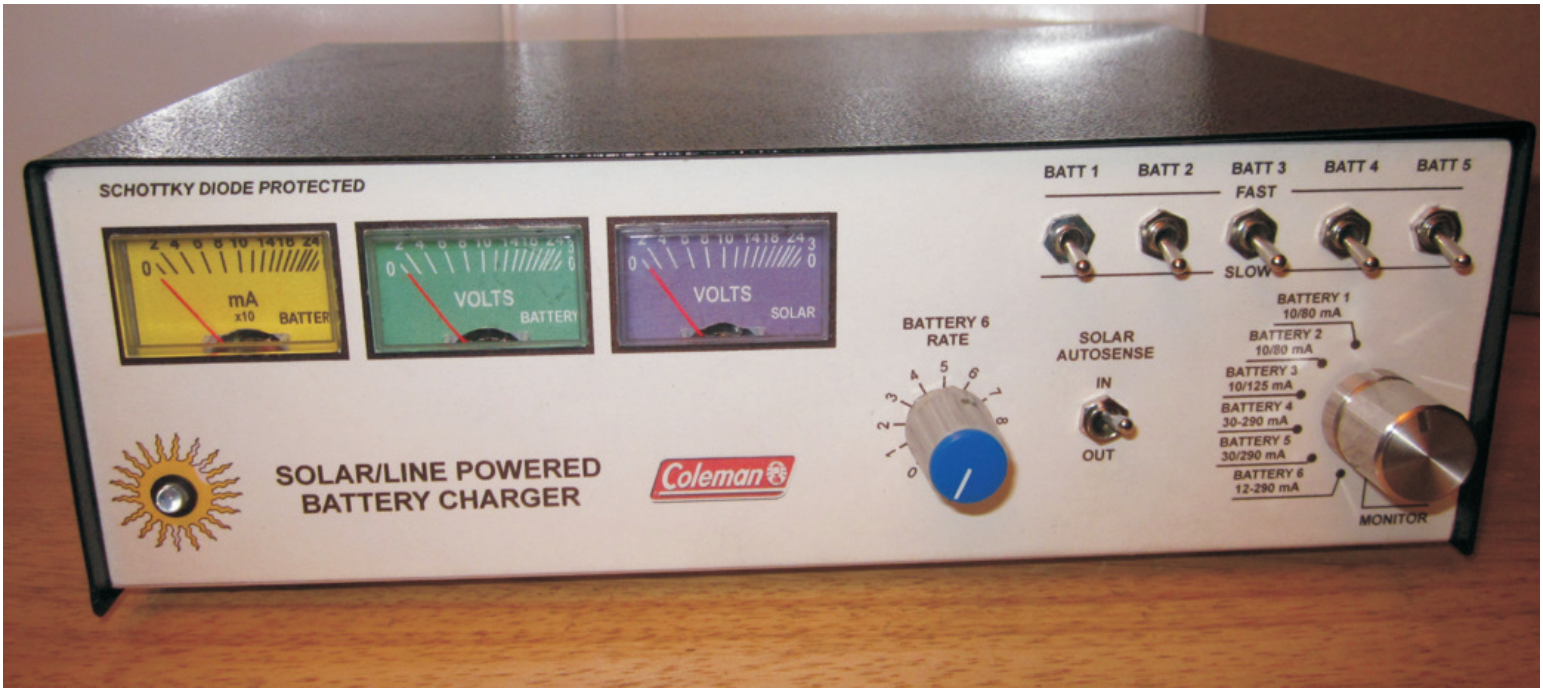


SOLAR/LINE POWERED BATTERY CHARGER FOR COLEMAN SOLAR PANEL BATTERY CHARGER 300mA MAXIMUM OUTPUT

I use nickle-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.

