Project Identity:

Orthodontic Wire Mechanical System Tester
Group 7
Week 8
Bethany Lepine

Work Completed:

The week began with the challenge of ordering materials from Yarde. All of the machining should occur soon, however Mike Brault is on vacation. Also, Yarde has not yet received our purchase order, so no plans can be made as to when and how machining will be done.

I continued to work on attachment drawings, and base layout configurations. Below in Figure 1 is the updated layout drawing of the base. The grid of holes will be for the third attachment point. The spacing between these holes will be dependent upon the base of the attachment point.

Figure 1: Updated base design

Another challenged faced this week had to do with the third attachment point. I was not sure how this would be configured to the base without having a bolt underneath, or
without having to disassemble other parts in some way. After some thought, it was decided that the screw to be used would be just thick enough to go through both layers of metal, but would not protrude through the bottom of the base. It needs to be determined whether or not Ultimate NiTi has screws available for our use.

The setup of the third attachment point has also been updated. This can be seen below in Figure 2.

![Figure 2: Third Attachment](image)

What concerns me about all of these mechanical design drawings is the dimensioning. I have been able to apply dimensional information through the drafting portion of Unigraphics, however these measurements are not always accurate if a part has been moved.

The base purchased from Yarde Materials has a density of 8000 kg/cm³, so the weight needs to be determined. This is due to the fact that in order to expedite the machining process and to cut shipping costs, the metal will be picked up from the drop zone. Upon calculating the weight of the 316L stainless steel, it was found to be approximately 88.579 lbs. This will be manageable to carry to and from a vehicle.
**Future Work:**

Complete dimensional drawings need to be created and an entire machining package should also be finished. This includes the dimensions of all parts and the specifications. Machining will be more complicated than predicted due to the many different parts.

Also, it needs to be established whether or not Ultimate NiTi has aluminum and screws of different sizes available. If not, we will also need to purchase this before bringing parts to be machined. A major limiting factor to all of this is that the purchase order is yet to be received by Yarde Materials, and Mike Brault has yet to get back to me.

Also, the Unigraphics drawings need to include spacing for the electrical components in the box containing the USB-6210, the RS 485 converter, and the PCB. This will need to be mounted on the base, so perhaps the size of the base should also be amended according to this addition of the electrical box.

**Project Review:**

This week, the mechanical development continued, and the designs should be completed by the time we have heard from Mike Brault. I am hesitant to put dimensions on the Unigraphics drawings due to the standards present on the specifications included in the users manuals of most of our parts. Therefore, I have decided to simply create a packet of information to explain to the workers of the machine shop at Ultimate NiTi.

**Hours Worked:** 14