



DLD Project

2 Digit Stopwatch

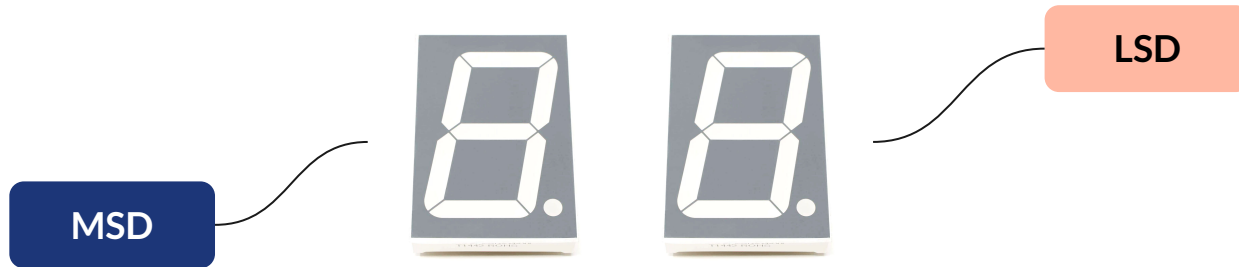
By

Mahekaash Kumar, Usman Arif, M.Owais Siddiqi



Introduction

The group members have assembled a simple yet effective, 2 digit stopwatch. There is also a button to reset the timer to 00.





Logic & Working

1. Timing Circuit

The timing circuit generates one second delay using **555 timer based astable multivibrator**. We have used two resistors ($R1=33k$, $R2=56k$) and one capacitor ($10\mu F$) after calculating the required frequency using the following formula.

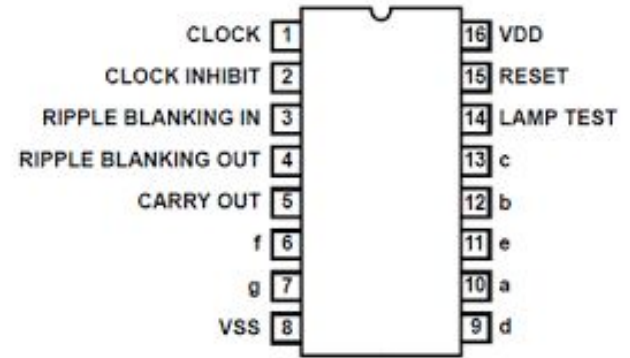
$$F=1/T= 1.44/(R1 + 2R2) C1$$

Logic & Working

2. IC CD4033 - Johnson counter

This is a counter and also a seven segment decoder. It receives clock signals and according to the clock pulses, it increments the counter and displays it through a 7 segment display.

The counter is reset by setting the RESET pin to HIGH.

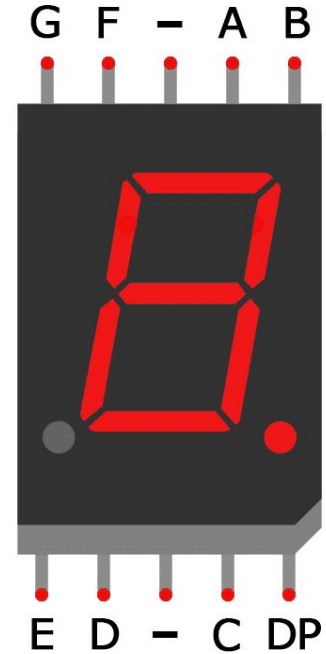


Logic & Working

3. 7 Segment Common Cathode Display

To turn on a segment, you set its associated pin to HIGH.

Each segment (A - G) is connected to the corresponding outputs (a - g) from the IC CD4033.



