

## 440 Watt Regulated Pedal Power Bicycle Generator for iPod, Cell Phone, Portable TV or DVD player

by [bdwhaley](#) on August 16, 2007

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## intro: 440 Watt Regulated Pedal Power Bicycle Generator for iPod, Cell Phone, Portable TV or DVD player

This bike generator design is good for running low power devices such as:

- An iPod through a 12V Car cigarette lighter adapter like this [one](#).
- Cell phone chargers
- Portable DVD [player](#)

You can use off the shelf parts from local stores to make this 296 Watt pedal power bicycle generator or buy parts from Amazon.com

Through volunteer efforts, 24 of these pedal power bicycle generators were assembled and used for charging cell phones at a 3 day event with 60,000 people attending a day. More Info [here](#).

Any one who can use a drill, socket wrench, hack saw, wire cutters, and crimpers can do this project.



### Image Notes

1. Vented tool box with car battery connected to 14.8 Volt DC Car GM 1-wire alternator purchased from Autozone.



## step 1: How It Works

I hacked together a quick LabVIEW program and some sensors to hook up to the bike generator so you can get an idea of how it works. The chart below shows actual data while it was hooked up in the living room to our Sony play station PS2. The game being played is Harry Potter and the Goblet of Fire.

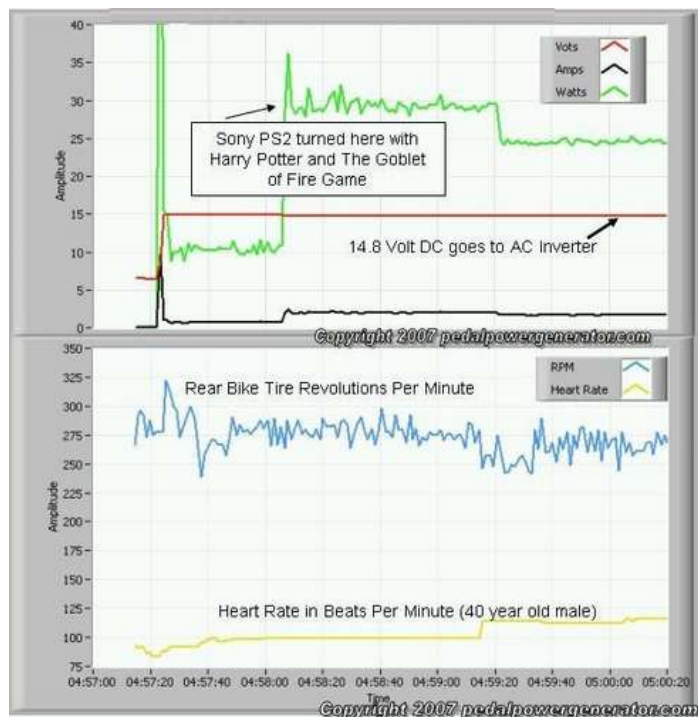
This test data shows Volts, Watts, Amps, Rear tire RPMs, and Heart Rate. The time period was about 3 minutes.

Note that the green line is actual wattage from the bicycle generator. When you first spin up the bike to about 275 revolutions per minute, about 5 seconds goes by while the alternator is developing a magnetic field, then the internal 14.8 Volt DC regulator kicks in and charges a 2 Farad capacitor.

This is the reason for the big green spike right at the beginning of the chart. After 2 seconds the capacitor is charged, and about 10 Watts of power is being consumed by an AC inverter which converts the 14.8 Volts DC to 110 Volts AC (The same stuff that comes out of your wall socket in your home).

Also note the red line showing that the voltage is stable at 14.8 Volts DC because the built in regulator is doing its job.

Next you will see where we turn on the Sony Play Station and the green line jumps up to 30 Watts.



## step 2: 16 Bicycle generators on May 15th Ellen Degeneres TV Show

16 of these bicycle generators appeared along with Cameron Diaz on the May 15th Ellen Degeneres Green Show. I donated time and energy to make these bikes so the non profit group Global Inheritance could set them up on stage for the show.

8 Generators were setup on Ellen's stage, and 8 more were put into her over flow room next to the stage were they were hooked up to power two television monitors, some lights on stage, and charging 12V car batteries.



## step 3: Parts & Tools

To see pricing & order information click on the links below, or go 'here'

- (1) Bike Trainer Stand
- (2) Two 24 Inch pieces of Super-strut (Home Depot / Lowes)
- (3) Lawnmower V-belt 5/8 " Wide 78" Long # B75
- (4) Superstrut 90 Degree Angle Bracket (Home Depot / Lowes)
- (5) 1 twelve inch piece of Super-strut
- (6) 5PK 3/8" Cone Nut & a couple of 3/8 X 1.25 inch bolts
- (7) 5PK 1/2" Spring Nut & a couple of 1/2 X 1.25 inch bolts
- (8) 1/2" Threaded Rod with two nuts and slip washers (Home Depot / Lowes)
- (9) 3/8" sholder bolt 3.5 inches Long or use threaded rod.
- (10) 14.8 Volt DC Alternator 63 Amp Internally Regulated at 14.8 Volt DC (Autozone P/N DL7140M)
- (11) Open House H218A 18" Custom Installation Enclosure
- (12) 2.0 Farad Digital Power Capacitor
- (13) TERMINAL STRIP 8 CIRCUIT (Center spacing of 0.562 inch, Accepts up to #10 AWG, 30 Amps per terminal)
- (14) Meter that shows volts, Amps, and Watts
- (15) DC to Dual-Outlet AC Power Inverter
- (16) Cigarette lighter receptacle Splitter so you can plug in a cell phone charger or game adapter for portable video games.
- (17) Fully Insulated Male and Female Crimp Connector rated for 10-12 Gauge wire
- (18) 6 of the yellow 3/8 inch crimp ring terminals And 10 of the regular size yellow 10-12 Gauge Vinyl Ring Connectors

<http://www.instructables.com/id/Bicycle-Power-for-Your-Television%2c-Laptop%2c-or-Cell/>

- (19) Jasco #52194 4W White Night Light
- (20) Size 12 Stranded wire 10 Feet (Home Depot / Lowes)
- (21) 30 Amp Fuse and 15 Amp Fuse (Auto Store)
- (22) In-Line Fuse Holder (BP/HHM) 5 each
- (23) Crimpers used for Crimp on connectors
- (24) Wire cutter and stripper
- (25) Drill and 5/16", 1/2", and 3/8" drill bits

OTHER ITEMS NEEDED:  
 Bastard file to remove burrs  
 1/2" Deep Socket



#### step 4: Un-box The Ascent Bike Trainer Stand

The Ascent Bicycle Trainer Stand comes packaged in a plastic bag with an upper and lower Styrofoam block. Keep the box because you can use it to ship the pedal power generator later after you are done.

Road bike or Mountain bike with "Quick Release" axle

The Ascent bike stand is supposed to work with a road bike or mountain bike that has the quick release lever. You know the kind that doesn't require you to use a wrench to remove your bike tires. You can get it to work with a regular bike axle that has nuts on each end, but the risk is that the stand may release the bike when you are riding it and cause personal injury.

NOTE!! It is not designed to work with a beach cruiser type bike which is a bike with a single rear gear. This is because the axle is too short on a one gear bike. The photo of the axle shows you what kind of bike axle the bike trainer is designed to connect to.





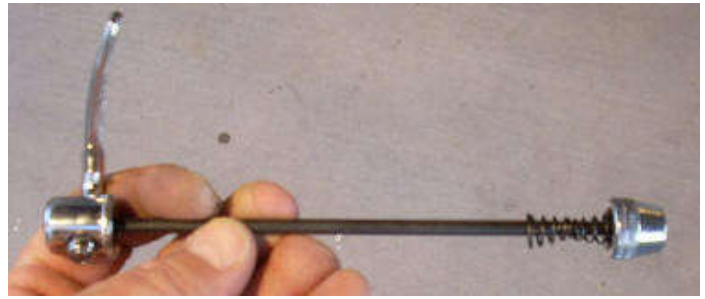
## Do It Yourself Bike Generator Step 2: Un Package Trainer Stand



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### step 5: Remove Screws From Ascent Magnetic 3 Level Trainer Friction Roller

The Ascent Bike Trainer Stand comes with a friction roller that just wastes all of the useful energy you put out. Let's toss it in the scrap metal recycle bin.

At this point you will need to use the 5/32 Allen wrench shown below to remove the two screws shown at detail 1 and 2 in the picture. After you have removed the screws put them back in the silver barrel threaded barrel they came out of so you will not lose them.

## Do It Yourself 14.8 Volt DC Bike Generator Step 1a: Remove Friction Roller



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**step 6: Step 4 - Remove Rubber Retaining Ring**

Use some needle nose pliers or some one who has really long & strong finger nails to remove the rubber retaining ring of the end of the metal support shaft.

Once this is off, gently shake the friction roller around and push on the end of the support shaft with your finger.

It will then slide out.

**Do It Yourself 14.8 Volt DC Bike Generator**  
**Step 1b : Remove Retaining Ring**



**Do It Yourself 14.8 Volt DC Bike Generator**  
**(1) Remove Friction Roller**



**step 7: Find The Strut**

Make your way through the tumult to the electrical area and find the spot shown in this picture "HERE" . That is the Superstrut rack section.

Pick yourself out a fine straight piece of Superstrut and try to make it out the store without mishap because it's really long and awkward to carry around the store, and if it happens to drop on the floor on accident like it did with me, it's so loud that people will hear it from one end of the store to the other.

**Do It Yourself 14.8 Volt DC Bike Generator**  
**Step 2a : Find The Super Strut**



**Do It Yourself 14.8 Volt DC Bike Generator**  
**Step 2b : Pick a Stick of Super Strut**



### step 8: Transport Strut To Parking Lot

Pay for the Super-strut and get it out to the parking lot.

Since you are working to achieve a small energy foot print and trying to conserve, you probably drive a fuel efficient car like a 1990 Honda Civic. This can present a challenge when you try to go to Home Depot to get your piece of Super Strut. Namely because it only comes in 10 foot lengths. You can see the piece below balanced on the shopping cart with the Honda Civic in the background.



### step 9: Locate Saw

At this point you reach into your front seat of your ride and grab your trusty hack saw.



### step 10: Hack The Strut

After about 100 strokes of your mighty blade, the Super-Strut yields.

