harry Luubovv](#)
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[Big fat hub ?](#) | 13 comments (13 topical, editorial)

Re: Big fat hub ? ([none / 0](#)) (#5)  
by DanB on Wed Nov 5th, 2003 at 05:31:13 PM MST  
([User Info](#))

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Re: Big fat hub ? ([none / 0](#)) (#6)  
by Norm on Wed Nov 5th, 2003 at 05:59:25 PM MST  
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by Jerry on Wed Nov 5th, 2003 at 09:26:53 PM MST  
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[Big fat hub ?](#) | 13 comments (13 topical, 0 editorial)

WOK ([none / 0](#)) (#4)  
by wdyasq on Wed Nov 5th, 2003 at 04:50:31 PM MST  
([User Info](#))

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Re: Big fat hub ? ([none / 0](#)) ([#12](#))  
by Jerry on Thu Nov 6th, 2003 at 09:14:48 AM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi zubbly  
I'm using a short power pole. Its about 20 feet tall. It is the lower portion of a taller pole.  
A power co. freind brought it over for me a installed it about 7 ft into the ground. Its fat I think about 12 inches at the gound and 10 inches at the top were I'll add 4 ft. of heavy mast above the pole. The mast its self will be about 10 ft. long.  
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Re: Big fat hub ? ([none / 0](#)) ([#13](#))  
by robotmaker on Fri Nov 7th, 2003 at 09:42:13 AM MST  
([User Info](#))

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[Stepper motor ?](#) | 5 comments (5 topical, editorial)

Re: Stepper motor ? ([none / 0](#)) ([#1](#))  
by Tommy L on Tue Nov 4th, 2003 at 12:04:20 AM MST  
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Re: Stepper motor ? ([none / 0](#)) ([#3](#))  
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# ANOTHER SMALL WIND GENERATOR

MADE FROM A LARGE STEPPER MOTOR AND PLASTIC BLADES

---

With the success of the "Microwind" genny made from a surplus NEMA 34 stepper motor, a prop from a trashed 20" box fan and some pipe fittings, I wanted to scale the design up to produce a bit more power, yet still retain the simplicity and the storm survival ability of the little genny.



After months of searching, I found a much larger surplus stepper motor. This one has the same diameter, shaft and flange dimensions, but is about twice as long. In addition, the shaft comes out of both ends, which brings up the possibility of coupling several together to be driven from a single prop. While the small stepper had one amp coils, the larger one has coils rated for four amps each. By using a bridge rectifier on each phase and connecting the DC outputs in parallel, this one should produce several times the power of the original Microwind.



I first thought about carving a set of wooden blades, but I ran across some scrap plastic pieces that were nearly the correct size, weight and shape. These were routed cutouts from a large plastic bin, and were curved in such a way as to form a somewhat undercambered airfoil. I cut a set of three



tapered blades from this material and used a rotary file to thin the trailing edge. Since these were scrap cutouts from a molded plastic part, each piece had a vent hole in the center. Being small, it shouldn't hurt anything. Each blade is 21" long, 4 1/2" wide at the root, and 2 3/4" wide at the tip.



I found a scrap of heavy gauge steel about 1 1/2" wide, and cut it into three equal strips about 7 inches long. These I sandwiched between two very large washers. A bolt and nut squished the washers together, capturing the steel strips. Once they were perfectly aligned, I welded them all together, forming a solid three-blade hub.

I bored a short piece of 1" aluminum barstock to fit the stepper motor shaft and added two #10 setscrews, then turned the piece around and counterbored it halfway, then tapped it for a 7/16" x 14 screw. While it was in the lathe, I turned a step on the O.D. to fit the hole in the washers. The step is a bit shorter than the width of the hub, so the center screw will draw it down tight and square.

The aluminum piece wouldn't fit all the way through the hub, since the three steel strips had actually stuck through a little way into the hole in the washers (the bolt was smaller than the hole.) Rather than file them away, I instead filed three small flats on the aluminum piece. This way it could not rotate inside the hub... simpler than cutting a keyway!



The three steel strips were marked and drilled, then tapped for three 1/4"-20 screws in each one to mount the blades. At this time I also scribed a line an inch out from the washer across each one. Each strip was then clamped in the vice at this line, and using a large crescent wrench I twisted each one to the proper blade angle, sighting it with another line drawn across the top of the vice with magic marker.

The blades were mounted on the hub using three 1/4"-20 bolts and washers for each one. Since the hub itself is tapped, once the bolts were drawn down very tight, a nut was threaded on to the back side of each bolt and tightened down to lock everything together.

Once the blades were installed, I mounted the hub onto one of the large stepper motors and took it out into the back yard. Shortly we had a small gust of wind, and as soon as I felt it on my face the genny started to rotate. It seems to start in a fairly low windspeed, and once spinning it maintained it's rotation quite well. With some of the larger gusts, it picked up quite a bit of speed. Since I can rotate it by hand and light a good-sized 12 volt bulb with each phase, it looks like this thing will produce some power once it's up in the air.

---



Since we've been known to get some storms around here with winds in excess of 85 mph, I thought it would be a good idea to reinforce the hub to prevent it from bending backwards. Rather than using a 7/16" bolt to secure the hub, I cut a piece of threaded rod and tightened it into the adapter. I then used a nut to secure the hub, leaving a few inches of rod sticking out. This gave me a point to attach three support rods from the center back to the outermost bolt on each blade. Before fastening the rods, I bent the arms of the hub slightly forward. This "rake" will allow the blades to flex a bit in high winds without risk of hitting the mast.





Here it is, up on the shop roof. To the right is the original Microwind prototype, fastened to the vent pipe where it's been adding it's share to the station batteries for over a year now. I've seen an amp out of the little guy, and I hope the bigger version will do much better.



This side view shows the forward rake of the blades. This should allow plenty of room for flexing in extreme weather.

---

The mini genny is an ongoing project. Now that it's up, naturally we have winds of less than 2 mph predicted for the next several days. Once we see some real wind, it won't take long to see what it's going to do. I expect to do some experimenting with the blade pitch to get the right angle to get as much out of the stepper motor as possible. Adjustment is a matter of putting the hub in the vice and twisting each arm with a very large wrench. So far, it seems to start in very light winds, and in a few light gusts shortly after it went up, it lit a 12 volt trailer light easily. Since these were very light gusts, this is a good sign... it should spin up much faster once the wind picks up. I'll post more data here as the project unfolds.

---

### UPDATE!

Once we got some gusty winds peaking around 15 to 18 mph, I took some measurements on the new wind generator. It starts easily, and when feeding power to a battery through a blocking diode, it would begin charging somewhere around 10 mph. At higher windspeeds the RPM and the current would increase, but not as fast as I had hoped. Since the plastic blanks were straight, I had no twist to the blades, and I suspect that under load, the tips were stalling at the higher wind speeds.

I brought the rotor down and trimmed some taper to the leading edge of the blades. Since the shape is undercambered, this did two things... first, it made the airfoil thinner at the tips. Second, it also made the airfoil fly at a lower angle of attack, adding a bit of "twist" to the blade.



The result is a bit more speed in the gusts. As I write this we're having winds with gusts up over

20 mph, and I'm seeing an easy 1 to 1 1/2 amps going into the batteries on the average, more in the strongest peaks. This is certainly not bad for a little NEMA 34 stepper motor. I have a feeling that it will do better in some real wind, at least as long as it holds together.

The biggest thing it needs now is good, clear, unobstructed wind. Once I'm sure it's doing what I want it to do, I'll move it from the shop roof to the top of one of the towers.

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Re: Stepper motor ? ([none / 0](#)) (#2)  
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[Stepper motor ?](#) | 5 comments (5 topical, 0 editorial)



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[Stepper motor ?](#) | 5 comments (5 topical, editorial)

Re: Stepper motor ? ([none / 0](#)) (#4)  
by TomW on Fri Nov 7th, 2003 at 07:49:27 AM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Jerry;

It may just be the wire size is far too small to pump more than an amp or so.

I want to pass on that I upgraded a 30 volt Ametek to neos with very little increase in amps out but with a slight voltage increase. In other words it was a huge pain in the posterior to reassemble it with neos for a dismal return in power plus it cogged a LOT more. It just seems like adding more flux would increase power but it did not work that way with the Ametek tape drive motor. I think it was at the limits of its windings current ability as stock from the factory

Just my experience and your experience may vary.

Cheers.

TomW

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Re: Stepper motor ? ([none / 0](#)) (#5)  
by Jerry on Fri Nov 7th, 2003 at 10:01:28 AM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hey Tom  
Thanks for the heads up. Its nice to take advantage of other peoples experiance and save yourself some truble.

It was one of those little back of the mind projects anyway.

JK TAS Jerry

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[Stepper motor ?](#) | 5 comments (5 topical, 0 editorial)

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[Pic test](#) | 4 comments (4 topical, editorial)

Glad it worked!! ([none / 0](#)) (#1)  
by TomW on Sat Nov 1st, 2003 at 10:22:15 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

Jerry;

Next thing you know you will be running your own webserver. None of this stuff is that hard just finicky.

Bravo.

Cheers.

TomW

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[Pic test](#) | 4 comments (4 topical, 0 editorial)

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[Pic test](#) | 4 comments (4 topical, editorial)

Re: Pic test ([none / 0](#)) ([#2](#))  
by Jerry on Sat Nov 1st, 2003 at 10:25:08 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi Guys

On Oct 5th I tried to post a pic. and it didn't work.  
Norm answered back and made some helpfull sugjestions.  
Thanks Norm.

Then Electric Ed, Tom W, Norm again, zubbly, ADMIN,  
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They were speaking that Chinese again. The closest  
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You may see a few big pictures from me for awhile. You  
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JK TAS Jerry

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[Pic test](#) | 4 comments (4 topical, 0 editorial)

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Re: Pic test ([none / 0](#)) ([#3](#))  
 by Norm on Sun Nov 2nd, 2003 at 09:55:48 PM  
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[\(User Info\)](#)

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Re: Pic test ([none / 0](#)) ([#4](#))  
 by Jerry on Mon Nov 3rd, 2003 at 11:07:51  
 AM MST  
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This alt with these mods, some wireing changes and some caps will make a few hundred watts with a direct mouted blade at around 4 ft.

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[Pic test](#) | 4 comments (4 topical, 0 editorial)



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[Lamination ?](#) | 2 comments (2 topical, editorial)

Re: Lamination ? ([none / 0](#)) ([#1](#))  
by DanB on Sun Nov 2nd, 2003 at 10:03:59 AM MST  
([User Info](#))

Hi Jerry - I think it would work allright....

Not ideal though, you'd see a big improvment if you used old transformer laminates or something. I used cold rolled steel for a while....

I did a test once and these were approx the results.  
Basicly I built up a 1/2" thick block of diff. steel material and rubbed a Neo magnet on it to get an idea how bad hystoresis losses might be.

Bandsaw blades would retain a magnetic field density of around 110 Gauss!

Plumbers strapping would retains about 25 Gauss.

The cold rolled sheet metal I was using would retain about 13 Gauss.

Transformer laminates would retain about 7 Gauss.

Ive not tried that silicon steel from Ed at Windstuffnow.com.

From the softness of the plumbers strapping I was a bit surprised just how good a permanent magnet it was. I wonder if perhaps it was the galvanized coating that sets up magnetic domains or something.... I believe rust can also setup magnetic domains to a small degree.

Regarding your question about the holes... I don't think they would affect things significantly. I suspect it would work allright with the plumbers strap, but there would be some drag, probably 3X more iron losses at least than if you used good silicon steel.

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Regarding your question about the holes... I don't think they would affect things significantly. I suspect it would work allright with the plumbers strap, but there would be some drag, probably 3X more iron losses at least than if you used good silicon steel.

[Lamination ?](#) | 2 comments (2 topical, 0 editorial)

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[Lamination ?](#) | 2 comments (2 topical, editorial)

Re: Lamination ? ([none / 0](#)) ([#2](#))  
by RayW on Sun Nov 2nd, 2003 at 07:09:10 PM MST  
([User Info](#))

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[Blade ?](#) | 4 comments (4 topical, editorial)

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The power you can get will depend on the diameter, not the number of blades.

More blades will give you more torque, but less speed.

Small diameter gives more speed and less torque and less power. For example your 6.5' diameter will catch only 42% of the power that a 10' diameter rotor will catch. If it is a standards shape (scaled down), then it will give about 27% of the torque of the larger blade. But if you use more, wider blades you can correct this to an extent.

When designing blades I usually look at the cut in speed of the alternator at the desired voltage. I then aim to build a blade that will be very happy at this rpm at about 7mph windspeed (3 metres per second).

You don't give us much help as far as the cut in speed goes. If the blade tips are slender (2" wide) then tip speed ratio could be about 5.5. Circumference is about 6.2 metres. Tip speed is about  $3 \times 5.5 = 16.5$  metres per second at cut-in. That's 160 rpm ( $16.5 \times 60/6.2$ )

Does that makes sense?  
Hugh Piggott <http://www.scoraigwind.co.uk>

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# "How to build a wind turbine"

## Workshop courses

with Hugh Piggott

### Upcoming courses:

Next year

[Four Winds in Edinburgh 15th March 2004 \(already filling up fast\)](#)

[SEI on Guemes Island in Washington USA April 12-17 2004 \(\\$600 for tuition\)](#)

[Scoraig 8-15 May 2004](#)

[LILI?](#)

workshop [course notes](#) for sale (July edition)

### Some **previous courses** photo pages:

2001	<a href="#">Scoraig Aug 2001</a> 	<a href="#">SEI Guemes Island WA USA Oct 2001</a> 	
2002	<a href="#">Scoraig May 02</a> 		<a href="#">CAT October 2002</a> 
2003	<a href="#">Scoraig May 03</a> 	<a href="#">SEI Guemes Island WA USA April 2003</a> 	<a href="#">CAT October 2003</a>  <a href="#">Four Winds Edinburgh February 03</a> 



Each day, a modest amount of theoretical introduction will lead to workshop sessions with opportunities to gain hands-on experience of carving wooden blades, winding coils and fitting magnets into purpose built alternators for windpower, wiring, fabrication, erection and all aspects which can be covered as time allows.

A complete wind turbine will be built from scratch and erected. Full drawings are provided as part of the course.

I should stress that these courses are to teach you **how to build** a wind generator, so please do not expect that you will go home with a completed wind generator.

[More info](#)

---

**"Thank you for an incredibly exciting and interesting course. It really taught me and revised for me a whole number of things, from aerodynamic physics to welding and I hope that in the not to distant future we shall have a wind turbine up... "**



---

[Scoraig](#) 8-15 May 2004

The cost of the Scoraig course is £500 per head, including accommodation at Shanti Griha. Concessionary rates may be negotiable. There may also be space for partners/friends to stay at [Shanti Griha](#) during but not partaking of the course.



This will be the fourth year we hold a course here on Scoraig at the Shanti Griha site. The courses are small (about 7-8 people) but lively and successful. We always complete one wind turbine during the project, and make progress in the construction of others. The main project is a 2.4 metres diameter wind turbine with wooden blades and a permanent magnet alternator. Output is about 500 watts electrical.

To book a place on the scoraig course, please send me [Hugh Piggott](#) a deposit of £100 at



Hugh Piggott  
Scoraig  
Dundonnell  
Ross shire  
IV23 2RE

Keep in touch closer to the time to arrange for car-sharing from nearby railway stations. I will meet you with a boat and take you across to Scoraig from Badluarach jetty. I shall also take your gear to Shanti Griha by quad bike and trailer. Meanwhile you can walk the two miles and enjoy the views of many small wind turbines along the way.

There is no shop on Scoraig so you are recommended to bring supplies of personal luxuries such as beer



or tobacco to last you out. Weather clothing including rubber boots are a good idea even though you will probably not need them. Depending on the season there may already be some small biting insects called midges which drive some people wild. You may wish to bring repellent of some sort.

When driving to Scoraig, take the A9 to Inverness, then follow signs towards Ullapool. Follow the Ullapool road as far as Braemore junction and turn left for Dundonnell. (**Do not** turn left onto the A832 Gairloch road at Garve - wait until **Braemore** where you see the sign for Dundonnell.) After Dundonnell, watch out for signs to Badluarach, and take a right turn down to the jetty.

---

## [Four Winds Inspiration Centre](#)



Edinburgh 15th March 2004 (date to be fixed soon)  
£300.00 per place. Six day course  
[to book a place - e mail \(click here\)](#)

or Telephone/Fax:  
0131~332~2229

---

# Purpose of the Build your own wind turbine workshop courses :

To inspire, empower, and inform participants who wish to build small wind turbines. To cater for people from all backgrounds, age-groups, nationalities, and educational levels. To provide some basic theoretical understanding, and to develop the necessary workshop skills and confidence to enable participants to undertake small wind turbine construction projects safely.



Course at [Liverpool](#)

[in 2000.](#)

## Scope of workshop course - goal and objectives:

A six day course in which the participants learn as much as they are personally capable of learning about small wind turbine design and construction. Each day, a modest amount of theoretical introduction will lead to workshop sessions with opportunities to gain hands-on experience of carving wooden blades, winding coils and fitting magnets into purpose built alternators for windpower, wiring, fabrication, erection and all aspects which can be covered as time allows. Participants who bring their own ideas and materials to the course will be welcomed and given assistance where possible.

We would hope to complete one wind turbine during the project, and make progress in the construction of others. Where participants have brought the materials, they will be able to take the complete (or partially complete) components (blades, alternators..) home with them. Other work in progress will remain on site for use in future courses.



# Scoraig Wind Electric



## COURSES AT CAT IN WALES

I help to teach more general windpower courses at CAT in Wales once or twice each year.

They include some self build material and also wind system design, gridlinked systems, theory of wind engineering etc... for all comers.

The next course takes place in MARCH 2004.

For details [click here](#).

To book please contact Laura Snowball in the Courses Office.

Tel. +44 (0)1654 705981

Fax. +44 (0)1654 703605

Email [courses@cat.org.uk](mailto:courses@cat.org.uk)



[More information about Hugh](#)

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by Jerry on Mon Nov 3rd, 2003 at 11:22:57 AM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Thanks Hugh

I'm not sure if I can make the trip but I will send a set of blades up any way.

Not sure how you could test them they are set up on a hub that fits most ac motor shafts. any where from 1/4 inch to 3/4 inch shaft. I'll send a 3 blade in the 4 foot size.

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I may be able to stop by for one day to discus the hole story behind and preformance details for the plastic blades.

Only if this does not interfear with your workshop.

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[Blade ?](#) | 4 comments (4 topical, 0 editorial)

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- [DanB](#)
- [Harry Luubovv](#)
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[Blades for sale](#) | 6 comments (6 topical, 0 editorial)

To Jerry ([none / 0](#)) (#1)  
by TomW on Thu Oct 30th, 2003 at 11:20:37 PM MST  
([User Info](#)) <http://oneota.net/~earthsourcepowr/>

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Cheers.

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[Stuff I have Online](#)  
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[Blades for sale](#) | 6 comments (6 topical, 0 editorial)

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Re: To Jerry ([none / 0](#)) (#6)  
by Jerry on Sat Nov 1st, 2003 at 08:10:05 AM MST  
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Re: To Jerry ([none / 0](#)) (#4)  
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[Blades for sale](#) | 6 comments (6 topical, editorial)

Re: To Jerry ([none / 0](#)) (#4)  
 by Jerry on Fri Oct 31st, 2003 at 07:24:55 PM MST  
 ([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Hi TomW

YA, We sell lots of 1 farrad caps 1,000,000UF/ 20 volt at \$99.95 ea. I'll sell these caps to OP board members for \$75. They come in red, blue, yellow, silver, green.

We also have 1.5 farrad, 2.5, 35 and 100 farrad caps. WE have a vehicle that holds the NW IASCA SPL record at 168.8 DB. This truck has 54,000 watts onboard. Lots of caps lots of batteries.

I aslo have caps in the 6,10,12,15,18,20,25,30,35,40,50,60,75,80,90,100,110,150,200,250,300,400 volt range with UF rating from 1 UF to 1 farrad. Cap prices from \$2 to \$100 depending on volts/UF rating. Have some non pollar caps as well also some large oil flds, motor start ,motor runs and ect.

Yep caps make a diferance. JK TAS Jerry

PS we also have plenty of gold distribution blocks, fuse blocks and holders, power wire from 10 ga. to 4/0 ga., split loom many sizes. All kinds of car stereo install hardware that realy works great for RE installs.

All this stuff shure is handy for our small wind genny farm on our store roof.

I guse I should make a list and post here and give all my RE buddies here the brotherinlaw discount. That is if its ok with the ADMIN and I don't step on any toes.

Thanks again Tom. Jerry

[Airheads Page](#)

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Re: To Jerry ([none / 0](#)) (#5)  
 by TomW on Fri Oct 31st, 2003 at 11:37:17 PM MST  
 ([User Info](#)) <http://oneota.net/~earthsourcepowr/>

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- [Putte](#)
- [wind pirate](#)
- [Harry Luubovv](#)
- [troy](#)
- Anonymous Users: 12

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Jerry;

I see no problem with listing your stuff at all.

Thats what classy fried ads are for. Giving our users a place to list stuff they have to sell to others in this RE thing that can supply a need. Especially if there is a discount to be had.

Lots of folks need blades and those high value caps don't exactly grow on trees and good connectors are nice to have available.

Another thought is go ahead and make up a list of stuff you have to sell send it to me and I will make a webpage out of it we can stick somewhere people can get to it online. Then include a link in your signature like the airheads link i did for you.

Cheers.

TomW

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Re: To Jerry ([none / 0](#)) ([#6](#))  
by Jerry on Sat Nov 1st, 2003 at 08:10:05 AM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Thanks Tom

Thats great now all I need is time?

I bet those guys that build those perpetual motion machines can also build us a time machine? Those something for nuthing ideas sound good to bad mother nature and the laws of physics don't agree.

JK TAS Jerry

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[Blades for sale](#) | 6 comments (6 topical, editorial)

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- [wind pirate](#)
- [Harry Luubovv](#)
- [troy](#)
- Anonymous Users: 12

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**Who's Online? (32)**

- [Harry Luubovv](#)
- [DanB](#)
- Anonymous Users: 28
- Cloaked Users (2)

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[Question for blade experts.](#) | 7 comments (7 topical, 0 editorial)

Re: Question for blade experts. ([none / 0](#)) (#4)  
by Dave B on Mon Dec 29th, 2003 at 10:42:52 AM MST  
([User Info](#)) <http://www.madbbs.com/users/bruggelog>

Thank you Ed for the great info. We have a wide range of wind here in Western NY but all charts say around 12mph annual average. Sustained winds of 20+ are very common during the winter so it's tough to guess at my design for my application. If this wasn't my first one I'd have a better feel for the specs. I have no easy way to physically measure the power or torque needed under load while I'm testing, pony brake is out. I'm going by feel and guess and just wondered if I'm better off going with more torque and sacrifice some speed, I know I can't have my cake and eat it too. This is great fun, you sold me the silicon steel a while back and I may be in the market again, I'm hooked.  
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Re: Question for blade experts. ([none / 0](#)) (#5)  
 by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon Dec 29th, 2003 at 11:11:13 AM MST  
 ([User Info](#)) <http://www.windstuffnow.com/main>

Dave,

You can usually guesstimate reasonably well if you have a tested output on your machine. I usually make a chart for the rpm range and calculated output for the alternator. This way you have more of a calculated "guess" instead of pulling numbers out of the air and hoping for the best. Once you know your approx alternator output at a given rpm then it makes it much easier to match a blade with that performance.

As an example say your test showed your alternator was making 12 volts at 100 rpm. The resistance of the stator was say 1 ohm to make it simple, and the charging voltage was 12 volts

$$100 \text{ rpm} / 12 = 8.33 \text{ rpm per volt}$$

So at 200 rpm we can calculate what the output might be without any losses...

$$200 \text{ rpm} / 8.33 = 24 \text{ volts open (no load)}$$

Charging to a 12V battery would yeild..

$$(24 \text{ volts open} - 12 \text{ volts charging}) / 1 \text{ ohm} = 12 \text{amps}$$

You can chart this at any rpm, I use a spread sheet to make it simple

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RPM	Open volts	Amps	Watts
200.	24	12	144
300.	36	24	288
400.	48	36	432

And so on...

Then you can easily go on to matching a prop to perform in the range of your wind from there.

Have Fun...

I have a new shipment of silicon coming in soon, I was going to pick it up but its a 5 hour drive and I didn't have the time to spend on the road. Its going to be trucked in instead. I'll have about 500 lbs of silicon available shortly and some sample rolls which I'll list in a few days...

Ed

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[Question for blade experts.](#) | 7 comments (7 topical, 0 editorial)



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[Question for blade experts.](#) | 7 comments (7 topical, editorial)

Re: Question for blade experts. ([none / 0](#)) (#7)  
by Dave B on Mon Dec 29th, 2003 at 08:27:48 PM MST  
([User Info](#)) <http://www.madbbs.com/users/bruggelog>

Ed,  
Thanks again for all the help. I'll start crunching some numbers and post my results to further narrow in on the blade design. I sure appreciate all the trial & error out there behind your experience that has saved me much time. Believe me if I had the time I would like nothing more than to help pave the way for others through experimenting. I'll keep in mind you will have the steel also, I'm already thinking about maybe bigger and better, that's what happens when you're addicted. Thanks, Dave B.

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[Question for blade experts.](#) | 7 comments (7 topical, 0 editorial)

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[Chemist Needed Please](#) | 14 comments (14 topical, editorial)

Re: Chemist Needed Please ([none / 0](#)) ([#11](#))  
by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Wed Dec 31st,  
2003 at 12:16:58 PM MST  
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Testing NEW STUFF.  
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[Chemist Needed Please](#) | 14 comments (14 topical, 0 editorial)

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#### Who's Online? (34)

- [Hank](#)
- [jeanpaul](#)
- [Harry Luubovv](#)
- [DanB](#)
- Anonymous Users: 30

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#### Who's Online? (23)

- [signweld](#)
- [jeanpaul](#)
- [Harry Luubovv](#)
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[Chemist Needed Please](#) | 14 comments (14 topical, editorial)

Re: Chemist Needed Please ([none / 0](#)) ([#10](#))  
by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Wed Dec 31st,  
2003 at 12:15:30 PM MST  
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testing NEW STUFF. Thanks for bearing with us.