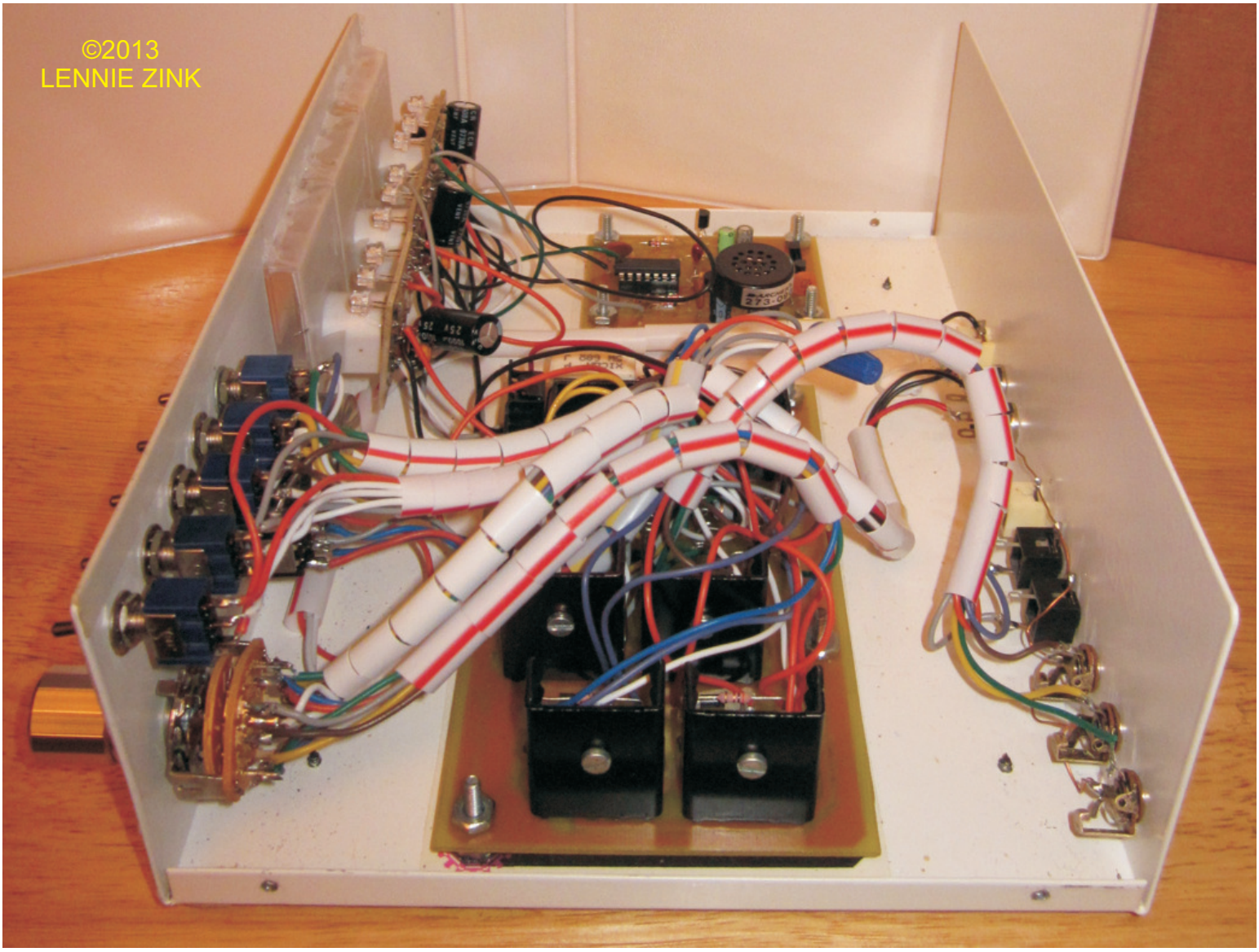
It's a fun project as it can automatically switch the power source from an unregulated wall-wart to the solar panel.

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.

