I. Backpack Lever Arm System

Work Completed:
During this week, the team continued to focus on the mechanical aspects of the Lever Arm System. Since the hinges made previously weren’t performing well, my teammates and I went to the machine shop and fabricated new hinges as shown below in the hopes that they are capable of handling the huge torque at Hinge 2.

After attaching the hinges to the lever arm, we tested the system with a bag pack. The results indicate that while the material we used to make the hinges is strong enough this time, the attachments of the hinges to the segments of the lever arm weren’t secure. Therefore, the team made two more sets of hinges that showed obvious improvements. The picture below is the final design of the hinges.

Figure 1. Final Design of the hinges
Another accomplishment this week was that I made the PCB for the microcontroller circuit that features switches which controls the two servo motors. The dimension of the PCB is 2.7” by 2.5”.

![PCB for the motors circuit](image)

**Figure 2. PCB for the motors circuit**

**Future Work:**
During next week, I will double check the PCB, and order it and all the components that we need to build the circuit. I will also help my teammates to continue create hinges and attachments for the Lever Arm System.

**Project Review:**
The team is moving along smoothly with this project, and followed the timeline this week. Once the PCB arrives, the team can focus more on the electrical aspects of the project.

**Hours Worked:** 12
II. Shampoo & Conditioner Identification Device

**Work Completed**

During this week, my teammate and I started to build the amplification circuit on the protoboard because the components have finally arrived. After testing the circuit, the results weren’t as good as we expected. The reason could be the speakers, or the surface mount adapters. Therefore, I ordered new adapters and hopefully that will take care of the problem. I also searched for insulation boxes for the circuit.

![Figure 3. Amplification Circuit](image)

**Future Work:**

Next week, I will continue working with the amplification circuit to figure out the cause of the problem. I will also keep searching for the insulation boxes that can be placed into the iPod holders.

**Project Review:**

The team is moving forward with this project, and following the timeline.

**Hours Worked:** 2