

ELG3331: Lab1

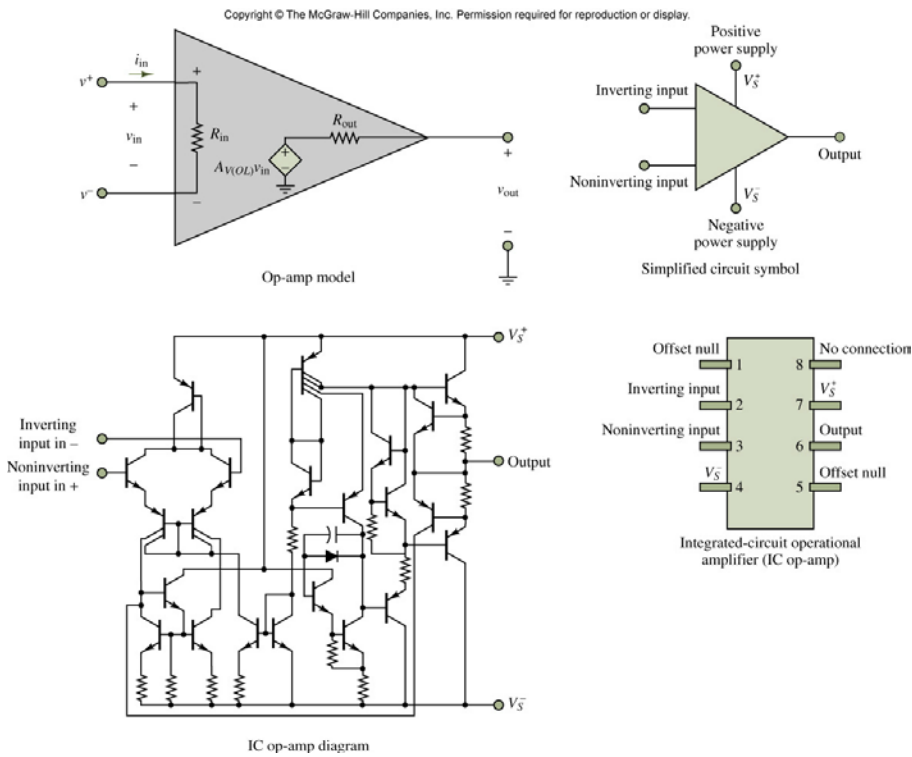
Inverting Operational Amplifier

Objectives

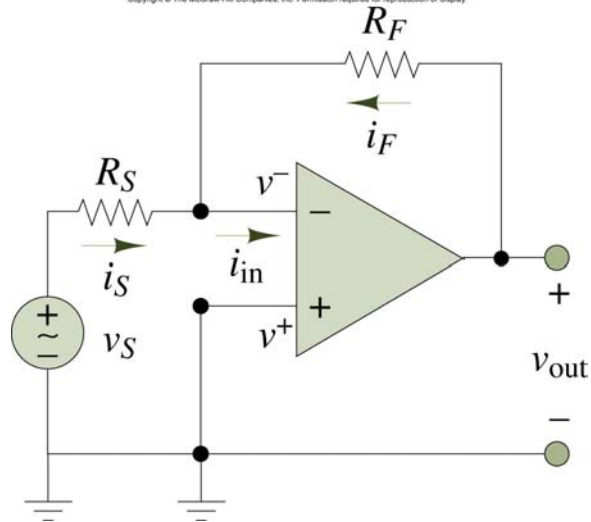
- To introduce operational amplifier circuits.
- To illustrate the power supply regulation properties of operational amplifiers

Theory

The figure below shows the circuit diagram and symbols for the operational amplifier. Refer to Chapter 8 of the textbook for further information.



The experiment deals with the following circuit. Refer to “FOCUS ON METHODOLOGY” pp. 410-412 for op-amp data sheet.



$$v_{out} = -\frac{R_F}{R_S} v_s$$

(Inverting Amplifier Closed-loop Gain)

Experimental Procedure

- Assemble the above circuit with $R_F = 20 R_S$. The power supply should be ± 15 V.
- Measure and plot its output voltage against its input voltage using an oscilloscope. Set the input v_s to a sine wave with frequency 100 Hz and peak-to-peak amplitude 2 V.
- Reduce the power supply to ± 10 V and see what will happen.
- Return to ± 15 V and change the frequency to 100 kHz and see what will happen.

Report

- Comment on how circuit behavior changes when the power supply changes.
- Comment on how circuit behavior changes when the frequency changes.