NOTE: the piece you cut has sharp edges that can cut your hands. Handle with care. Bring a file with you to file off any sharp burrs that are there. Now you can easily load the Superstrut into your car and head home.





**step 11: Cut 24" Pieces of Super Strut**

Now cut two 24" long pieces of Superstrut as shown in the photo.

NOTE: the piece you cut has sharp edges that can cut your hands. Handle with care. Bring a file with you to file off any sharp burrs that are there.



**step 12: Cut a 9" piece of super strut**

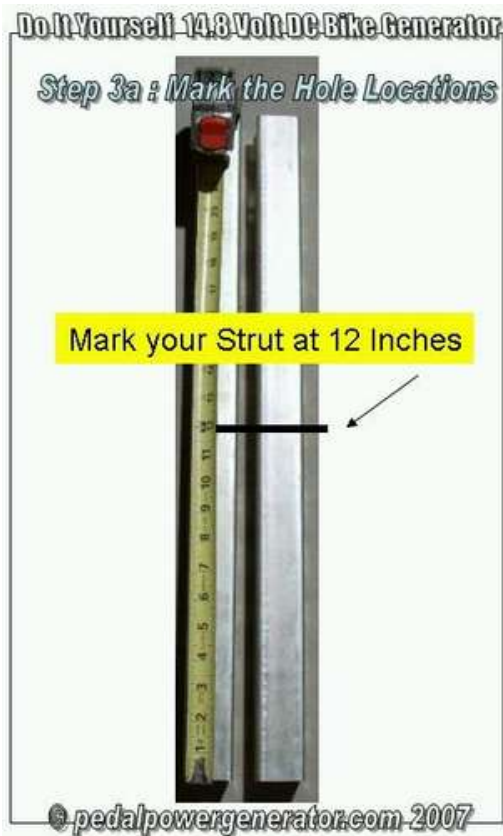
Cut a 9" piece of strut as shown.

NOTE: the piece you cut has sharp edges that can cut your hands. Handle with care. Bring a file with you to file off any sharp burrs that are there.



### step 13: Mark Your Strut for 1/2 Hole Location

Mark Your Strut as shown in the picture.



### step 14: Drill your 1/2" Holes

You have three options for this step. (1) Use a small drill press to make your 1/2" hole (2) Use a hand drill to make your 1/2" holes (3) Get some one else or machine shop to drill your 1/2" holes.

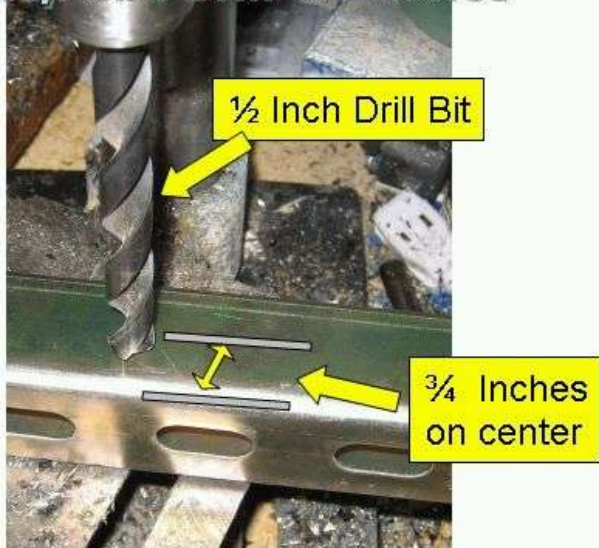
If you use option (1) or (2) read the safety instructions in the manual that came with your tools. You are liable for injury or damage caused by your failure to comply with safety and operating guidelines of your tool.

Option(1) is the best in my opinion. For those of you whose modus operandi is to constantly try to justify buying more tools for your garage (like me) now is the opportunity to get a small drill press for \$85 at your local hardware store. A drill press is nice because it drills straight through the Superstrut. With a hand drill this is a little harder. Note that the holes need to be straight through the Superstrut or your pieces will look crooked when they are mounted to the stand.

For this step you have to drill completely through both sides of the Superstrut. If you choose your drill press, set it to low speed. Don't press too hard. It should take about 1 minute per hole. NOTE: The tills (shavings from the hole) are HOT! You must wear safety glasses when doing this. You could get small piece of metal in your eye like I did on another project. It caused a rust ring in my eye and I had to do to the eye doctor to get it out.

## Do It Yourself 14.8 Volt DC Bike Generator

### Step 3b : Drill 1/2" holes



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### step 15: Remove Burrs From 1/2" Holes

Use a larger bit to scrape the sharp edges from the hole. If you don't have a larger bit, then use a round rod hand file.





**step 16: Assemble the Superstrut frame**

Put the strut pieces on the 1/2 Threaded Rod and slide them into the bike trainer stand bracket as shown in the photo.

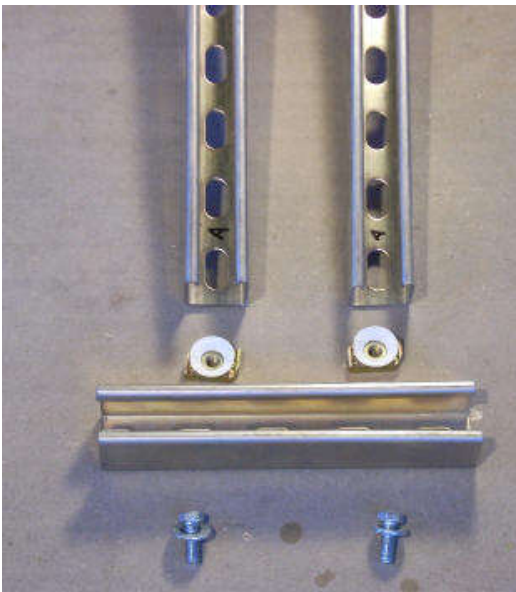


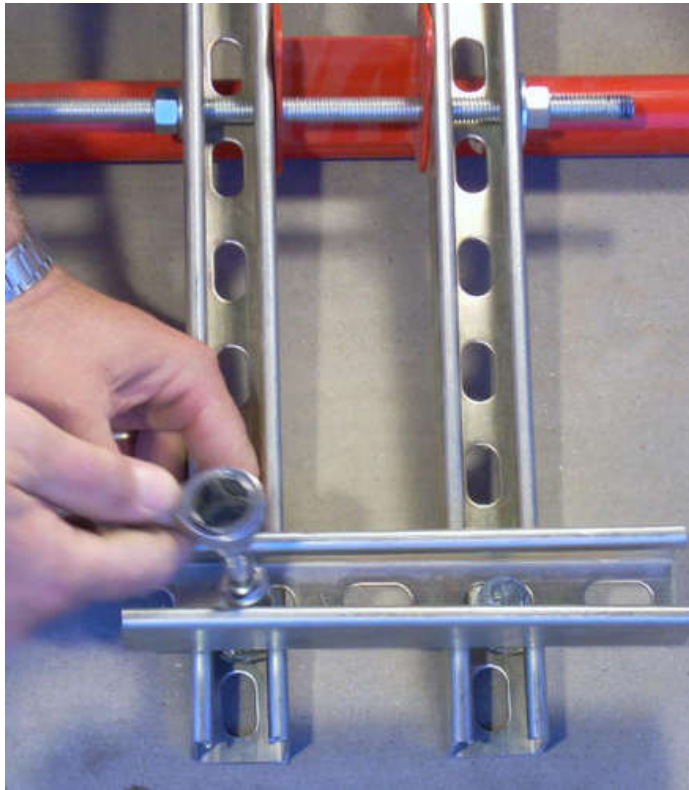
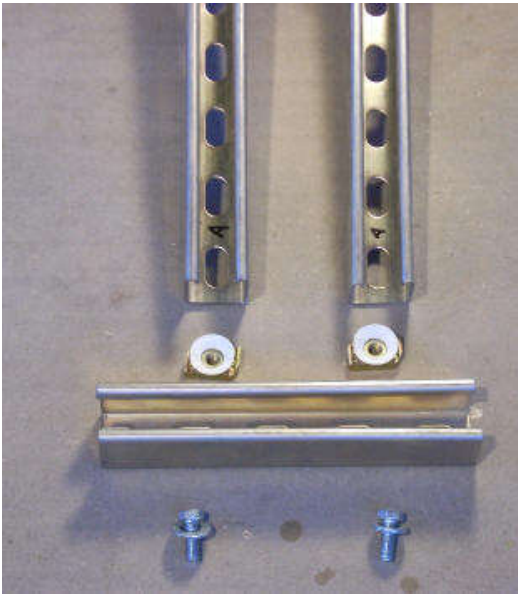
**step 17: Attatch Alternator Cross Mount**

This is the Alternator mounting cross piece. You will use the cone nuts and some short 3/8" X 1" bolts.

TOOL: Socket wrench with 4 Inch Extension.

Assemble as shown.





**step 18: Drill mounting holes in L-Brackets for 68 AMP Car Alternator**

The hole in the L-bracket does not work for mounting the bike generator. You will have to make a small hole as shown in these 3 pictures.

*Two L-Brackets With 3/8" Holes*



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*Drill 3/8" holes in L -Brackets*

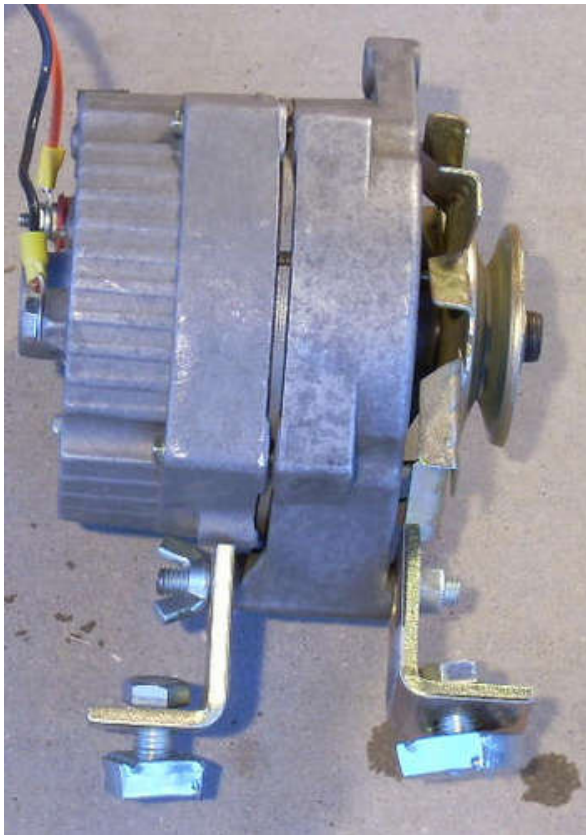


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**step 19: Put the L Brackets on the Alternator**

Mount the L-bracket loosely to the alternator as shown. Loosely attach the spring nuts as shown.

