Week 4

Project Identity:

Accessible Syringe Dosing Device

February 09, 2005 – February 16, 2005

Robert Mock

Work Completed:

Thursday I finished the completion of all circuit diagrams. This includes the complete motor setup. Also, the complete setup of the keypad was finished. All pertinent LCD display connections were completed. All inputs and outputs from the microprocessor to the motor driver, keypad and LCD display were chosen. The finalized wiring of the LCD display and keypad was also done.
The next day in the lab we received the linear actuator early, which was great. As soon as we opened it Megan and Karen took the linear actuator down to lab in order to measure its dimensions for completion of the case. In the meantime, I called our contact at HSI-inc. to find out where we could purchase the cable we need that wasn’t provided with the encoder, and to find out the correct wire arrangement for the bipolar windings of the linear actuator. These were labeled in a way that made them impossible to read.

Also while in the lab, I wired the driver to a function generator in order to produce the clock signal that runs the motor and to a 20V power supply. The driver runs on three signals. The first signal is logic 1 or 0 to control the direction. The next is logic 1 or 0 to enable the driver. Last, a clock signal determines the speed at which the linear actuator operates. Gabe decided we should wire a switch to the enable and CW/CCW signal inputs to increase ease of use. After wiring all of that Gabe and I powered up this baby to find out nothing works. Our advisor Chris walked over and said try this frequency for your input step, then everything worked perfect.
Tuesday I planned to begin the construction of a motor driver that uses less current. Our driver uses 1A of current and 20V. After studying the driver that uses less current, I found out it runs on 30V and would make our job of finding a battery even harder. Therefore the net was searched, only to find that most drivers do not output enough power to run our motor and the driver we’re using now is optimal.

This Wednesday I went to the U.S. Digital website and found the cable we need for the linear actuator encoder. This will interface with a computer or other testing equipment to give us information such as step count and rotational speed. After that I read over all the help info on Express PCB and SCH and began the creation of schematics that will later be converted into a PC board for our project.

Future Work:

Next week, now that we have all the parts and we know what our power supply options are, I plan on finalizing the schematic in Express SCH and designing the rough PC Board in Express PCB. In addition to this, I must find a voltage regulator that meets our needs.

Project Review:

The case and overall circuitry are very close to completion with nothing holding them back. I should have a preliminary PCB design pumped out by Monday. Gabe and Megan are both working on the program, while Karen completes the case.

Hours Worked:

Final Keypad schematic and setup: 3 hours

Circuit Construction and testing of actuator and driver: 5 hours

Testing different actuator speeds and max and min lengths: 1 hour
Looking into the purchase of lower power drivers: 2 hours

Order for encoder cable: 1 hour

Express SCH schematic program: 3 hours

Total: 15 hours