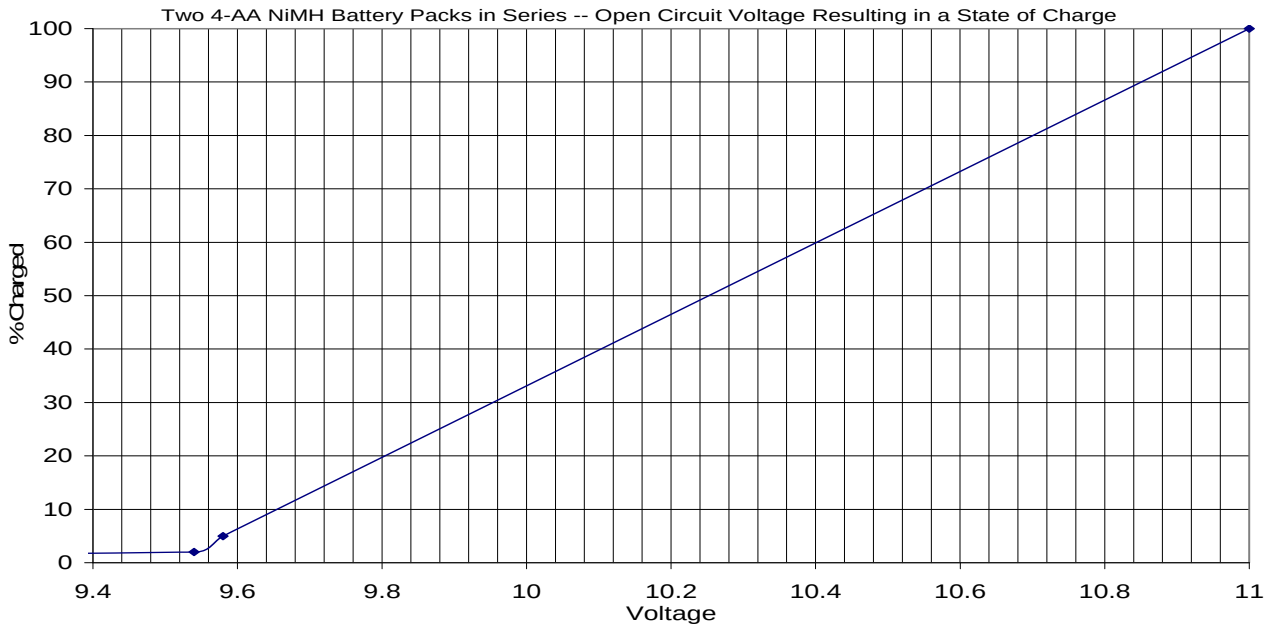
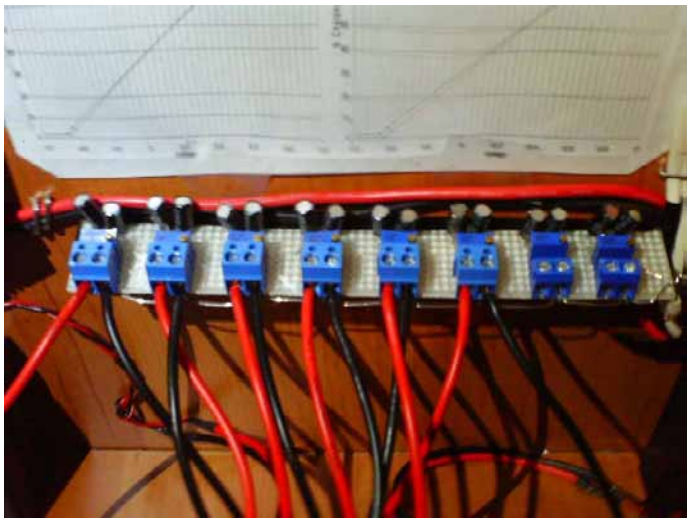
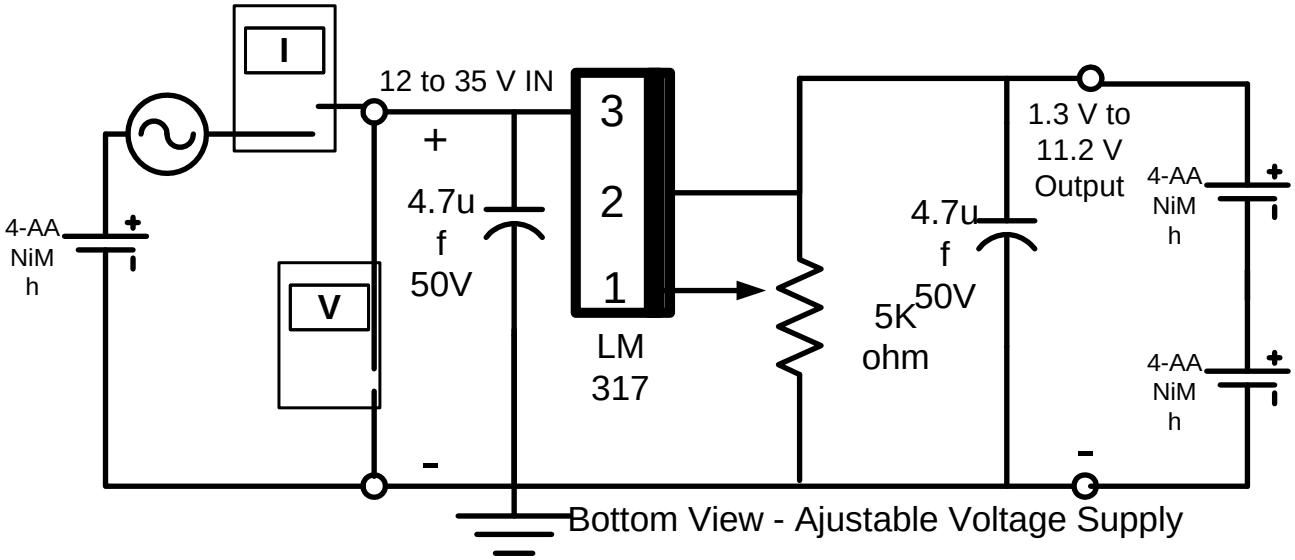
Cap Task Light – Charging Station

