

Home made wind power

Eskom (utility) power is not sustainable energy, unreliable, pollutes the atmosphere, and in the case of nuclear power, produces dangerous radioactive waste. [Click here to see a summary](#) of Eskom's plans to dispose of nuclear waste safely (part of "The African Potato"). Eskom power is not the only option, however, and since I live in the windiest city in South Africa wind energy was the obvious alternative. Nine months of experimentation later, I had a working permanent magnet generator in my back garden.

The generator had to fulfill the following design criteria:

- An effective source of alternative power, allowing the generation of a portion of the electricity required for the household
- Constructed using only a drill press and bandsaw (although rotors needed industrial cutting), and avoiding high technology
- Small and light enough to be picked up and mounted by hand
- Made from readily available materials
- Items such as bearings and the shaft should be easily available and low cost
- Safe: i.e. if something failed or broke damage to property would be minimal
- Cheap, but sturdy enough to withstand a Northwest gale in Cape Town!



"Very cool site!!
I have it bookmarked..
this is the most
thorough and helpful
site on using the wind
to generate power,
your drawings, pics
and illustrations are
outstanding.. will be
putting this to work
on our homestead.
Thanks so much!!"

naomi
freewebs.com/hopei91

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If you have technical questions after reading this site, please [please register on the forum](#) and post your questions there. Workshops can be arranged to learn hands-on how to make your own, and [events for schools are also available](#). You may contact me at info@windpower.org.za.

Various components are available from [The](#)



[Windpower Shop.](#)



[Bench Testing](#)

updated 3 Jun 2008 ([forum](#))

Tests were done on the workbench at speed of 600 rpm, and also with a variable speed motor at various rpm, from about 120rpm to 230rpm. Here are the results, together with graphs and some simple analysis.

[Mounting](#) updated 30 Jul

2007 ([forum](#))

It's no use having one ready if you can't get it up there! Here is the relatively simple way how I managed to get a 6 metre pole erected without a winch or assistance. And no need to build a tower, which is often quoted as necessary and the most expensive part of a small wind generating system. Nonsense! Some sites also say mounting on a building is out of the question, due partly to vibration. I think this may be true for wooden buildings (common in North America), but is not true for brick and cement.

[First live run](#) updated 8

Nov 2006 ([forum](#))

Finally after nine months of development, it's up and producing electricity - 240Watts in the gusts! I have read that anyone who claims their wind generator is silent must be lying... well this one IS silent (as verified recently by Popular Mechanics magazine).

[All steel rotors](#) ([forum](#))

These rotors are water cut from a DWG file. At first, to keep tool requirements as simple as possible, I tried 1mm steel plate epoxied to plywood disks. They failed spectacularly, so I went for these solid 6mm mild steel rotors...

[Electrics - circuits and wiring diagrams](#) updated 17

Nov 2007 ([forum](#))

Generating power is one thing, using it is another... this page shows the controls and plans for a controller, simple electronic circuits, as well as 12V lighting with CFL bulbs.

[Home made lead acid batteries?](#)

updated 13 Aug 2006 ([forum](#))

There seems to be so little information available on doing this, so having read what I could, I have started to experiment with making my own three cell 6V battery, using lead sheet, battery acid, and jam jars...

[Stator Test](#) updated 7

Aug 2006 ([forum](#))

Why can't DC current be generated directly by a PM (permanent magnet) generator? This was a (failed) attempt to do just that,



by sheilding one leg of the coil, and facing
all the magnets the same way...

Photo Galleries [\(Back to top\)](#)

Here are some photos which show how to go about the various stages of constructing the wind powered generator:



[Latest blades](#) updated 22 Sep 2008 ([forum](#))
1.5mm balsa with leading/trailing edges. 1000mm long, 100mm wide at root.

[Veneer blades](#) updated 15 Dec 2007 ([forum](#))
1mm veneer with leading and trailing edge beading. 1000mm long, 110mm wide at root

[Balsa wood blades](#) ([forum](#))

1.5mm balsa sheet with leading and trailing edge beading. 900mm long, 100mm wide at root.



