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# A quick, ugly "pedal generator" made from an old 3 speed bicycle.

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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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