

# Lab ~~Calculations~~ Calculations #3

EL66N 325

- 1) Supply Voltage:  $-15V - 15V$       Differential Input Voltage:  $-15V - 15V$   
 input offset voltage:  $6mV$       Voltage gain:  $106dB$  typical  
 power consumption:  $50\text{ max}$ ,  $25\text{ min}$   
 output resistance:  $75\Omega$       Bandwidth:  $.7\text{ MHz}$   $\approx 1\text{ MHz}$   
 input resistance:  $2\text{ M}\Omega$       input offset current:  $200\text{ nA}$   
 slew rate:  $.5$  typical

2) Inverting: 
$$\frac{V_x - V_i}{R_1} + \frac{V_x - V_{o1}}{R_2} = 0 \quad V_x = 0$$

$$\frac{-V_i}{R_1} + \frac{-V_{o1}}{R_2} = 0 \quad \frac{-V_i}{R_1} = \frac{V_{o1}}{R_2}$$

$$\boxed{\frac{V_{o1}}{V_i} = -\frac{R_2}{R_1}}$$

Non-inverting: 
$$\frac{V_i}{R_3} + \frac{V_i - V_{o2}}{R_4} = 0 \quad V_i \left( \frac{1}{R_3} + \frac{1}{R_4} \right) = \frac{V_{o2}}{R_4}$$

$$\frac{V_{o2}}{V_i} = R_4 \left( \frac{1}{R_3} + \frac{1}{R_4} \right) = 1 + \frac{R_4}{R_3}$$

$$\boxed{\frac{V_{o2}}{V_{in}} = 1 + \frac{R_4}{R_3}}$$

Voltage follower:

$$\boxed{\frac{V_{o3}}{V_i} = 1}$$

3)  $R_1 = R_3 = 10\text{ k}\Omega$   
 $R_2 = 30\text{ k}\Omega$   
 $R_4 = 50\text{ k}\Omega$

$$\frac{V_{o1}}{V_i} = -1 = -\frac{R_2}{R_1} \quad \cancel{R_1} R_1 = \cancel{R_1} R_2$$

$$\frac{V_{o2}}{V_i} = 6 = 1 + \frac{R_4}{R_3} = 1 + \frac{R_4}{10000} \quad \cancel{R_3} R_4 = 50000$$