Design principles

The LED Flasher, is designed to be built by young Scouting youth members with limited to no soldering experience. It has many design principles that should ensure lower assembly failure rate, and a longer lasting robust kit

Design features

- PCB Mount battery holder
- Recommend using a small 2mm thick piece of double sided tape to help hold the battery holder on - see assembly section.
- Larger solder pads 2.5-3mm, to make soldering easier for Scouts
- Wider spacing for radial component leads to prevent solder bridges, and components laid down to prevent breakage.
- Hole at the top for connecting to a Lanyard
- Wider tracks so that if through holes are delaminated, then the component lead can be soldered to the track - saves replacing the board and starting again,
- No more than 1 track connected to a through hole to reduce the number of tracks to be reconnected if a pad is delaminated.

Circuit details

The circuit is based on a 7555 timer running as an astable multivibrator.

The circuit will draw approx. 70ua, and should run for at least 2 years on AA Alkaline batteries.
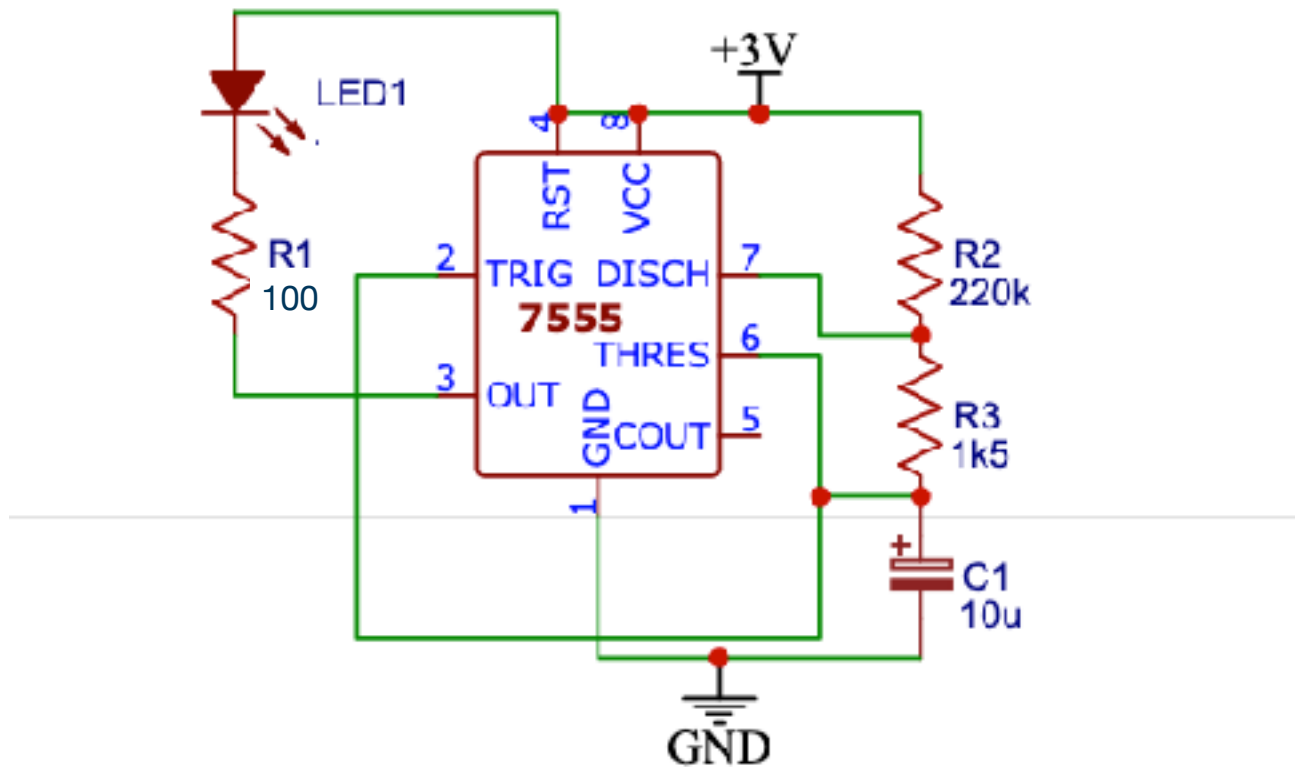
LED Options

LED 1 - is a diffused 5mm LED. Recommend using only Red, Orange or Yellow as they have a low forward voltage (1.8 approx), so the circuit will work down to 2.1-2.2 Volts. Green and Blue Led have a much higher forward voltage and will stop working when the battery voltage gets down to 2.7-2.8 volts.
The Blue/Green led will only run for about a year, whereas the Red/Orange/Yellow Led will go for much longer.
Also the Blue and Green Led's are very bright at night, and if the youth leave these running in their rooms, the leds are bright enough to dimly illuminate the room, so stick with Red/Orange/Yellow

I have tested may Led's and the diffused ones from Ledsales.com.au, seem to work better (better light dispersion) in this circuit

Main page for 5mm Diffuse case LEDS
https://www.ledsales.com.au/index.php?main_page=index&cPath=148_152_154_252&sort=20a&page=1

5mm diffuse tinted superbright amber LED
https://www.ledsales.com.au/index.php?main_page=product_info&cPath=148_152_154_252&products_id=1407

5mm diffuse tinted superbright red LED
https://www.ledsales.com.au/index.php?main_page=product_info&cPath=148_152_154_252&products_id=2229

5mm diffuse tinted superbright orange LED
https://www.ledsales.com.au/index.php?main_page=product_info&cPath=148_152_154_252&products_id=1440

Battery Holder options

The board is designed to use a PCB Mount battery holder, there are many different brands available, in qty of 10 or more they are about $1 each. See the shopping list for suggestions. The recommended one in the shopping list is available from Altronics, but I have also seen it at, Jaycar and Radio parts for a similar price.

Different manufacturers have different pin spacing, the board has slotted holes for the battery holder that can accommodate pin spacing from approx 12.5 to 14 mm.

It is advisable to use a piece of 2mm thick double sided tape (automotive tape is nice and strong) at the end of the battery holder near the on /off switch end. This will secure the battery holder firmly to the board at both ends, and prevent it from being broken off.

Double sided tape

Assembly guide suggestion

Install the components in the following order (the board will stay relatively flat on the bench this way, and will not require you to splay the wires much to keep the component from falling out.

1. Resistors - 3
2. IC Socket -1
3. Electrolytic capacitor - 1
4. LED - 1 (leads need to be bent so that the Led is flat on the board)

Check the soldering before going any further

5. Check the soldering for dry joints etc, as its hard to remove the battery holder to fix anything, once its soldered and stuck in.
6. Put in the 7555 IC, then put in the batteries, and put the battery holder into the board and twist it slightly, so that the pins make contact with the holes/pads. If the LED starts to flash, then its ok to proceed. Remove the batteries at this stage.

7. Battery Holder - remember to remove the double sided tape cover, this will hold the bottom end of the battery holder onto the board, to help prevent it getting broken off
8. Get them to write their name and Scout Group on the label on the side of the battery holder..
9. Put a piece of tape over the battery holder pins on the front of the board to cover to help prevent electrical shorts.

10-15mm wide tape over the battery holder pins