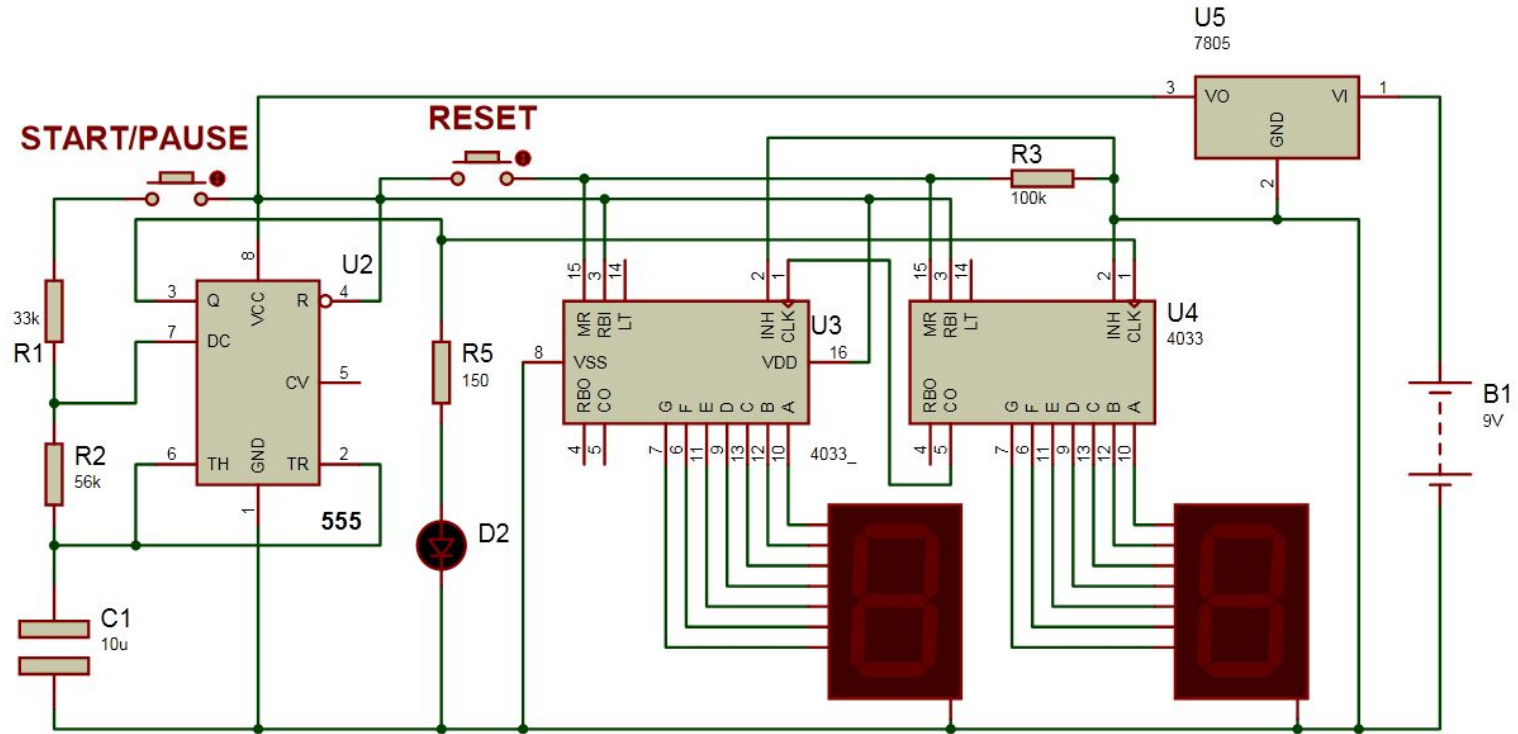


Logic & Working

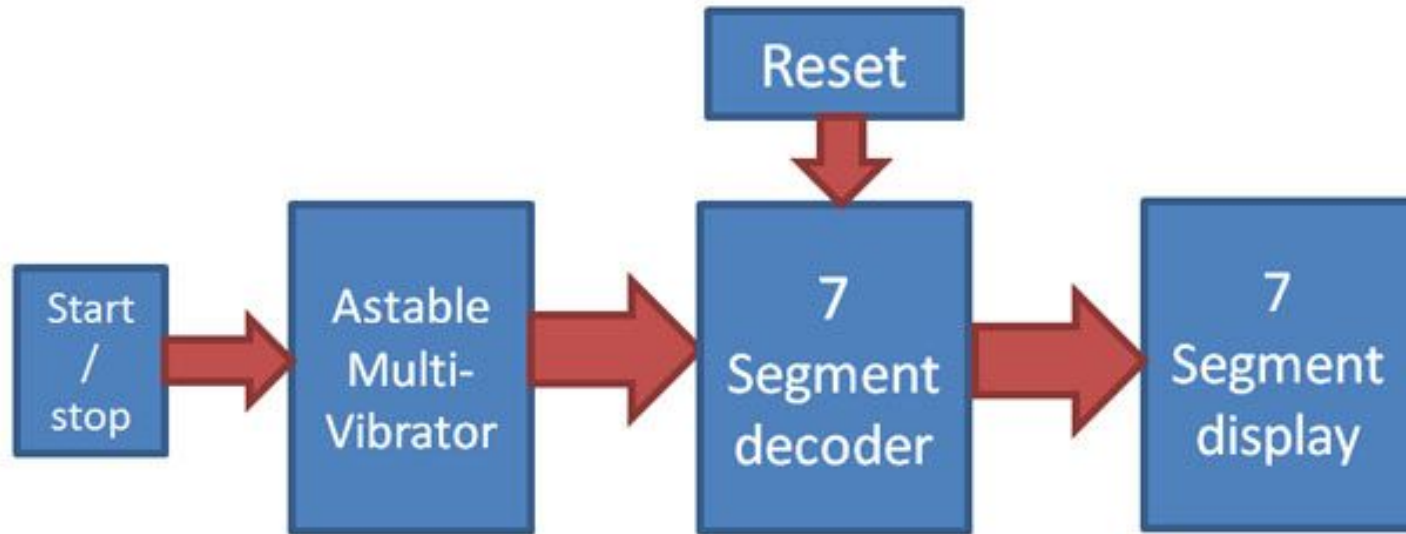
4. The Stopwatch

The IC of the LSD gives a carry out signal after counter reaches 9. This carry out signal is the clock for IC of MSD, while the 555 timer provides the clock for LSD IC.

This ensures that the LSD increments according to the timing circuit, and the MSD increments according to LSD



