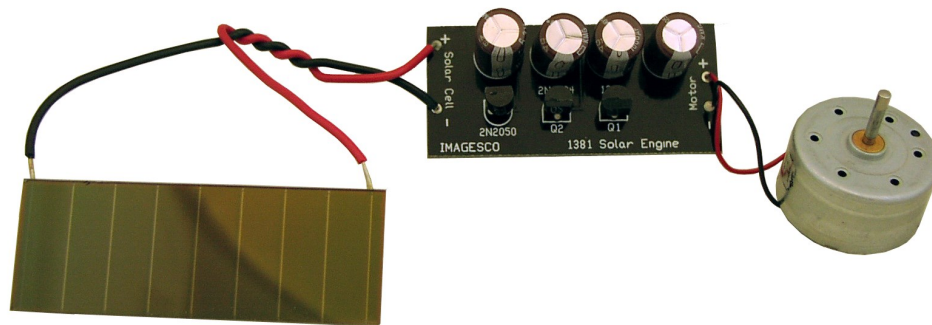
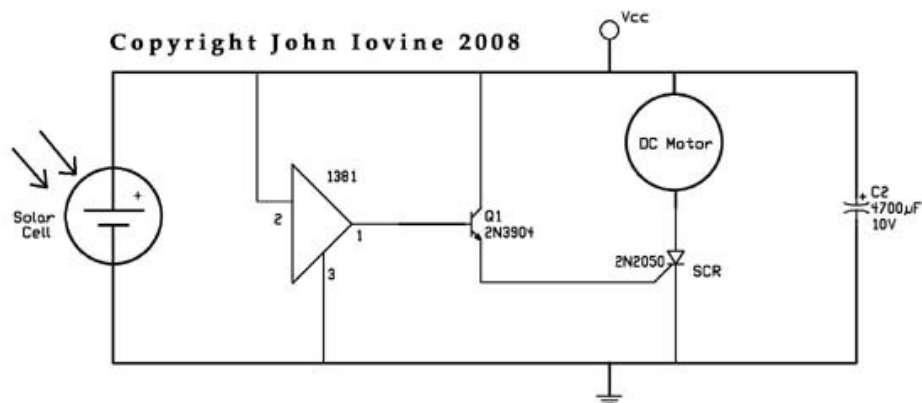


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1381 Solar Engine Kit



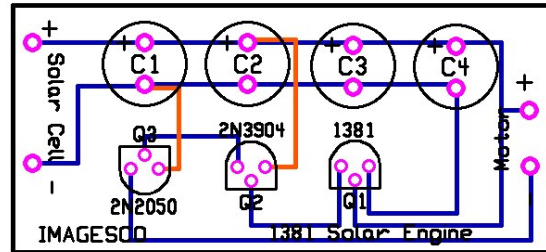
1381 Solar Engine



The main components are a solar cell, main capacitor and a 1381 voltage detector that operates as a trigger. The solar cell charges the capacitor, until a predetermined voltage is reached, where the trigger circuit dumps the stored electrical power from the main capacitor through the main load (usually a high efficiency motor). The cycle then repeats.

How it Works

Figure 1 is the schematic for the solar engine. Here's how it works. The solar cell charges the main 4700 uF capacitor. As the capacitor charges, voltage level of the circuit increases. When the circuit voltage has risen to about 2 volts from the main capacitor, the trigger pulse generate by the 1381 turns on Q1. When Q1 turns on, this turns on Q2 the 2N2050 SCR. The SCR opens and allows current to flow through the DC motor. The DC motor spins momentarily until all the store power in the main capacitor is dumped through the 2N2050 and the high efficiency (HE) motor. The cycle repeats.



Construction

Start by placing and soldering the four 1000 uF capacitors onto the top (silk screen) side of the pc board. Match the positive lead of the capacitor (usually the longer lead) to the positive hole on the pc board. Next mount and solder the semi-conductors onto the board. Start with Q1, the 1381 Voltage Detector. Orientate the 1381 case to match the silk screen outline on the pc board. Next mount and solder Q2 (2N3904) and Q3 (2N2050) to the pc board, orientating the transistor cases to the silk screen outline.

