Project Identity:

Orthodontic Wire Mechanical System Tester
Group 7
Week 2: 9/23/06 – 9/30/06
Max Feldman

Work Completed:

This week was spent investigating the organization of how our labVIEW program will run, and was spent getting the starting stages of the program written.

The first component of the program that I wrote was a program to mimic the signal that will be inputted to the computer by the sensor. This signal allows me to run testing on the functionality of the program before we have received and hooked up the sensor. The program creates a sine wave of variable amplitude and frequency and adds noise to the signal. The signal is then sent thorough a butterworth filter, of which the properties can be changed, and the filter signal is displayed along with an FFT of the filtered signal and a calculation of the amplitude of the signal. This calculation is very important as this is the essential information measured from the signal. The front panel of this program is shown below in figure 1:

![Signal Processing Program](image)

The next part of the program that was built was a program that performs the necessary calculations on the output signals from the sensor. The program inputs six channels (SG0, SG1, SG2, SG3, SG4, SG5) and performs a
series of calculations to output an $F_x$, $F_y$, $F_z$, $M_x$, $M_y$, $M_z$. The program, as of now, still has a series of user inputs to account for variables in circuit elements, however when the circuit is finalized, this program will take no user inputs. This program also has a functionality that allows the user to zero the instrument. In the calculations of the sensor outputs, it is necessary to have a loaded and unloaded voltage values from each channel. This program allows the user to unload the sensor, set this value as unloaded, and then loaded the sensor to experience accurate readings. The front panel of the program can be shown below in figure 2:

Finally, I believe that the hardest part of the program will be writing script to communicate and read from our component devices (i.e. the motors and sensors). I started to investigate into the VISA.vi in LabVIEW, which is made to communicate with peripheral devices.

**Future Work:**

In the direct future I would like to finish MultiChannelCalculations.vi so that it is fully functional. I would also like to hard code values into this program once our circuit elements are finalized. Also I am anxiously awaiting the sample motor so that I can start writing code and testing the communications between LabVIEW and the motor system.

**Project Review:**

We are having a tough time moving forward with our project because our designs have not yet been approved and given the ok to order parts by our sponsors. While I feel that I can get most of the program written without these elements, I feel that we as a group are about to hit a dead
end in terms of work that we can get done on this project without parts.

**Hours Worked:** 14