

University of Colorado at Boulder

Monthly Status Report: May

Overview Since 3/30/2012:

Since April, the team's primary focus has been on further testing, design, prototyping, and assembly of the payload. Currently, we are aiming to deliver a CDR presentation during the first or second week of June. This has required a refinement of several design points, and consistent testing to verify critical aspects. Additionally, with the onset of summer we have unfortunately lost three of our team members due to summer living situations and obligations.

Current Team Members, Leaders, and Mentors:

Project Coordinator

Lia Matthews

Project Advisor

Dr. James Green
Director of CASA

Project Manager

Gabrielle Massone (Fr.)

Systems Engineer

Glenda Alvarenga (So.)

Structure and Thermal

Lead: Jake Broadway (Fr.)
Joe Papa (So.)
Mentor: Tyler Murphy

Science

Lead: Vincent Staverosky (Fr.)
Nicole Ela (Fr.)
Gloria Chen (Fr.)
Mentor: Kyle Kemble

ADCS

Lead: J.J. Busse (Jr.)
Jannine Vela (Fr.)
Corey Wilson (Fr.)
Alberto Lopez (Grad.)
Mentor: Lee Jasper

Computing and Electrical

Lead: Greg McQuie (Fr.)
Zac Collver (Jr.)
Mentor: Andrew Thomas

Activities of Team Members

The team's focus through the month of May has been on ordering components, prototyping, and assembling. The Structure and Thermal team has begun machining of the structure using a CNC, and has successfully machined the side trusses.

Electrical and Computing has finalized the power board design in the program Altium and has ordered a test PCB, which will be used in conjunction with future testing and operations. Additionally, they have installed the OS system on our flight computer and are in the process of programming serial communications, camera drivers, and other flight code.

ADCS has determined a final photodiode configuration, deciding to use visible light photodiodes along with a searching algorithm to track the sun. They are also adding a magnetometer to determine initial position upon initialization. Rather than using a gear system to control the payload's movement, we are now developing a chain and sprocket system, which seems more feasible. Finally, we are in the process of developing pseudo code that will guide the final programming.

Finally, the Science team is in the process of calibrating a Rapid Prototype of the current telescope design, with which they are performing preliminary analyses and tests. Additionally, due to the multiple layers of complexity and increased cost of the Infrared system, we have decided to switch our infrared camera to a Calcium-K wavelength in the visible spectrum. This allows us to simplify the construction and programming of the cameras, while still gathering valuable science and remaining within budgetary constraints.

Issues Encountered

Several problems have been encountered throughout the design, many of which are ongoing. Primary issues include:

1. Interfacing components with our Pandaboard computer, and trimming the Linux distribution.
2. Designing and assembling the interface between the rotating platform and the stationary electronics housing.
3. Limited summer hours in the campus machine shop combined with a limited number of machine-shop certified members on the team
4. Designing and implementing the control systems, as many of the control equations are relatively arbitrary and must be confirmed by testing

Milestones Reached

This month primarily marked a transition between spring semester and a summer working schedule. Despite the change, the structure's team has fully finalized their design and begun construction, the electrical team has finalized the PCB, Science has decided to implement the Calcium-K offramp, and ADCS has decided to implement a chain system off-ramp. Overall, all sections have undergone marked progress this month.

Next Objectives

With the start of summer, all of our goals are geared towards having a fully functional payload by July 30th. As a final verification of the design before we begin final construction, we will hold a CDR with our mentors and other Space Grant staff. After integrating any significant advice into our design, we aim to have the majority of the payload built by the end of June and then using the month of July for final assembly, testing, and addressing problems.