[TV shoot for Free Spirit](#) updated 22 Sep 2008
Some photos of the day of shooting for SABC3's Free Spirit.

[Bracket version 1](#) ([forum](#))

This holds the main shaft and stator mounting bolts in place...

[Bracket version 2](#) updated 29 Mar 2007 ([forum](#))

This holds the main shaft and stator mounting bolts in place...

[Plywood and steel rotors - 21cm](#) ([forum](#))

5mm marine ply epoxied to 1mm steel plate, 8 magnets on each rotor.

[Plywood and steel rotors - 25cm](#) ([forum](#))

5mm marine ply epoxied to 2 x 1mm steel plate, 12 magnets on each rotor.
Under test, these delaminate - the metal is pulled off the plywood by the magnetic force, and the magnets press against the stator. This demonstrated I needed an alternative for the rotor plates



[Rain and dust cover](#) updated 28 Oct 2007
Although the components are theoretically waterproof, it seemed like a good idea to keep rain from getting onto the bearings. So I used some styrene to heat form a top cover, and a slice of a pot plant holder to cover the front bearing - this makes it

sloped in a way to direct water forwards and out when the rotors are spinning.



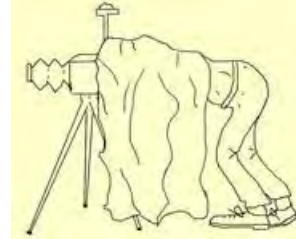
[Stator version 5](#) updated 28 Oct 2007 ([forum](#))
8mm thick, 3 phase, 3 coils per phase, 64 winds per coil, 1.0mm diameter wire.



[Stator version 4](#) updated 7 Apr 2007 ([forum](#))
8mm thick, 3 phase, 3 coils per phase, 80 winds per coil, 0.8mm diameter wire.



[Stator version 3](#) updated 27 Jul 2006 ([forum](#))
8mm thick, 3 phase, 3 coils per phase, 60 winds per coil, 1.0mm diameter wire. Up to 1000 RPM





[Stator version 2 \(forum\)](#)

16mm thick, 3 phase, 2 coils per phase, 80 winds per coil, 0.8mm diameter wire. 12V, 4 Amps

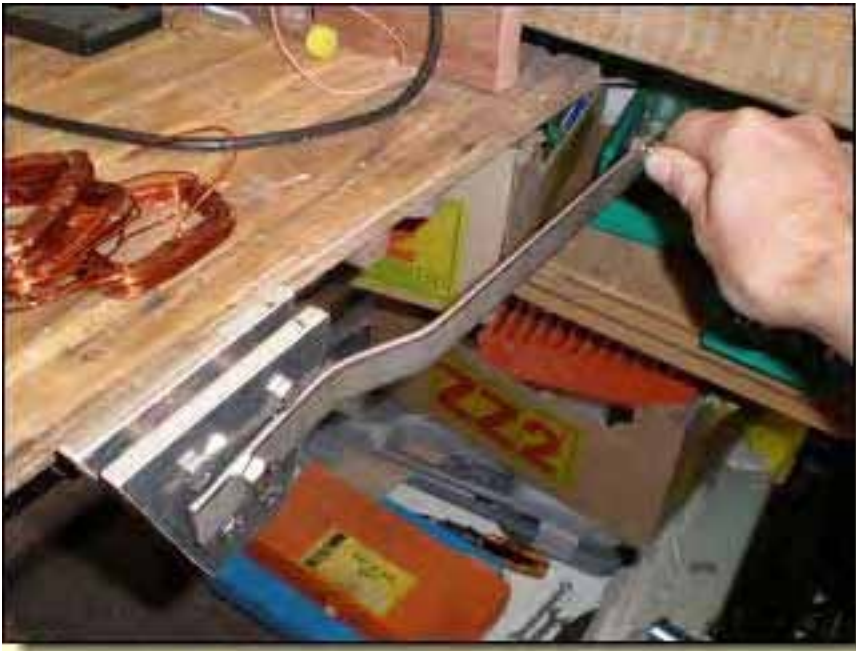
[Stator version 1 \(forum\)](#)

16mm thick, 3 phase, 4 coils per phase, 15 winds per coil, 1.6mm diameter wire
6V

[Wind energy in Europe, 2007](#) updated 8 Jul 2007

When travelling in Europe I took note, and photographs of wind power installations I saw...

