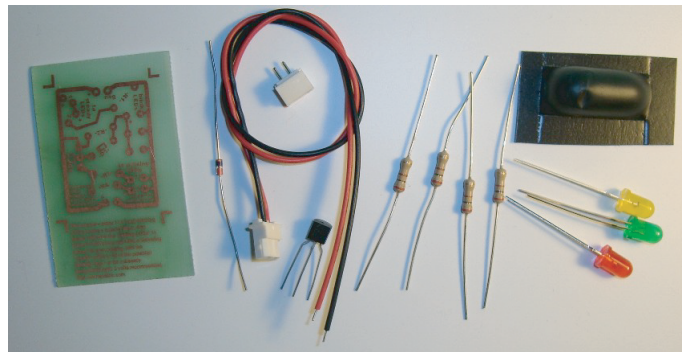


# Assembling *The Pulsator*

The Pulsator uses one or more, self-blinking LEDs to cause a regular, steady LED to blink along with it or them. You can, of course have one blinker make the regular one(-s) blink along. But by having two or three blinkers, you can have a random flickering effect that can serve in any number of ways.

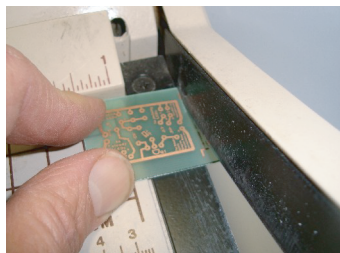
The circuit can power several LEDs, the exact number depending on what type they are. Generally, you can add to either of the "pulsing" LEDs-- doubling or tripling in parallel. There is also provision for running steadily-lit LEDs to augment the pulsing ones. This is so there are no "gaps" in the flickering quality of the light.

You will need: a small soldering iron and solder-- flux paste and a set of "Third Hands" optional. Radio Shack has a number of small irons and their small spool of "Light Duty Rosin-Core Solder" .032" (64-005 E) is great for general use as well. The 'rosin' is flux enough but if you like, their 1 oz. tube of "Paste Flux" (64-021) will also work for many other projects. Shop around for the Third Hands; they all seem to be made by the same people so why pay more!



Note that you will also get lengths of black and red heat-shrink tubing to help protect the battery leads. What you don't get are LEDs for the rest of your project-- there are far too many choices to include them all or even a portion of them. These are great times for model lighting as LEDs of all kinds are inexpensive and available. You also do not get a battery pack mostly because you can use 6 or 9 Volts with various combinations of LEDs.

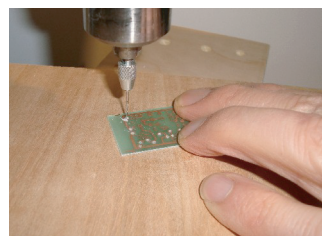
Sources of LEDs: <http://www.eled.com/> these guys provide milliamperage and voltage specs, for those who care and <http://www.allelectronics.com> will give you quick and easy choices.



**Getting Started:** You can trim the circuit board as tightly as you wish to the crop marks. You can use either a paper cutter board, a big pair of scissors or poultry shears.

Then drill out all the holes. You may not think you will use them all, but while you are there, you may as well get them all. You can use a drill press, a Dremel Tool or a hand drill. Use care whenever you are using any small drill bit in a power tool. They can snap at any time. **Eye protection is necessary!**

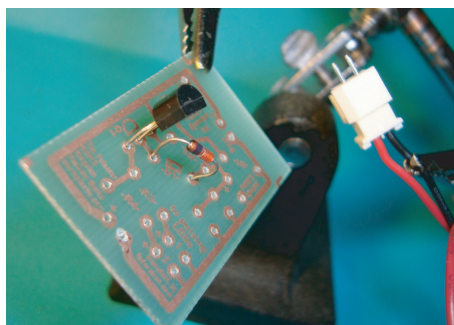
Use a 1/32" drill bit or a #41-- It is wise to have several on-hand; you may not need more than one, but it is best to be prepared.



