

# Police Siren Circuit using NE555 Timer

## Multivibrator:

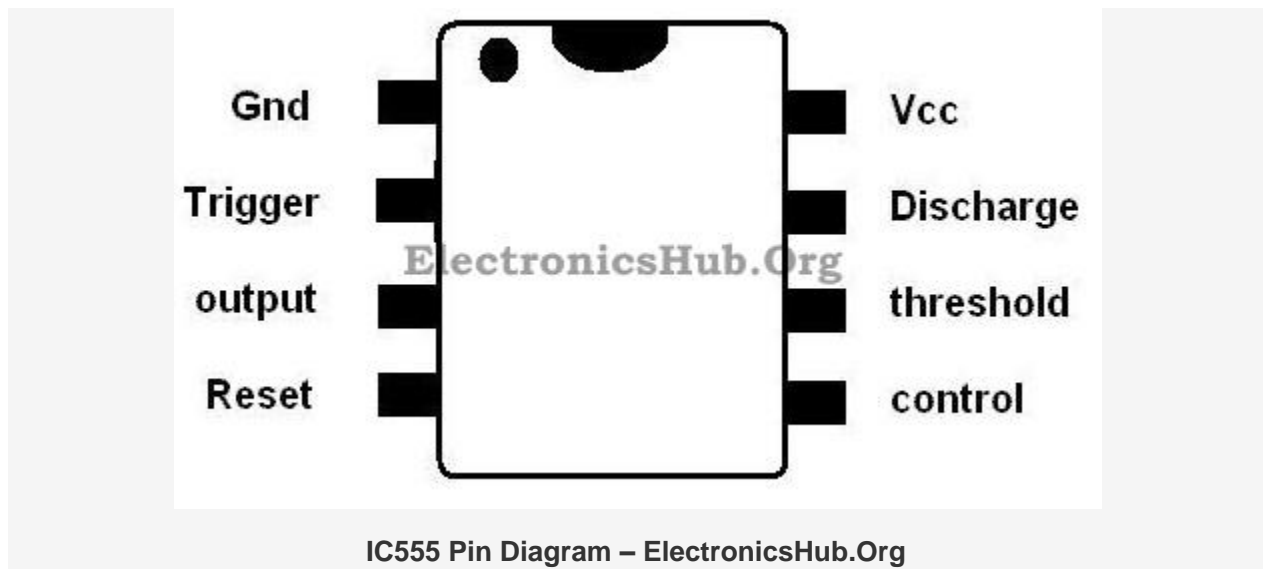
Multivibrator discover their own space in lots of applications as they are among the most broadly used circuits. The application can be anyone either a household application or industrial or communication, etc. The multivibrator can also work in such type of application either as an oscillator or digital flip flop or pulse generator circuit or like a timer or I can be lay generator circuit and lots more.

There are mainly three types of Multivibrators. They are

1. **Astable Multivibrator:** It has actually no stable state. It has two quasi steady state which rapidly alters from one to another and again to the same state. So it's mainly alters from high to low and from low to high devoid of any input trigger input after pre settled time.
2. **Monostable multivibrator:** Out of two states, one is stable state and another one is quasi state. When trigger input is given, it switches from a stable state of quasi state. And it automatically switches to a stable state from quasi state after a pre decided time.
3. **Bistable Multivibrator:** Both the state is stable in it. To alter the state between low and high two different input trigger is used.

All the above three types of multivibrators can be easily constructed with the help of transistors. But there is one type of IC which is easily obtainable that can be used as Astable, Monostable or Bistable multivibrator and it is known as IC555.