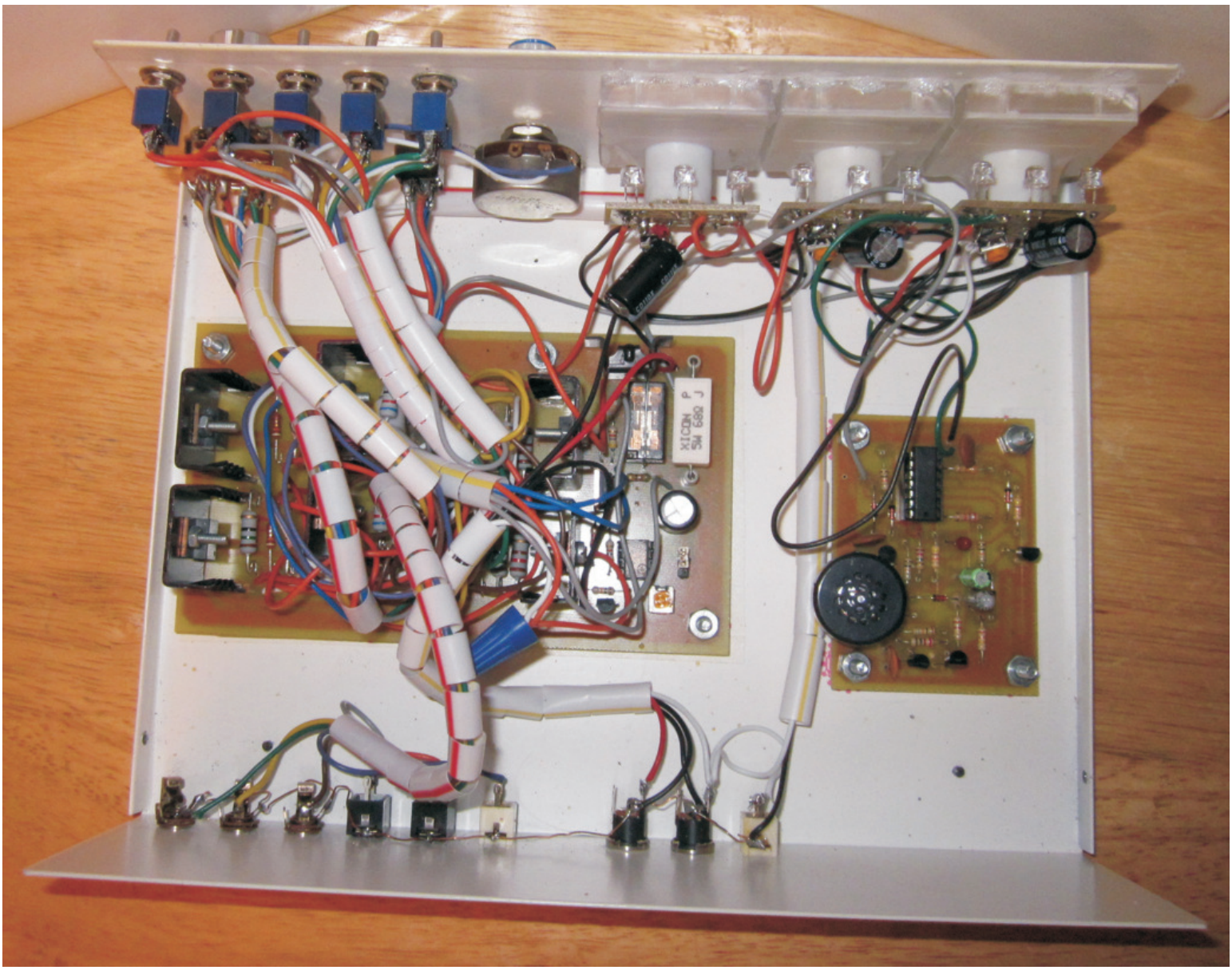
The LED, located in the sun graphic, is slow-changing red, green, and blue. In auto sense, it only lights when there is enough solar voltage. Otherwise, it is on when the charger is on. Another fun indication!

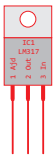


STRAWS ARE HANDY THINGS!

