

555 Timer IC

Astable Operation (Operates like an oscillator)

$$f = \frac{1}{T} = \frac{1.49}{(R_A + 2R_B)C}$$

$$t_{High} = 0.69(R_A + R_B)C$$

$$t_{Low} = 0.69R_B C$$

$$T = t_{High} + t_{Low}$$

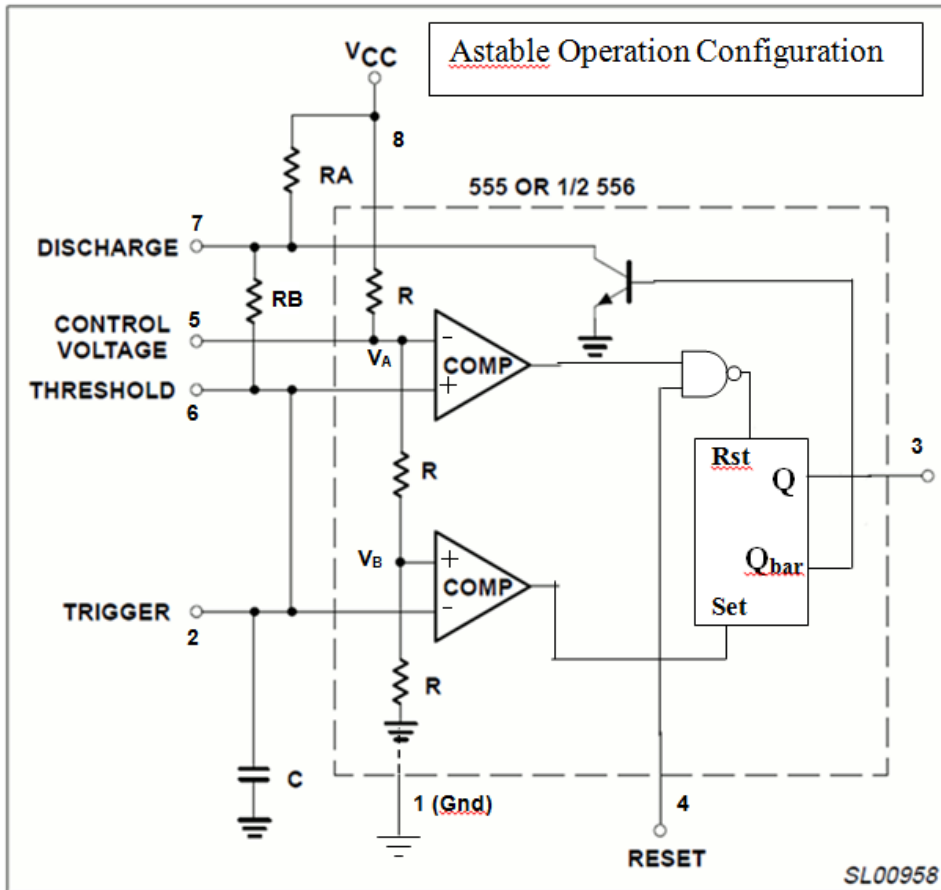
Design Approach:

1. Choose C to get the frequency range you want
2. Choose RB to get the required frequency
3. Choose RA ~0.1RB (1 kOhm min)

If you want to use a pot, make it RB.

(<http://www.kpsec.freeuk.com/555timer.htm> and table)

555 astable frequencies			
C1	R2 = 10kΩ R1 = 1kΩ	R2 = 100kΩ R1 = 10kΩ	R2 = 1MΩ R1 = 100kΩ
0.001μF	68kHz	6.8kHz	680Hz
0.01μF	6.8kHz	680Hz	68Hz
0.1μF	680Hz	68Hz	6.8Hz
1μF	68Hz	6.8Hz	0.68Hz
10μF	6.8Hz	0.68Hz (41 per min.)	0.068Hz (4 per min.)



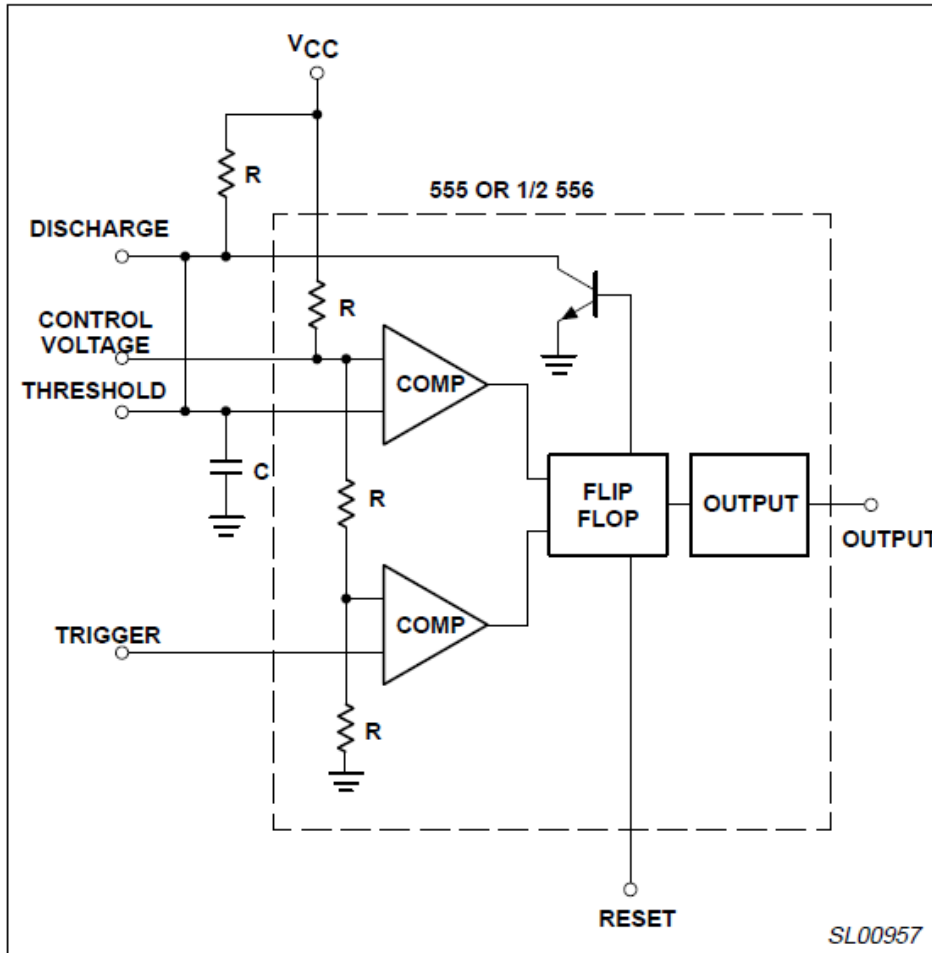
Source: Philips NE555 and NE556 applications note AN 170

Mono-stable Operation (One shot)

Period, T (output high) = $1.1 RC$

Notes:

1. Tie Reset to V_{cc} unless you need to reset the output



Source: Philips NE555 and
NE556 applications note AN 170

Figure 4. Monostable Operation

References:

- <http://www.sentex.ca/~mec1995/gadgets/555/555.html>
- <http://www.kpsec.freeuk.com/555timer.htm>
- <http://www.electronics-tutorials.com/devices/555.htm>
- <http://www.williamson-labs.com/555-tutorial.htm>
- http://www.doctrionics.co.uk/pdf_files/555an.pdf
- <http://www.national.com/mpf/LM/LM555.html>
- <https://homepages.westminster.org.uk/electronics/555.htm>