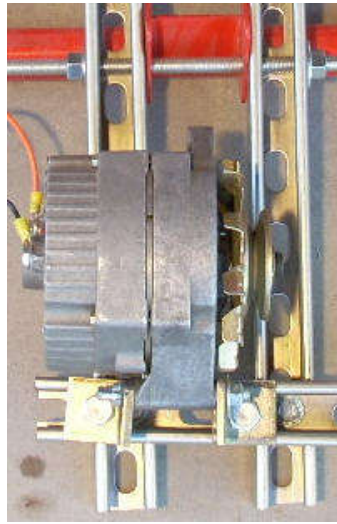


**step 20: Slide Alternator On To Support Strut**

Remove the springs from the nuts because they get in the way. Snip them off with a pair of wire cutters.

Slide the alternator on to the support cross piece as shown. Snug the bolts up hand tight with enough play to allow you to make some adjustments.





### step 21: Remove Rear Bike Wheel and Tire

Turn your bike upside down and remove the rear tire. The ascent bike stand comes with a spare quick release axle. It has hardened ends in the optimal shape to fit with the Ascent Bike stand. If you quick release axle has plastic ends, don't use it! Use the axle that comes with the bike stand.

Remove the tube and tire from your rear wheel so it looks like this. You can leave the rubber liner thing on if you want. It doesn't seem to make a difference.

NOTE: Make sure that your quick release handle is on the opposite side of your wheel that your gears are on. It must be that way to work in the Ascent Bike Stand!



**step 22: Put The Belt On**

Put the belt on as shown.



**step 23: Put the wheel back on the bike frame.**

Put the wheel back on the bike frame as shown in the picture.

Make sure the wheel is equi-distant from the frame. This is a very common mistake. Notice in the picture below how the gaps between each side of the wheel and frame are the same size. you need to do the same comparison check.



## step 24: Mounting Your Bike To the Ascent Magnetic 3 Level Trainer

Follow the instructions that came with the Ascent Trainer to mount your bike.

Some of my tips are:

Unscrew the tension knob out all the way as shown in the first picture.

Insert the axle end first that does not have the handle on it as shown in second picture.

Adjust your quick release handle so that it is on the top of the axle. Next adjust the landing cup of the bike trainer so it's wide opening is also facing upward. This will allow you set the axle end right into the cup as you tighten the tension knob. (refer to 3rd picture)



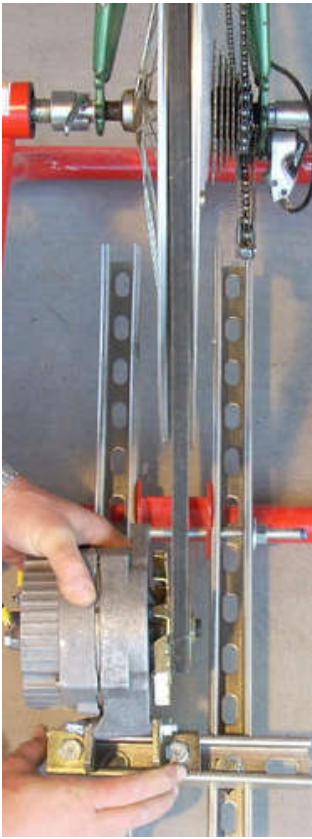
## step 25: Aligning the belt to the wheel

**WARNING: DO NOT TEST OUT YOUR BIKE PEDAL POWER GENERATOR WITHOUT AN ELECTRICAL LOAD HOOKED UP TO THE ALTERNATOR - IT WILL KILL THE ALTERNATOR. IT HAS TO HAVE AT LEAST a 150 OHM Resistor across it or a small 2 Watts Light Bulb. That way the regulator won't go to high voltage output , and burn out.**

Since you only hand tightened the bolts, you can know adjust the car Alternator as shown below. By doing a proper alignment, you have a more efficient bike generator because there will be less friction. And it will keep the belt from jumping off when you are pedaling.

When aligned, the belt should look like the picture. Also make sure the alternator is square with the rim. Adjust the angle of the the alternator so its pulley is perfectly aligned with rear wheel.

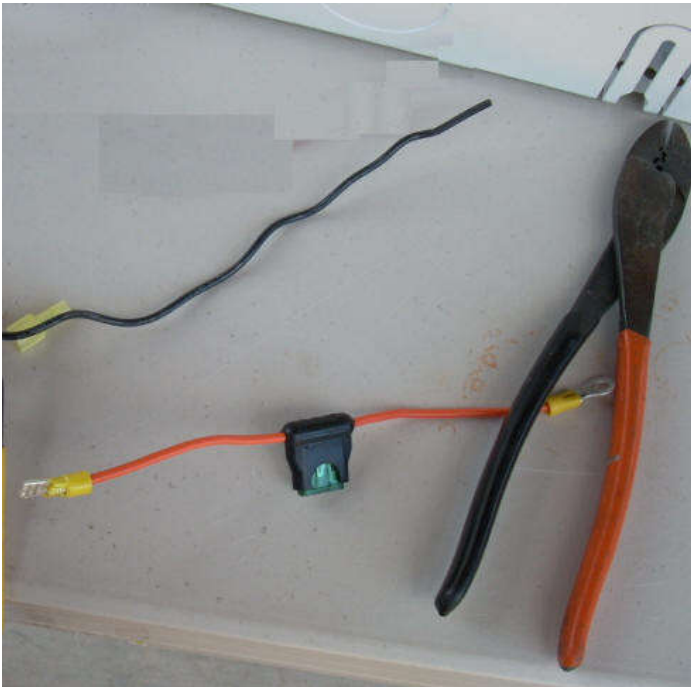




### **step 26: Cut Alternator Hook Up Wire**

Prepare the In-Line Fuse Holder wire by crimping on a 1/4" inner diameter ring terminal on one end and a female spade connector on the other.

Next prepare a 9 inch black wire with a large 3/8" inner diameter crimp terminal ring on one end and a crimp on male spade connector on the other. These need to be YELLOW which means these connectors are rated for high current up to 20 Amps.



### step 27: Attach Hookup Wire to Alternator

Use lock washers when you put these on to help make sure they don't get loose.

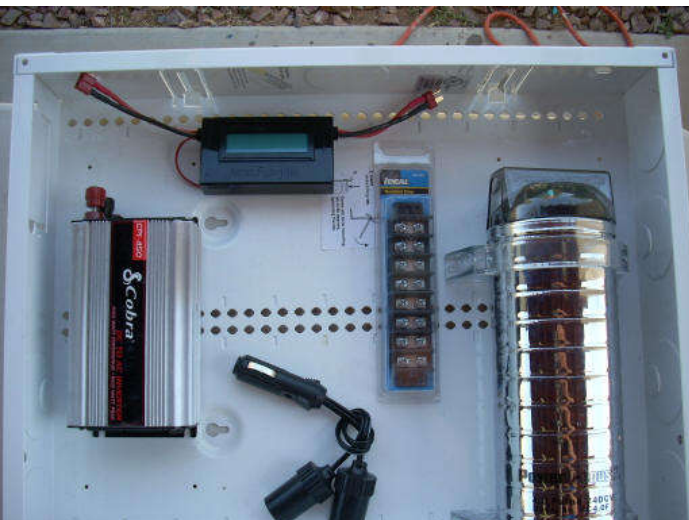
Make sure you have a 20 Amp Fuse in the fuse holder. This 12 AWG wire is only rated for 20 Amps. So do the right thing and play it safe. Even though the fuse holder comes with a 30 Amp fuse it's not ok to use it.

