

1. Study the 555 Timer, see pages 1369 – 1374 of Sedra/Smith, “Microelectronic Circuits,” 6th edition. More data including pin numbers is available at http://en.wikipedia.org/wiki/555_timer_IC. A full data sheet is at <http://www.ti.com/lit/ds/symlink/ne555.pdf>

The package available is the 8 pin one. For this experiment make a design for each of a) Astable (=continuous pulse generator), b) bistable (=flip-flop) and c) Monostable (=triggered one-shot). The connections are shown below.

2. Beginning with the astable configuration, start with typical values of the TI data sheet: $R_1=3.9\text{K}\Omega$, $R_2=3\text{K}\Omega$, $C=0.01\mu\text{F}$, $V_{CC}=5\text{V}$. Check, analytically and by experiment, the results. Try several other values of R’s and C’s to check analytical design equations. ($R_1=R_A$ & $R_2=R_b$ on some data sheets)
3. For the monostable design start with $C=1\mu\text{F}$ and R near $91\text{K}\Omega$.
4. Check the behavior of the bistable configuration by set and reset pulses observing the rise and fall times.
5. The Philips application note, AN170 of December 1988, pages 7 – 9, gives several other uses which if time allows would be worth testing. These are also nicely summarized on page 5 of http://www.williamson-labs.com/555_apps.htm.

The following connection diagrams are copied from the Wikipedia web page.