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[Chemist Needed Please](#) | 14 comments (14 topical, editorial)

Re: Chemist Needed Please ([none / 0](#)) ([#10](#))  
by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Wed Dec 31st, 2003 at 12:15:30 PM MST  
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testing NEW STUFF. Thanks for bearing with us.

[Chemist Needed Please](#) | 14 comments (14 topical, 0 editorial)

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[HomeBuilt Float Switch - What about low level cutoff?](#) | 3 comments  
(3 topical, editorial)

Re: HomeBuilt Float Switch - What about low level  
([none / 0](#)) (#3)  
by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Sat Dec 13th,  
2003 at 11:50:21 AM MST  
([User Info](#))

The hall effect sensor and flipflop are a great idea - BUT in my location I've had outdoor electronics fail so many different times from lightning that I hesitate to use them for a critical application like a float switch.....if it failed and I didn't notice, the pump could burn out. I also worry about the extremely harsh, condensing environment -- tho I suppose the entire thing could be potted in epoxy.

However, I think my next electronics project is going to be a water system status panel. The challenge is that the house is 480 feet from the spring. I think I have enough wire in place to make a system monitor that will show -- pump running or not, status of both float switches, and a sensor at the cistern to show that water is actually flowing.

DAN

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[HomeBuilt Float Switch - What about low level cutoff?](#) | 3 comments  
(3 topical, 0 editorial)

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[HomeBuilt Float Switch - What about low level cutoff?](#) | 3 comments  
(3 topical, editorial)

Re: HomeBuilt Float Switch - What about low level  
([none / 0](#)) (#2)  
by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Sat Dec 13th,  
2003 at 11:24:37 AM MST  
([User Info](#))

Perfectly appropriate posting for here.

I did have a prototype of this low-level switch working at one time. I didn't want to have the reed switch submerged, OR the magnet (some concerns about possible contamination of the water by epoxy, or Neodymium if the magnet coating failed). So I used a rod with a magnet on it that extended above the water level inside a PVC tube, and a reed switch on the side of the tube. When the water level dropped, the magnet lowered to next to the reed switch and closed it, and both were still above the water line. There was an extension of the bottom of the rod, too -- long enough that the magnet could not travel down past the reed switch and accidentally turn the pump back on again, and so that it could not stick to the switch.

In any case, my problem was ice....the upper level of my well rings is still an icy environment and the water vapor condensed in the tube and froze, causing failure--clogged the whole tube with hoarfrost. I did not find a way around this, other than the possibility of re-building my whole spring house with more space and more insulation. So the project was never written up for our web pages.

In any case -- SJE Rhombus sent us new replacement float switches, one for low level and one for high. That's my next project -- installing them. Time will tell how well they work.

Hope that answers your question.

Cheers  
DANF

[HomeBuilt Float Switch - What about low level cutoff?](#) | 3 comments  
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by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Wed Dec 10th,  
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Upgrading to the latest version of Scoop. That's why all the weirdness. Please hang in there, Rusty should be done with it soon.  
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["WindPower" generator plans](#) | 10 comments (10 topical, editorial)

Re: "WindPower" generator plans ([none / 0](#)) ([#9](#))  
by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Tue Dec 9th, 2003 at 10:37:17 AM MST  
([User Info](#))

<http://dragonflypower.com/DragonBlerb.htm>

[ [Parent](#) ]

Re: "WindPower" generator plans ([none / 0](#)) ([#10](#))  
by desertratjack on Wed Dec 10th, 2003 at 08:33:52 AM MST  
([User Info](#))

Thanyou

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["WindPower" generator plans](#) | 10 comments (10 topical, 0 editorial)

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### ["WindPower" generator plans](#)

By [johnjach](#), Section [Homebrewed Electricity](#)

Posted on Mon Dec 8th, 2003 at 10:13:28 AM MST

[Wind](#)

Is this power output possible?

Plans for a "WindPower" wind generator are available from [www.lookout2000.com](#).

This is a homebrew generator with a 6' dia. 2-bladed prop geared down to a 12V, 60 amp GM alternator. They are claiming an output of 720 watts in a 20 mph wind.

Is this realistic?

Thanks for your help.

["WindPower" generator plans](#) | 10 comments (10 topical, 0 editorial)

Re: "WindPower" generator plans ([none / 0](#)) (#1)  
by [windstuffnow](#) ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Mon Dec 8th, 2003 at 10:28:33 AM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

I didn't see the unit...The site you posted brings me to some web hosting site. On the possibility of making that much power with a 6 ft blade... That comes out to about 63% overall which means they beat the betz and are using an alternator of 100% efficiency.

The best I got from my set up with a 6ft blade and a 60 amp alternator with a modified rotor using neo's was around 320 watts in a 20 mph wind. I thought that was pretty good at the time but still only comes out to around 28% overall efficiency.

Can you repost the site? I'd like to take a look at the unit...

Have Fun  
Ed

Re: "WindPower" generator plans ([none / 0](#)) (#2)  
by [johnjach](#) on Mon Dec 8th, 2003 at 10:41:29 AM MST  
([User Info](#))

So sorry Ed, the complete website is [www.lookout2000.com/windpower/](#)

I'll look forward to your comments. Another DIY unit using an unmodified car alternator is the "Dragonfly" listed on the site list of Otherpower. What do you think of that one?

Thanks. JJ.

[ [Parent](#) ]

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Re: "WindPower" generator plans ([none / 0](#))  
(#3)  
by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Mon Dec  
8th, 2003 at 11:05:50 AM MST  
([User Info](#))

The Dragonfly, to me, looks like about the best you could do with a car alternator....that's why we linked to him. He's also been in business quite a while. We've all discussed the limitations of car alternators and gearing in wind turbines here.....all I can say is that at least the Dragonfly has wood blades and a furling system. I doubt that low wind performance is very good, but at least the machine probably won't blow up. And, the builder advises scheduled maintenance. Another plus, I liked his attitude about maintenance. And it appears he mostly sells for marine users, where 20mph is fairly common....I can't think of a car alternator machine I've seen that starts up below 20 mph.

As for the WindPower machine (I first saw it on Ebay) -- sheet metal blades sound really scary to me. And there's no furling. Sounds like metal fatigue waiting to happen. Maybe OK in the Mojave desert where the builder is located, but I think it would blow up here.

Nuff said.  
DANF

[ [Parent](#) ]

Re: "WindPower" generator plans ([none / 0](#))  
(#6)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on  
Mon Dec 8th, 2003 at 01:22:26 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

I'd have to say Dan's right about the blades... I'm not real comfortable with metal blades at all. The dragonfly looks like a stout little unit. My attempts of using the alternator out of the box were less than satisfying but the modified rotor unit worked fairly well. I still prefer building my own alternator for whatever project I'm working on. I purchased the plans for the dragonfly some time ago out of curiosity but never built one.

I would say if your going to build any type of turbine use good judgement on the strength and durability of the spinning mass....

Have Fun but play safe!

Ed

[ [Parent](#) ]

Re: "WindPower" generator plans ([none / 0](#))  
(#8)  
by desertratjack on Tue Dec 9th, 2003 at  
10:25:23 AM MST  
([User Info](#))

A word search on Dragonfly doesn't yield anything  
and I don't see a site list to find  
"Dragonfly".....Help!

[ [Parent](#) ]

Re: "WindPower" generator plans  
([none / 0](#)) (#9)  
by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on  
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Re: "WindPower" generator plans  
([none / 0](#)) (#10)  
by desertratjack on Wed Dec 10th,  
2003 at 08:33:52 AM MST  
([User Info](#))

Thanyou

[ [Parent](#) ]

Re: "WindPower" generator plans ([none / 0](#)) (#4)  
by desertratjack on Mon Dec 8th, 2003 at 11:40:22 AM MST  
([User Info](#))

Wind power plant outputs have been exaggerated by  
dealers/designers in the past. Generally I expect 1/2 of the  
stated maximum rated output (at 20 mph).

Re: "WindPower" generator plans ([none / 0](#)) (#5)  
by desertratjack on Mon Dec 8th, 2003 at 11:52:25 AM MST  
([User Info](#))

I looked at the site mentioned. I enjoyed it and will look more  
at it in the future. (He's located about 50 miles south of me).  
What I read was 500 watts at 30MPH. Half of this at 20 MPH  
(250 watts) sounds about right. I'd be glad to visit him and  
attempt to verify his figures.



Re: "WindPower" generator plans ([none / 0](#)) ([#7](#))  
by desertratjack on Tue Dec 9th, 2003 at 10:18:33 AM MST  
([User Info](#))

Here is an example of proper documentation of windmill output.

<http://www.wind-works.org/articles/H40Whisper.html>

["WindPower" generator plans](#) | 10 comments (10 topical, 0 editorial)

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["WindPower" generator plans](#) | 10 comments (10 topical, editorial)

Re: "WindPower" generator plans ([none / 0](#)) (#3) by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Mon Dec 8th, 2003 at 11:05:50 AM MST ([User Info](#))

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["WindPower" generator plans](#) | 10 comments (10 topical, 0 editorial)

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Re: "WindPower" generator plans ([none / 0](#)) (#3) by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Mon Dec 8th, 2003 at 11:05:50 AM MST ([User Info](#))

The Dragonfly, to me, looks like about the best you could do with a car alternator....that's why we linked to him. He's also been in business quite a while. We've all discussed the limitations of car alternators and gearing in wind turbines here.....all I can say is that at least the Dragonfly has wood blades and a furling system. I doubt that low wind performance is very good, but at least the machine probably won't blow up. And, the builder advises scheduled maintenance. Another plus, I liked his attitude about maintenance. And it appears he mostly sells for marine users, where 20mph is fairly common....I can't think of a car alternator machine I've seen that starts up below 20 mph.

As for the WindPower machine (I first saw it on Ebay) -- sheet metal blades sound really scary to me. And there's no furling. Sounds like metal fatigue waiting to happen. Maybe OK in the mojave desert where the builder is located, but I think it would blow up here.

Nuff said.  
DANF

[ [Parent](#) ]

["WindPower" generator plans](#) | 10 comments (10 topical, 0 editorial)

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[Good news for Mother Earth News fans](#) | 3 comments (3 topical, editorial)

Re: Good news for Mother Earth News fans ([none / 0](#)) (#2)  
by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Mon Dec 8th, 2003 at 10:49:24 AM MST  
([User Info](#))

I saw that too in the latest issue, and will be ordering it.

Quite a few years back, Mother Earth News was turned into a rich yuppie outdoor magazine, with articles about helicopter salmon fishing in New Zealand and such; I cancelled my subscription then. They lost thousands of subscribers from this, and many staffers. Some of the ex-staffers and readers went on to start Back Home Magazine, to which I have been a contributing author twice now. That's actually my house on the cover of the latest issue of Back Home, with the remote communications article ;~) I do highly recommend Back Home....lots of organic gardening, home cooking, home business success stories, livestock tips, renewable energy, homesteading info....

Then someone at TMEN realized that, hmmm, maybe this was a bad idea. The new TMEN magazine is more back to the roots of the original. My only complaint is they don't run much about renewable energy systems anymore.

In fact, there's not even much about homebrew RE systems anywhere anymore, not even in Home Power.....they seem to focus on mostly big, expensive commercial systems now. It's a void we are considering trying to fill. Just a thought for now, but who knows?

Cheers!  
DANF

[Good news for Mother Earth News fans](#) | 3 comments (3 topical, 0 editorial)

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[how to get off spec solar panel to adequate voltage?](#) | 3 comments  
(3 topical, editorial)

Re: how to get off spec solar panel to adequate vo  
([none / 0](#)) (#2)  
by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Wed Dec 3rd,  
2003 at 09:51:59 AM MST  
([User Info](#))

If that 23V rating is for open-circuit voltage, it's already just fine for charging a 12v battery.

ADMIN

[how to get off spec solar panel to adequate voltage?](#) | 3 comments  
(3 topical, 0 editorial)

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[threshing machine plans](#) | 9 comments (9 topical, editorial)

Re: threshing machine plans ([none / 0](#)) (#4)  
by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Wed Dec 3rd, 2003 at 09:44:46 AM MST  
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"remote living" here IS an appropriate place for this kind of question. And home grain production is still done by the very most remote and/or hardcore homesteaders.

I think I've seen info on home-built threshing machines in older issues of The Mother Earth News, and possibly an issue of Back Home. The latest issue of TMEN has a photo of a homesteader threshing by hand, and she is not looking particularly pleased about the whole process. I can see why you want to build a machine!

ADMIN

[threshing machine plans](#) | 9 comments (9 topical, 0 editorial)

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[SLA batts](#) | 5 comments (5 topical, editorial)

Re: SLA batts ([none / 0](#)) ([#2](#))  
by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Mon Dec 1st, 2003 at 08:49:18 AM MST  
([User Info](#))

Forcefield magnet magnate MattB has about 3000 a/h of surplus SLAs from ChuckM installed at his place -- they went online a couple weeks ago. So far so good! We'll see how they perform, but my opinion is that if the SLAs are in good shape when you get them, and you use the proper regulator (in his case a c-40 set for SLAs) to prevent overcharging, they are probably just great. We've seen lots of dead SLAs, but I think they were murdered by the owners....you can't just add distilled water, so it's critical to not overcharge and boil them.

His SLAs were mounted in steel racks, horizontally. There are 4 racks, and each weighs about 800 lbs. We used an engine hoist to unload them from Chuck's truck into Matts. Matt stated that he used a variety of Mankind's most basic tools to unload them and get them up the hill to their spot underneath his house -- the lever, the fulcrum, the wheel, and the chainsaw :-)

DANF

PS -- the chainsaw was used to widen the doorway so they would fit thru!

PPS -- we'll try and get some pics posted.

Re: SLA batts ([none / 0](#)) ([#4](#))  
by RobD on Tue Dec 2nd, 2003 at 08:35:33 AM MST  
([User Info](#))

Good Dan,  
You crack us up here with your sense of humor!

Where did Matt get his batts?  
I looked for the Surplus Center batts. Are they Surplus Center o Nebraska? I couldn't find them there.

[ [Parent](#) ]

Re: SLA batts ([none / 0](#)) ([#5](#))  
by Chuck on Tue Dec 2nd, 2003 at 12:07:40 PM MST  
([User Info](#))  
<http://www.greeleynet.com/~cmorrison>

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#### Who's Online? (19)

- [jeanpaul](#)
- [DanB](#)
- Anonymous Users: 17

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Hi Rob,

I picked up the batteries in Denver from a guy who was disposing of them for US West. Last I spoke with him it looked like he had made arrangements to have the rest (about 10 48v strings !) sold in mid november. If you are interested, contact me off list and I can make sure they're gone (or not). (See my web site for my email address)

Yes, it was Surplus Center of Lincoln, Neb. They might have sold them by now too.

Chuck

[ [Parent](#) ]

[SLA batts](#) | 5 comments (5 topical, 0 editorial)



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[SLA batts](#) | 5 comments (5 topical, editorial)

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[SLA batts](#) | 5 comments (5 topical, 0 editorial)



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[Low-RPM Hamster-Powered Alternator](#) | 13 comments (13 topical, 0 editorial)

Re: Low-RPM Hamster-Powered Alternator ([none / 0](#)) (#12)  
by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Sun Nov 23rd, 2003 at 10:57:41 AM MST  
([User Info](#))

We will have that data for you soon!

The key thing seems to be getting the drag on the wheel from the coils and magnets just enough for max power output, but not so much that Skippy refuses to run because it's all uphill too steep.

We shall see....

DANF

[ [Parent](#) ]

[Low-RPM Hamster-Powered Alternator](#) | 13 comments (13 topical, 0 editorial)

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[Low-RPM Hamster-Powered Alternator](#) | 13 comments (13 topical, 0 editorial)

Re: Low-RPM Hamster-Powered Alternator ([none / 0](#)) (#11)  
by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Sun Nov 23rd, 2003 at 10:55:13 AM MST  
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Yep, I thinking a strip of corrugated cardboard for traction.

OR -- maybe little tiny track shoes and a possible Nike endorsement? The front of a Wheaties box? Next I might try feeding him on wheaties just to see....

DANF

[ [Parent](#) ]

Re: Low-RPM Hamster-Powered Alternator ([none / 0](#)) (#13)  
by Thomask on Sun Nov 23rd, 2003 at 01:38:55 PM MST  
([User Info](#))

Hello DANF,  
Good idea, but i´m thinking of Material which is used to cover a running circle in a Stadium for Lightathletics - just to make it more convinient for your Powerrunner.  
This should be inside of the Wheel. lol  
Thomas

[ [Parent](#) ]

[Low-RPM Hamster-Powered Alternator](#) | 13 comments (13 topical, 0 editorial)

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[Science Fair Wind Generator](#) | 9 comments (9 topical, editorial)

Re: Science Fair Wind Generator ([none / 0](#)) (#9)  
by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Sun Nov 23rd, 2003 at 10:37:04 AM MST  
([User Info](#))

I agree -- congratulations on your project. And even more congratulations on your data acquisition and graphing! Looks very professional. I'd go for a 4 footer next!  
ADMIN

[Science Fair Wind Generator](#) | 9 comments (9 topical, 0 editorial)

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[Science Fair Wind Generator](#) | 9 comments (9 topical, editorial)

Re: Science Fair Wind Generator ([none / 0](#)) (#9)  
by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Sun Nov 23rd, 2003 at 10:37:04 AM MST  
([User Info](#))

I agree -- congratulations on your project. And even more congratulations on your data acquisition and graphing! Looks very professional. I'd go for a 4 footer next!  
ADMIN

[Science Fair Wind Generator](#) | 9 comments (9 topical, 0 editorial)

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- [signweld](#)
- [Putte](#)
- [wind pirate](#)
- [Harry Luubovv](#)
- [DanB](#)
- Anonymous Users: 13

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[Hey Admin could it be possible](#) | 5 comments (5 topical, 0 editorial)

Re: Hey Admin could it be possible ([none / 0](#)) (#4)  
by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Sun Nov 23rd, 2003 at 10:24:58 AM MST  
([User Info](#))

We ruled out bumping up the posts with new comments to the top-- there would be too many older posts on the front page many mornings.

Instead, we are working on an op that displays only new stuff wherever you deploy it. The programmer we use for all this is real busy, so we'll have to wait for a bit. We'll also have him alphabetize the FAQs by topic and within topics.

It'll happen, please be patient!

ADMIN

Re: Hey Admin could it be possible ([none / 0](#)) (#5)  
by Reno on Sun Nov 23rd, 2003 at 11:01:27 AM MST  
([User Info](#))

thanks, keep up the great work

[ [Parent](#) ]

[Hey Admin could it be possible](#) | 5 comments (5 topical, 0 editorial)

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#### Who's Online? (34)

- [jeanpaul](#)
- [Harry Luubovv](#)
- [DanB](#)
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- Cloaked Users (1)

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[Hey Admin could it be possible](#) | 5 comments (5 topical, editorial)

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ADMIN

[Hey Admin could it be possible](#) | 5 comments (5 topical, 0 editorial)

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- [wind pirate](#)
- [Harry Luubovv](#)
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## [Our Beautiful 1967 Jeep Fire Engine](#)

By [ADMIN](#), Section [Diaries](#)

[ADMIN's Diary](#)

Posted on Sun Sep 21st, 2003 at 11:20:39 AM MST

When you live next door to DanB, you'd BETTER have a fire engine handy!

---

This gorgeous old girl belongs to the Rist Canyon Volunteer Fire Dept., Larimer County Colorado. Our response area is huge; it's a one-hour drive at code 3 (lights and siren) from our east border to our west border. Therefore we have 5 stations....none are manned. The old girl resides at DanF's house since we don't have a "physical" station way up here on the west border of our area.

She's a 1967 Jeep M-715 cargo truck with 38K miles on her. 4WD with high and low range -- and low range is REALLY LOW. She runs a 232 Tornado engine, and was converted to 12v from 24v in the early 1970s. She is outfitted with a modern BB4 fire pump, 250 gallon water tank, booster line reel, and full complement of hose line and tools. RCVFD built the pump system, and it is designed to drain back for winter use -- she can be fully drained and winterized in under 15 minutes, and can draft up a full tank of water again in about 10 minutes. She was originally owned by Larimer County Search and Rescue, and they gave her the nicely-fabricated metal cab and utility bed to replace the old cloth top and flatbed.

She is registered with the county as a Type 6X wildland engine, Rist Canyon Engine 651. She's lovingly referred to as our "slow response pumper" -- she doesn't move very fast, the "Armstrong" power steering gives the driver an upper-body workout, and she will rattle your bones on a rough road, but she also can travel to remote areas where our more modern trucks (like Ford F-550s) fear to tread.

She's one of 3 Jeep M-715s in active service with our department, and she's the only one of the 3 that's classified as a "first out" engine--so she rolls on all fire, medical and rescue calls in our Area 5.



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[Our Beautiful 1967 Jeep Fire Engine](#) | 2 comments (2 topical, 0 editorial)

Re: Our Beautiful 1967 Jeep Fire Engine ([none / 0](#))  
([#1](#))  
by Seth on Mon Sep 22nd, 2003 at 10:35:43 AM MST  
([User Info](#))

Im going to post this link on my Fav FSJ site.... this is a thing of beauty..

PS... did u ever get a line on that flat fender truck , that was just sitting in the hills??

Re: Our Beautiful 1967 Jeep Fire Engine ([none / 0](#))  
([#2](#))  
by RobD on Wed Oct 1st, 2003 at 06:23:53 AM MST  
([User Info](#))

Dan,  
You you guys never cease to amaze me!!  
RobD

[Our Beautiful 1967 Jeep Fire Engine](#) | 2 comments (2 topical, 0 editorial)

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[Our Beautiful 1967 Jeep Fire Engine](#) | 2 comments (2 topical, 0 editorial)

Re: Our Beautiful 1967 Jeep Fire Engine ([none / 0](#)) (#1)  
by Seth on Mon Sep 22nd, 2003 at 10:35:43 AM MST ([User Info](#))

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PS... did u ever get a line on that flat fender truck , that was just sitting in the hills??

[Our Beautiful 1967 Jeep Fire Engine](#) | 2 comments (2 topical, 0 editorial)

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#### Who's Online? (31)

- [Harry Luubovv](#)
- [DanB](#)
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[Our Beautiful 1967 Jeep Fire Engine](#) | 2 comments (2 topical, editorial)

Re: Our Beautiful 1967 Jeep Fire Engine ([none / 0](#)) (#2)  
by RobD on Wed Oct 1st, 2003 at 06:23:53 AM MST ([User Info](#))

Dan,  
You you guys never cease to amaze me!!  
RobD

[Our Beautiful 1967 Jeep Fire Engine](#) | 2 comments (2 topical, 0 editorial)

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- Anonymous Users: 27
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## [Wind -- How do I regulate voltage from my windmill to my battery bank?](#)

By [ADMIN](#), Section [Renewable Energy FAQ](#) [Wind](#)

Posted on Tue Nov 4th, 2003 at 12:43:45 PM MST

The batteries actually regulate themselves, UNTIL they get full. At that point you must start diverting power to a Dump Load.

Many people ask how you can connect an alternator or generator that puts out 30v (into an open circuit) to a battery bank that's only 12v without frying the batteries. The batteries actually regulate themselves and pull the generator voltage down to their charging voltage, UNTIL they get full. Then the power needs to be diverted somewhere else. That is the job of a diversion charge controller and the dump load it sends power to.

Dump loads can be as simple as turning on more lights in your house when it's windy and your battery bank is full. Electric heatings elements are often used. Many people buy or build an automatic diversion charge controller that senses your battery bank voltage and turns heating elements or other loads on to dump power.

Homemade units:

<http://www.bioelectrifier.com/charge.htm>

<http://www.homepower.com/files/shuntregulator18.pdf>

Some commercial units can operate as dump load controllers, for example:

<http://www.xantrex.com/products/product.asp?did=191>

(note -- they can be set to function as a solar charge controller or as a wind dump load controller, but not both at the same time.)

Some good discussion on diversion charge controllers and dump loads:

<http://www.fieldlines.com/story/2003/7/18/8715/42490>

[Wind -- How do I regulate voltage from my windmill to my battery bank?](#) | 0 comments (0 topical, 0 editorial)

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- <http://www.bioelectrifier.com/charge.htm>
- <http://www.homepower.com/files/shuntregulator18.pdf>
- <http://www.xantrex.com/products/product.asp?did=191>
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[Wind -- Can I use a car voltage regulator to regulate my wind generator?](#)

[Wind](#)

By [ADMIN](#), Section [Renewable Energy FAQ](#)  
Posted on Tue Nov 4th, 2003 at 12:24:53 PM MST

No, vehicle voltage regulators are built to perform a completely different function.

Car alternators use spinning electromagnets in the armature to induce current into the coils of the stator and charge your car's battery and/or run your headlights, etc. Your car's voltage regulator is designed to change how much power it puts into the alternator's electromagnets and thus change how powerful the magnetic field is, and therefore how much power it generates. When your car is using lots of power, the voltage regulator increases the power to the magnetic field and the alternator loads up and makes more power. When the battery is full, the voltage regulator reduces power to the electromagnets, letting the alternator spin more freely and make less power.

With any kind of wind turbine, when the batteries get full during a windstorm, you MUST keep the wind turbine loaded up--otherwise it will freewheel, overspeed and blow up. A car voltage regulator would perform the opposite function...it unloads the alternator when the batteries fill.