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

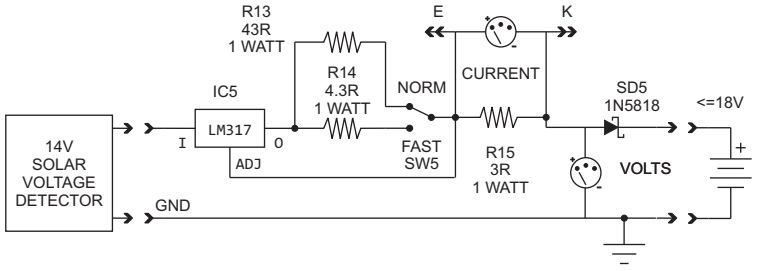
DON'T LET THE NEXT PAGE SCARE YOU. EACH CIRCUIT NEEDS A SCHEMATIC DRAWING AND THERE ARE LOTS OF CIRCUITS!



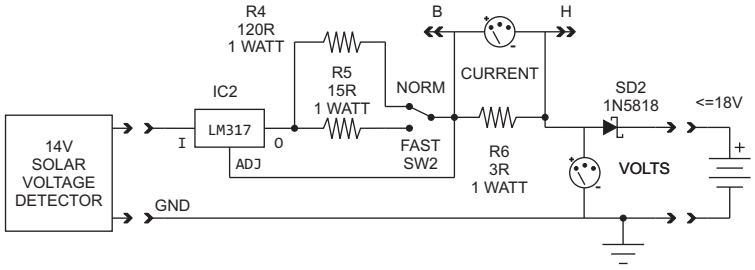


SOLAR POWERED BATTERY CHARGER 1: 10mA/80mA

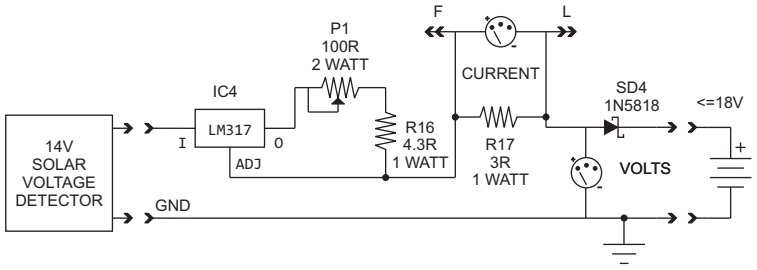
SOLAR POWERED BATTERY CHARGER 5: 30/290mA



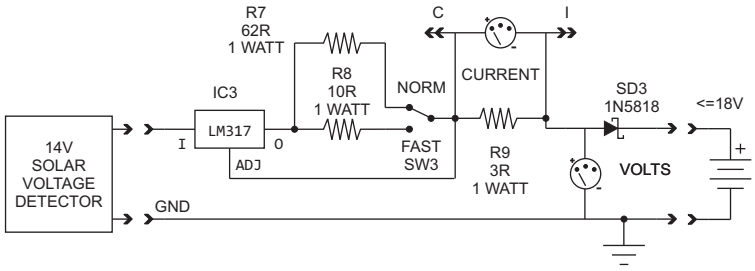
SOLAR POWERED BATTERY CHARGER 2: 10mA/80mA



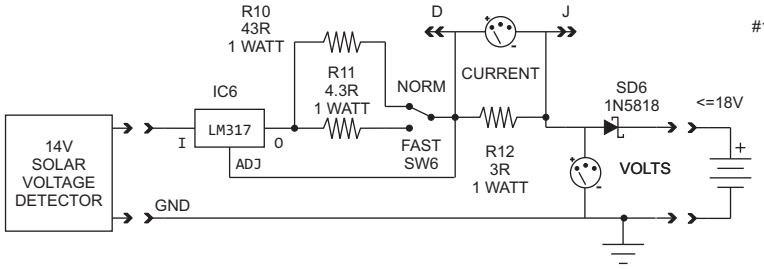
SOLAR POWERED BATTERY CHARGER 6: 12-290mA ADJUSTABLE



