

1. Study the 555 Timer, see pages 1369 – 1374 of Sedra/Smith, “Microelectronic Circuits,” 6<sup>th</sup> edition. More data including pin numbers is available at [http://en.wikipedia.org/wk/555 timer IC](http://en.wikipedia.org/wk/555_timer_IC). A full data sheet is at <http://www.ti.com/general/docs/lit/getliterature.tsp?genericPartNumber=lm555&fileType=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:  $R_1=RA=3.9K\Omega$ ,  $R_2=RB=3K\Omega$ ,  $C=0.01\mu F$ ,  $V_{CC}=5V$ . Check, analytically and by experiment, the results. Try several other values of R’s and C’s to check analytical design equations.
  3. For the monostable design start with  $C=1\mu F$  and R near  $91K\Omega$ .
  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](http://www.williamson-labs.com/555_apps.htm).
- The following connection diagrams are copied from the Wikipedia web page.

