ECEN 325 – Electronics

Fall 2020

Lab 1: Report

Submitted by:

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Date Performed: Sept 1st, 2020

I. Objective

The objective of the lab is to learn frequency responses of circuits by using circuit design and analysis.

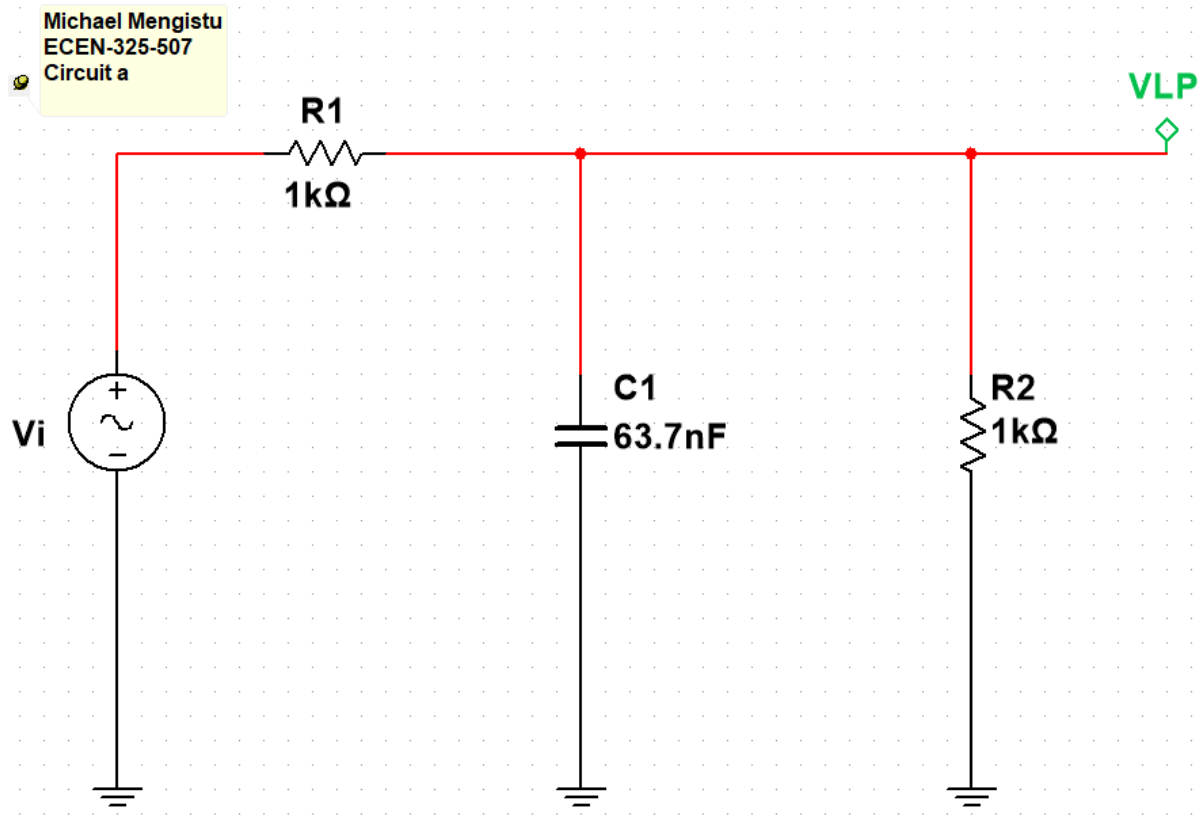
II. Procedure

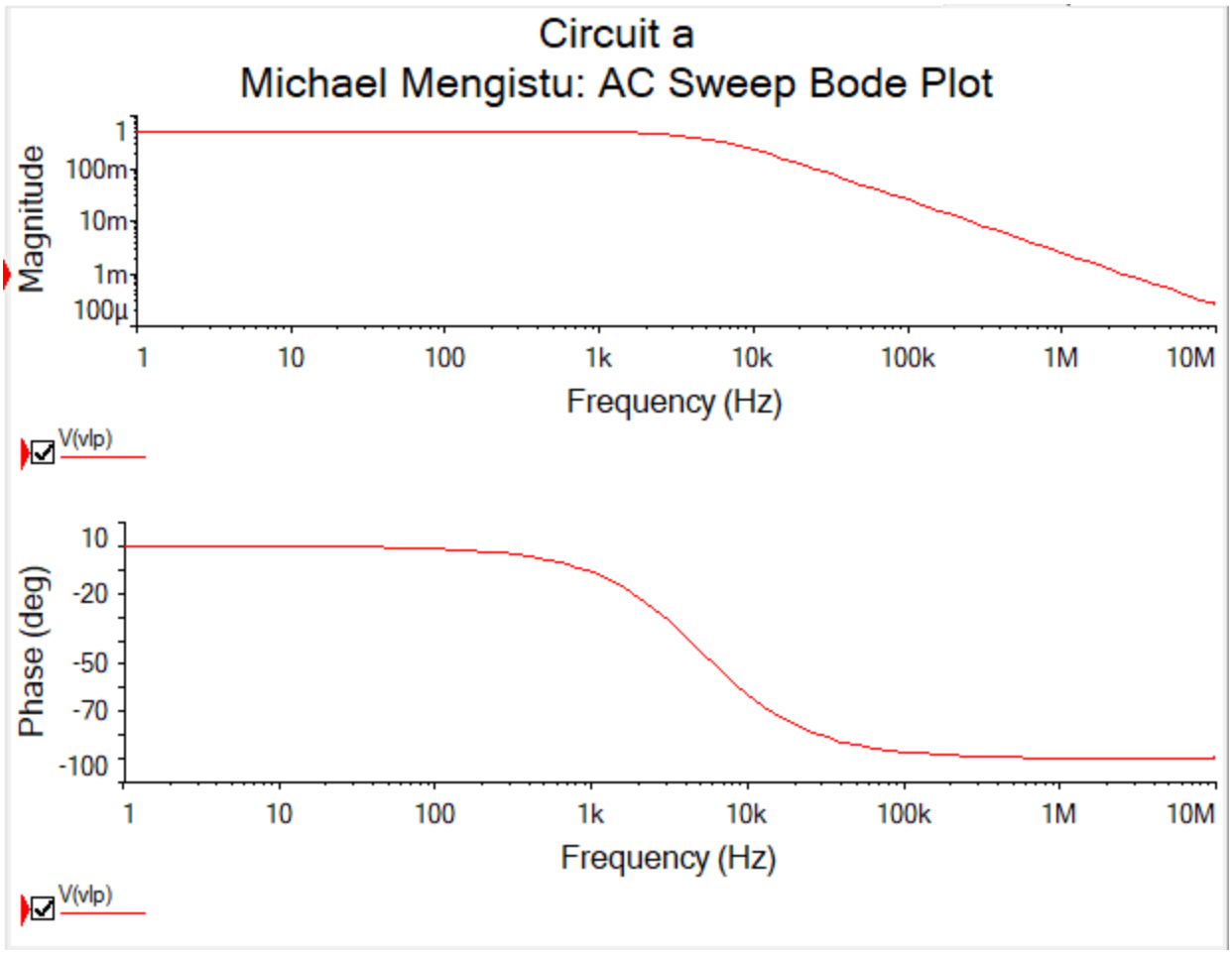
