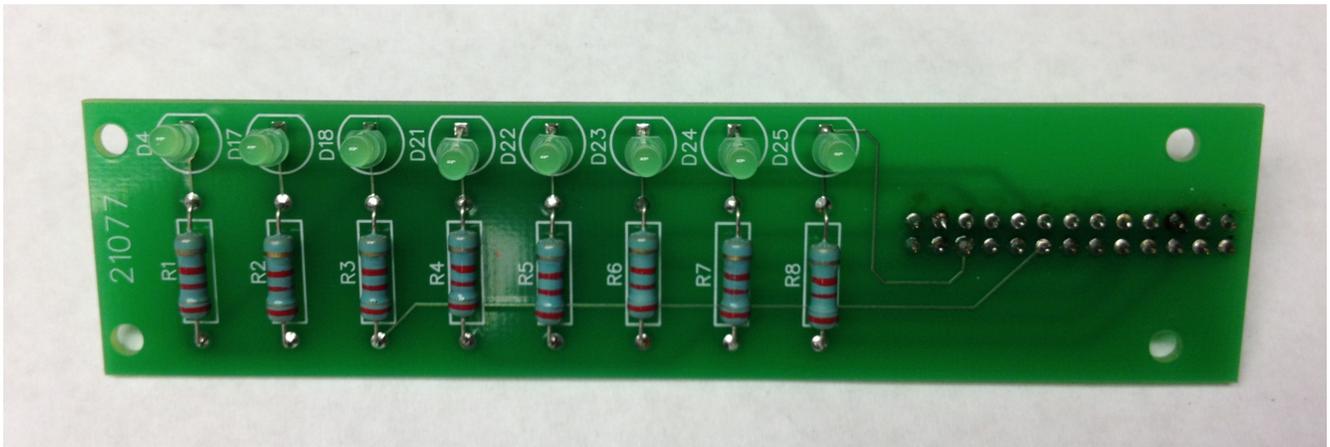


The GPIO LED board for Raspberry Pi



Assembly and User Documentation

applies to GPIO LED board rev 6

Document Revision 11 August 2013

Summary of Changes

11 August 2013	Updated to conform to Rev6 PCB Removed step to assemble 26 pin cable. Added idea to use wire tie with LEDs
19 May 2013	Updated to conform to Rev5 PCB

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Introduction

The Raspberry Pi is an excellent experimenter's Linux platform. Not only do you get a full Linux system, but it has a number of pin outs that can sense and control other devices.

The RPi board has a standard 26 pin connector called the GPIO. All the pins you need to run some LEDs are in this connector. The question is how to get those pins to your LEDs. The GPIO LED board solves that problem.

Once assembled you can connect the GPIO LED board to your Raspberry Pi and start using software to turn the LEDs on and off. A good place to start is the WebIOPi application that is available for free in the Raspberry Pi Store application on your RPi desktop.

The GPIO LED board is also a compatible plug in to the Shrimpware Bread Box.

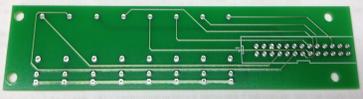
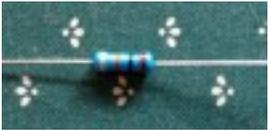
`http://www.shrimpware.com/rpi/`

Be sure to check our web site for updates and links to information about the GPIO LED board. The most current version of these assembly instructions are always available there.

We hope you have fun with your new toy!
Jim Schrempp

Parts List

In your kit you should have (your parts may look slightly different from the photos below):

		Description	Qty
1.		GPIO LED printed circuit board	1
2.		3mm LED	8
3.		2.2k ohm resistor	8
4.		2x13 pin board header	1
5.		26 conductor ribbon cable with connector on each end 6-inches	1

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You Will Need to Supply

A Raspberry Pi

Tools You Will Need

Long Nose Pliers

Wire Cutters

Soldering Iron and solder

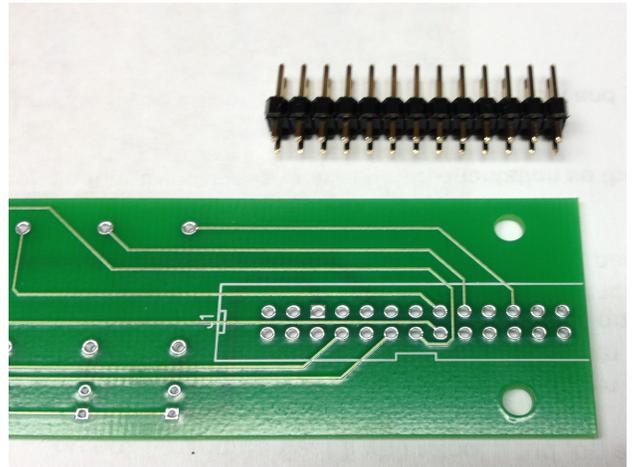
Optional: One small plastic wire tie

Step 1 – Mount the Connector

You will need:

- 2x13 pin header
- Circuit board

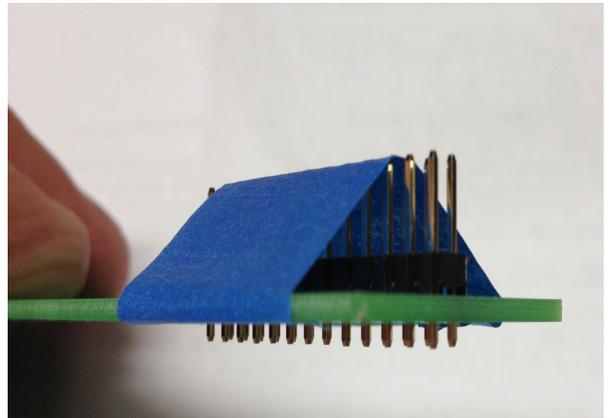
Place the circuit board on the table in front of you with the square outline facing up as shown.



Place the short end of all 26 header pins into the circuit board.

A small piece of tape can be used to hold the pins in place.

Now solder the header pins in place.

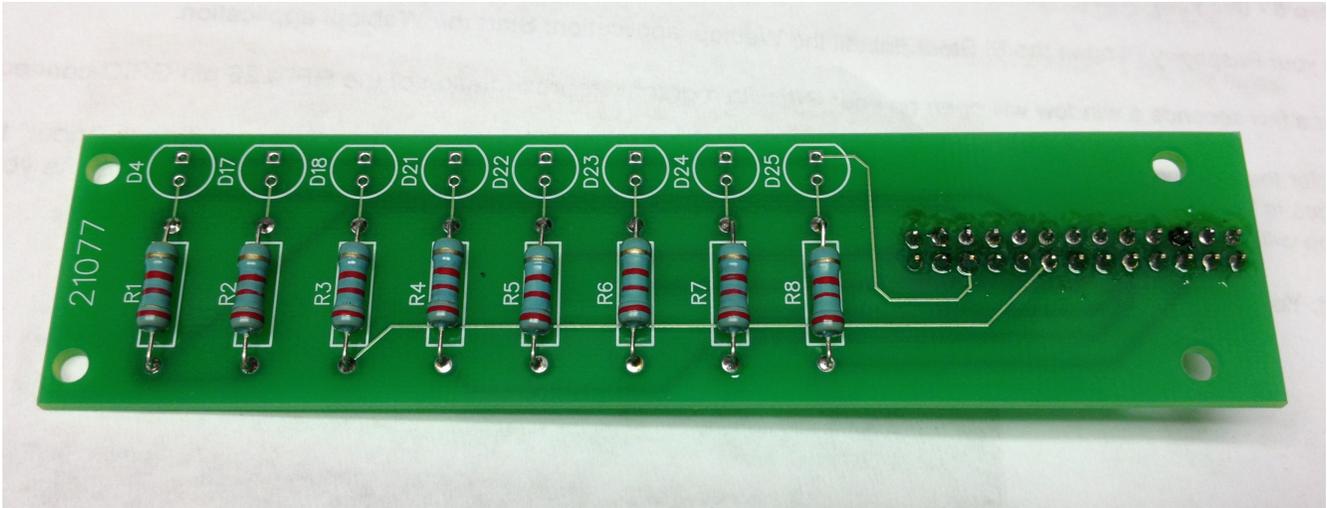


Step 2 – Mount the Resistors

You will need

- 8 resistors

Turn the board over so that the connector is on the bottom. We will place the resistors on the OPPOSITE side of the board from the connector.



Locate the holes for the 8 resistors as shown in the photo.

Bend the wires for the resistors, place them in the holes, and solder them in place.

Step 3 – Mount the LEDs

You will need

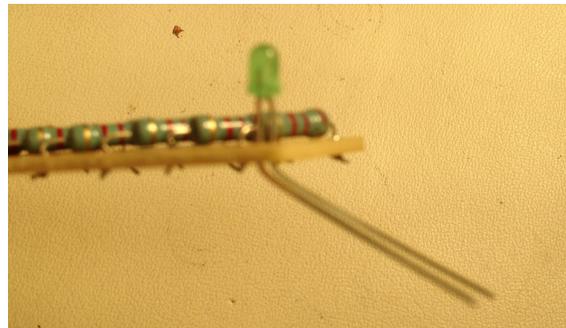
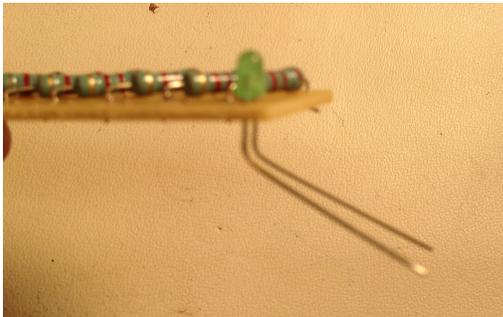
- 8 LEDs

The LEDs will go on the circuit board on the SAME side as the resistors.

Locate the 8 pairs of holes.

Note that each LED has two leads, one of them slightly longer than the other. The longer lead is the (+) lead. The longer (+) lead MUST go in the hole that is closest to the resistor for each LED position.

