



HASP Monthly Status Report

Report Month: June 2023
Submitted by: Benjamin Dyer
Submit Date: 06 / 30 / 2023
Institution: McMaster University
Payload Number: 2023-11
Payload Name: Electron Spectrometer Telescope

I) Activities During Previous Month:

Mechanical

All mechanical parts have either arrived or have been manufactured. The first dry run of assembling the instrument has concluded, there are a few holes that are misaligned in the outer structure but these will be easy to fix. The electroholding magnet is currently being tested in vacuum to confirm no overheating issues will occur.

Electrical

The PDM and CSMD have both been completed and passed functional acceptance testing. The CSMD operates as expected and should not require any further work. The PDM firmware is still being written and tested. Communication via CSP has been tested along with the serial pass through to the DAM.

Instrument - Hardware

Both the DAM and FEM have passed functional acceptance testing and have been connected showing they are able to work together. The high voltage rails on the FEM can now be controlled through firmware and show good noise characteristics.

Instrument - Firmware

The HDL to process data from the FPGA has progressed well and is expected to be ready for testing in the next few days. We have also finished writing code to load data into the MRAM (persistent memory) for flight. The CAN communication has been tested and is working so communication between the payload and PDM is good. Software for reading out signals on the ground during flight have been developed and are able to display both trace and list modes.

II) Issues Encountered:

Firmware development for the instrument is ~1 week behind schedule. We still expect to have an operational instrument by integration but will likely have less time to qualify it in the lab.

III) Milestones Achieved:

- Mechanical components completed and dry run of assembly completed
- All PCBs completed and passed functional acceptance tests
- New B-grade Silicon detectors arrived and tested, these will be flown

IV) Plans for Coming Month:

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Mechanical

Following the dry run of assembly, the instrument will be fully assembled with the Silicon detectors. Dependent on results of thermal testing the electro holding magnet, a thermal strap may be considered. If a thermal strap will not be possible the shutter module will be cycled on and off throughout flight to ensure the magnet does not overheat. Once this is complete all mechanical tasks will be done

Electrical

Hardware for the PDM is complete. Firmware will continue to be developed and testing in conjunction with the instrument.

Instrument – Hardware

Hardware for the instrument is complete.

Instrument - Firmware

The main tasks to get an operational instrument by integration are:

1. Test SPI and I2C
2. Write HDL to ingest data from ADC into FPGA (mostly an IO configuration task)
3. Verify data processing chain works correctly.
4. Test instrument to determine appropriate settings for registers.

V) Other Comments or Questions for HASP Management:

N/A

VI) Team Composition and Organization:

Name ⁽ⁱ⁾	Start Date	End Date	Role	Student Status	Race⁽ⁱⁱ⁾	Ethnicity⁽ⁱⁱⁱ⁾	Gender ⁽ⁱ⁾	Disabled
Benjamin Dyer	01/10/22	Present	Student Leader	Graduate	Asian	Non-Hispanic	Male	No
Andrei Hanu	01/10/22	Present	Faculty Advisor	Faculty	White	Non-Hispanic	Male	No
Graham Power	01/10/22	Present	Firmware Lead	Graduate	White	Non-Hispanic	Male	No
Connor Chandran	01/10/22	Present	Electrical Lead	Undergrad	White	Non-Hispanic	Male	No
Patrick Chin	01/10/22	Present	Mechanical Co-Lead	Graduate	Asian	Non-Hispanic	Male	No
Angela Tolis	01/10/22	Present	Mechanical Co-Lead	Undergrad	White	Non-Hispanic	Female	No
Jonathan Wang	01/10/22	Present	Mechanical	Undergrad	Asian	Non-Hispanic	Male	No
Michael Altali	01/10/22	Present	Mechanical	Graduate	Asian	Non-Hispanic	Male	No
Kosta Gianicos	01/10/22	Present	Electrical	Undergrad	White	Non-Hispanic	Male	No
Elijah Menna	01/10/22	Present	Electrical	Undergrad	White	Non-Hispanic	Male	No
Felix Yuan	01/10/22	Present	Electrical	Undergrad	Asian	Non-Hispanic	Male	No
Austin Liu	01/10/22	Present	Firmware	Undergrad	Asian	Non-Hispanic	Male	No
Connor O'Reilly Juarez	01/10/22	23/03/23	Instrument Mechanical	Undergrad	White	Hispanic	Male	No
Xingzhi Cheng	01/10/22	Present	Instrument	Graduate	Asian	Non-Hispanic	Male	No
Larysa Duda	01/10/22	01/06/23	Instrument	Undergrad	White	Non-Hispanic	Female	No
Kristen Di Loreto	01/04/23	Present	Instrument Mechanical	Undergrad	White	Hispanic	Female	No
Barnett Wan	05/04/23	Present	Instrument	Undergrad	Asian	Non-Hispanic	Male	No
Caleb Gannon	05/24/23	Present	Instrument	Undergrad	White/ African-American	Non-Hispanic	Male	No

- i. Current NASA guidance requires information from up to date legal documentation (for instance, Driver's License, Passport)
- ii. Accepted options include African-American/Black, Asian, American Indian/Alaskan Native, Native Hawaiian, Pacific Islander, White
- iii. Accepted options are Hispanic on Non-Hispanic.