## IC555 Pin Diagram:



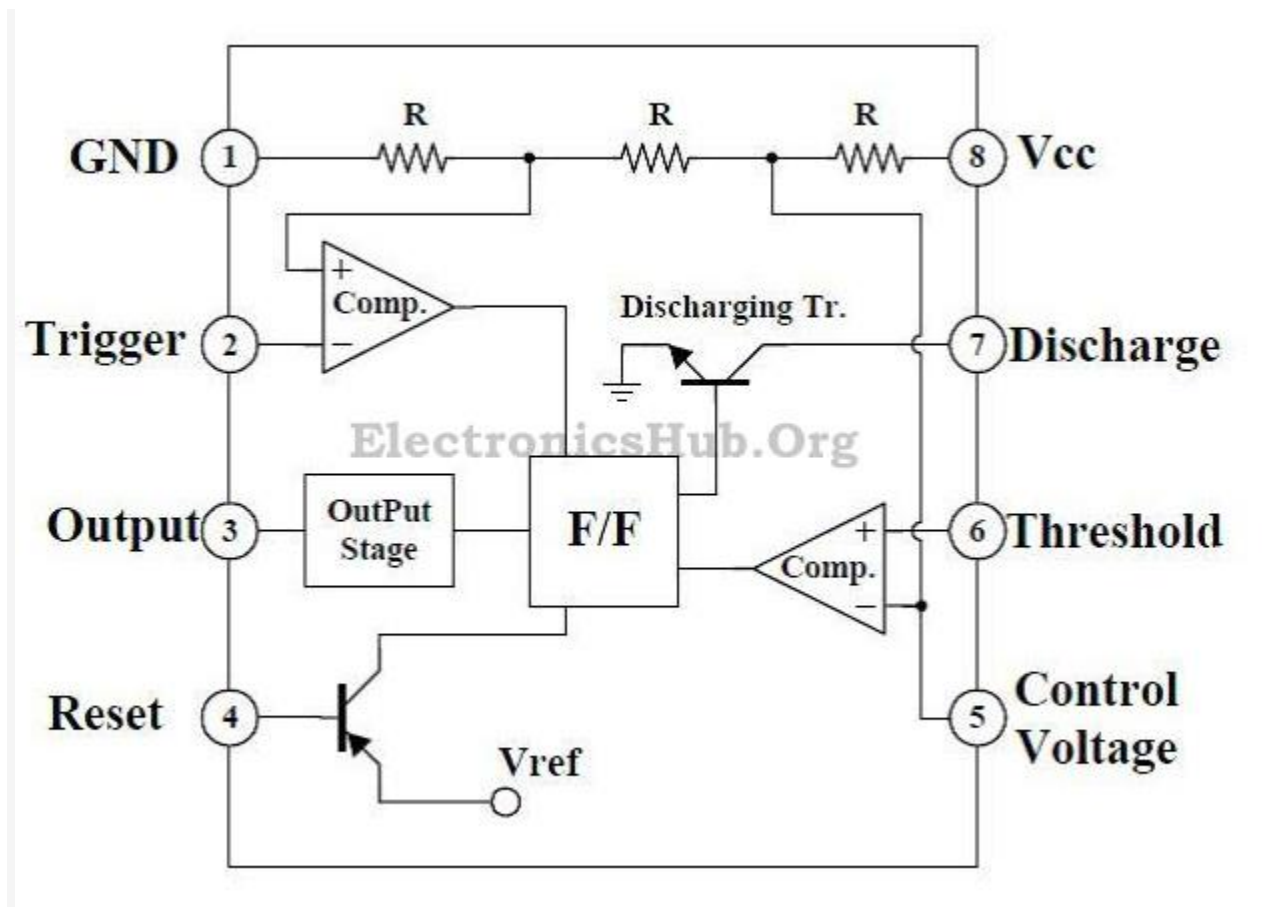
### Pin Functionality of IC555:

