ISSN 2349-7815

International Journal of Recent Research in Electrical and Electronics Engineering (IJRREEE)
Vol. 5, Issue 1, pp: (19-23), Month: January - March 2018, Available at: www.paperpublications.org

Digital Stop Watch Using 555 Timer

Chilakala Haritha

Abstract: **This paper presents the design of a Digital Stop Watch Using 555 Timer.It displays 60sec. A time-based oscillator containing a 555 timer Integrated Circuit (IC) in an astable mode with a frequency of 1Hz provides the clock pulses for the seconds display and two counter ICs to carry out the counting operation. The counter ICs connected in cascading format and each counter output is connected to Bcd To Seven Segment Counter used to drive the 7 segment displays.**

Keywords: **Digital Stop Watch, Integrated Circuit (IC), frequency, display.**

1. INTRODUCTION

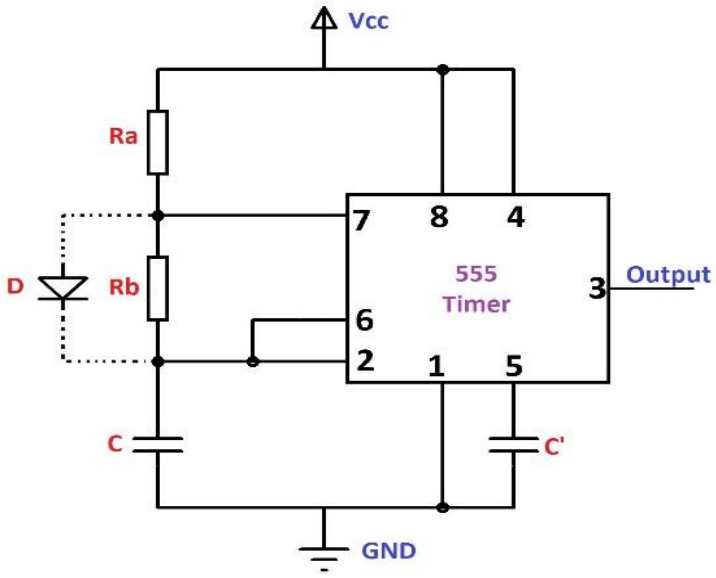
This **digital stopwatch circuit** can be worked as a clock in this counter will advance after every one second. When you provide power supply it start its counting from zero and you can stop the timing with the help of switch.Timer can be adjusted by rotating preset clockwise or anticlockwise.It can be used in playing games.Helpful while cooking,studying, medical field and ind IC CD4033

555 Timer:

The 555 timer IC is an 8 pin integrated circuit used in a variety of timer, pulse generation, and oscillator applications. The 555 can be used to provide time delays or as an oscillator.

The 2 common operating modes of the 555 timer IC are:

Monostable mode: In this mode, the 555 functions as a "one-shot" pulse generator. Applications include timers, missing pulse detection, bouncefree switches, touch switches, frequency divider, capacitance measurement, pulse-width modulation (PWM) and so onAstable (free-running) mode: The 555 can operate as an oscillator.

