SCARLET HAWK I – HASP 2013

February Status Update
02/22/13

INTRODUCTION

Summary of progress

The IIT HASP team has made a great deal of progress in better defining our mission requirements and completing subsystem prototypes. Both the February 7 and February 15 deadlines outlined in the last status update were met and deliverables were completed on time or early. The next steps have been to take the separate parts and now integrate them into a functioning payload.

Upcoming deadlines

- March 5: Freeze the payload structure design
- March 12: Functioning payload prototype and finalize the PCB designs
- March 28: Response will be delivered that addresses payload design issues and deficiencies listed in the HASP Payload Summary.

Updated Team Structure

Project Manager: Peter Kozak

Faculty Adviser: Keith Bowman

GPS & Comm.

Aniruddha Katre (Subgroup Leader), Raisa Vitto, Lou Grimaud, Collin Rutenbar

Electronics and Sensing

Shalmik Borate (Subgroup Leader), Peter Kozak, Raisa Vitto, Jesus Garcia, David Stuart

Image Processing

David Finol (Subgroup Leader), Rodolfo Manotas, Corey Page, Collin Rutenbar

Structure

Miguel Javier (Subgroup Leader), Manpreet Singh, Josh German

GPS AND COMMUNICATION

In order to complete the February 15 Payload Summary Addendum, the data transmission strings were developed for the Sensor Mode. The GPS receiver can now be run in tandem with the rest of the sensors, bringing us closer to complete integration. The GPS and Communication subgroup made the final decision that during payload operation, GPS output data will stored first before collating and sending with the other sensor data.

SENSING AND GENERAL ELECTRONICS

At this point, every sensor that will be used during the HASP mission has been operated independently as well as together with the other sensors and the GPS. Preliminary cold tests of individual sensor components have be conducted using IIT facilities and the results show that every sensor can function at temperatures below -40C. An LT1776-I high efficiency DC/DC converter was chosen to step down the voltage. Preliminary designs of some of the PCB's have begun. The deadline for completed PCB designs was pushed back to March 12 in order to provide enough time to test the designs more thoroughly than originally planned.

IMAGE CAPTURE AND PROCESSING

The Image Capture subgroup has managed to get multiple cameras to take pictures, store the file, and transmit to a computer in sequence. Code is being developed to protect the data during transmission by implementing a forward correction method using the Reed-Solomon algorithm. Since this is a technically challenging task, the subgroup is also developing a simple checksum procedure to be used in the event that the first method can not be implemented.

STRUCTURE

As part of the Payload Summary Addendum, a detailed weight budget was completed and shows that SCARLET HAWK I is well under the limit, as it is now designed. Development of the main structural features and integration mechanisms is now complete, leaving only the PCB stack, sensor board, and camera interface. A decision was made to push back the structural design freeze to March 5 in order to accommodate any last minute changes to the PCB stack design.

QUESTIONS FOR HASP COORDINATORS

- The 2 discrete commands we may send are toggle (ie: 2 true/false commands)?

- When can we expect to receive the base plate?

- Is the base plate counted toward the total payload weight?

- What is the error rate for data transmission at half-way through the mission?

- To minimize the risk of image file corruption we want to use a Reed-Solomon error correction code. There is no reference on the website about other teams using this algorithm, has it been implemented before?