

# THE 555 INTEGRATED CIRCUIT

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# THE 555 INTEGRATED CIRCUIT

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## 1. INTRODUCTION TO THE 555 INTEGRATED CIRCUIT

## 2. THE 555 MONOSTABLE CIRCUIT

## 3. THE 555 ASTABLE CIRCUIT

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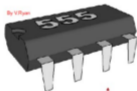
# INTRODUCTION TO THE 555 IC

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This integrated circuit is used for timing. Many circuits are composed of timers and the most common of them all is the 555 Integrated Circuit. It is used in many commercially manufactured items such as video recorders and timers.

The 555 has eight pins (legs) but the function of two are very important. These are pin two and three. This chip is used in timing circuits.

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This pin is where the current / voltage enters the chip and starts the timing sequence or starts to count.

This is where the current comes out after the timer has completed counting.

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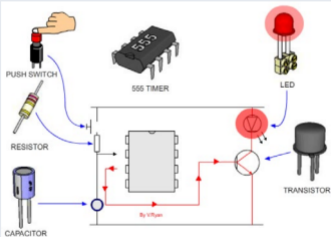


# THE 555 – THE BASICS

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This circuit is a simplified version of a 555 circuit. It is a timer. When the switch is pressed a current / voltage goes into the IC through pin two (the input pin). The chip starts counting and when it has finished counting it 'pulses' a current or voltage from pin three (the output pin). This voltage from pin three switches a transistor and allows the LED to light.

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# THE 555 MONOSTABLE CIRCUIT

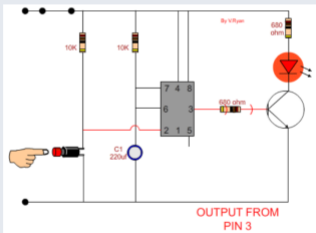
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When the 555 IC is used to produce an MONOSTABLE circuit - it will **only pulse once**.

Monostable circuits can be used to turn lights/LEDs on or off just once. They are also used in many more school based circuits.

Look at the circuit drawn below. Pins 6 and 7 are connected and go to the positive (+9 volts). This is the easiest way of recognising that a 555 IC has been set up as monostable.

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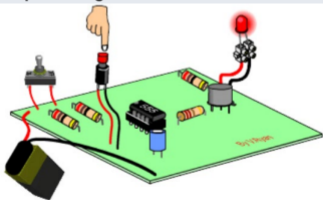


# THE 555 MONOSTABLE CIRCUIT

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When the switch is pressed current flows into pin 2. Current then flows out of pin 3 switching the transistor. Current can now flow from +9 volts to -0 volts and the LED lights. In this monostable circuit when the switch is pressed the LED only lights once. The switch has to be pressed each time for the LED to light. This example shows the LED staying on for approximately 8 seconds. If the value of the capacitor is increased the length the LED stays on increases.

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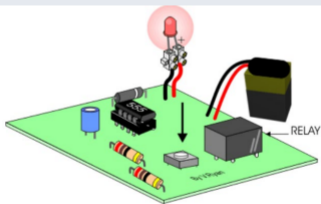


## 555 MONOSTABLE EXAMPLE

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555 Timer Circuits can be used to drive outputs other than LEDs. The circuit below is a 555 monostable circuit, that energised a relay, when the push switch is pressed. The relay could easily be used 'drive' a secondary circuit.

**Tap the image** for more examples of 555 monostable circuits.



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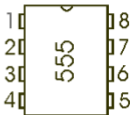
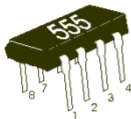
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# THE 'PINS' OF THE 555

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FUNCTION	555
GROUND	1
TRIGGER	2
OUTPUT	3
RESET	4
CONTROL V	5
THRESHOLD	6
DISCHARGE	7
Vcc	8

TABLE OF PIN FUNCTIONS

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# QUESTIONS – MONOSTABLE CIRCUIT

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QUESTIONS



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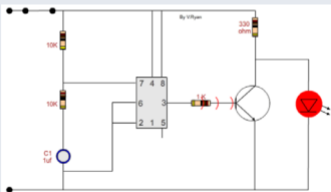


## THE 555 ASTABLE CIRCUIT – THE BASICS

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When the 555 IC is used to produce an ASTABLE circuit - it will continually pulse until power is removed. Astable circuits can be used to flash lights/LEDs on and off or to turn a buzzer on and off repeatedly. They are also used in many more school based circuits. Look at the circuit drawn below. Pins 6 and 2 are connected and go to the negative (0 volts). This is the easiest way of recognising that a 555 IC has been set up as astable.

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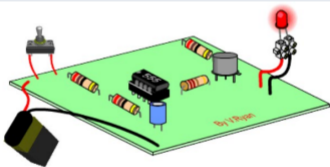


# STOCK FORMS AND SECTIONS

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In an astable 555 circuit pins 2 and 6 are connected which means that the circuit will trigger itself continually until power is removed. The larger the value of the capacitor the longer the LED stays on and off.

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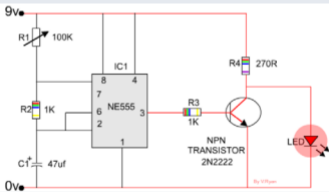
# THE 555 ASTABLE CIRCUIT - DETAIL

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The 555 is activated by current at pin two and the output is through pin three. Altering the variable resistor alters the time between 'pulses' at pin three. The pulse at pin three switches the transistor which allows the LED to come on.

The LED flashes on and off because with this astable circuit the pulses from pin three are repeated until the power is switched off completely.

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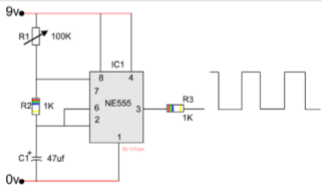


# 555 PULSE GENERATOR

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This 555 astable circuit is called a 'pulse generator'. Circuits like this are often used to produce a pulse or signal that will start a second circuit. This can be seen in a simple alarm or a counter circuit

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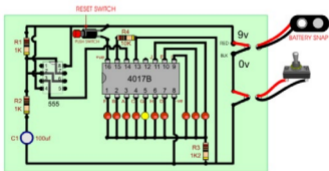
# THE 555 ASTABLE CIRCUIT AND THE 4017B DECADE COUNTER

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Continuous pulsing by the 555 IC results the LEDs of the 4017B turning on and off in sequence, creating a ripple effect.

When the switch is pressed, counting will start again at pin 'A' of the 4017B IC.

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# ASTABLE AND MONOSTABLE 555 CIRCUITS

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