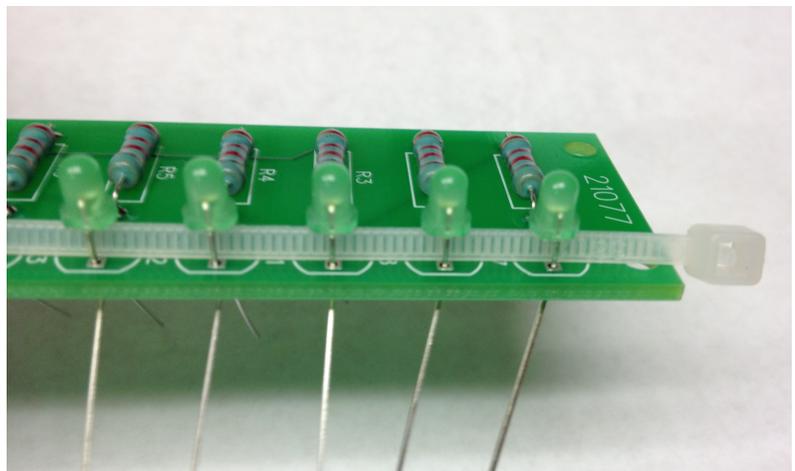
If you plan to use your GPIO LED board with the Shrimpware Bread Box, then you need to mount each LED slightly above the PCB.



The photo on the left shows the LED inserted into the board. The leads are bent about 1/8th inch below the board. The photo on the right shows the LED pushed up into the position where it is ready to be soldered.

Another clever technique is to place a small plastic wire tie under each LED as shown in the photo to the right.

This allows you to get all the LEDs the same distance above the PCB. Once you have soldered the LEDs in place you can easily remove the wire tie.



Step 4 – Test It

You will need:

- The assembled GPIO LED board
- A Raspberry Pi with WebIOPi installed

Before connecting the GPIO LED board to your Raspberry Pi you need to carefully inspect it. Look at each solder pad and make sure that there is no solder crossing between pads. This is particularly important at the 26 pin connector. Any solder that bridges two pins is a possible way to permanently damage your Raspberry Pi.

If you have an ohm meter you can test the resistance between the ground pin and the 5vdc pin; there should be infinite resistance. Also check between the ground pin and the 3.3vdc pin; there should be infinite resistance too. If either of these tests fail you should not connect you GPIO LED board to you Raspberry Pi.

Once you are sure that the GPIO LED board is correctly assembled, connect the ribbon cable to the 26 pin connector. Connect the cable so that the white stripe is near the LEDs and resistors.



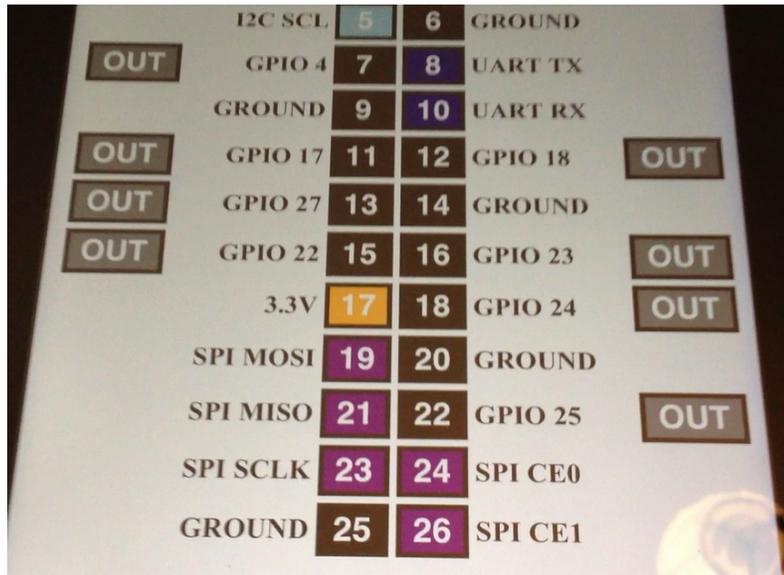
Now put a turn into the cable as shown in the photo above.

On the Raspberry Pi, the other end of the cable attaches to the 26 pin GPIO connector. On the RPi the white stripe goes towards the edge of the Raspberry Pi.

Now open a remote desktop to your RPi and bring up the Raspberry Pi store application. Download the free WebIOPi application. When it is installed, go to My Software tab in the RPi store and double click the WebIOPi application. In a minute this will bring up the WebIOPi control page.

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Your LEDs are connected to GPIO number 17, 18, 21, 22, 23,24 and 25. (Note that in the WebIOPi screen shot below pin 13 is incorrectly labeled GPIO 27. It should be GPIO 21.) On the WebIOPi page click to make the pins OUT. Then click the little square of each pin and see the corresponding LED light up.



Ta-da!

Option – GPIO LED and the Breadbox

If you have purchased a Breadbox by Shrimpware.com then you may want to mount your GPIO LED board on it. The LEDs for this board press fit into the holes in the breadbox. This photo shows how the LED board fits the breadbox.