For the procedure I first had to find the transfer function of a low-pass and high-pass circuit. Then I found the calculations values of the components of the circuits given the frequency and K value and sketched the bode plots. After that, I simulated the circuits and built the circuits onto a breadboard for measurements.

III. Difficulties

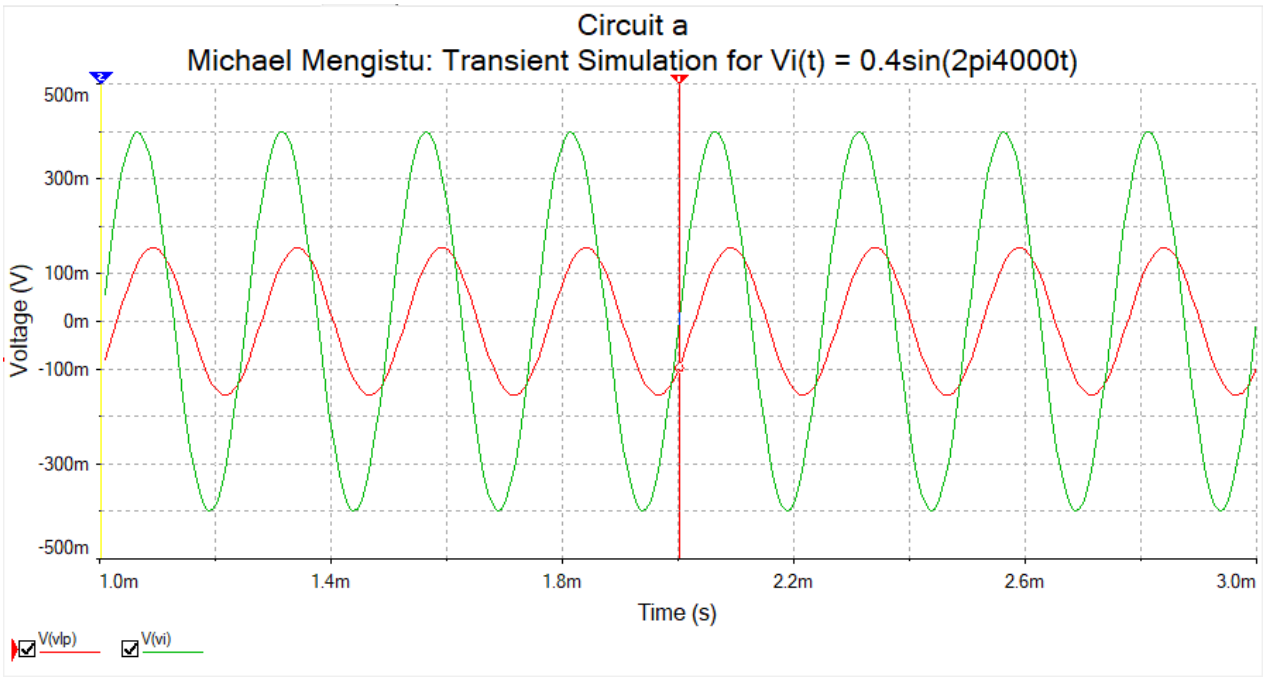
There were no difficulties about the lab.