Stator version 5



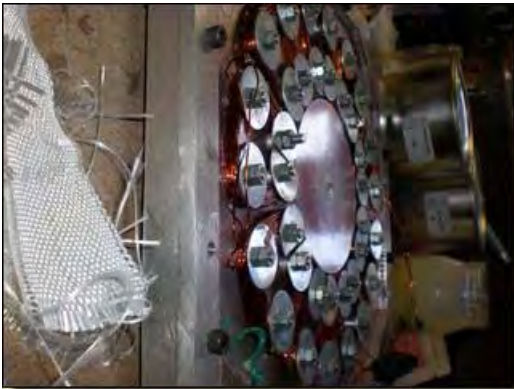












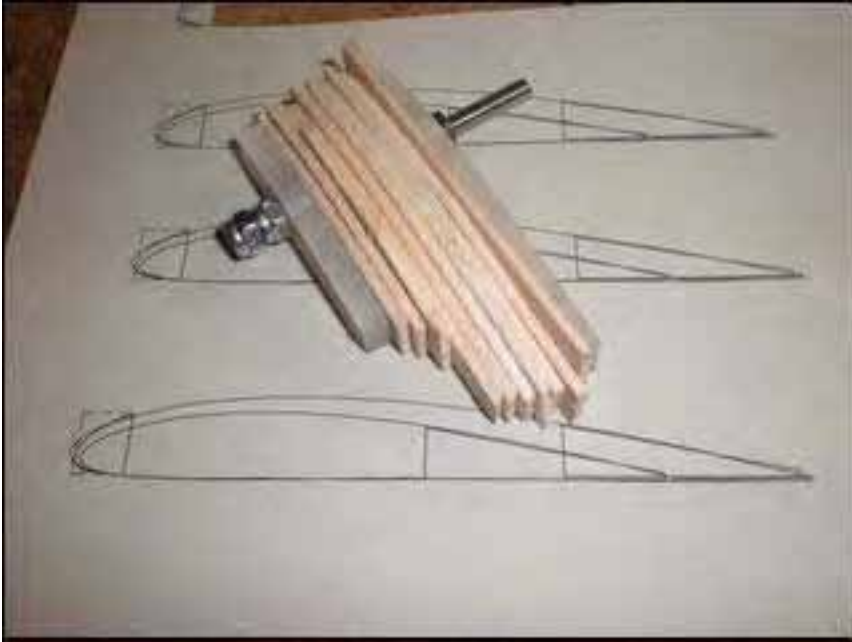