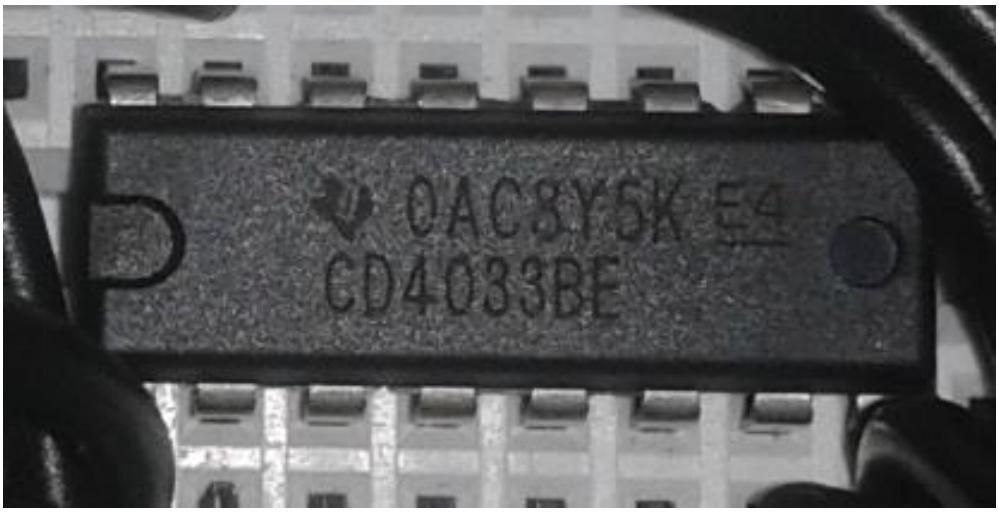


ISSN 2349-7815

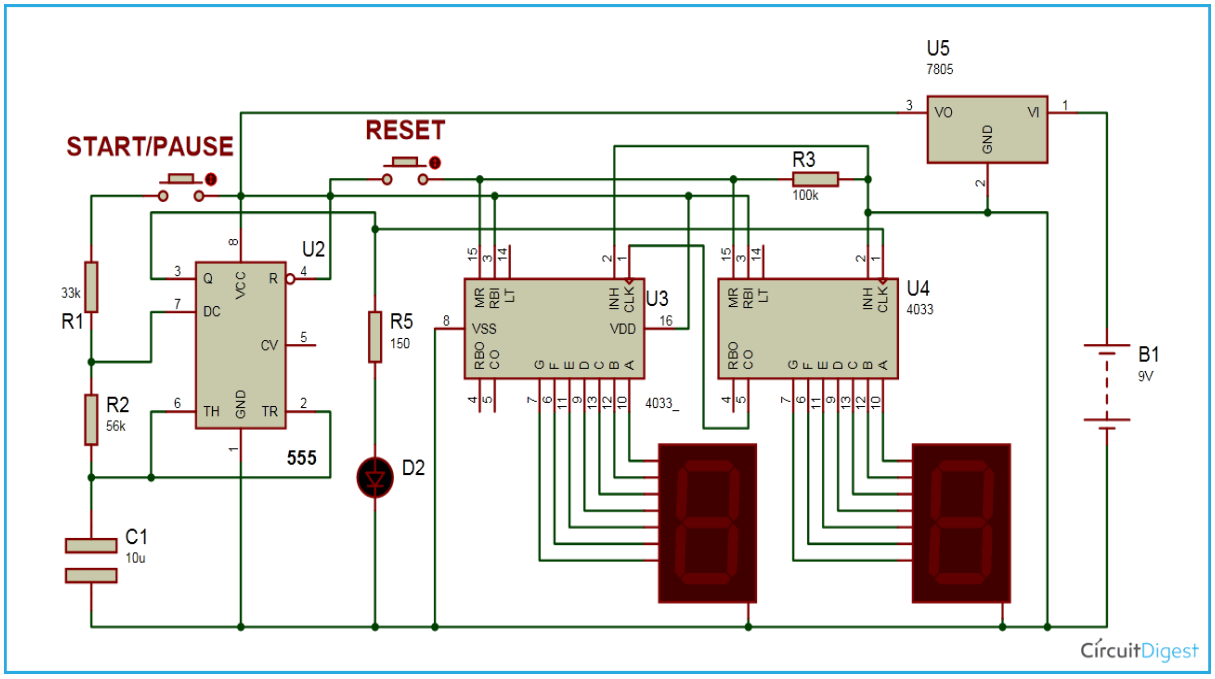
International Journal of Recent Research in Electrical and Electronics Engineering (IJRREEE)
Vol. 5, Issue 1, pp: (19-23), Month: January - March 2018, Available at: www.paperpublications.org

IC CD4033:

This is counter and seven segment decoding in one package IC which is very easy to interface with seven segment displays. This is fully static counter operational IC and ideal for low power displays. This IC can be used for decade counting seven segment decimal displays, frequency division seven segment decimal displays, clocks, watches, timers, counter/display driver for meter applications.