SOLAR POWERED BATTERY CHARGER 3: 10/125mA



SOLAR POWERED BATTERY CHARGER 4: 30/290mA

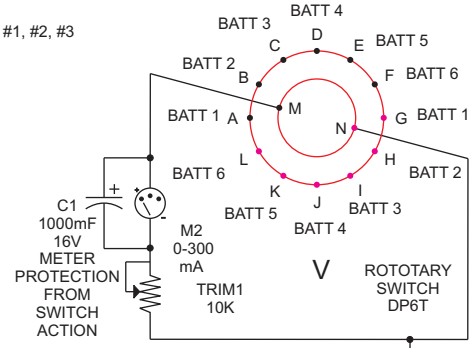


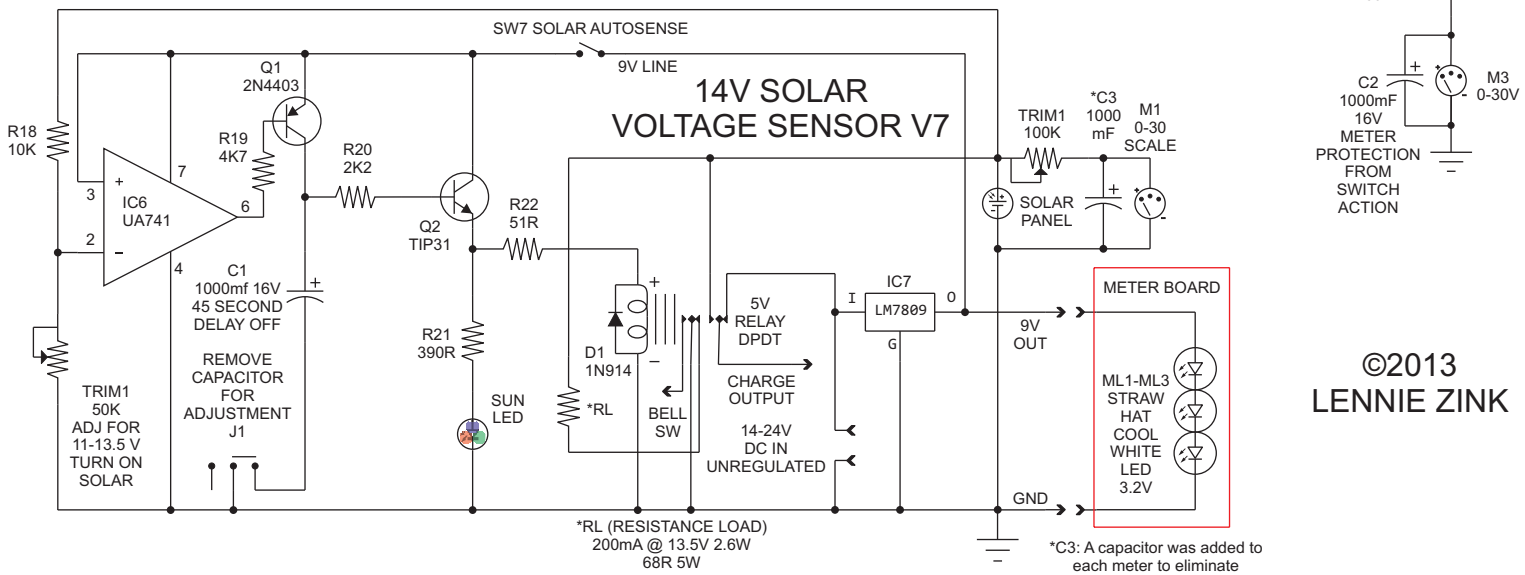
300 mA MAX 14-24V SOLAR PANEL

CONSTANT CURRENT CHART I=1.25/R

OHM	mA	OHM	mA	
3.9	320	39	32	
4.3	290	43	29	#5, #6
4.7	266	47	26	
5.1	245	51	24	
5.6	223	56	22	
6.2	201	62	20	
6.8	183	68	18	
7.5	166	75	16	
8.2	152	82	15	
9.1	137	91	14	
10	125	100	12	#3, #4
11	113	110	11	
12	104	120	10	#1, #2, #3
13	96	130	9	
14	89	150	8	
15	83	160	8	#1, #2, #4
16	78	180	7	
18	69	200	6	
20	62	240	5	
22	56	300	4	
24	52	390	3	
27	46	620	2	
30	41	1200	1	
36	34			

hr = mAh / mA
c=battery capacity
Trickle charge=c/100
12V should not exceed 14.7V



