Lab report #4

Electrotech CS1025

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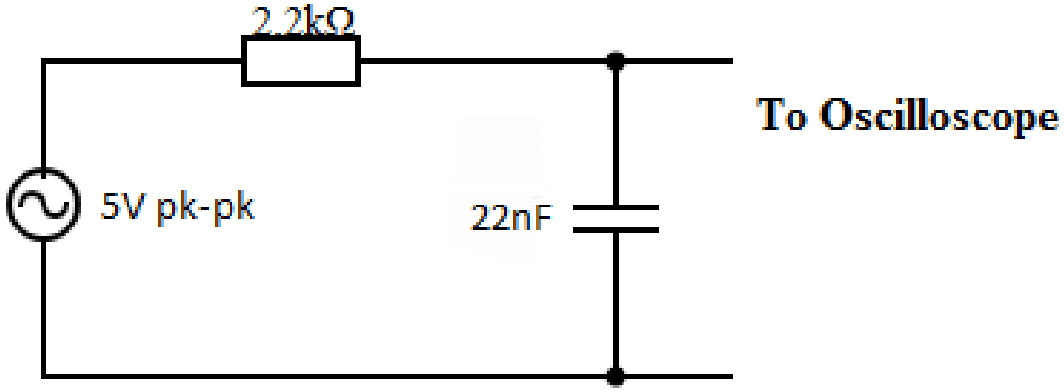
09/12/16

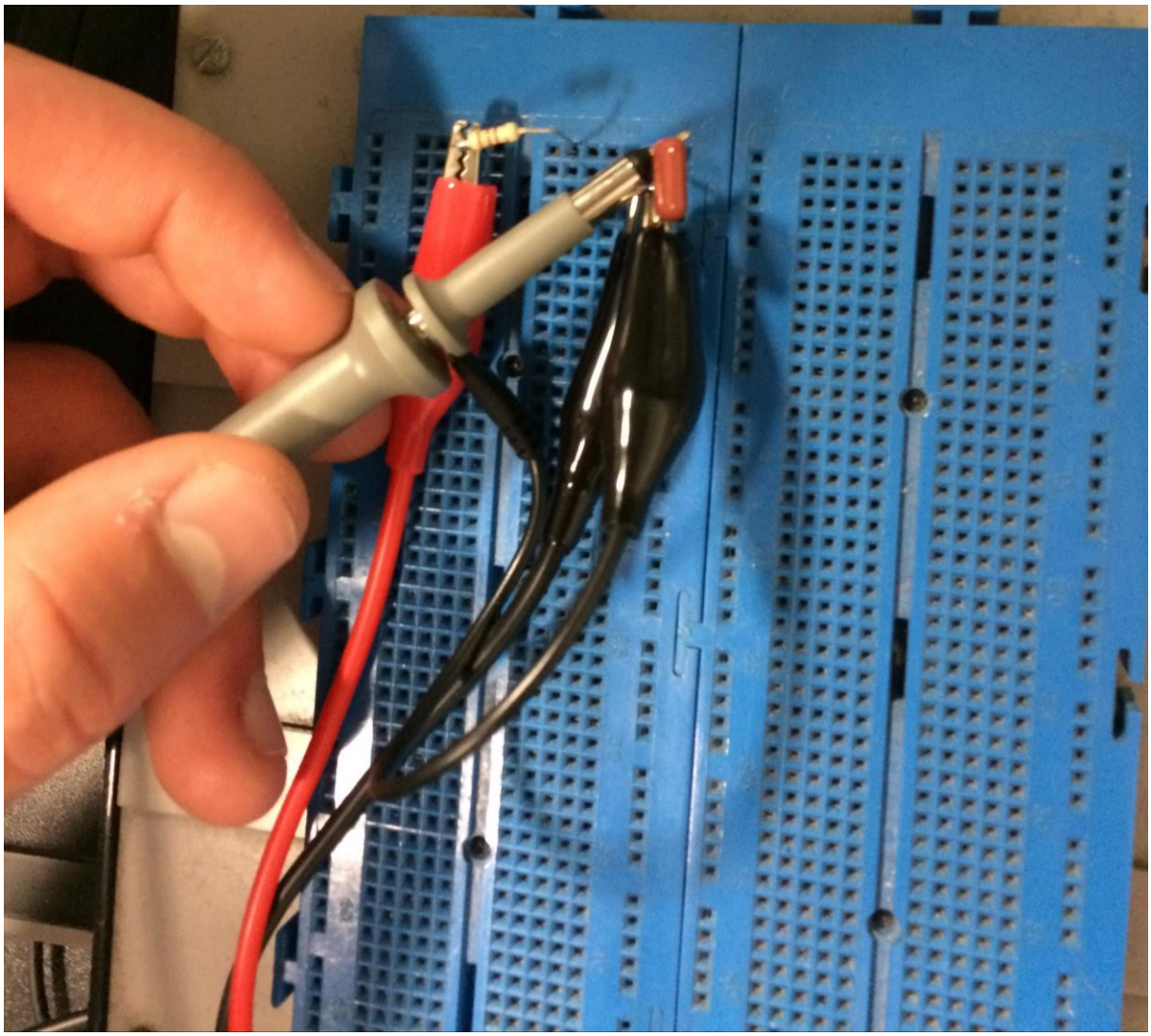
Lab Session #2- 4.00-6.00pm

Introduction:

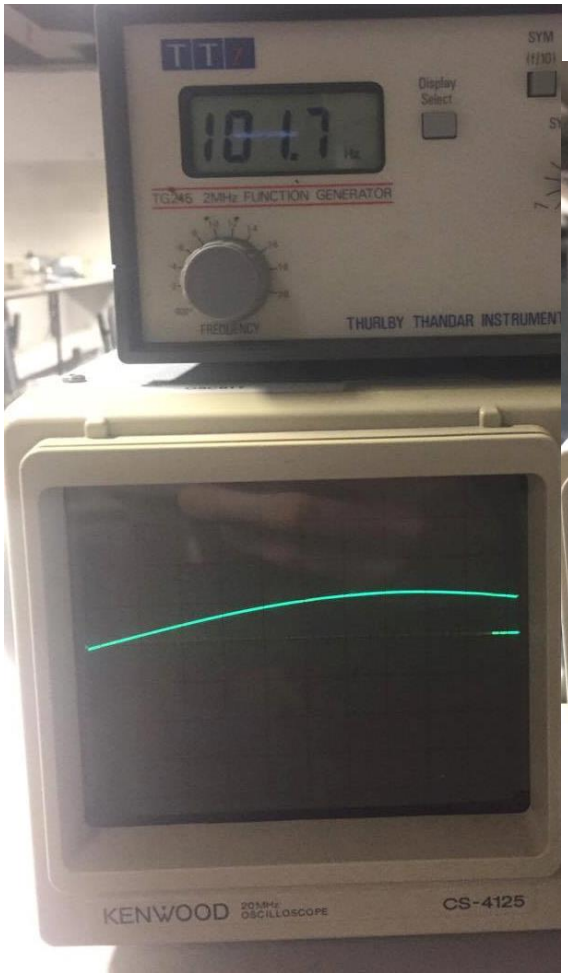
An oscilloscope is a measurement instrument that displays a picture of the way that a voltage changes over a period of time.
A capacitor is a two-terminal element that stores energy in an electric field.
Capacitance is the ability to store electrical energy. A higher capacitance in a capacitor will allow it to store more charge.
We output the circuit to the oscilloscope to visually view the way the voltage flows.
The power supplied was A.C. in both cases. The current was initially set at a frequency of 50Hz and modified throughout the experiment.
The objective was to analyse the effect of varying frequency to the output voltage.
This experiment shows the main properties of capacitors and how they can be used with resistors to make filters that pass some frequencies and block others. In this case the capacitor and a resistor are used to make a Low Pass Filter.

Part 1





First we connected the circuit as shown in the circuit diagram above. We then applied a sine wave input. I checked the resistor on a mustimeter set to resistance to check that it wasn't faulty. I set the initial frequency to be 100Hz and increased it every time by a factor of 500Hz. The circuit was output to an oscilloscope and it displayed the results as shown below.


TTi
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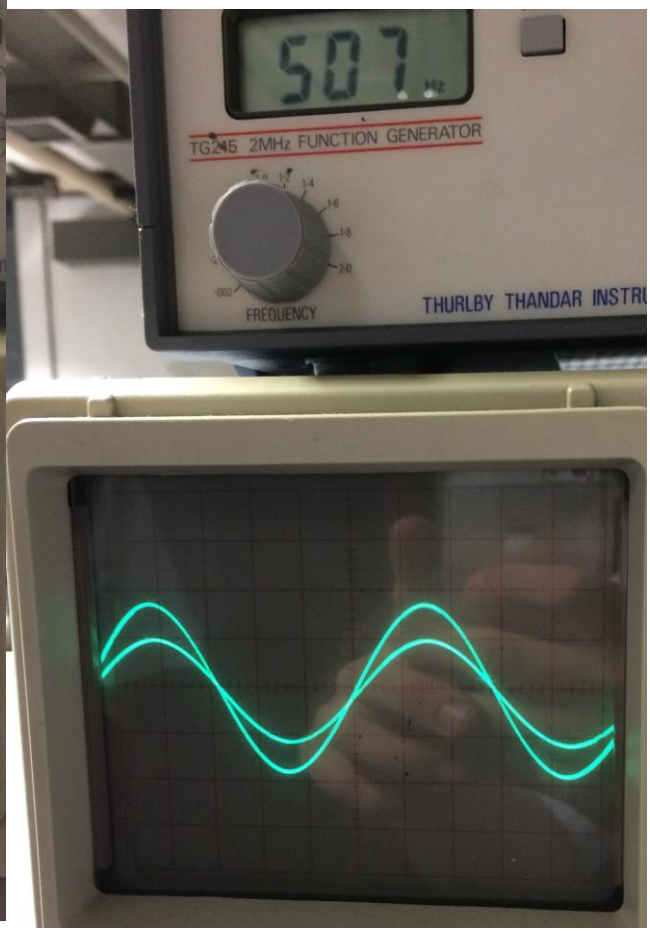
101.7 Hz
TG245 2MHz FUNCTION GENERATOR
FREQUENCY
THURLBY THANDAR INSTRUMENT
KENWOOD 20MHz OSCILLOSCOPE
CS-4125


