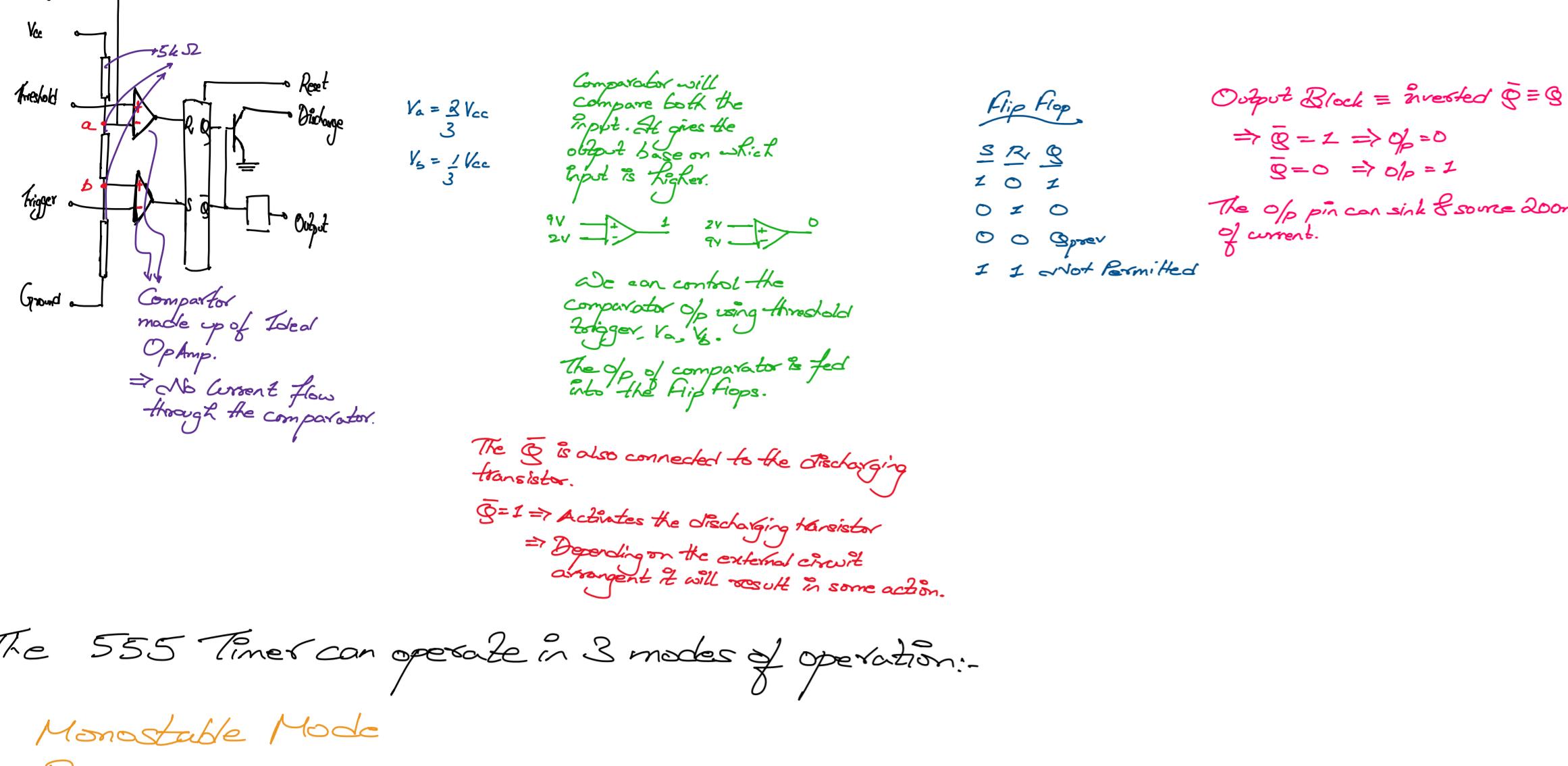


Supply Voltage Max = 18 V

Vcc = 5V to 15V

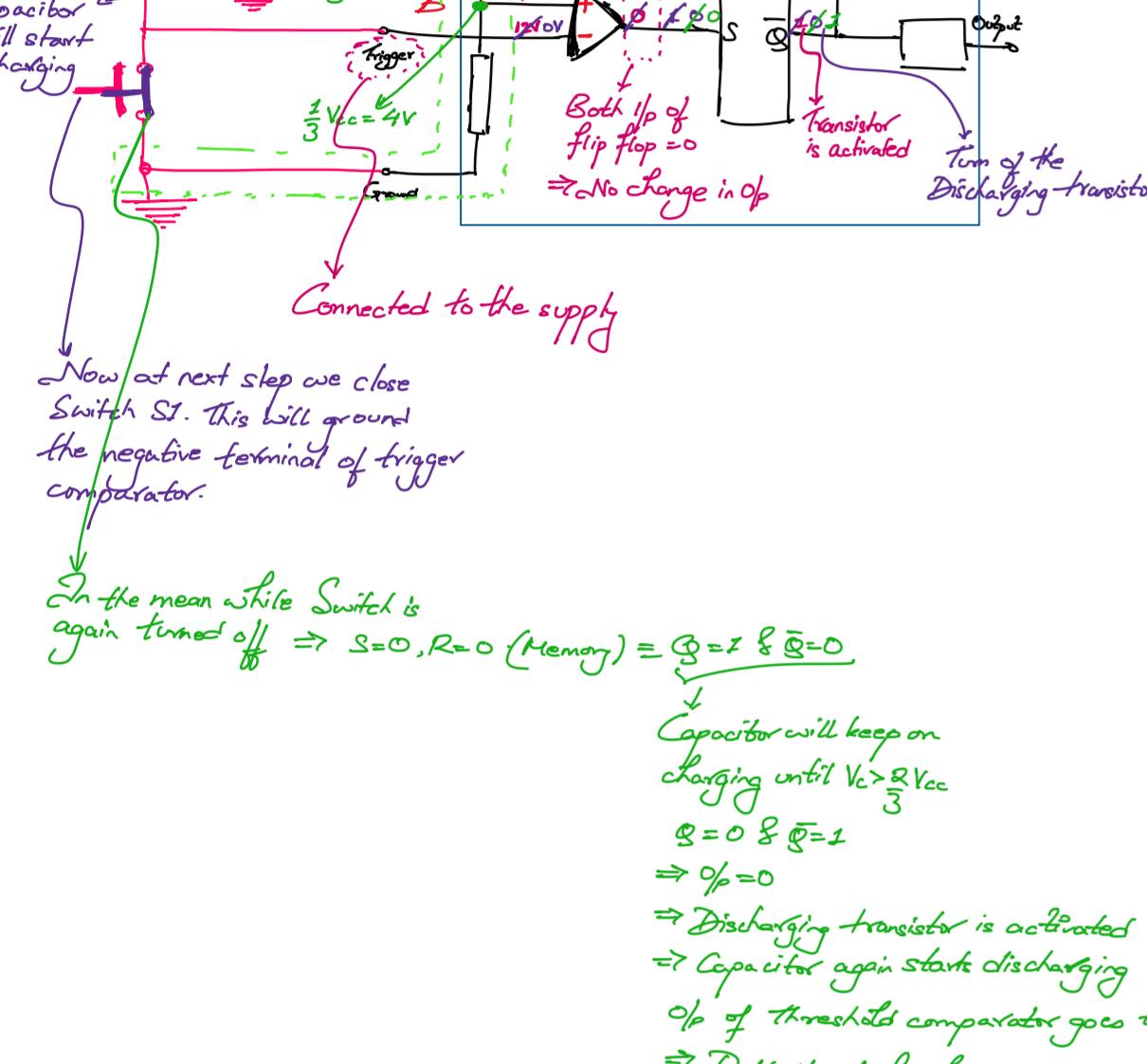
