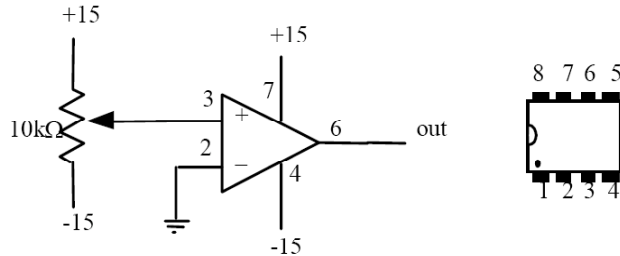


ELECTRONICS

LAB 4: OP-AMPS - Inverting and Non-inverting Circuits

Open loop op-amps:

Test your op-amp by constructing an open loop circuit as shown:

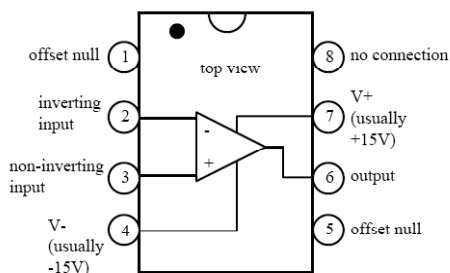


Observe the output voltage as you adjust the wiper of the potentiometer to try to apply 0 V to pin 3 of the op-amp. What happens if you switch the connections to pins 2 and 3?

Closed loop op-amps:

Construct and Test the following:

1. An inverting x10, x100, x 500 and x 0.1 circuit.
2. A non-inverting x10, x 100, x 500 circuit. (Try x0.1 too.)
3. For the inverting x100 circuit, collect data and plot $\log_{10}(V_{out}/V_{in})$ vs. $\log_{10}f$ (a log-log plot) and measure the roll-off slope and determine the unity gain point. (For the roll-off part the theoretical slope should be -1; on your graph, draw a curve with this theoretical slope to show agreement with the data.) Pay attention to the relative phase of the input and output. Does the output stay nicely sinusoidal?
4. Try a square wave at various frequencies, for one of the inverting op-amps. Write down your observations. Try a triangle wave to check the circuit linearity; does the output remain a triangle?
5. Construct the inverting op-amp circuit in Electronics Workbench and include the Bode plot and Oscilloscope trace in your report. (If you're running in Mac Classic mode on an OS X iMac, use the screen shot [⌘-shift-3 for full screen shot, ⌘-shift-4 to select an area for the screen shot] to obtain a hard copy of the Bode plot and scope trace.)
6. Experiment! You'll do more with this op-amp next week.



Pin-out for the 741 op-amp mini-DIP package