Week five was mainly focused on ensuring that the device was self-contained and could function with minimum battery power. The Ipod shoulder straps were also received this week and so work began on making them waterproof. The issue with the previous battery configuration is that 4 batteries put together would take up to much space in the Ipod holder and so would be inconvenient for the client. David Price suggested that we try and find an alternative amplifier that could run on less than 3 volts. This turned out to be difficult as most 1 watt audio amplifiers run in a range from 3 to 5 volts. I decided to test weather our digilent amplification system could be sustained with on two AAA batteries (3 volts). The system worked fine with this setup so I went out and bought enclosed battery holders for two AAA batteries. Once this power system was applied to our setup the entire system became independent and fit well into the Ipod holder.

The next step was to build our amplification system on the protoboard. This is done to ensure that the PCB layout will actually function correctly. This was done up until the actual amplifier was to be installed because will need to order this component. The last thing done this week was the first stages of insulation for the Ipod holder. We are thinking of using greenhouse plastic to incase the back of the holder and create a locking system similar to that of a ZipLock bag. This will ensure that there is easy access to the batteries and the entire system while also keeping moisture away from the components.
Future work:

- Water seal the belt housing.
- Order the PCB based on the design created this week.
- Order the components necessary to build the second amplification board.
• Test the protoboard layout

• Make a list of all test point on the circuit.

**Project Review:**

The team is making good progress to finish this project. We have finished one full system and are now ordering the necessary supplies to build a second system. Since our system is now running off only two AAA batteries it has become significantly more compact.

**Hours worked:** 6

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**Backpack Lever Arm**

By: Nahum Kryzman

Week 5 Report

2-25-08 through 2-29-08

**Work Completed:**

Week five was mainly dedicated to exploring the servo motors and the PWM code. One of the main issues with the PWM this week was the fact that the delay settings seemed to have no affect on the actual timing of the pulse. The other interesting thing to note was that connecting the servo motors to the microcontroller output it seemed change the output timing. This was evident from the frequency at which the LEDs were turning on and off. It was also odd that the smaller servo motor would not really rotate when the signal from the microcontroller was applied. However, the larger motor functioned well with the same signal. This is a serious issue because there is virtually no documentation about these servos. It would be of great benefit for the group to know is there were thresholds that the input signals needed to be above. This seems like the only real solution to the current problem.

To test weather there is a minimum signal amplitude for the motors they were tested using the signal generator. This should that if the signal
intensity was too low the motor would not rotate. It also showed that if the signal frequency was too high or too low the motor would also stop functioning. This is a serious issue that will need to be addressed next week because without proper functionality of the motors the whole project may fail.

**Future Work:**

- Connect motors to device.
- Ensure that motors will run properly from the microcontroller output.
- Order crossover clamps.
- Order components from 8020.

**Project Review:**

Now that the motors have come in work has picked up on this project. Next week will mostly be dedicated to mechanical construction of the system as progress with the code is slow. Once the lever arm is fully constructed we will have time to finalize the servo control.

**Hours worked:** 8