Work completed:

During the week since the last report I was able to cut the sides down for the syringe cut out. Initially I had sawed both sides of the box using the small saw, therefore making cutting the piece smaller than desired. After cutting both side pieces and realizing my mistake, because we only want one side piece cut out, I had to re-cut from the second piece of stock another side panel. Then I had to mill the sides of the panel down to the appropriate dimensions. Once I restored the side panel I continued to cut one of the end pieces down also. In order to make the corners square a different type of cutter was needed. Then I milled down the cut out of both the end and side pieces. The 1 inch by 1 inch piece for the syringe linear actuator was cut, milled, and machined. The smallest diameter cutter available in the machine shop was 1/8 inch which I used to make the slot for the diameter of the syringe along with the insert for the plunger cap of the syringe. The next piece of work I did was to drill and tap a hole that would fit the lead screw of the linear actuator. In order to do this a number 30 drill was used in the drill press to drill the hole and a metric tap size 4 x 0.7 was used to make the threads.

The linear actuator was also received during the week. Upon inspection of the device, I noticed that the screw holes did not completely go through the motor base. Therefore, a piece of angle iron will be used to attach the linear actuator to the case by screws. I piece of 1.5” aluminum angle iron was cut from the stock. Then I predrilled a hole, drilled a ½ inch hole which was too small. Then I drilled a larger hole using a tapered drill bit with a sleeve. After making the hole as big as possible using the drills I
had to file the hole so that it would fit over the largest diameter. Bought two screws and tap for the linear actuator screws.
Current status:

Currently, the aluminum angle iron still needs to be drilled for the holes of the screws for the linear actuator and for the holes to attach it to the case. Upon talking with Serge and Rich, the machine shop does not have the appropriate tap for the threads of the screws for the linear actuator. As a result I had to pause my work and go to Mansfield Supply and purchase the correct tap and screws.

Future work:

During the next week, plans are to finish the angle iron piece, decide on what size screws needed to hold the Plexiglas together and the angle iron to the case, find out the size of the screw holes for the driver and PCB board and begin drilling holes. Once the linear actuator is attached properly I plan to mill the bottom of the battery case and the end piece to fit the syringe.

Project review:

This week the goals of completing the linear actuator piece was completed, which was a priority. Learning that a piece of angle iron needed to be added to the design and machined pushed back the drilling process. This is due the priority of making sure that it attaches properly with enough room and then the other pieces can be accommodated for.

Hours worked: 15