**ASTABLE MULTIVIBRATOR USING IC555**

**Exp No: 9 Date: 7/4/2022**

**Objective:**

**To design, simulate and verify astable multivibrator using IC555 on LT Spice.**

**Software Required:**

LT SPICE - XVII

**Theory:**

Astable Multivibrator Circuits: -

Astable Multivibrators are the most commonly used type of multivibrator circuit. An astable multivibrator is a free running oscillator that have no permanent “meta” or “steady” state but is continually changing its output from one state (LOW) to another state (HIGH) and then back again. This continual switching action from “HIGH” to “LOW” and “LOW” to “HIGH” produces a continuous and stable square wave output which switches abruptly between the two logic levels making it ideal for timing and clock pulse applications.

As with the previous monostable multivibrator circuit above, the timing cycle is determined by the RC time constant of the resistor-capacitor, RC Network. Then the output frequency can be varied by simply changing the value(s) of the resistors and capacitor in the circuit.

Regenerative switching circuits such as Astable Multivibrators are the most commonly used type of relaxation oscillator because not only are they simple, reliable and ease of construction they also produce a constant square wave output waveform.

Unlike the Monostable Multivibrator or the Bistable Multivibrator we looked at in the previous tutorials that require an “external” trigger pulse for their operation, the Astable Multivibrator has automatic built in triggering which switches it continuously between its two unstable states both set and reset.

The Astable Multivibrator is another type of cross-coupled transistor switching circuit that has NO stable output states as it changes from one state to the other all the time. The astable circuit consists of two switching transistors, a cross-coupled feedback network, and two time delay capacitors which allows oscillation between the two states with no external triggering to produce the change in state.

Diagram, schematic

Description automatically generated

**Procedure: -**

1. **Open LT Spice and click on new schematic to start the circuit making.**
2. **Components needed are: wires, ground, resistor, op-amp and voltage sources.**
3. **Place them all in the required way as per the requirement of circuit analysis.**
4. **Perform required analysis like transient or ac etc. (simulation commands)**
5. **Run the schematic once the circuit is complete**
6. **Click above the ac input voltage source for the input signal**
7. **Click above the load resistor to obtain the output signal.**
8. **Analyse the input and output obtained from the circuit analysis on LT Spice.**
9. **Save the schematic and continue further analysis if required.**

ASTABLE MULTIBIBRATOR: -

CIRCUIT: -

Diagram, schematic

Description automatically generated

OUTPUT:

A picture containing chart

Description automatically generated

**RESULT: -**

**Thus, Astable Multivibrator using IC555 is designed, tested and verified using LTSPICE.**