

Project Identity

Accessible Blood Glucose Monitor Interface

Week # 7 (February 27 – March 4, 2006)

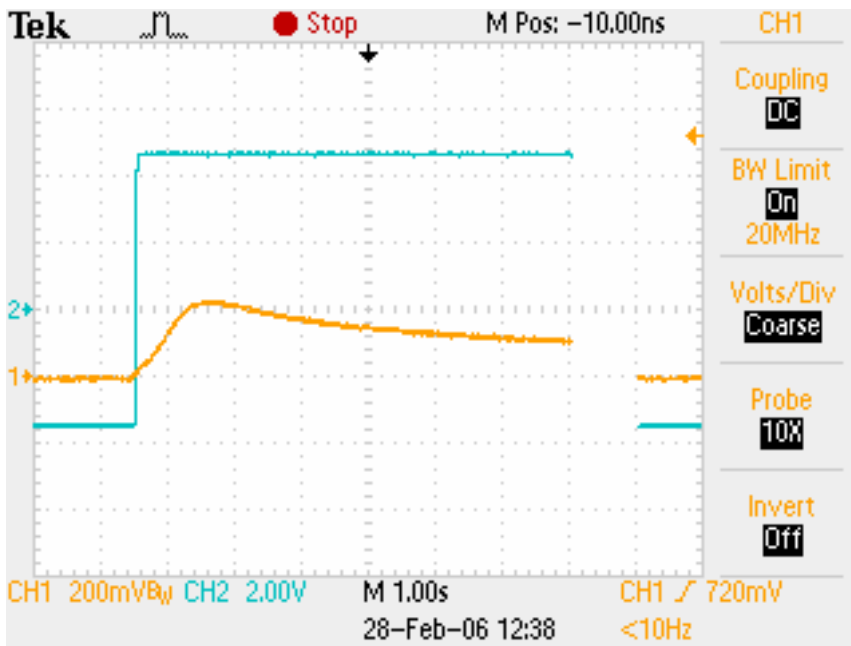
Mike Rivera

Work Completed

Week 7 was spent developing the comparator that will be used during measurements. As discussed in previous weeks, this comparator will recognize when sample has been applied by continuously measuring the voltage and detecting when this voltage exceeds a reference voltage. It was decided that the reference voltage will be about $.02V$. This was the value that when reached, definitely implies a voltage spike (blood application). The comparator was built using a TL082ACP op-amp. A voltage divider was also constructed to convert the $+5V$ source to a $.02V$ reference voltage.

Once the comparator had been built, tests were done to verify that it worked. Image 1 is the oscilloscope image of the glucose voltage curve along with the comparator output. Channel 1 (orange) is the glucose output, and channel 2 (blue) is the comparator output. The built comparator did exactly what it was supposed to and seems to be working just right. It gave a $5V$ output when the glucose curve exceeded $.02V$ at its initiation. One problem though, is that it does not start from zero. Prior to the $5V$ step, it stays at about $-3.6V$, which is not desired. For the microprocessor to work with the comparator, it needs to be at $0V$ until it steps to $5V$. After speaking with Chris, using a different op-amp may be able to solve this problem. He believes the $-3.6V$ is due to the negative voltage that is being applied to the op-amp, being that it is a dual source. Switching to a $+5$ single source op-amp should rid that negative voltage, thereby having the output of the comparator $0V$ until the $+5$ step.

Image 1: Comparator Output with Glucose Output



Future Work

In the upcoming week, I can begin work on the vial scanner. This part of the design still needs much to be done. Dave is making progress with the screen and will continue with that until completion. Microprocessor programming is also coming along, but really is moving hand-in-hand with the screen development. The speech-chip is moving along as well. Communication with the chip has been accomplished, so it is a matter of writing code for the microprocessor to implement.

Project Review

So far, so good. Things are running smoothly and we seem to be making good progress. Coming soon we should be bringing all our parts of the project together and beginning to develop a working meter.

Hours Worked: 13