Mechanical Overview

Year: 2024 **Semester: Spring** **Team: 12** **Project:** Audio Interface
Creation Date: February 6, 2024 **Last Modified:** February 10, 2024
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Assignment Evaluation: See Rubric on Brightspace Assignment

1.1 Commercial Product Packaging

There are two products that can be analyzed to compare with our project. There is the "Neumann MT 48 USB-C Audio Interface" [1] and the "Focusrite RedNet X2P Audio Interface" [2].

1.2 Product #1

Figure 1: Neumann MT 48 USB-C Audio Interface

The Neumann packaging is an angled rectangular prism made out of a metal material. It has seven buttons, one big knob and a touch screen as an interface. It also positions all of the inputs and outputs in the back. Having the screen and user inputs at a slight angle provides a better ergonomic view for the user. Also having all the ports on one side makes the design more compact and provides less potential for tangled wiring. These are both good aspects when considering the design of our packaging.

We are considering adding touch screen functionality as a stretch goal in our design. However, we believe controlling each effect with a rotary encoder would be more precise. We would also have multiple smaller rotary encoders not encroaching on the screen for better viewing. The metal packaging is a more likely better material than plastic but because of manufacturing and design constraints, will not be used in our design. We also don't plan to display sliders on our screen.

1.3 Product #2

Figure 2: Focusrite RedNet X2P Audio Interface

The Focusrite is packaged within a case that is part acrylic and part metal. It has multiple rotary encoders and buttons. This audio interface also includes a screen. Similar to the Neumann, the user side of the packaging is slanted and has most of its ports in the back. There also seems to be holes on the sides and back of the packaging. Even though its purpose is not explicitly stated they may be there to introduce heat dissipation from the circuitry. The buttons contain lights which signifies if it's enabled. This may be a good quality of life feature to add in our design.

This packaging seems to be the most parallel with our idea for the design. Although we would have a bigger screen and less buttons as a result of our reduced amount of effects. We also do not think that the aesthetic value of the acrylic and metal combination will be work efficient for this project.

2.0 Project Packaging Description

Our packaging will be simple in design. It includes one screen, three rotary encoders, and two buttons. The majority of the interface will be partitioned for the screen while the bottom section will be reserved for the controls. This is illustrated in *Figure 2*. The ports for the TRS jacks and USB will be on the back of the packaging. This is illustrated in part by *Figure 3*.

3.0 Sources Cited

1) Neumann MT 48 USB-C Audio Interface [Online]. Available: https://www.guitarcenter.com/Neumann/MT-48-USB-C-AES67-Connectivity-Audio-Interface-1500000394997.gc?cntry=us&source=4SOS0DRBA
2) Focusrite RedNet X2P Audio Interface [Online]. Available: https://www.guitarcenter.com/Focusrite/RedNet-X2P-Audio-Interface-1500000147954.gc?cntry=us&source=4SOS0DRBA

