

Project 2 Proposal Example

Partner 1: Jeff Braunstein

Project Title: Implementation of a Transistor Radio

Keywords (should be from the topics covered in class): Transistors, Filters, Discovery Board measurements (DC, Oscilloscope, AC sweeps)

(The following description is perhaps a little more formal than your submission.)

A simple transistor radio can be implemented using an antenna, transistor amplifiers and resistors to bias the transistors. A speaker is also needed to allow the music to be heard. Also, due to noise outside the audio spectrum and high frequency carrier signals, a low pass filter is implemented with a corner frequency or around 20kHz, just above the range that the human ear can typically hear sound. In order to protect the speaker from DC bias current, a blocking capacitor is implemented in the circuit. This capacitor acts as a high pass filter. Since the corner frequency of the high pass filter should be below the audio range, approximately 30Hz, the capacitance will be chosen based on the speaker resistance and output resistance of the amplifier

The described circuit can be tested in stages. The input-output characteristics of the transistor amplifier stages is easily measured using the Discovery Board with sinusoidal inputs in the audio range. Likewise, the filters can be evaluated using the AC sweep features of the Discovery Board. Furthermore, the effectiveness of the blocking capacitor can be determined by using the DC measurement features on the Discovery Board. The overall circuit will be evaluated by hearing an AM radio station on the speaker.

References (document/book titles, website links, etc.):

Quan, Ronald (2012), *Build Your Own Transistor Radios: A Hobbyist's Guide to High-Performance and Low-Powered Radio Circuits 1st Edition*, McGraw-Hill

[Phil's Musical Snippets and Interesting Projects](#) (2012, August 4), How to make a Two Transistor Medium Wave Radio, <https://www.youtube.com/watch?v=3la0nqlmcsw>