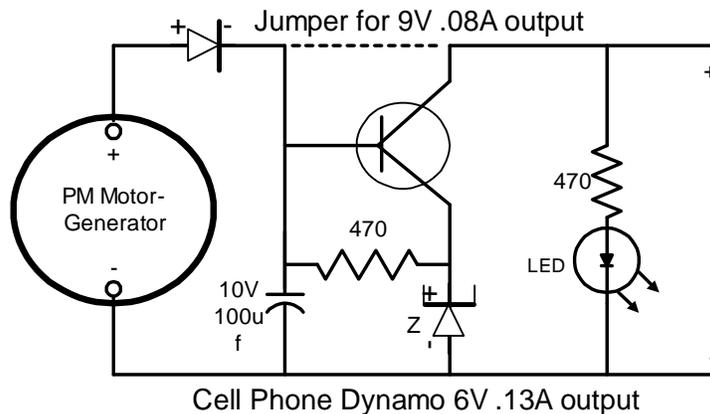


## A Simple Backpack Portable Dynamo Hand Crank AAA Battery Charger

In an emergency -- How well does a low cost cell phone charger work at charging small batteries? Is it practical for after pole shift use? If so what would be it's most likely use?

E-bay currently (Feb 2011) has a low cost "USB Hand Power Dynamo Torch Charger Cellphone MP3 PDA" for under \$3 including shipping. 30 seconds of cranking = 5 minutes of bright light, 2 minutes of charging = up to 6 minutes of talk time, up to 30 minutes of standby. This was found to be the best so far tested.

A USB mail to mail cable costs \$1. It can be cut in half and used with two dynamos. This unit is capable of producing a maximum of about .15 amp with the more typical average about .13 amp. The maximum voltage is 6.48 volts.



However if one opens the unit and makes the dotted line connections as shown in the above circuit it can then also be used to charge 9 volt batteries at about .08 Amp. One can charge a single 1.25 volt cell. The lower the voltage being charged the higher the current available and the harder it is to crank. The higher the voltage of the cells being charged the easier it is to crank but the less current able to be output.

Four rechargeable AAA cells is the most efferent size to charge. Even then it would take about 8 hrs of cranking to fully charge 4 small 800 mAh NI-MH AAA cells. One typically gets tired of cranking after a couple of minutes. So the typical use would be to take one in a back pack in case one runs low on power to charge up a flash or task light cells just enough to do the task at hand. A single LED running at 10 ma would run 13 times whatever the cranking time ends up to be. Using a joule theft circuit it would run much longer. I recommend only purchasing (low self discharge) LSD NI-MH AAA cells for this use. These retain a charge of about 85% over a year's time frame.

E-Bay also has at around the same cost a "Hand Wind up Power Dynamo Crank Charger for cell phone" (number 2). It is advertized as "Just 3 minutes wind-up gives you up to 8 minutes power to your mobile phone". This unit will deliver about .065 amp when charging 4 cells. It also is limited at about 6.28 volts maximum. The cranking speed and

force used to crank it is the same as the one above. It's only advantage is it comes with a cable and 4 adaptors. Both are blue and the same size and shape. The only difference in appearance is the output connectors are different with the better one being USB.

Various types of clamps can be used to allow a better grip on the case. These clamps could have other uses in a back packing situations. The follow pictures show typical configurations ready to use. Note a 4 pack AAA case could be soldered into the USB port permanently if one wishes to build a dedicated cell charger.



Jumper clip lead can be cut in half and soldered into the USB port as shown on the right. Or a USB cable can be cut in half adding clip leads as in the lower part of the picture. In the center top is the number 2 type unit that outputs only about half the amperage for the same cranking force. It shows the most workable harbor freight type plastic clamp to be used as a handle. On the bottom right is a typical open type AAA battery holder that can be found at most electronics supplies or can be salvaged from something that is non-operational after the PS.

The way to test the effectiveness of any cell phone charger is to measure the open circuit voltage maximum and the short circuited current maximum. Normal use can be any voltage less than maxim and the current will depend on the cranking speed but will be less than the short circuited maximum. The short circuit maximum for the first one above is .3 amp and for the last one (number 2) is .1 amp. Both are the same size: 6 x 2.8 x 4.3cm