ENEE 417 – Spring 2009
Weeks #3 & #4; starting 02/09/09
Design #1: Op-Amp Curve Tracer

a. If Laboratory Projects for weeks 1 & 2 have not been run, do those first.

No report is needed for weeks 1 & 2 but continue to gain working knowledge of the tools, especially LabVIEW, data acquisition, and Spice using transistor models.

b. In this experiment for weeks3 an op-amp curve tracer will be designed, constructed, and tested; use 1458 op-amps and bias them with symmetric + & - voltages of about 15 volts each.

1. Review use of a) the Tektronix 577-177-D1 commercial curve tracer for BJTs and b) curve tracing in PSpice (or Spice) for MOS & BJT.
2. Design an op-amp curve tracer following the circuit shown below. Test this on resistors and diodes; compare with the results from the commercial curve tracer. Using LabVIEW as a signal generator for your op-amp curve tracer, obtain 2N3904 & 2N3906 transistor curves.
3. Using the LabVIEW oscilloscope, obtain a hard copy along with a file of the curves on a disk.
4. Use LabVIEW to computer control the Tektronix oscilloscope and record a file on disk of the curves. Print them on the 417 laboratory printer.
5. For the 4007 CMOS transistors, use the DAQ card to acquire transistor curve data and display on a virtual oscilloscope the drain current ID versus VDS curves with VGS as a parameter for some fixed values of VGS. Compare with curves obtained via Spice using the equivalent RCA 3600 transistor models. For the following circuit you can use a DC supply to give the VGS for a single curve.
6. Write a one to three page report summarizing your results (for this op-amp curve tracer).

(as soon as possible) make a parts list from your final choice of circuit and paper and give this to the laboratory technicians; verify that they will be able to obtain the parts needed.)