Appendix 1: CAD Model Illustrations

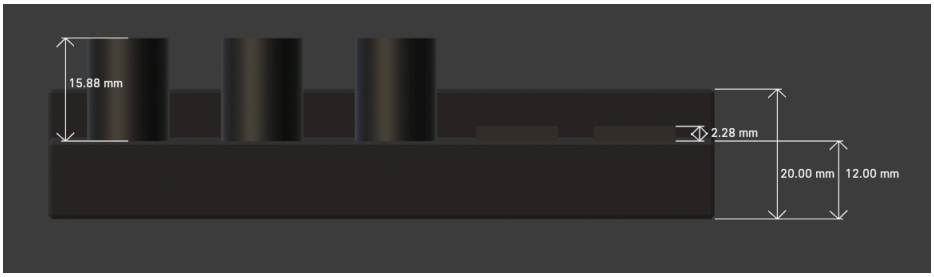

Figure 1: Side Profile of packaging

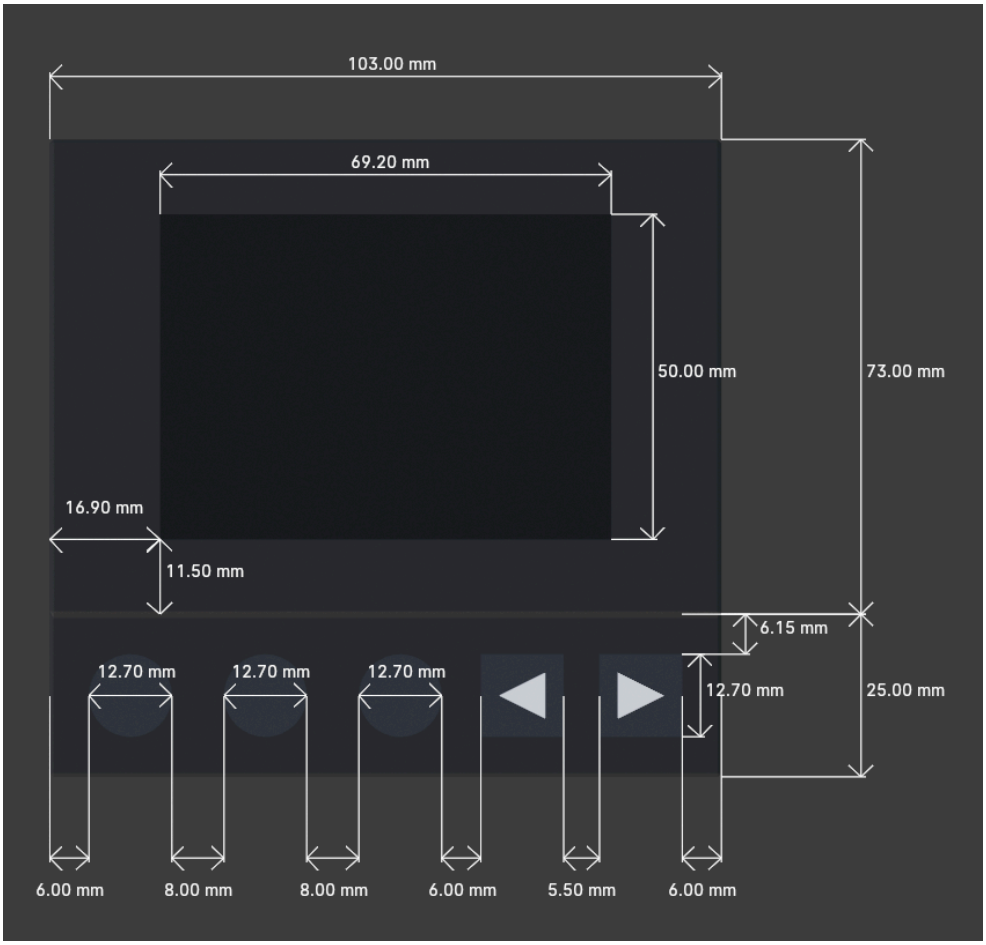

Figure 2: Top Profile of packaging

Appendix 2: Project Packaging Specifications

Material	Tools Required	Weight	Cost
ABS 3D Printer Filament ±0.02mm	3d printer, adhesive, dremel		$0.46/oz
Screws	Screwdriver		$0.10/pc
Standoffs	Screwdriver		$0.20/pc