With a permanent magnet alternator, your battery bank is an integral part of the electrical circuit and regulates the voltage on it's own -- UNTIL the batteries get full. At that point you need to divert power to a Dump Load.

See these FAQs for "How do I regulate my windmill?" for more details on regulation, dump loads, shunt regulators, etc.

Good voltage regulator discussion here:  
<http://www.fieldlines.com/story/2003/7/18/8715/42490>

[Wind -- Can I use a car voltage regulator to regulate my wind generator?](#) | 0 comments (0 topical, 0 editorial)

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## [Wind -- Can I use a car alternator to build a wind generator?](#)

By [ADMIN](#), Section [Renewable Energy FAQ](#)

Posted on Tue Nov 4th, 2003 at 12:09:21 PM MST

[Wind](#)

You could...but they are poorly-suited for the task, requiring high rpms to make power, and have other problems.

You could do it, but car alternators need to spin much too fast to be direct-driven by a windmill. You'll need pulleys and gears to get the rpms up above 1000, whereas a homebuilt PM alternator can cut in at only 110 rpm and rarely exceeds 500 rpm (ideally). There are major friction losses involved in gearing the machine up, and these losses come right off the top and seriously hurt your low-wind performance. It's possible to rewind a car alternator with thinner wire to improve low cut-in speed, but the other problems still remain and it's complicated to do. The electromagnetic field in a car alternator also uses up power. There are also brushes that wear out, and the bearings are not designed for thrust loads. These facts all make a good case for building your own permanent magnet (PM) alternator instead of adapting a car alternator.

We have more details about selecting an alternator or generator for a wind turbine on our site here:  
[http://www.otherpower.com/otherpower\\_wind\\_alternators.html](http://www.otherpower.com/otherpower_wind_alternators.html)

Some discussion on this board about using car alternators for wind power and the relationship inside them between coil wire size, voltage and amperage:  
<http://www.fieldlines.com/story/2003/8/4/22368/12185>

(Blatent Otherpower.com Self-Promotion)

A good and cheap (US\$3) booklet 'Alternator Secrets' explaining exactly how car alternators work:  
[http://www.wondermagnets.com/cgi-bin/edatcat/WMSstore.pl?user\\_action=detail&catalogno=1101](http://www.wondermagnets.com/cgi-bin/edatcat/WMSstore.pl?user_action=detail&catalogno=1101)

[Wind -- Can I use a car alternator to build a wind generator?](#) | 0 comments (0 topical, 0 editorial)

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- [http://www.wondermagnets.com/cgi-bin/edatcat/WMSstore.pl?user\\_action=detail&catalogno=1101](http://www.wondermagnets.com/cgi-bin/edatcat/WMSstore.pl?user_action=detail&catalogno=1101)
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## [Wondermagnet.com -- major site update!](#)

By [ADMIN](#), Section [Site News](#)

[Magnetism](#)

Posted on Wed Sep 10th, 2003 at 11:05:54 AM MST

Should make navigation easier for everyone, plus some new pages. Enjoy!

<http://www.wondermagnet.com/>

[Wondermagnet.com -- major site update!](#) | 0 comments (0 topical, 0 editorial)

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### [Hugh Piggott's Axial Flux Alternator Windmills Plans in stock](#)

By [ADMIN](#), Section [Site News](#)

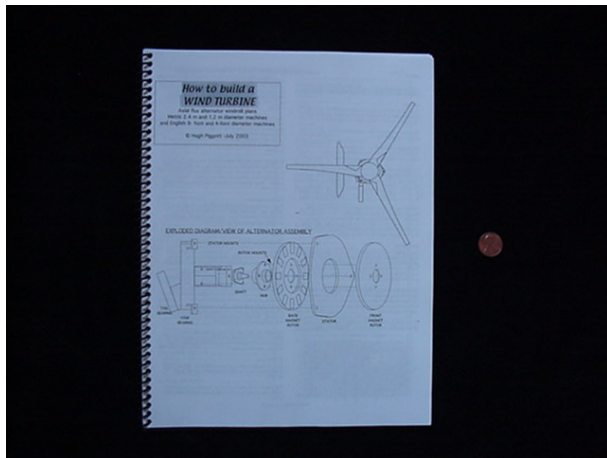
Posted on Fri Aug 29th, 2003 at 03:04:29 PM MST

[Wind](#)

The latest version of the wind turbines Hugh is building in his seminars....

This is the same mill the Dans helped build at Hugh's seminar on Guemes Island, WA, April 2003. 8-foot diameter, dual-magnet-rotor machine, with details on building the 4-foot version too. Nicely detailed and dimensioned CAD drawings, charts, and photos. All the information, details and measurements you need to build an axial-flux wind turbine. Hugh's focus is on slow, gentle, heavy and reliable machines that stand up to extreme conditions.

[http://www.wondermagnets.com/cgi-bin/edatcat/WMSstore.pl?user\\_action=detail&catalogno=1502](http://www.wondermagnets.com/cgi-bin/edatcat/WMSstore.pl?user_action=detail&catalogno=1502)



[Hugh Piggott's Axial Flux Alternator Windmills Plans in stock](#) | 0 comments (0 topical, 0 editorial)

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## [Windpower Workshop by Hugh Piggott now in stock](#)

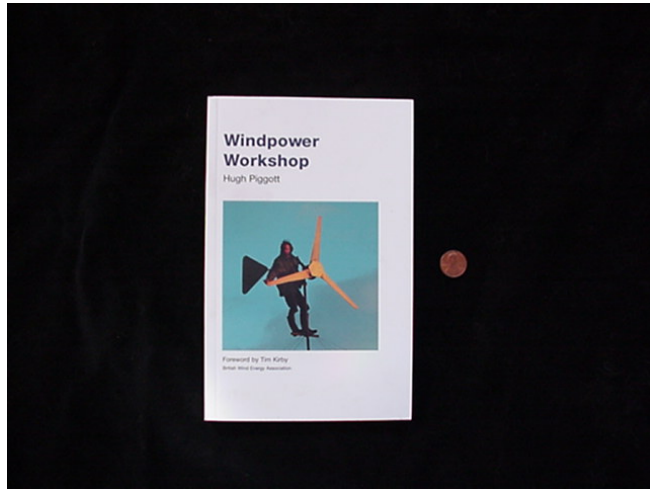
By [ADMIN](#), Section [Site News](#)

[Wind](#)

Posted on Thu Aug 28th, 2003 at 10:28:13 AM MST

**This is an ESSENTIAL book for your wind turbine library!**

[Hugh Piggott's Windpower Workshop](#) is now on Forcefield's shopping cart!



\$15.95 + S/H from Forcefield.

[Windpower Workshop by Hugh Piggott now in stock](#) | 0 comments  
(0 topical, 0 editorial)

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## [Bicycle Speedometer Anemometers](#)

By [ADMIN](#), Section [Homebrewed Electricity](#)

Posted on Thu Aug 14th, 2003 at 12:07:42 PM MST

[Wind](#)

We built 2, and they are really slick and easy to build. Works as wind odometer too! Read on.....



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### Related Links

- <http://www.otherpower.com/anemom2.html>
- [More on Wind](#)
- [Also by ADMIN](#)

DETAILS: <http://www.otherpower.com/anemom2.html>

Have fun!

ADMIN

[Bicycle Speedometer Anemometers](#) | 3 comments (3 topical, 0 editorial)

Re: Bicycle Speedometer Anemometers ([none / 0](#)) ([#1](#))  
by Seth on Thu Aug 14th, 2003 at 12:39:00 PM MST  
([User Info](#))

? But how accurate is it????

Re: Bicycle Speedometer Anemometers ([none / 0](#)) ([#2](#))  
by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Thu Aug 14th, 2003 at 01:02:03  
PM MST  
([User Info](#))

Pretty darn good accuracy. It does not respond as fast to gusts as my analog anemometer, since the refresh rate on the bike speedometer is only once per second. But when calibrated off my truck using both GPS and speedometer (GPS showed the truck speedometer is on within 1 mph) it's right on the money. And it matches right up with my Easter Egg anemometer.

CHeers  
ADMIN

[ [Parent](#) ]

Re: Bicycle Speedometer Anemometers ([none / 0](#)) ([#3](#))  
by Seth on Sat Aug 16th, 2003 at 02:09:12 PM MST  
([User Info](#))

what diameter cups/egg thingys did u use..... oh u said calibrated.... so u can change its scale ??

[Bicycle Speedometer Anemometers](#) | 3 comments (3 topical, 0 editorial)

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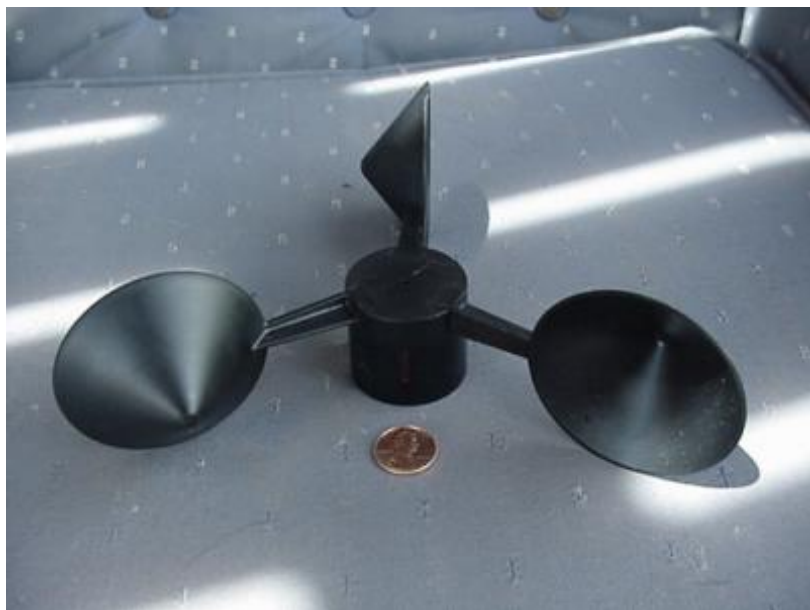
## [New Product -- Anemometer Cup and Hub Assembly](#)

By [ADMIN](#), Section [Site News](#)

Posted on Wed Jul 16th, 2003 at 09:10:54 AM MST

[Wind](#)

Takes care of the tedious part of anemometer building -- fabricating and balancing the cups and hub!



A really nice unit made of durable Polycarbonate (Lexan®). Mounting, glueing and balancing those durn Easter Eggs was a pain in the butt. With this thing, you just press the cups into the hub and are ready to rock n roll.

[http://www.wondermagnets.com/cgi-bin/edatcat/WMSstore.pl?user\\_action=detail&catalogno=4201](http://www.wondermagnets.com/cgi-bin/edatcat/WMSstore.pl?user_action=detail&catalogno=4201)

### CATALOG COPY

\*\*\*\*\*

A quick and easy way to build your own anemometer! A windspeed meter is essential both for evaluating a site for wind power potential, and for measuring the performance of your wind turbine. The most tedious part of building our Easter Egg Anemometer was fabricating and balancing the cup assembly. This product makes that easy! You can use it for any design, including bicycle speedometer versions.

The 3 cups and the hub are made from extremely durable black polycarbonate plastic (Lexan®). They ship unassembled, and the cups simply press fit very firmly into the hub -- no glue is needed. In both of the anemometers we built with these cups, no balancing was needed. There is a 3/32 inch diameter reinforced hole in the exact center of the hub to make fitting your own shaft,

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- [More on Wind](#)
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bearing, or surplus gadget to the hub fast and easy.

The total diameter of the unit is 4.125 inches. Each cup is 2.5 inches in diameter. The hub is 1.5 inches in diameter and 1.375 inches deep.

No sensing apparatus is included, that is up to you. This product includes the cups and hub assembly only.

\$20.00

[New Product -- Anemometer Cup and Hub Assembly](#) | 4 comments (4 topical, 0 editorial)

Anemometer humor ([none / 0](#)) ([#1](#))

by ADMIN ([admin@otherpower.com](mailto:admin@otherpower.com)) on Wed Jul 16th, 2003 at 09:23:15 AM MST

([User Info](#))

Sorry, could not resist!

What do you call a device for measuring the speed of certain carnivorous invertebrate creatures across the ocean floor?

An "Anemonemometer"

Cheers

ADMIN

Re: New Product -- Anemometer Cup and Hub Assembly ([none / 0](#)) ([#2](#))

by Demetri ([corvettemach1@yahoo.com](mailto:corvettemach1@yahoo.com)) on Wed Jul 16th, 2003 at 11:12:39 AM MST

([User Info](#))

That was horrible! In tribute to Callahan's Place custom, picture me holding my nose and running screaming into the night.

A group this wacky DOES read science fiction/fantasy, right?

Demetri

Always be the lead dog.

Re: New Product -- Anemometer Cup and Hub Assembly ([none / 0](#)) ([#3](#))

by gameman on Wed Jul 16th, 2003 at 08:35:44 PM MST

([User Info](#))

hi

do you think that i can make something like this but bigger and put it on a dc motor and use it as a wind gen ????

Re: New Product -- Anemometer Cup and Hub Assembly ([none / 0](#)) ([#4](#))  
by troy on Thu Jul 17th, 2003 at 12:41:53 PM MST  
([User Info](#))

You sure can. It's called a drag machine because it uses drag and not lift like a "propellor" based mill. Drag machines are generally pretty good on torque and pretty bad on rpm. Plus the tip of the rotor (like the cup on the anemometer) can never go faster than the ambient wind speed, which is much much different than a machine with a prop. The tip speed on a prop will run anything from 3 to 10 times faster than the ambient wind speed.

A Savonius rotor is another example of a common drag machine.

Best regards,

troy

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### [On the Road Again!](#)

By [ADMIN](#), Section [Homebrewed Electricity](#)

Posted on Fri Apr 11th, 2003 at 08:46:01 AM MST

[Wind](#)

Yeeee-hah, DanB and DanF are taking off for the drive to Seattle this morning.....

, to attend Hugh Piggott's wind generator building seminar. We are both loaded down with cameras, and We plan to put together some detailed webpages about our experiences. And I convinced DanB that we should take my 1999 Ford Ranger instead of his 1931 Model A .... Neither of us will have any internet access for all of next week, but everything will be running normally at our shipping office, retail store and Ebay operations...those folks don't get to go :- ( Anyway, if you have ordering questions or problems, as usual send them to ff@wondermagnet.com Cheers, and have fun...we will be! DANF DANB

[On the Road Again!](#) | 0 comments (0 topical, 0 editorial)

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and more testing (4.00 / 1) (#2)  
by scadmin0 ([scoop@dobbster.com](mailto:scoop@dobbster.com)) on Fri Mar 21st, 2003  
at 09:41:14 PM MST  
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Email: [scoop@dobbster.com](mailto:scoop@dobbster.com)

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by scadmin0 ([scoop@dobbster.com](mailto:scoop@dobbster.com)) on Fri Mar 21st, 2003 at 09:40:37 PM MST  
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testing replies (none / 0) (#3)  
by DanF ([danf@otherpower.com](mailto:danf@otherpower.com)) on Tue Mar 25th, 2003 at 08:50:47 PM MST  
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posted by [witapple](#) on 12/27/2003 10:02:16 PM MST

attached to [Maintaining two batteries with one charger?](#)

2) [Re: The 88 cent counter](#) [[none](#) / [0](#)] Replies: 1

posted by [witapple](#) on 12/22/2003 02:22:24 PM MST

attached to [The 88 cent counter](#)

3) [Re: Big Wind Turbine](#) [[none](#) / [0](#)] Replies: 0

posted by [witapple](#) on 08/17/2003 10:42:22 PM MST

attached to [Big Wind Turbine](#)

4) [Re: savonius turbine that looks like cork screw](#)

[[none](#) / [0](#)] Replies: 0

posted by [witapple](#) on 07/15/2003 11:45:44 PM MST

attached to [savonius turbine that looks like cork screw](#)

5) [Re: Photo of Enertech. Can anyone identify ?](#) [[none](#)

/ [0](#)] Replies: 1

posted by [witapple](#) on 06/19/2003 09:44:13 PM MST

attached to [Photo of Enertech. Can anyone identify ?](#)

6) [ceiling fan](#) [[none](#) / [0](#)] Replies: 0

posted by [witapple](#) on 05/20/2003 08:37:39 AM MST

attached to [Ceiling Fan Generator](#)

7) [censorship](#) [[none](#) / [0](#)] Replies: 1

posted by [witapple](#) on 05/12/2003 12:48:38 AM MST

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by [Old F](#) - December 26

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1 comment

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by [Geek](#) - November 28  
10 comments

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by [swami](#) - November 15  
2 comments

#### [Up and running! \(way up\)](#)

by [marv](#) - November 8  
7 comments

#### [renewable energy faq](#)

by [kurt](#) - November 1  
2 comments

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by [jimu](#) - October 31  
3 comments

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by [Demetri](#) - October 28  
15 comments

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What do you think is the best (as by efficiency, availability, cost, etc.) source of electricity?

- Hydro
- Wind
- Chemical Reaction
- Steam
- Bio-mass
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- Nuclear
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1. [400Hz Gensets](#) ([Homebrewed Electricity](#), [Alternators](#))  
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posted by [wdyasq](#) on 01/05/2004 12:55:39 AM MST  
attached to [400Hz Gensets](#)
- 2) ["OHM's Law"](#) [none / 0] Replies: 0  
posted by [wdyasq](#) on 01/04/2004 04:59:11 PM MST  
attached to [motor bike battery charger](#)
- 3) [Straightening Sheet Metal](#) [none / 0] Replies: 0  
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attached to [Wincharger Rebuild](#)
- 4) [Re: Really thin coils.](#) [none / 0] Replies: 0  
posted by [wdyasq](#) on 12/23/2003 06:12:34 AM MST  
attached to [Really thin coils.](#)
- 5) [JUST FALSE](#) [none / 0] Replies: 1  
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- 6) [Not Dan](#) [none / 0] Replies: 1  
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attached to [Help, DanB](#)
- 7) [Re: System set up ?](#) [none / 0] Replies: 1  
posted by [wdyasq](#) on 12/19/2003 07:36:48 PM MST  
attached to [System set up ?](#)
- 8) [Page 3](#) [none / 0] Replies: 0  
posted by [wdyasq](#) on 12/19/2003 05:42:58 PM MST  
attached to [So you want to build a waste oil heater, eh bunky?](#)
- 9) [Re: 19 amps?](#) [none / 0] Replies: 0  
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attached to [Controller for Router](#)
- 10) [19 amps?](#) [none / 0] Replies: 2  
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- 11) [ground temperature](#) [none / 0] Replies: 0  
posted by [wdyasq](#) on 12/18/2003 04:48:05 PM MST  
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- 12) [Trash Pump](#) [[none / 0](#)] Replies: 0  
posted by [wdyasq](#) on 12/18/2003 07:53:29 AM MST  
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- 13) [by-products](#) [[none / 0](#)] Replies: 0  
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attached to [Moisture and Humidity problem?](#)
- 14) [vacuum](#) [[none / 0](#)] Replies: 2  
posted by [wdyasq](#) on 12/09/2003 07:08:36 PM MST  
attached to [Hydrogen motor conversion](#)
- 15) [Cheaper relays](#) [[none / 0](#)] Replies: 0  
posted by [wdyasq](#) on 12/07/2003 03:33:35 PM MST  
attached to [Electric Ed, help, I think you da man !  
\(anyone's invited\)](#)
- 16) [Tesla](#) [[none / 0](#)] Replies: 1  
posted by [wdyasq](#) on 12/07/2003 09:20:28 AM MST  
attached to [Cold Electricity](#)
- 17) [Rectifier](#) [[none / 0](#)] Replies: 1  
posted by [wdyasq](#) on 12/03/2003 04:04:51 AM MST  
attached to [PMA not filling Battery](#)
- 18) [Re: Update on Wind Turbine](#) [[none / 0](#)] Replies: 1  
posted by [wdyasq](#) on 11/30/2003 08:14:41 AM MST  
attached to [Update on Wind Turbine](#)
- 19) [\\$25](#) [[none / 0](#)] Replies: 0  
posted by [wdyasq](#) on 11/29/2003 07:32:51 AM MST  
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- 20) [rebuilder](#) [[none / 0](#)] Replies: 0  
posted by [wdyasq](#) on 11/28/2003 02:19:41 PM MST  
attached to [Making a drill battery pack - can I up the  
voltage a little?](#)
- 21) [the way](#) [[none / 0](#)] Replies: 1  
posted by [wdyasq](#) on 11/28/2003 10:36:33 AM MST  
attached to [Radial design revisit](#)
- 22) [Unworkable Devices](#) [[none / 0](#)] Replies: 1  
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attached to [Finding the poles on a magnet](#)
- 23) [More information?](#) [[none / 0](#)] Replies: 0  
posted by [wdyasq](#) on 11/28/2003 07:55:09 AM MST  
attached to [Passive Solar Windows, Multi-pane low-e right?](#)
- 24) [On PCBs](#) [[none / 0](#)] Replies: 0  
posted by [wdyasq](#) on 11/27/2003 06:18:41 AM MST  
attached to [More Lamination Dialog?](#)
- 25) [Do WHAT?](#) [[none / 0](#)] Replies: 0  
posted by [wdyasq](#) on 11/26/2003 04:52:18 AM MST  
attached to [Do array of batteries want an equal distance to  
positives](#)
- 26) [AC?](#) [[none / 0](#)] Replies: 0  
posted by [wdyasq](#) on 11/23/2003 03:46:36 PM MST  
attached to [Solar panel help](#)
- 27) [Re: Are squirrel cage rotors a dead issue?](#) [[none /](#)

[0](#)] Replies: 1

posted by [wdyasq](#) on 11/23/2003 09:52:55 AM MST  
attached to [Are squirrel cage rotors a dead issue for vawt and why ?](#)

28) [WHY grade 8?](#) [[none / 0](#)] Replies: 0

posted by [wdyasq](#) on 11/22/2003 06:14:44 AM MST  
attached to [Up and running! \(way up\)](#)

29) [Re: Wind Turbines - wood](#) [[none / 0](#)] Replies: 0

posted by [wdyasq](#) on 11/21/2003 05:15:53 PM MST  
attached to [Wind Turbines - wood](#)

30) [Summertime tricks](#) [[none / 0](#)] Replies: 0

posted by [wdyasq](#) on 11/18/2003 03:43:58 PM MST  
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What do you think is the best (as by efficiency, availability, cost, etc.) source of electricity?

- Hydro
- Wind
- Chemical Reaction
- Steam
- Bio-mass
- Fossil Fuels
- Nuclear
- Lightning
- Static
- Solar

Votes: 80 | Comments: 0  
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7. [VAWT site](#) ([Homebrewed Electricity](#), [Alternators](#))  
 posted by wdyasq on 10/28/2003 03:25:30 PM MST  
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8. [New Generation potential](#) ([Homebrewed Electricity](#), [Free Energy](#))  
 posted by wdyasq on 10/19/2003 08:23:07 PM MST  
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9. [Small power meter](#) ([Homebrewed Electricity](#), [Electronics](#))  
 posted by wdyasq on 10/12/2003 06:58:24 PM MST  
 3 comments

10. [The Easter Bunny marries Santa.](#) ([Homebrewed Electricity](#), [Free Energy](#))  
 posted by wdyasq on 10/12/2003 12:08:15 PM MST  
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11. [New and cheaper Solar Cells](#) ([Homebrewed](#)

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[Electricity](#), [Solar](#))

posted by wdyasq on 10/02/2003 06:44:24 PM MST  
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12. [WoodGas Generator plans](#) ([Homebrewed Electricity](#),  
[Bio-Fuels](#))

posted by wdyasq on 08/31/2003 07:01:35 PM MST  
2 comments

13. [The Ultimate UPS?](#) ([Homebrewed Electricity](#),  
[Batteries](#))

posted by wdyasq on 08/28/2003 04:31:11 AM MST  
1 comment

14. [Power Requirement for StarBand](#) ([Remote Living](#),  
[Electronics](#))

posted by wdyasq on 08/25/2003 05:39:07 PM MST  
9 comments

15. [Airfoils and trial JPG posting](#) ([Homebrewed](#)  
[Electricity](#), [Wind](#))

posted by wdyasq on 07/20/2003 09:01:49 PM MST  
0 comments

16. [Stepper Motor Genny](#) ([Homebrewed Electricity](#),  
[Alternators](#))

posted by wdyasq on 07/13/2003 08:21:16 AM MST  
1 comment

17. [Grid Tie](#) ([Homebrewed Electricity](#), [Inverters](#))

posted by wdyasq on 07/10/2003 09:04:12 PM MST  
1 comment

18. [Airfoild and angle of attack of said Airfoil](#)  
([Homebrewed Electricity](#), [Alternators](#))

posted by wdyasq on 07/05/2003 04:19:40 PM MST  
13 comments

19. [Energy Efficient Frig](#) ([Remote Living](#), [Power](#)  
[Systems](#))

posted by wdyasq on 07/01/2003 07:05:13 PM MST  
12 comments

20. [Coils and Voltage](#) ([Homebrewed Electricity](#),  
[Alternators](#))

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 posted by [veewee77](#) on 01/05/2004 01:43:19 AM MST  
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- 2) [Re: reading material](#) [[none / 0](#)] Replies: 0  
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 posted by [veewee77](#) on 12/19/2003 05:25:18 PM MST  
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 posted by [veewee77](#) on 12/18/2003 12:32:00 PM MST  
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- 5) [Re: What size and voltage](#) [[none / 0](#)] Replies: 0  
 posted by [veewee77](#) on 12/15/2003 04:56:48 PM MST  
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- 6) [Re: Stovetop Heating Elements](#) [[none / 0](#)] Replies: 0  
 posted by [veewee77](#) on 12/12/2003 02:57:27 PM MST  
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- 7) [Re: Electric Car?](#) [[none / 0](#)] Replies: 0  
 posted by [veewee77](#) on 12/08/2003 06:42:32 PM MST  
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- 8) [Re: car heater fans](#) [[none / 0](#)] Replies: 1  
 posted by [veewee77](#) on 12/01/2003 06:52:18 PM MST  
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- 9) [Re: Home Made Solar Questions](#) [[none / 0](#)] Replies: 0  
 posted by [veewee77](#) on 12/01/2003 01:53:27 PM MST  
 attached to [Home Made Solar Questions](#)
- 10) [Re: Yaw stops & furling ?](#) [[none / 0](#)] Replies: 0  
 posted by [veewee77](#) on 11/18/2003 06:15:19 AM MST  
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- 11) [Re: Radiant light from gas flame for solar power?](#)

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[[none / 0](#)] Replies: 0

posted by [veewee77](#) on 11/14/2003 06:11:22 PM MST  
attached to [Radiant light from gas flame for solar power?](#)

12) [Re: becoming synergy?](#) [[none / 0](#)] Replies: 1

posted by [veewee77](#) on 11/12/2003 01:05:14 PM MST  
attached to [becoming synergy?](#)

13) [Re: rotate ni-cad batts](#) [[none / 0](#)] Replies: 0

posted by [veewee77](#) on 11/12/2003 12:51:53 PM MST  
attached to [rotate ni-cad batts](#)

14) [Re: another brake rotor alternator](#) [[none / 0](#)]

Replies: 0  
posted by [veewee77](#) on 11/11/2003 05:23:47 PM MST  
attached to [another brake rotor alternator](#)

15) [Re: Windmill Repairs](#) [[none / 0](#)] Replies: 0

posted by [veewee77](#) on 11/03/2003 01:37:24 PM MST  
attached to [Windmill Repairs](#)

16) [Re: Microwave oven transformer question???](#)

[[none / 0](#)] Replies: 1  
posted by [veewee77](#) on 10/30/2003 07:55:41 PM MST  
attached to [Microwave oven transformer question???](#)

17) [Re: Question about dc to ac inverters](#) [[none / 0](#)]

Replies: 1  
posted by [veewee77](#) on 10/30/2003 05:46:53 AM MST  
attached to [Question about dc to ac inverters](#)

18) [Re: Question about dc to ac inverters](#) [[none / 0](#)]

Replies: 1  
posted by [veewee77](#) on 10/30/2003 05:26:31 AM MST  
attached to [Question about dc to ac inverters](#)

19) [Re: LED and 12Volts power supply HELP!](#) [[none / 0](#)]

Replies: 1  
posted by [veewee77](#) on 10/23/2003 06:08:02 AM MST  
attached to [LED and 12Volts power supply HELP!](#)

20) [Re: Hard Drive Magnets](#) [[none / 0](#)] Replies: 0

posted by [veewee77](#) on 10/22/2003 11:27:14 AM MST  
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21) [Re: more pictures of plastic props](#) [[none / 0](#)]

Replies: 1  
posted by [veewee77](#) on 10/21/2003 08:47:42 PM MST  
attached to [more pictures of plastic props](#)

22) [Re: Solar Panel](#) [[none / 0](#)] Replies: 0

posted by [veewee77](#) on 10/06/2003 08:47:05 PM MST  
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by [jimu](#) - October 31

3 comments

#### [Fun with fuel](#)

by [Demetri](#) - October 28

15 comments

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- Hydro
- Wind
- Chemical Reaction
- Steam
- Bio-mass
- Fossil Fuels
- Nuclear
- Lightning
- Static
- Solar

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What do you think is the best (as by efficiency, availability, cost, etc.) source of electricity?