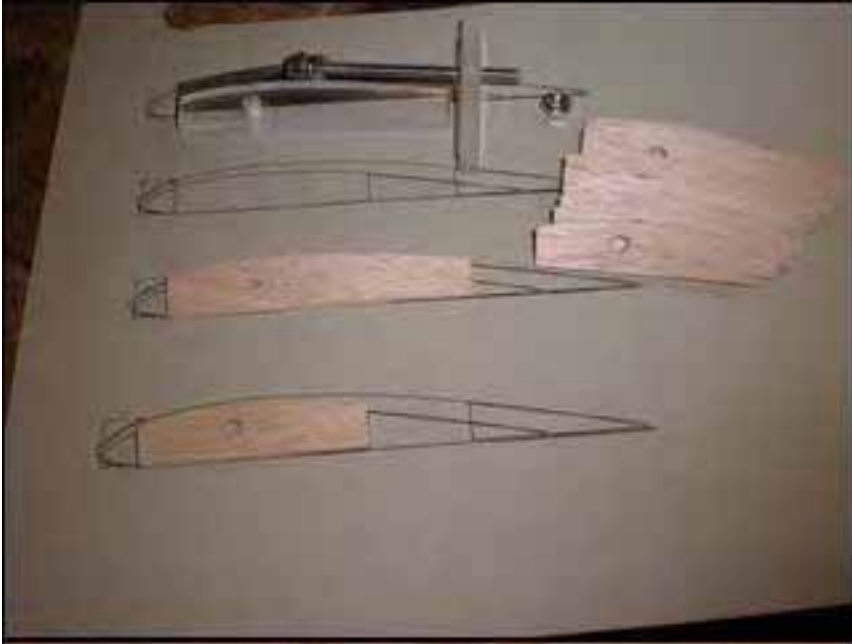


<http://windpower.org.za/>



[Latest blades](#) updated 22 Sep 2008







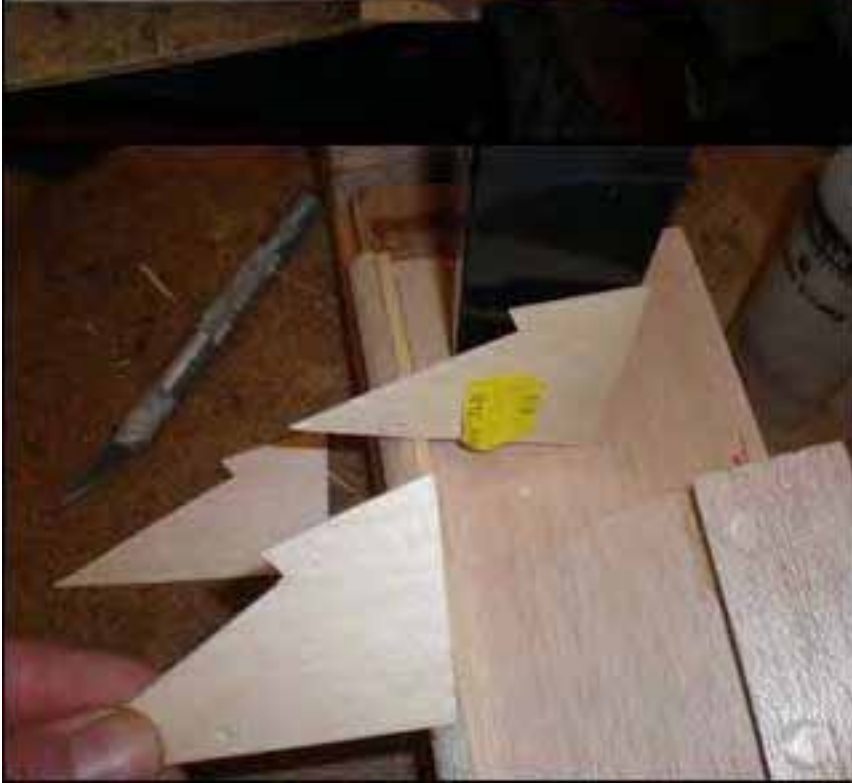






