

BoardMan BloodTracker



The BoardMan BloodTracker, is an attempt to take an inexpensive, ordinary LED flashlight and convert it to a sportsman's aid to track blood trails from game.

This style flashlight can be found at many places, including Harbor Freight and convenience store gas stations. They sell for anywhere from \$4.99 to \$10.00.

I have tried several different red and blue emitting LED's of different wavelengths to enhance the visibility of a blood trail. I have found fresh blood to be fairly easy to see with the aid of this light. Dried blood or blood on the ground in areas where there are many red or orange colored leaves, buds or berries makes it more difficult to distinguish the blood from those items.

These instructions are free for educational purposes to experiment with and come up with an even more effective BloodTracker. Just experimenting with other combination of Red to Blue LED'S or LED's of different wavelengths could greatly increase its usefulness in more types of forests. If you discover a different combination of Red or Blue LED's which are more effective please send me a note and I will add those links to the website.

Some pointers on soldering:

- Do not use a Solder gun type of soldering iron. Use a soldering pencil. One in the 25W to 60W range will work fine. You can apply too much heat to the resistors and the LED's which could damage or melt them. If the circuit board is clean and you use a small diameter flux solder you will have no problems.
- To remove the original LED's, I use something called solderwick to suck up the old solder from the old LED's. Radio Shack carries this. The old LED's generally will simply fall out of the holes if you remove the solder completely. Another method which works OK is to heat up the solder on LED's then quickly bang the PCB on the table and let the force knock out the solder; I suggest you use safety eye glasses if you use this method.
- LED's are not like light bulbs, they are current sensitive devices and made similar to integrated circuits found in your computer and other electronic devices. Different color LED's operate at different maximum voltages and currents. The average operating current generally falls around 20ma, however the voltage can vary by a large amount from one color to the next. This is why you need to have a resistor in series with each LED to limit the current to a safe level (20ma). The Blue LED's need a different value resistor than the Red LED's. I have picked the values to use in this modification based on a calculator found at the website where the LED's are purchased. This is the path to that page on their website (<http://led.linear1.org/1led.wiz>). Since this is not a hyperlinked article you will have to cut and paste or type that website into your browser to take you there. There is also a good explanation of what an LED is on their site at this location. (http://www.superbrightleds.com/led_info.htm)

For the Blue LED I use a series resistor with a value of 56 ohms

For the Red LED I use a series resistor with a value of 120 ohms

Now we are ready to build The BoardMan BloodTracker!

BoardMan BloodTracker

The LED's I bought came from www.Superbrightleds.com.

Part number

Blue RL5-B4630 \$0.66 each

Red RL5-R8030 \$0.54 each

You will need 4 each per BloodTracker Flashlight.

The Flashlight comes from Harbor Freight <http://www.harborfreight.com>

Item number 93712 (<http://www.harborfreight.com/cpi/ctaf/displayitem.taf?Itemnumber=93712>)

I have seen this flashlight several places on EBay, and I am sure it is at other stores as well but I will leave that up to you to locate.

The Resistors I use are NOT available from Radio Shack. They are a surface mount resistor SM1206 size and I purchase them from <http://www.digikey.com>.

Their part numbers are:

311-56ERCT-ND for the 56 ohm resistor used for the Blue LED's 10 pcs for \$0.78

311-120ERCT-ND for the 120 ohm resistor used for the Red LED's. 10 pcs for \$0.78



Unscrew the front cap of the flashlight. Using tweezers or needle nose pliers, unscrew the aluminum ring insert holding the LED assembly in the front cap as in the drawing to left. Turn CCW.



Remove all the pieces in the cap as in the drawing to the left. Take the LED disk in (Fig A) and unsolder all the LED's which came with the flashlight. The disk should now look like (Fig B). Using a razor blade or X-acto knife and scrape the solder mask (green covering) off the spokes of the PCB as shown in (Fig C). This will allow you to solder to the bare copper. Now take your knife and cut a gap in the copper traces of each spoke as in (Fig D). I find if you score or scratch each trace through to the fiberglass board material then take your solder iron and apply heat in the middle of the trace, the foil we

want to remove will slide right off. This is going to provide an opening where we will solder the current limiting resistor for each LED.



Figure A



Figure B



Figure C



Figure D

BoardMan BloodTracker

Your new LED'S will have 2 leads; one is longer than the other as shown in (Fig E). The long lead on each LED will need to go into the holes on the inside of spokes and the short lead to the outer ring of the PCB. I strongly suggest only mounting 4 LED's of the same color first since the Blue and Red LED's have different resistor values. For the purpose of these instructions, take your Blue LED's and insert them, long lead to the inside, into 4 locations you remove the original LED's from. It doesn't matter which holes you pick, 4 side by side or every other spoke to alternate the colors. I find if I use the reflector base, (Fig F), to hold the leads in place while I solder it works great. Solder each lead of the LED's to the PCB. Now take the resistor for the Blue LED's, which is the 120 ohm value, Each end of the resistors have a small solder strip on them , Hold the resistor with a pair of tweezers so you place one of the solder ends up against the inner hole of the LED'S, heat the solder at the LED lead again to melt the solder and slide the solder end of the resistor into the melted solder, Don't hold the solder iron on the resistors very long, as soon as the resistor slides into the melted solder remove the iron and let cool. Now you can release the resistor from the tweezers. Apply some solder to the other end of the resistor in the center of the board (Fig G). Do this for each of the Blue LED's. Next take your Red LED's and insert them the same way into the remaining 4 holes around the outside of the board. This time use the 56 ohm Resistor for the Red LED's and follow the resistor instructions above. After you're done, add enough solder in the center of the board to create a small puddle of solder as in (Fig H).



Figure E

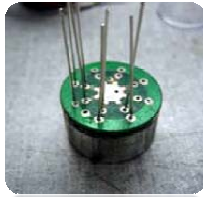


Figure F



Figure G



Figure H

You're done!

Reassemble the cap and turn it on.

You've just built your own BoardMan BloodTracker Flashlight!