IV. Results

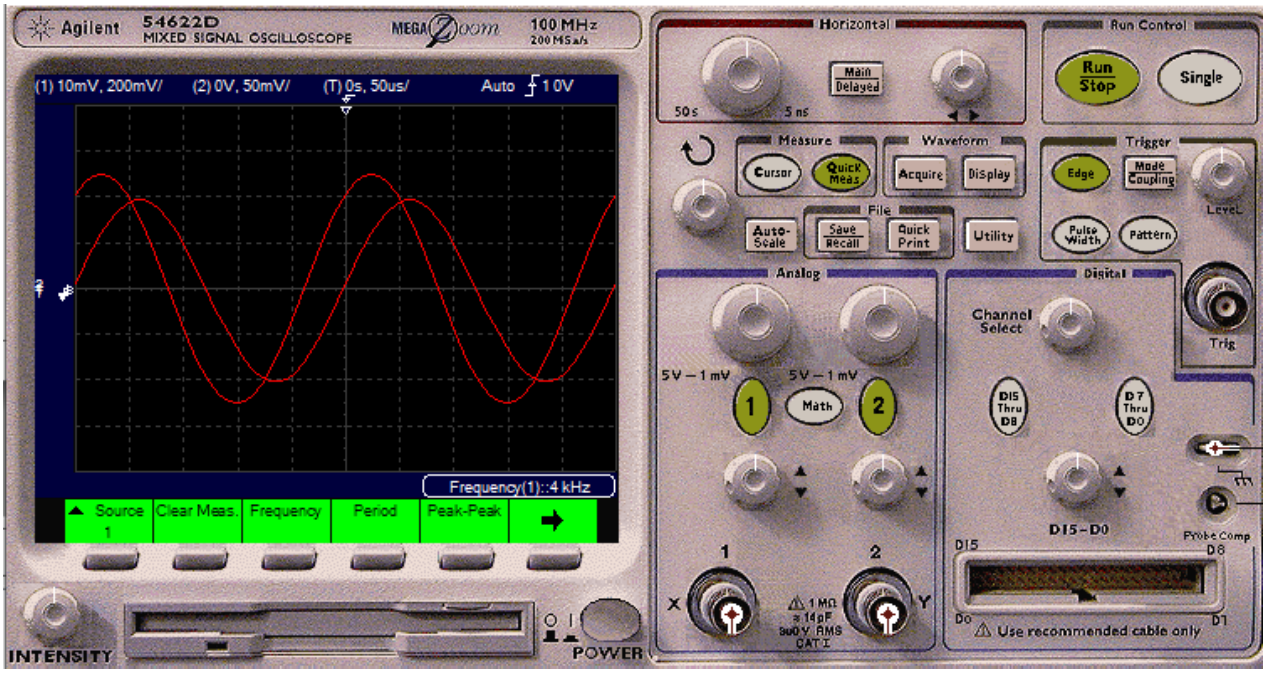




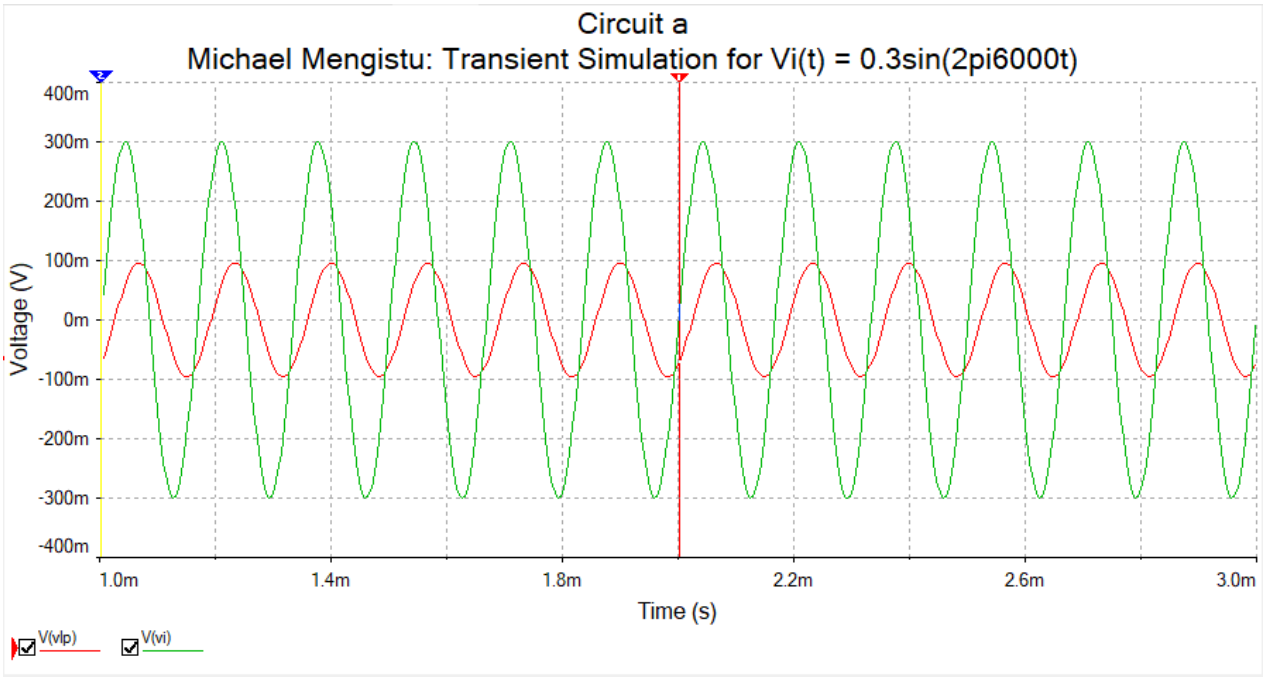
Circuit a:	Results:
Magnitude at 4kHz	390m dB