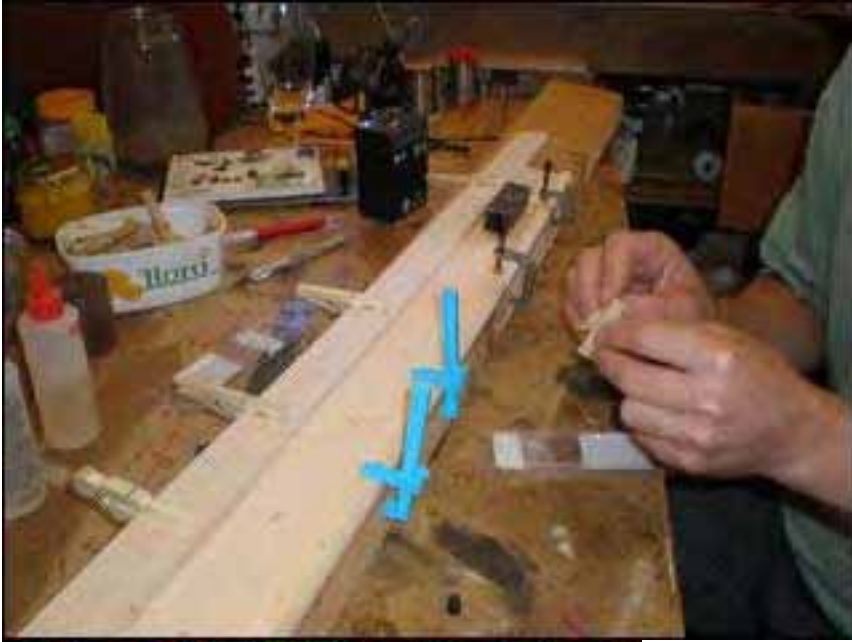


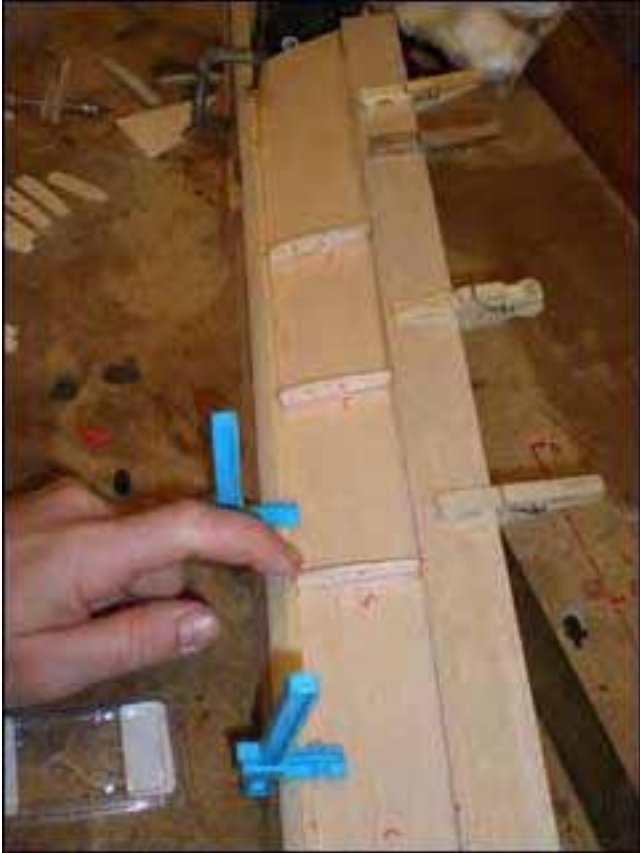












