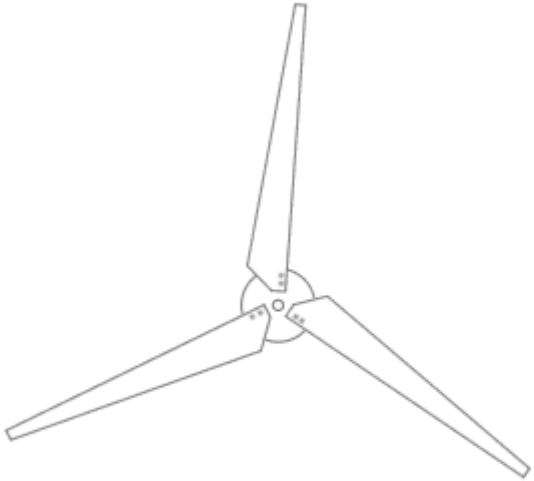
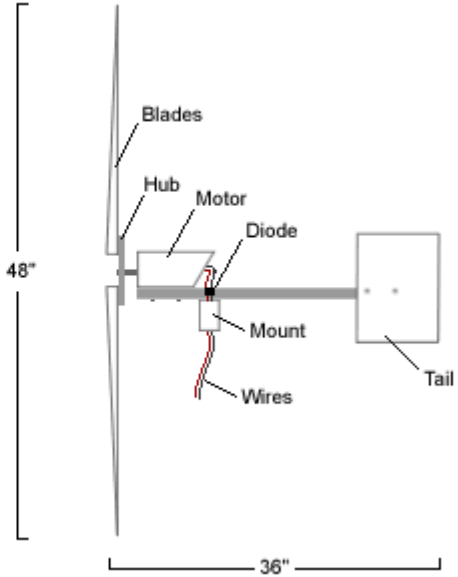
Home : Chispito Wind Generator

We no longer offer the kits mentioned on this site.

Use these instructions to build your own!

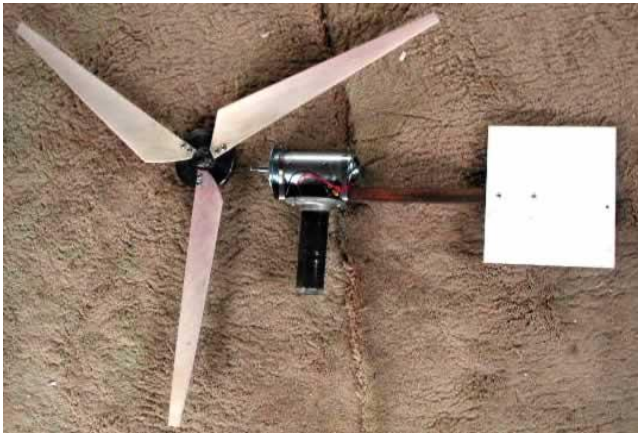
HOW TO BUILD A CHISPITO WIND GENERATOR




Blades
Hub
Motor
Diode
48"
Mount
Tail
Wires
36"

NOTE: THE MAKE MAGAZINE ARTICLE SHOWS THE BLADES BEING CUT FOR A CW ROTATION. IF YOU ARE USING THE TREADMILL MOTOR MENTIONED IN THE ARTICLE PLEASE CUT THE BLADES PER THE WEBSITE INSTRUCTIONS.

INTRODUCTION



Wind power is abundant, clean, inexpensive and easy to do. It is our belief that anyone can be in control of where his or her electricity comes from. There is nothing more rewarding and empowering than making a wind powered generator from scrap materials. Most of the tools and materials in this manual can be found in your local hardware shop or junk pile. We highly recommend you search your local dump and/or junkyards for the materials required. If you live in a city, do a search on freecycle.org for salvaged parts.

Safety should be our highest priority. Human life is more important than electricity, so please follow any and every safety guideline you come across. Wind generators can be very dangerous, with fast moving parts, electrical sparks, and violent weather conditions.

The Chispito Wind Generator was designed to be simple and efficient with fast and easy construction. There are no limits to what you can do with wind power. For more information and inspiration on wind generator construction, please visit otherpower.com

SUPPLIES

This manual is based on using a 260 VDC, 5 A continuous duty Treadmill Motor with a 6 inch threaded hub. These motors are available for under from most motor surplus stores. We are getting about 7 amps in a 30 mph wind. In other words, it is a simple, cheap little machine to get you started.

