This week Nolan and I completed a lot of work towards finishing the keyboard. The parts that were ordered on Monday came in, so we were able to complete required testing. We received vertical keys, which will act for “Enter” and “Space”. The measurements were taken, and they were incorporated into our keyboard design. Also the potentiometer we will be using was received. It is mountable on a PCB, and is able to be adjusted by turning a knob that will be positioned outside of the keyboard case.

A major hurdle was overcome this week as Nolan and I were able to use the power from the USB source to light up the LEDs. We had to adjust for the new power source by using different resistors than earlier, and the incoming voltage and the voltage drop was measured using a multimeter. Using 27 LEDs we tested the power source from the USB connection. The input voltage is normally 5.16 V, but after using 27 LEDs, it dropped to 4.46 volts. After the voltage drop from the 150 ohm resistors, the voltage was 2.25 V. We will be using different LEDs in the final design, and there will be 55 LEDs in use, so the resistors will have to be adjusted. Given below are images of the protoboard soldered to the control board (Fig. 1) and the LEDs lit up (Fig. 2)
Along with the LED testing, the layout of the PCB is basically complete. We have to come to a decision between two designs, both of which are seen below (Fig's 3 and 4)
By Friday we plan on coming to a final decision, and after reviewing our PCB with Bill, we will submit it for ordering.

**Future Work**

This week Nolan and I plan to finalize our design and order the PCB. Along with this, we plan to order new LEDs and calculate and order the correct resistors.

We also plan to start building the case for the keyboard. I have been machine shop certified over break, so Nolan and I can use the machine shop to cut our PCB to the correct dimensions.

**Project Review**

Our project has been moving along smoothly and on schedule. We may have been slow at the beginning, but now we have caught up and should be done within four weeks. Nolan has mastered programming the control board, and after our PCB has been ordered, we only have to solder all the pieces and
the electrical part of our project will be complete. After that we only have to design the keyboard case and Sam’s hand grip and we will be done.

**Hours Worked:**

~12