I. Backpack Lever Arm System

Work Completed:
Since the client has informed us last week that they might upgrade Mason’s wheelchair, the dimensions of the Lever Arm were not decided until this week. After obtaining client’s feedback and the confirmation of the technical specs of the new wheelchair (Quickie P222), I suggested the final dimensions for the three segments, which are 22 inches for limb one, 20 inches for limb two, and 10 inches for limb three. After the team meeting last week, the team took the advice and decided to research about the 80/20 material. We were able to obtain scrap 80/20 material from previous years, and I went to the machine shop and cut the stock material according to these sizes. The team also decided to use the sliding bracket from 80/20 Inc. to attach the backpack to the lever arm. It will need some modification so that the clipper can be attached.

Figure 1. Three Limbs made out of 80/20 material

I contacted 80/20 Inc. about the material for the lever arm, and the potential of 270 degrees rotation. Unfortunately the maximum
The amount of rotation that 80/20 provides is 180 degrees. The team also experimented with the 270 degrees overlay hinges that we ordered, but they were too small for the material. Therefore, the team decided to explore other rotation mechanisms, and decided to use a vertical rod to connect the limbs which will allow 360 degrees rotation.

![Figure 2. The rotational mechanism of the Lever Arm System](image)

The microcontroller is an essential part of the device because it controls the sequential movements of the Servo Motors. The team is still in the process of learning about it and C.

**Future Work:**
During next week, the main focus of the team should be the microcontroller because it is critical in operating the lever arm system properly. Connecting the three limbs and finish modifying the sliding bracket are also very important tasks. We should also spend sometime learning about the Servo Motors.

**Project Review:**
The team is moving along smoothly with this project, and followed the timeline this week. After the Servo Motors arrive, the team will be able to proceed with the project.

**Hours Worked:** 9

**II. Shampoo & Conditioner Identification Device**

**Work Completed**
During this week, the team focused on amplifying the speaker because that was the main problem that we had for this project based on the feedback from the advisor. We first tested different speakers, however using a better speaker doesn’t seem to solve the problem completely, so the team decided to look into amplifiers. We discovered the Digilent Amplification Circuit which is a very compact sound...
amplification circuit board with a small speaker built into it. After testing the Digilent Circuit board, we felt it was the perfect size for our device and amplifies the speakers enough to satisfy the client's needs.

Figure 3. Circuitry for the Shampoo & Conditioner Identification Device

After getting the positive feedback during last team meeting, the team finalized the decision on the attachment mechanism which is using the iPod arm strap. The diagram below provides a visual representation of the finished product.

Figure 4. The Shampoo & Conditioner Identification Device
**Future Work:**

Next week, the team will need to focus on insulating methods and material because the device will be operated in the shower. If the Digilent Circuit board couldn’t be found online, the team will also build the circuit.

**Project Review:**

The team is moving forward with this project, and following the timeline. It is relatively simpler than the backpack lever arm system, so the team has focused on that project a little more.

**Hours Worked:** 5