You may use any other simple permanent magnet DC motor that returns at least 1 V for every 25 rpm and can handle upwards of 10 amps. If you do, there will be certain changes to this supply list (for example, you will have to find a hub - a circular saw blade with a 5/8" shaft adaptor will work).

Tools

- **Drill**
- **Drill Bits (7/32", ¼", 5/16")**

- **Jigsaw with a metal blade**
- **Pipe Wrench**
- **Flat Head Screwdriver**
- **Crescent Wrench**
- **Vise and/or Clamp**
- **Wire Strippers**
- **Tape Measure**
- **Marker Pen**
- **Compass + protractor**
- **¼" #20 Thread Tapping Set**
- **An extra person helps a lot!**

Materials

Mount

- **36" of 1" Square Tubing**

- **2" Floor Flange**
- **2" X 4" Nipple**
- **3 X 3/4" Self-tapping Screws**

NOTE: if you have access to a welder, you can weld a 4" section of 2" pipe onto your square tubing instead of using the flange, nipple and sheet metal screws.

Motor

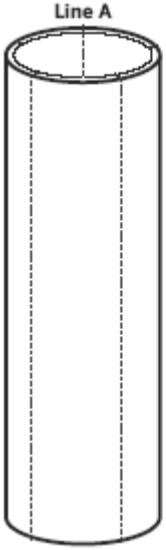
- **260 VDC, 5 A continuous duty Treadmill Motor with a 6 inch threaded hub**
- **30 - 50 Amp Blocking Diode (one-way)**
- **2 x 5/16" x ¾" Motor Bolts**
- **3" X 11" PVC Pipe**

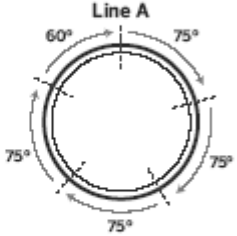
Tail

- **1 sqft (approx) lightweight material (metal)**
- **2 X ¾" Self-tapping Screws**

Blades

- **24" length of 8" PVC Pipe (if it is UV resistant, you will not need to paint it)**
- **6 X ¼" X 20 Bolts**
- **9 x ¼" washers**
- **3 sheets A4 paper and tape**

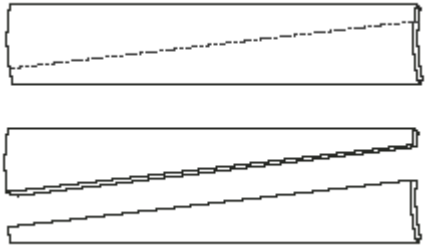




PREPARATION

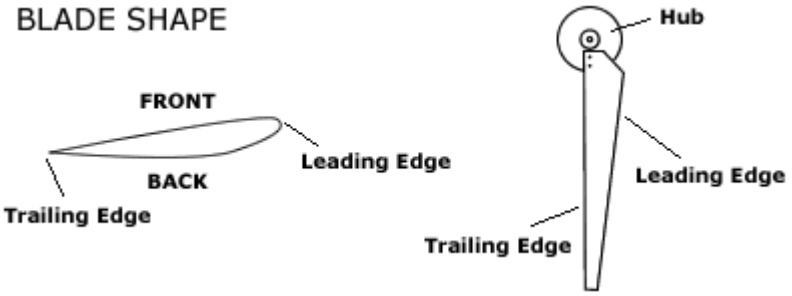
Cutting Blades - makes 9 blades (or 3 blade sets) and a thin waste strip.

1. **Place the 24" Length of PVC pipe and square tubing (or other straight edge) side by side on a flat surface. Push the pipe tight against the tubing and mark the line where they touch. This is Line A.**
2. **Make a mark near each end of Line A, 23" apart.**
3. **Tape 3 sheets of A4 paper together, so that they form a long, completely straight piece of paper. Wrap this around the section of pipe at each of the two the marks you just made, one then the other. Make sure the short side of the paper is straight**



along Line A and the paper is straight against itself where it overlaps. Mark a line along the edge of the paper at each end. Call one Line B and the other Line C.

4. Start where Line A intersects Line B. Going left around Line B, make a mark at every 145 mm. The last section should be about 115 mm.
5. Start where Line A intersects Line C. Going right around Line C, make a mark at every 145 mm. The last section should be about 115 mm.
6. Mark each line using a straight edge.
7. Cut along these lines, using the jigsaw, so that you have 4 strips of 145 mm and one strip about 115 mm.
8. Take each strip and place them with the inside of the pipe facing down.
9. Make a mark at one end of each strip 115 mm from the left edge.
10. Make a mark at the other end of each strip 30 mm from the left edge.
11. Mark and cut these lines, using the jigsaw.
12. Place each blade with the inside of the pipe facing down.
13. Make a mark along the angled line of the blade, 3" from the wide end.
14. Make another mark on the wide end of the blade, 1" from the straight edge.
15. Connect these two marks and cut along the line. This prevents the blades interfering with the others' wind.