- Hydro
- Wind
- Chemical Reaction
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[formatted re-post of more on ferrous cores...](#) | 10 comments (10 topical, editorial)

Re: formatted re-post of more on ferrous cores...  
(none / 0) (#1)  
by Reno on Thu Jan 1st, 2004 at 08:55:45 AM MST  
([User Info](#))

Happy new year to you and all. Couple of questions How did you decide how much metal to use did you consider placing the layers of metal between windings of mag wire Will you try to see if it is scaleable in other words less copper same amount of production. This could be a good weight reducer, money saver, space reducer..... Great job I am hoping to start my coil testing but am stilling trying to locate a backing plate for my mags (needs to be cut special) My first design was going to be the metal copper metal idea.

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Re: formatted re-post of more on ferrous cores...  
([none / 0](#)) (#2)  
by [bill541](#) on Thu Jan 1st, 2004 at 12:02:34 PM MST  
([User Info](#))

Ted(Monte350c),

I'm glad somebody else is interested in this too. If more than one person can get positive results, then there may be something to this. I like your idea of the spiral laminations, that is a good way to make a round form out of flat stock. I think the silicon steel mostly comes in the form of flat stock.

It looks like the inside diameter of your coils are the same as the outside diameter of your magnets. I wonder if the diameter differences could account for the differences in gain between your setup and mine?

In the tests I'm running, the finished coil diameters are the same as the magnet diameters. I also found by having a metal disk on the ends of the coils helped as well (the spool shape). The disks I used were just mild steel washers and I swagged them to the ends of the center tube. Basically flaring the ends of the tubing to hold the washers in place.

I'm wondering if you placed metal discs on the ends of the coil you have if there would be any change in output.

Keep us posted on your tests!

Happy New Years!

-Bill-

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Re: formatted re-post of more on ferrous cores...  
([none / 0](#)) (#3)  
by [cevonk \(atsignhere\)aol.com](#) on Thu Jan 1st, 2004 at 02:51:50 PM MST  
([User Info](#))

You might be interested in looking at this patent, which includes using coils with metal inserts, among other things.

Go to German patent office website

<http://depatinet.dpma.de/> (There is an English option)

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EP0001237262A1

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Re: formatted re-post of more on ferrous cores...  
 (none / 0) (#4)  
 by SteveM on Thu Jan 1st, 2004 at 07:55:01 PM MST  
 ([User Info](#))

Ted, Those results are impressive and after some research I think I am starting to understand it a little better. I found out that permeability is the resistance to magnet flux (U). Higher numbers are good and conduct more flux. Air, wood, and plastic are approx = 1, iron = 5000, and silicon steel 40,000. If the magnetic circuit can be approximated or crudely represented by a simple circuit  $v=I*R$  where I is the flux than lowering the total resistance is a good thing. More flux should mean higher voltage. I have been considering a concept to bridge the air gaps in the circuit. If total R is the combined resistance of two air gaps and the conductor in the center we want to minimize it. If 3 resistors are in series then I believe we add the sum to compute total R. If any one of them is a large number the system resistance will be high and bring the flux across the system down. I just posted a picture in the MY PHOTO UPLOAD section that shows a magnetic brush concept. I have explained the picture in my last Magnetic Brush post. I have read your and Bill541 work and think it is well done. I would really like to get your perspective on this addition.  
 Regards, Steve M

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Regards, Steve M

Re: formatted re-post of more on ferrous cores... ([none / 0](#)) (#5)  
by monte350c on Thu Jan 1st, 2004 at 10:22:59 PM MST  
([User Info](#))

Hi guys,

Still recovering from New Year's...

I like the brush concept - but what about trying to put the brushes on the magnets instead? Perhaps some kind of fine hardened steel wire like a brush.

I'm still doing more playing around with various coil formats. I'll post more when I've tested a few. Sure wish Santa had brought me a lathe - maybe next year!

Ted.

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Re: formatted re-post of more on ferrous cores... ([none / 0](#)) (#6)  
by charged on Fri Jan 2nd, 2004 at 10:26:45 AM MST  
([User Info](#))

Get a roll of soft-steel MIG welding wire or just plain 'ol mechanics wire from the hardware store. Wrap the mechanics wire right along with the copper wire as you make your winding. Start winding on a 3/8" dowel and work your way out. This integrates the ferrous material right into the coil and virtually zeros out the eddy-current losses.

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Re: formatted re-post of more on ferrous cores... ([none / 0](#)) (#7)  
by Electric Ed on Fri Jan 2nd, 2004 at 03:03:52 PM MST  
([User Info](#)) <http://www.electric-ed.com>

Better do this with a coil that you don't value very highly. There will be voltage induced into the iron wire, and if the turns are not insulated from each other, short circuits will exist where adjacent turns come in contact.

Current will flow in these "shorted" coils, producing hot spots, similar to what happens in a motor winding that has partially shorted coils.

Electric Ed

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Re: formatted re-post of more on ferrous cores... ([none / 0](#)) (#9)  
by Jerry on Sat Jan 3rd, 2004 at 10:09:42 PM MST  
([User Info](#))  
<http://www.dplusv.com/Photo-03.html>

Ok guys now you've went a done it again. And just when I thought i had to many ideas and projects you go and add another one. This board is addictive and dangerus. OK so heres my next progect idea. My brother use to work for Mead paper Corp. you know those folks that make spieral note books and stuff like that. He use to bring me large carboard tubes. We make sub woofer inclosers at the car stereo store. Some of these tubes still had a very nice varnish coated soft steel wire they used to make the spiroll spring things. However its nice and straight on these big rolls. I still have a few 100 feet. Magnets realy like this

stuff. So I'm going to wind some coils with copper and this stuff in perelell. I have a zilion speaker magnets so I'll wind the coils same size and shape as the speaker magnets. This will get the magnets very close to the laminations (Mead wire) and copper coils at the same time. Very small gap. Thanks so much for this idea. I guess better get ahold of Mead or = to see about more of the soft and candy coated steel wire? JK TAS Jerry

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Re: formatted re-post of more on ferrous cores...  
([none / 0](#)) ([#10](#))  
by bill541 on Sun Jan 4th, 2004  
at 07:16:41 PM MST  
([User Info](#))

I would have to agree with Ed on this one. The steel wire will make an inductor, not unlike your copper wire does. This steel inductor will have voltage induced on it, so it must be insulated from itself just as the copper magnet wire is. If you could wind a full layer of the steel wire and bond it to itself so that it did not form an inductor, then I think you would get it to work. Otherwise it should be insulated steel wire. You may be able to wind the coil so that the copper insulated wire always keeps the steel wire separated, but you would need to put a layer of insulating material between each winding layer... Just my thoughts, Bill

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[formatted re-post of more on ferrous cores...](#) | 10 comments (10 topical, 0 editorial)

Re: formatted re-post of more on ferrous cores...  
([none / 0](#)) (#7)  
by Electric Ed on Fri Jan 2nd, 2004 at 03:03:52 PM MST  
([User Info](#)) <http://www.electric-ed.com>

Better do this with a coil that you don't value very highly. There will be voltage induced into the iron wire, and if the turns are not insulated from each other, short circuits will exist where adjacent turns come in contact.

Current will flow in these "shorted" coils, producing hot spots, similar to what happens in a motor winding that has partially shorted coils.

Electric Ed

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Electric Ed

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Re: formatted re-post of more on ferrous cores... ([none / 0](#)) (#9)  
by Jerry on Sat Jan 3rd, 2004 at 10:09:42 PM MST  
([User Info](#)) <http://www.dplusv.com/Photo-03.html>

Ok guys now you've went a done it again. And just when I thought i had to many ideas and projects you go and add another one. This board is addictive and dangerus. OK so heres my next project idea. My brother use to work for Mead paper Corp. you know those folks that make spieral note books and stuff like that. He use to bring me large carboard tubes. We make sub woofer inclosers at the car stereo store. Some of these tubes still had a very nice varnish coated soft steel wire they used to make the spiroll spring things. However its nice and straight on these big rolls. I still have a few 100 feet. Magnets realy like this stuff. So I'm going to wind some coils with copper and this stuff in perelell. I have a zilion speaker magnets so I'll wind the coils same size and shape as the speaker magnets. This will get the magnets very close to the laminations (Mead wire) and copper coils at the same time. Very small gap. Thanks so much for this idea. I guess better get ahold of Mead or = to see about more of the soft and candy coated steel wire? JK TAS Jerry

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Re: formatted re-post of more on ferrous cores... ([none / 0](#)) ([#10](#))

by [bill541](#) on Sun Jan 4th, 2004 at 07:16:41

PM MST

([User Info](#))

I would have to agree with Ed on this one. The steel wire will make an inductor, not unlike your copper wire does. This steel inductor will have voltage induced on it, so it must be insulated from itself just as the copper magnet wire is. If you could wind a full layer of the steel wire and bond it to itself so that it did not form an inductor, then I think you would get it to work. Otherwise it should be insulated steel wire. You may be able to wind the coil so that the copper insulated wire always keeps the steel wire separated, but you would need to put a layer of insulating material between each winding layer... Just my thoughts, Bill

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[stator](#) | 7 comments (7 topical, 0 editorial)

Re: stator ([none / 0](#)) ([#3](#))  
by jon 63 on Wed Dec 31st, 2003 at 02:09:51 PM MST  
([User Info](#))

i was thinking of trying to make a generator and windmill,i got a 6 volt stator and amp from a motorcycle .seems it would be hard to turn . thanks for reply.

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Re: stator ([none / 0](#)) ([#4](#))  
by jimU on Wed Dec 31st, 2003 at 02:20:53 PM MST  
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Jon..

I own several motorcycles, and have no idea what a stator and amp are..

Now, my 87 Harley Softail has a 30 amp PM alternator on it, which contains a stator and a rotor , using ceramic magnets. Mebbe this is what you are talking about?

If so, not good for wind because of the HI RPMs required for output. I have heard of some success with the rewinding of Harley alternators used to generate some power in wind. You also state 6 volt .. again, still unsure what you are talking about with "amp" , but 6 volt alternators are not a viable option

JimU

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Re: stator ([none / 0](#)) ([#6](#))  
by jon 63 on Wed Dec 31st, 2003 at 02:35:15 PM MST  
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Re: stator ([none / 0](#)) (#7)  
by JB on Wed Dec 31st, 2003 at  
03:23:11 PM MST  
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Re: stator ([none / 0](#)) ([#8](#))  
by Harry Luubovv on Fri Jan 2nd, 2004 at 02:07:01 PM MST  
([User Info](#))

Cute !

Luubovv

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2. [My Mini Geni isn't working very good](#) ([Homebrewed Electricity](#), [Alternators](#))

posted by woofershound on 12/30/2003 02:35:48 PM MST  
18 comments

3. [Untraditional Magnet/Coil Shape/Spacing](#) ([Homebrewed Electricity](#), [Wind](#))

posted by woofershound on 12/07/2003 10:52:57 PM MST  
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4. [PVC Savinous Props](#) ([Homebrewed Electricity](#), [Wind](#))

posted by woofershound on 12/01/2003 12:22:43 PM MST  
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5. [Here are the plans to make PVC Pipe Props](#) ([Homebrewed Electricity](#), [Wind](#))

posted by woofershound on 11/11/2003 05:27:21 PM MST  
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6. [Terbium and Dysprosium Metal, possible power generation](#) ([Homebrewed Electricity](#), [Power Systems](#))

posted by woofershound on 11/02/2003 07:02:18 PM MST  
4 comments

7. [Four Blade PVC Prop](#) ([Homebrewed Electricity](#), [Wind](#))

posted by woofershound on 10/29/2003 05:01:44 PM MST  
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8. [Pool Heating, Only when the Sun is shining](#) ([Remote Living](#), [Water Heating](#))

posted by woofershound on 10/12/2003 09:18:16 PM MST  
1 comment

9. [Using a Speaker to make power](#) ([Homebrewed Electricity](#), [Magnetism](#))

posted by woofershound on 10/11/2003 08:40:29 PM MST  
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10. [Dancing Magnets in an electromagnetic field](#) ([Magnets & Magnetism](#), [Free Energy](#))

posted by woofershound on 10/10/2003 08:21:53 PM MST  
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11. [Coil Sizing Revisited](#) ([Homebrewed Electricity](#), [Alternators](#))

posted by woofershound on 08/30/2003 02:28:27 PM MST  
16 comments

12. [Size Relationships](#) ([Magnets & Magnetism](#), [Science Fair](#))

posted by woofershound on 08/28/2003 06:48:27 AM MST  
4 comments

13. [Magnet Size vs Coil Size](#) ([Homebrewed Electricity](#), [Magnetism](#))

posted by woofershound on 08/25/2003 12:22:14 PM MST  
3 comments

14. [Thermocouple Power Generation](#) ([Homebrewed Electricity](#), [Solar](#))

posted by woofershound on 08/14/2003 08:41:50 AM MST  
2 comments

15. [Using a Heatsink for your Food](#) ([Homebrewed Electricity](#), [Free Energy](#))

posted by woofershound on 07/10/2003 06:38:11 PM MST  
7 comments

16. [Solar Powered Pool Heater](#) ([Homebrewed Electricity](#), [Solar](#))

posted by woofershound on 07/08/2003 07:17:07 PM MST  
17 comments

17. [Air Dam](#) ([Homebrewed Electricity](#), [Wind](#))

posted by woofershound on 07/07/2003 09:20:21 AM MST  
4 comments



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[My Mini Geni isn't working very good](#) | 18 comments (18 topical, editorial)

Re: My Mini Geni isn't working very good ([none / 0](#)) (#1)  
by Electric Ed on Tue Dec 30th, 2003 at 03:14:02 PM MST  
([User Info](#)) <http://www.electric-ed.com>

From the photos, the coil "span" appears to be somewhat less than the magnet pole center-to-center distance. I suspect that there may be some voltage cancelling happening.

Also, there appears that there is no stator iron, which would create a very inefficient magnetic circuit.

Electric Ed

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[My Mini Geni isn't working very good](#) | 18 comments (18 topical, 0 editorial)

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Electric Ed

Re: My Mini Geni isn't working very good ([none / 0](#)) ([#6](#))  
by wooferhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Tue Dec 30th, 2003 at 06:33:57 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

When I was testing, I was only using 1 coil at a time. For the picture I just stuck those two coils in there so folks could see how I planned to place them. There will be 12 coils and 12 magnets and they will line up to each other 1 to 1.

The ring around the outside is the laminate material from the original fan motor. I was sure that would work for the stator iron.

} = - W o o f --{

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Re: My Mini Geni isn't working very good ([none / 0](#)) ([#9](#))  
by wooferhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Tue Dec 30th, 2003 at 07:30:48 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

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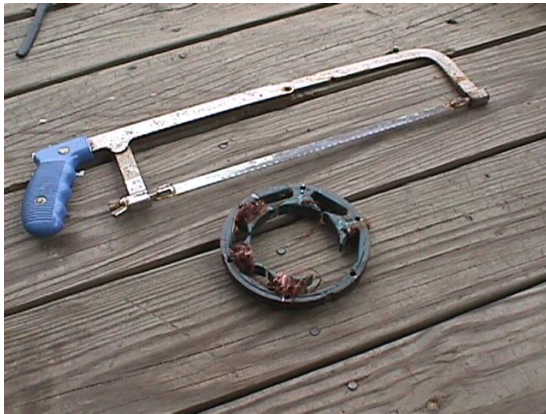
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I should point out that I cut the slots out of the original fan stator, leaving me with an almost perfect circle of laminates.



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Re: My Mini Geni isn't working very good ([none / 0](#)) (#13)  
by Norm on Wed Dec 31st, 2003 at 07:30:20 AM MST  
([User Info](#))

I've got the same thing (even the same hacksaw, but yellow handle) get another junk fan motor (you know they're not that scarce) and start all over again, but don't cut the laminates, this time grind down the armature enough to allow for some of those small magnets that Ed on Windstuffnow has (99 cents each so they won't break you) Have Fun ( :>) Norm

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[My Mini Geni isn't working very good](#) | 18 comments (18 topical, 0 editorial)

Re: [My Mini Geni isn't working very good](#) ([none / 0](#)) (#13)  
by Norm on Wed Dec 31st, 2003 at 07:30:20 AM MST ([User Info](#))

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[My Mini Geni isn't working very good](#) | 18 comments (18 topical, 0 editorial)

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by Norm on Wed Dec 31st, 2003 at 07:30:20 AM MST ([User Info](#))

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[My Mini Geni isn't working very good](#) | 18 comments (18 topical, 0 editorial)

Re: My Mini Geni isn't working very good ([none / 0](#)) (#2)  
by [cevonk \(cevonk\(atsignhere\)aol.com\)](#) on Tue Dec 30th, 2003 at 03:24:08 PM MST ([User Info](#))

Very interesting project! Getting things to work on a small scale is sometimes harder than on a large scale. If the magnets are 1/4" in diameter and 1/4" thick, it looks as if the field airgap between the magnets and the outside stator is about 3/4". With larger magnets, say 1/2" thick, that would work out to an airgap of 1 1/2", which would probably be a serious drawback.

It's neat to see the ideas that you are working on!

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[My Mini Geni isn't working very good](#) | 18 comments (18 topical, editorial)

Re: My Mini Geni isn't working very good ([none / 0](#)) (#2)  
by cevonk ([cevonk\(atsignhere\)aol.com](mailto:cevonk(atsignhere)aol.com)) on Tue Dec 30th, 2003 at 03:24:08 PM MST  
([User Info](#))

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It's neat to see the ideas that you are working on!

Re: My Mini Geni isn't working very good ([none / 0](#)) (#7)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Tue Dec 30th, 2003 at 06:39:35 PM MST  
([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

It's hard to tell the scale from the photos, but the airgap from the end of the magnet to the laminates is slightly over 1/2 inch. was planning on making coils at 3/8 inch thick.

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Re: My Mini Geni isn't working very good ([none / 0](#)) (#4)  
by Norm on Tue Dec 30th, 2003 at 03:43:51 PM MST ([User Info](#))

What happens if you just run the output of one coil thru one small 1 amp diode? or even try measuring the ac voltage? ,,or check the voltage of the battery...then check the voltage of the battery thru the rectifier...you should be getting some kind of voltage ac or dc? even .001 volt? Hope this helps until you get a more expert advice....Like Zuck perhaps? Maybe with a different arrangement of magnets ( :>) Norm.

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Re: My Mini Geni isn't working very good ([none / 0](#)) (#5)  
by JB on Tue Dec 30th, 2003 at 04:34:52 PM MST ([User Info](#))

I did a little 1/6 hp motor something like that last week. it was a small 6 pole 7.8 amp 1000 rpm ac motor and had only 6 coils in series. They looked about 17 or 18 gauge. i put 6 of the 1/2 by 2 by 1/4 neos on it skewed ns ns ns. It still cogs pretty good. I wasnt terribly impressed with my results but it did show 4 amps 15.5 volts on the dc side of the bridge rectifier on my meter at 400 rpm and 5.3 amps 24 volts dc at 770rpm I think if i had doubled the magnets amd made them 1/2 thick I would have been able to bring the charging voltage down considerably. JB

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Re: My Mini Geni isn't working very good ([none / 0](#)) (#10)  
by woofhound ([timmythy@mindspring.com](mailto:timmythy@mindspring.com)) on Tue Dec 30th, 2003 at 07:45:19 PM MST ([User Info](#))  
<http://timmythy.home.mindspring.com/timmy.htm>

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I did try to test the straight AC voltage, but after I disconnected everything I realized that it was'nt hooked up properly. I'll try again in the morning.

Also I did consider testing using a single diode, but the wife wanted the vacuum cleaner fixed so I went on to the higher priority project at the time.  
Thanx

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Re: My Mini Geni isn't working very good ([none / 0](#)) (#12)  
by Norm on Wed Dec 31st, 2003 at 07:06:14 AM MST ([User Info](#))

I think you'll do better with cheap ceramic magnets of the right size, so you know the flux lines will cut the coils where and when you want them to.  
I agree ...something like Ed has would have been a lot less fuss and bother:  
[http://www.windstuffnow.com/main/builders\\_corner.htm](http://www.windstuffnow.com/main/builders_corner.htm)  
and less fuss and bother = More Fun! ( :>) Norm

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Re: My Mini Geni isn't working very good ([none / 0](#)) (#14)  
by Jerry on Wed Dec 31st, 2003 at 08:30:03 AM MST ([User Info](#)) <http://www.dplusv.com/Photo-03.html>

I did 6 of the little Ed/Windstuff magnets on a smaller version of this motor. Didn't change a thing but machined the armature down to fit the magnets.

It dose cogg hard but I'm seeing 60 watts at 500 rpm. Just try getting 60 watts from a solar panel for 6 bux.

JK TAS Jerry

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big gap..... (none / 0) (#16)  
by Norm on Wed Dec 31st, 2003 at 12:51:12 PM MST  
([User Info](#))

After taking a real close look at the pictures and especially the last ones ,I think I have the solution...a couple of the ones that replied and said about the gap were on the right track especially Electric Ed where he also referred to the width of the magnets to the width of the coil or something like that, so I'll be back with the solution as soon as I draw a couple of illustrations on one of your pictures. OK? Norm

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Re: big gap..... (none / 0) (#17)  
by Norm on Wed Dec 31st, 2003 at 02:48:13 PM MST  
([User Info](#))



Okay....on the next one you get like this(this would be an alternative for someone with only simple handtools)after carefully unwinding each coil.....cut each pole straight down as on the red line, when you are finished it will look something like the first picture. Now center a block of wood as thick as the laminate and scribe the radius of the rotor and cut the ends of each pole off accordingly take a large half-round file and file the curve to allow clearance of the rotor. Then rewind the coils and put em back. This is far from ideal but it should work. The better

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way would be as Jerry suggested....Hope this helps....Have Fun! (:>) Norm.

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Re: big gap..... ([none / 0](#)) ([#18](#))  
by Harry Luubovv on Wed Dec 31st, 2003 at  
08:30:05 PM MST  
([User Info](#))

Ok Woofer,

Why not try using square magnets to line up one after another instead of round ones ? because the rounds do give trouble to the magnetic paths, that is, pulling and distorting the flux path. Square ones should behave more "Squarely" in this regard, no pun intended. :-

Love experimenters !  
Luubovv

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[My Mini Geni isn't working very good](#) | 18 comments (18 topical, editorial)

Re: big gap..... (none / 0) (#17)  
by Norm on Wed Dec 31st, 2003 at 02:48:13 PM MST  
([User Info](#))



Okay....on the next one you get like this(this would be an alternative for someone with only simple handtools)after carefully unwinding each coil.....cut each pole straight down as on the red line, when you are finished it will look something like the first picture. Now center a block of wood as thick as the laminate and scribe the radius of the rotor and cut the ends of each pole off accordingly take a large half-round file and file the curve to allow clearance of the rotor. Then rewind the coils and put em back. This is far from ideal but it should work. The better way would be as Jerry suggested....Hope this helps....Have Fun! ( :>) Norm.

