Executive Summary

To help Tektronix both test their devices as well as offer remote operations for engineers working at home, they have requested a device that can be used both in a laboratory setting and remotely accessed. Our team has designed a gantry-style oscilloscope validation robot for Tektronix. This robot is able to push buttons and turn the knobs of many different types of Tektronix oscilloscopes and aims to allow remote testing and validation. Similar to a 3D printer our robot will be able to autonomously test and run validation from scripts provided by Tektronix engineers. The device also allows manual operators to work with the device on-site. With this approach, we can program the robot to interface with any type of oscilloscope Tektronix may use, and whatever testing procedure they need. This document serves to give people a better understanding of the system at large and its technical aspects of it, with unique challenges across multiple disciplines, including mechanical, electrical, and computer engineering, and computer science. The team for the Automated Front Panel Testing consists of four individuals. Kevin Ho, Dennis Kichatov, Felipe Orrico Scognamiglio, and Ryan M Christensen. All of the members major in Electrical and Computer engineering and we are all very excited to tackle this project and all its challenges. Since this is a partner project, the team will be working closely with our partner, Tektronix. Tektronix is a company that specializes in the creation and manufacturing of electrical testing equipment. During this project's lifetime, our team of four will be working with staff members from Tektronix to assist along the way.

We have approached this project with extreme care in mind. The initial phase of the project was 11 weeks. It was the drafting phase of our project. It was imperative to decide on a simple yet reliable design so if the team needed to make changes, there would be enough time. In order to deliver Tektronix a proper system, it was necessary to take into account the amount of time that was available to us and how proficient each group member was with their specific tasks. The second phase of our project focused on the implementation of the design for each of our separate blocks, later bringing all the blocks together to constitute one single system. During this phase, the designs and drafts created during phase 1 were used to develop and integrate the system. We found multiple obstacles along the way. The most recent problem encountered was how to approach the knob turning behavior for our system, multiple attempts on different 3d printed designs and servo motors were made. We are currently working on testing new designs and approaches to solve this problem. Our main focus is to deliver a complete project to the

Tektronix team that was very supportive along the way. We are working with close measurements and it has proven to be imperative that our design is compact and reliable.

We are currently in the final phase of the project. Presentation and Closing. During this time we are working hard to finish the requirements for Tektronix and deliver all necessary materials and documentation. It is imperative that we deliver all materials to Tektronix so that their team is able to reproduce our design.

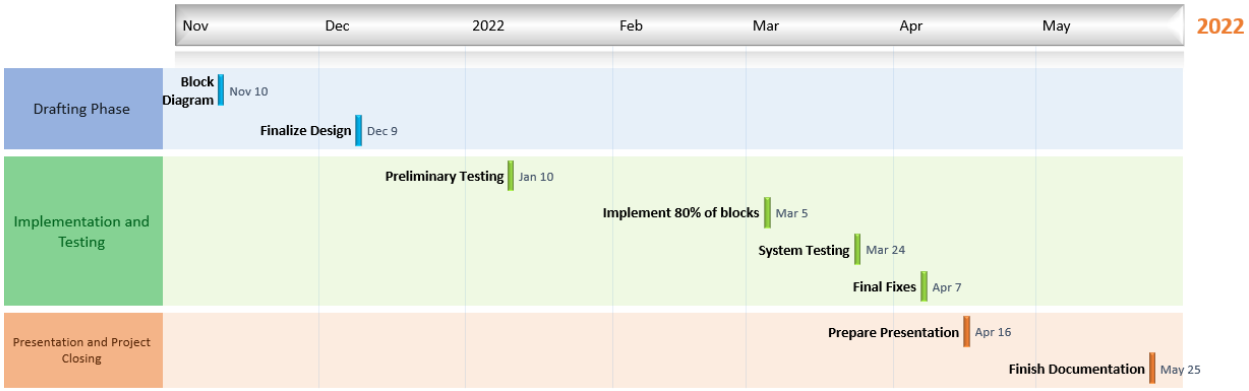

Figure 1: Timeline

As a team, we have learned that integration is the hardest part of any project. Separately, we had great success in designing and implementing our separate blocks. It was when we had to integrate it all together that we started finding problems with our design and adjusting it so it would all fit together. We guess that the main takeaway from this is that protocols should be discussed early on. It is important that all parts have only one way to fit together so that there are no misunderstandings when doing so.