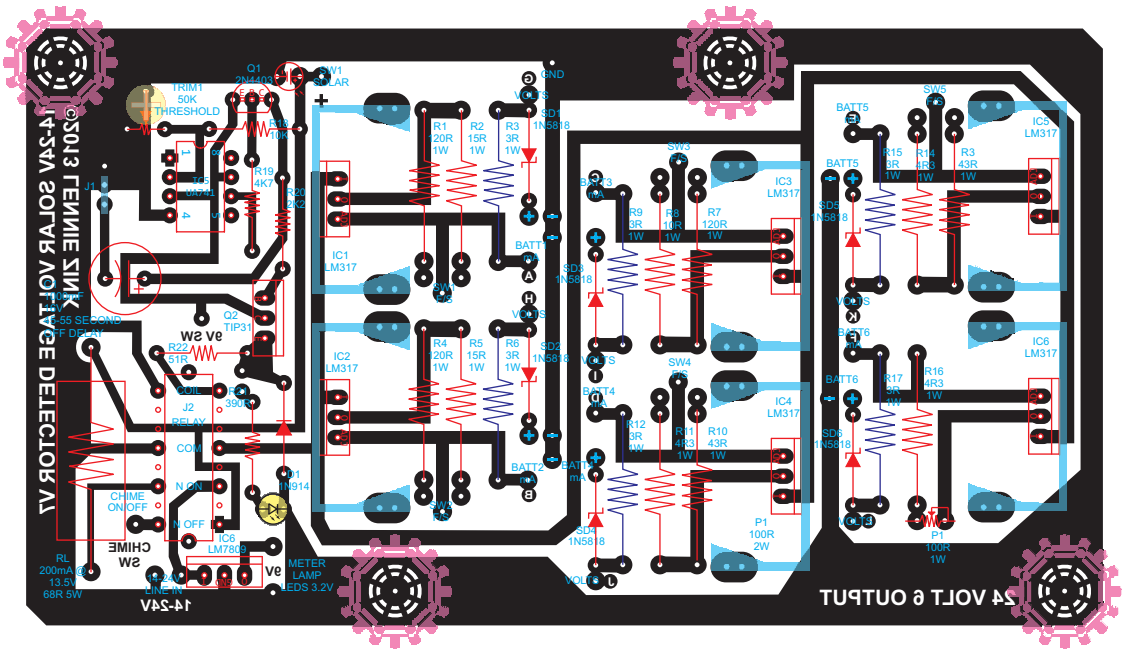


WIRE COLOR CODE:

