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ECE 222L – Winter 2016
LAB TA under Prof. Donald Duncan

# Lab 4 AM Radio Receiever

CHAPTER 1 SIMULATION

Procedure to simulate the system:

Step 1: Place two voltage sources and set their values as shown below. Connect one end to ground and end label it to "Vs" and place it one of the source ends and repeat the same another source by naming it "Vc" using the following option in toolbar in LTSpice.

➔ Label net
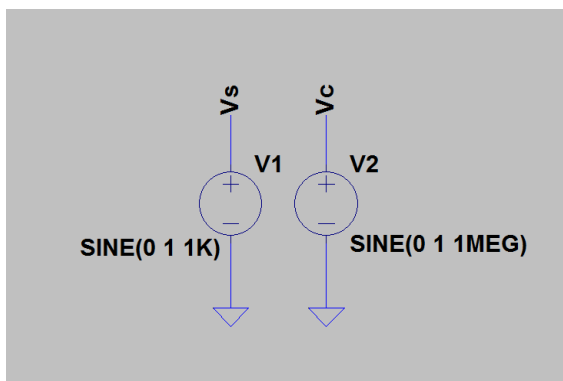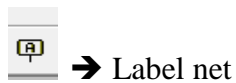
Step 2: Press "F2" you will see components listing. In that choose fourth option namely [Misc] then go ahead and choose battery and place it in the schematic as depicted below. Set their values and much like in previous step name one ends of the battery using label net as "V+" and "V-"

[Note: Please give attention to polarity and connection. It should exactly like this]
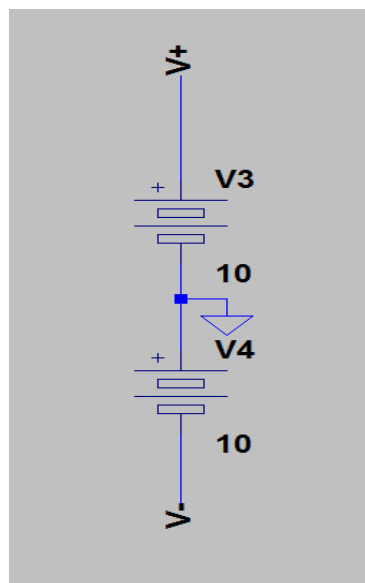
Step 3: Hit "F2" (component list) and choose "bv" component. It should be there in second column first row and place it in the schematic window. It will look like this

B2
V=F(...)
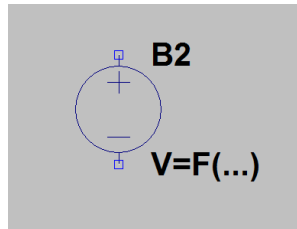
Then right click on the component you will see a pop up window named "Component Attribute editor". In that window double click on value parameter and enter the following equation "V=V(Vs)*V(Vc)".

You will see the following changes in it.

B2
V=V(Vs)*V(Vc)
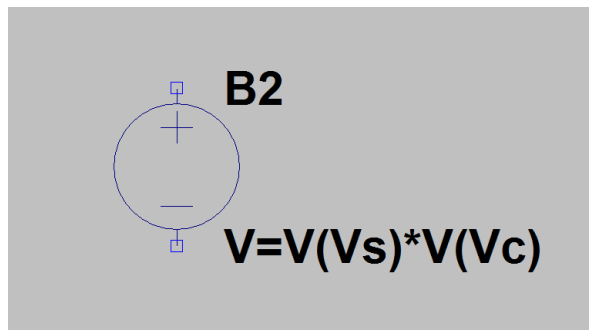
[Note: The above equation should correspond to the names you have previously named two sources in the first step "Vs" and "Vc"]

Step 4: Hit "F2" again (by this time you have annoyed F2 by hitting him so many times ;) Choose [opamps] from the list and grab hold of LT1001 or LT741 and place it in the schematic. Rotate twice and mirror once to make it look something like this.

