Miniproject 2  
EE 3444, Fall 2008  

This miniproject is intended to provide practice with active filters, D/A converters, comparators, and oscillators.

1. Design an active Chebyshev bandpass filter (0.5 dB ripple) with center frequency of 1 kHz, 3 dB bandwidth of 100 Hz and 20 dB of bandwidth of 300 Hz.

2. Design and test (in Spice) a 3-bit D/A converter that uses a R-2R ladder. R=10kΩ and output voltage must range from 0 to 10 V.

3. You are to design a windowing comparator (using a 741 op amp) that provides a high level output when a voltage of -3.5V is exceeded and a low level output when the voltage drops below +1V.

4. Design and test (in Spice) an astable multivibrator to produce a signal of at least 2V peak-to-peak at 2.5 kHz, with duty cycle of 80%.

A brief writeup should be included and must show (and describe) schematics for each of the stages with component values, analytical computation of each of the parameters requested, and PSPICE plots showing the value of the requested parameters. The writeup should include references by figure or plot number to the results and should explain any deviations between the analytical computation and the PSPICE results. Only include in the report those PSPICE printouts that are necessary for accomplishing the objectives stated above.