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Re: big gap..... (none / 0) (#18)  
by Harry Luubovv on Wed Dec 31st, 2003 at 08:30:05 PM MST  
([User Info](#))

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Ok Woofer,

Why not try using square magnets to line up one after another instead of round ones ? because the rounds do give trouble to the magnetic paths, that is, pulling and distorting the flux path. Square ones should behave more "Squarely" in this regard, no pun intended. :-

Love experimenters !  
Luubovv

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by Harry Luubovv on Wed Dec 31st, 2003 at 08:30:05 PM MST  
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[4 foot blades](#) | 2 comments (2 topical, editorial)

Re: 4 foot blades ([none / 0](#)) ([#1](#))  
by jon 63 on Tue Dec 30th, 2003 at 11:12:02 AM MST  
([User Info](#))

ok maybe i got it this time.lol.i got 2 foot blades 4 foot radius and need to make generator, can you help me on decideing what size magnets i need for a start that would be exceptable for 5 to 15 mile winds on most days. i live in alabama, we have some pretty strong winds sometimes .I have material to build a 30 to 35ft tower, i'm a machinist by trade and also welder..retired.i guess you all know whati mean .lol i'm a hobbieist and always tinkering with things i dont understand . i would be tickle if i could get this to work and see it in action ..thanks John

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Re: 4 foot blades ([none / 0](#)) ([#2](#))  
 by Jerry on Thu Jan 1st, 2004 at 10:36:45 PM MST  
[\(User Info\)](#) <http://www.dplusv.com/Photo-03.html>

Hi John. Could you discribe your blades. Size at the root, size at the tip, any twist, how thick, profile, cup, leading edge, degrees of attac tip and root, trailing edge and how many? I've not built a working disc genny yet. Although I've started a couple. I have mostly been doing AC motor conversions. I have seen 1200 watts from my 22 inch plastic blades (49 inches tip to tip) so at least that part is similar to yours? JK TAS Jerry

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- [Harry Luubovv](#)
- [DanB](#)
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- 1. [pass magnet inside the coils ? \(Magnets & Magnetism, Alternators\)](#)  
 posted by amethyste on 12/28/2003 01:13:20 AM MST  
 4 comments

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[Is this possible?](#) | 8 comments (8 topical, editorial)

Re: Is this possible? ([none / 0](#)) (#2)  
by DERFMOOSE on Sat Dec 27th, 2003 at 01:54:04 PM MST  
([User Info](#))

I think this might work if U use a pendulum lke on a clock ,it swings back & forth and never moves from the centre, might be worth a try.

[Is this possible?](#) | 8 comments (8 topical, 0 editorial)

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1. [Is this possible? \(Homebrewed Electricity, Alternators\)](#)  
posted by EdParenteau on 12/27/2003 10:04:12 AM MST  
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[Is this possible?](#) | 8 comments (8 topical, editorial)

Re: Is this possible? ([none / 0](#)) ([#3](#))  
by Dave B on Sat Dec 27th, 2003 at 11:28:58 PM MST  
([User Info](#)) <http://www.madbbs.com/users/bruggelog>

Look up linear motors. I used to work on very large disk drives that used a linear motor for the read / write heads. It used a chrome etched scale with electronic reading head for indexing the distance moved in or out. The "motor" probably weighed 20 lbs itself and had incredibly fast precise movement. A very large electromagnet coil surrounding the "piston" linear rotor I'll call it and was mounted on rails with ball bearings just like you mention. Wish I had kept a couple of these for just such experiments. If you find one be very careful experimenting, these could clip your fingers off very easily ! Dave

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Re: Is this possible? ([none / 0](#)) ([#4](#))  
by Harry Luubovv on Mon Dec 29th, 2003 at 08:09:39 PM MST  
([User Info](#))

Hi Yo, Pardon me if I appear to be bad when I do not agree with you :-). But I think the idea is a waste of time first off, a reciprocating coil/magnet device would induce too much vibration for the blades. Remember an internal combustion engine has good rubber mounts when it has piston(s) going up and down. Still, there are vibration that you can feel while sitting in the car. But those engines would absolutely indeed need something (Piston) to go up and down because of the function of the fuel system --the fuel needed to be expanded and exploded in order to create powers and so we need top-dead-center position which is the best position to allow the explosions to happen. But this idea again if applied to generator of sorts, would mean wasted power as someone already mentioned, that when the magnet or whatever travels to the top dead center position, it stops for some moments before reversing direction. Hence, you get the lost of energy and wind energy can be too precious to lose this way. Besides again, we would have to have some forms of a crank, or at least a cam device in order for that going-up-and-down thing to motion up and down, this arrangement is an additional source for wasted energy. I could think of many other negative areas for the reciprocating idea but I stop here and want to just briefly mention the difference between reciprocating action and linear one. Linear one is the most efficient type of motions since it has no repeated action loss, meaning, something goes forever straight-on forward, NOT REVOLVING around and around !! But we cannot apply this linear

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technology to some generators because a generator is always something affixed stationarily. But if applied to moving vehicles or vessels, then the linear idea I think is the ideal medium for future transportation propulsion folks. In fact, I can remember still in my failing head that we already have this form of motions for some thirty odd years ! I remember some monorail systems did indeed use linear electro induction theory to move forward back from that time ! And some of those vehicles indeed do not use real rolling bearings neither, they use magnetic powers to float the vehicles above the metal track, so the friction loss is about near zero much like hovercrafts sort of. We did also have other in-plant vehicles moving this way etc etc. However, this gives me an idea, if we can somehow make a continuous "Tube" which is actually a loop of magnet wires and we allow a magnet (Which is magnetically coupled to the blades hub by a spinning disk with magnets affixed to it) to travel inside around and around and at the same time having the magnet inside to float off the wire tube, we can then cut down friction to zero and this will enhance greatly to precious wind power uses I think. But the only obstacle here is, how do we devise some magnets to travel and floats inside a tube of wires without touching the sidewall ? This is the only question in my head folks ! Perhaps we can have the a real tube made of plastic to covering the wires and have the inside of this tubing vacuum filled and have some form of fluids to float the magnet. But this fluid still would not create zero friction. But perhaps then we can use laser beams to float the magnet, this is possible. Think on folks ... but I think we are getting too high tech here, I will have to come down from the sky you would have to say ..... ! Hey last, I am not a scientist honestly, I am someone just like you, who tends to like to fiddle with things just to find out ..... so as a fellow human being, I can be wrong too in areas folks ..... hey ! ! Ciao ! Luubovv.

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Hi Yo, Pardon me if I appear to be bad when I do not agree with you :-). But I think the idea is a waste of time first off, a reciprocating coil/magnet device would induce too much vibration for the blades. Remember an internal combustion engine has good rubber mounts when it has piston(s) going up and down. Still, there are vibration that you can feel while sitting in the car. But those engines would absolutely indeed need something (Piston) to go up and down because of the function of the fuel system --the fuel needed to be expanded and exploded in order to create powers and so we need top-dead-center position which is the best position to allow the explosions to happen. But this idea again if applied to generator of sorts, would mean wasted power as someone already mentioned, that when the magnet or whatever travels to the top dead center position, it stops for some moments before reversing direction. Hence, you get the lost of energy and wind energy can be too precious to lose this way. Besides again, we would have to have some forms of a crank, or at least a cam device in order for that going-up-and-down thing to motion up and down, this arrangement is an additional source for wasted energy. I could think of many other negative areas for the reciprocating idea but I stop here and want to just briefly mention the difference between reciprocating action and linear one. Linear one is the most efficient type of motions since it has no repeated action loss, meaning, something goes forever straight-on forward, NOT REVOLVING around and around !! But we cannot apply this linear technology to some generators because a generator is always something affixed stationarily. But if applied to moving vehicles or vessels, then the linear idea I think is the ideal medium for future transportation propulsion folks. In fact, I can remember still in my failing head that we already have this form of motions for some thirty odd years ! I remember some monorail systems did indeed use linear electro induction theory to move forward back from that time ! And some of those vehicles indeed do not use real rolling bearings neither, they use magnetic powers to float the vehicles above the metal track, so the friction loss is about near zero much like hovercrafts sort of. We did also have other in-plant vehicles moving this way etc etc. However, this gives me an idea, if we can somehow make a continuous "Tube" which is actually a loop of magnet wires and we allow a magnet (Which is magnetically coupled to the blades hub by a spinning disk with magnets affixed to it) to travel inside around and around and at the same time having the magnet inside to float off the wire tube, we can then cut down friction to zero and this will enhance greatly to precious wind power uses I think. But the only obstacle here is, how do we devise some magnets to travel and floats inside a tube of wires without touching the sidewall ? This is the only question in my head folks ! Perhaps we can have the a real

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tube made of plastic to covering the wires and have the inside of this tubing vacuum filled and have some form of fluids to float the magnet. But this fluid still would not create zero friction. But perhaps then we can use laser beams to float the magnet, this is possible. Think on folks ... but I think we are getting too high tech here, I will have to come down from the sky you would have to say ..... ! Hey last, I am not a scientist honestly, I am someone just like you, who tends to like to fiddle with things just to find out ..... so as a fellow human being, I can be wrong too in areas folks ..... hey !! Ciao ! Luubovv.

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[Is this possible?](#) | 8 comments (8 topical, 0 editorial)



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Re: Is this possible? ([none / 0](#)) (#5)  
by EdParenteau on Mon Dec 29th, 2003 at 10:18:26 PM MST  
([User Info](#))

Thanks for the comments. What I was actually thinking is probably a goofy idea. I was thinking of what would happen if I were to make a thirty foot or more long string of coils vertically and then use the turbine to haul up the magnet "rotors" which would be dropped down the string of coils (using gravity as the force) one after the other and loop back up again.

And thank's for the welcome Tom!

Ed P

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Re: Is this possible? ([none / 0](#)) ([#6](#))  
by RobD on Tue Dec 30th, 2003 at 07:11:39 AM MST  
([User Info](#))

Not all is lost. The appication might work in a wave or tidal condition.  
RobD

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Re: Is this possible? ([none / 0](#)) ([#7](#))  
by Harry Luubovv on Wed Dec 31st, 2003 at 08:57:29 PM MST  
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Hi Ed,

Don't worry about the goofy ideas, we are all here just to goof one way or another. So lets see if I can goof along longer. I understand your idea, it would be like one round circle standing up vertically, with some benches all around, and this thing turns around and around vertically, and we are the ones who sit in those benches, like what we see in the carnivals ! This will be a true linear motor if you made the circle large enough so that the arrangement will not be seen as a circle anymore. So the magents and the coils are actually crossing paths one vertically and the other horizontally. Or we can say that the coils stay on the inside of the revolving magnet circle. I like the part about letting gravity help move down the magnets on the return side. This actually would be a noval idea, we are not just letting the wind doing the job for us, but now we are utilizing gravity at the same time, and to think about it, the magnets are naturally heavy so there are going to be great momentum to help the down push motion, and the down motion is really the same effect as the up motion for the other side of the circle ! ! ! But sadly one hitch, because by the same token, the weigh of the magnets when first going up, will balance away the gains from the down momentum.

Happy New Year.  
Luubovv.

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Re: Is this possible? ([none / 0](#)) ([#8](#))  
by elvin1949 ([elvin1949@wmconnect.com](mailto:elvin1949@wmconnect.com)) on Fri Jan 2nd, 2004 at 10:30:20 PM MST  
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## BRUSHLESS 24VDC MOTOR W/ SPEED CONTROL (USED)



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Powerful 24Vdc motor with built-in speed control. Removed from electric scooters, these motor/speed control assemblies provide smooth acceleration from 165 to 2880 RPM (no load). No load rating: 2880 RPM @ 24 Vdc @ 0.70 Amps. With a load these motors may draw 15 Amps or more. We estimate them to be about 300 Watts. The speed control is in a potted assembly inside the motor housing. Motor dimensions: 5" diameter x 2.63". 5/16" diameter x 1" long shaft. A removable .5" diameter collar, which was part of the drive mechanism, covers the shaft. The control and power leads have been cut to a length of 3." There are two power leads and six control leads. A 100K linear potentiometer (not included) is required to connect to three of the control leads. Two other leads are a kill switch. The purpose of the remaining lead is unknown. Motors are tested and guaranteed functional. Hook-up diagram supplied.  
CAT# DCM-221

Your Price: \$26.00 each

In stock, ships within 24-48 hours.

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Avg. Customer Review: ★★★★★  
Number of Reviews: 3

10 of 14 people found the following review helpful:



Correction

12/16/2003

Reviewer: A viewer from Winfield, KS US

My face is red, but..... In fairness to All Electronics and people who read my first review, I need to comment again. Having ordered two more motors before discovering the no-load current increase I mentioned, I immediately tested the next two and they seemed to be fine. Problem is, I also test the first motors again, and wasn't able to reproduce the same results as before. Nor can I explain why at this time. All I can say is try them for yourself. Thanks

Was this review helpful to you?  YES  NO



16 of 21 people found the following review helpful:

More comments

12/12/2003

Reviewer: A viewer from Winfield, KS US

Having purchased 2 of these motors and reading Ron's review, I decided to do some testing of my own. (I just checked to see that they ran when I first recieved them) I'm in agreement with Ron's analysis. The current into the (white) control wire tracks the applied voltage at 100 microamp per volt, suggesting an input impedance of 10K ohm. The 100k pot works as a speed control with or without the black lead, indicating it is functioning as a current controlling device. I found the control range to be the same, about 1.7 to 4+ volts. Unfortunately during my testing I found that the no load current, while starting around 0.7 amp began to increase after the motor ran for a period of time, until it exceeded the current limiting of my bench supply (3amp). At full RPM this was a couple of minutes, at a more moderate RPM (1000?) about 10-15 minutes. I tried this on a power supply with more current capacity (15amp) and found that it only became worse. I stopped at 5 amp because I was convinced if the motor was not thermally protected, it would lock up and self-destruct. Both motors I have do the same thing, making them more or less useless. Bad design, bad bearings, or what I don't know. Unfortunately I didn't take the time to check them better when I first recieved them.

Was this review helpful to you?  YES  NO

36 of 45 people found the following review helpful:



more info you'll need - please read!

12/06/2003

Reviewer: Ron Chinnery from Independence, MO USA

First, it's a great deal. However, the hookup drawing supplied needs some correction/additions. The small Black wire should not be used as part of the POT hookup for speed control. That wire appears to be an Output, possibly an open collector output for status of some sort. It is floating open at all times, in all conditions as far as I've been able to tell to this point. (if you figure it out, post it here!) The small Green and Blue wires are Ground, common with the large Black DC Power wire. Use one of these wires for the POT ground, if you need it. The small Red wire outputs a non-regulated DC voltage of less-than the supplied Input DC voltage. I'm not too keen on using this for the +V source for the POT, because it varied a lot with motor load. The Brown wire, when connected to Ground, does indeed disable the motor. In addition, it also reduces the "idle" current consumption to around 40mA. In a typical application, you would not want to use a switch in series with the main DC power to the motor, since it draws such high current. With the current drain reduced to 40mA, you don't really have to worry about the controller draining your batteries. The "speed control" input wire (the small White wire) requires a range of 1.7V to 4.2V to cover the entire speed control range. Personally, I would insert a 10K resistor in series with the White wire, to be sure you don't over-current that input. Once you exceed about 5V on that input, the current (on the White wire) starts to climb fast... leading me to believe the original design had a limit on the control voltage of maybe 5V or so. I also found that using a capacitor of 10uF/50V on this input helped get rid of some (apparently) high input-impedance issues... noise. The controller is an "open loop" design, no speed regulation was employed. :( One of the 2 units I got sounds like it has bad bearings, the other is fine... that's the risk with "used/surplus" motors. Weight: 3lb 10oz Have fun!

Was this review helpful to you?  YES  NO

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posted by kell on 11/03/2003 09:55:42 AM MST  
5 comments
4. [obtaining magnets for generator](#) ([Magnets & Magnetism, Wanted](#))  
posted by kell on 10/13/2003 10:26:38 AM MST  
14 comments

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1. [Static Discharge...Lightning \(Homebrewed Electricity, Alternators\)](#)  
posted by MrResistor on 12/24/2003 04:22:02 PM MST  
3 comments

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[Static Discharge....Lightning](#) | 3 comments (3 topical, editorial)

Re: Static Discharge....Lightning ([none / 0](#)) (#3)  
by MrResistor on Wed Dec 24th, 2003 at 05:48:20 PM MST  
([User Info](#))

Thanks drdongle, I kind of suspected that. I just couldn't get the tesla coil picture out of my head...: =) It occured to me later the metal tower would always be a better ground. If these props work as advertised the RPM should be significantly higher. Put that together with iFred's many thin coil design and I got a bit nervous.....

My aim was to minimize line losses to the house of course.

Now I'm off to find some carbon fiber poles and little props.....

MrResistor

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[Static Discharge....Lightning](#) | 3 comments (3 topical, 0 editorial)

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[Scale model PMG?](#) | 2 comments (2 topical, editorial)

Re: Scale model PMG? ([none / 0](#)) ([#1](#))  
by Bach On on Wed Dec 24th, 2003 at 09:15:47 AM MST  
([User Info](#)) [change AT: bach\\_on AT hotmail.com](#)

What would he use as a power source? You might be able to find some hobby motors. One could power the other one, which would actually produce the electricity. He might be able to build a shell around one to make it look like a diesel engine.

Frankly, it seems like a stretch (at least to me) to make it functional. Without a miniature diesel engine, it can't actually be authentic. You'd also need motors for each of the wheels. But, hey! What do I know? Maybe he could try some of the more exclusive hobby shops - especially those that deal with model trains. Good luck!

Bach On

- I'm just as happy as if I had good sense! -

[Scale model PMG?](#) | 2 comments (2 topical, 0 editorial)

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1. [Scale model PMG? \(Homebrewed Electricity, Alternators\)](#)  
posted by doubter3 on 12/24/2003 07:54:07 AM MST  
2 comments
2. [Resistance in 3 phase alternator windings \(Homebrewed Electricity, Alternators\)](#)  
posted by doubter3 on 10/25/2003 01:29:48 PM MST  
2 comments

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[Silicon steel](#) | 3 comments (3 topical, editorial)

Re: Silicon steel ([none / 0](#)) (#1)  
by Firefly on Tue Dec 23rd, 2003 at 11:17:27 AM MST  
([User Info](#))

Ed,  
I am interested. How do we go about getting together on pricing etc.? will this be offered on windstuffnow?  
Firefly

[Silicon steel](#) | 3 comments (3 topical, 0 editorial)

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Firefly

Re: Silicon steel ([none / 0](#)) (#3)  
by windstuffnow ([elenz@windstuffnow.com](mailto:elenz@windstuffnow.com)) on Tue Dec 23rd, 2003 at 03:00:01 PM MST  
([User Info](#)) <http://www.windstuffnow.com/main>

If you interested in the 1/2" silicon the formula to find weight is:

$$(OD^2 - ID^2) \times .7854 \times .134 = \text{lbs}$$

This is for the 1/2" stuff, the 3/4" will have a different conversion, I'll know when I get it here.

The cost of the stuff is \$4.00 per lb. for either

You can email me with any specifics.

I'm thinking of putting it on my site but in specific size rolls instead of winding each one specific for an application. So there will most likely be 5 or 10lb rolls as a standard.

Have Fun  
Ed

[ [Parent](#) ]

[Silicon steel](#) | 3 comments (3 topical, 0 editorial)

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[Silicon steel](#) | 3 comments (3 topical, 0 editorial)

Re: Silicon steel ([none / 0](#)) ([#2](#))  
by bob golding ([yubba at clara dot net](#)) on Tue Dec 23rd, 2003 at 02:52:29 PM MST  
([User Info](#))

hi ed, thjinking about silicon steel,it ocured to me that the cores out of toriodal transformers might work. has anyone tried using these?

bob

[Silicon steel](#) | 3 comments (3 topical, 0 editorial)

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[Really thin coils.](#) | 5 comments (5 topical, editorial)

Re: Really thin coils. (none / 0) (#2)  
by Bach On on Tue Dec 23rd, 2003 at 04:48:16 AM MST  
([User Info](#)) [change AT: bach\\_on AT hotmail.com](#)

Dan,

Thanks for the response. I've tried 1 by wood as the core for my coils. I've also tried dowels. The quarter inch thick wood seems a better thickness. I might even try to plane that down to something like 3/16 of an inch.

I suspect my post was not clear. I'm talking about two different steps. First, using the plexiglass as a mold for the nine individual coils.

After molding and setting the coils in whatever glue/resin to hold them together, that plexi and wood would be removed and probably discarded. Pure copper would remain.

Then there would be one thickness of plexiglass to which my nine coils would be glued. This should leave me with a stator in the range of 3/8 to 7/16 inches thick.

A difficulty I always seem to have is that my fiberglass molded stators often vary in thickness. This often forces me to have a wider gap to accomodate the less than "plumb" and uniformly level surfaces. I just haven't found the right process to end up with a level molded surface. The plexiglass should be uniformly level, while adding minimally to the thickness.

The plexiglass I have is about an 1/8 of an inch thick.

Bach On

- I'm just as happy as if I had good sense! -  
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[Really thin coils.](#) | 5 comments (5 topical, 0 editorial)

Re: Really thin coils. ([none / 0](#)) ([#3](#))  
by wdyasq on Tue Dec 23rd, 2003 at 06:12:34 AM MST  
([User Info](#))

Bach On,

If I were trying to build the thinnest and strongest stator for the thickness, I would make the front and back plates of high-tensile epoxy resin and 'S-glass' or carbon-fiber cloth first. These thin laminates would be made on a piece of waxed plate glass and made with as little resin as it took to soak the cloth. All excess would be pulled off or I might vacuum bag it with 'peal-ply'.

I would then make my coils and sandwich them between the two skins I had just made. Spacer blocks would keep the skins at a constant thickness and squeeze out the excess resin.

The resulting product would have the structural material as separated as possible. The 'skins' would likely be less than .030 inches each.

But, there is an old saying -Go ahead, it's not my cow.-

Ron

[Really thin coils.](#) | 5 comments (5 topical, 0 editorial)

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Bach On,

If I were trying to build the thinnest and strongest stator for the thickness, I would make the front and back plates of high-tensile epoxy resin and 'S-glass' or carbon-fiber cloth first. These thin laminates would be made on a piece of waxed plate glass and made with as little resin as it took to soak the cloth. All excess would be pulled off or I might vacuum bag it with 'peal-ply'.

I would then make my coils and sandwich them between the two skins I had just made. Spacer blocks would keep the skins at a constant thickness and squeeze out the excess resin.

The resulting product would have the structural material as separated as possible. The 'skins' would likely be less than .030 inches each.

But, there is an old saying -Go ahead, it's not my cow.-

Ron

[Really thin coils.](#) | 5 comments (5 topical, 0 editorial)

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[Really thin coils.](#) | 5 comments (5 topical, editorial)

Re: Really thin coils. ([none / 0](#)) ([#4](#))  
by Nando on Sun Dec 28th, 2003 at 09:53:21 AM MST  
([User Info](#))

Why dont you try to explain what you are trying to do, I mean, the final product; it may be better, this way, for someone to understand what you are trying to do, this way you may get a lot of more practical help.

Nando

[Really thin coils.](#) | 5 comments (5 topical, 0 editorial)

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Re: Really thin coils. ([none / 0](#)) ([#5](#))  
by Harry Luubovv on Tue Dec 30th, 2003 at 09:41:32 AM MST  
([User Info](#))

Hi guys,

Don't forget, it is important to use clamping-down method while epoxying the sandwich. This will keep the stator thinner and the clamps can be adjusted to get an even thickness ALL AROUND the stator disc as you can squeeze the coils down (Unless you already have the coils wound in high density, which is not so easy to do in homemade situations). That too, you won't even have to fabricate spaces. Using 4 or even 6 clamps around the disc can get must precise height adjustments than using the "Lazy" 3 clamps. With 3 clamps, sometimes you might think you got it under control but when the resin or epoxy is dried and you opened the clamps, you would find the uneven thickness still. (Sorry for the outburst "Lazy", did not mean to contradict others. Just wanted to update ideas. Get the drift ? :-)

Smile,  
Harry Luubovv.

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[Really thin coils.](#) | 5 comments (5 topical, 0 editorial)

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[Progressive winding alternator](#) | 5 comments (5 topical, editorial)

Re: Progressive winding alternator ([none / 0](#)) (#5)  
by Harry Luubovv on Tue Dec 30th, 2003 at 10:12:30 AM MST  
([User Info](#))

Hi Windstuff Ed,

I think your "Progressive Coil" idea is innovative thinking, and I like innovative thinking. I had such a thought also once, but only briefly though because nevertheless (Pardon my ignorance Ed), I think, the various sizes of wires will sum back up to the same output figures as if you used an averaged 3 sizes of wires. If we literally did this experiment it can prove out itself. Because I think it is the matter of total copper and the spaces available for the copper to set in, that makes the difference aside from ..... yes, the only way to optimize outputs for high-low winds situations could only be by switching between parallel and series connections. Another matter I think Ed, in both series or parallel situations, the larger sized wires would be dragged down of its output by the smaller sized wires. One thing I've learn in electronics is never to parallel nor to series two different sizes of wires coils unless you are sure that the smallest of wires alone can handle at least half of the current produced in 2 coils situation, or one third the capacity in 3 coils situations, 1/4 cap in 4 coils situation, etc etc ! But in a windgen, we can never be sure of this because we do not control the speed of the mills, the wind does.