Next solder the solar cells so the positive (+) leads of the solar cells are soldered to the (+) solar cell lead on the pc board. The negative (-) lead to the (-) lead on the pc board.

The high efficiency electric motor is connected with a few inches of wire to the motor leads on the pc board.

Testing

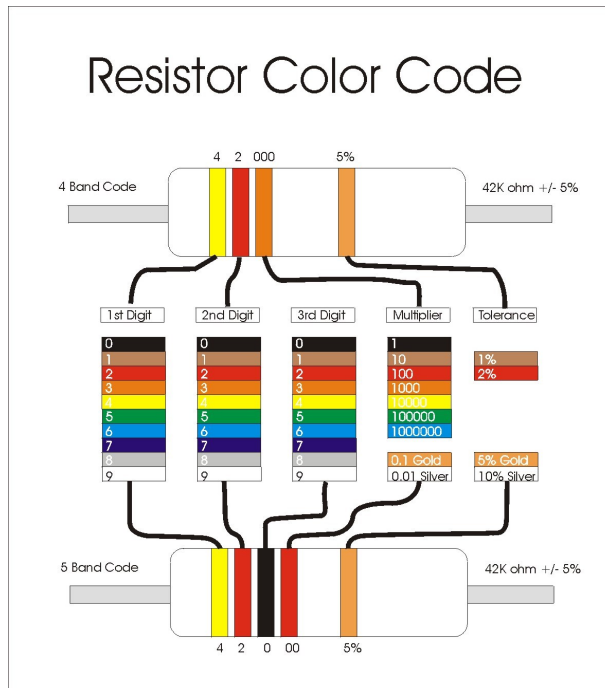
To test the solar engine place something on the shaft of the HE motor. The purpose of which is to see the rotation of the shaft when the motor becomes active. Place the solar cells under a light source. The motor should activate, by spinning momentarily, in about a minute, depending upon the intensity of the light.

Uses

The circuit may be used in many novel and innovative ways. It may be used as a on board power plant for a solar racer, supplying power to the car motor, flashing LED's, pumping fresh water intermittently from a solar distiller, etc.

Parts List

Item	Qty.
Printed Circuit Board	1
Solar Panel	1
HE Motor	1
1000 uF Capacitor	4
2N3904 Transistor	1
2N2050 SCR	1
1381 Voltage Detector	1



How to Solder



Tools

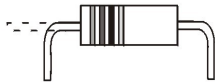
This page provides the basic steps for soldering electronic components onto a pc board.

Soldering Iron, small sponge, electronic rosin core solder, side cutters and needle nose pliers.

Step 1:

Turn on soldering iron. Moisten small sponge with water.

When soldering iron is hot, tin the soldering iron tip using a small amount of rosin core solder. Melt the solder onto the tip until the tip is completely covered with solder. Excess solder on the tip may be removed by wiping the tip across the wet sponge. Keep the tip clean by wiping the iron across the wet sponge periodically.



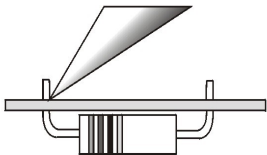
Step 2:

Bend the component leads to fit inside the PC board holes



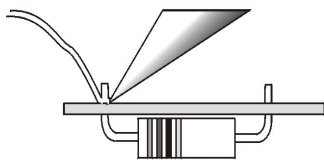
Step 3:

Insert the component into the pc board, taking care to orientate the component as described in the directions. Bend the leads slightly to hold the part into position



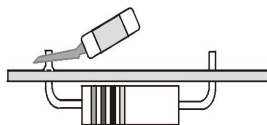
Step 4:

Tin soldering iron tip if necessary. Heat the joint by positioning soldering iron tip against the component lead and the pc board lead.



Step 5

After a few moments of heating, apply the solder to the joint. The solder should flow easily around the joint. After the solder flows, remove the solder, while keeping the soldering iron tip in contact. Then remove the soldering iron tip.



Step 6:

Trim the excess component lead from the bottom of the pc board using the side cutters.

Step 7: Inspect the solder connection

A good solder connection joints the component lead and pad together and has a bright finish.

If the connection is a glob of solder that looks like a ball, or bridges other solder connections.. Reflow the connection by remelting the connection using the soldering iron. Do not apply any more solder.