Phase at 4kHz	-38.7 deg
Magnitude at 6kHz	319m dB
Phase at 6kHz	-50.2 deg



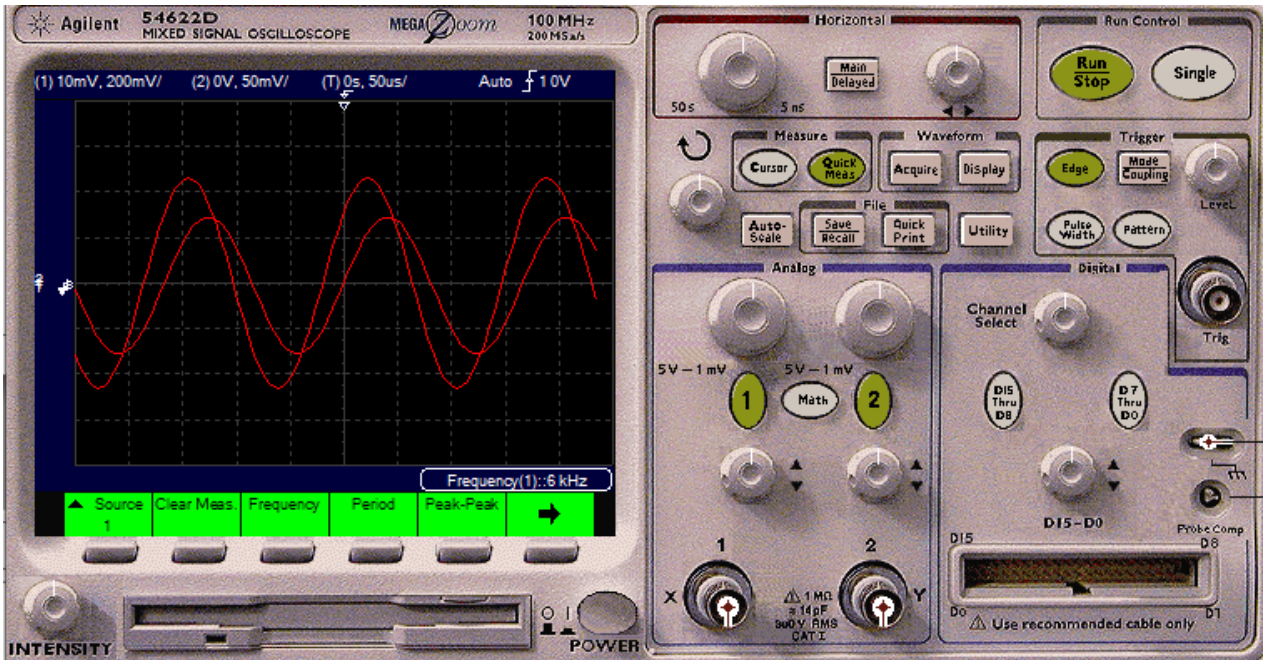
Circuit a Vi(t) = 0.4 sin(2π4000t)



