
SECTION FOUR
Project Improvement
(Week 6 – 9)

SECTION OVERVIEW

In this section of the lab, you will be modifying and improving your existing amplifier design. The selection of what modification is up to you. Each individual must complete their own design and prototype of the modification. You are strongly encouraged to make an improvement that is interesting to you. Some suggested improvements include; Bluetooth audio, lighting the responds to the music, increase loudness, portable with batteries and onboard recharging, custom enclosure, or a PCB.

PRE-LAB

Complete your project improvement proposal document (located on lab page). The proposal shall contain at minimum the following parts; a short paragraph describing how and why your improvement choice is important and 3 ‘things your improvement will do’ the current system does not. This document **MUST** be approved by the TA. If your improvement and this document is **NOT** approved by the TA, you will not receive any credit for this or following lab assignments including your final presentation.

PROCEDURE

Just like with any engineering design, the first step is to define the problem. Actually writing down the problem will help to keep you focused on the end goal. An example problem might be ‘The current design is not reproducible easily so it needs a PCB’ or maybe ‘The current prototype is not portable so it needs to have batteries and USB charging.’.

Write your problem statement here:

Once you have a clearly defined goal, the next step will be to design the solution. This process varies dramatically based on what improvements you plan to accomplish. Regardless of what you do however, the result will be a set of design files. These design files could be schematics, mechanical drawings, code, or other items. These files will need to be attached to the turn in for this section. Make sure they are complete and detailed enough that someone unfamiliar with your design could produce your improvement **from just those design files**.

Based on previous project improvements, you must also follow these rules to get credit for this section

- Enclosures must be designed in Solidworks or Autocad. They may only be fabricated with 3D printing, laser cutting, or some other form of CNC process. No cables are allowed to directly enter and exit the enclosure. Instead there must be 'panel mount' connection for all wires entering and leaving the enclosure.

TURN-IN

- A printed copy of your design files. As applicable:
 - a. Schematics
 - b. Printout of the PCB layers
 - c. Isometric views of the case including dimensions
 - d. Simulation results
- A printed copy of page 1 from the datasheet for each semiconductor part in the design
- A copy of your project improvement proposal with TA's approval signature
- Check-off sheet

FINAL CHECK-OFF SHEET

Please be sure to include your improvement check-off criteria

<u>Test (from Project Specification)</u>	<u>Measurements</u>	<u>TA signature</u>
7.1.1 – USB Powered		_____
7.1.2 – Components Used		_____
7.1.3 – Signal Source		_____
7.1.4 – Volume Control		_____
7.1.5 – Stereo Output		_____
7.1.6 – Current Consumption		_____
7.1.7 – System THD		_____
7.1.8 – Solid Construction		_____