

## Monostable Timers.

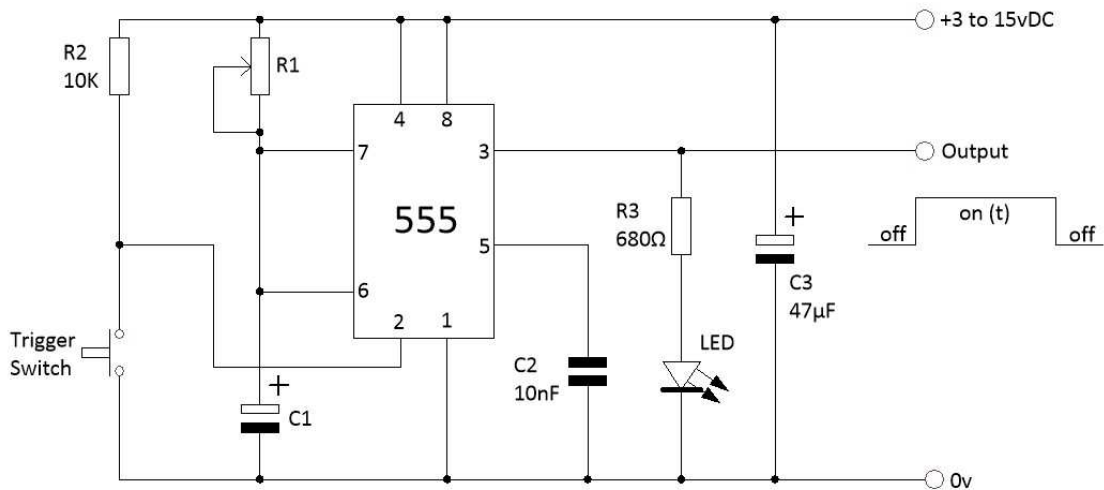
Monostable timers have only one stable state (hence their name: “Mono”), and produce a single output pulse when it is triggered externally. Monostable timers return back to their first original and stable state after a period of time determined by the time constant of the timing capacitor,  $C_1$  and the resistor  $R_1$ . The timer will then remain in this original stable state indefinitely until another input pulse or trigger signal is received.

Monostable timers can be used for the following:-

Station Stop Timers.

Train Run Timers

Any situation where something needs to be ON for a specific period of time.



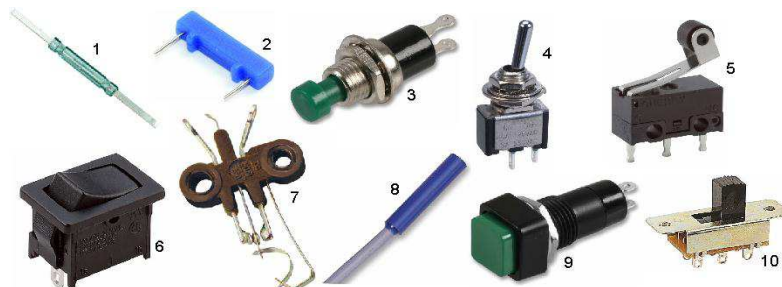
The following table shows a small selection of Resistor and Electrolytic Capacitor combinations to give you specific ON time. The formula to calculate the required components is:

$$t = 1.1 (R1 \times C1)$$

| (t)      | R1   | C1    | (t)      | R1   | C1     |
|----------|------|-------|----------|------|--------|
| 1.1 sec  | 100K | 10uF  | 2.25 Min | 560K | 220uF  |
| 2.42 Sec | 220K | 10uF  | 4.0 Min  | 1M   | 220uF  |
| 6.1 sec  | 560K | 10uF  | 51.0 sec | 100K | 470uF  |
| 11.0 sec | 1M   | 10uF  | 1.8 Min  | 220K | 470uF  |
| 11.0 sec | 100K | 100uF | 4.8 Min  | 560K | 470uF  |
| 24.0 sec | 220K | 100uF | 8.6Min   | 1M   | 470uF  |
| 1.1 Min  | 560k | 100uf | 1.8 Min  | 100K | 1000uF |
| 1.8 Min  | 1M   | 100uf | 4.20 Min | 220K | 1000uF |
| 24.2 sec | 100K | 220uF | 10.2 Min | 560K | 1000uF |
| 53.2 sec | 220K | 220uF | 18 Min   | 1M   | 1000uF |

### Trigger Switch

Here is a selection of all the types of switches that can be used to trigger the timer depending on your application.