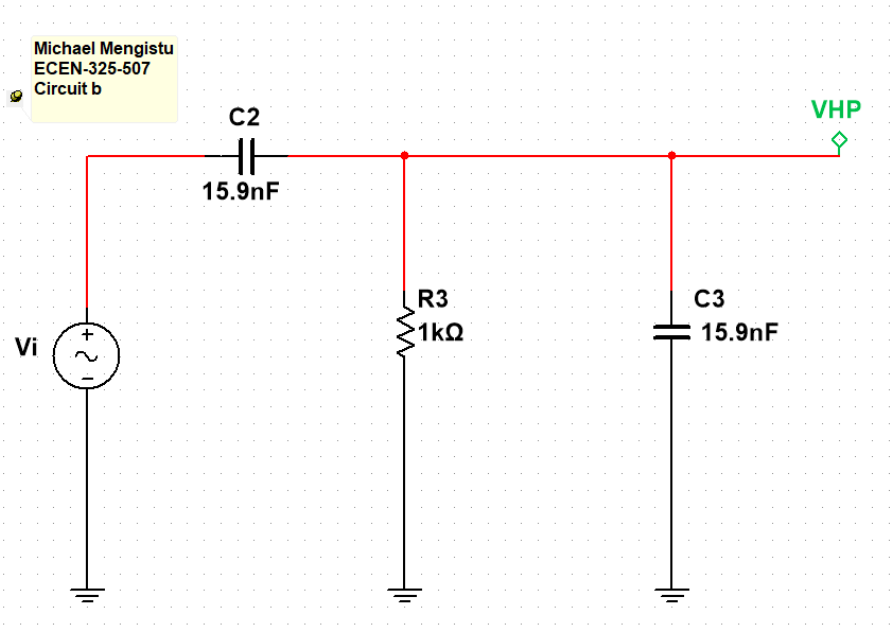
Circuit a Vi(t) = 0.4 sin(2π4000t):	Results:
V_i at t=2m	-45.9 uV
V_{LP} at t=2m	-97.3 mV

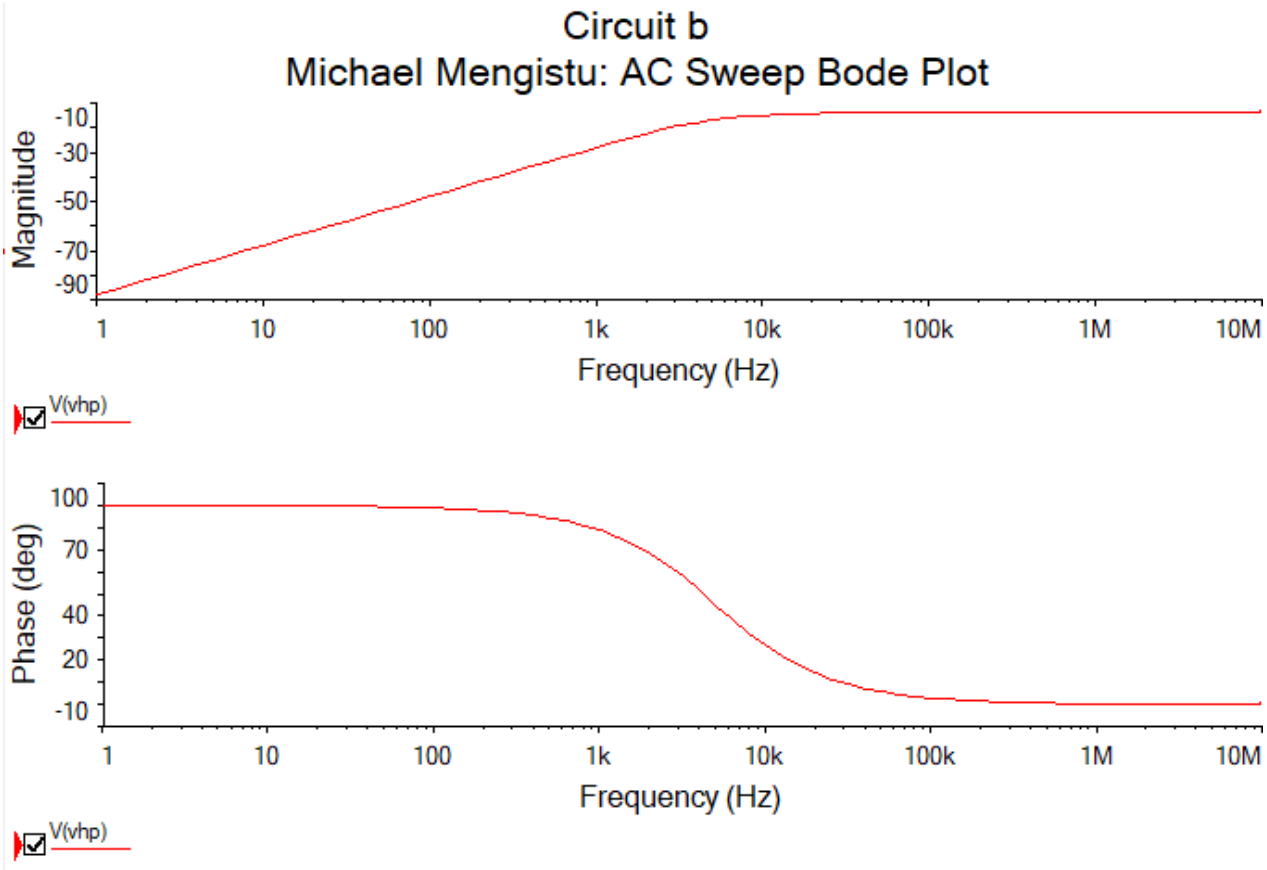


Circuit a Vi(t) = 0.3 sin(2π6000t)