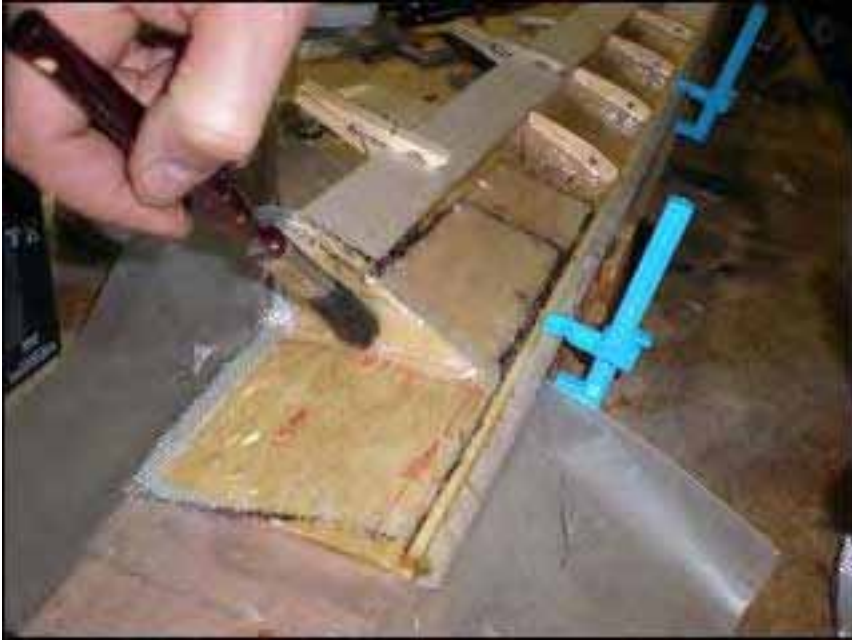








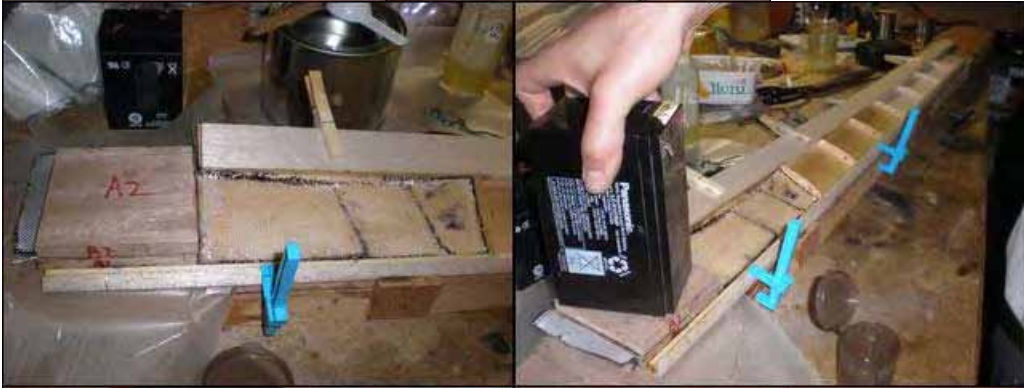
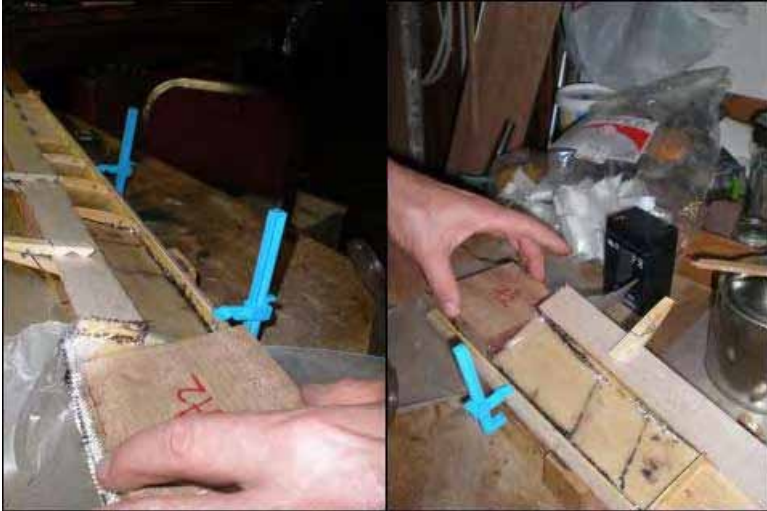