507 Hz
TG245 2MHz FUNCTION GENERATOR
FREQUENCY
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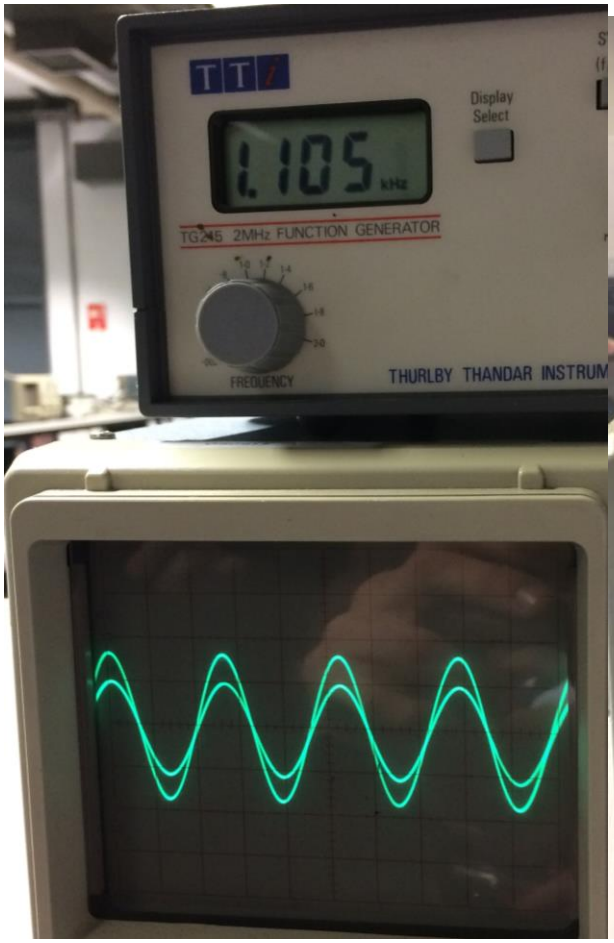
TTi
1.105 kHz
Display Select
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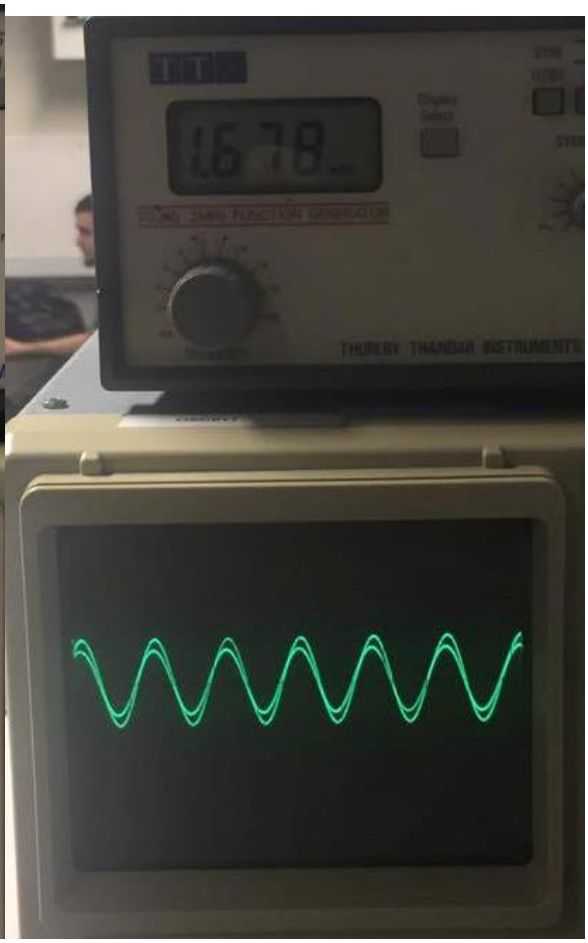
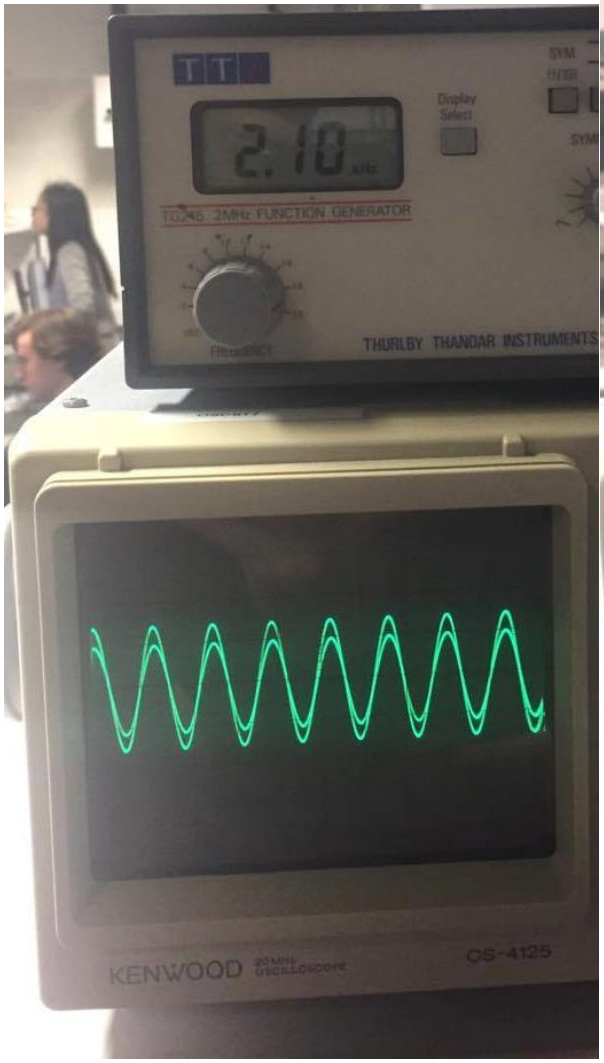
FREQUENCY
THURLBY THANDAR INSTRUM


1678
THURLBY THANDAR INSTRUMENTS


2.10
Display Select
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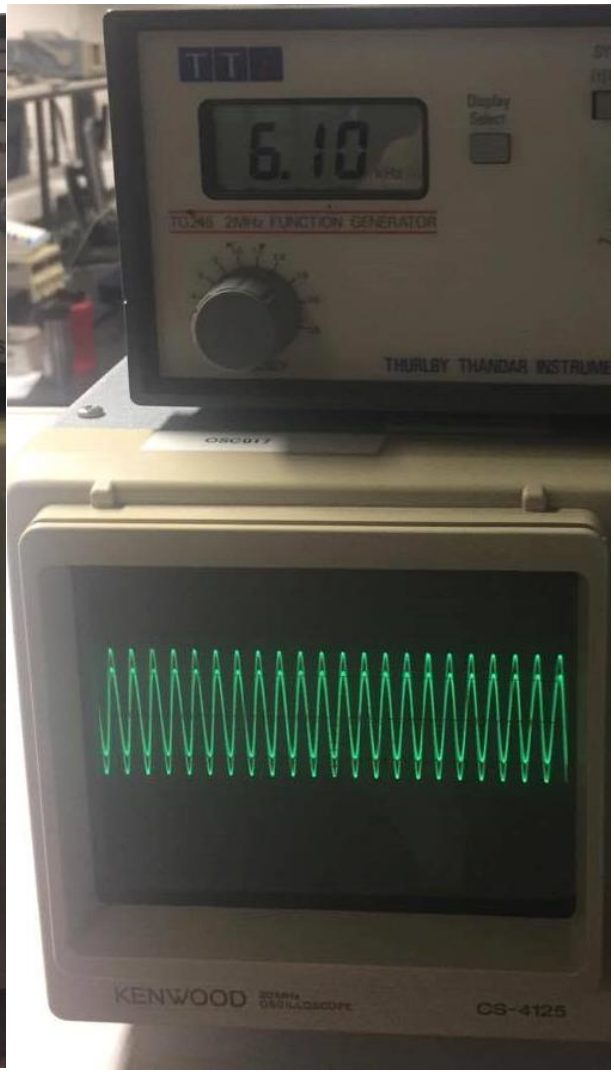
THURLBY THANDAR INSTRUMENTS
KENWOOD
CS-4125


