SMITH Status Report June 2011

Electrical Progress

There have been several changes to the electrical design: placement of certain components, removing sensors, and redesigning some of the boards. The team decided the pressure sensors in the sampling chamber were not vital to the success of the mission. As a result, the four temperature sensors will be combined on one board freeing up more channels on the BASIC Stamp and the ADC (Analog to Digital Converter). The board for the four temperature sensors has been designed and we are waiting for it to come in to begin soldering, testing, and calibrating. We also discussed getting rid of the Control Board and splitting the components between the Power Board and the Communication Board. It would be better for the switches for the values and motors to be close to the power supply. The only place we can fit the circuits for the gate sensors is on the Communication Board. System diagrams are being redrawn to reflect the changes in design.

Mechanical Progress

We preformed FEAs on the SolidWorks assembly file of the SMITH frame. The FEAs (Vertical and Horizontal) took approximately 5 hours of computer time each to run. Two lab reports document the findings of the analysis.

We created a prototype of the Temperature Pressure Humidity Sensor Conditioning Board and created detailed testing protocols. The design of the Communications Board is near completion and will be fabricated soon.

Recent testing of the previous motor/engine coupling and the current drawn outside of a vacuum reveled the throttling could be utilized. In addition, we have found a system capable of measuring temperature in the vacuum chamber, set it up, built a vacuum plug, (with advice from Dr. Sprunger) and tested the motor/engine coupling using WD-40. We also ran a 2nd test on the motor/engine coupling using WD-40 without the vacuum. We are also researching alternative lubricants.

Software Progress

The current task lists and software flowcharts are being reevaluated. Initial attempts for communication between the SUBR sensor board and the SMITH Communications Board are promising. We wrote a program that was able to read characters from the UART and display them on the terminal running the program. A separate computer connected to the Communications Board was able to input the characters.