

## Monostable Multivibrator Circuit Operation

Multivibrator is an electronic circuit which will work as two stage amplifier operating in both stable and astable mode. In the multivibrator the output of first stage is given to the second stage and the second stage output is again feed back to the first stage by this the cutoff state will become saturate and saturate state will become to cutoff. Because of the transition of states the multivibrator can be used as oscillators, timers and flip-flops.

Types of Multivibrator:

The multivibrators are divided into three types according to the stability in states.

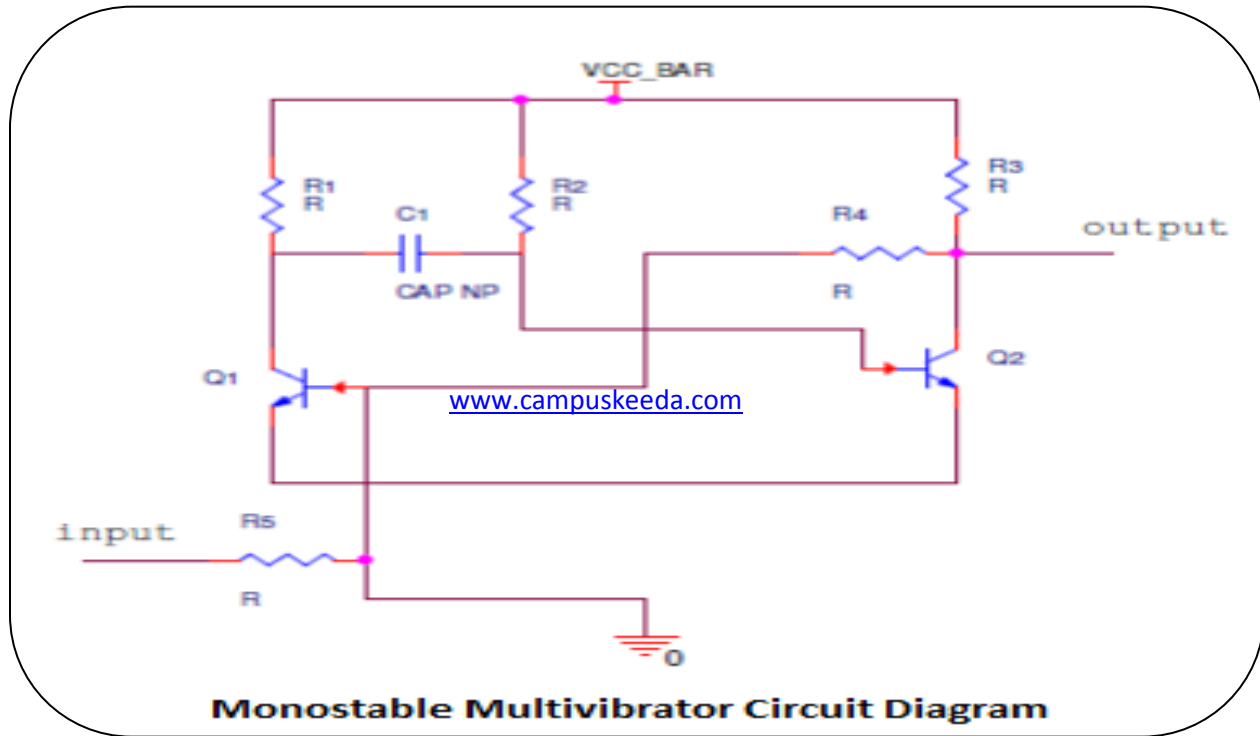
1. **Astable Multivibrator:** This multivibrator will not be stable in both the states; it will rapidly get switches from one state to another state. This type of multivibrator is mainly used as oscillators. Astable multivibrator is also called as free running multivibrators there is no limit or time for switching the states.
2. **Monostable Multivibrator:** Monostable is also called one shot multivibrator. In monostable multivibrator there is one stable state and one astable state. This multivibrator need a trigger (external signal) to enter into the astable state and get back to the stable state after some time period. The time period will be set by the user, the monostable multivibrator is mainly used as timer.
3. **Bi-Stable Multivibrator:** This circuit has both the stable states. Valid trigger will change state; it will be in that state only up to the next trigger. This circuit is mainly used as flip-flops.

### Monostable Multivibrator:

Monostable multivibrator has one stable state and one quasi stable state (astable state). When an external trigger applied to the circuit, the multivibrator will jump to quasi stable state from stable state. After the period of time it will automatically set back to the stable state, for returning to the stable state multivibrator does not require any external trigger. The time period to returning to stable state circuit is always depends on the passive elements in the circuit (resistor and capacitor values)

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### *Circuit Diagram:*



### *Circuit Operation:*

- When there is no external trigger to the circuit the one transistor will be in saturation state and other will be in cutoff state. Q1 is in cutoff mode and put at negative potential until the external trigger to operate, Q2 is in saturation mode.
- Once the external trigger is given to the input Q1 will get turn on and when the Q1 reaches the saturation the capacitor which is connected to the collector of Q1 and base of Q2 will make transistor Q2 to turn off. This is state of turn off Q2 transistor is called astable stable or quasi state.
- When capacitor charges to VCC the Q2 will turn on again and automatically Q1 is turn off. So the time period for charging of capacitor through the resistor is directly proportional to the quasi or astable state of multivibrator when a external trigger occurred ( $t=0.69RC$ ).