6.10
Display Select
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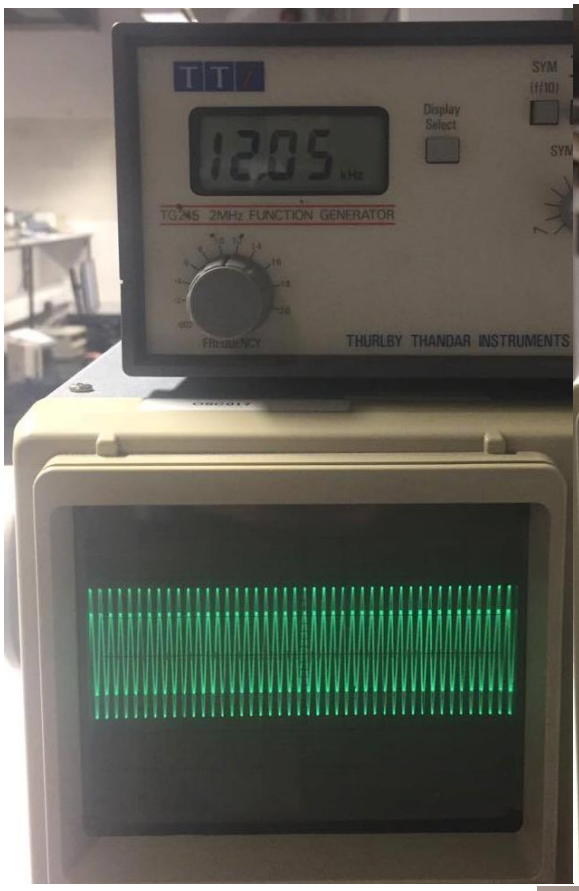
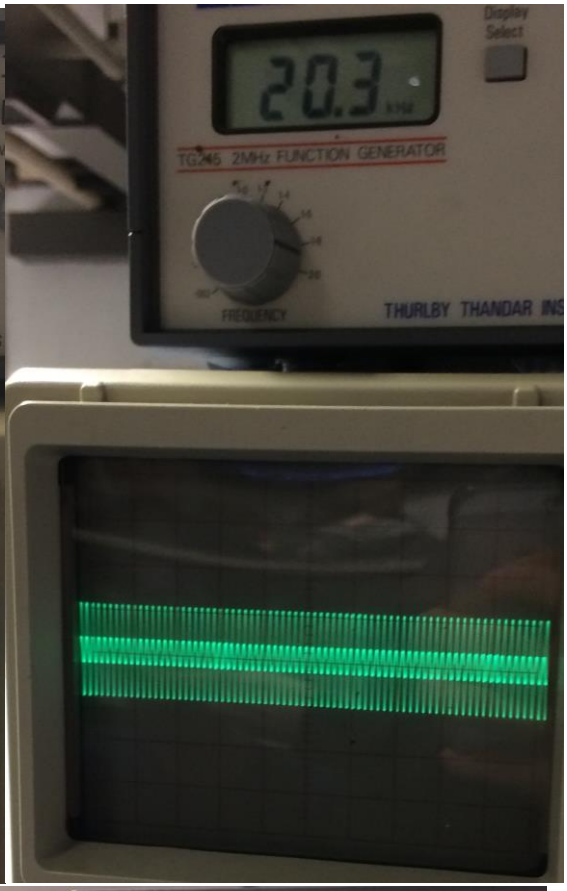
KENWOOD
CS-4125


