1) Backpack Lever Arm System

Work Completed

I continued to work with the PIC 16F877 to develop the code in C. Primarily, I worked with the Delay subroutines within my nested ‘for’ loops. In addition, I tried to change the frequency/period of my PWM signal by setting the PR2 and T2CON to different values. I also worked with the CCP1 and CCP2 to try and activate the pins on the PIC to give the appropriate output. A lot of time was spent debugging the code, to try and get it to download onto the PIC.

Currently, I have not connected the servo motors to the PIC setup. I am still working with the LEDs to give me a better idea of the output signal. Although the program is successfully downloading to the PIC, I have not been able to successfully change the interval at which the LEDs are blinking.

I think that I have been successful in terms of initializing all the data ports on the PIC, and setting it up correctly for PWM mode, as the PWM signal is being outputted from the correct port.

Since speed of movement is not a major concern for our design, this aspect can be ignored. However, a major concern that still exists after the components discussed are made to work, is integrating a switch and getting a reverse motion.
**Future Work**

Future work will involve operation of the PIC16F877, and further development of the C code. The Servo motors arrived last week; now, I am able to experiment on them, using outputs from the PIC CCP1 and CCP2 pins, that have been set up for PWM.

The team is still to decide whether the 270 degree hinges (ordered) will be necessary, or if an alternative mechanism will be necessary to ensure optimal movement. As stated previously, if this does not support the structure, we will have to modify the 180 degree Pivot design, by making a further 90 degree cut in the component.

We plan on finalizing the mechanical design this week.

**Project Review**

The team is proceeding according the schedule. The code development is very time-consuming; as long as I am able to make progress on the sequential movement of the motors this week, we should be alright.

**Hours Worked: 9**

2) Shampoo-Conditioner Identification Device

**Work Completed**

This week, my teammate and I experimented with 2 AAA batteries, rather than 4 and 3. After concluding that they were sufficient, in providing a highly audible sound output, we purchased a covered battery holder that can contain the batteries. In addition, the IPOD cases arrived last week, so we are analyzing ways in which we can fit all components into the case, and insulate the circuit. Possible alternatives for insulation, like thick plastic bags that can be sealed are also being examined.

The 2 AAA batteries are placed in an enclosed plastic casing. This reduces the problem of water contact with electrical components. In addition, in case the batteries do not adequately fit into the IPOD casing, it may be necessary to place them elsewhere on the belt.

My teammates are working on building the circuit on a protoboard, to verify that the setup will work before ordering the PCB and necessary components.
This is a picture of the recording circuit, the 1 W Digilent speaker, and the battery supply (enclosed in the black plastic casing).

**Future Work**

Once we finalize the functioning of our circuit on the protoboard, the team will order the PCB. We still need to affix the button, and insulate the electrical components of the design.

**Project Review:**

This project is on track, as the voice amplifier has already been constructed. In addition, the design of the circuit has been finalized using ExpressPCB. Once its functioning has been verified by a model on the protoboard, we will order the PCB boards. The IPOD casing and the buttons have arrived. Once these components are put together, the team will focus on safety issues that are relevant and necessary for a long-lasting product.

**Hours Worked: 3**