I use nickel-metal-hydroxide rechargeable batteries for many things. The cordless mouse is one of them. Batteries are always ready for use with this constant current charger.

It’s a fun project as it can automatically switch the power source from an unregulated wall-wart to the solar panel.

How it works: The solar panel is connected to a load resistor. A voltage comparator circuit senses the load voltage at about 200mA. When it exceeds the selected voltage level, it switches the charging source from line to solar. In case of clouds, there is a delay of about 45 seconds before releasing the solar source.

An added feature, which is not necessary, is the Ding Dong chime circuit. This later addition makes the project even more fun. It is a subtle indication of cloud activity. It audibly indicates the switching action of the charger.

The battery 1-5 charge rates are selected with switches for fast or slow. Battery 6 has a potentiometer to adjust the rate of charge. This is handy for testing or for heavier duty batteries. Keep in mind that the output of all charge circuits together must not exceed 300 mA at full sun! A manual switch can disengage the auto sensing of the solar panel and keep the wall-wart as the charge source, which may exceed 300 mA-depending on the current rating of the wart.

The LED, located in the sun graphic, is slow-changing red, green, and blue. In auto sense, it only lights when there is enough solar voltage. Otherwise, it is on when the charger is on. Another fun indication!
STRAWS ARE HANDY THINGS!
It’s been said, “Nothing is as permanent as a temporary thing.” That’s the case with the ugly shelf I built for my computer desk hutch. The Solar Charger is a good companion for my Atmospheric Disturbance Monitor (weather station). The screw driver is handy to adjust the Solar Radiation Monitor. I thoughtlessly moved the potentiometer when taking photos. It’s easy to adjust, though. See these projects: http://www.geopodium.com/files/Lennie/Lennies%20Corrected%20Lightning%20Detector-2.pdf and http://www.geopodium.com/files/Lennie/Solar%20Radiation%20Meter.pdf

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DON'T LET THE NEXT PAGE SCARE YOU. EACH CIRCUIT NEEDS A SCHEMATIC DRAWING AND THERE ARE LOTS OF CIRCUITS!
Source Material:

NiMH Battery Charging Basics
http://www.powerstream.com/NiMH.htm

Voltage Comparator:
http://www.zen22142.zen.co.uk/Circuits/Switching/comparator.htm
Bells Ring Generator

A very interesting project! I thought this circuit could be used as a door bell. Turns out that the delay sometimes misses the switch action. I didn’t feel like trying to alter that. If you improve this circuit, let us know!
Since the meters display the voltage and charge rates, the rotary switch label was simplified.

Doesn't that sound impressive?

SCHOTTKY DIODE PROTECTED!

BATTERY CHARGER

SOLAR/LINE POWERED

HOBEELECTRONICS

UPDATED LABELS