

Electronics and Instrumentation

Name _____ **ENGR-4220 Spring 1999** Section _____

Project 2: Pre-Project Report (15 points) _____

Introduction (1 pt): Introduce and describe the goals of the project. _____

Design (3 pts): Describe your project design, how it works, how you came up with this particular design, and discuss potential problems. This last item is very important. You should not expect your initial design to be a complete success. Remember that you will have the opportunity to make changes while you build and test your project. _____

Describe the functionality of each part of these circuits. Test using both the audio source and the function generator. Measure voltage levels at all points of the transmitter and receiver using two loads: a speaker and a resistor with the same value as the speaker. Select a transducer to replace the audio source. Test the transducer to see what its electrical properties are. Modify the circuit diagrams to accommodate the requirements of the new source. Develop a plan for testing your design.

Analysis (3 pts): Discuss why your project should work and support your discussion with calculations, graphs, PSpice simulations, and common sense reasoning. _____

Determine the Thevenin equivalent for the walkman and the transducer. Analyze the functionality of each part of the circuits.

Personal Responsibilities (1 pt): A short paragraph should be written describing what each group member contributed to the project design. _____

Appendix (2 pts): Include any background materials you used. _____

Basic Design Performance (5 pts): To test out your designs, you must first build the basic transmitter and receiver. When you successfully transmit and receive an audio signal using a personal stereo and the function generator as sources, you will receive the full 5 points. Successful transmission of the audio signal requires only that it can be understood. For the function generator (with output levels comparable to the personal stereo), your group must determine the minimum and maximum discernible frequencies and the frequency that is best reproduced. These judgments are somewhat qualitative.

Personal Stereo _____ **Witnessed** _____
Function Generator _____ **Witnessed** _____
Min. Freq. _____ **Best Freq.** _____ **Max. Freq.** _____

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Project 2: Final Report (10 points) _____

Introduction (1 pt) -- Problem statement. _____

Update your problem statement to address the specific transducer you have selected. List at least two of the educational issues we have been addressing in this course that you encountered in this project.

Implementation (3 pts) -- Discuss what problems were encountered during the implementation of your project and how you solved them. Include advice you would offer to someone who wished to avoid these problems in the future. _____

Final Design (5 pts)-- Describe your final design, what needed to be changed and why. Show that the new design works with experimental data from your hardware and PSpice simulations or paper-and-pencil analysis. Include schematics. **Have your experimental data signed by a TA or instructor.** _____

It is not necessary to do both paper and pencil and PSpice analysis. Demonstrate the operation of your design to a TA or instructor and have them sign your data. Show them the procedure you are following. Test your design under at least two conditions. Describe the overall performance of your design.

Final Design Test Witnessed _____

Personal Responsibilities (1 pt) -- A short paragraph should be written describing what each group member did to develop and implement the final design. _____

Creativity (0-2 pts) – Any creative approaches to implementation or in the final design will be rewarded with up to 2 additional points. _____