BATT1 GREEN
BATT2 YELLOW
BATT3 BROWN
BATT4 GRAY
BATT5 ORANGE
BATT6 PURPLE

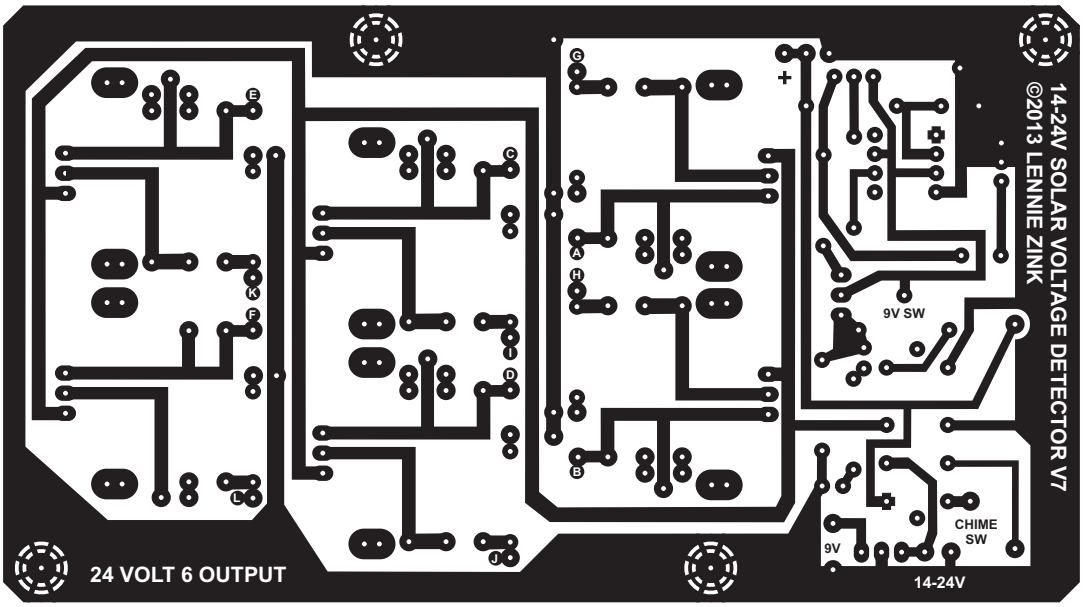
LINE POWER RED
SOLAR POWER WHITE
GND BLACK

