LED Flasher Instructor Guide

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

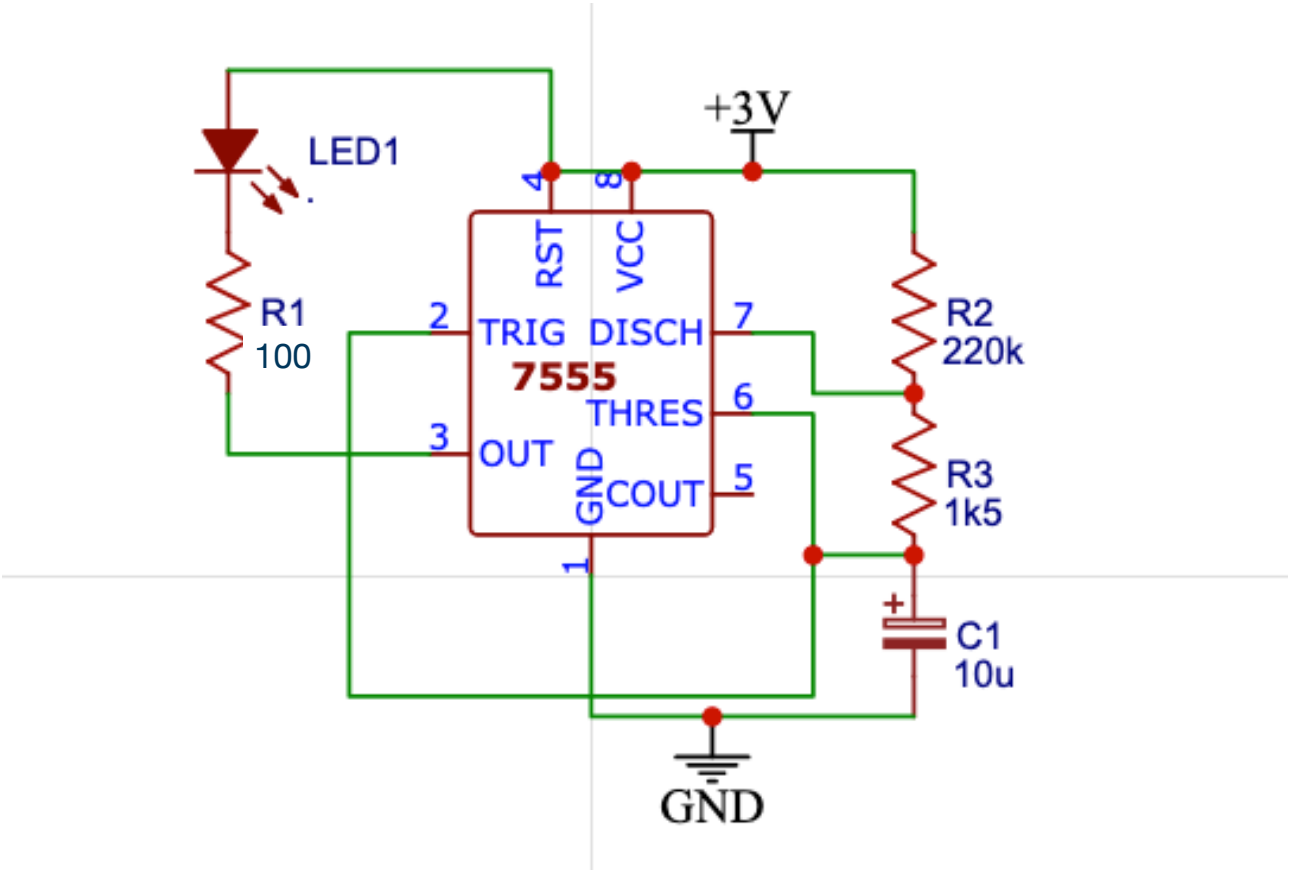
Design features

- PCB Mount battery holder, but can also accommodate a wired 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.
- Longer IC pads to help with Soldering,
- 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.
- Space for youth members name and group on the back

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 can accommodate different 9v battery holder types

The main preference is 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. Just be aware if you are using a different brand battery

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.

It is not recommended to use a normal battery snap, as the battery ends up hanging by the wires and it does not take long to break these off.

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)
5. 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

Check the soldering before going any further

6. 7555 IC and Batteries - Give this out when the soldering has been checked and the Battery holder soldered in.
7. Get them to write their name and Scout Group on the back in the space provided.
8. Put a piece of Kaption tape over the back to cover the soldered in component leads. This will help protect the 7555 IC against static, and also help stop the component lead ends getting stuck on things (clothes etc), and also help prevent electrical shorts.

35mm wide
Kapton tape