LT1001
U3
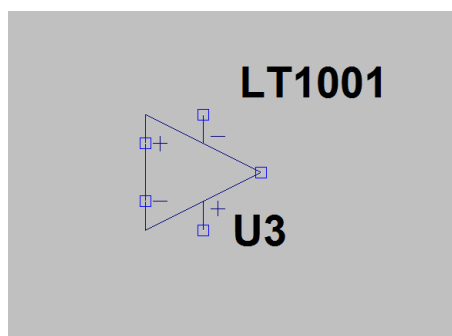
Then go ahead and connect two wires on vertical supply terminals (+) and (-). Name them with V+ on the bottom (+)ve terminal and V- on the top (-)ve terminal. Make it look like this
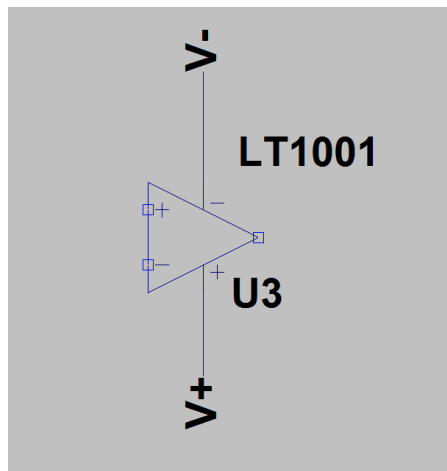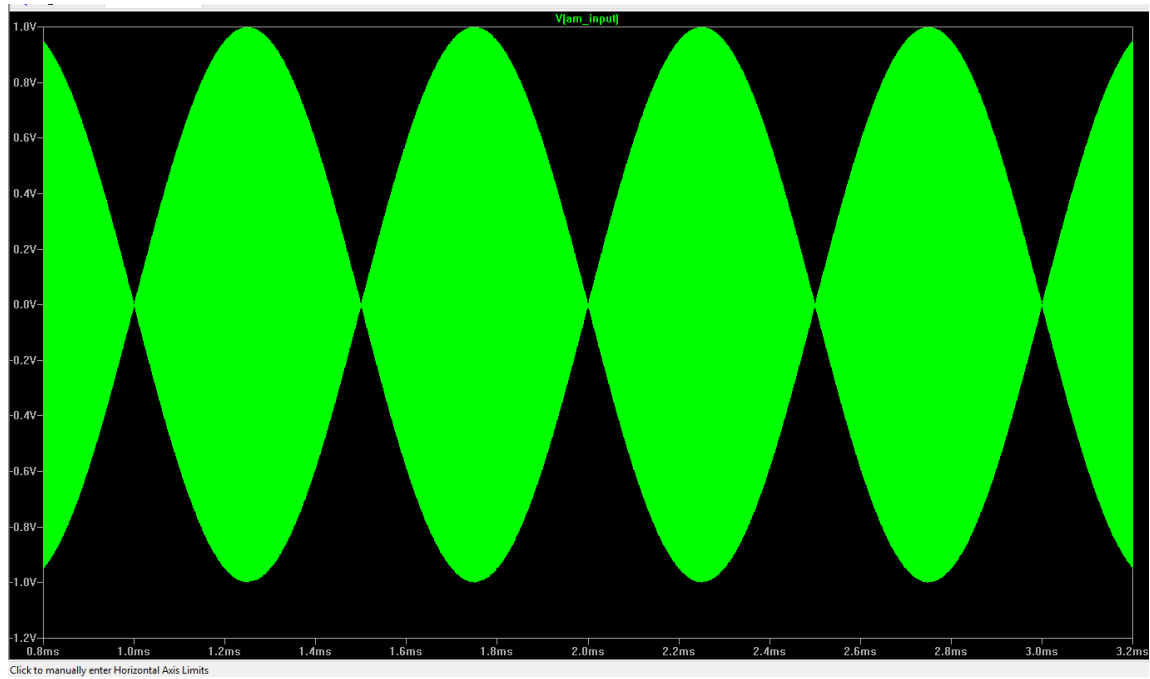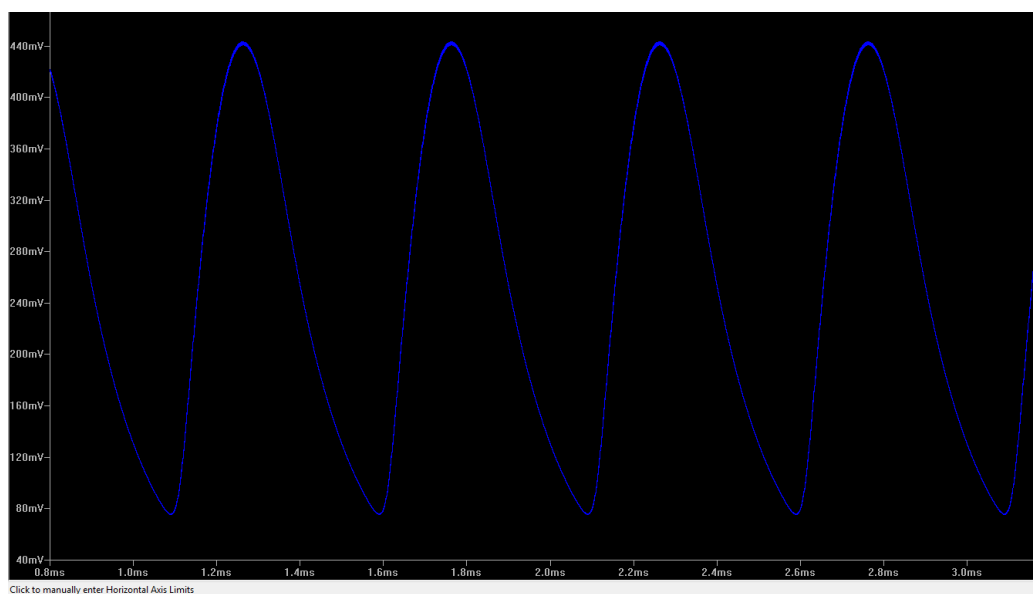