Circuit Diagram:



Working of digital stop watch using 555 timer:

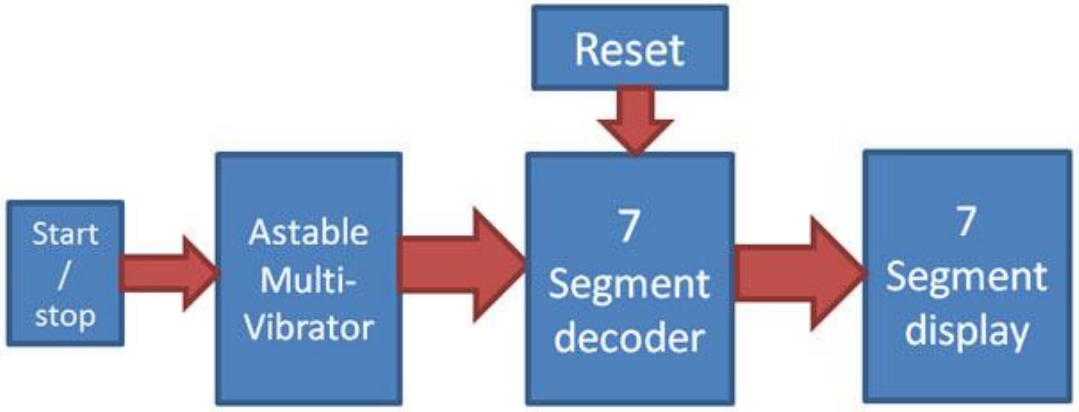
The circuit operation begins once the normally open switch is changed to closed position. one second delay is generated by using **555 timer based astable multivibrator**. The time period of counter can be calculated by following formula-

T = 0.7 (R1 + 2*R2)*C1

Ass Astable multi-vibrator generates one seconds delay, this delay is oscillations or pulse of 0 and 1. So we will use this pulse for triggering the seven segment decoder then seven segment decoder changes the digit number with the one second of time period.

ISSN 2349-7815

International Journal of Recent Research in Electrical and Electronics Engineering (IJRREEE)
Vol. 5, Issue 1, pp: (19-23), Month: January - March 2018, Available at: www.paperpublications.org

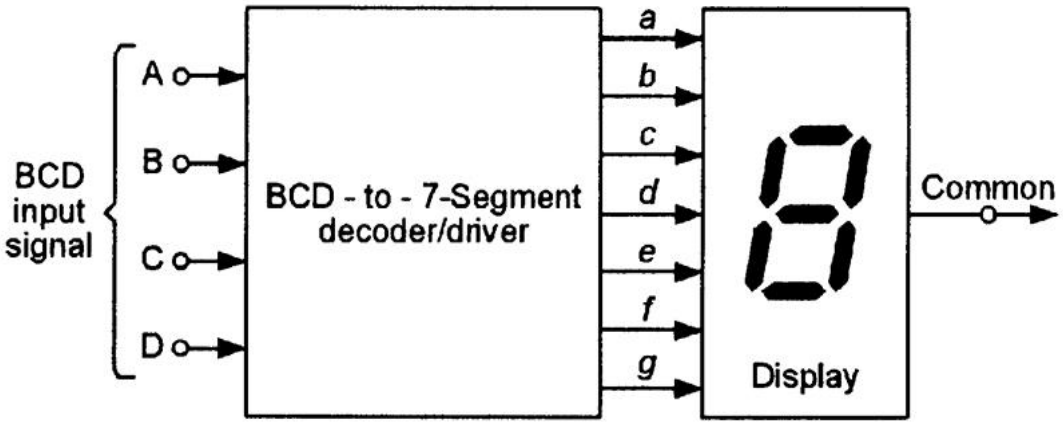


When we ON the stopwatch (by start/stop button) it start counting from zero and if we turned OFF the same button then counting is stop or pause until again turned ON the same button or press reset button.

There are two seven segments, so this **stopwatch circuit** can count 00-99 seconds time.