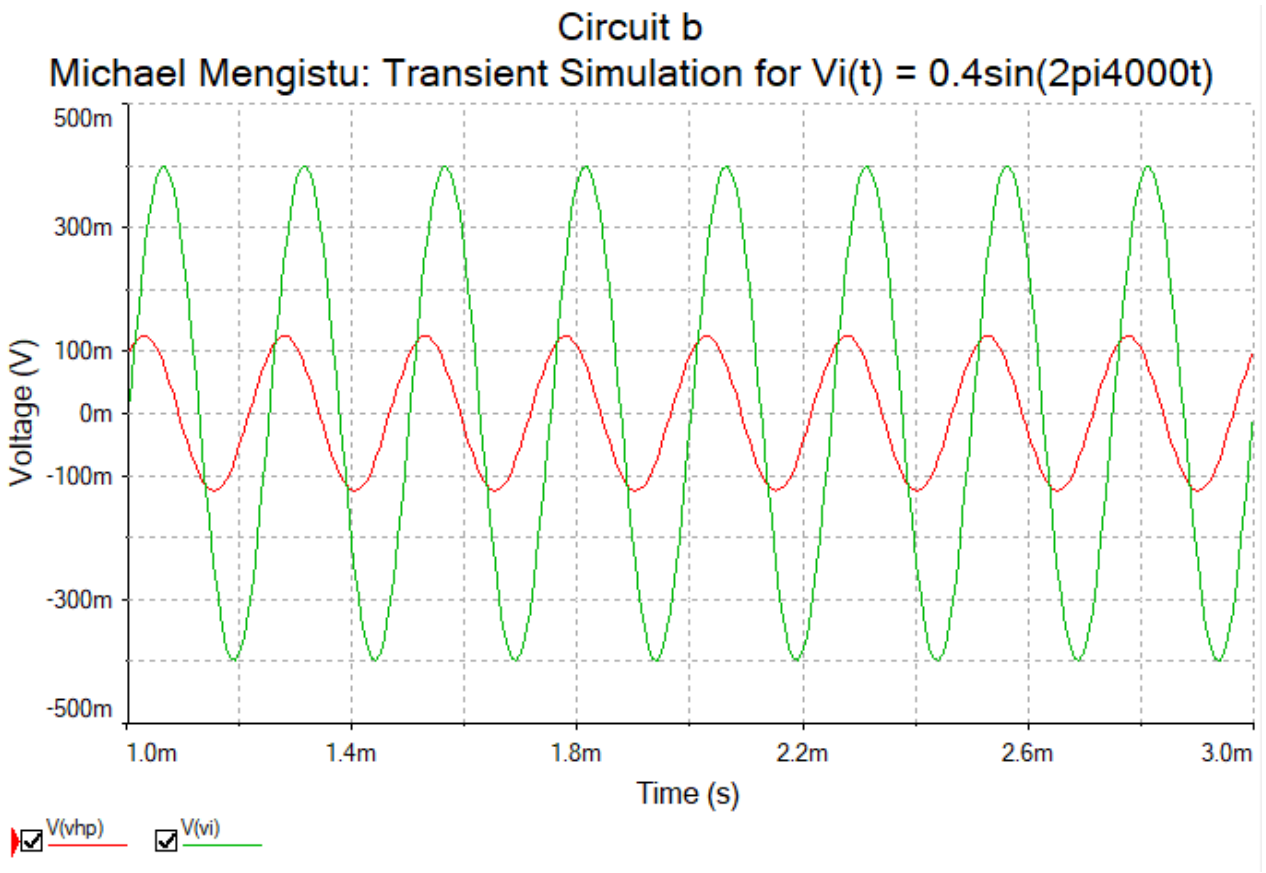


Circuit a Vi(t) = 0.3 sin(2π6000t):	Results:
V_i at t=2m	-34.4 uV
V_{LP} at t=2m	-73.4 mV

