This past week was spent preparing the blueprints for the shampoo-conditioner ID device casing. The 3” slab of polypropylene plastic has arrived along with a waterproof toggle switch, a 8MHz crystal oscillator, and our PC board.

The polypropylene slab came exactly in the dimensions that we ordered it (12”x12”x3”), translucent with white tint. After the casing undergoes machining, we will paint it to a more attractive color. Kenta has drawn out the general casing dimensions which I will translate to Visio then begin the machining process this week. The polypropylene slab is heavy, but over ¾ of its mass will be cut and hollowed out, so it should work out okay. A ridge around the device and battery compartments will be made for the gasket to rest on. The gasket will be ordered from McMaster-Carr, and will be roughly 1/8” wide, and span the entire perimeter of the device and battery compartments.

The waterproof switch is a single pole single throw toggle pushbutton switch which may serve the device. If this switch is used in our device, then we would have to use either one 9V battery or two of them in series. In this configuration, battery life becomes a bigger concern. The sensor is usually operated from a single 9V battery, and when that same battery also powers the PIC, SP03 and speaker simultaneously, a big power demand results. If given the option to run this device on two 9V batteries in series or one standing alone, I would choose the series configuration. The other option here is to purchase a double pole single throw switch so that we could run the PIC, speaker and SP03 on one battery, and the sensor on the other, as two separate circuits that switch on simultaneously. The problems associated with this approach are that both batteries would have to be fresh in order for the device to work. If one battery is low and the other one is well charged, the device will not function properly or not function at all. In the series battery configuration, one battery can be low and the other high, without affecting the device operation, or at least not on start-up.
The PC board has also arrived just as we ordered it. The traces look fine, and things seem to fit, except for the pin holes for the SP03. The holes were a little bit too small for the SP03 pins to fit through, so I tried stretching the holes larger by forcing small narrow objects through them. This had little effect, so I just had to use some careful force to push the pins in the holes. Although the SP03 pins did not go all the way through the holes, they went deep enough to hold the SP03 in place. To help hold the SP03 in position, I added solder to the connection zones on each side of the PC Board, and hopefully this should do the job.

The 8MHz crystal that has arrived works perfectly with the PIC. This enabled me to test the entire circuit from sensor to speaker, and it works fairly well. Perhaps a slight adjustment in frequency selection can be made because the Quick start crystal was a 7.3MHz crystal, and we’re using an 8MHz crystal now. That test worked successfully in the protoboard, but before transferring it to the PC Board, I soldered-in the 4MHz crystal and tested the response to see whether the device works on the board. It has worked successfully, completing the transfer from Quick-Start to PC board.

Future Work

In the coming week, the final work to be done is machining the device casing for the Shampoo/conditioner and Medicine Reminder devices. This process will begin by drawing detailed blueprints in Visio, then discussing the machining plans with the machine shop staff. Another critical task is to order red and blue stickers for the shampoo and conditioner bottles.

Project Review

This week is the final week before progress inspections. Considering that the “guts” of the device is complete, it is fair to say that we are more or less finished making the active part of the device. By the end of this week, we should have a presentable
device that can actively distinguish between two colors (red and blue), and use that
distinction to signal and output an audible “Shampoo” or “Conditioner” voice response.

Hours Worked: 13