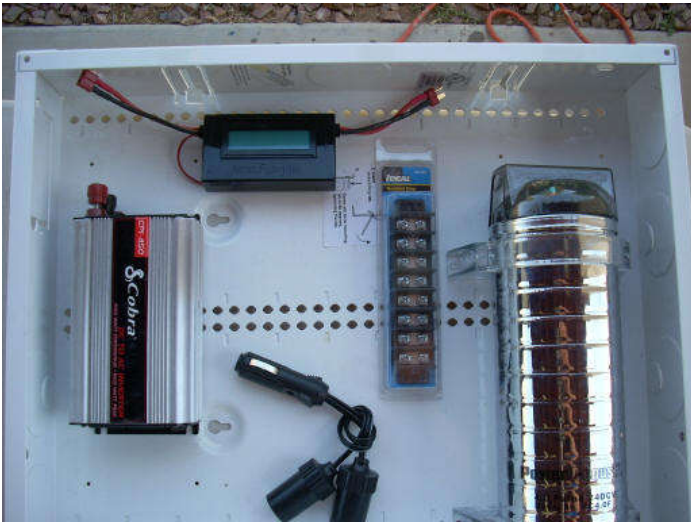


### step 28: Lay Out Your Low Voltage Electrical Box

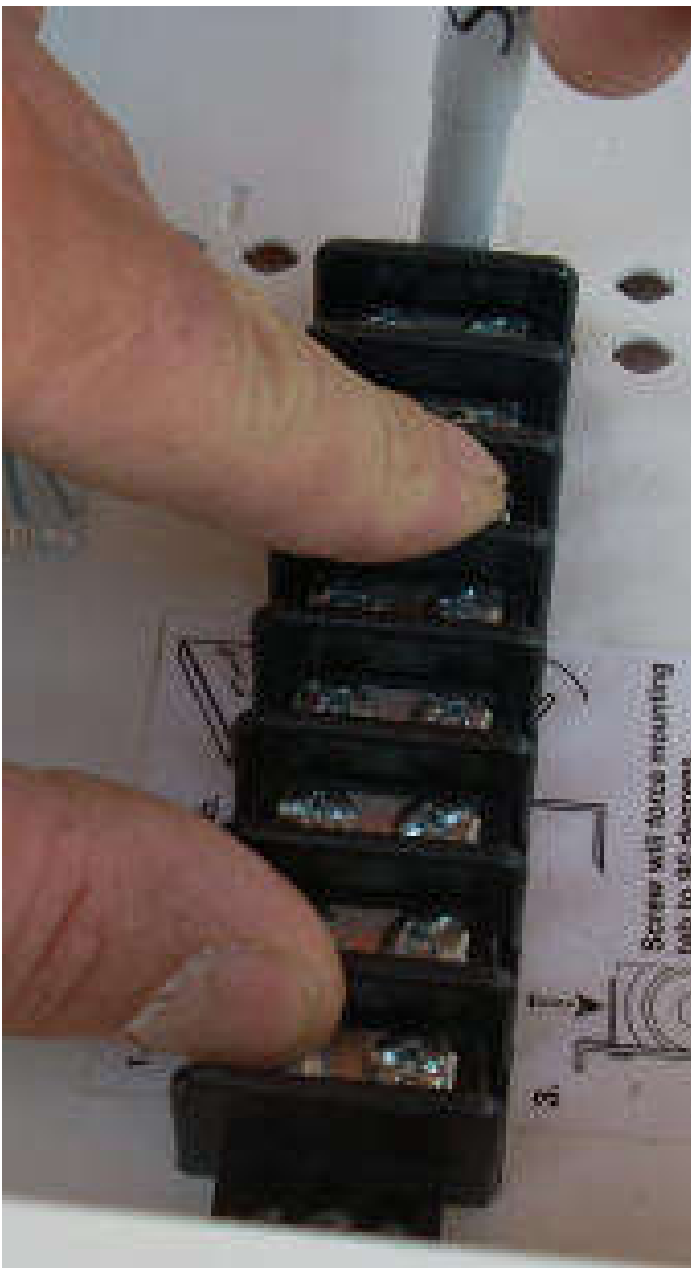
(1) First lay out your electrical box the way you want it.

(2) Next Mark your holes with a sharpie



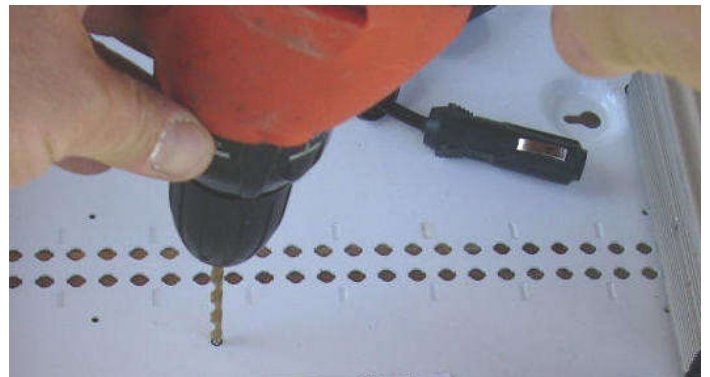


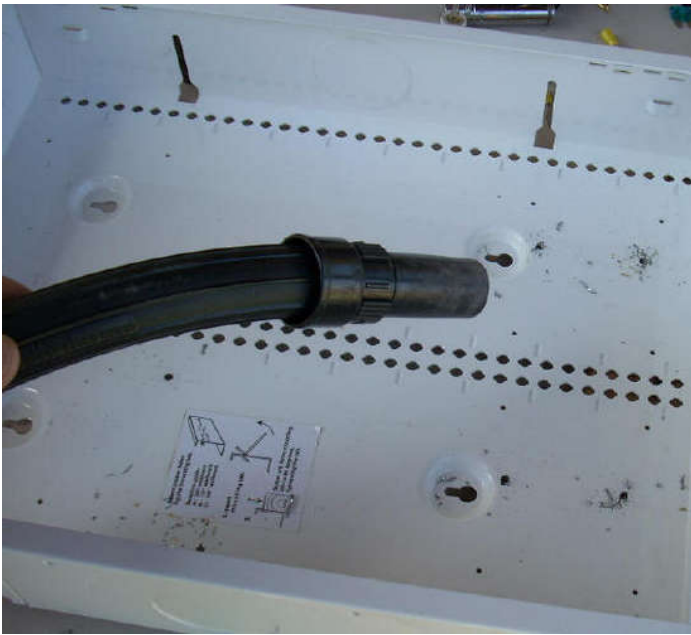
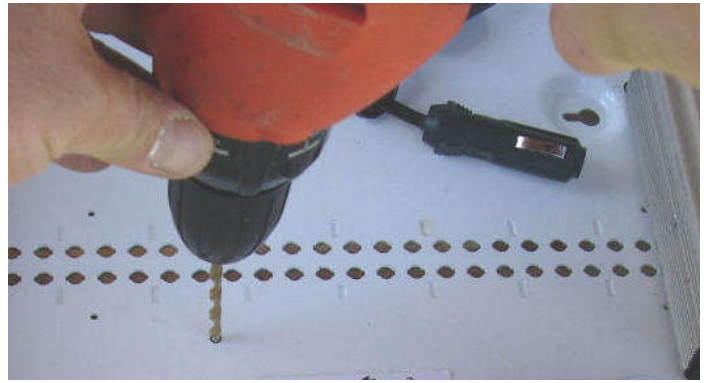
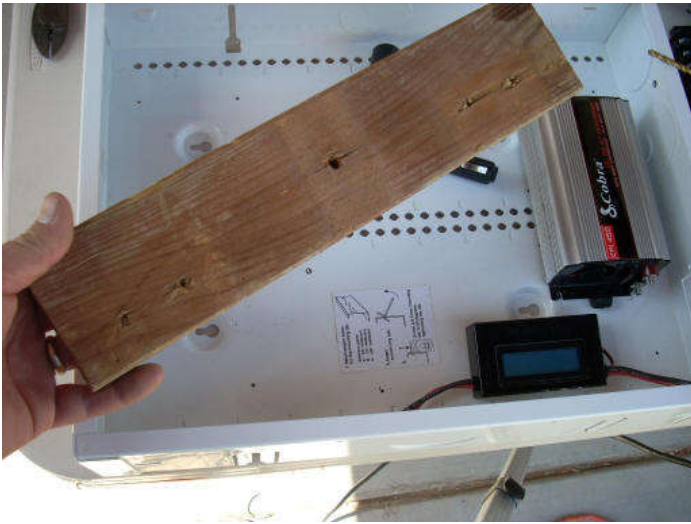




### step 29: Drill & Clean Holes

- (1) Get a scrap piece of wood to put under the electrical box so you don't drill a hole into the nice table below like I did.
- (2) Drill your holes in your box. Use a 1/4" bit.
- (3) De Burr your holes for safety reasons - to avoid cuts
- (4) Use a vacuum to clean up the shavings - they are sharp!





### step 30: Mount Box Electrical Components

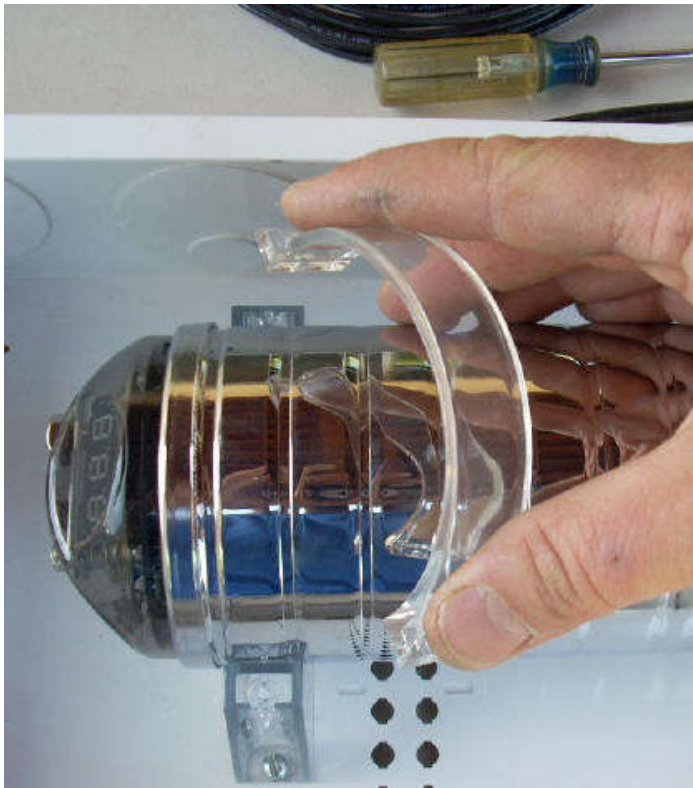
Use some 8-32 machine screws that are 3/8" long. Also you need some lock washers.

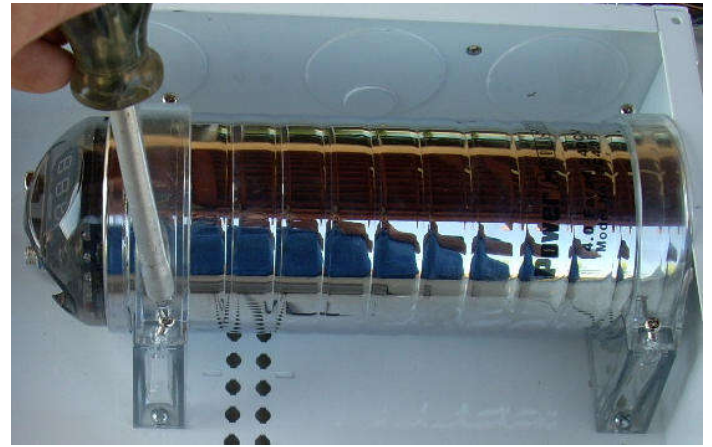
You need two people to make this go quickly without dropping parts. Tile the electrical box up on end. Have one person hold the DC-to-AC Power Inverter part being mounted while you stand at the rear of the box and put the lock washer and the nut on.

Mount capacitor, terminal strip as shown in photos.

