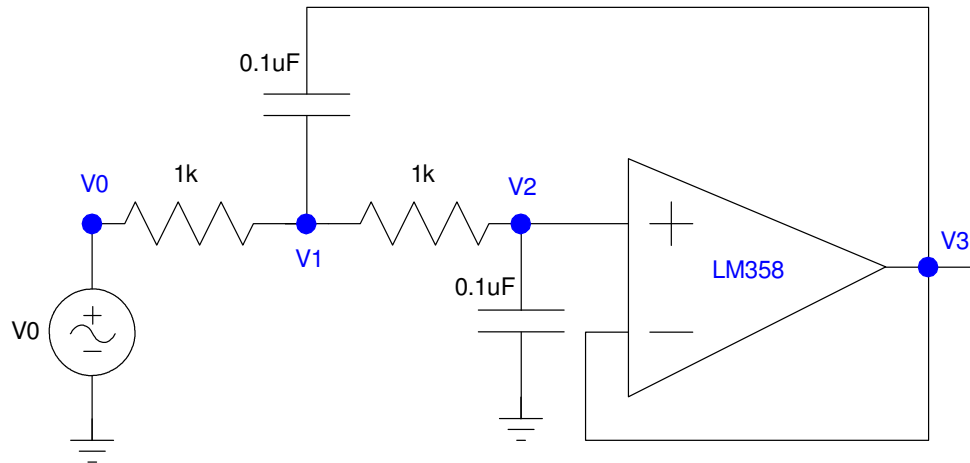


ECE 211: Homework #8

Phasors & Op-Amps, Active Filters, Superposition

Phasors & Op-Amps



Problems 1-3

1) Let V_0 be a $3V_{pp}$ $1kHz$ sine wave

$$V_0 = 1.5 \sin(6280t)$$

- Find the phasor representation for each element in this circuit
- Write the voltage node equations

2) Solve for $\{V_1, V_2, V_3\}$

3) Simulate this circuit using CircuitLab. Measure the signals at $\{V_1, V_2, V_3\}$

- Magnitude and phase

Lab

4) Build this circuit using your lab kit

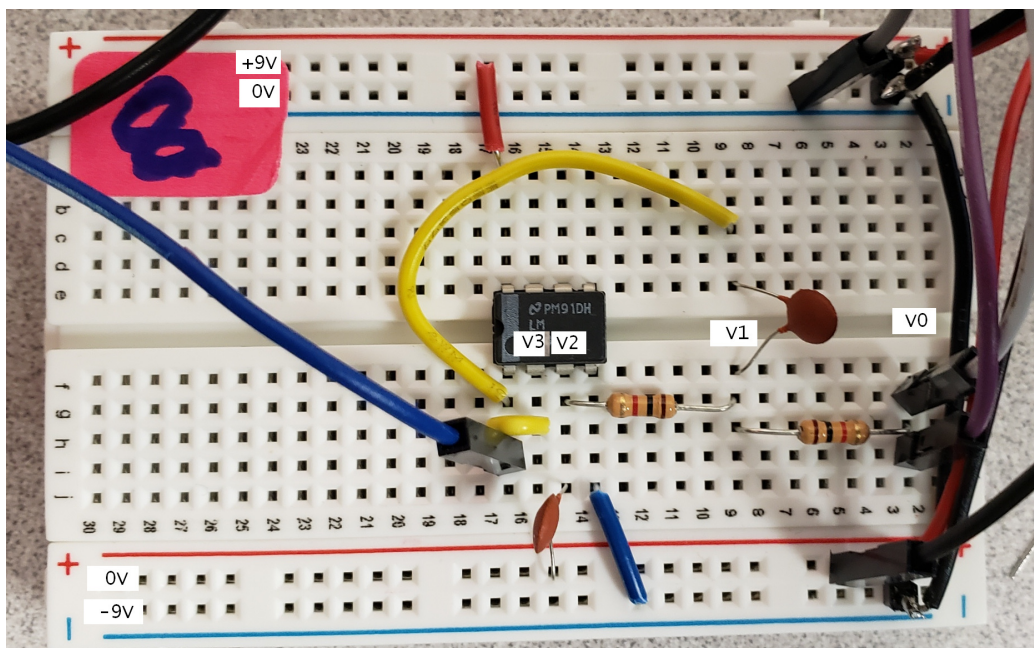
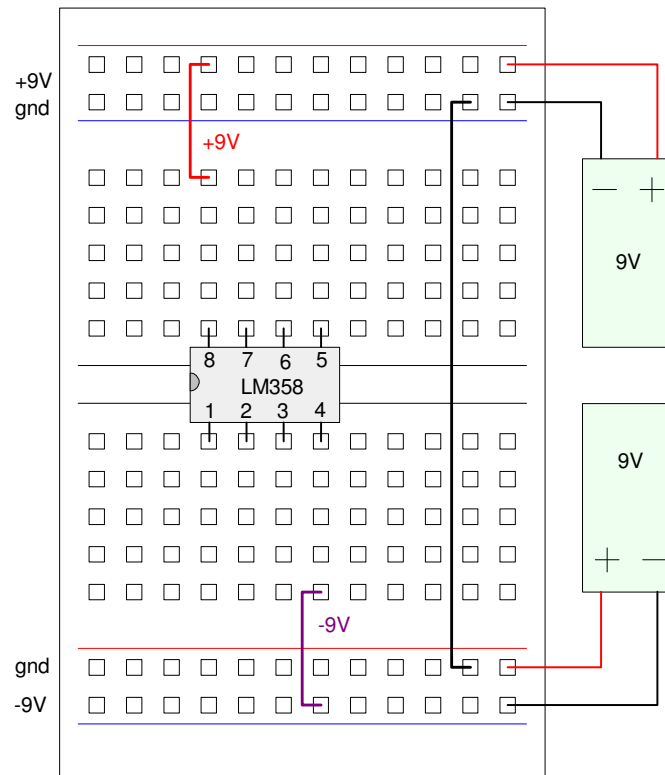
- Set V_0 to be a $3V_{pp}$ $1kHz$ sine wave using your FNRSI signal generator
- Use two 9V batteries to provide $+9V$ and $-9V$ to your breadboard
- Include a photo of your finished breadboard

