**Work Completed**

This week I have been keeping in close contact with the machine shop and have been figuring out exactly how all of our parts are going to be put together. I have been talking with Thomas Barber and his partner. The dimensions of the base of our device will be 18x18 inches of aluminum and will have a width of 3/8 inches. This width gives enough strength to work with while still keeping the overall weight of the device down.

The price for a 18x18 (3/8’’) would be $126 if we ordered it from the company that the machine shop orders from. However this price includes the machining of the black as well. I was told that we could buy a block of these dimensions from the machine shop for $60.00.

The base of our device will be propped up by four rubber platforms. This will allow the device to be easily picked up by users. This is essential because if it were to lay flat on a table it would be very difficult to lift. The four platforms will be in each corner of the base and will be approximately 1’’ in from the side and 1’’ in from the top. (I have included on the next page a drawing of CAD that will supplement my explanations of how our device will be machined.)

The platforms will be screwed into our base using English mount 10-32 screws. This means that the four holes that will be in each corner will need to have a diameter of 0.1590’’ and then a tap of 10-32 will need to be run through the hole. The screw will run through the platform and screw it into our base.

The machine shop has given me four platforms that we can use. These are platforms off another device that they had, however even though they are used, they will still suit our project.
The XY linear slide will also be attached to our base using English mount 10-32 screws. There are four holes in the linear slide which need to be screwed in. They are approximately 9.600'' apart in length and 3.300'' apart in width. The holes for these screw positions will need to be drilled into the base with a 0.1590 diameter drill and then tapped with a 10-32 tap.

Our contractors have asked for the option of being able to move the slides around after we have finished constructing the entire device. We will allow this option by drilling a grid of 0.1590 tapped holes into the base. Thus allowing the users to be able to unscrew a linear slide, reposition it and then screw it in at a different distance. Upon completion of our project we will label each hole as to the distance it is away from the center points. That way the user will not have to measure the change in distance upon moving the linear slides. Instead the change in distance can just be recorded off our pre-measured holes.

I contacted Anaheim Automations about the ability to mount slides vertically. Slides can be mounted vertically against a wall, however they cannot be screwed in from their base. If we were to drill any holes into the slide we would eliminate the warranty on them. This is not an option as we want to test each slide thoroughly and make sure it is working correctly. Each one costs over $1,000 and it is imperative it has no problems.

To solve this problem we will mount a steel block standing upright on the base of our device. The vertical block will have dimensions of 12'' in height, 4'' in width, and 0.5'' in thickness. This block will allow us to mount our sensor vertically by using the four holes already on the slide to do a wall mount.

The steel block that is standing vertically on our device will be screwed into the base using 3/8 flat head screws. The dimensions of our block and the screws were recommended to me by the machine shop at UConn. The holes in the vertical block will be drilled with a 3/8 diameter and then will be tapped with a 3/8-16 tap. The holes for the base of our device will just be holes for clearance. Therefore those holes will be drilled with a diameter of 25/64. These three holes will then be countersunk which
allows the flathead screws to be drilled into the bottom of our base.

There will be three holes drilled into the vertical block. This will make sure that it is steady and unmoving. There will be no need for our user to move the vertical linear slide and therefore there will not be a grid option for the vertical block. I have started the drawings in CADKey for the base and they can be seen in the following figures on the next page.

In the drawings you will see lines that are running through the entire block. These lines are used for reference so that objects can be created in their exact required positions on the block. The two intersecting lines in the center are used for reference and then everything else is created in ratios off of those two lines. The three lines to the right of the drawing are used to reference the holes for the screws.

Figure 1: bottom view of the base
You can see in figure one the four holes that will be drilled in each corner for screwing in the rubber platforms. The three holes to the right of our base is holes for the $3/8''$ flathead screws. The rectangle is the size of the $\frac{1}{2}''$ steel block, the holes only look bigger because the are the countersunk holes. The actual hole has a diameter of 0.406'' and the head of the screw (which fits into the countersunk hole) has a diameter of 0.762''.

In Figure 2, below you can see the 3D representation of our base in CADKey. The drawings still need the holes for the linear slides.

Future Work

I need to finish the drawings in CADKey. The holes need to not only show the diameter but also must be put in using the “tapped” hole option that CADKey offers. It is essential that all of the objects in our drawing are exact. That is because our manufacturers will be machining our base based off of these pictures. Thus I will be working on finalizing all of the construction instructions and CAD drawings over the next few weeks.
Project Review

We found out a few days ago that our parts order had not been sent out by the UConn Health Center. This is going to delay when we receive everything and is a large obstacle in the completion of our project. We are getting all of the side things done that we can without our parts. Everything is coming along, it is just very important that we get our parts as soon as possible so we can test everything.

Hours Worked: 12