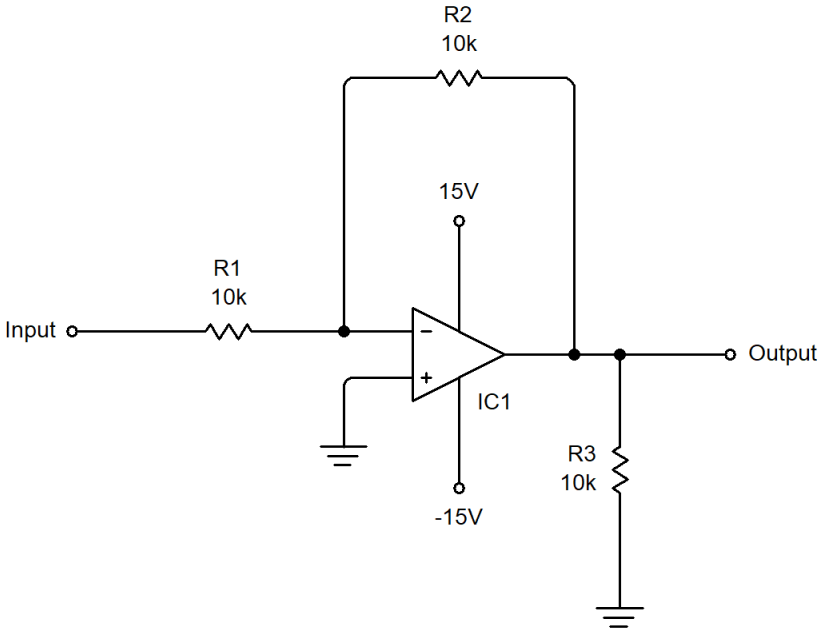
A211
Lab #14-2

First an Inverting Amplifier

1. Build the circuit to the right on your breadboard. The Binding posts (Red,Green,Black) on the breadboard do not make a connection to anything. Typically you must use the wires connected to them to connect to the breadboard. I have already done this for you. 😊

   The V+ is coming from the right side adjustable supply on the RED wire, V- is coming from the left side adjustable supply on the Black wire, and GND on the Green wire. It should be set to that the Right voltage control effects both + and -.

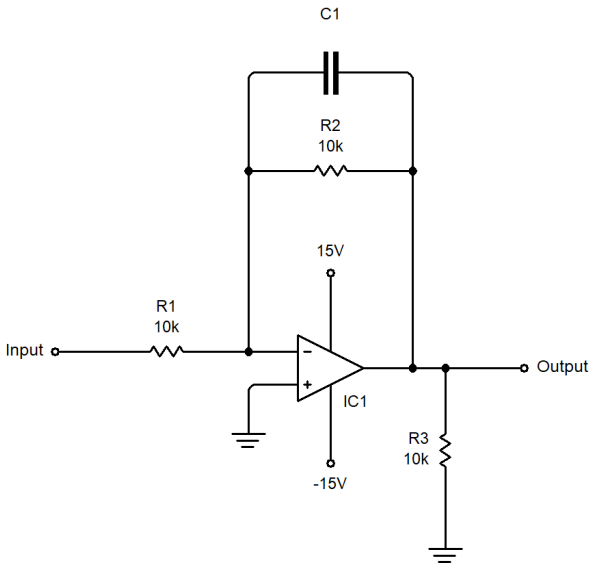


2. Connect the function generator to the circuit input (don't forget GND!).
   Connect the oscilloscope Channel 1 probe to the circuit output (don't forget GND!).
3. Set the Function Generator for a Square Wave of $1V_{PP}$ and 500Hz.
4. Set the scope settings so that you have a few cycles on the screen.
5. Is the waveform you see a perfect square wave?
   If not, why not!!!!

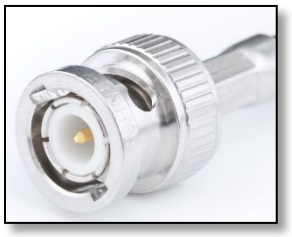
Filtering for fun

6. If you added C1 into the circuit, how would the square wave change?

7. With the square wave still showing, add a 0.047µF capacitor for C1 into the circuit.
   do this with some leads to a different part of the breadboard so you can easily change this capacitor
8. How did the square wave change? Was it as you expected? Disconect one side of the capacitor to see without the filter.



9. Describe how this would sound if you sent audio through and listened with a speaker?



10. Disconnect the BNC connector from the Oscilloscope Function Generator and connect it to the Audio out box for your lab computer. Find an audio source on your computer.

11. Disconnect the BNC connector from Channel 1 of the oscilloscope and connect it to the input of the Speaker.

12. Turn up the speaker and listen, disconnect one side of the capacitor to hear without the filter. Did you hear what you expected?

Make it more or less

What will happen if you decrease the value of the capacitor?
How will the square wave look?
How will it sound?

13. Change C1 out for the other values you have and then both look at the waveform and listen to audio. Note the differences below. Also note what the square wave indicates about how it sounds.

C1 Value	Square Wave	Sound
0.001µF		
0.005 µF		
0.01 µF		
0.047 µF		