Lesson 1456 Experiment 2

The Monostable Multivibrator
Monostable Operation

A timer IC produces a single rectangular pulse of a specified or particular pulse duration.
Monostable Multivibrator

- A Monostable Multivibrator has two states
  - The first is the *standby* state, which exists until the monostable is triggered by a pulse on pin-2.
Pin 2 must be brought low to trigger the monostable

The second state is the duty cycle in which the pin-3 output is high.
Once the duty cycle is over, the monostable goes back to the standby state until the next trigger pulse on pin-2.
Things to note before constructing Figure 8

- You **will not be** asked to measure and compare the length of the duty cycle with calculated values.
- This is due to the wide tolerances of Electrolytic Capacitors.
Electrolytic Capacitors have a tolerance on their **marked values** which **can range from -20%, +80%**.

This means the capacitor you use can have a value which is quite different than the one we used preparing the experiment.
Monostable Multivibrator, Fig 8

[Diagram of a monostable multivibrator circuit with details on the components such as 555 Timer, 10KΩ, 47KΩ, 1KΩ, 100µF, 0.01µF, +Vcc, GND, and LED with a jumper wire.]
Discussion on Experiment 2

- You will be changing the values of $R_A$ and $C_1$ to help you understand how the RC time constant affects the duty cycle of the monostable multivibrator.
What is the Duty Cycle again?
- The time the output of the monostable vibrator is high.

Fig 9 is a graph to help you see RC combinations that will cause specific time delays.
Fig 9 Graph of RC Combinations

C - Capacitance (μF)

t_d - Time Delay

100s 10s 1s 100ms 10ms 1ms 10μs 10μs
To use the chart, simply select the time delay required; move up the graph to the line that corresponds to the resistor value you have chosen; and then move to the left to find the capacitor value.
Fig 9 Graph of RC Combinations

C - Capacitance (μF)

$\tau_d$ - Time Delay

10μs 10μs 1ms 10ms 100ms 1s 10s 100s
Building your circuit

- Remember the basics
- Remember where Pin 1 and 8 are located on the IC
- Center the IC on the divider strip on the Breadboard
Make sure you do not short out the component leads

Spread your circuit out to make it easier to follow the connections.

Use different color jumpers for the VCC and GND connections.
Make sure you pay attention to component polarities

Electrolytic capacitors have a polarity which you need to follow.

Diodes have a polarity as well

The band is the cathode on a diode

The short lead or notch side on an LED is the cathode
Monostable Multivibrator, Fig 8

![Monostable Multivibrator Circuit Diagram]
Close-up of Monostable Multivibrator
Questions?
The End

Developed and Produced by the Instructors in the CIE Instruction Department.
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