Work Completed

This week was spent writing PIC microcontroller code. I am using assembly language despite its complexity because it allows closer control of what is going on within the microcontroller. It is also more familiar to me because I am using the basics in my introduction to microcontrollers class. I had the option of programming in C++, but I have not used that since my first semester, and relearning the language as well as researching how to control various ports with it would cost valuable time.

I have decided to use Port D for all of the I/O required for this project because it has no special functions like the other ports do, leaving them open for any future modifications to the project. I also decided against having the main body of the program in an interrupt because this was a waste of the interrupt port, and the function of only moving when the handle button is pressed can be carried out with a simple check of the port that the button is attached to. So far, I have laid the basic framework of the program, successfully created an analog to digital converter subroutine, and completed initialization in both bank 0 and bank 1.

The electric circuit that will run the motor is another major area of work this week. I made a link that allows the MPLAB ICD to program the microcontroller directly on the breadboard, eliminating the need for the Qik-Start development board that I had been using previously. To do this I took a 6-wire telephone cord and cut one end off. I then stripped the individual wires and soldered color-coded wires that fit into the breadboard to the ends. After this, I tested them all for connections, and hot glued the end for stability and ease of placement into the breadboard.

The circuit itself works perfectly under power by the 35V power source that is in the lab, but using the 48V source that came with the motor has caused major problems. When connected to the 48V source, the P-Channel MOSFETs that form the top of the H-Bridge are destroyed as soon as the power is connected. I have gone through 6 of them, and I believe the problem is that the motor is drawing too much current for them to handle when it first starts up. In hopes of overcoming the problem, I ordered more powerful MOSFETs, which should be in by Friday.
Future Work

This week the project needs to be completed. The microcontroller code must be finished and completely debugged. I must find a solution to the problem with the circuit, and send out the order for a PCB. It also must be integrated with the mechanical aspect of the project, which is being worked on by the other group members.

Project Review

The deadline for the project is growing near, and much work still needs to be done. Unfortunately, there is little room for error if the project is to be completed on time.

Hours Worked

Total hours worked this week: 30