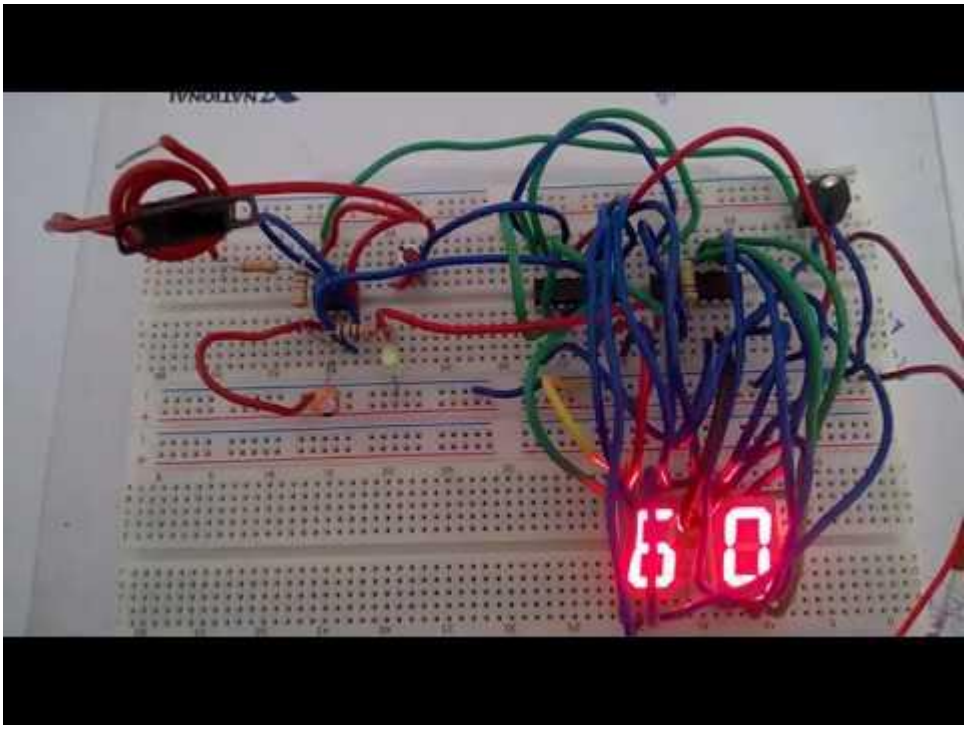
BCD to Seven Segment decoder:

Decimal Digit	Input lines				Output lines							Display pattern
	A	B	C	D	a	b	c	d	e	f	g	
0	0	0	0	0	1	1	1	1	1	1	0	
1	0	0	0	1	0	1	1	0	0	0	0	
2	0	0	1	0	1	1	0	1	1	0	1	
3	0	0	1	1	1	1	1	1	0	0	1	
4	0	1	0	0	0	1	1	0	0	1	1	
5	0	1	0	1	1	0	1	1	0	1	1	
6	0	1	1	0	1	0	1	1	1	1	1	
7	0	1	1	1	1	1	1	0	0	0	0	
8	1	0	0	0	1	1	1	1	1	1	1	
9	1	0	0	1	1	1	1	1	0	1	1	



ISSN 2349-7815

International Journal of Recent Research in Electrical and Electronics Engineering (IJRREEE)
Vol. 5, Issue 1, pp: (19-23), Month: January - March 2018, Available at: www.paperpublications.org



Digital Stop Watch:

2. CONCLUSION

Despite that the cost of producing digital clocks is higher than that of analog clocks; digital clocks are more common and independent of external source. Analog clocks in most cases uses scale and a pointer, due to this, it is susceptible to parallax and human errors while taking readings which make it less accurate. The design of this digital clock can be altered to perform many applications and can be later changed when improvement are required. This saves both time and money when a field upgrade is required. However, there are limitations with respect to processing power and memory. This digital clock makes use of a 555 timer IC wired in an astable mode and designed to give output pulse of 1Hz i.e. one second for one complete cycle. The BCD counters are cascaded and various processes are undergone. The use of BCDs allows two BCD digits to be stored within a single byte (8-bits) of data, allowing a single data byte to hold a BCD number in the range of 00 to 99.

REFERENCES

[1] Pan, T. (2008), Development and Implementation of Microcontroller-based Digital Clock, Journal of Academy of Science and Technology, Vol III, Myanmar.

[2] Nachum, A. (2011), Basic Electronics Technology (Series), Scientific Education Systems, SES, Rishon-Lezion 75151 Israel.

[3] G.S.M Galadanci, etal (2015), Design and Deveelopment of a Microcontroller-Based Timing System, Bayero Journal of Physics and Mathematical Sciences, 4:2:91.

[4] Shetty, D. and R. A Kolk, (1997), Mechatronics System design, 2nd Edition, PWS Publishing Company, Boston, MA.

[5] Farcas, etal, (2005), Transparent Distribution of Real-Time Components Based on Logical Execution Time, 1:1, Department of Computer Science, University of Salzburg, Austria.

[6] Aggarwal, etal, (2012), Comparative Implementation of Automatic Car Parking System with least distance parking space in Wireless Sensor Networks, International Journal of Scientific and Research Publications,