Table 1: Materials, Tools, Weight, & Cost

Appendix 3: PCB Footprint Layout

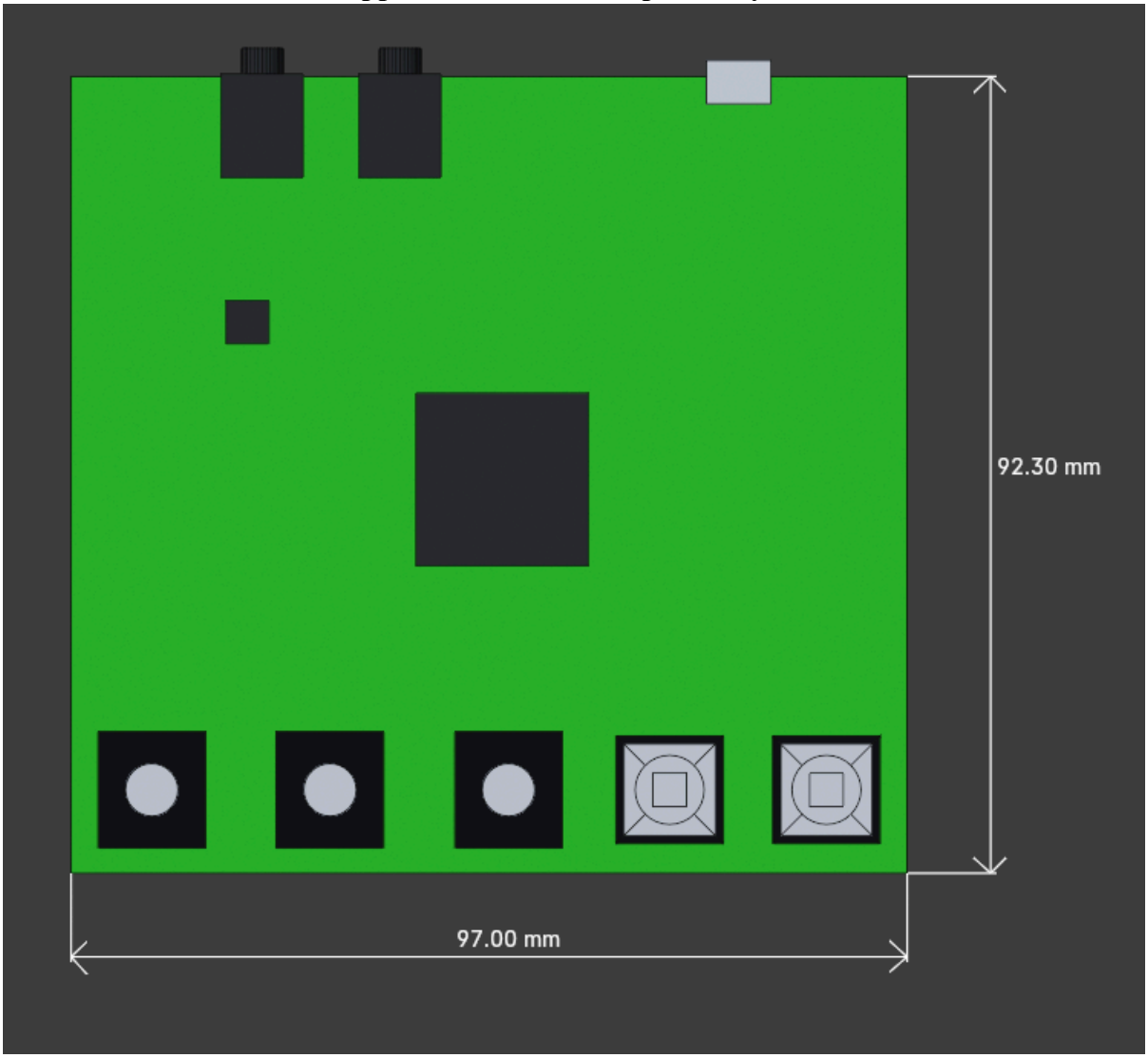

Figure 3: Circuit Board

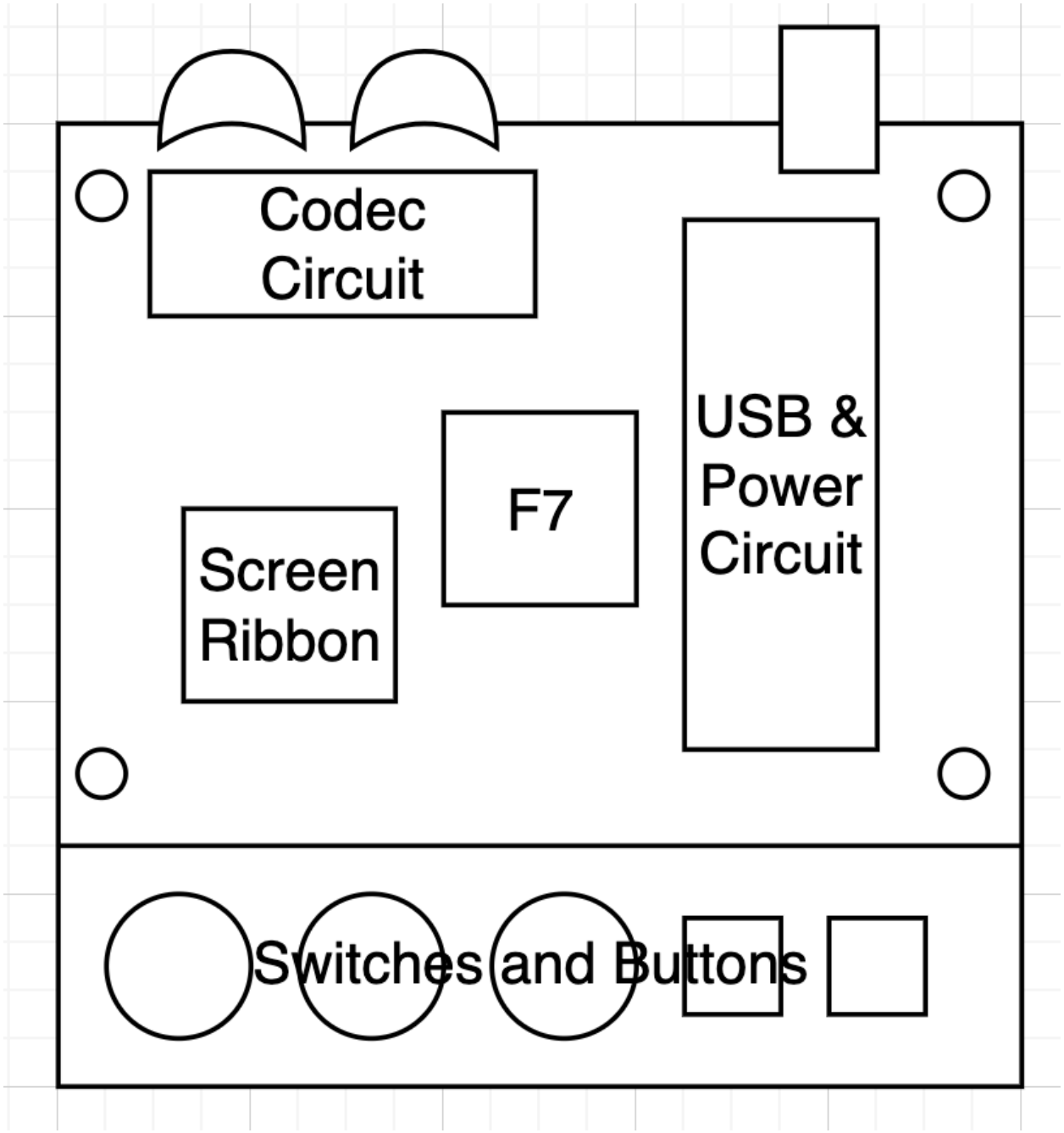

Figure 4: PCB Layout