Please correct me if I am wrong !

Cheers,  
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[Finding servo motors](#) | 2 comments (2 topical, editorial)

Re: Finding servo motors ([none / 0](#)) ([#1](#))  
by wpowokal on Tue Dec 23rd, 2003 at 05:32:08 AM MST  
([User Info](#))

Windrules,

For a fellow OZ tell me what specifically you are looking for. Here or 'e' mail me wpowokal@bigpond.com

Allan

[Finding servo motors](#) | 2 comments (2 topical, 0 editorial)

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[Finding servo motors](#) | 2 comments (2 topical, editorial)

Re: Finding servo motors ([none / 0](#)) ([#2](#))  
by bob golding ([yubba at clara dot net](#)) on Tue Dec 23rd, 2003 at 06:29:33 AM MST  
([User Info](#))

i dont know personally but if you look at the tesla coil list pupman.com or the tesla coil web ring you might find someone. i know there are a few tesla coilers in oz who might be able to help. lot of simularities between this list and the tesla list.

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[Finding servo motors](#) | 2 comments (2 topical, 0 editorial)

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- 1. [Finding servo motors \(Homebrewed Electricity, Alternators\)](#)  
 posted by windrules on 12/21/2003 06:12:01 PM MST  
 2 comments

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[Net metering with a generator??](#) | 3 comments (3 topical, 0 editorial)

Re: Net metering with a generator?? ([none / 0](#)) ([#1](#))  
by wpowokal on Sun Dec 21st, 2003 at 05:18:47 AM MST  
([User Info](#))

This begs the question of why would you want to!

However the least one would need for the generators well being is the facility to synchronise to the system frequency. This ensures your generator is closed to the system in phase at zero volts. A very small generator could be simply crashed onto the system and come into sync, probably without much harm.

Then there is the problem of voltage, the power factor of the grid (inductive or capacitive), frequency (should the system frequency drop your generator may try to supply the whole of uncle Sam)

Then the legality of a system outage, linesman working and your generator electrocuting them. (thus the features of grid interactive inverters)

Allan

[Net metering with a generator??](#) | 3 comments (3 topical, 0 editorial)

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Allan

Re: Net metering with a generator?? ([none / 0](#)) ([#2](#))  
by JW on Sun Dec 21st, 2003 at 10:15:54 AM MST  
([User Info](#))

I agree with Allan,

It most likely is doable on a small scale, but why bother. It can be feasible to make homebrew power at 2 cents per kwh, but chances are, you most likely won't produce enough power over-time to "contribute" to the grid. Also a good point is the line-mans safety...

If somehow you have managed to assemble a substantial, micro power plant, that can produce 60kw continious 24/7, at 2 cents per kwh, including overhead(equip cost) and fuel cost and will conform to EPA emmissions standards(btw- corn burners do meet these standards). then most likely the local utility will advise you how to do this properly (your results may vary :)

with wind power this is becoming much more popular "ie" wind farms. generally the problems of "freq-sync" to the grid are lessend by stable battery banks and grid-interactive inverters.

back to the original question- use the search feature "of this site" for a -VAR- or VAR power controller. this

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is part of how you can sync to the grid with a mechanical gen-set. but these systems are difficult to manage(and expensive) and you must consult with the utility comp. to do it right.

-JW            www.flashsteam.com

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Re: Net metering with a generator??  
([none / 0](#)) ([#3](#))  
by richhagen on Sun Dec 21st, 2003 at  
12:57:01 PM MST  
([User Info](#))

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[Net metering with a generator??](#) | 3 comments (3 topical, 0 editorial)



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[Net metering with a generator??](#) | 3 comments (3 topical, editorial)

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by JW on Sun Dec 21st, 2003 at 10:15:54 AM MST  
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I agree with Allan,

It most likely is doable on a small scale, but why bother. It can be feasible to make homebrew power at 2 cents per kwh, but chances are, you most likely won't produce enough power over-time to "contribute" to the grid. Also a good point is the line-mans safety...

If somehow you have managed to assemble a substantial, micro power plant, that can produce 60kw continious 24/7, at 2 cents per kwh, including overhead(equip cost) and fuel cost and will conform to EPA emmissions standards(btw-corn burners do meet these standards). then most likely the local utility will advise you how to do this properly (your results may vary :)

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back to the original question- use the search feature "of this site" for a -VAR- or VAR power controller. this is part of how you can sync to the grid with a mechanical gen-set. but these systems are difficult to manage(and expensive) and you must consult with the utility comp. to do it right.

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Re: Net metering with a generator?? ([none / 0](#)) ([#3](#))  
by richhagen on Sun Dec 21st, 2003 at 12:57:01 PM MST  
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1. [Using different kinds of magnets on same rotor \(Homebrewed Electricity, Alternators\)](#)  
posted by Jeremy on 12/20/2003 09:17:38 PM MST  
17 comments

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[Using different kinds of magnets on same rotor](#) | 17 comments (17 topical, editorial)

Re: Using different kinds of magnets on same rotor  
([none / 0](#)) (#2)  
by [Sponge](#) on Sun Dec 21st, 2003 at 02:27:44 AM MST  
([User Info](#))

Im working myself on a harrdisk magnet rotor, this week I'm going to try my test setup for it.

As you might have noticed.. magnets come in all sorts and sizes.. liek this picture demonstrates. I took it yesterday night, bit unsharp:



(clickable)

My current amount of proper magnets:



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I have not yet made laminates. I can't find any decent info about it. The only metal I can find overhere is 10mm wide, 1mm in height and 1m long. (or a 16mm wide version).

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Oh, I forgot: Does anyone think the material from a "cookie box" (like where my magnets are on, at the top picture) would be a nice amination material? :) It's thin.. :)

Also, right here:

<http://www.fieldlines.com/story/2003/10/15/102538/69>

Someone is telling about his HD magnet windmill (somewhere in center of the page), but the guy doesn't have a nemail adres unfortunately.

Regards,  
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[Using different kinds of magnets on same rotor](#) | 17 comments (17 topical, 0 editorial)



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Re: Using different kinds of magnets on same rotor  
([none / 0](#)) (#3)  
by Hank on Sun Dec 21st, 2003 at 06:41:33 AM MST  
([User Info](#))

Try this site

[http://www.otherpower.com/otherpower\\_experiments.html](http://www.otherpower.com/otherpower_experiments.html)

There is a lot of info there on various genny's.

The Volvo 240 and the "Ward Mill" will discuss laminates.

Have fun

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Re: Using different kinds of magnets on same rotor  
([none / 0](#)) (#5)  
by Jeremy on Sun Dec 21st, 2003 at 09:17:13 AM MST  
([User Info](#))

I have to say that I've seen alot of your comments on the rest of the discussion board and I usually have the same questions as you do. Are you not worried by Hanks advice about the dual poles on the hard drive magnets? It seems to me that others have used them with some success. I also hear you saying, "over here" a lot. Where is that?

Thanks,

Jeremy

[ [Parent](#) ]

Re: Using different kinds of magnets on same rotor  
([none / 0](#)) (#8)  
by Sponge on Sun Dec 21st, 2003 at 10:34:47 AM MST  
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Well, ChrisW (the post I mentioned above) got it working right. Although someone else that I mailed failed on his "harddisk magnet" windmill.

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[Using different kinds of magnets on same rotor](#) | 17 comments (17 topical, 0 editorial)



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[Using different kinds of magnets on same rotor](#) | 17 comments (17 topical, 0 editorial)

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[Using different kinds of magnets on same rotor](#) | 17 comments (17 topical, editorial)

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[Using different kinds of magnets on same rotor](#) | 17 comments (17 topical, editorial)

Re: Using different kinds of magnets on same rotor  
([none / 0](#)) (#4)  
by [Jeremy](#) on Sun Dec 21st, 2003 at 09:09:34 AM MST  
([User Info](#))

Thanks for the advice,

The part I find confusing about laminates is firstly, what kind of metal to use (which I think I understand more about from your comment) and secondly, are the strips wound in a coil or are they concentric rings insulated completely from eachother? I would also love an example of a product or thing in everyday life that is made of this metal. I suppose I'm ignorant to what low-carbon or silcon steel is. It sounds so specialized, but perhaps it is an everyday metal I come across all the time. Thanks again for the insight.

Jeremy

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[Using different kinds of magnets on same rotor](#) | 17 comments (17 topical, editorial)

Re: Using different kinds of magnets on same rotor ([none / 0](#)) (#4)  
by [Jeremy](#) on Sun Dec 21st, 2003 at 09:09:34 AM MST ([User Info](#))

Thanks for the advice,

The part I find confusing about laminates is firstly, what kind of metal to use (which I think I understand more about from your comment) and secondly, are the strips wound in a coil or are they concentric rings insulated completely from eachother? I would also love an example of a product or thing in everyday life that is made of this metal. I suppose I'm ignorant to what low-carbon or silcon steel is. It sounds so specialized, but perhaps it is an everyday metal I come across all the time. Thanks again for the insight.

Jeremy

[ [Parent](#) ]

Re: Using different kinds of magnets on same rotor ([none / 0](#)) (#6)  
by [Hank](#) on Sun Dec 21st, 2003 at 09:43:02 AM MST ([User Info](#))

Jeremy,

Low carbon steel is probably the cheapest steel. Probably used in making cars. You may also find it in a Auto Body supply shop. It's soft and easy to work. You can also call a steel supply shop and ask about it. Key here is "low carbon" and that's what I would reccommend as being the most cost effective.

The strips are concentric rings insulated from each other. I used masking tape on one side for the insulation.

The pic here shows my stator. If you look carefully behind the coils in the center you will see the laminates. The width of all the laminates should be at least the size of your magnets and they serve the purpose of focusing and completing the magnetic circuit.

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This greatly enhances the power capabilities of the genny.

Have fun,  
Hank

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[Using different kinds of magnets on same rotor](#) | 17 comments (17 topical, 0 editorial)



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[Using different kinds of magnets on same rotor](#) | 17 comments (17 topical, editorial)

Re: Using different kinds of magnets on same rotor ([none / 0](#)) ([#7](#))  
by [Sponge](#) on Sun Dec 21st, 2003 at 10:30:10 AM MST  
([User Info](#))

btw, staying on topic, I have tried various coils today..and right now, the power output of one coil - currently without laminates - is still a bit disappointing I think. I get about 0.3v with one coil (circular, and wide), spinning my mill as fast as I can. So I'm wondering a bit if I could improve my coil:

Note: Right now you see various magnets. This was just quicly for testing if it was a magnet problem for the low output. For my "real" setup, check out picture above!

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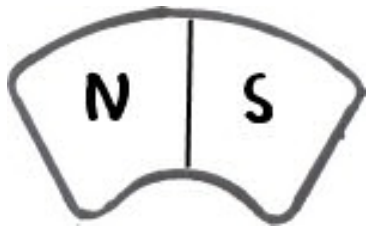
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Since this is my first windmill, I have no idea how those coils exactly work, even after reading all sites I could find :)

All my magnets look like:



Anyone can tell me what the best size would be? :)

Regards,  
Sponge

[Using different kinds of magnets on same rotor](#) | 17 comments (17 topical, 0 editorial)



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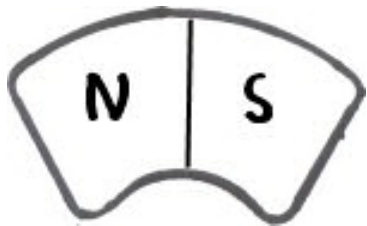
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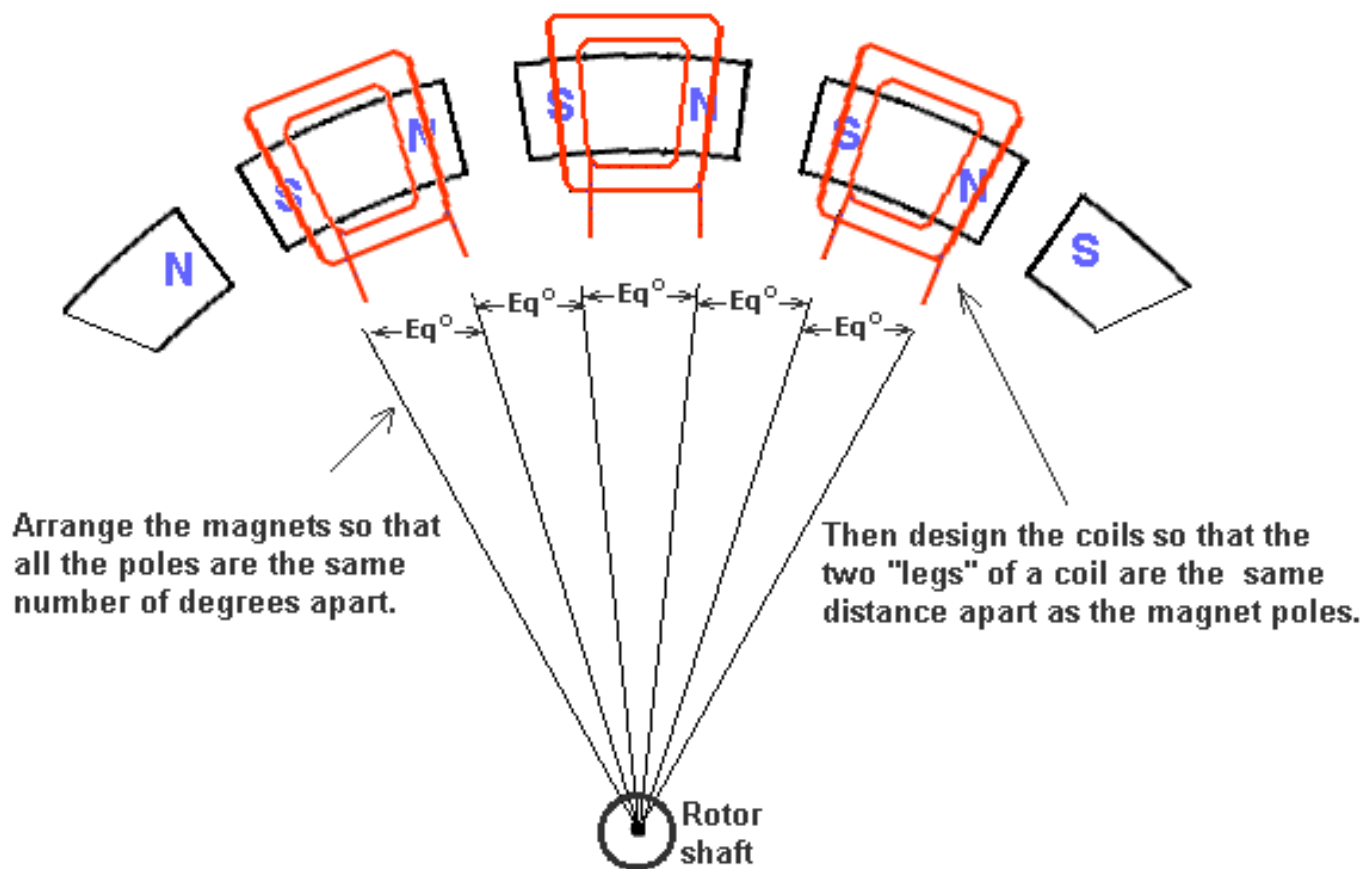
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Re: Using different kinds of magnets on same rotor ([none / 0](#)) ([#9](#))  
by Electric Ed on Sun Dec 21st, 2003 at 11:16:41 AM MST  
([User Info](#)) <http://www.electric-ed.com>

Sponge,  
Try the design approach outlined in the sketch below.

Electric Ed





[ [Parent](#) ]

Re: Using different kinds of magnets on same rotor ([none / 0](#)) ([#10](#))  
by DanB on Sun Dec 21st, 2003 at 11:59:23 AM MST  
([User Info](#))

Yes, I would try what Electric Ed suggests below. I think your coil is way too large... at most, it should be the size of a single magnet there, so that the OD of the coil is not larger than two poles (1 magnet).

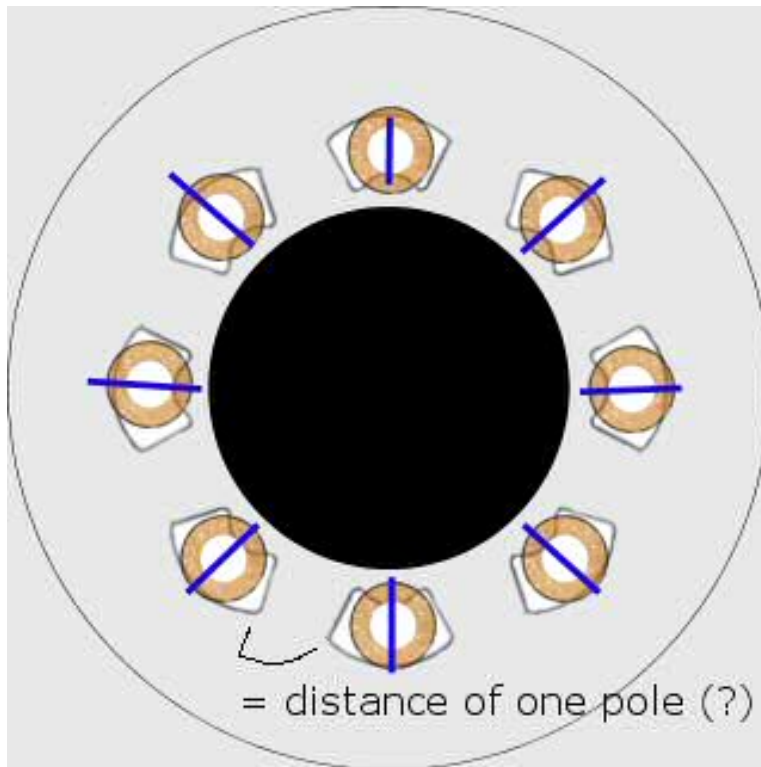
Id also try to keep the coil pretty thin - if you use laminates, i believe there becomes a point of diminishing return when the airgap is thicker than thne magnets. So if you can stack your magnets up to say... 1/4" thick - try to keep the airgap (distance from magnet to laminates) not much more than that...

It sounds a bit funny - but I think perhaps youd get better results if you could break those hard drive magnets in half so that there was a bit of seperation between the poles.

[ [Parent](#) ]

Re: Using different kinds of magnets on same rotor ([none / 0](#)) ([#11](#))  
by [Sponge](#) on Sun Dec 21st, 2003 at 01:20:01 PM MST  
([User Info](#))

Thanks, a bit like this?



I don't like breaking the magnets in two, actually :)

Regards,  
Sponge

[ [Parent](#) ]

Re: Using different kinds of magnets on same rotor ([none / 0](#)) ([#12](#))  
by Hank on Sun Dec 21st, 2003 at 02:14:13 PM MST  
([User Info](#))

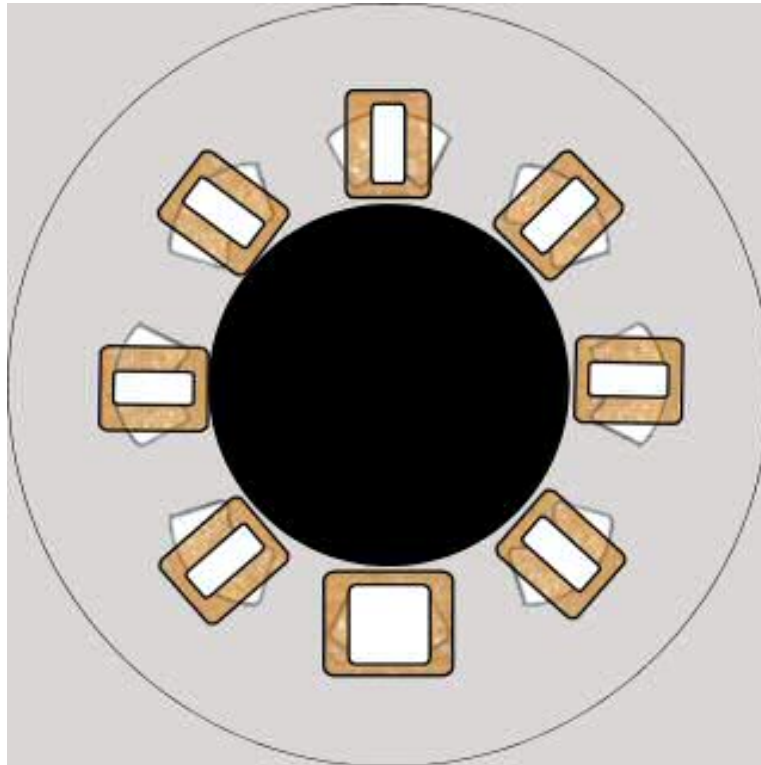
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Re: Using different kinds of magnets on same rotor ([none / 0](#)) ([#13](#))  
by Sponge on Sun Dec 21st, 2003 at 02:45:13 PM MST  
([User Info](#))

Yeah, I tried rectangular before, but somehow the circular one gave more output :). But I guess it was my first "flat" coil. So, if I understand correctly, it should be like this? (or more like the bottom coil?).

With one magnet per pole, it's easier to be sure than with these HD magnets :)  
So.. just checking :) (And I think there are more people looking for answers like these in the future too :- ) !)



Regards,  
Almar

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Re: Using different kinds of magnets on same rotor ([none / 0](#)) ([#14](#))  
by Hank on Sun Dec 21st, 2003 at 06:07:22 PM MST  
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Yes that's more like it. NOT like the bottom one it's to large. Also I think you might want to make the legs a bit longer so the whole magnet can be seen thru the hole in the center of the coil.

Magnets passing parallel with the coil windings don't produce power. This is a waste of potential power.

The coils don't have to be perfectly rectangular, you may want to make them a bit trapazoidal to sort of fit to the shape of your magnets. Perhaps similar to the pic I have above in an earlier thread.

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Re: Using different kinds of magnets on same rotor ([none / 0](#)) ([#16](#))  
by DanB on Mon Dec 22nd, 2003 at 08:27:57 AM MST  
([User Info](#))

I think thats close... the best bet is experiment I suppose. Id try the coils slightly larger. If it were me, If you're not going to break the magnets, then Id try to run them close together so the poles are as equally spaced as possible.