A voltage per cell of 1.33V (Vinput=12V) to 1.4V (Vinput=12.8V) can be obtained when charging 8 cells in series or 2 battery packs in series. The constant charging voltage is adjusted to 11.1 volts. Depending on state discharge the current flow of charging for discharged 300ma (oc V=9.6) to charged 10ma (oc V=11.1) will be noted. 11.15 V is maxim float voltage for minim flow 10-20ma for new Ni-MH low discharge cells.

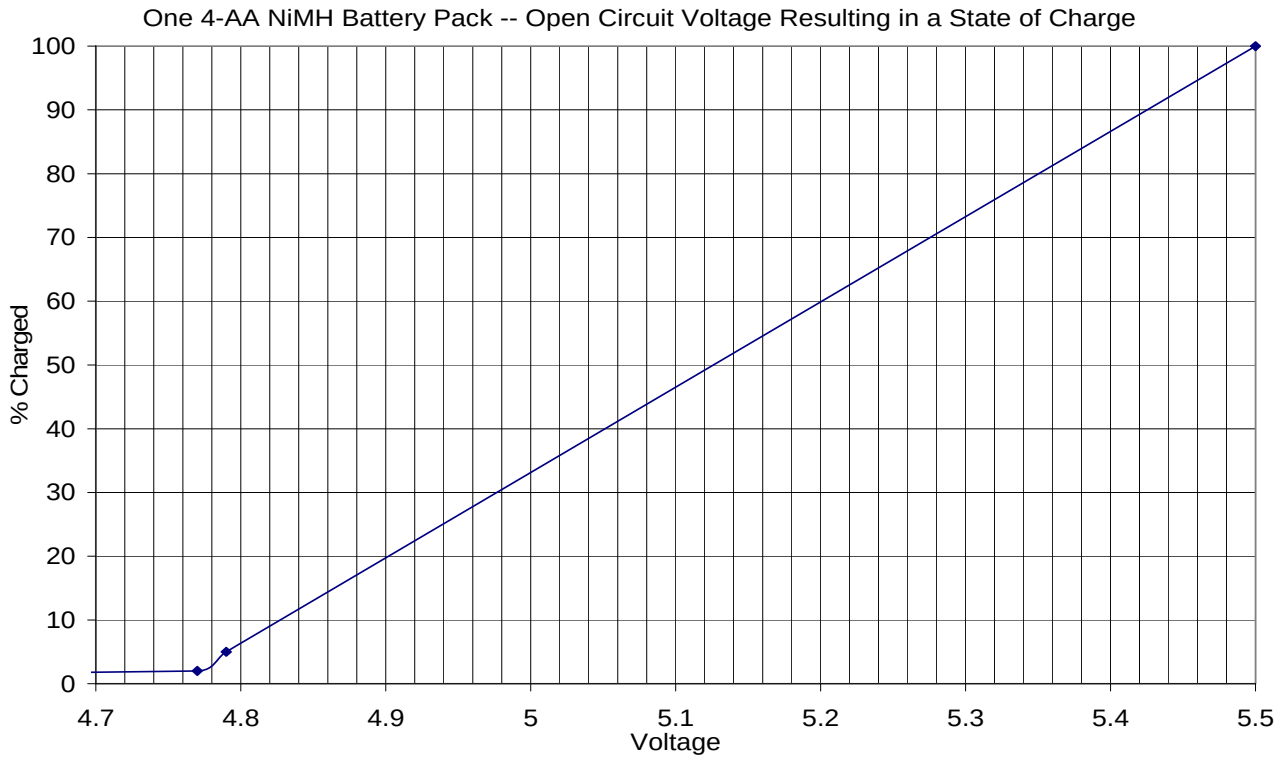






8 of above LM 317 circuits were put in parallel all connected to the terminals on left. The current measured then is the combination of all 8. The voltage is the voltage of the source. When this is in the range of 12 to 12.5 charging proceeds a bit slower. Two of the circuits are hooked individually to 8 AA and to 8 AAA open battery packs. This is to allows individual loose AA and AAA cells to be changed for other uses. One circuit was dedicated to charging 9 volt cells. Depending on whether it is made up of 6 or 7 internal cells the voltage could be set at 8.3 to 9.7. The way to tell is to creep up on it wait 10hrs and as soon as the current starts to go up after 10hrs then you are above the ideal float voltage. Disconnect the battery for one hour and measure it's voltage. This will be a good float voltage for charging and not wasting extra energy and will make the battery longer lasting. The connectors used are common rubberized for the auto industry and can only be plugged in one way. Female and mail alternate with polarity so as to allow only correct attachment.

The following graph can be used to estimate the state of charge of one battery pack that has been in use for a while. Turn off the flow and measure open circuit voltage then look it up on the graph to get the approximate state of charge.



A simplistic way of charging is to use a resistor in series to limit current. If this is done the following is a typical result.