Power dissipation 613 mW to 1183 mW

Temperature 0 to 70°C

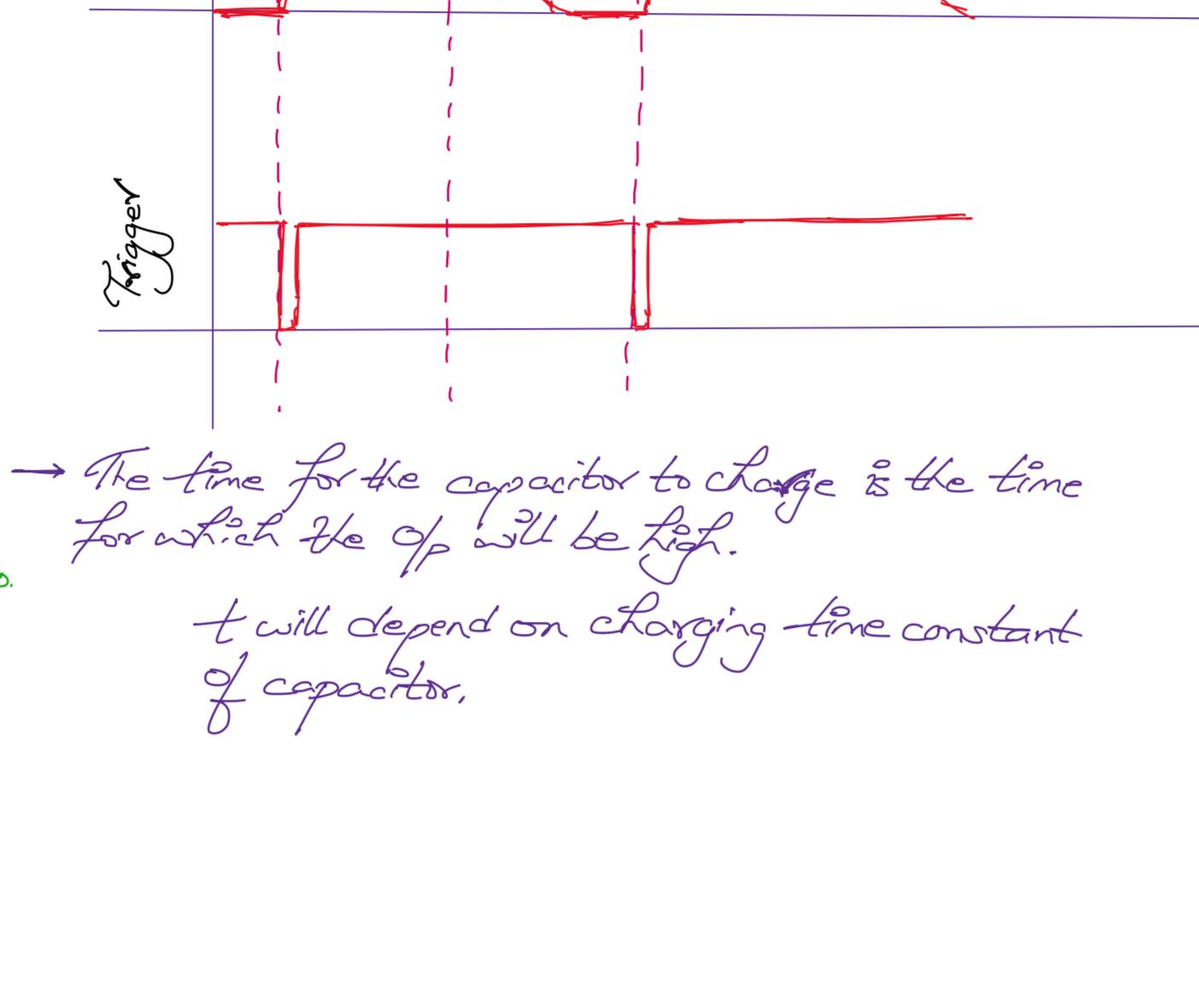


The 555 Timer can operate in 3 