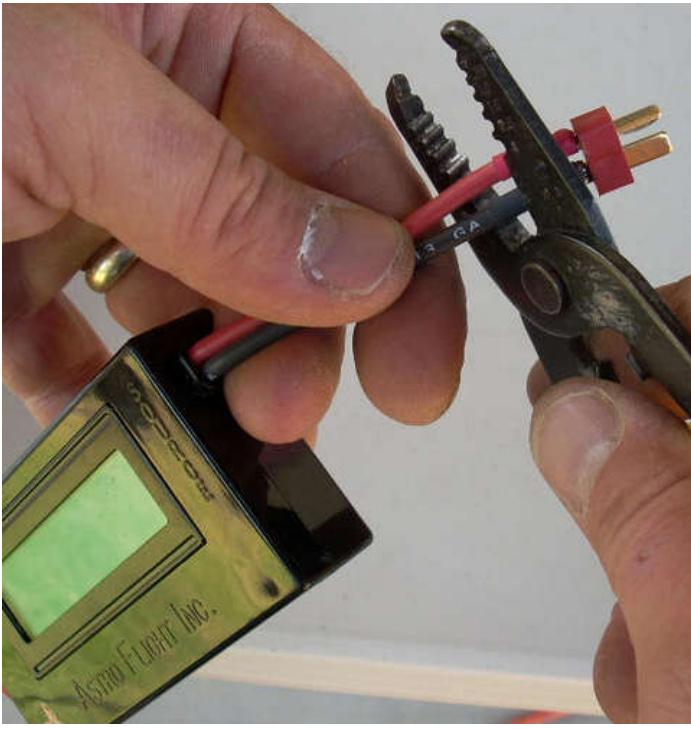








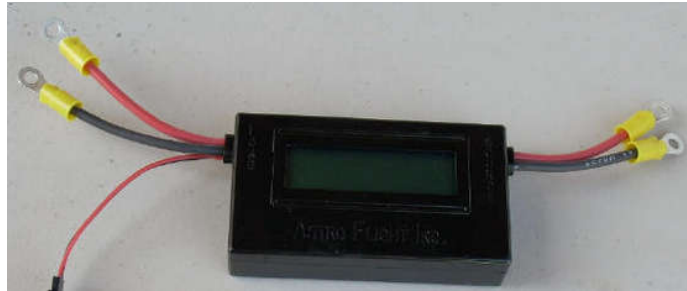
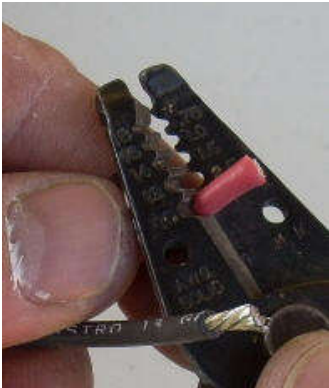
**step 31: Cut the ends off of the Watt Meter**  
Now cut the ends off of your Astro Flight DIGITAL WATTS/VOLT METER as shown.



### step 32: Strip And Crimp Watt Meter Wires

Now strip the ends of the wires so you can crimp some connector terminals onto them.

It should like the picture below when you are done.



### step 33: Install Watt Meter

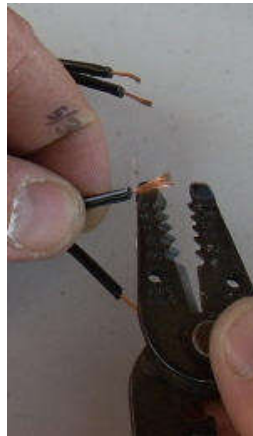
Now connect the right side (Also known as the supply side) of the Astro Flight DIGITAL WATTS/VOLT METER to the terminal strip. Tighten the screws firmly to get a good solid electrical connection that will handle 20 Amps. Don't over tighten! It may strip the threads of the screw.





### step 34: Modify Cigarette Lighter Plug Splitter

Next take off the male connector of the cigarette lighter plugs. These are used for low current charging of cell phones or game poyos, or portable play stations or I pod devices. Strip the ends of the wires so you can put crimp on ring terminals onto them.



### step 35: Verify & Label Wire Ends of Splitter

These plugs are what you can use to charge cell phones with. They are optional.

Use an ohm meter to make sure you know which wire is positive and which is negative. If you don't do this right, you could end up blowing fuses or damaging your bike generator. Set your \$10.00 volt meter from Radio Shack to a resistance measurement.

Next put one hand probe on the end of one wire and the other Ohm meter hand probe on the center contact post of the cigarette lighter plug. You will see it when you look down into the barrel of the cigarette lighter plug. If the ohm meter shows 0.2 to 1 ohms then you know the wire you are holding is connected to the positive terminal.

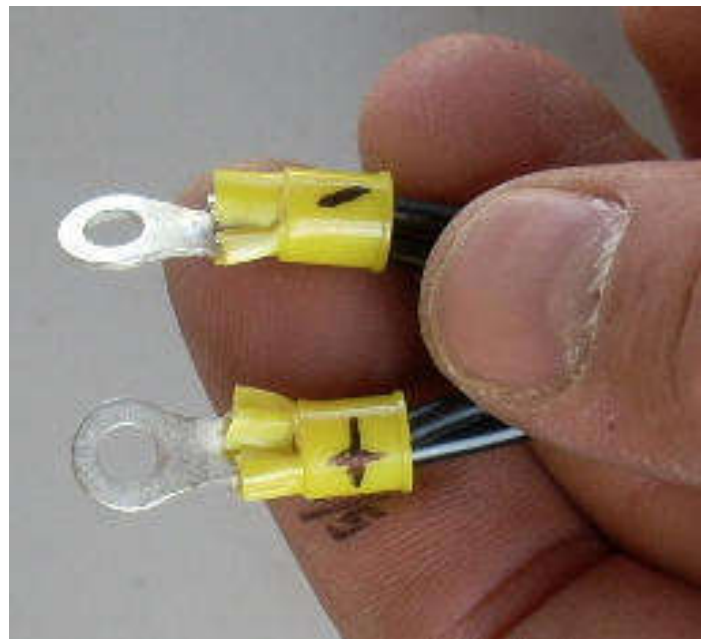
Get a piece of tape and mark that wire so you make no mistake when putting it together. If the ohm meter doesn't show any measurement change when you touch the two points, then switch your hand probe to the other wire end to confirm that it is the positive voltage wire.

(2) Do the polarity check described above on both pairs of the cigarette lighter sockets. Now twist their wire ends together. Make sure the positives are twisted together.

(3) Now crimp on the ring terminals to the ends of these wires.

(4) Now to make extra sure you don't get mixed up, mark the connectors positive and negative with a permanent marker as shown below.





### step 36: Make 10 Inch Jumpers With In Line Fuse Holder

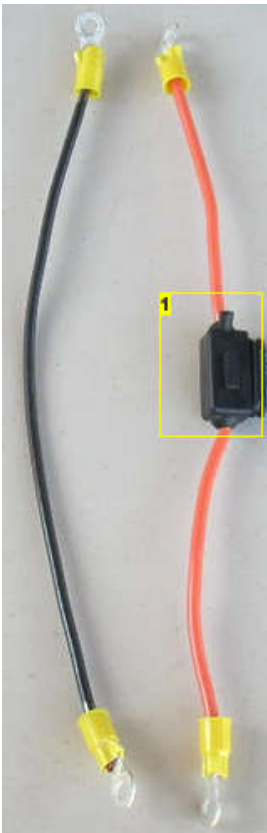
This step is to enable power to the cigarette lighter plugs. If you don't plan on using the cigarette lighter receptacles for charging cell phones then you can skip this step.

The wire needs to be size 12 AwG, black and red is preferable.

Prep an In-Line Fuse Holder with two crimp on ring terminals as shown below. This will hold a 10 Amp fuse for whatever you plan on providing power to. The reason why it has to be 10 Amps is because the wiring for the cigarette lighter plugs can only handle a max current of 5 Amps each. So  $5 + 5 = 10$  Amps.

After you prepare the In-Line Fuse Holder cut a black wire of the same length and put crimp on ring terminals on both ends of it.

If you want to charge 10 cell phones at once, you can buy a splitter to plug into these receptacles. This will give you more places to plug the cell phone chargers into.





### Image Notes

1. In Line Fuse holder found at any auto store. Use 10 Amp fuse.

### step 37: Attach Jumper Wires To AC Inverter & Terminal Block

Connect one end of the black wire to the negative (Black) terminal of the 450 Watt DC-to-AC Power Inverter terminal along with the negative (black) wire from the Astro Flight DIGITAL WATTS/VOLT METER as shown on the picture on the right.

Then connect the other ends of the two wires as shown on the left.

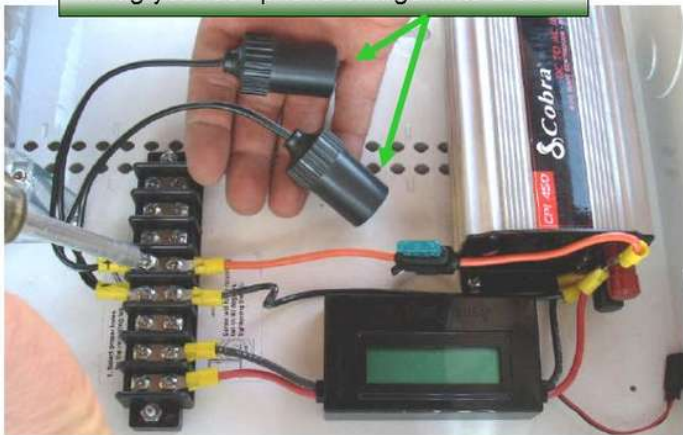
Now connect the cigarette lighter receptacles as shown in the picture.

Note:

This step is optional. It is only necessary if you plan on using the cigarette lighter receptacles for charging cell phones or other 12V type of electronics.



Plug your cell phone charger into these



### step 38: Hookup Negative Side of Capacitor to Terminal Strip

Now you are ready to hook up your 2 Farad Digital Capacitor.

This is a really cool cap because it has a slick built in blue LED voltage meter so you can always know what exactly your generator is running at.

You have to look very carefully at the markings in the plastic housing. Make sure you see which one has the plus sign and which one has the negative sign before moving forward.

REMEMBER: if you want to power up a TV set, having short thick wiring to the DC-to-AC Power Inverter is the key. This is because a TV set has a very large current spike when it turns on. So make the wiring short, and the crimps of a good quality.

- (1) Remove nuts at end of terminal shafts
- (2) Crimp a 3/8" ID (inner diameter) connector onto the end of a black 12AWG Wire as shown in the picture. Attach this end onto the NEGATIVE terminal of the 2 Farad Capacitor- it is VERY IMPORTANT THAT YOU GET THIS RIGHT!!
- (3) Route your black wire over to the terminal strip and cut the wire to a length that will reach the terminal screw as shown in the next photo.
- (4) Strip and crimp on a nother connector - the smaller ID size to connect to the terminal block. Do a tug test on the connector and wire to make sure it is secure.
- (5) Use a phillips head screw driver to tighten



#### Image Notes

1. Strip 3/8" of wire insulation using wire strippers. Then crimp on large yellow connector. This will go to the negative post of your capacitor.