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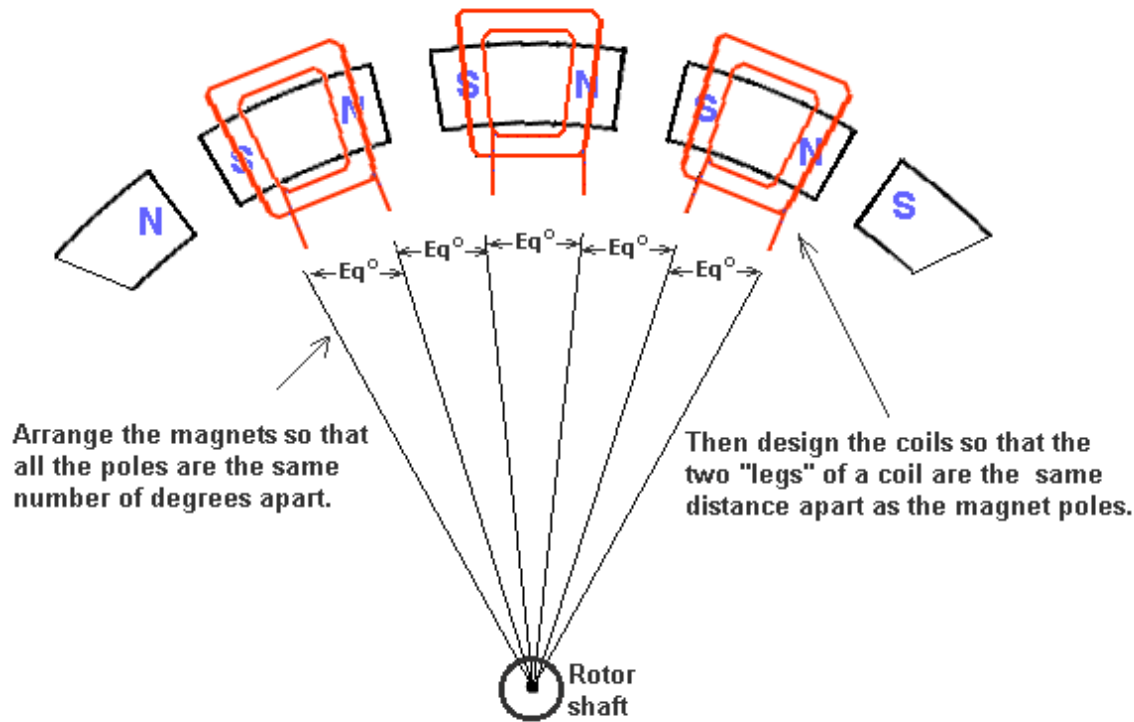
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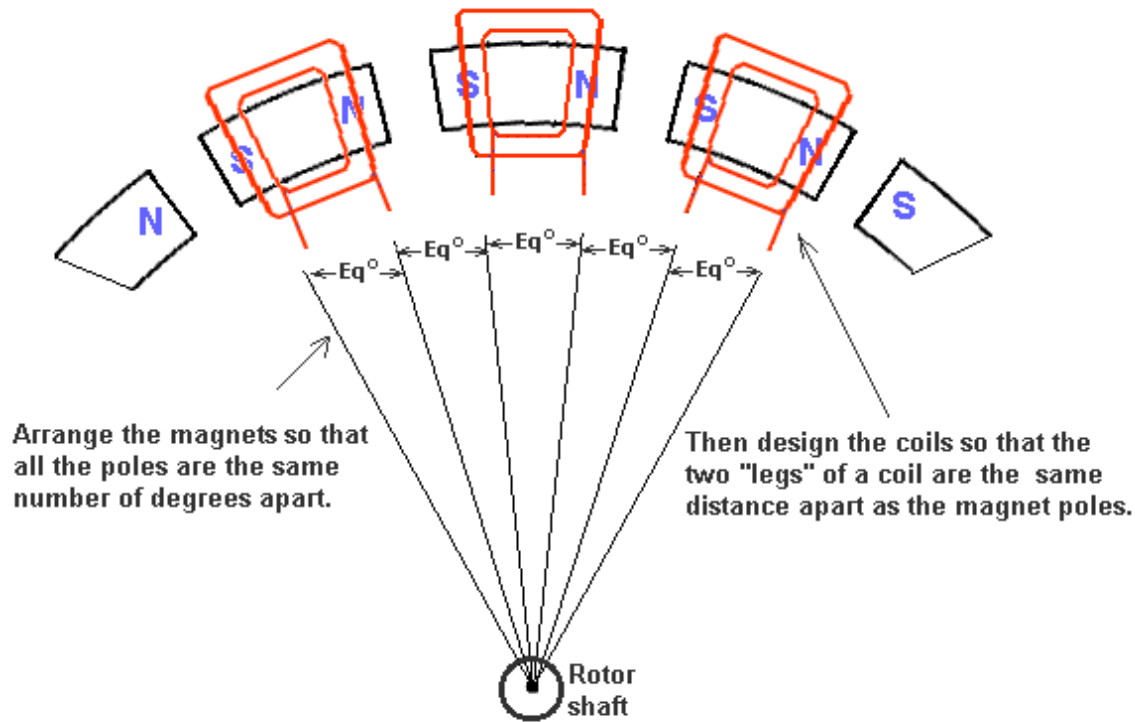
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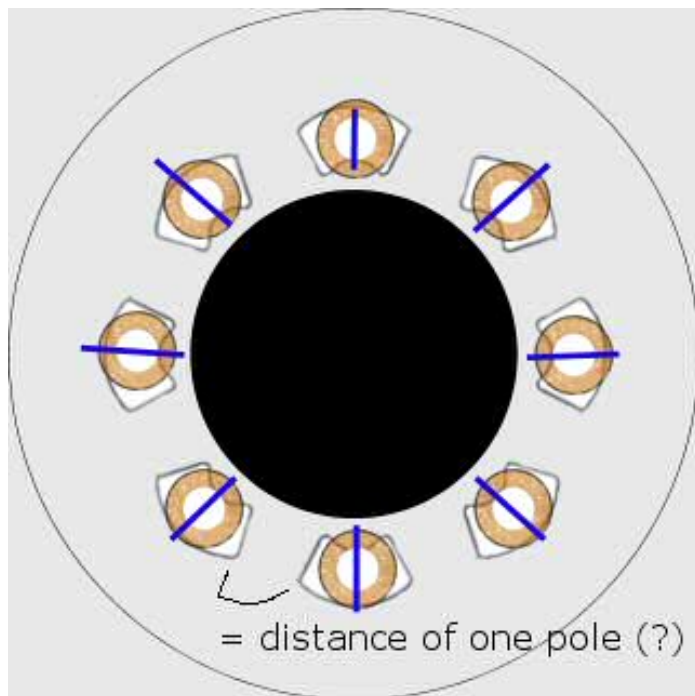
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Re: Using different kinds of magnets on same rotor  
([none / 0](#)) (#11)  
by [Sponge](#) on Sun Dec 21st, 2003 at 01:20:01 PM MST  
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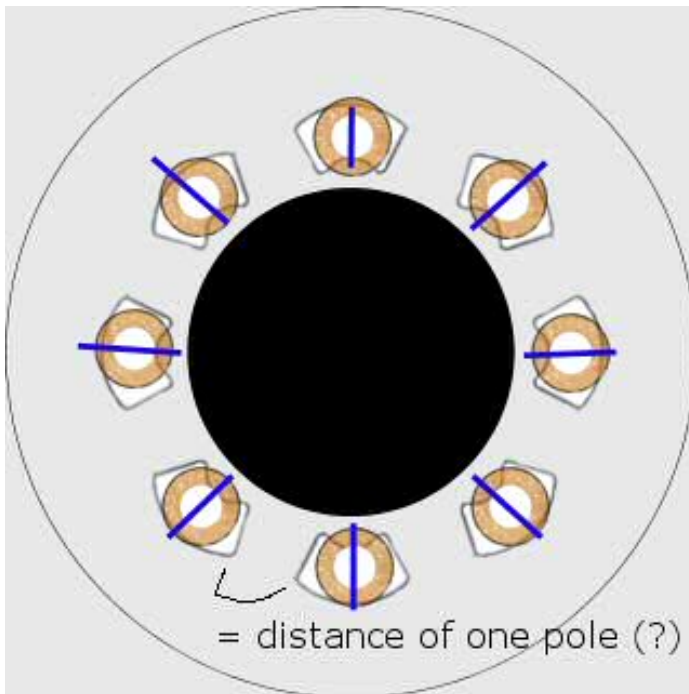
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by [Hank](#) on Sun Dec 21st, 2003 at 02:14:13 PM MST ([User Info](#))

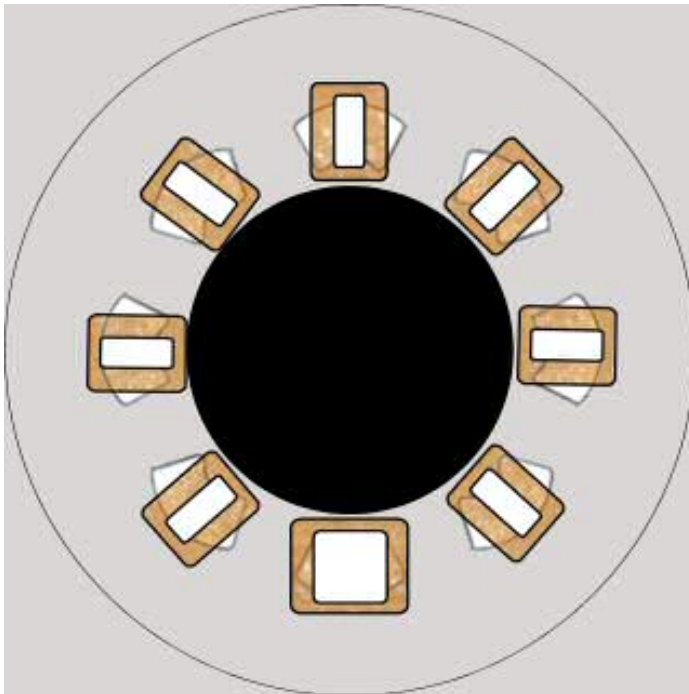
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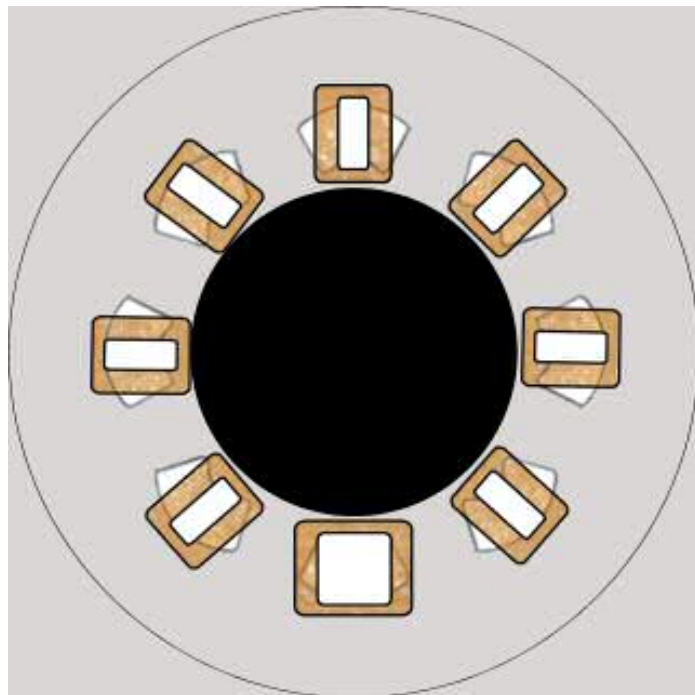
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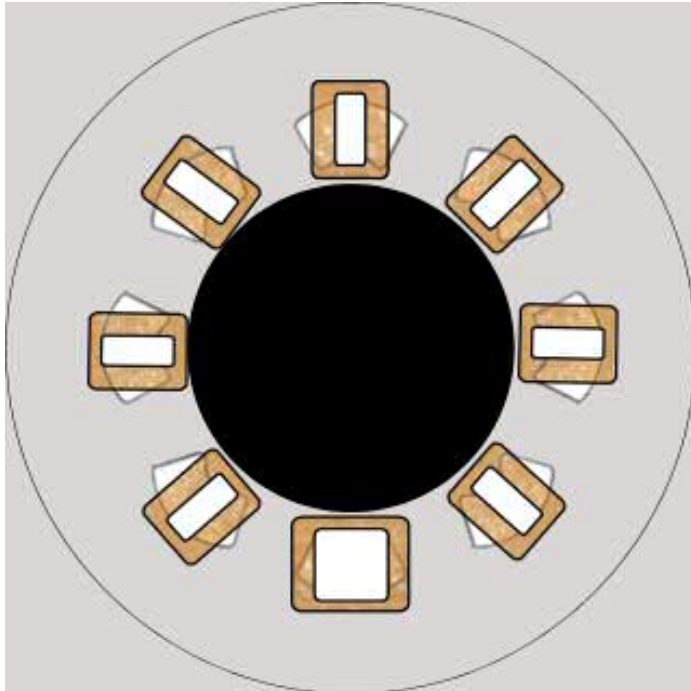
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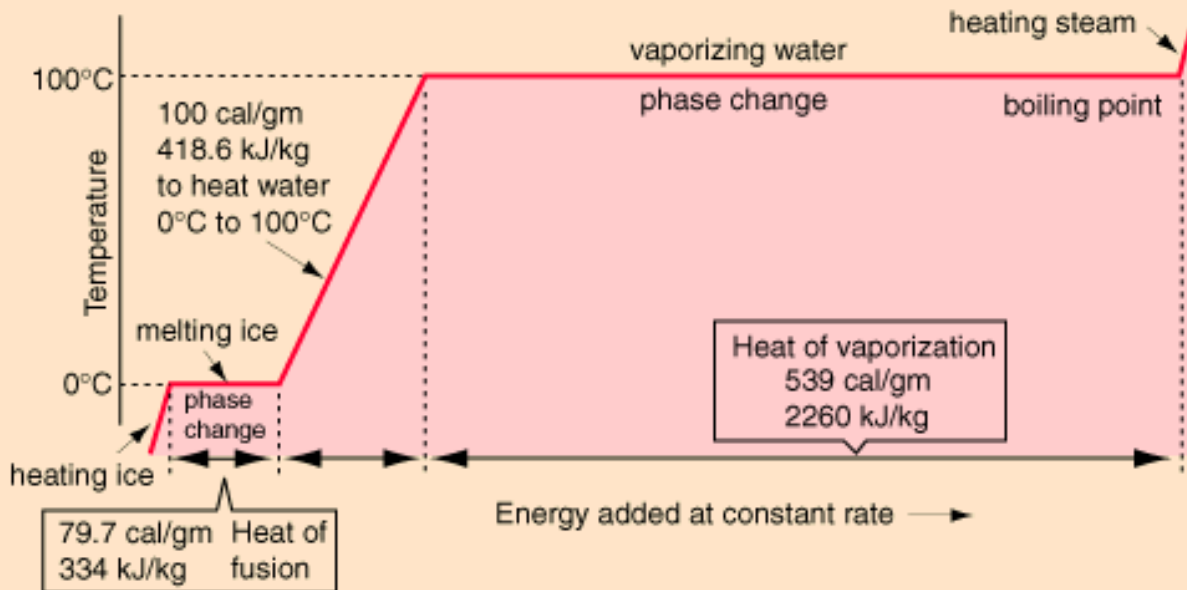
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# Phase changes

Transitions between solid, liquid, and gaseous phases typically involve large amounts of energy compared to the [specific heat](#). If heat were added at a constant rate to a mass of ice to take it through its phase changes to liquid water and then to steam, the energies required to accomplish the phase changes (called the latent [heat of fusion](#) and latent [heat of vaporization](#)) would lead to plateaus in the temperature vs time graph.



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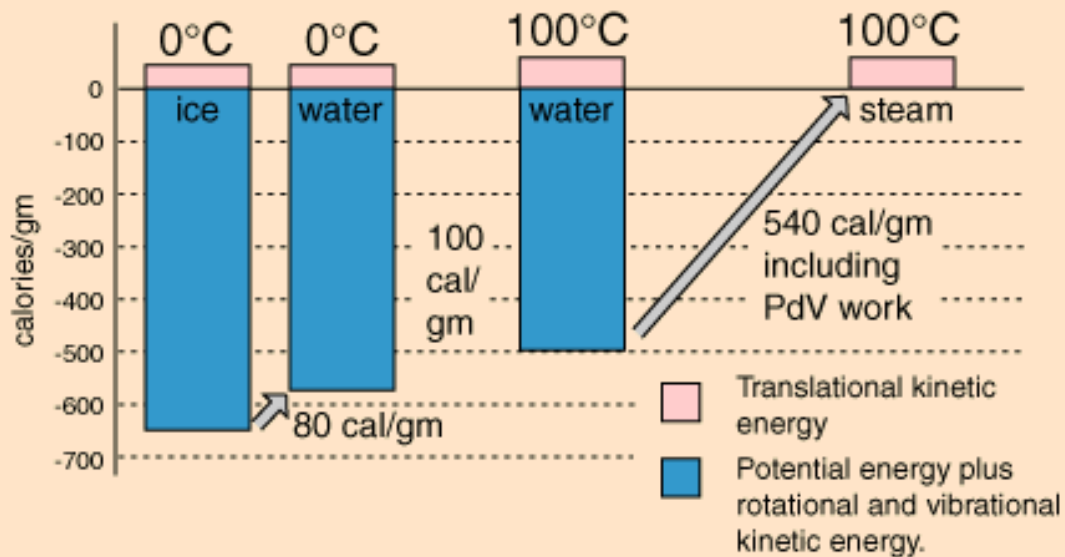
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*R Nave*

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# Energy Involved in the Phase Changes of Water



[Why negative potential energy?](#)

[Heat of fusion](#)

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# Why is the Potential Energy Negative?

In discussing the energy of the [phase changes in water](#), we found that the potential energy is treated as a negative quantity. An analogy with a mechanical system with [gravitational potential energy](#) and [kinetic energy](#) might be helpful in understanding the logic of a negative energy quantity. You are always free to choose the zero of potential energy, and it seems logical to choose the [zero of potential energy](#) such that a free molecule at rest has zero energy. A bound particle at rest then has negative potential energy.

A marble sits on a table with zero mechanical energy - that is, its kinetic energy is zero and, being supported, its potential energy is also zero.

If the marble now tips over the edge and rolls down into the depression, it will have negative PE, positive KE and the total mechanical energy will still be zero.

But if the marble is stopped at the bottom of the depression, it will have just the negative potential energy and will be trapped in a "bound state".

Positive kinetic energy of molecular motion

Zero energy

Negative potential energy from intermolecular attractive forces.

**Particles in bound states are said to have negative energy compared to free particles .**

The intermolecular attractive forces between water molecules hold them together in the liquid or solid state. This means they have negative potential energy with respect to free molecules. and that the negative potential energy exceeds the positive kinetic energy so that they are in a negative energy "bound state".

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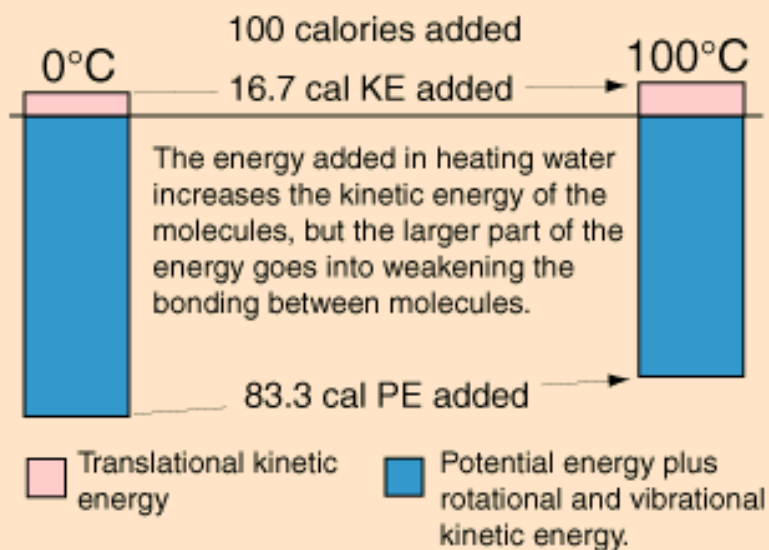
[HyperPhysics](#)\*\*\*\*\* [Thermodynamics](#)

*R Nave*

[Go Back](#)

# Details of Heating Water

It is known that 100 calories of energy must be added to raise the temperature of one gram of water from  $0^{\circ}$  to  $100^{\circ}\text{C}$ . Part of that energy increases the kinetic energy of the molecules, and some adds to the [potential energy](#).



The sizes of the blocks which represent the kinetic energy of the molecules at  $0^{\circ}\text{C}$  and  $100^{\circ}\text{C}$  provide a visual illustration of the meaning of [temperature](#) and the nature of the absolute or [Kelvin temperature scale](#). From the definition of [kinetic temperature](#), the size of the block is seen to be proportional to temperature, and the ratios of the heights of the KE blocks is the ratio of the temperatures. But the kinetic temperature is inherently the absolute temperature, so that the ratio of the heights of the blocks is  $373\text{K}/273\text{K}$ . So the absolute temperature is actually proportional to the translational kinetic energy of the molecules, while the Celsius temperatures are just chosen for convenience.

[Water phase changes](#) [More detail about energy changes](#)

[Water](#)

# Some energy details related to heating water

In the process of [heating water](#) from from 0 to 100 C, 100 calories of energy must be added. Part of that energy increases the kinetic energy of the molecules, and some adds to the [potential energy](#). To assess the amount added to kinetic energy, the molecular speeds at the two temperatures may be evaluated with the [Boltzmann speed distribution](#).

$$v_{\text{rms}} = 615 \text{ m/sec at } 0^\circ\text{C for H}_2\text{O}$$

$$\begin{aligned} \text{K.E./mole} &= \left(\frac{1}{2}\right)(18 \text{ amu/molecule})(615 \text{ m/sec})^2 \\ &\quad \times (6.02 \times 10^{23} \text{ molecules/mole})(1.66 \times 10^{-27} \text{ kg/amu}) \end{aligned}$$

$$\text{K.E./mole} = 3400 \text{ J/mole} = 45 \text{ cal/gm at } 0^\circ\text{C}$$

At 100°C the corresponding translational K.E. is:

$$45 \text{ cal/gm} \times \frac{373\text{K}}{273\text{K}} = 61.7 \text{ cal/gm}$$

The net gain in kinetic energy is then 16.7 calories/gram when the water is heated from 0 to 100 C. The remainder of the energy goes into weakening the attractive forces between the water molecules. This weakening of the intermolecular forces manifests itself in the reduction of the [surface tension](#) of water as it is heated.

In the process of vaporization of water, a large amount of energy must be added to overcome the remaining cohesive forces between the molecules and an additional amount of energy goes into [PdV work](#) to expand the gas from its very small liquid volume to the volume occupied by the resulting vapor.

PdV work during vaporization at 100°C:

$$\begin{aligned} &\frac{(1.013 \times 10^5 \text{ N/m}^2)(22.4 \times 373/273 \times 10^3 \text{ cm}^3/\text{mole})}{(18 \text{ gm/mole})(10^6 \text{ cm}^3/\text{m}^3)} \\ &= 172 \text{ J/gm} = 41 \text{ cal/gm} \end{aligned}$$

If the [heat of vaporization](#) of water at 100°C is 539 calories, then subtracting the 41 calorie work component suggests that the actual binding energy of the water molecules at 100°C is 539-41=498 calories.

## Why is the heat of vaporization more at body temperature?

An interesting feature of the process of [cooling the human body](#) by evaporation is that the heat extracted by the evaporation of a gram of perspiration from the human skin at body temperature (37°C) is quoted in physiology books as 580 calories/gm rather than the

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nominal 540 calories/gm at the normal boiling point. The question is, why is it larger at body temperature?

The main part of the answer is that the binding energy of the water molecules is greater at that lower temperature, and it therefore takes more energy to break them apart into the gaseous state. The change in the heat of vaporization can be roughly calculated using what we know from the [specific heat](#) of water, 1 calorie/gm °C. It takes 37 calories to heat a gram of water from 0°C to 37°C, but the change in the kinetic energy is much less than that:

$$\text{K.E./mole} = 3400 \text{ J/mole} = 45 \text{ cal/gm at } 0^\circ\text{C}$$

At 37°C the corresponding translational K.E. is:

$$45 \text{ cal/gm} \times \frac{310\text{K}}{273\text{K}} = 51.1 \text{ cal/gm}$$

The energy contributed to weakening the bonds is then  $37 - 6.1 = 30.9 \text{ cal}$

It was shown above that the kinetic energy of the water molecules only increases by  $61.7 - 45 = 16.7$  calories/gm when the water is heated from zero to 100°C but we know it takes 100 calories to do that heating. Therefore the contribution to weakening the water bonds is 83.3 calories/gm. Using the result for water at 37°C it is evident that 52.4 calories of additional energy must be supplied at 37°C to vaporize the water.

There is one additional element in modeling the heat of vaporization at body temperature - the PdV work required to expand the water into its gaseous form is slightly less at 37°C. By analogy with the work calculation above, that work is found to be 34.2 calories/gm, 6.8 calories/gm less than at 100°C.

This model then suggests a heat of vaporization at 37°C:

$$\text{Body temperature heat of vaporization} = 539 \text{ cal/gm} + 52.4 \text{ cal/gm} - 6.8 \text{ cal/gm} = 585 \text{ cal/gm.}$$

So this simple model agrees fairly well with the quoted 580 cal/gm.

[Water phase changes](#)

[Water](#)

## BUILD A SIMPLE

# CHARGE CONTROLLER

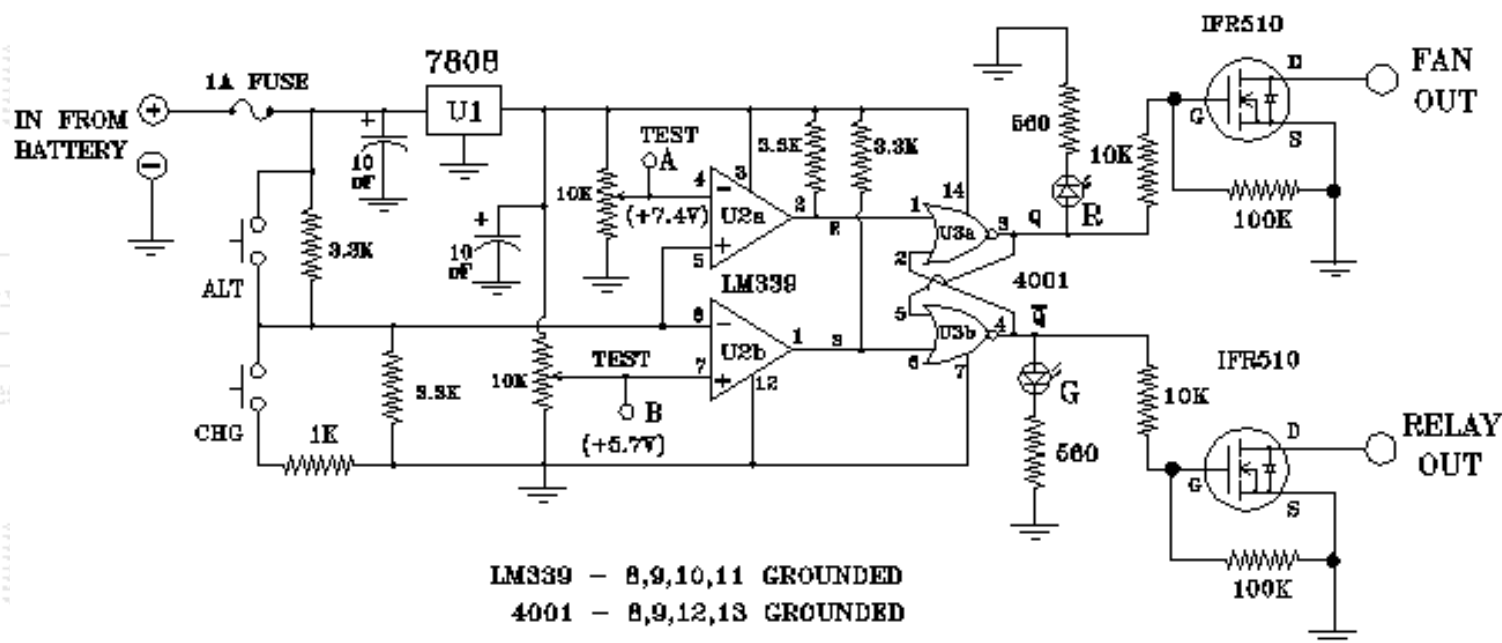
## FOR WIND AND SOLAR POWER SYSTEMS

Once our wind generators and solar panels were up and running, the next obvious requirement was some sort of charge controller, since continuous overcharging would boil the electrolyte dry and ruin the expensive battery bank. Several small controllers came bundled with the solar panels, but they were totally unsuitable for wind power use.

Charge controllers intended for solar panels work by monitoring the battery voltage, and once it reaches full charge, the controller simply shorts the solar panel leads together. This doesn't harm the solar panels, but it does waste whatever power they're generating. The energy ends up heating the transistors in the controller.

This type of controller is not ideal for a wind generator, since shorting the output of the genny while it's spinning at high speed will generate a huge current spike, possibly destroying the controller and perhaps even the generator in the process. On the other hand, simply unhooking the generator from the batteries is not a good idea either, since with no load on it, the generator might overspeed in a strong wind and destroy itself.