modes of operation:-

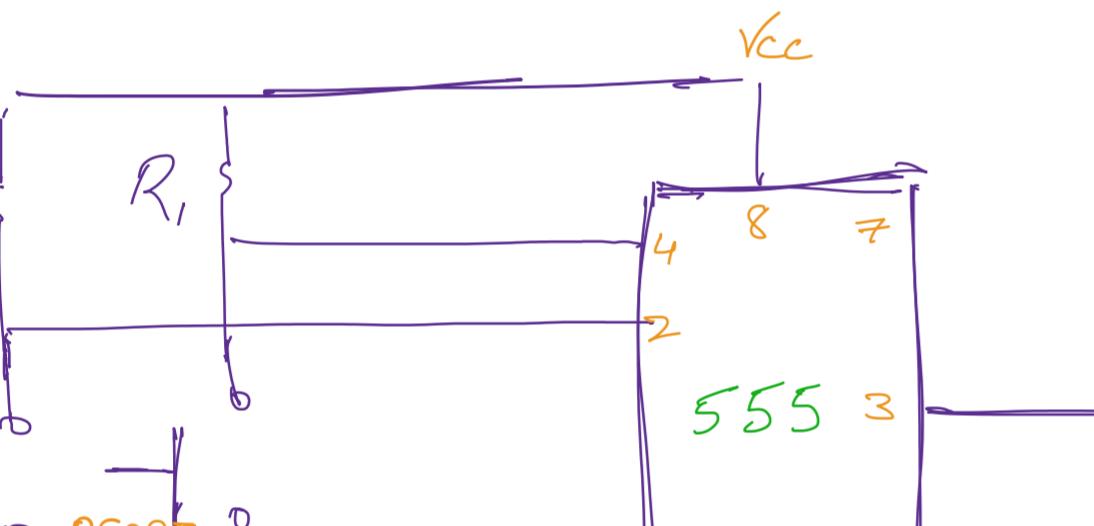
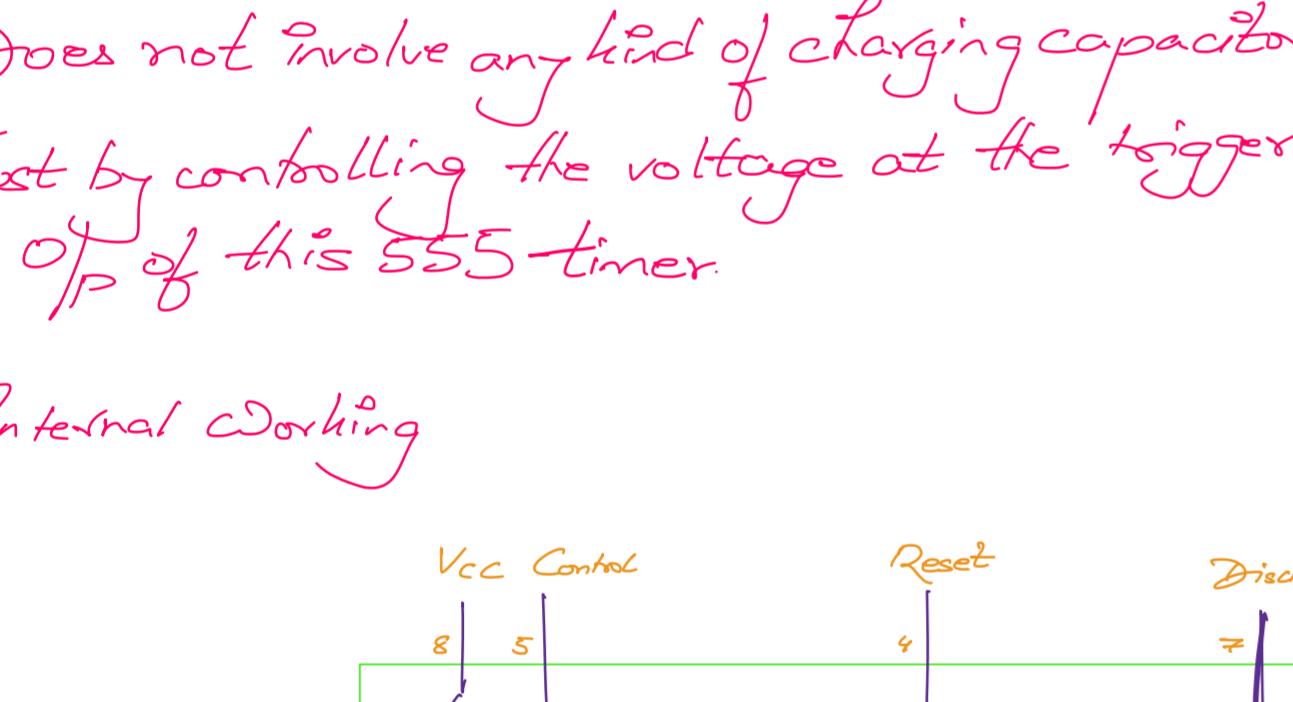
- Monostable Mode
- Bistable Mode
- Astable Mode

Monostable Mode

→ Used in Delay Circuits, Timing Circuits, Temporary Memory, Square Wave generation, etc.

