# QUASAR PROJECT KIT # 3138 – ASTABLE Bi-LED FLASHER

## General Guidelines for Electronic Kits and Assembled Modules

Thank you for choosing one of our products. Please take some time to carefully read the important information below concerning use of this product. The assembly and operating instructions are on the following pages.

**WEEE Directive (Waste Electrical and Electronic Equipment)**
**Notice To All European Union Citizens - Important Environmental Information About This Product.**

The crossed out wheeled bin symbol on this product, package or documentation indicates that disposal of this product after its lifecycle could harm the environment. Do not dispose of this product (or batteries if used) as unsorted municipal waste. It should be disposed by a specialized company for recycling.

The unit should be returned to your distributor or to a local recycling service. Please respect the local environmental rules. If in doubt contact your local authorities about waste disposal rules.

**Safety: General rules concerning safe use of our Kits or Modules.**
**To ensure your safety, please observe these safety measures. In no way are these complete. As safety requirements vary, please check with your local authorities, in order to comply with local requirements. If in doubt, seek the help of a qualified person.**

**Battery or wall-adaptor operated devices are safe devices. They do not require special attention unless mains voltage is connected to an output e.g. a relay.**

To ensure electrical safety, and also protection from fire or personal injury, make sure your mains operated equipment complies with these safety hints:

- Use a suitable plastic enclosure. If a metal enclosure is used, make sure it is properly earthed.
- Use a power switch if the device consumes more than 10W. Use a double pole switch for mains operated, transformer-less kits.
- Mount a fuse in series with the mains switch. Use a slow blow (T) 50mA fuse for transformers up to 10W and a 100mA fuse for transformers up to 20W.
- Use a mains input connector, or a robust power cord with a clamp.
- Internal wiring carrying mains voltages must have a minimum cross-sectional area of $0.5mm^2$.

If supplied, attach the power rating label near the power cord of the device and fill-out the mains voltage, frequency, power consumption and fuse values.

### Troubleshooting and Support

90% of non-working kits are due to poor soldering.
We operate a Get-You-Going service for non-working kits but there is a charge based on the time and components needed to complete the repair. Quite often it is not economically viable for us to repair and it is cheaper to supply a new ready-made product at full cost.

### Disclaimer

# QUASAR PROJECT KIT # 3138 – ASTABLE Bi-LED FLASHER

This kit uses the popular 555 IC as an astable, free-running multivibrator. In other words it is wired as a square wave oscillator. It has a double ended output connection in which one LED is OFF when the other is ON, and vice versa.

For an animation of what happens in this kit go to

www.williamson-labs.com/480_555.htm

Note the animated charging and discharging of the capacitor. Also note which resistors are involved with the charging and with the discharging. See which LED is on in what part of the cycle. A few minutes watching this animation and making it go faster will give an excellent understanding of how this circuit works.

The capacitor C2 charges exponentially through resistors R1, R2 and the resistance of the trimpot. When C2 has charged to about 2/3 $V_{CC}$ it stops charging and it discharges to about 1/3 $V_{CC}$ through R2 and the trimpot resistance via pin 7.

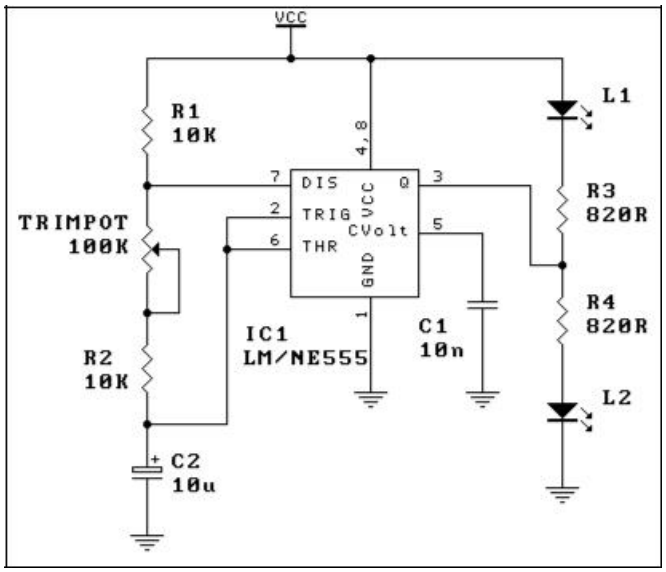
There are links on this site to download the 555 Data Sheet and a lot of other relevant information.

In the website at

www.bowdenshobbycircuits.info/555.htm

you can enter values for R1, R2 and C and see what flash rates they would give.

## CIRCUIT DIAGRAM




## ASSEMBLY

Read the resistor colour codes to make sure you get the right ones in the right places. The electrolytic capacitor, 1N4004, LEDs and IC must be put in the right way around. The two pins make it easy to attach alligator clips to the board (you do not have to use them if you do not want to). It is best to add the components in ascending height order – the resistors and D1 - C1 - IC socket - C2 - RV1 and the LED – solder pins and lastly the IC.

## TESTING & USE

Perform a final inspection - check component values and orientation of polarised components previously mentioned. Finally, connect a battery or power supply of between 5V and 15V DC to the pins. The LEDs should start to flash on and off. Adjust the trimpot to adjust the flash rate (it only turns through 180 degrees).

## IF IT DOES NOT WORK

Check your soldering first as this accounts for 80% of faulty kits. Then check component values and orientation are correct. Is power connected to the right way round?

## COMPONENT LISTING

| | | | |
|---|---|---|---|
| *Resistors (1/4w 5% Carbon)* | | | |
| 820R | R3, R4 | grey red brown | 2 |
| 1K | R1, R2 | brown black red | 2 |
| 100K | VR1 | Trimpot (104) | 1 |
| *Capacitors* | | | |
| 10n | C1 | Ceramic capacitor (103) | 1 |
| 10uF | C2 | Electrolytic capacitor, 25V | 1 |
| *Semiconductors* | | | |
| 1N4004 | D1 | Rectifier diode | 1 |
| NE555 | IC1 | Timer IC | 1 |
| LED | L1, L2 | Superbright red LED | 2 |
| *Miscellaneous* | | | |
| 8 pin IC socket | | | 1 |
| Solder pins | | | 2 |
| Kit 3138v2 PCB | | | 1 |
| Documentation | | | 1 |

QUASAR electronics

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For Technical Support please email
**support@quasarelectronics.co.uk**

For more great kits please see our website at
**www.quasarelectronics.co.uk**