

University of Colorado at Boulder October Status Report

In the month of October, HELIOS III has made significant progress restoring the payload to its flight condition. They have added several new members and have completed the second draft of their final science report. They are in the progress of putting together, editing, and formatting the science report and have started getting ready for their final science presentation that they will give to the Colorado Space Grant Consortium.

Team Demographics:

Cooper Benson: Caucasian male, sophomore, Aerospace Engineering

Paige Arthur: Caucasian female, sophomore, Aerospace Engineering

Kristen Hanslik: Caucasian female, sophomore, Aerospace Engineering

Dylan Richards: Caucasian male, sophomore, Aerospace Engineering

Ryan Cutter: Caucasian male, sophomore, Aerospace Engineering

Brandon Boiko: Asian / Caucasian male, junior, Mechanical Engineering

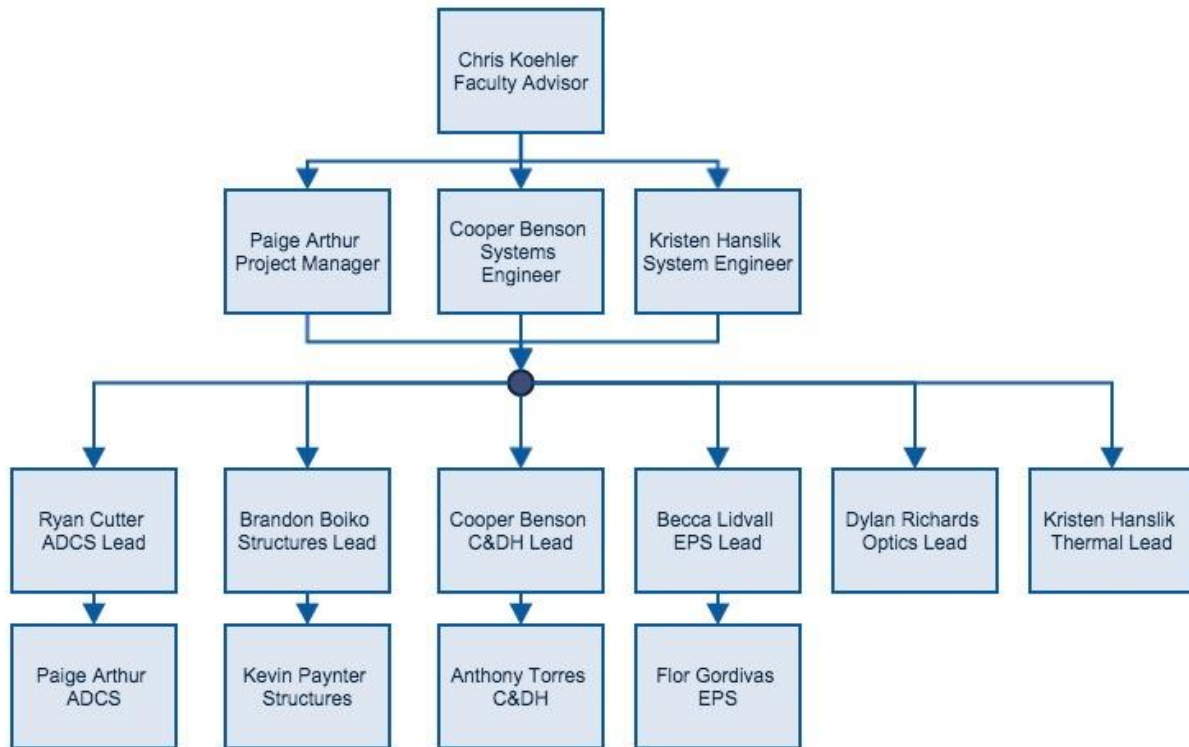
Flor Gordivas: Hispanic female junior, Electrical Engineering

Rebecca Lidvall: Caucasian female, junior, Aerospace Engineering

Anthony Torres: Caucasian male sophomore, Aerospace Engineering

Kevin Paynter: Caucasian male junior, Mechanical Engineering

Team Organizational Chart:



Accomplishments of October:

ADCS: The Attitude Determination and Control System received their new motor drivers. They began by testing one of them with a motor on an Arduino, then on the Raspberry Pi. Then they hooked the motor back up to the structure and ensured that the motor could turn the structure on azimuth. After that, they hooked the photodiodes up to the Pi and ensured that the motors could turn on azimuth while responding to diode readings. They hooked up the driver to the elevation motor and started testing on elevation. By turning the current limit up, they were able to elevate the structure to an extent, but at about 35 degrees the motors stalled. ADCS is working with structures to solve this problem.

C&DH: Command and Data Handling took on a new member several weeks ago. They compiled the drivers for the cameras, programmed the system to set the camera settings upon start up, and coded the temperature sensors to be more precise. They reviewed the command table and determined that none of the commands needed to be changed. They got RTC working and changed the timestamp on the images captured during flight to match the timestamp on the downlinked data package from HASP. They have also started working on real-time photodiode calibration image analysis software.

EPS: The Electrical and Power System learned Altium and completely redesigned the power

board. The new board is smaller and more efficient than the board flown and solves the power issues encountered during flight. It has been ordered and will arrive mid next week. EPS also compiled a list of parts needed for the new board and will order them as soon as the list is approved by the Colorado Space Grant director. EPS is looking into hiring a new member, since the current lead is leaving at the end of the semester.

Optics: Optics measured all of the pieces in the optics system to determine how much the length needed to be changed to get the cameras in focus. They researched parts that would get the length to the necessary 250mm and found one on one of the old cameras in Space Grant. They are in the process of adding the part and getting the cameras into focus.

Structures: Structures put the payload back into a single piece (since it had broken into two pieces upon impact with the ground at the end of flight). They balanced the camera housing to make it easier to turn on elevation and reattached the motors. They are in the process of changing the arm length of the payload so that the elevation gears will mesh better so that the payload can hopefully elevate the camera housing to a larger degree. They have also worked extensively on getting ready to create a new structure. They have worked closely with their mentor to make some minor design modifications, including a larger gear ratio on elevation to make it easier to elevate the camera housing. They have been putting together a parts list for the new structure and are going to present their proposed design modifications to their mentor and the director of COSGC next week.

Thermal: Thermal has been working on designing a system to heat sink the new motor drivers, since they handle much more current than the old ones did and heat up much faster. They have been working with EPS so that they will be able to heat sink the drivers through the new board.

Management: Management has orchestrated the taking on of the two new members. They reviewed multiple resumes and conducted interviews to ensure the quality of the new members. They organized and conducted meetings and set goals for each sub team and put the goals onto a shared website where each team member can view, edit, and update their goals. They also briefly presented their project to several Space Grant directors during a conference that took place at CU. They have organized the writing of the final science report and are in the processes of organizing and formatting the report. They have coordinated with the director of COSGC.

Plan for November

HELIOS III will get the parts for their new structure and machine it. While it is being built, ADCS will still be able to test with the old structure. EPS will receive, populate, and test the new power board. If it works as expected, ADCS will be able to test through the board instead of hooking up directly to an external power supply. If not, EPS will make the necessary modifications and re-order the board. Optics will get the cameras focused within the next week and will continue to test with taking images. Management will aim to have the final science report finished by the end of November. HELIOS III aims to present their final science presentation mid-November.