Sanding the Blades
You should sand the blades to achieve the desired airfoil. This will increase the efficiency of the blades, as well as making them quieter.

The angled (leading) edge wants to be rounded, while the straight (tailing) edge wants to be pointed.

Any sharp corners should be slightly rounded to cut down on noise.

Cutting Tail
The exact dimensions of the tail are not important. You want about one square foot of lightweight material, preferably metal. You can make the tail any shape you want, so long as the end result is stiff rather than floppy.

Drilling Holes in Square Tubing - using the 5/16” drill bit

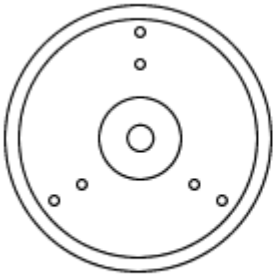
1. **Place the motor on the front end of the square tubing, so that the hub part hangs over the edge and the bolt holes of the motor face down.**
2. **Roll the motor back so you can see the bolt holes, and mark their position on the square tubing.**
3. **Drill a 5/16” hole at each mark all the way through the square tubing.**

Floor Flange Holes

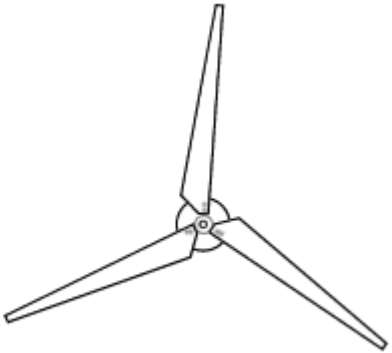
This will be dealt with in the assembly section of this manual, as these holes are what determine the balance.

Drilling Holes in Blades - using the ¼" drill bit

1. **Mark two holes at the wide end and along the straight edge of each of the three blades. The first hole should be 3/8 " from the straight edge and ½ " from the bottom. The second hole should be 3/8 " from the straight edge and 1 ¼" from the bottom.**
2. **Drill these 6 holes.**



HUB LAYOUT

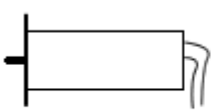


BLADE LAYOUT

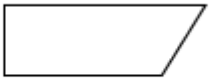
Drilling and Tapping Holes in Hub - using the 7/32" drill bit and ¼" tap

1. **The Treadmill motor comes with the hub attached. To take it off, hold the end of the shaft (which comes through the hub) firmly with pliers, and turn the hub clockwise. This hub unscrews clockwise, which is why the blades turn counter-clockwise.**
2. **Make a template of the hub on a piece of paper, using a compass and protractor.**
3. **Mark 3 holes, each of which is 2 3/8" from the center of the circle and equidistant from each other.**
4. **Place this template over the hub and punch a starter hole through the paper and onto the hub at each hole.**
5. **Drill these holes with the 7/32" drill bit.**
6. **Tap the holes with the ¼" x 20 tap.**
7. **Bolt the blades onto the hub using the ¼" bolts. At this point, the outer holes have not been drilled.**
8. **Measure the distance between the straight edge of the tips of each blade. Adjust them so that they are**

all equidistant. Mark and punch each hole on the hub through the empty hole in each blade.



MOTOR SIDE VIEW



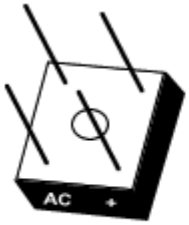
SLEEVE SIDE VIEW

SLEEVE FRONT VIEW

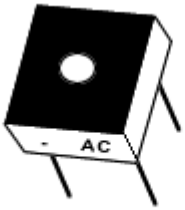
9. **Label the blades and hub so that you can match which blade goes where at a later stage.**
10. **Remove the blades and then drill and tap these outer three holes.**

