Project Identity:

Team 2: Automatic Syringe Loading Device  Week 4  2/19/08  Scott Relation

Work Completed:

I continued working with the MPLAB interface; becoming more familiar with how to use the ICD2 to upload and run programs on the PIC24 processor. I started expanding on my initial C programs in an attempt to use one of the processor’s output ports to control LEDs I had connected to its pins. My initial attempts had mixed results; only a few LEDs operated as expected. Consulting MPLAB’s and the PIC24’s documentation and searching online for suggestions hadn’t yielded much insight as to what the problem was. I had previously learned that the processor’s port bits had to be set for use as outputs, and yet was still having difficulties. Only once I started reading the “Programming 16-bit Microcontrollers in C” book by Lucio Di Jasio did I begin to understand what the issue was. Due its small size, many of the PIC24’s 28 pins need to perform multiple functions. When performing a given function a pin becomes unavailable for other functions; if a pin is being used for analog-to-digital conversion it will be excluded from normal input/output processing. With some further research, reading, and trial & error I was able to fully enable the pins I was attempting to output with and was able to implement a small binary counter program to activate the LEDs.

Next I started looking at how the PIC24 could be used to control a servo. After some investigation I learned that the servo was designed to receive one input for the processor which, by use of pulses of different duration, would cause it to rotate clock-wise or counter clock-wise. After some research and trial & error I was able to find the correct length to use for the pulses. I created a program which could cycle through rotating the servo’s shaft back and forth. Figure 2 shows the servo and LED’s being controlled by the microprocessor. Figure 3 shows a portion of the C program that written to accomplish this.

I started looking into what settings and code would be required to enable a few pins for input. I would like to add a switch or two to the protoboard which could be used to trigger the rotation of the servo. This would be a step towards using a program to poll input ports for sensor data, and then utilizing the results of those inputs to make code execution decisions.
Future Work:
I will continue working on the C programming for the microprocessor. I will learn more regarding the configuration and use of ports for inputs and I will build a servo/switch circuit to test the new input triggered program. I will also investigate what will be needed programming & connection-wise, to use the PIC24 to control one of the stepping motors that will be used in our project. Research will also begin on how we can use the PIC24 processor to communicate with the LCD screen and send text to its display.

Project Review:
Work is progressing steadily. Dan is continuing work on the syringe cartridge and is beginning work on the claw assembly. Designs for the case layout and component interaction are being further refined. Progress is being made with the programming of the microprocessor; work has begun on code that will be used to control various components within the device. The cardboard prototype is still being updated to reflect design changes. The search for a suitable voice recognition chip has concluded; after some discussion amongst team members and approval is granted from the project supervisor an order for it should be placed this week.

Hours Worked: 19 hrs