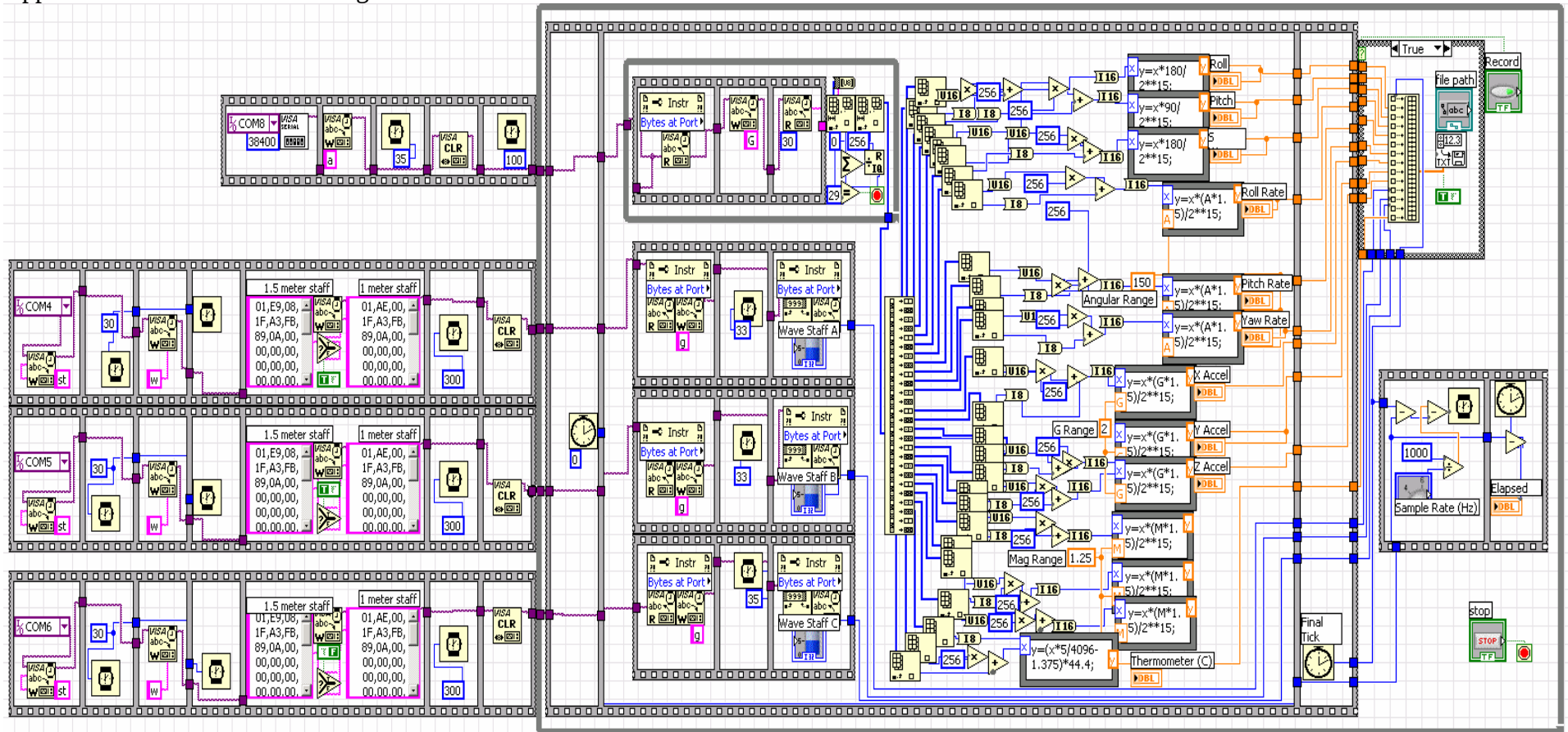


Appendix B: LabView Block Diagram.



The four flat sequences on the left hand side are used to initialize each of the instruments. The top left sequence opens a connection with Com 8, which is the AHRS unit. An “a” is written to the unit to set it into angle mode, and then it is ready to be polled. In the other three sequences, com ports 4, 5, and 6 are used to bring in the data from the wave staffs. An “st” stops the staff then a “w” allows the staff settings to be edited, and the proper setting, depending on the length (1 or 1.5 meters), are written to each of the units, finally the buffers are cleared and the instruments are ready to be polled.

In the main loop first the initial time is reset. In the next frame each of the instruments are polled by writing a “g” then reading the buffer. The wave staffs output a single number 0-4095 as a percentage of the height. This value passes out of the flat sequence in to the write to file in the top right corner. The AHRS outputs 30 different values in a string with a header and checksum. After the “G” is written and the 30 bits are read, it looks for a header and checks the checksum. If the data is not OK, it is resampled. If it is OK, it is sent on to be parsed out, scaled, and recorded in the excel file along with the other data. The final time is checked in the next frame.

The last section has two main parts, the top right frame which is the write to file command, and the lower right sequence which controls the sample rate by calculating the elapsed time and adding a wait for the time required to achieve the desired rate.