Making a Protective Sleeve for the Motor

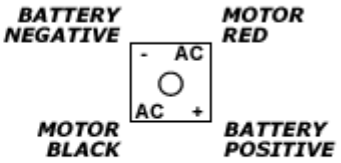
1. **Draw two straight lines, about ¾" apart, along the length of the 3" x 11" PVC Pipe. Cut along these lines.**
2. **Make a 45º cut at the end of the pipe.**
3. **Place needle nose pliers inside the strip that has been cut out, and pry the pipe apart.**
4. **Making sure the bolt holes of the motor are centered in the middle of the missing strip of PVC pipe, push the motor into the pipe. An extra person will make this a lot easier.**



DIODE TOP VIEW



DIODE BOTTOM VIEW



DIODE WIRING

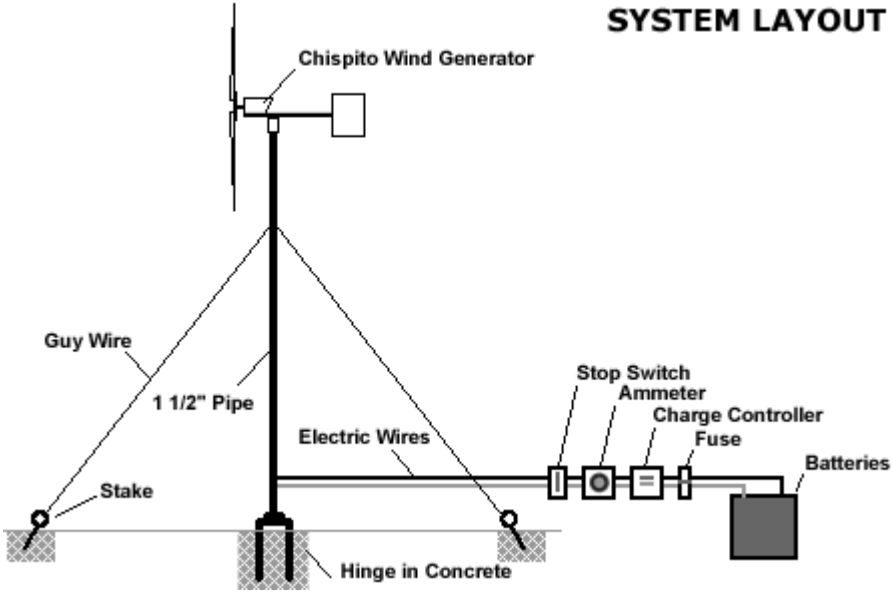
ASSEMBLY

1. **Place the motor on top of the square tubing and bolt it in, using the two 5/16” x ¾” bolts.**
2. **Place the diode on the square tubing, about 2” behind the motor, and screw it into position using the self-tapping metal screw.**
3. **Connect the black wire coming out of the motor to the positive incoming terminal of the diode (Labeled AC on the positive side).**
4. **Connect the red wire coming out of the motor to the negative incoming terminal of the diode (Labeled AC on the negative side).**
5. **Center the tail over the square tubing, at the back end. Clamp your tail onto the side of the square tubing.**
6. **Using 2 self-tapping screws, screw the tail in place.**
7. **Place each blade on the hub so that all the holes line up. Using the ¼" bolts and washers, bolt the blades to the hub. For the inner three holes, use two washers per bolt, one on each side of the blade. For the outer three holes, just use one washer next to the head of the bolt. Tighten.**

8. **Hold the end of the shaft of the motor (which comes through the hub) firmly with pliers, and turn the hub counterclockwise until it tightens and stops.**
9. **Screw the nipple tightly into the floor flange using a pipe wrench.**
10. **Clamp the nipple in a vice so that the floor flange is facing up and level.**
11. **Place the square tubing (and everything that is on it) on top of the floor flange and move it so that it is perfectly balanced.**
12. **Through the holes of the floor flange, mark the square tubing at the point of balance.**
13. **Drill these two holes using a 5/32" drill bit. You will probably have to take off the hub and tail to do this).**
14. **Attach the square tubing to the floor flange with two sheet metal screws.**

For a longer life span of your wind generator, you should paint the blades, motor sleeve, mount and tail.

ADDITIONAL INFORMATION



Use of Chispito Wind Generator

You will need a tower, wire, ammeter, charge controller/regulator, and a battery bank for your Chispito Wind Generator.

Tower

The tower is one of the most important components in your wind generator system. It must be strong, stable, easily raised and lowered, and well anchored. The higher your tower is, the more wind your generator will be exposed to. Guy wires must be placed at least every 18 feet of tower height. Guy wires must be anchored to the ground at least 50% of the height away from the base. For full tower instructions, please refer to our Tower How-To.