#### Image Notes

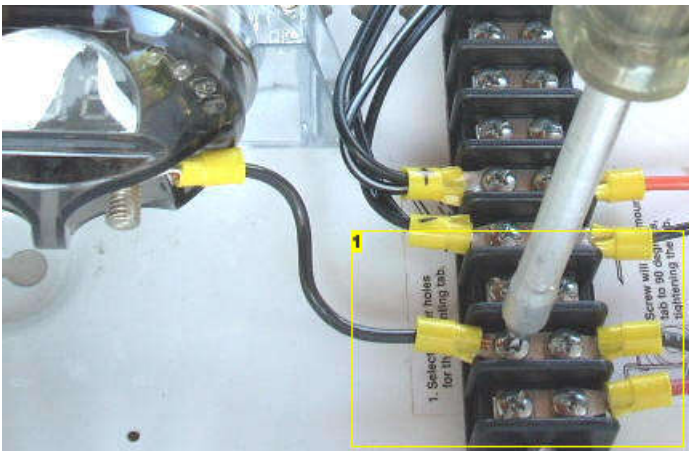
1. Remove Nuts

#### Image Notes

1. Use wire cutters and a good eye to cut the negative wire to the right length

#### Image Notes

1. Strip wire, and crimp on small yellow crimp on connector.



#### Image Notes

1. Use Phillips Head screw driver to connect the black wire to the 2nd position of the terminal block

**step 39: Connect Positive Side of Capacitor to Terminal Switch**

(1) Cut a length of size 12 AWG red wire so that it will reach from the Positive side of the capacitor to the terminal strip.

(2) Strip each end so that 3/8" bare copper is showing.

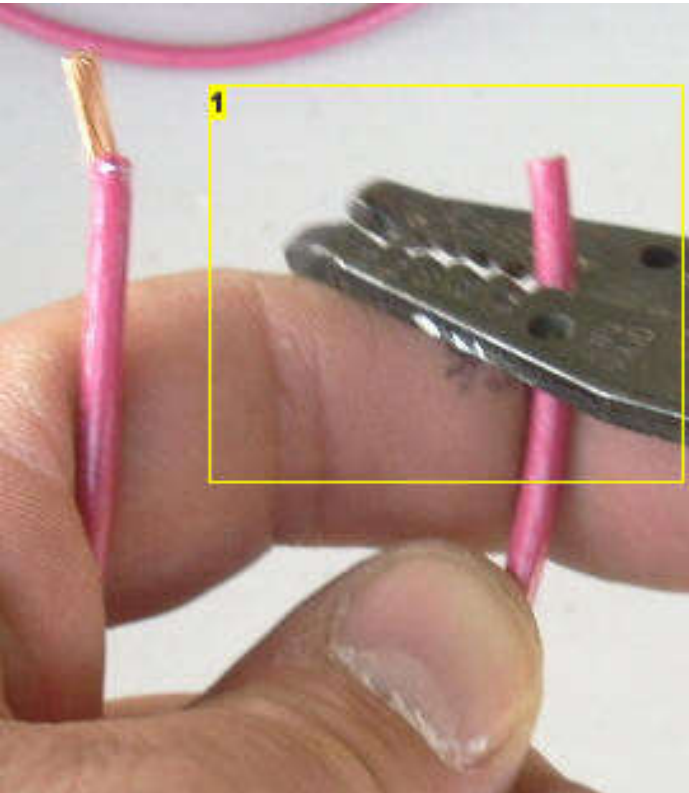
(3) Use wire crimpers to crimp on connectors as shown in the photo. One end has the larger 3/8" inner diameter terminal. That end will be connected to the positive side of the cap.

(4) Install the red wire as shown in the photo. Do not tightend to the capacitor side yet. Just the terminal strip side.



**Image Notes**

1. Use wire cutters to cut size 12 AWG red wire





#### Image Notes

1. Use wire strippers to remove 3/8 inches of insulation from wire.



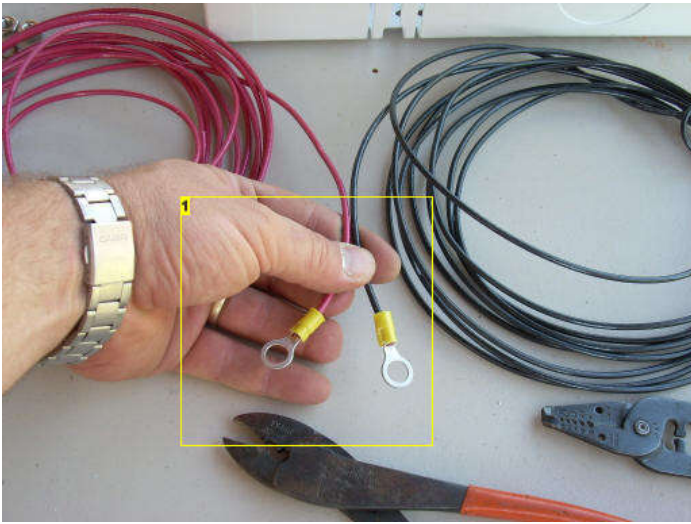
#### Image Notes

1. Connect the red wire from the positive side of the cap to the terminal strip.

### **step 40: Connect 10 Feet of Wire to Capacitor**

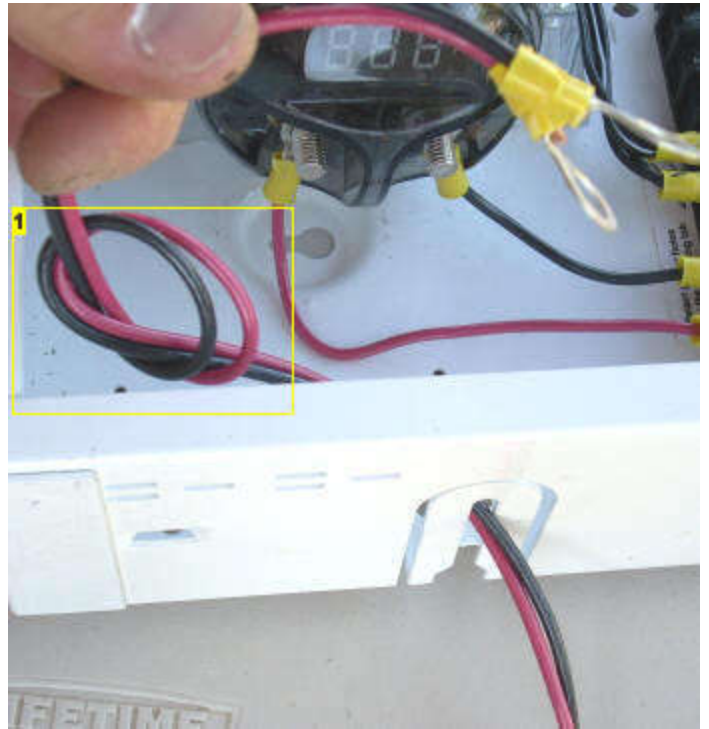
Now it's time to make a wire connection from the power box to your bicycle generator.

- (1) Buy about 10 Feet of size 12 AWG Stranded black and red wire.
- (2) Strip the insulation of each end so about 3/8" of bare copper is showing.
- (3) Use crimpers to crimp on large yellow terminal connectors that will go onto 2 Farad capacitor
- (4) Slip the ends through the box as shown.
- (5) Tie a knot in the wire as shown in the photo. This will act as a strain relief in case someone trips on the wire some day.
- (6) Connect the yellow terminals to the capacitor terminals. MAKE SURE YOU PUT THE RED wire on the positive terminal. You must get this right or very bad things could happen.
- (7) Use a 1/2 Inch deep socket as shown to tighten down the terminals. DO NOT OVER TIGHTEN. The nuts should be just tight enough so that the ring terminals can't slide back and forth around the shaft when you push on them with your finger.