12.05
kHz
TG245 2MHz FUNCTION GENERATOR
Display Select
SYM
FREQUENCY
THURLBY THANDAR INSTRUMENTS


20.3
kHz
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FREQUENCY
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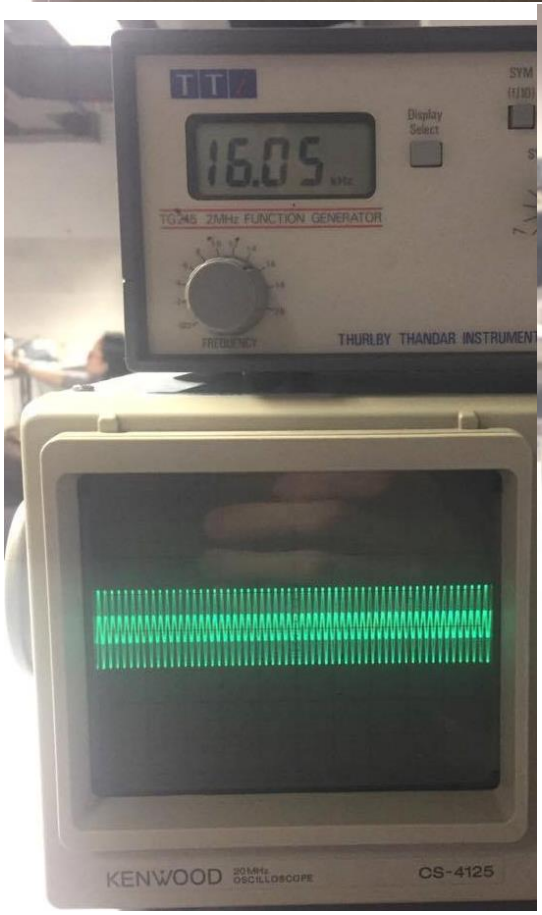
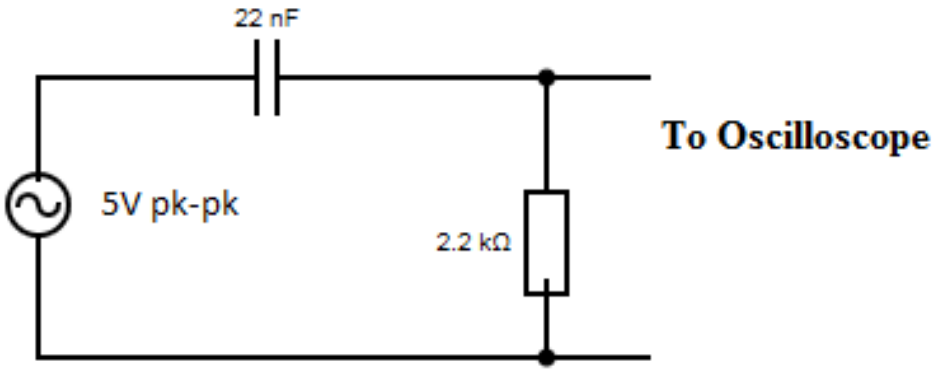
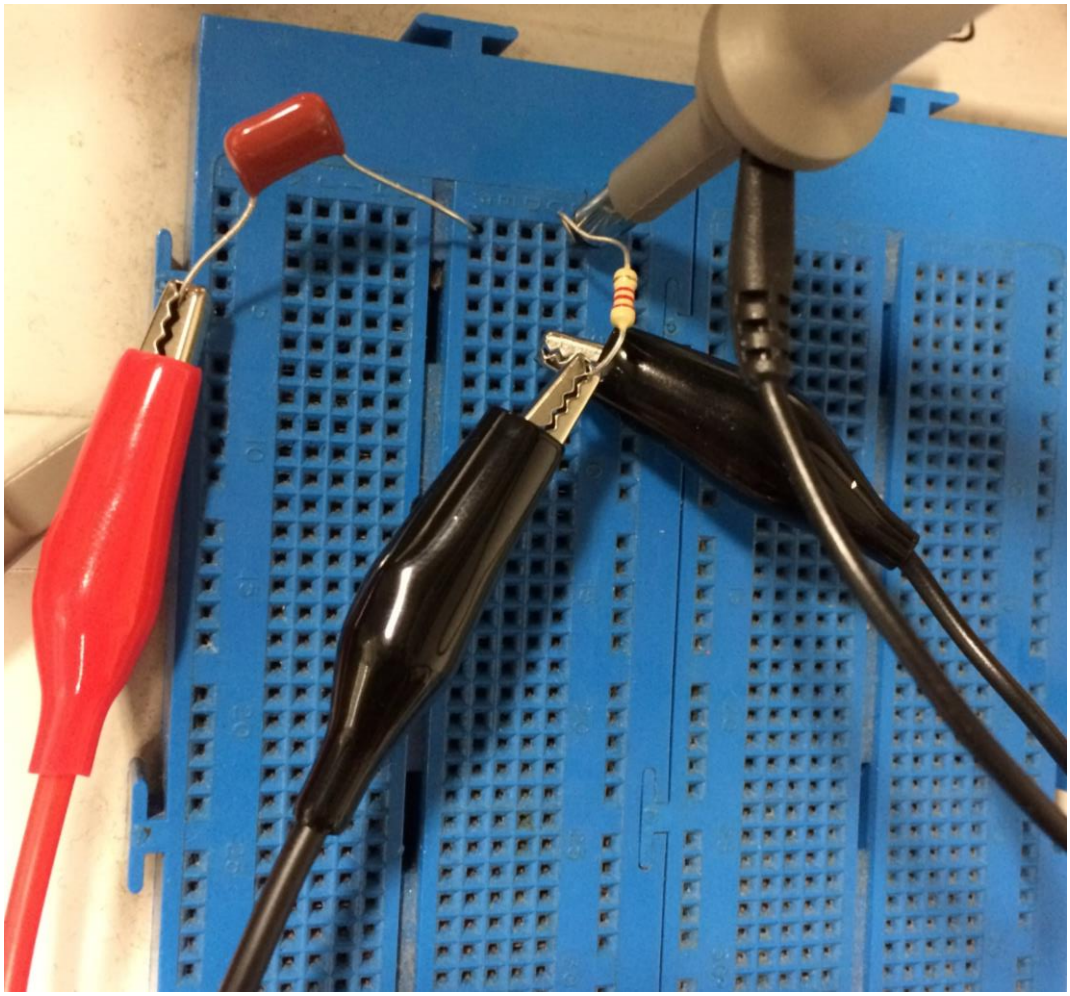

16.05
kHz
TG245 2MHz FUNCTION GENERATOR
Display Select
FREQUENCY
KENWOOD
CS-4125

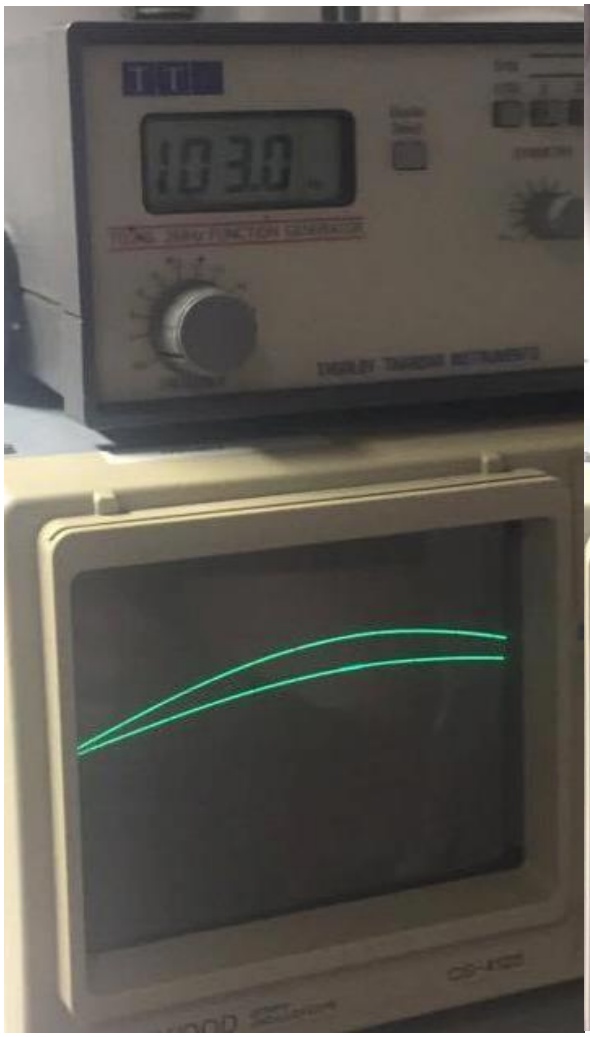
16.66
kHz
TG245 2MHz FUNCTION GENERATOR
Display Select
THURLBY THANDAR

