



Scarlet Hawk II-HASP 2014

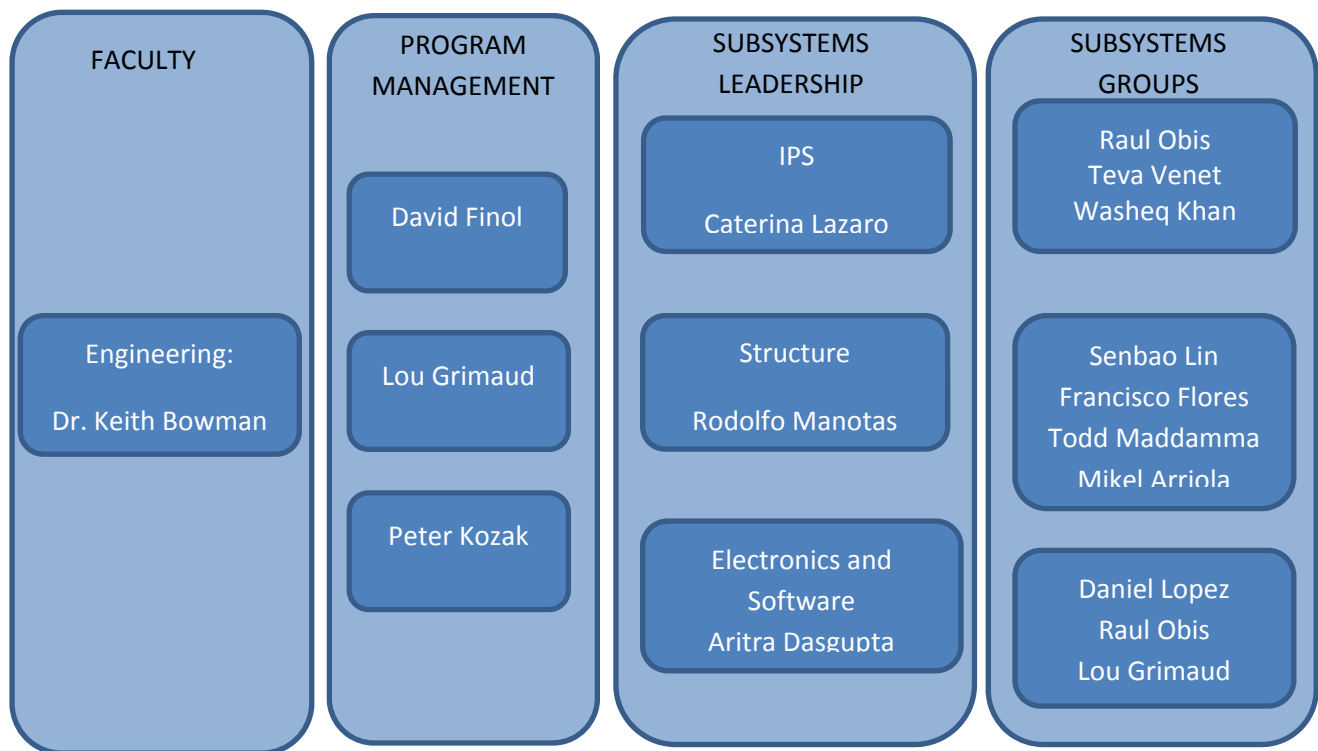
March Status Update

3/28/2014

Summary of Progress

All the teams have been steadily working on the system during the past month. The Electronic and Software team focused on finalizing all the PCBs for the entire system this month. The Independent Power System team finished all the details of the Cameras System and the Maximum Power Point Tracker. The structure team completed the main frame and is moving towards the integration of the system with the structure. The prototyping part is then getting to an end. The next steps are to finish the manufacturing of the structure and start integrating the systems to later proceed to the testing phase.

Updated Team Structure



Electronics and Software (ES)

The electronic part of the circuit moved into its finalization phase as we progressed towards the realization of the PCBs. We worked towards the circuit of the MPPT which is going to be used. This part was done in DipTrace. This software also enabled us to obtain a PCB layout to later be able to use with the CMC. Our main objective with the board of the MPPT was to place all the components and their connecting wires in such a manner so that everything can be placed on the single side of a PCB. Also, the current sensors that were mentioned in the previous report have been ordered. The current sensors that were chosen are precision current sensors and can calibrate small degrees of current. This precision was indeed required in order

to get an accurate estimation of the power in the system. We also figured out the process of how it can be connected to the Arduino board. Thus the team has taken a giant step in order to handle the power management in the system as well as the MPPT part. In the coming weeks, we are planning to work on the MPPT to obtain the final board. We are currently awaiting the components to be delivered in order to complete our circuit.

Independent Power System (IPS)

The IPS team ordered and tested a new brand of solar cells that are less brittle and more efficient during this past month. The new size of the cells avoids the need of any size adjustment or cutting, which proved to be problematic with the previous brand of cells. The cameras were tested along with the batteries monitoring their charging and discharging capacity and thresholds. The PCB holding the Arduino and its power supply has been soldered. This board has been left with some room for modifications, as the team is considering incorporating status LEDs to help troubleshooting the code if necessary. It would allow us to see the state of the on board code without having to connect to the serial port.

The picture-taking frequency as well as the implementation of different modes depending on the battery level has been discussed. The Arduino system will be monitoring the battery level as part of our assessment of the system's performance and using this information to shut down the cameras if necessary. Further testing on the independent power system is needed to determine the thresholds at which the power saving mode would be integrated. We are also considering having a "take off mode" where the cameras would be left on to have more pictures of this part of the flight. The next step is going to be testing the whole control system with the final hardware and a simplified version of the code.

Structure

During the month of March, the structure team has been focusing on building the main frame of the payload structure, as well as making small modifications to the design. These modifications were made to make it easier for manufacturing and do not have considerable effects on functionality or strength. The aluminum panels that comprise the inner structure were built using CNC machining. The FRP panels that comprise the outer structure were also cut out of the raw material. Welding of the aluminum structure will be undertaken on April 3rd, while FRP shell construction will follow shortly afterwards. The challenges involved with welding have been addressed. Small changes to the overall design will continue to be made along the following weeks.

Demographics

Last Name	First Name	Gender	Ethnicity	Race	Status	Disability
Dasgupta	Aritra	M	Non-Hispanic	Indian	Grad	NO
Lazaro	Caterina	F	Hispanic	Caucasian	Grad	NO
Lopez	Daniel	M	Hispanic	Latino	Undergraduate	NO
Finol	David	M	Hispanic	Latino	Undergraduate	NO
Flores	Francisco	M	Hispanic	Latino	Undergraduate	NO
Arriola	Mikel	M	Hispanic	Caucasian	Grad	NO
Obis	Raul	M	Hispanic	Caucasian	Grad	NO
Manotas	Rodolfo	M	Hispanic	Latino	Undergraduate	NO
Grimaud	Lou	M	Non-Hispanic	Caucasian	Grad	NO
Lin	Sembao	M	Non-Hispanic	Asian	Grad	NO
Kozak	Peter	M	Non-Hispanic	Caucasian	Grad	NO
Teva	Venet	M	Non-Hispanic	Caucasian	Undergraduate	NO
Maddamma	Todd	M	Non-Hispanic	Caucasian	Undergraduate	NO