

1. For the astable multivibrator of Figure 11.15, page 1026, do Spice runs using the CA3600 package for its 4007 transistors. For this take $R=2K\Omega$ and $C=100nF$ and label the nodes with the subscripts on the three signal node voltages shown. Submit your Spice results for the three voltages. Do this for two realization of the inverters as follows:
 - a) Use standard CMOS inverters as in the 6 transistor package using only one CMOS pair per inverter and all from one CA3600 package.
 - b) Use two CA3600 packages with each one realizing a CMOS NOR gate following the connection of Figure 10.12, page 967 (except tie all PMOS bulks to VDD and all NMOS bulks to ground).
2. Realize the three state ring oscillator of Figure 11.16 using the 4007 transistors for the (two transistor) CMOS inverters. However, insert 100pF capacitors at the output of each inverter (to ground) [you will need to set some initial conditions for Spice]. Submit curves of the signal voltages at the output of each inverter (all in one plot).