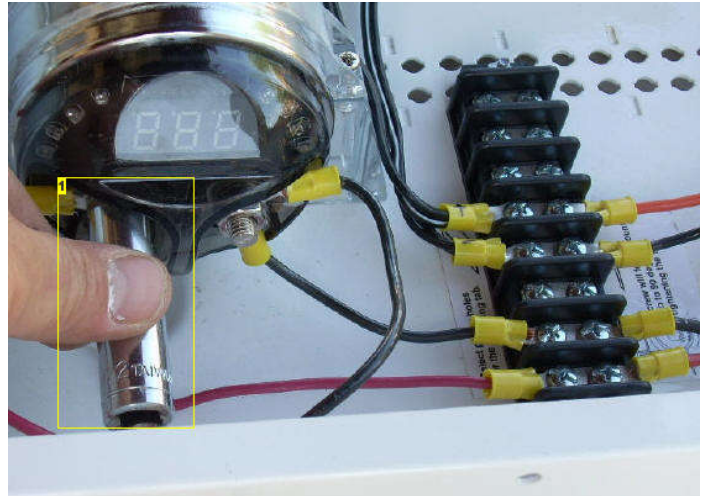
**Image Notes**

1. Use wire strippers to first strip off 3/8" wire insulation, then crimp on large 3/8" inner diameter ring terminals



**Image Notes**

1. Tie a loose knot to act as a strain relief



**Image Notes**

1. Use 1/2 Inch deep socket to tighten down nut

**Image Notes**

1. Make sure you double check that the red wire is connected to the positive side of the capacitor.

### step 41: Twist the Wires

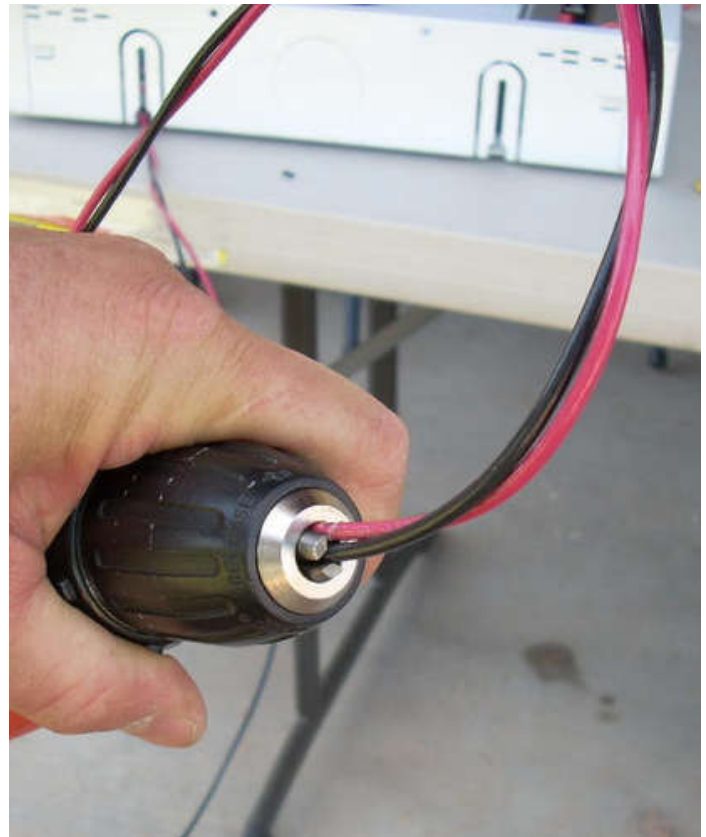
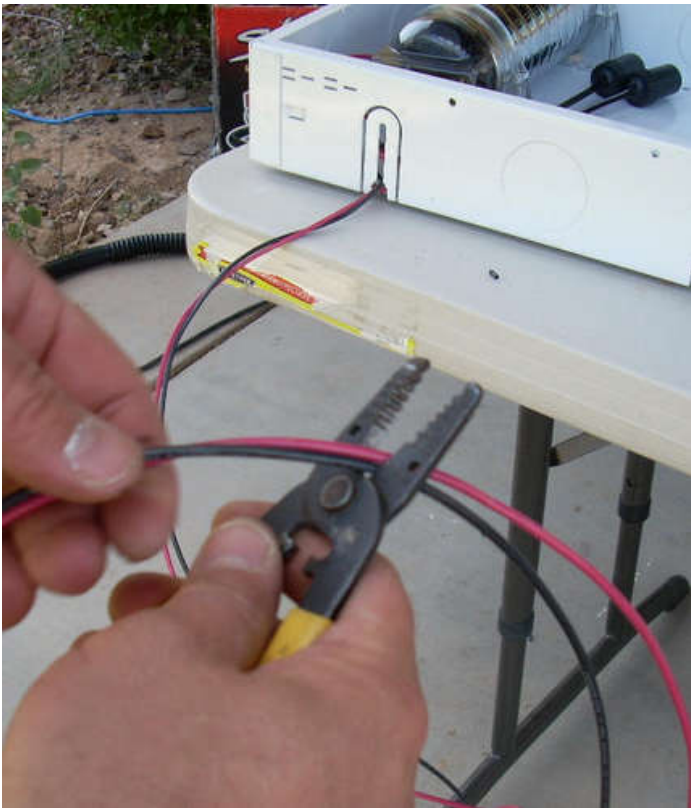
The ten foot red and black wires are very easy to get tangled in so you need to twist them together using a drill as shown.

(1) Cut your wires to ten feet. If you want to cut them shorter you can do that.

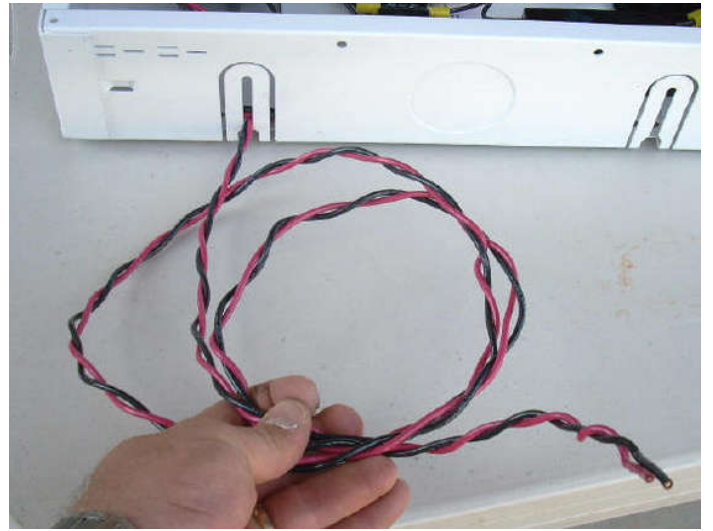
(2) Tighten the chuck on the drill so the wires are securely held

(3) SLOWLY Rotate drill as shown in video. YOU need to have another person hold onto your box so you won't pull it off the table.

Insert ends of wire into drill.







#### step 42: Add crimp on connectors to end of 10 Foot Wires

Now you will crimp on some connectors to the 10 Foot pieces of wires as shown in the picture.

You will need to strip and prepare the ends of the red and black wires as shown below. The red wire needs to have a male yellow crimp on spade connector. And the black wire needs to have the opposite- a female yellow spade crimp on connector. This will help to ensure you hook up to the bike generator with the right polarity.



#### step 43: Install Night Light

The GM one wire alternator only regulates to 14.8 Volts if it is hooked up to something. So you need to install a small 4 Watt night light so that the voltage does not creep up over 15 volts. Going over 15 Volts is bad because if it does this, the AC inverter shuts down by going into over voltage protection mode.

Install a 4 Watt night light into the Cobra Power Inverter

This will make sure that the inverter has some kind of load on it so that bike generator won't over shoot the inverter's operating range of 15 volts.

Note that many night lights are automatic and only turn on at night. So if you have one of these automatic lights, put a piece of dark tape over the light sensor on it to block out the light.

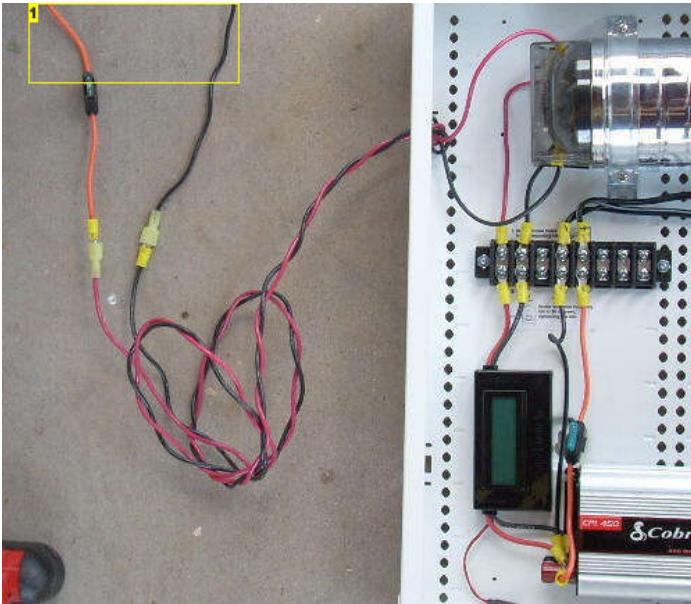


#### step 44: Final Hookup

Now connect your 10 foot wires to the connectors on the car alternator. YOU ARE READY TO RIDE!!

If you are just charging cell phones or a car battery, then turn off the AC inverter.

If you are providing power to the television, playstation, or something else, then make sure the AC inverter button is in the "ON" position.



**Image Notes**

1. These wires are attached to your car alternator.

**step 45: How It Looks Hooked Up To A Playstation PS2 Video Game**

Now you're ready to be a green lean power machine!

The photo shows how it looks when you hook up your bike generator to your playstation video game. If you want more information go to [pedalpowergenerator.com](http://pedalpowergenerator.com).



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## Comments

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 **ncoded** says: Jan 11, 2009. 12:38 AM [REPLY](#)  
This is such a useful article, perhaps not 'now' but probably for the future! Would it be possible to put this guide together into a .pdf for download? Also, is it possible to boil water using a similar type method?

 **bdwhaley** says: Jan 12, 2009. 12:38 PM [REPLY](#)  
Hello, just curious, but why do you want it in a pdf? Also yes, you can easily boil a cup of wate in it. It might take you about 5 minutes for a cup of water. The hard part would be to find a 12 V heating element, or hot plate. Brad, pedalpowergenerator.com  
Brad


 **TheGoodLife** says: Mar 29, 2009. 10:47 AM [REPLY](#)  
The Instructables website automatically makes a pdf of every instructable.  
After step 45 you will see a pdf has been created.  
I like pdfs because I can add it to my CD of useful things to make when the big "power down" comes.  
After all, you wouldn't be making a bicycle generator if you didn't think there was a need for an off-grid (or no more grid) source of electricity. No grid means no Internet and no chance to view this instructable.


 **captain Jack** says: Mar 16, 2009. 6:22 PM [REPLY](#)  
nice.


 **gabethegeek** says: Jan 30, 2009. 1:53 PM [REPLY](#)  
These steps are unnecessary and cause confusion. Having multiple steps on how to fit a strut into a Civic is just annoying to the reader.

 **bdwhaley** says: Feb 22, 2009. 5:34 AM [REPLY](#)  
????

 **drbill** says: Feb 13, 2009. 10:46 AM [REPLY](#)  
I don't see a battery to energize the field coil. How do you do it?

 **bdwhaley** says: Feb 22, 2009. 5:33 AM [REPLY](#)  
You don't need a battery because there is enough of a residual magnetic field within the alternator to allow it to start generating 14.8 volts after 3 seconds of fast pedaling. Watch it done on this video:  
<http://www.youtube.com/watch?v=bJFGEQRWxz8>


 **amariusd** says: Apr 23, 2008. 7:11 AM [REPLY](#)  
Very neat! My neighbor has a street riding bicycle from the 60's that has a generator to power a detachable headlamp. I'm curious if this could be modified to do the same.

 **bassbindevil** says: Feb 1, 2009. 3:47 PM [REPLY](#)  
Yes, more or less. Power will be limited to 5 to 10 watts at most, at around 6 volts at an average riding speed. It's usually AC, which is a good and bad thing. Bad because it needs a rectifier to turn it into DC (and it'll only be half-wave rectified unless you don't mind having the DC output floating with respect to bike chassis ground), but good because if you hook up a step-up transformer you can get more volts (though less current - there's no free lunch here). I once ran a 120V radio off a bike generator using a 6V to 120V transformer, so it is definitely possible. To change the nominal 6V up to something like 12V, you could use a 12V center-tapped transformer: connect one side of the transformer 12VCT side to chassis ground, wire the output of the bike generator to the center tap, and there will be 12 volts AC on the other 12V terminal. The normal primary will have about 120 V AC on it, so it would be sensible to insulate the heck out of it. Or hook it up to some LED rope lights or other very low power 120V light. Another option would be a "voltage doubler" circuit that uses diodes and capacitors; that should weigh less than a transformer.. This could be enough to run a low power charger for a cell phone or MP3 player, or run some LED lighting.