5) Measure the voltages at $\{V_1, V_2, V_3\}$

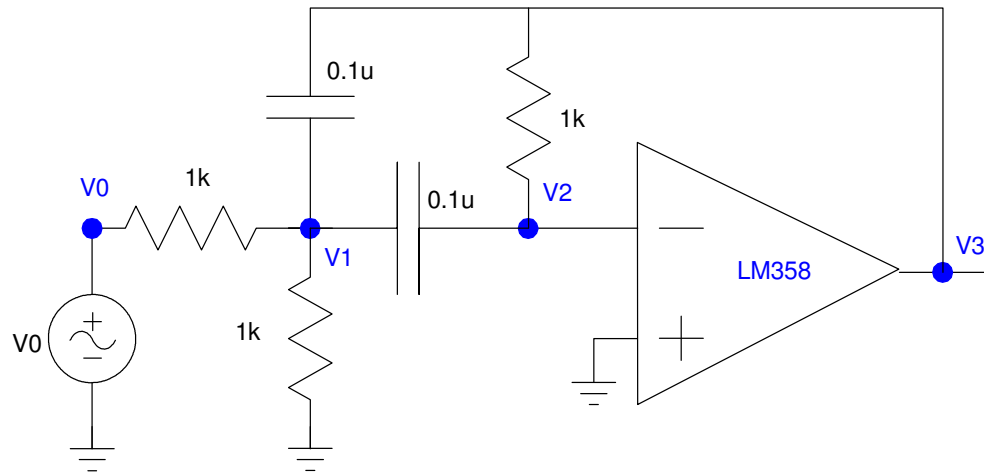
- Magnitude & phase

note:

- Use two 9V batteries to create +9V, 0V, and -9V to power your op-amp.
- Use the LM358 op-amp



Active Filters



6) Let V_0 be a 3Vpp 2kHz sine wave

$$V_0 = 1.5 \sin(12560t)$$

- Find the phasor representation for each element in this circuit
- Write the voltage node equations

7) Solve for $\{V_1, V_2, V_3\}$

8) Simulate this circuit using CircuitLab. Measure the signals at $\{V_1, V_2, V_3\}$

- Magnitude and phase