Circuit Diagram



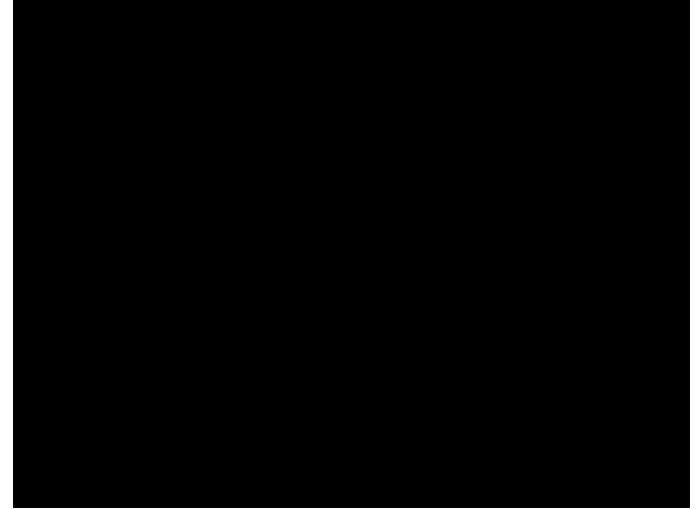
Block Diagram



Output

The LSD increments with each second until it reaches 9, after which it resets to 0. With every reset of the LSD, the MSD increments until it also resets after reaching 9.

The result is that the 2 digit counter increments with a time period of 1 second, until it reaches 99. After this, the counter resets to 00.



video of project