



HASP Monthly Status Report

Report Month: April 2023
Submitted by: Elsa Carreras
Submit Date: 4/28 / 2023
Institution: Cu Boulder Space Grant
Payload Number: 2023-03
Payload Name: LunaSat Testbed

I) Activities During Previous Month:

This past month we received many of our components, including the Raspberry Pi Zero. We have been working tirelessly on Raspberry Pi testing, trying to transfer data directly from the LunaSats to the RPi using I2C communication protocol. We've also been testing other components including the buck converters. We have successfully tested the LunaSats and RPi with external 30V going through the buck converters. We completed our PSIP as well. We remodeled our payload to be bigger so now it is at its final dimension of 13x13x25 cm. We also ordered the materials that we need to build it. Remodeling it also came with changing the size of the payload in CAD. With this new size we will not have an overhang on the top LunaSats.

II) Issues Encountered:

We have encountered some problems this month. We've had trouble communicating between the RPi and the LunaSats using I2C, since the LunaSats essentially behave like an Arduino. We've been progressing through the problem slowly and I think we will overcome it very soon, but it's been difficult. We also have had problems with our buck converters. While we were trying to set up our circuit to measure the current drawn at 30V, we think the power supply we were using for the 5V buck converter had a high transient voltage above 30V, and it blew out all 4 of our 30V buck converters. So, until we order more, we cannot use our buck converters at all. Some other issues we encountered were sizing of the payload and balancing weight requirements.

III) Milestones Achieved:

Preliminary PSIP, NASA Flight On-site Security, and finished structures design.

IV) Plans for Coming Month:

Plans for coming months include testing the RF capabilities with aluminum and plastics. Get a CAD assembly of the model done so we can run a shock test of the payload in CAD. After we do the CDR, we plan on building the real model of the payload. In the next month, we plan to continue extensive testing of the LunaSat to RPi communication and vice-versa. We also plan to test a full circuit running off 30V for extended periods of time to judge the reliability of our components, especially the buck converters. We have a lot of test plans for both power and software. Once we get the communication between the LunaSats and the RPi working right, we plan to write software that allows us to store all our data on the SD card with timestamps (gotten from an external real-time clock module). We also plan to write code to have everything immediately start when the RPi starts up before the flight. We also plan to finish designing our PCB to help reduce the space taken up by components and other pieces in the payload.

V) Other Comments or Questions for HASP Management:

Do we get the bolts to mount onto plate? What brand/ type of converters to you recommend?

VI) Team Composition and Organization:

Name ⁽ⁱ⁾	Start Date	End Date	Role	Student Status	Race ⁽ⁱⁱ⁾	Ethnicity ⁽ⁱⁱⁱ⁾	Gender ⁽ⁱ⁾	Disabled
Veronica Corral Flores	9/9/22	Present	Faculty Advisor	Faculty	Mixed race	Hispanic	Female	No
Mary Hanson	9/9/22	4/7/23	Faculty Advisor	Faculty	White	Non Hispanic	Female	No
Elsa Carreras	9/9/22	Present	Project Manager	Undergrad	White	Caucasian	Female	Yes
Benjamin Hellem	9/9/22	Present	Systems	Undergrad	White	Caucasian	Male	No
Chloe Zentner	9/9/22	Present	Structures lead	Undergrad	White	Caucasian	Female	No
Chris Brown	9/9/22	Present	Avionics lead	Undergrad	White	Non Hispanic	Male	No
Hallie Hill	9/9/22	Present	Structures Member	Undergrad	White	Caucasian	Female	Yes
Nicholas Mueller	9/9/22	Present	Structures Member	Undergrad	White	Caucasian	Male	No
Brice Parrott	9/9/22	Present	Avionics Member	Undergrad	White	Non Hispanic	Male	No
Zack Goldberg	9/9/22	Present	Avionics Member	Undergrad	White	Caucasian	Male	No
Jack McDonald	2/8/23	Present	Avionics Member	Undergrad	White	Non Hispanic	Male	No
Emanuele Rimini	2/8/23	Present	Avionics Member	Undergrad	White	Italian	Male	No
Sebastian Vargas	9/9/22	12/12/22	Avionics Member	Undergrad			Male	