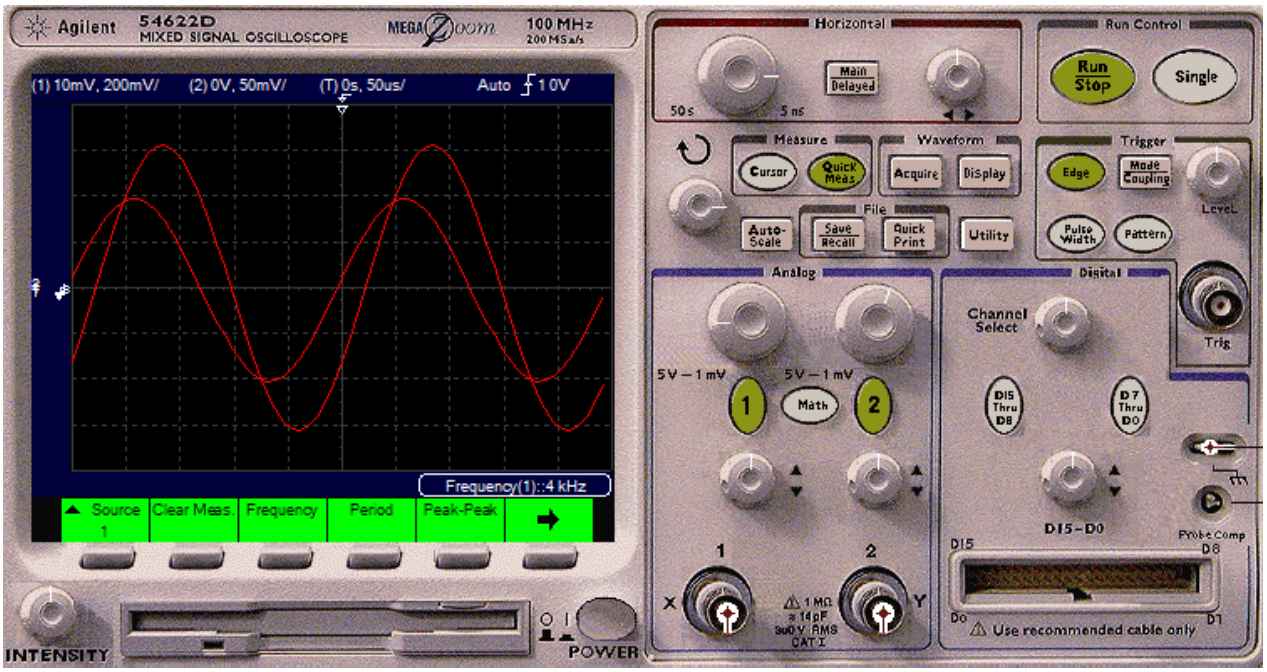




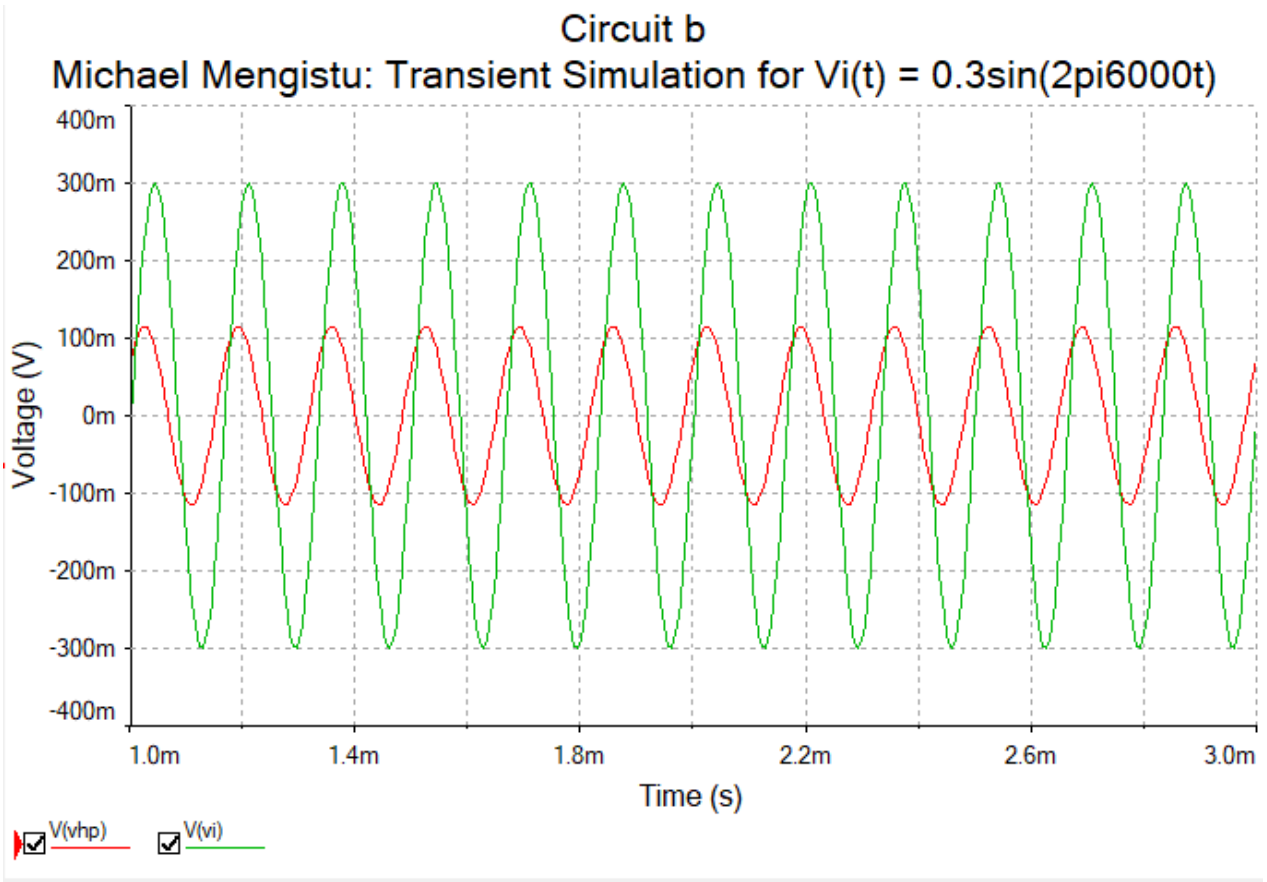
Circuit b:	Results:
Magnitude at 4kHz	-70.1 dB
Phase at 4kHz	51.4 deg
Magnitude at 6kHz	-68.3 dB
Phase at 6kHz	39.8 deg