| Pin No. | Pin Name  | Input/Output | Function   |
|---------|-----------|--------------|--|
| 1       | Gnd       | Input        | Provides ground  |
| 2       | Trigger   | Input        | Trigger comparator input pin. Negative trigger ( $< 1/3 V_{cc}$ ) is given in monostable operation |
| 3       | Output    | Output       | Its output pin   |
| 4       | Reset     | Input        | Internal flip flop reset pin. Necessity be high to enable output                                   |
| 5       | Control   | Input        | Control voltage input to manage charging discharging of external capacitor                         |
| 6       | Threshold | Input        | Threshold comparator input pin. Positive trigger ( $> 2/3 V_{cc}$ ) is given in bistable operation |

| Pin No. | Pin Name  | Input/Output | Function  |
|---------|-----------|--------------|---|
| 7       | Discharge | Input        | Discharge pin. Gives discharge path to external capacitor |
| 8       | Vcc       | Input        | For +Ve biasing voltage. Between 4.5 V to 16 V            |

IC 555 is one of most versatile chips and due to its multi-functionality, it can be used in almost all kinds of applications. It is a DIP or SOP package kind of chip having 8 pins with direct current drive output of 200 mA. This IC is made up of analog as well as digital components that's why it is known as mixed signal chips. The general application of the IC is to generate timing, clock waveform, square wave oscillator and many more.

#### Internal Block Diagram of IC555:



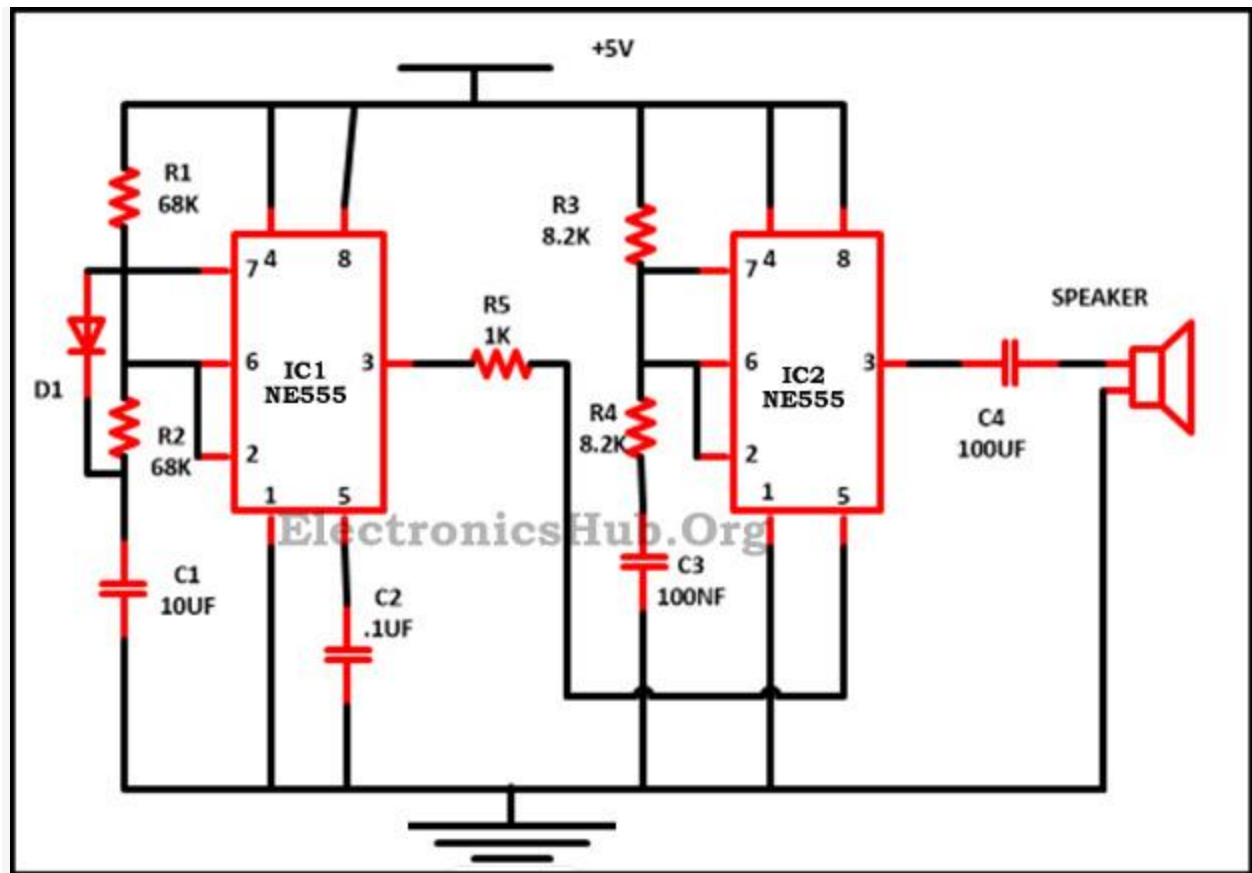
Internal Block Diagram of IC 555 – [ElectronicsHub.Org](http://ElectronicsHub.Org)