GraphsBistable Mode

- It has 2 stable states.
- At any given time, the output is one of the two states.
- When some external trigger happens, then output moves from one stable state to another.

Circuit

- 1 → Ground
- 2 → Trigger → Connected to Supply Voltages by R_2 & R_1 . ⇒ Whenever set & reset pins are pressed, the trigger pins are grounded.
- 3 → Output → S = 0, R = 0 ⇒ This alters the Q_p of the 555 timer IC.
- 4 → Reset → Connected to ground terminal.
- 5 → Control
- 6 → Threshold → Connected to the ground terminal.
- 7 → Discharge
- 8 → V_{cc}

* Does not involve any kind of charging capacitors.

* Just by controlling the voltage at the trigger & reset pin, we can control the Q_p of this 555 timer.Internal Working

- 1) Threshold pin is connected to ground, the first comparator will always give '0' as the output.
- 2) The trigger pin by default is connected to the supply voltage V_{cc} . So by that logic $V_{cc} > \frac{2}{3} V_{cc}$. ⇒ 2nd Comparator will also be logic 0.
- 3) At any point $S=0$ & $R=0$ for the flip-flop. ⇒ It will store the output of previous state.

- 4) When set pin is pressed, momentarily the pin 2 will be grounded.

- ⇒ Trigger = 0V
- ⇒ Now the 2nd Comparator will show 1 as the output.

- 5) The Q_p of the 1st comparator will still be logic 0.

$$\Rightarrow S=1, R=0 \Rightarrow Q=1$$

- 6) Once the set pin is released, $S=0, R=0 \Rightarrow$

flip flop stores the Q_p of previous state i.e. $Q=1$.

- 7) Now if Reset pin is pressed, flip flop is reset.

i.e. $Q=0 \Rightarrow Q_p$ of 555 timer = 0.

Basic Working

- 1) Threshold pin is connected to ground, the first comparator will always give '0' as the output.

- 2) The trigger pin by default is connected to the supply voltage V_{cc} . So by that logic $V_{cc} > \frac{2}{3} V_{cc}$.

⇒ 2nd Comparator will also be logic 0.

- 3) At any point $S=0$ & $R=0$ for the flip-flop.

⇒ It will store the output of previous state.

- 4) When set pin is pressed, momentarily the pin 2 will be grounded.

⇒ Trigger = 0V

⇒ Now the 2nd Comparator will show 1 as the output.

- 5) The Q_p of the 1st comparator will still be logic 0.

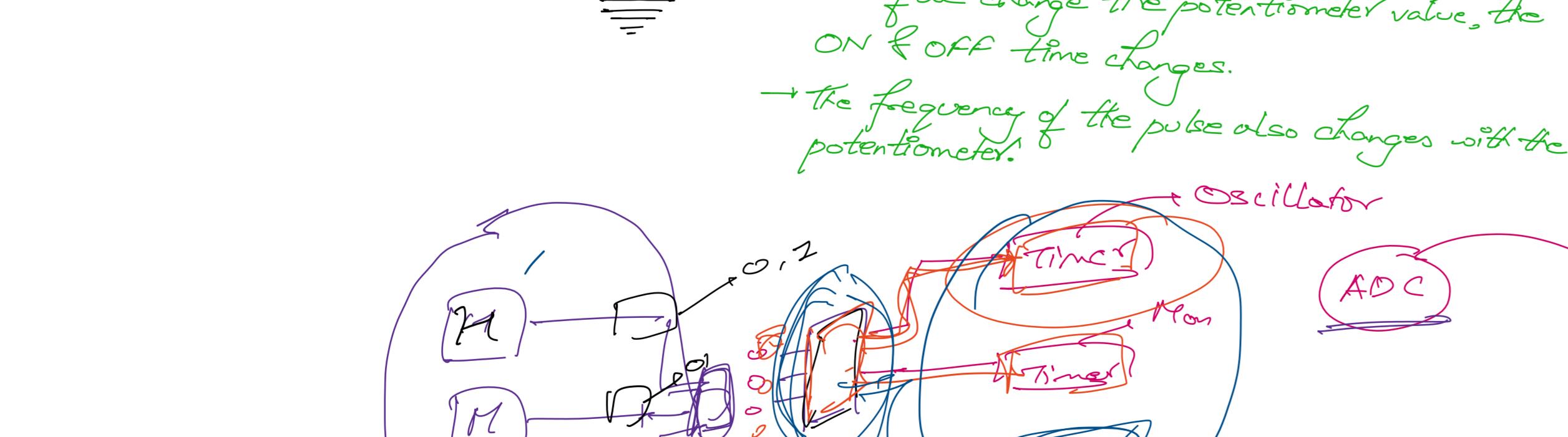
$$\Rightarrow S=1, R=0 \Rightarrow Q=1$$