Step 5: Connect the following circuit.
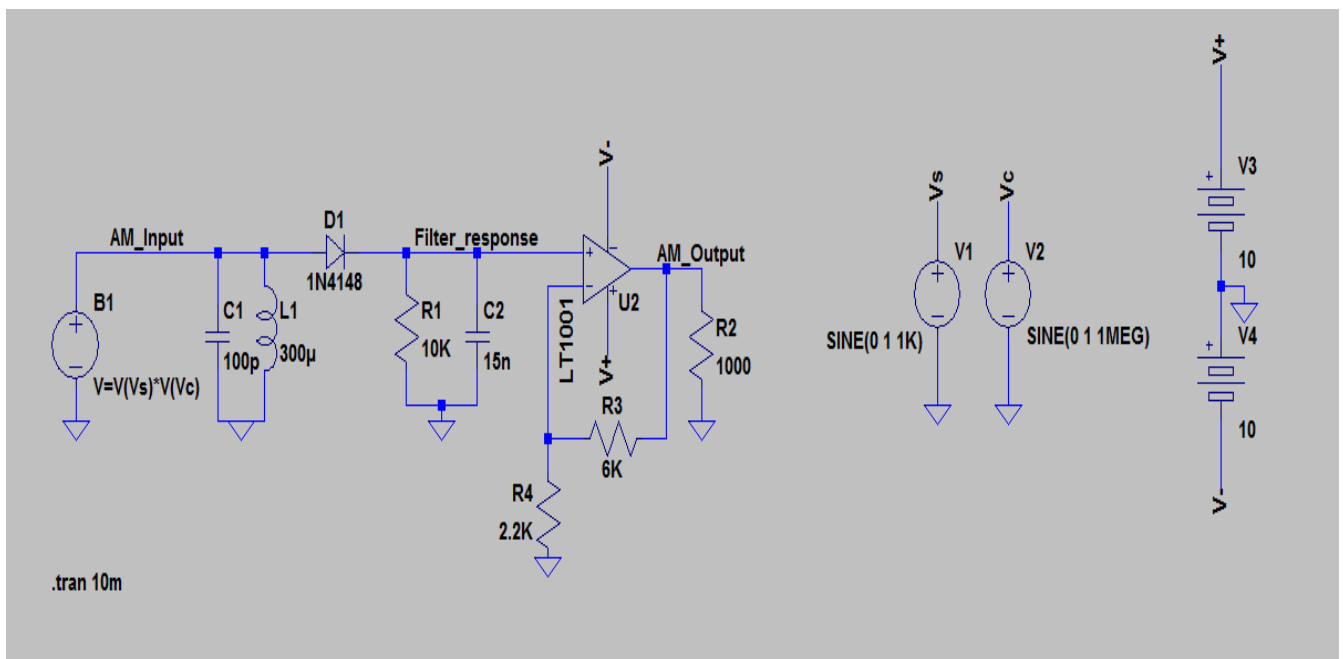
[Note: Please take a look at the all the blocks and the values and connect them.]
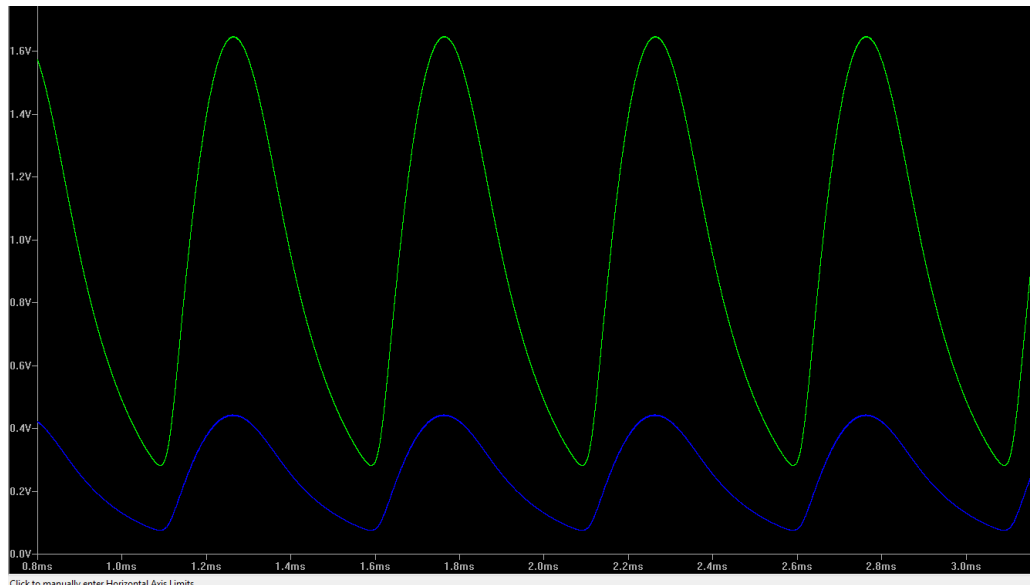
Simulation Results:

i) Input should look like this
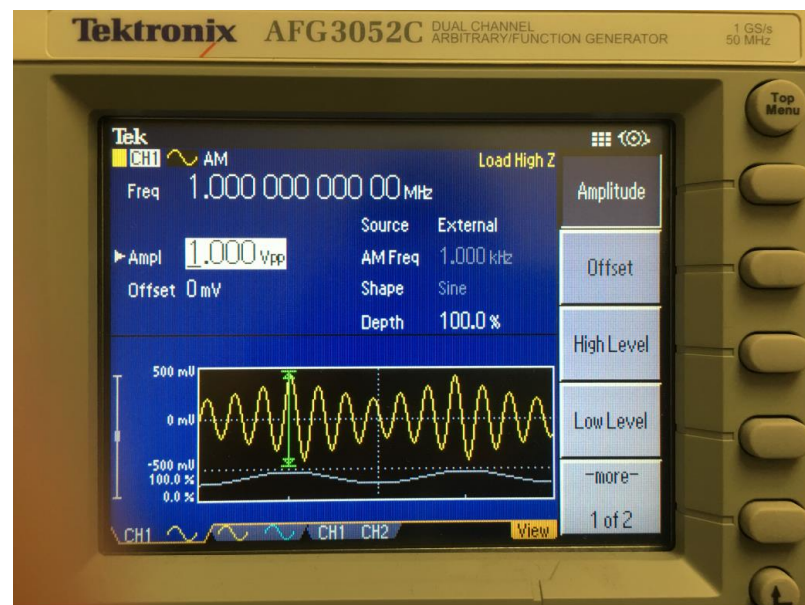

ii) After diode it should be like this

iii) And finally the output should look like an amplified version of the above


CHAPTER 2 BUILDING THE CIRCUIT AND TESTING

Step 1: Set the Channel 1 of Function generator to sine wave and hit "Modulation" soft key. And on screen select modulating source "external".
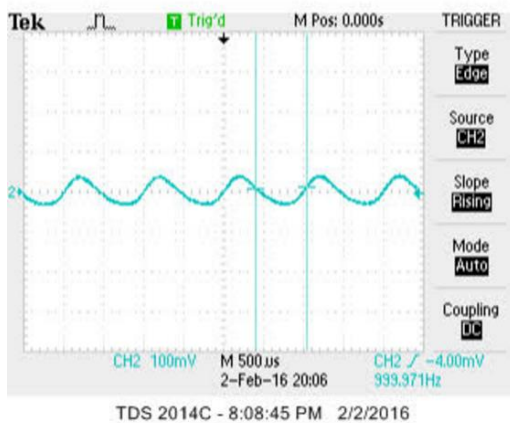
It should look like this

Step 2: Set the Channel 2 to Sine wave 1KHz continuous with 1Vpp amplitude and connect this to back end of the function generator to modulation source channel 1.

Step 3: Take channel 1 source and see how it looks. May be like this.
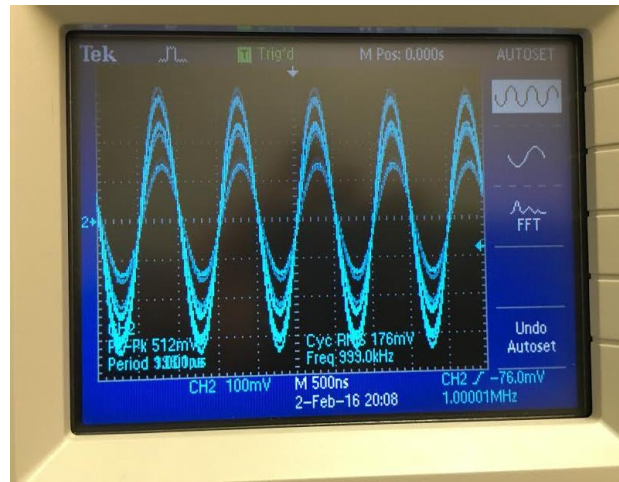
Circuit results

This is output before amplification

This is after amplification (final output).

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