ELEC 240
Lab 5 - Signal Analysis and Characterization

Test performed: October 2, 2018

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1   Objective

The first objective of this lab was to learn how to generate a virtual signal with LabView and vary the signal's parameters. The second objective of the lab was to learn how to acquire a signal in LabView from an external source like our VirtualBench function generator and then perform frequency analysis on the acquired signal. The third and final objective of the lab was to modify the circuit from Lab 4 so that we could perform speech analysis as well as analyze an unknown signal.

2   Materials

- Virtual Bench (Software, Oscilloscope, Function Generator, DC Power Supply)
- LabView
- BNC Male to Clips cord
- BNC T connector
- Oscilloscope Probe
- Breadboard (with setup from Lab 4
- 2 10 cm length wires (with 6 mm stripped on each end)
- Digital Multimeter
- 2.2 $k\Omega$ resistor
- 033 μF capacitor
- Telephone handset
- Dynamic microphone
- Smartphone (or some device to play audio from a speaker)

3   Test Description

In Experiment 5.1, Part A, we focused on generating a signal in Labview by configuring circuit components on the block diagram pane in Labview. Once we created a configuration to generate a circuit, we created a spectrum analyzer in Part B by adding a Fast Fourier Transformer to the configuration and observed how varying the parameters of both the signal and measurement tools could affect the power spectrum graph.

In Experiment 5.2, Part B, we acquired a signal from the NI VirtualBench by connecting the Data Acquisition Card (DAQ) within the PC running the LabView software via a DAQ cable. In this step, we also had to modify the previous configuration from Experiment 5.1 so that the circuit would accept an external signal.

Note (To be deleted): This section provides a summary of the test your team performed. Give enough information so readers can understand what you did, but do not go into the details of every step.

3.1   Pre-Lab Calculations and Schematics

Your text here

Note (To be deleted): Include the homework pre-calculations and schematics that serve as the initial setup for the test. Briefly explain the importance of each item you include. You may want to number your equations/figures so you can refer to them in later sections. Including photos of handwritten work is okay.

4   Results and Discussion

Your text here

Note (To be deleted): The heart of your report is the presentation of your results and a discussion of those results. In your discussion, you should not only analyze your results, but also discuss the implications of those results.

5   References

Your text here

Note (To be deleted): List any datasheets, websites, lab procedure, etc. used during the lab.

6   Conclusion

Your text here

Note (To be deleted): While the "Results and Discussion" section focused on the test results individually, the "Conclusion" discusses the results in the context of the entire experiment. Usually, the objectives given in the "Introduction" are reviewed to determine whether the experiment succeeded. If the objectives were not met, you should analyze why the results were not as predicted.

7   Errors

Your text here

Note (To be deleted): Briefly list sources of error and discuss how to eliminate or deal with them