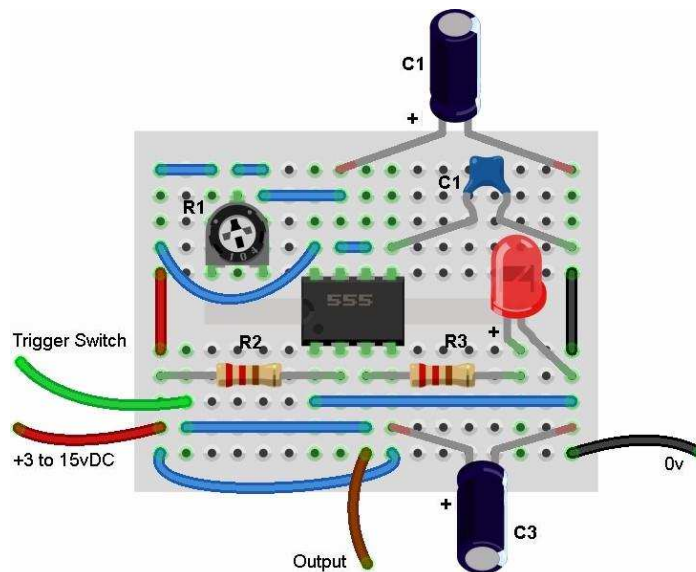
Trigger Switch Types

|   |             |    |             |
|---|-------------|----|-------------|
| 1 | Reed        | 6  | Rocker      |
| 2 | Reed        | 7  | Leaf        |
| 3 | Mini Push   | 8  | Reed        |
| 4 | Mini Toggle | 9  | Push Button |
| 5 | Micro       | 10 | Slide       |

### Breadboard.

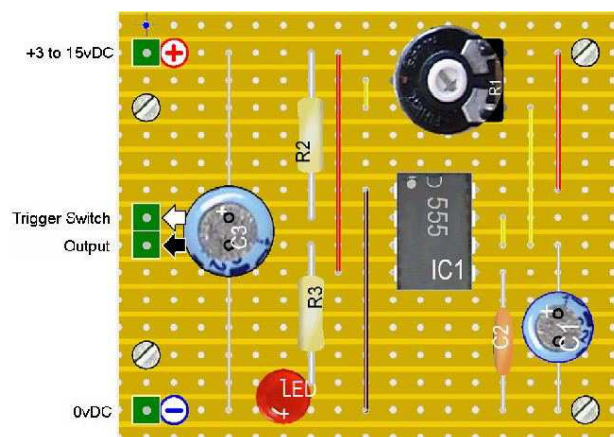
A solder-less breadboard consists of a perforated block of plastic with numerous tin plated phosphor bronze or nickel silver alloy spring clips under the perforations. The clips are often called tie points or contact points. The number of tie points is often given in the specification of the breadboard.

Here the circuit has been built on a Mini Breadboard. The advantage of this is there is no soldering and the breadboard has a self adhesive back so can be stuck any where you want it. When using a breadboard it is best to use 1/0.6 solid core wire, as stranded will be very difficult to insert into the holes. Ideal to check it works in your situation before you go to strip-board & soldering.



### Strip-board.

When you are happy with your circuit and its application you could now make the circuit more permanent by soldering onto a strip-board. The layout is on a 47w x 40h mm strip-board. All 4 strips are cut underneath the IC. R1 is a preset variable resistor of 1M.



The Parts List for both board types.

#### MR420

- 1 x Breadboard
- 1 x 555 Integrated Circuit
- 1 x Red 5mm LED
- 1 x C1 Electrolytic Capacitor (Your Choice)



1 x C2 Capacitor 10nF  
1 x C3 Electrolytic Capacitor 47 $\mu$ F 25v  
1 x R1 Preset Resistor (Your Choice)  
1 x R2 Resistor 10K 0.25w  
1 x R3 Resistor 680 $\Omega$  0.25w

**MR421**

Replaces the Breadboard with a strip-board (this will need to be cut to size.)