This week I completed the bottle holder and assembly. Next, I intend on collaborating with Dan on attaching it to the frame he built. The unit is considerably lighter than the previous design and in testing with the servo everything seems to be working well together. The use of epoxy in attaching the gear rack, spring and bottle top cap to the case proved to adhere well to the plastic case.

I also was able to successfully build a preliminary circuit for the tilt sensor. The tilt sensor is required for the whole device to operate. Without the proper orientation, the syringe cannot be expected to avoid air in the extraction of insulin. However in testing the circuit, the tilt angles are larger than I had hoped for. In one plane there is $\pm 40^\circ$ range, which almost dismisses the intention of the sensor. The other plane is better with a range of $\pm 10^\circ$ to $20^\circ$. I hope to integrate the two additional bidirectional sensors purchased to create a narrower region for the device to operate in.

Additionally, I was able to update the existing case drawings to better show the current design. Figure 2 shows the backside of the device. This figure does not show the frame or the PCB board, however the figure is meant to show how the components were designed around
the frame and also how there is additional room for the PCB board. Figure 3 shows how cutouts will be made in order for the patient to put in and remove both the insulin bottle and the syringe cartridge.

**Figure 2**: Case

**Figure 3**: Case with cutouts

**Future Work**

Next week I will work closely with Dan to complete the additional components required for the device. We will also properly install all of these components on to the frame. After completing the tilt sensor circuit I will move on to begin work on the presence sensors required by the insulin bottles and syringes. There will also be a sensor that determines the size of the syringe that I will work on.

**Project Review**

It feels that more of the components are coming together with the insulin bottle assembly and the case frame. If this week’s goals are accomplished the team will feel more confident about the deadline of next week.

**Hours Worked**

21.5