# Piggyaxe 555 Flasher Kit

Electronics is FUN – so let's build a Two-LED alternate flasher!

Start by collecting the following parts (Available as a Rapid Electronics kit, order code 70-1051):

555 microchip, PP3 battery snap, PCB, 2x 5mm LEDs (kit contains red), C1: 100nF ceramic capacitor (brown disc marked 104), R1 and R4: 220Ω resistor (red-red-brown-gold), R2: 1kΩ resistor (brown-black-red-gold) and R3: 6.8MΩ resistor (blue-grey-green-gold). If you want a faster flash rate make R3 something smaller by using either the 1.5MΩ or 680kΩ resistors included.

You will also need: a soldering iron with a stand and a wet sponge, a PCB holder of some sort, some solder and a pair of side cutters. Remember: soldering irons can burn you. You should always wash your hands after handling solder.

Take great care to fit the components exactly where they are supposed to go, otherwise your circuit may not work as expected. Use the photograph below to help you place the components correctly.
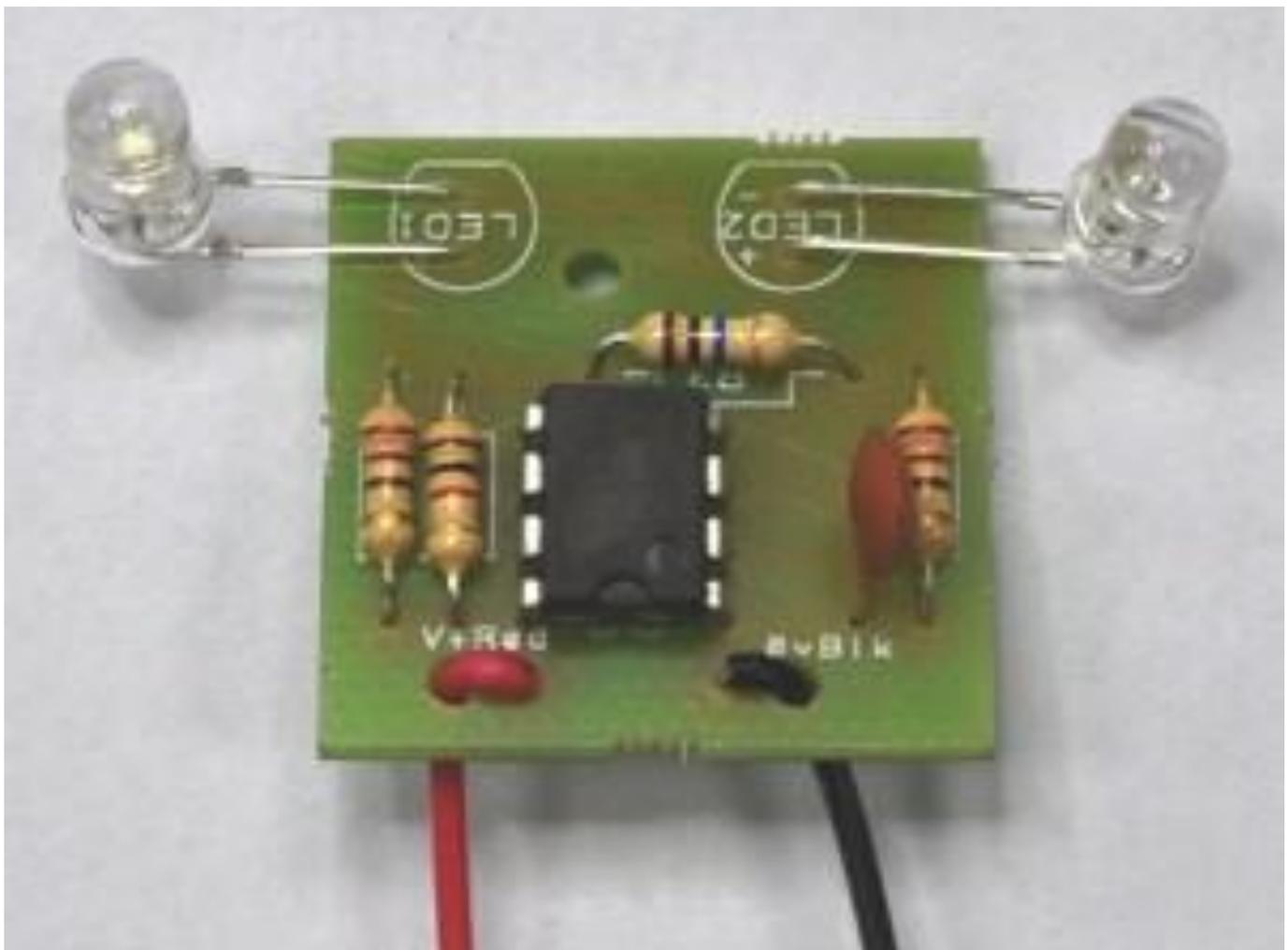
Put a tick ✓ in each box as you solder in each part or, if you prefer, get someone to check your placement before you solder it. **CHECK TWICE – SOLDER ONCE!**

Resistor R1 ❑	Resistor R2 ❑	Resistor R3 ❑	Resistor R4 ❑	Capacitor C1 ❑

Microchip 555 – make sure the indent at one end matches the outline on the PCB ❑

Finally, fit the RED + and BLACK - wires up though the

Stress relief holes then down into the PCB and solder ❑

> **TIP!** Remember you can bend the legs on the LEDs to change the spacing of them if you want. Bend, **then** solder. Or fit them into the holes in your design first to check, and then solder them in place.

Now carefully check your soldering for errors (missed joints or solder splashes). If it looks OK, connect up to a PP3/MN1604 (9 volt) battery. 4x AA batteries (6 volts) in a suitable holder (e.g. Rapid order code 18-0115) will also work well. Enjoy the flashing!
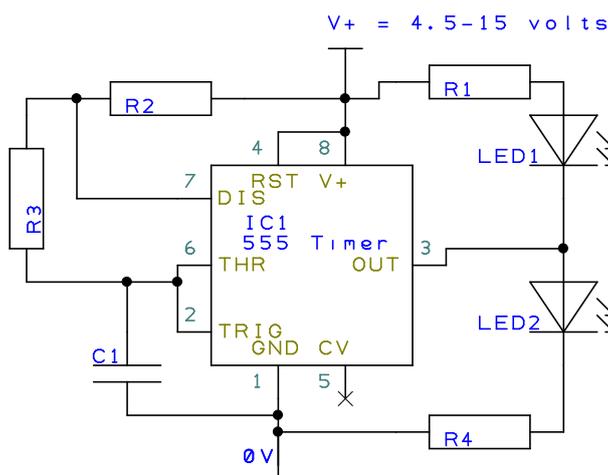
The circuit diagram above shows the parts required, to make the 555 function as an astable oscillator – it continually flashes the two LEDs alternately. Resistors R1 and R4 can be selected to suit your power supply or how long you want the battery to last. Resistors R2 and R3 can be chosen to suit the desired flash rate. There are a number of internet sites with built-in applications to help you calculate the flash rate and duty cycle, plus the excellent ElectroDroid software (free) for Android based tablets and phones.

The output of a 555 can handle a current of up to 200mA, so quite a few LEDs can be flashed at the same time from a single chip, or even small 60mA torch bulbs. Take care not to exceed the 200mA maximum (which most torch bulbs will), or the circuit will not work as expected.

Although it has been in production since the 1970s it remains a handy little chip. Data sheets from various manufacturers abound, here is a link to one. http://www.ti.com.cn/cn/lit/ds/symlink/lm555.pdf