SOLAR CHARGER
PARTS LAYOUT



RESISTOR LOAD AND CHIME ARE SWITCHED ON/OFF FROM GROUND

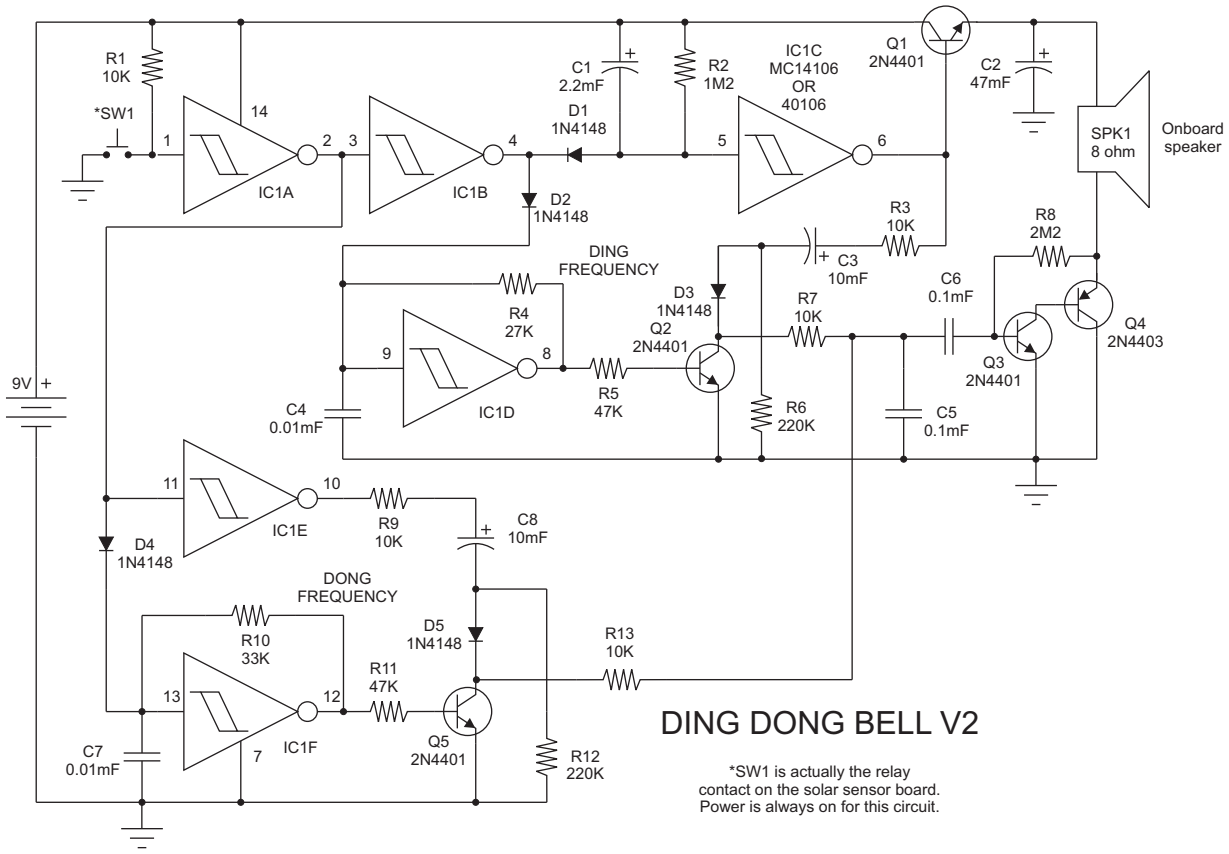
SOLAR CHARGER
BOTTOM VIEW



Source Material:

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

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

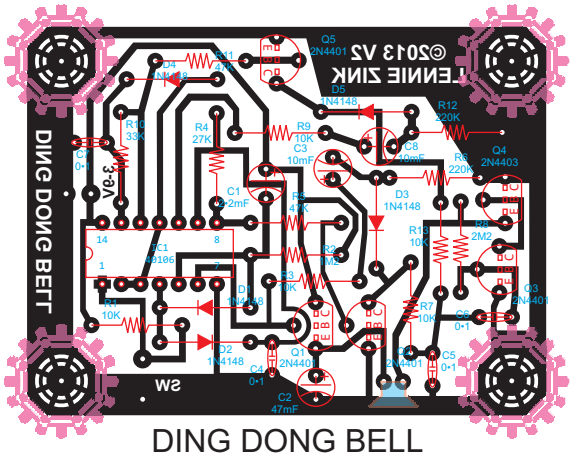


DING DONG BELL V2

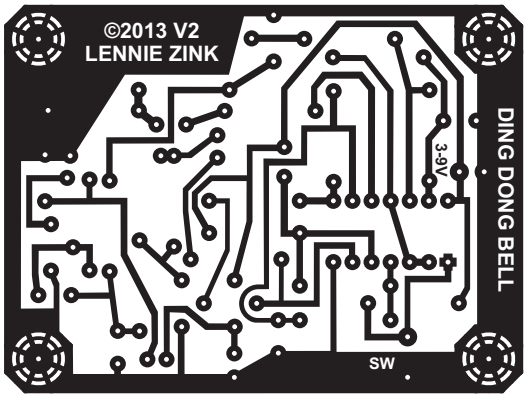
*SW1 is actually the relay contact on the solar sensor board. Power is always on for this circuit.

Bells Ring Generator
http://www.circuit-finder.com/categories/sound-and-oscillator/sound-generator/854/bells-ring-generator-circuit-schematic

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!



DING DONG BELL
PARTS LAYOUT



DING DONG BELL
BOTTOM VIEW

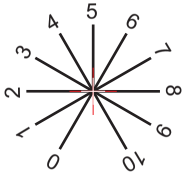
SCHOTTKY DIODE PROTECTED

1 2 3 4 5

FAST

SLOW

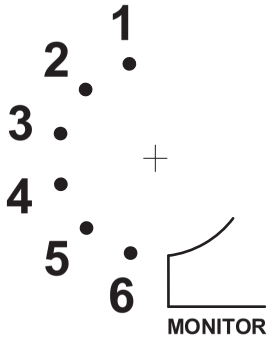
6
RATE

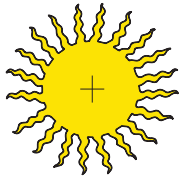


SOLAR
AUTOSENSE

IN

OUT





SOLAR/LINE POWERED BATTERY CHARGER

HOBBY ELECTRONICS

BATT 1 BATT 2 BATT 3 BATT 4 BATT 5 BATT 6

POWER IN SOLAR IN SOLAR OUT

UPDATED LABELS

Schottky Diode Protected!
Doesn't that sound impressive?

Since the meters display the voltage and charge rates, the rotary switch label was simplified.