The ideal solution is to charge the batteries until they reach a full charge, then switch to an alternate load where the energy can be safely handled. While we're at it, this energy should be used for some useful purpose, such as supplementing a water heater or powering a peltier-junction refrigerator, but in a pinch, a bank of 12 volt light bulbs will do.

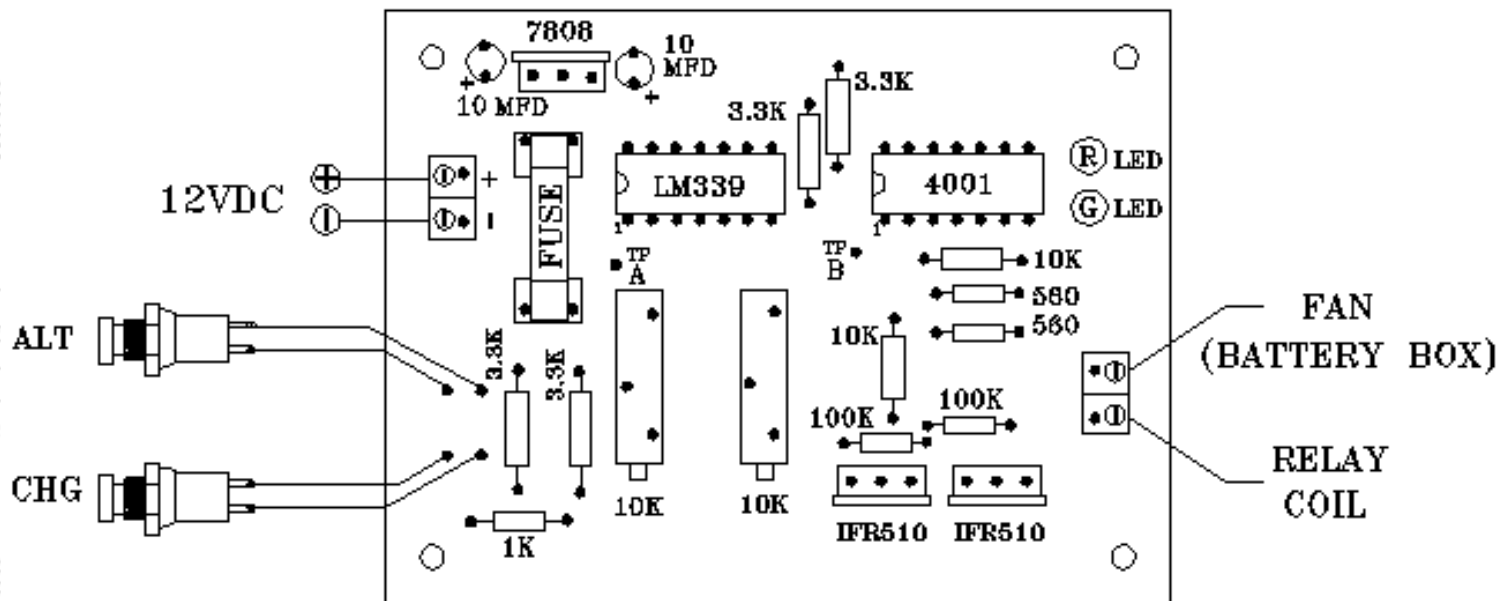


The above schematic shows the simple charge controller circuit. The incoming battery voltage is divided in half by a pair of 3.3K resistors, so the trip points are adjusted to one-half the desired levels. The actual trip points will depend on your particular batteries, but a good starting point is 14.5 volts for full-charge, and 11.8 volts for discharged. In this case, the trimpots should be adjusted to read 7.25 volts at TP-A and 5.9 volts at TP-B. You will probably need to monitor your battery voltage through several charge - discharge cycles to determine the perfect trip points for your system.

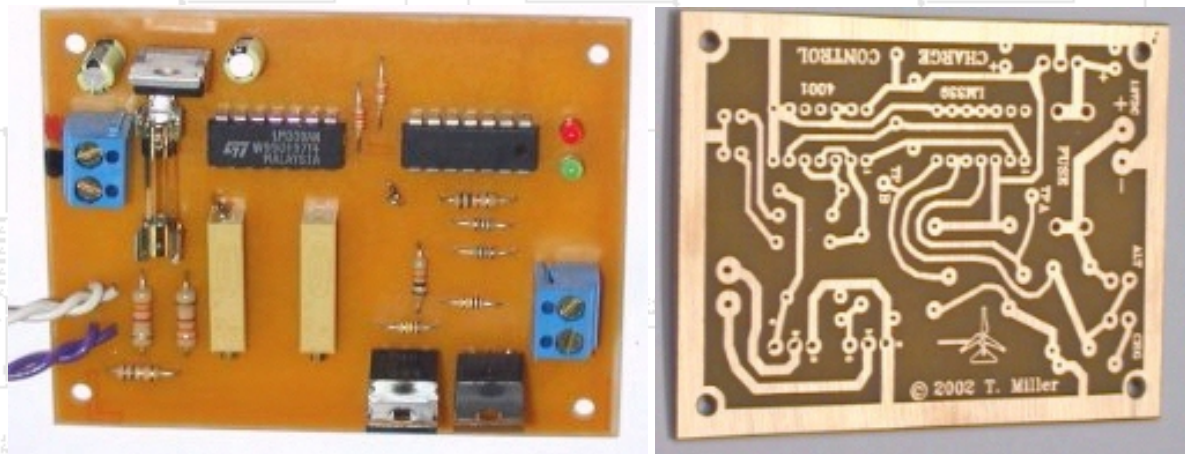
The outputs of the controller are latched, and drive a pair of IFR510 power FETs, which serve as relay

drivers. If you use a double-throw relay, only one output is necessary, since the relay can switch the incoming power to either the batteries or the alternate load as required. The second output can be used to switch a small 12 volt DC muffin fan to vent hydrogen gas from the battery enclosure to prevent the danger of explosion when charging the batteries.

The two push-buttons provide a way to toggle the output manually when the battery voltage was in the "null zone" between the trip points. By momentarily pressing one of the buttons, the output state will reverse and latch. A 1K resistor prevents a dead short, just in case someone decides to press both buttons at once!



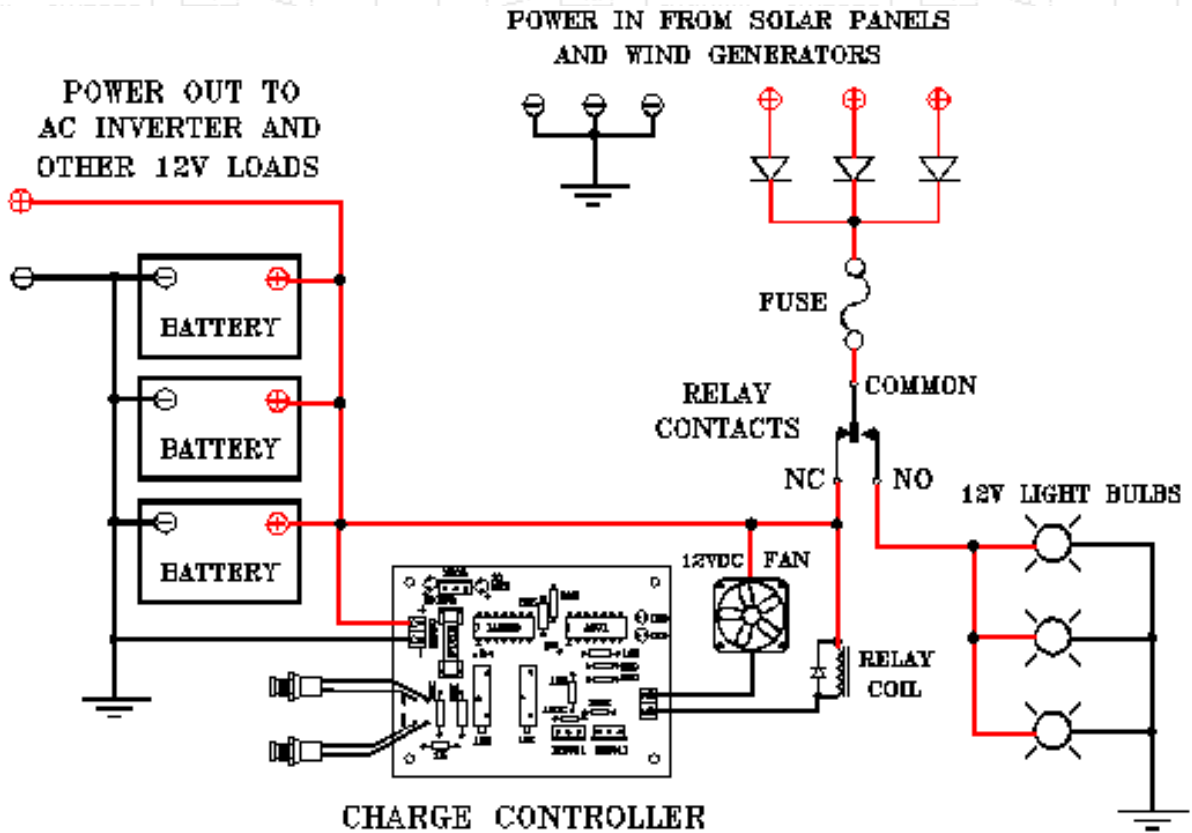
The charge controller is built on a small printed circuit board, as shown below. The diagram above shows the component layout. Be sure to install the I.C.s and capacitors correctly, as reversing them will most likely generate a puff of smoke. Terminal blocks are soldered to the board for the incoming 12 volts and for connections to the relay coil.



...(LEFT) COMPONENTS INSTALLED .... (RIGHT) BARE CIRCUIT BOARD...

Since the incoming power is produced by several different types of surplus solar panels and homebuilt wind generators each producing different voltages, they can't just all be hooked together... each has its own blocking diode in series with the positive lead. When the battery is charging, each source is pulled down to

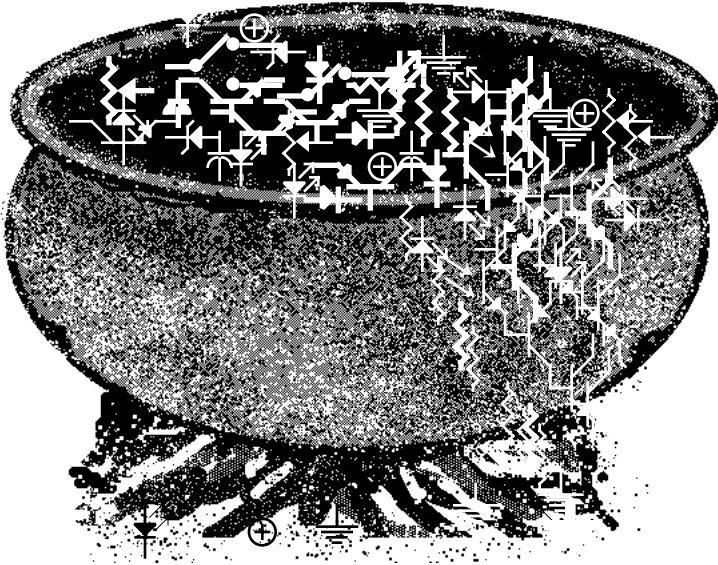
the battery terminal voltage, so each source contributes whatever current it's capable of producing. Each blocking diode has to be sized for the current that source can generate. The negative lead from each source is connected to ground.



Here's the hookup as it's working here. As long as the batteries are charging I can see the red LED glowing. As soon as the trip voltage is reached, the red LED goes out and the green one comes on, and the power is shunted to the alternate load. This way, no power is wasted.

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# Homebrew



## Shunt Regulator

Chris Greacen

Wind, hydro and photovoltaic panels can sometimes produce more electricity than our batteries can store. Overcharging batteries increases water loss in the electrolyte, decrease battery life; and is potentially more dangerous. Under charge, the voltage of a fully charged battery system can rise to levels which will fry 12 Volt electronics (including some inverters) attached to the system.

There are two basic kinds of regulators: series regulators and shunt regulators. Both regulators have a sensing circuit which regulates current flow into batteries when the voltage exceeds a threshold level. Series regulators work by switching off current from the

charging source (panels, etc) when the voltage climbs too high. With the charging source disconnected like this the battery voltage sinks to its standing voltage (lower than its voltage under charge). Series regulators are simple, but they have two disadvantages: first, not all power potentially produced by the power source is used. When the load is switched off, generators used in hydro or wind systems can spin more quickly than they are designed for and destroy themselves. This does not apply to solar cells - running PVs open circuit, or short circuit for that matter, does no harm.

Shunt regulators work by diverting the power from the batteries into some other load. In effect they waste electricity, but wasting electricity is much better than overcharging batteries - or destroying electronics. Of course if you do have a way to put those electrons to a good use, by all means do it - run the washing machine or vacuum cleaner.

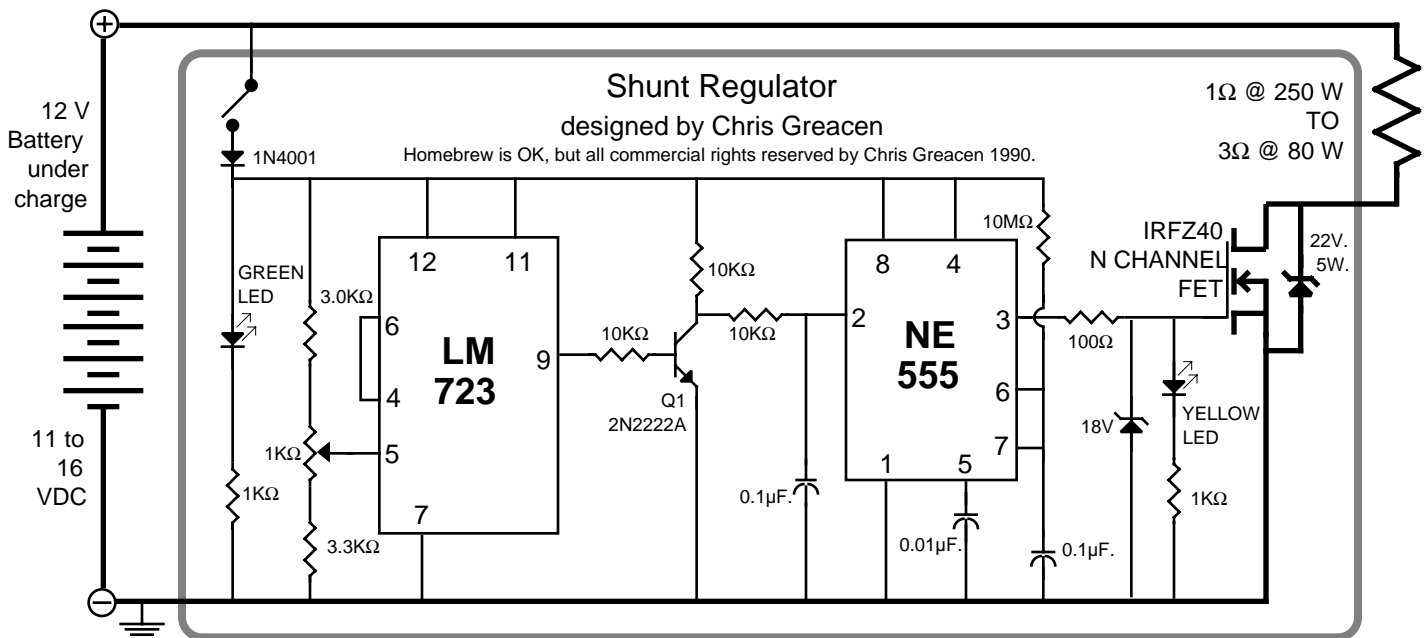
What follows is a working, simple shunt regulator. With a proper load, this shunt regulator can regulate up to 15 Amps (more than 3 Kyocera J-48 PV panels on a very sunny day).

### How it Works

The threshold voltage is determined by the potentiometer on the voltage divider into pin 5 of the 723 (refer to the schematic). When this voltage exceeds the 723's internal reference voltage (pin 6), pin 9 goes high saturating Q1. The 10kΩ resistor and 0.1μF capacitor assure that the power FET does not make the ON-OFF-ON transition too fast. When the capacitor on pin 2 is discharged to 1/3 Vcc the 555 is triggered and pin 3 stays high for a time period determined by the resistor to Vcc and capacitor to ground on pins 6 and 7: time ≈ 1.1RC ≈ 1.1 seconds. Pin 3 feeds the gate of the FET, protected against over voltage (Vgatemax= 20 Volts) by an 18 Volt zener. When the gate goes high the FET conducts, sending full current through the shunt load. A 5 Watt, 22 Volt zener diode protects against voltage spikes from inductive loads. The two LEDs help see what the electronics are doing. The green LED is on whenever power is on. The amber LED lights whenever the regulator is diverting power to the load.

### Construction and use information

In the schematic dark lines indicate high current carrying wires. To avoid overheating on these use 16 gauge or larger wire. For a load



D381 24/48 volt Dual 30 amp 3 lbs \$65  
Square Flange Adapter 1 lb \$20

[ [Parent](#) ]

Re: Need help on how to regulate voltage  
([none / 0](#)) (#8)  
by Andrew ([andrew@lookingglass.com](mailto:andrew@lookingglass.com)) on  
Mon Jul 21st, 2003 at 02:29:15 PM MST  
([User Info](#))

I did somewhat the same for a heating element load...

I used the rods from a water heater...

Each measuring 2.2 ohms...

Put them in parallel across a board

I made a bar that was attached to some all thread...

The bar would slide across the resistive rods to determine the right resistance (think of a really big potentiometer)

And to get the right load, I would simply turn the all thread in a direction...

Like 120v it would be the farthest away, and 12v it would be pretty close to the top...

Get it?

The bar is acting like like the other end of the circuit...

And when it is closer to the opposite side, the resistance will be lower, meaning more load....

-Andrew

[ [Parent](#) ]

[Need help on how to regulate voltage](#) | 8 comments (8 topical, 0 editorial)

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I suggest using high wattage power resistors since reliability of the load is the primary consideration. Using a bunch of car tail lights in parallel would also provide a good load since chances are excellent they will not burn out at once. Here is an example for determining resistance and wattage. Suppose the maximum current I wanted to regulate was 15 Amps at 15 Volts. Since  $R = V/I$  we need a resistance of  $15 \text{ Volts}/15 \text{ Amps} = 1.0 \Omega$ . Wattage is given by  $P = IV$ .  $P = 15 \text{ Amps} * 15 \text{ Volts} = 225 \text{ Watts}$ . To be safe, I'd use 250 Watts. When hooking up your regulator make sure the system's voltage is

below 16 VDC since the NE555 is rated at a maximum 16 Volts. The regulator will regulate voltages from 12.0 to 15.8 Volts. When hooking up your shunt regulator it is a good idea to hook up the load first and make sure there are no short circuits.

**Access:**

Chris Greacen, Box 229, Reed College, Portland OR 97202

**For Power resistors:**

Hosfelt Electronics Inc. 2700 Sunset Boulevard, Steubenville, OH 43952; tel 1-800-524-6464



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[Need help on how to regulate voltage](#)

By [unclebuck68](#), Section [Homebrewed Electricity](#)

Posted on Fri Jul 18th, 2003 at 08:07:15 AM MST

[Wind](#)

Please help!

I'm planning to build a three phase alternator windmill. I'm thinking of using the diode rectifier from a Chevy alternator. One question, how can I regulate the voltage? I dont understand how the voltage regulator in the Chevy alternator works and how I can adapte it for my use? I'm also looking for information on how to build the furling system.I looked and did a search, and couldn't find enough information on how to build it. Thanks in advance. Mike

[Need help on how to regulate voltage](#) | 8 comments (8 topical, 0 editorial)

Re: Need help on how to regulate voltage ([none / 0](#)) ([#1](#))  
by [DanB](#) on Fri Jul 18th, 2003 at 08:32:08 AM MST  
([User Info](#))

Hi Mike -  
You need not regulate the voltage, the batteries will do that for you.  
You may want a charge controller which will put a load on either the windmill, or the batteries once the batteries are full charged to prevent overcharging.

Regarding the furling system.... at this point I cannot think of a detailed description on the web. (I'm sure there is one out there).  
Hugh Piggott's is great, I'd go to his website and either buy his plans, or get his book "Windpower Workshop" - it's all very helpful.

There was some discussion about this recently:  
<http://www.fieldlines.com/story/2003/7/9/21444/13286>

Re: Need help on how to regulate voltage ([none / 0](#)) ([#2](#))  
by [troy](#) on Fri Jul 18th, 2003 at 09:55:56 AM MST  
([User Info](#))

As far as voltage regulation, that depends on what you're doing with the juice. If you're charging a decent sized battery bank, the batteries will draw down the output voltage of the mill to the battery level. If you have an extremely high voltage mill (say over 50 volts at speed) and a 12 volt battery bank, you might run into problems. But if your mill makes voltage more in the 15-30 volt range, no problem. You don't have to regulate the voltage at all.

However, your batteries will eventually get charged, and then you have to switch the current to a dump load, a heater or light bulbs or whatever, appropriate for the voltage and current. There are commercial units to do the switching or some home brew designs that you could build if you're handy with a soldering gun.

So if you could give a bit more info on what you're doing with your system, we can be more helpful.

Best regards,

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troy

Re: Need help on how to regulate voltage ([none / 0](#)) ([#3](#))  
by Barnac ([barnac@videotron.ca](mailto:barnac@videotron.ca)) on Fri Jul 18th, 2003 at  
10:33:18 AM MST  
([User Info](#))

What do you mean by voltage regulation ? What is the difference from voltage rectification ? As I understand it vorage rectification is the process of making AC vorage become DC voltage. While voltage regulation is the process of controlling the voltage so It will show little or no voltage variation. Just to clarify the termilogy used here, I am francophone so maybe you guys use different terminolgy.

[ [Parent](#) ]

Re: Need help on how to regulate voltage ([none / 0](#)) ([#4](#))  
by Jimbob on Sun Jul 20th, 2003 at 12:31:46 PM MST  
([User Info](#))

There are two types of common voltage regulation designs- series & shunt. The precision series type that is commonly used in a regulated linear type DC power supply maintains a preset voltage irregardless of the load (current) & burns off the over-voltage (voltage above the preset output voltage) in the form of heat. The shunt type simply loads the output down to the desired voltage level, but usually requires a series resistor as well.

Unless your battery storage is undersized with regard to your generator output, you do not need a voltage regulator. The beauty of a battery system is it will draw a variable load during charging & maintain approximately 10% regulation. One does not need a precision regulator. Once the batteries are fully charged, a resistive load bank can be switched in circuit to drawdown the excessive voltage & prevent overcharging the batteries. A good resistor bank is a 24vdc hot water heater. Some electric commercial water heaters that are fast recovery type makes use of a lot of heater elements. These heaters are rated for either 480 or 240 vac & most are 3-phase. One could use either 240 volt or the best are 120 volt elements & rewire the water heater to single phase. If an elements is 1000 watts at 120 volts, at 24 volts it will draw 200 watts. If you have 6 elements, that is a 1200 watt load. If 12 elements are used, that is a 2400 watt load.

I am new to this power generation for the home owner business, but have built large power generation plants. Others can point you to some load shedding type devices to achieve your needs. I am modeling my system to use that commercial hot water heater. Summers have less wind vs the winter where I live. If I have a situation of excessive hot water during the winter, I will divert it to heating my house. I doubt this issue will arise during the summer. I also will build my own controller to like mil-spec standard for ultra high reliability. (I have designed for NASA once).

Re: Need help on how to regulate voltage ([none / 0](#)) (#5)  
by scoraigwind ([magnet@scoraigwind.co.uk](mailto:magnet@scoraigwind.co.uk)) on Sun Jul 20th,  
2003 at 03:48:14 PM MST  
([User Info](#)) <http://www.scoraigwind.co.uk>

Hmm.

If an elements is 1000 watts at 120 volts, at 24 volts it will draw 40 watts. The current and voltage both go down so you only get 1/25 the power out.

Power = Vsquared /R  
Hugh Piggott <http://www.scoraigwind.co.uk>  
[ [Parent](#) ]

Re: Need help on how to regulate voltage ([none / 0](#))  
(#6)  
by Jimbob on Mon Jul 21st, 2003 at 07:47:41 AM MST  
([User Info](#))

Resistance per ohms law of a 1000 watt @ 120vac heater (resistor) is 14.4 ohms. At 24 volts, the 14.4 ohm element would draw 1.66 amps. 1.66 amps times 6 elements is say 10 amps. 24 volts x 10 amps is 240 watts. I miss calculated. Tnx for the correction. I will use lower resistance elements to get to the 1200 watt load.

[ [Parent](#) ]

Re: Need help on how to regulate voltage ([none / 0](#)) (#7)  
by troy on Mon Jul 21st, 2003 at 11:46:02 AM MST  
([User Info](#))

Dear Jimbob and others,

Here's a source with specifications and prices for ready made low voltage heating elements for water heater. Convert away!

Best regards,

troy

[http://www.kansaswindpower.net/water\\_heaters.htm](http://www.kansaswindpower.net/water_heaters.htm)

Use one or more of these elements as a diversion load with Trace C35, C40, C60, TC60 controllers. They fit most standard water heaters with screw-in elements. An adapter is used for the square flange type element. The dual 12/24 element has two separate 25 elements. It can be wired for 25 amps or 50 amps at 14.5 volts or 25 amps at 29 volts. The dual 24/48 volt element has two separate 30 amp elements. It can be wired for 30 or 60 amps at 29 volts or 30 amps at 58 volts. Order enough elements with a total current draw greater than your charging system's maximum output, but no more than about 75% the maximum amp rating of controller. 150 watt hours will raise 1 gallon of water about 60°. D380 12/24 volt Dual 25 amp 3 lbs \$65