Project Identity:
Orthodontic Wire Mechanical System Tester
Group 7
Week 7
Bethany Lepine

Work Completed:

This week, a good deal of work was done on the mechanical design of the device. I made several Unigraphics drawings, and I updated those that had been made in the past. It was imperative that drawing updates were completed because machining will need to begin as soon as the material is obtained from Yarde Metals.

I suppose one of the goals of last week was to have completed drawings on the sensor attachments. I developed a design for how this would be accomplished. The Unigraphics drawing of the complete sensor mounting onto the slides can be seen in Figure 1 below.

Figure 1: Sensor to Slide attachment.

This setup requires the sensors to first be screwed into the small rectangular mounting piece in the center.
These holes will be countersunk so that the head of the nail lies flush with the surface. This mounting piece will then be screwed into the thicker slide attachment with a screw at each corner. The slide attachment will then be connected to the slide itself via T-nuts.

These T-nuts can be purchased for 19 dollars per slide through Anaheim Automations. I am in the process of acquiring a quote for this. Also, I inquired as to whether lubricant was available through Anaheim. I am still awaiting a response.

I also placed three screw holes, equidistant at about 120 degrees from each other, to be fit into the tool mounting side of the sensors. The sensor to bracket attachment can be seen in Figure 2 below.

Figure 2: Sensor to Bracket Attachment.

I also affixed a small bracket onto the box at the end of the attachment arm. This bracket will be facing upwards so as to decrease error in testing. The bracket will be attached using orthodontic cement. The dimensions, particularly distance from the sensor, will be identified
and given to the client in case new attachment configurations were desired.

After choosing Yarde Metals as a source for stainless steel for the base material, I did some drawings based upon a slab that is 18” x 30”. A Unigraphics drawing can be seen in Figure 3 below.

![Base cutting sketch](image)

**Figure 3: Base cutting sketch**

With a slab this large, basic cutting will need to be completed in order to optimize use of the metal. Some changes to this cutting pattern may still be necessary.

**Future Work:**

Purchase orders for the metal, the Tnuts, the lubricant, and the power supplies with the calculated shipping charges need to be completed.

**Project Review:**

This week, a good deal of time was spent on the mechanical development. A source for the metal has been obtained, and we had the opportunity to get input from Michael Holbert.

**Hours Worked:** 12