Shampoo and Condition Identification Device

By: Nahum Kryzman
Week 3 Report
2-4-08 through 2-8-08

Work Completed:

Week three was dedicated to finding a proper amplification system for the device and also ensuring that power can be provided from batteries. I started the week off by fiddling with the old amplification circuit. However, this was still yielding poor results. The team considered the idea that it may simply be the speaker is too weak for the amplification. So, I went to the ECE department and borrowed various speakers. When these were tested it was found that the power from the amplifier was generally not enough to activate the speakers. However, among the units borrowed from the ECE lab was the Digilent Speaker Peripheral Module. This device included a 8 ohm 1 watt speaker. This is 4 times the power of the speaker provided with our setup.

This system uses the LM4876 amplifier in order to give a gain of 30 dB and an output of up to 1 watt. This system was wired to our circuit and powered by a power supply for testing. The volume was significantly higher and should be audible by anyone. The system is also quite compact and would be ideal for the setup we plan to use. The company was contacted however they have discontinued this device. They schematic is provided online so that we can potentially build our own setup and solve the problem this way. Below are pictures of both actual Digilent module and the circuit diagram.

Figure 1: Circuit diagram
Future work:

- Water seal the belt housing.
- Ensure that proper voltage and current is provided from the batteries.
- Build a second amplification system if necessary.
- Make a list of all test points on the circuit.

Project Review:

The team is moving quickly to complete this project. Now that the volume is sufficient the team can focus on further perfecting the design. Straps for the device were ordered and should come in this week. Once they do we can focus on water proofing the entire setup.

Hours worked: 8
Backpack Lever Arm

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Work Completed:

Week three was dedicated to exploring option for use of the 80/20 material and further investigation of the PIC microcontroller code. Upon the suggestion of Dr. Enderle and David Price the team decided to go with the 80/20 material for the entire setup. The material provides both the structural rigidity that is needed and the potential of a variety of attachments. Raw stock was found in the senior design lab and was appropriated for use in the project. Based on final measurement by the client the raw stock was cut to this length:

- Limb 1: 22”
- Limb 2: 20”
- Limb 3: 10”

Once this was done the next main concern was a method for rotation of the limbs. The original hinges were tested however they were found to be too small and caused clearance issues. 80/20 was contacted about the possibility of 270° rotation. However, they said the maximum the can provide is 180°. The team decided that is a larger hinge can not be found one can be constructed in the machine shop. Below is a picture of the 80/20 180° bracket.

![Figure 1: 180° bracket.](image-url)
Future Work:

- Connect motors to device.
- Create a $270^\circ$ rotation.
- Order crossover clamps.
- Device an attachment for the backpack to limb 3.
- Familiarize ourselves with the PIC microcontroller and compiler.

Project Review:

As soon as the remaining components are received the team should be moving well to finish the project. The main concern for the team is to create a code that will control the motors in the proper sequence. This can be done without actually receiving the motors so we should be able to have significant progress by next week.

Hours worked: 6