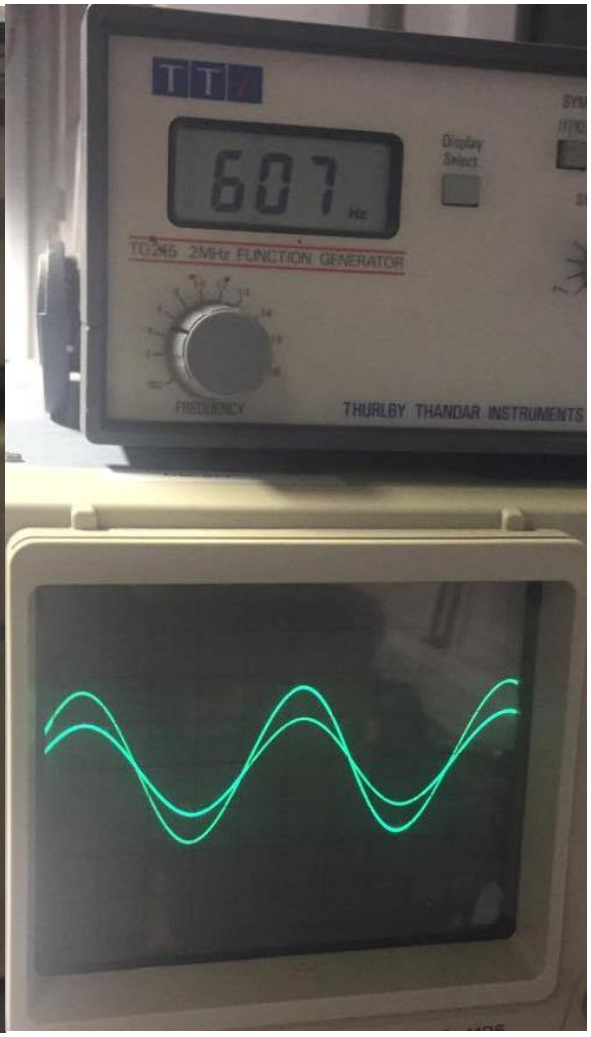
Part 2

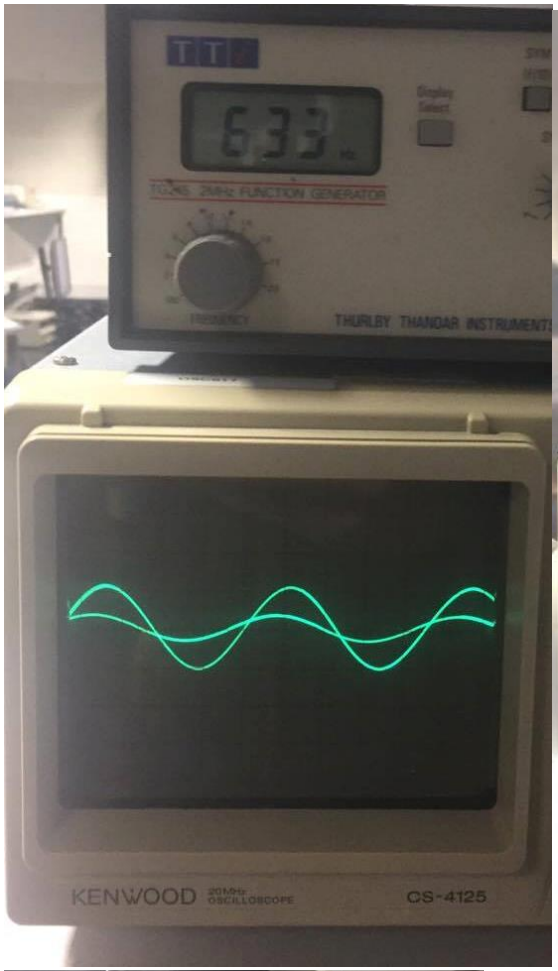




The circuit for part 2 was the same but the resistor switched positions with the capacitor. Bot the resistor and capacitor had the same values as in part 1. The frequency was once again adjusted by 500 Hz every time.




