



The glucose circuit was connected to the input of the analog-to-digital converter to begin the integration process of these two circuits. Initial tests showed that the A/D is able to detect the immediate spike in voltage but had difficulty detecting the decaying drop. Various reference voltages were tried to increase the resolution of the A/D in an attempt to detect smaller voltage changes from the glucose circuit. The A/D was unable to accurately convert the voltages to digital counts. The problem with the glucose circuit and the A/D is probably due to the noise in the glucose signal. Mike will need to do more work with the glucose signal to try and reduce the noise using filters. Another possible reason for the A/D failure is a slow clock speed. Perhaps raising the clock from 6 MHz to 20 MHz will increase the A/D's conversion speed.

### **Future Work**

This week will be spent working with A/D converter and glucose circuit as well as starting to integrate the speech chip or speech module. I will develop code to use the SPI (serial peripheral interface) port with the speech module. The speech module will allow me to learn how to interface devices to the microprocessor without waiting for the speech chip to be prototyped. Depending on the difficulty of the SPI interface I may choose to use the USART port to communicate with the speech module. More work will be done with the A/D converter and increasing the acquisition sampling speed to try and resolve the glucose circuit input problems. Once this problem has been solved I can then work on the algorithms to convert the voltage level to a glucose concentration.

### **Project Review**

The work with the microprocessor went very well again this week. The glucose circuit filtering problem is proving to be more difficult than expected. Mike will continue to work with the glucose circuit to resolve the signal-to-noise problem. The finding of the SP03 speech module will help us learn how to prototype the speech chip. If time is running out with the development of the speech chip circuit then the speech module can be substituted into the design. Matt will work with the speech module to better understand the communication procedures with the microprocessor. Goals for this week are to get the A/D code working with the glucose circuit, communicate with the speech module using the microprocessor, and reduce the noise on the glucose circuit. Total costs to date are \$470.07.

### **Hours Worked**

Hours spent on the project for Week 4: **15.5 Hours**