If you're going shopping for a bike generator, the smoothest kind is the sort that mounts under the bottom bracket (where the pedal shaft is), and contacts the tread portion of the tire. Sanyo used to make one, and I believe there's others. Actually, there is a better type: one that either replaces the

front hub (Sturme-Archer Dynohub - rare), or mounts to it; there's some Instructables on that. That technology is more practical now thanks to those tiny superpowerful magnets.


---

 **mikeulrich84** says: Jan 7, 2009. 2:50 PM [REPLY](#)  
So I used your design to build a bike for my physics class and everything worked great, but the alternator's putting out about 17 volts. It's too high for the inverter. Do you have any suggestions on how to regulate that? Is the internal regulation in the alternator busted?


---

 **bdwhaley** says: Jan 8, 2009. 8:36 AM [REPLY](#)  
Take it to an autozone store and have it tested. Did you put the night light on it to give it a little load? If the alternator checks out as being good, then the best solution might be to order one of the 300 Watt samlex pure sine wave inverters which has a max input voltage of 15.


---

 **mikeulrich84** says: Jan 8, 2009. 2:33 PM [REPLY](#)  
thanks for the reply. I did not load it with a night light. Would that drop the voltage or just give more current? I tested the voltage across the terminals of the alternator and it was 17 volts. So you're saying that they will test the internal regulation? Thanks again.


---

 **jtgumby** says: Sep 7, 2007. 9:40 AM [REPLY](#)  
"Energy Bikes" have for many years been part of the K-12 energy curriculum developed at the U. of Wis. Stevens Point. See:  
<http://tinyurl.com/2f8w3z>  
Here's a link to a fabricator of displays/generators:  
<http://tinyurl.com/2f8w3z>

---

 **bdwhaley** says: Sep 7, 2007. 3:51 PM [REPLY](#)  
How many watts is your 12 Volt regulator good for? can you post a datasheet for it?  
12V DC Regulator 1 \$11.96 JC Whitney 74SE7551W

---

 **Ziggythewiz** says: Jan 2, 2009. 2:50 PM [REPLY](#)  
I can't find that model on their site, is it still there, or do you know of any similar options?

---

 **iPodGuy** says: Nov 24, 2008. 12:15 PM [REPLY](#)  
Great instructions, great pictures, great job!

---

 **ReCreate** says: Nov 24, 2008. 11:46 AM [REPLY](#)  
wow 50+ steps

---

 **omkar\_hummer** says: Oct 29, 2008. 10:57 PM [REPLY](#)  
you can install such bikes in gyms!


---

 **lancego30** says: Oct 20, 2008. 12:03 PM [REPLY](#)  
this is the best instructable i read so fAR


---

 **Derin** says: Oct 4, 2008. 5:02 AM [REPLY](#)  
I remember that cars had voltage regulators in them somewhere...

---

 **lil\_agelu4life** says: Aug 18, 2008. 2:21 AM [REPLY](#)  
Can me and my physics group use this as our science fair project? (thats if we can get it 2work lol)  
It is sooooo kew!!!

---

 **bdwhaley** says: Aug 18, 2008. 5:22 AM [REPLY](#)  
Sure, But I would recommend using the permanent magnet DC motor as a generator and make a floating ball go up and down using an AC Yard blower. People really enjoy that. The plans for doing the Permanent magnet DC Motor / generator are here:  
<http://www.scienceshareware.com/build-your-own-generator-bike-trainer-stand.htm>



**dustar** says:

This is AWESOME!! Any idea if this could be adapted to a row machine or does the alternator need a constant rotation??

Jan 25, 2008. 12:56 PM [REPLY](#)



**hachi-control** says:

Rowing machines use a fly-wheel type thing, don't they?

Aug 6, 2008. 2:28 AM [REPLY](#)



**bdwhaley** says:

Can you send me a picture of the rowing machine so i can figure out if it could be done? Email is support@scienceshareware.com

Jan 28, 2008. 3:41 AM [REPLY](#)



**theburn7** says:

heres one. where the circular part is, is a fan like thing that resists when you pull the rope

Jun 15, 2008. 9:07 PM [REPLY](#)



**Richandler** says:

Maybe I'm the only nut here, but I would think that all that exercising would speed up your respiratory system and thus causing you to produce more CO<sub>2</sub>; probably as much as any other equivalent source.

Sep 21, 2007. 7:14 PM [REPLY](#)



**theburn7** says:

So.... the fix to this is not breathing? We run, jump, and live by breathing, plus, only a small percentage we breathe out is carbon dioxide (Co<sub>2</sub>)

Jun 15, 2008. 8:59 PM [REPLY](#)



**GoatBoy** says:

Well, that's great that you picked the one emission common between the two power sources.

So what about the other chemicals released by "equivalent sources"?

Sulfur? Mercury? Nanoparticle soot?

Mar 16, 2008. 2:32 AM [REPLY](#)



**bdwhaley** says:

Some power plants put out an average of 2 lbs of CO<sub>2</sub> per KW Hour. If you pedal for 10 hours at 100 Watts to generate your own KW Hour, you put out any where from 500mg to 900 mg (From 1 to 2lbs) So worst case would we humans are putting out as much as a coal burning power plant, and best case we put out half as much.

Jan 28, 2008. 4:27 AM [REPLY](#)



**musing mumbler** says:

Yes, but keep in mind that the CO<sub>2</sub> that we breathe out is reabsorbed by the crops that we grow for food.

While this isn't going revolutionize our global power economy, it is still an awesome way to exercise and maybe trim the electrical bill a little bit,

Dec 11, 2007. 12:44 PM [REPLY](#)



**bdwhaley** says:

I have already thought about this and my take is that people who already work out will want to do this pedal power generator project, since they already work out and create CO<sub>2</sub>, at least they will be harnessing some energy from the their body and using it for use around the house. So in the end if you already work out, you might as well save your energy and not worry that your net carbon savings is Zero.

Jan 6, 2009. 6:57 PM [REPLY](#)



**Derin** says:

yep, we are carbon neutral

Oct 4, 2008. 5:16 AM [REPLY](#)





**mnapier61** says:

Excellent! You know, its a crime that all the exercise equipment in gyms is not generating electricity...

Aug 17, 2007. 4:29 PM [REPLY](#)



**Truik** says:

I've always wanted to develop and mass produce a "marketable" version of something like this and sell them to gyms. Someone will do it one day as things progressively "green" and they will make a fortune.

Aug 19, 2007. 6:02 AM [REPLY](#)



**wooter** says:

I'm already busy developing such a marketable version. However it looks easy, it is quite a hard job to develop such a product and it takes a lot of time. I must say that i did not know this site and never have seen a product like "my" idea.. Very interesting.

Aug 29, 2007. 10:29 AM [REPLY](#)



**tcc0828** says:

I wanted to call mine "Green's Gym" instead of Gold's.

Sep 10, 2007. 12:55 PM [REPLY](#)



**Lintballoon** says:

Please do it!

I often had the same wish, never could understand why all the cardio (except the treadmill) machines had to be plugged in. My fantasy also included a gym/laundramat or laundramat/gym so you could get your laundry done while you work out...

May 4, 2008. 4:58 AM [REPLY](#)



**jester\_rob** says:

couldn't you also just mount the alternator on the front or rear forks of the bike with a wheel attached to the shaft that is resting on the wheel of the bike so that you could use this while you are riding. The batteries on my ipod go dead on some of those long rides and it would be nice to be able to charge it as you go, also, you could make it so that you simply had to lift the wheel of the alternator to disengage it from the bike tire and give less resistance if you just wanted to ride and not charge something.

Apr 27, 2008. 1:15 AM [REPLY](#)



**musing mumbler** says:

Hi,

Is it possible to use a 1 Farad capacitor if it is being used to charge cell phones?

Mar 29, 2008. 3:43 PM [REPLY](#)



**twocvbloke** says:

I love it, I'm going to try to get a moderately intact bike and salvage a trainer that my mum's partner's got out the back, and hopefully assebmle it into something that resembles the results of this Instructable, plus I need the excercise!!! :D

Dec 18, 2007. 3:42 PM [REPLY](#)

I would like to use it to charge several car batteries (I'll try to salvage those too from a local scrapyard) and use those in conjunction with an inverter to power as much as the inverter can take... :D



**bdwhaley** says:

Hi,

This design is regulated and impossible past 40 Watts of power. This design uses an alternator which tries to regulate voltage at 14.8 Volts all the time. When you try charging a car battery with it, it is EXTREMELY hard to pedal.

You can look at the other high power bike generator DIY project that uses a permanent magnet dc motor as a generator. It is much more efficient and will charge your batteries easily over time.

Here is the URL.

<http://www.scienceshareware.com/build-your-own-generator-bike-trainer-stand.htm>

Also, if you take a cheap \$10.00 volt meter to the junkyard and check DC voltage on the battery, it should read around 12.8 if the battery is in great condition. If it is lower than that, and has sat for a long time, the plates inside the battery could be damaged by having lead sulfate deposit on them.

Jan 28, 2008. 3:48 AM [REPLY](#)



**bhunter736** says:

Very good instructable. I like the detail and the fact that you listed sources for parts.

Dec 17, 2007. 2:40 PM [REPLY](#)



**Paulper** says:

wonderful I love it. I've been pondering the idea of setting up those as an input to a homes or schools I wonder if u could adapt them.

Dec 8, 2007. 10:14 AM [REPLY](#)



**jt gumby** says:

Sorry, but I'm not the maker of the pedal power displays. You can contact him at the URL I supplied, however.

Sep 9, 2007. 7:10 PM [REPLY](#)

JT



**theque** says:  
incredible! i want one :).

Sep 8, 2007. 11:14 PM [REPLY](#)

---



**Brennn10** says:  
Just curious, are all these pictures of your personal device, or are they off of pedalpowergenerator.com?

Aug 17, 2007. 5:31 PM [REPLY](#)

---



**bdwhaley** says:  
Yes.  
pedalpowergenerator.com is my web site.  
Brad

Aug 17, 2007. 9:39 PM [REPLY](#)

---



**Brennn10** says:  
Oh neat!

Aug 18, 2007. 4:40 AM [REPLY](#)

---

[view all 56 comments](#)