As you can find in the figure above that IC555 comprises of two comparators one is known as RS flip flop another one is the combination of the some discrete components viz transistor, resistor and more. The voltage for biasing is parted among three parts by voltage divider having similar value of resistor R through these non-inverting voltage get  $1/3 V_{cc}$  of the trigger while the inverting terminal get  $2/3 V_{cc}$  of threshold comparator. R and S input terminal of the flip flop receives the both comparator output. The real output of the IC is  $Q'(Q \text{ bar})$  output while output terminal Q. The discharging transistor that gives discharging way to external capacitor at the time it reaches high.

At the time  $1/3 V_{cc} >$  negative trigger is given at the input pin trigger, the trigger comparator move to high output and the flip flop reach to original state and the chip output which is output from Q' moves to high.

Now when  $2/3 V_{cc} <$  positive trigger is given to threshold input pin, the flip flop is in set state as the output from the threshold comparator is high. The chip output moves to low as the output Q will turn to high. The external capacitor that receives the discharging path during the time of transistor discharges. The high input resets hold the flip flop to enable. At the phase of low state flip flop put out of action and receives low at the output. No other result of threshold as well as trigger comparator outputs.

## Circuit Diagram of Police Siren Circuit using NE555 Timer:



Police Siren using NE555 Timer Circuit Diagram – [ElectronicsHub.Org](http://ElectronicsHub.Org)

### Description:

This circuit produces a sound similar to the police siren. The two 555 act as an astable multivibrator. The 555 timer IC is an integrated circuit used in a variety of timer, pulse generation and oscillator applications. The 555 can be used to provide time delays, as an oscillator, and as a flip-flop element. In the beginning 555 is coupled like a low-frequency oscillator so to command the voltage at the second 555 IC at pin 5 which is a control pin. The shifting of the voltage on pin 5 is the root of the second oscillator frequency to get up and down.

Police siren circuit which is explained here is worked on **NE555 timer IC**. The circuit is built with the help of two NE555 IC (i.e. IC1 and IC2) which is the basic block of this circuit. Both the timer IC in these circuit is connected like an astable multivibrator. Although both the IC in the circuit work at two

dissimilar frequency. IC1 is a astable multivibrator of slow frequency work on frequency of 20HZ and having 50% of duty cycle while IC2 is a fast astable multivibrator works on frequency of 600Hz. IC1 output is then serve to IC2 at the control pin(oin5). Through the help of this arrangement IC2 output frequency will be modulated with the IC1output frequency. The circuit works on the DC supply between a range of 6V to 15V.

The frequency range of the siren can vary with the exchange of R2 and R4 resistor with potentiometer. The pitch of sound can be enlarged with the attachment of the power amplifier at the output point. The accurate effect of police siren can be produced by connecting flashing LEDs at the correct place. The circuit can be made on a Perfboard. NE556 can be used in the place of two NE555.

**Source:** <http://www.electronicshub.org/police-siren-circuit-using-ne555-timer/>