***Wear eye protection!***

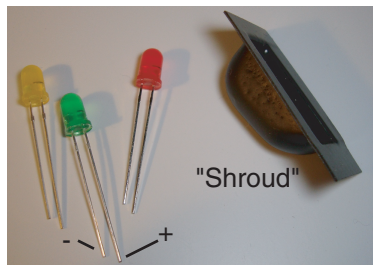
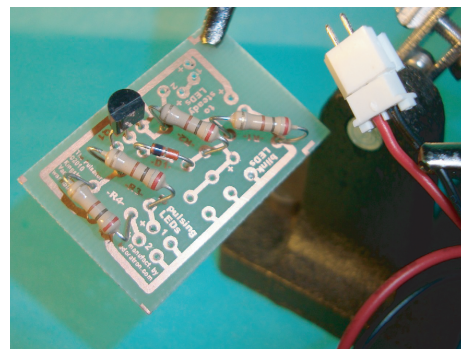
**Special Note: Keep the included self-blinking LEDs separate from any other LEDs you have or plan to use. They are not marked.**

Note: You can solder any of the parts at any time-- but you may find it more convenient to fit the soldering iron in before you fill the board! Remember to try to touch the point of the iron to both the circuit board copper trace and the lead, heating both. Then touch the solder to where they touch. You don't need much solder, but the two pieces of metal must be hot.



Left: Bend the three leads of the transistor so they fit neatly into the three holes marked "Q1" --follow the symbol of the transistor case to see which leads go where. The small glass bead with a dark band on it is the diode. Follow the symbol on the board to place the leads in the area marked "D1."

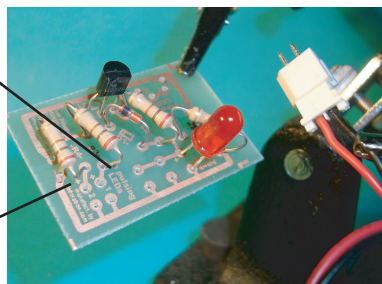
Right: Bend the leads of all the resistors so they fit neatly into their holes, marked R1, R2, R3 and R4. There is no orientation so they can go in one way or the other.



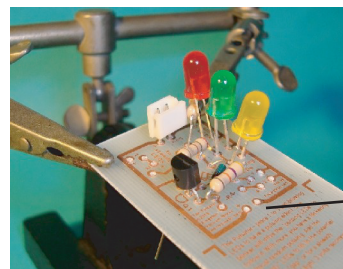
Note: "Pulsing LEDs" here are positions for two regular LEDs to be mounted or extended into your project. These will be driven by the self-blinker LEDs. Also note their small "+"

The three self-blinking LEDs. Note the long leg is positive and is placed in the solder-pad hole marked "+". Note the black styrene shroud-- it is to be used to cover any of the blinking LEDs should their flashing be visible and not desired. Place the LEDs on the underside if you are using the shroud.

The Pulsator is a pseudo-random LED blinker intended for modeling and hobby use. Please take reasonable care when assembling and installing this circuit, no liability is assumed. Made by warmplastic.com distributed by Fedoratron.com USA The design shown, text and pictures are ©2012 Eliot Brown and warmplastic.com



Here is one blinker installed. Note the small "+" on the circuit board. It is linked to a series of mounting holes for other self-blinking LEDs, they are all to take the + lead, if used.



Note that power can be routed through The Pulsator to another part of the project. This circuit will add its own resistance to any overall power circuit.

Here are all three self-blinking LEDs installed and with the power "header" loosely on the board.

Of course, you can use these self-blinkers in your model or diorama as other lighting. They can be extended with 28 or 30 gauge wire-- be sure to maintain the polarity of the LED-- the + lead must stay with the + hole.

***Note: all 3 blinkers, two pulsing and two steady LEDs were tested at 9V.***