Project Identity

Freely Adjustable and Accessible Keyboard and Arrow Pad for Client with Cerebral Palsy

Work Completed

This week was mostly dedicated towards the electrical aspect of the project. I spent most of my time working on the PCB layout. Using the PCB Express program I was able to begin the design for our keyboard. The program allowed me to account for the various mounting holes, switch connector pins, and LED jumper holes. Figure 1 below shows the measurements needed before applying it to the program.

![Figure 1: Key switch mounting holes and measurements.](image)

Currently we will be using two layers of the PCB. The top layer includes the LED circuit, and the connections that correspond to the row the switches are located. The opposite layer contains the column connections for the switch and the diodes. Figure 2 displays our unfinished PCB. The two colors, green and red, represent the different layers on the PCB board. As one can see, there are fifty-six keys on the board, two which will be used for the spacebar.
There is still a lot more work that needs to be accomplished with this program. The connections need to be altered into the most compact and efficient manner and it must be reviewed several times before ordering. This is an expensive part of the project that we cannot afford to return and lose money. Due to the dimension on the keyboard, this item will cost approximately one hundred and fifty dollars.

The keyboard external design was worked on as well. We tried to enable the keyboard to angle at different levels but maintain a strong setting when mounted. We will incorporate a pin or hinge connection at the front of the keyboard while at the back there will be a locking mechanism that allow for three different angles. Figure 3 displays this setup.

Due to inclement weather last week, Sam’s team was unable to meet and therefore our original designs were not confirmed. The vacuum suction option to mount the keyboard may not be necessary and all that will be needed is a rubber
bottom. The rubber may create high enough friction to hold the keyboard in place.

**Future Work**

We would like to have the PCB done this week so it can get examined, perfected and ordered. Our PCB needs to be completed relatively quick because there are several other aspects to our project that still need to be accomplished after our electrical wiring and programming. The LED circuit must also be included on the PCB. This circuit will be simulated on a protoboard using an 18 volt source, comparable to the two 9 volt batteries that we will use. A better gripping device to replace the barbell/suction method our client currently uses we be designed and most likely attached to the keyboard in some fashion. A trip to Mansfield Supply will help us with the rubber mounting, locking mechanisms, and hinges.

**Project Review**

A lot of progress has been made so far. Though the team was not able to meet for confirmation on the keyboard, we still went ahead with the design to not lose time. After several meetings with the Hampton Elementary School staff we believe there will not be any more last minute changes. The PCB design is nearly complete, and with this piece ordered, it should not be long before the electrical features of the keyboard are complete. The programming for the keyboard is not too difficult and should allow for a quick and successful programming of each desire switch.

**Hours Works:**

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