- 6) Once the set pin is released, $S=0, R=0 \Rightarrow$

flip flop stores the Q_p of previous state i.e. $Q=1$.

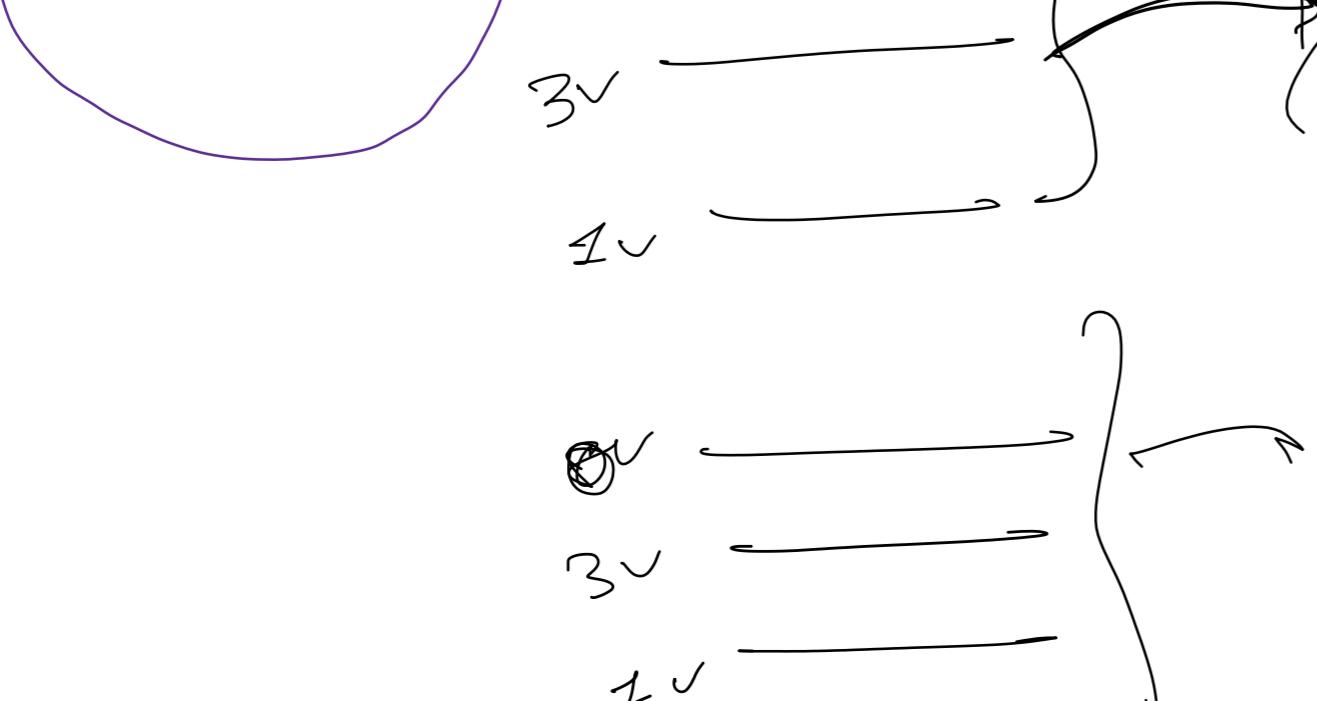
- 7) Now if Reset pin is pressed, flip flop is reset.

i.e. $Q=0 \Rightarrow Q_p$ of 555 timer = 0.

555 Timer PWM Generator

So if we change the potentiometer value, the ON & OFF time changes.

The frequency of the pulse also changes with the potentiometer.



Oscillator

Normal

Moisture

Soil

Moisture