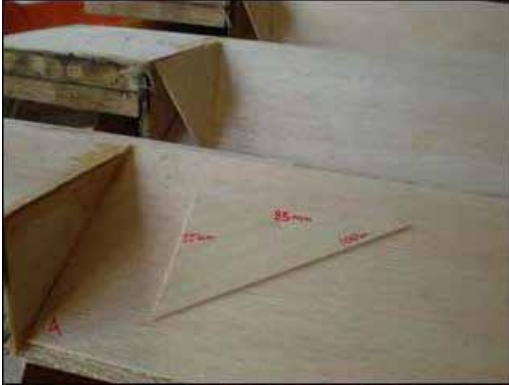


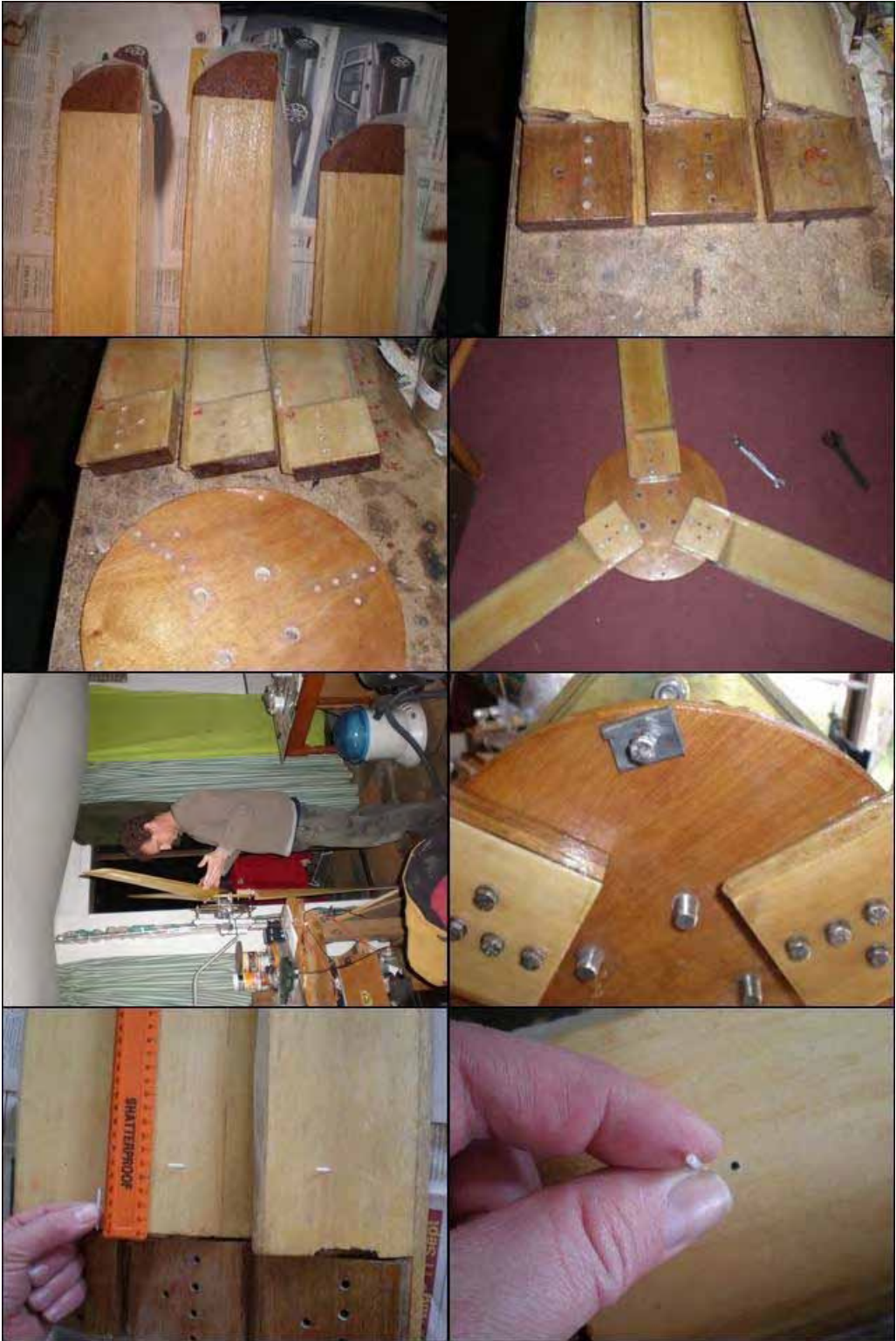












<http://windpower.org.za/batteries/batteries.html>