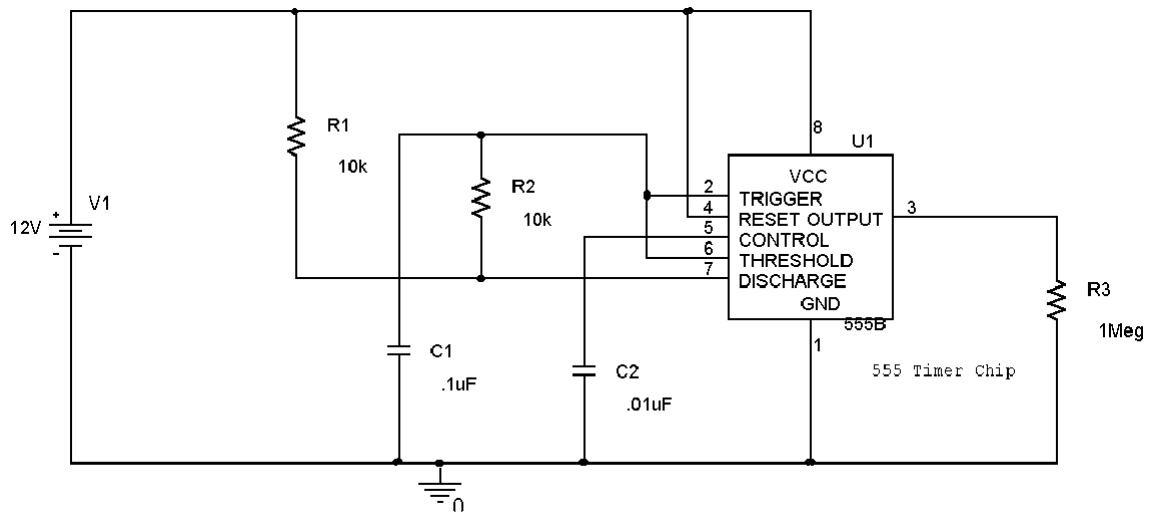
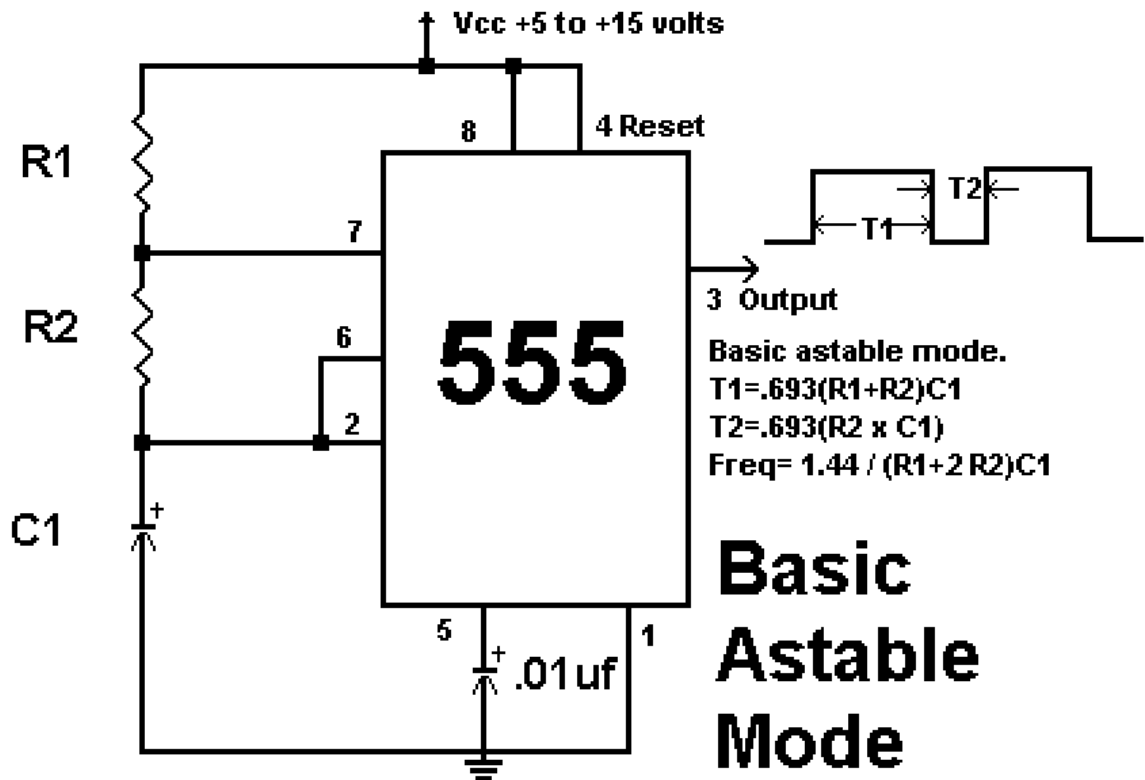


Homework #7
Introduction to the 555 Timer, LEDs and Photodiodes

Here is the 555 timer circuit set up as an astable multivibrator that you have already simulated in experiment 7.



1. Design an Oscillator

Using the circuit you have simulated and the equations in the figure, pick some component values that will produce an output with a frequency equal to about 500Hz, making it look as much like a square wave oscillator as possible. Check your component selection with a PSpice simulation. Each integrated circuit has its limitations. For the 555 timer chip, it is best to keep the currents in the 10s of mA range, if possible. It may be able to handle larger currents, but you have to check to be sure it is behaving correctly. If the lengths of the on and off times are not consistent with the design rules, the components inside the timer chip are not sequencing properly. Include a copy of your calculations, your circuit (from Pspice) and a copy of the output pulses (from Pspice).

2. Photodiodes

Look at the following two links: <http://www.xrefer.com/entry/491299> and <http://www.xrefer.com/entry/491265>. What is the difference between a photodiode and a phototransistor?

3. Op Amps again.....

Read about voltage followers on pages 76-80 in Lunn. What is a voltage follower?