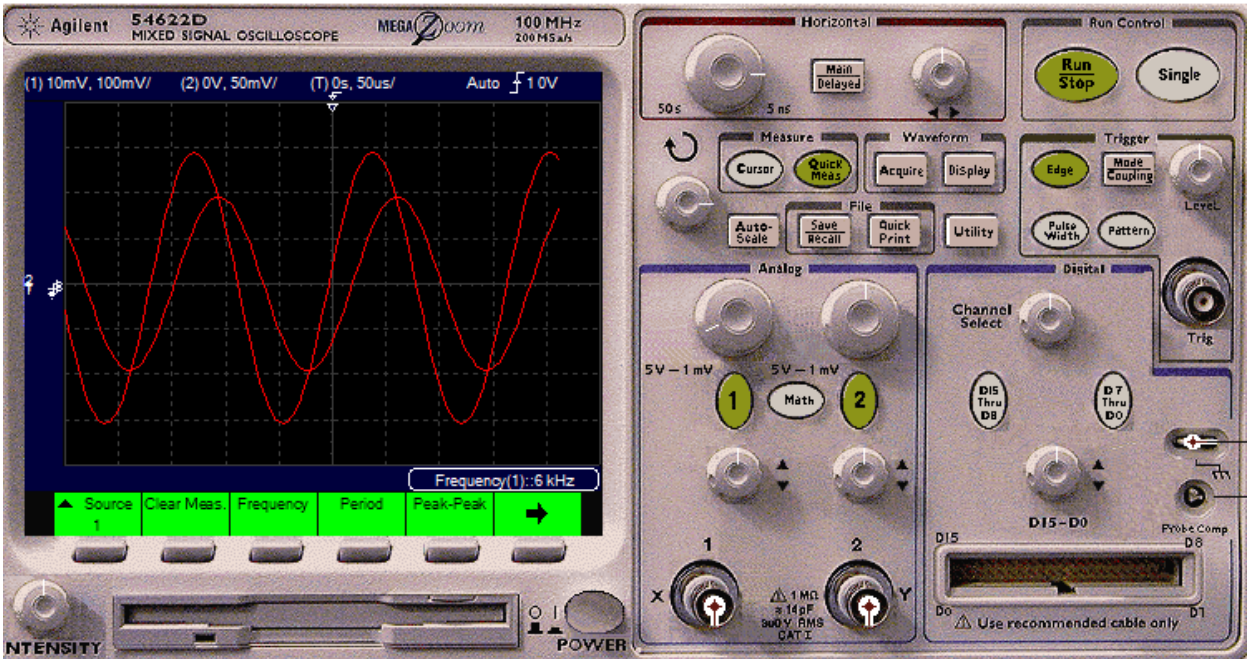
Circuit b Vi(t) = 0.4 sin(2π4000t)



Circuit b Vi(t) = 0.4 sin(2π4000t):	Results:
V_i at t=2m	44.7 uV
V_{HP} at t=2m	97.2 mV



Circuit b Vi(t) = 0.3 sin(2π6000t)



Circuit b Vi(t) = 0.3 sin(2π6000t):	Results:
V_i at t=2m	33.5 uV
V_{HP} at t=2m	73.5 mV

V. Conclusion

When comparing my results from my calculations. I tested to see if they where correct by checking the Magnitude and phase of circuits a and b for frequencies 4kHz and 6kHz from my measurements with my calculations. I then calculated the output and input voltages at time 2m seconds to compare with my measurements in the lab to check if I picked the right resistors and capacitors for the high-pass and low-pass circuits.