607
Display Select
TG245 2MHz FUNCTION GENERATOR
FREQUENCY
THURLBY THANDAR INSTRUMENTS


633
Hz
TG345 2MHz FUNCTION GENERATOR
Display Select
FREQUENCY
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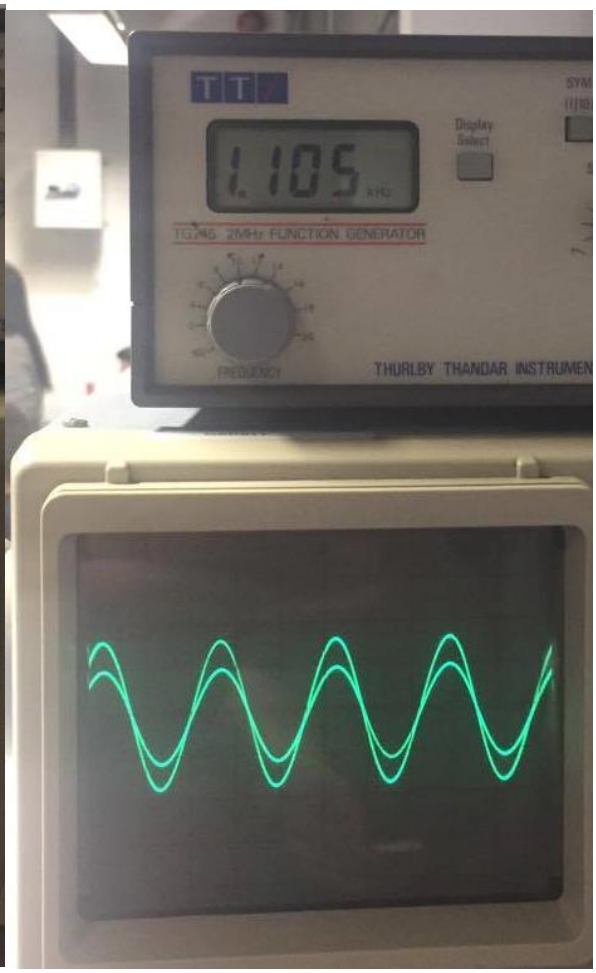
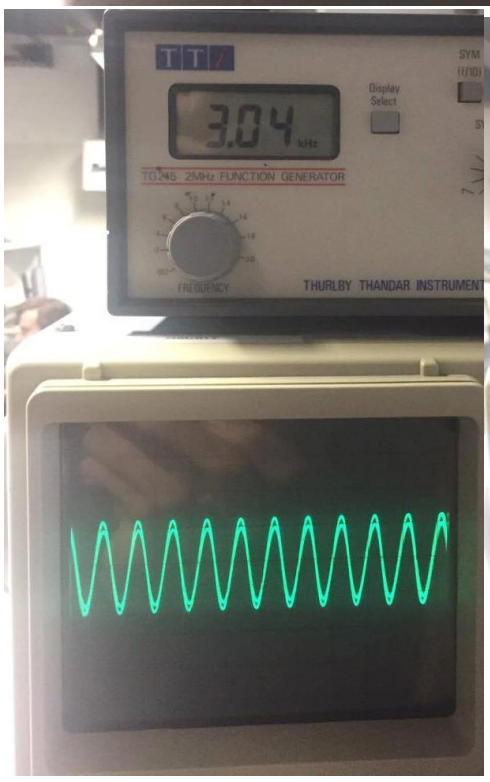
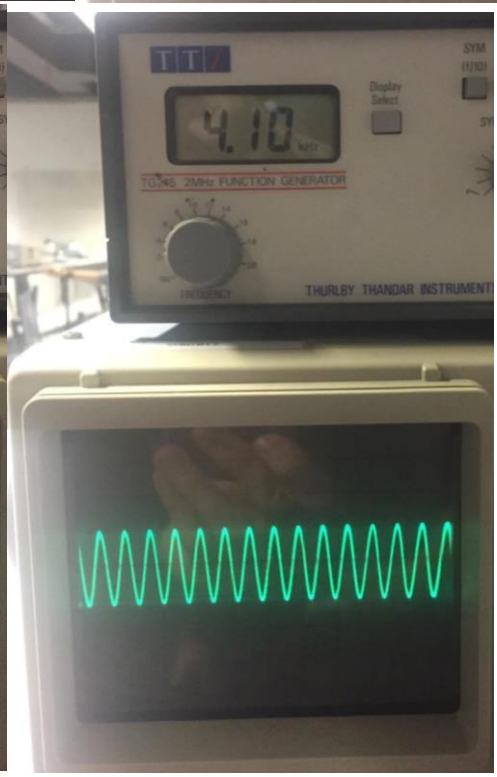
KENWOOD 20MHz OSCILLOSCOPE
CS-4125


1.105
kHz
TG345 2MHz FUNCTION GENERATOR
Display Select
FREQUENCY
THURLBY THANDAR INSTRUMEN


3.04
kHz
TG345 2MHz FUNCTION GENERATOR
Display Select
SYM
FREQUENCY
THURLBY THANDAR INSTRUMENT


4.10
kHz
TG345 2MHz FUNCTION GENERATOR
Display Select
SYM
FREQUENCY
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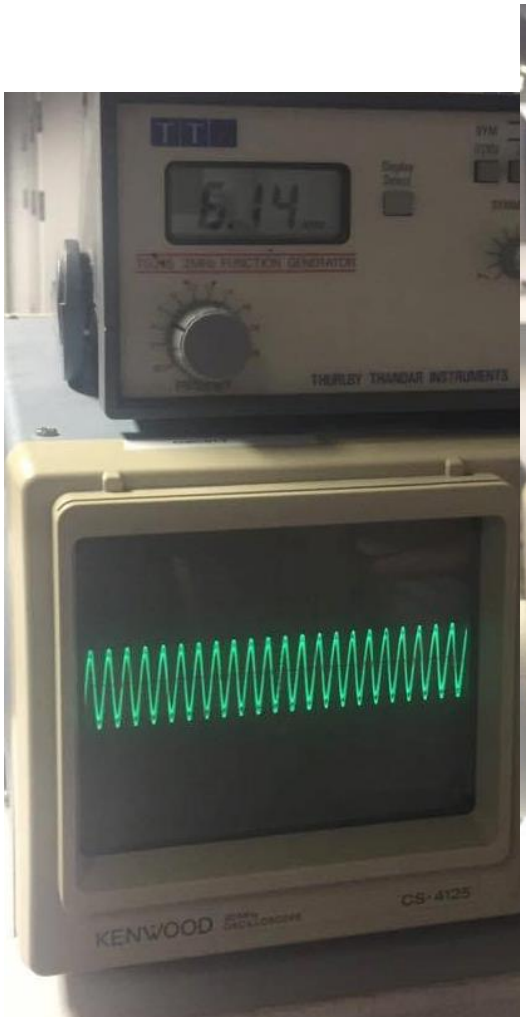
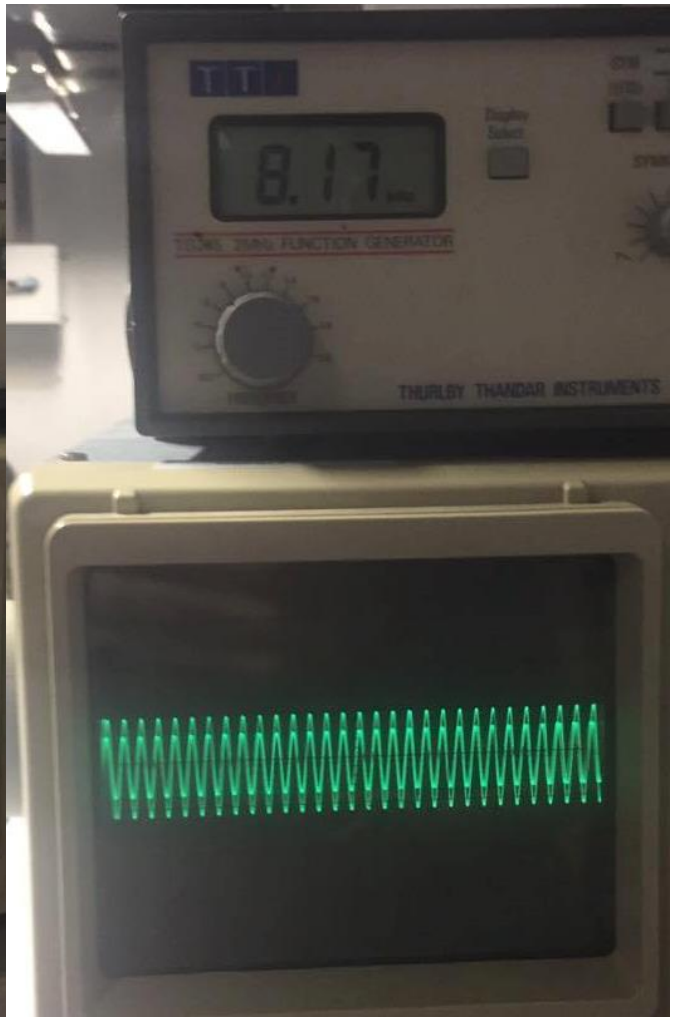

6.14
THURLBY THANDAR INSTRUMENTS
KENWOOD
CS-4125


8.17
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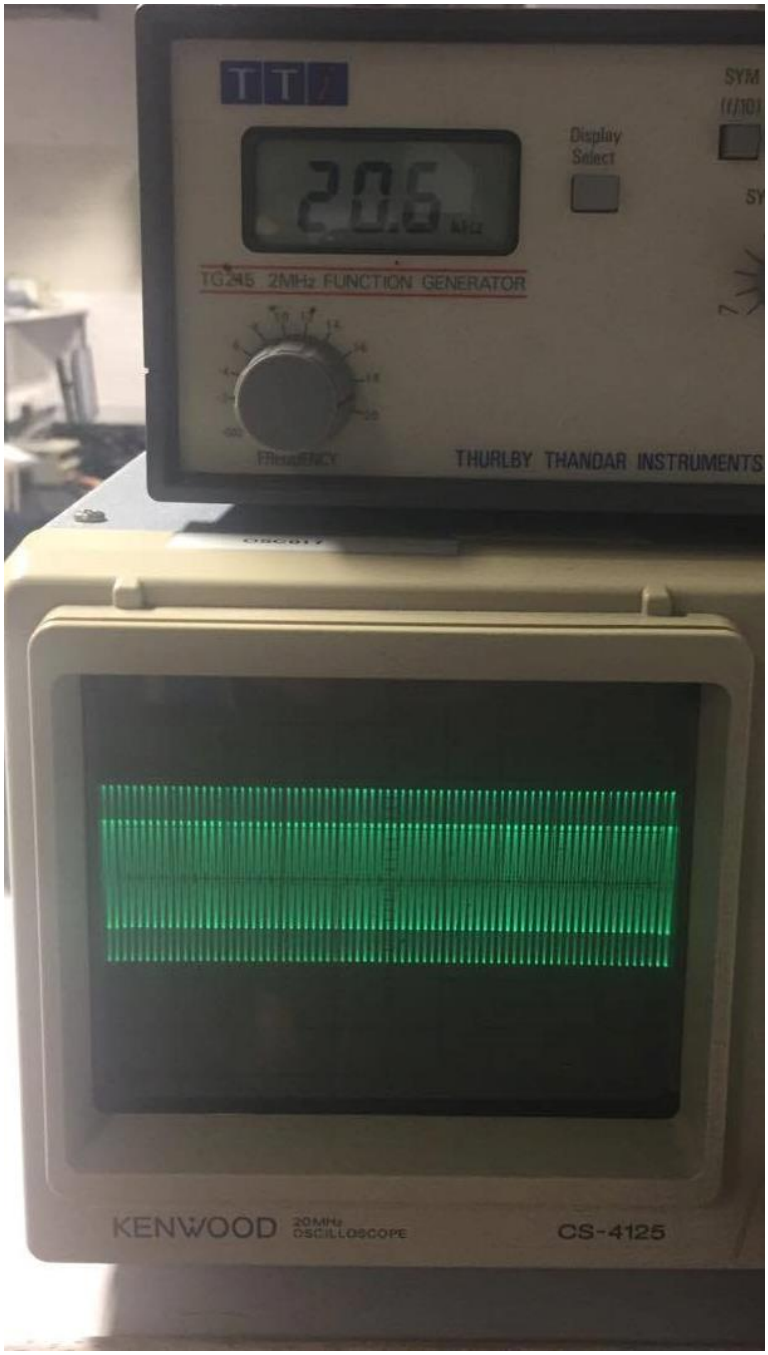

- These circuits are simple low and high pass filters. Low pass filters are used as hiss filters in audio speakers to reduce the high frequency hiss produced in the system and these are used as inputs for sub woofers. High pass filters Eliminate rumble distortions in audio applications so these are also called are treble boost filters.