

Communications Subteam

Weekly Updates, Spring 2025

Week 1

Team Progress:

- Defined current progress and milestones for the first few weeks of Spring 2025
- Filed subsystem issues on GitHub for FSW, GS hardware, and GS SW / infrastructure
 - <https://github.com/cmu-argus-2/FSW-mainboard/issues>
 - <https://github.com/cmu-argus-2/Comms-GS-Hardware/issues>
 - <https://github.com/cmu-argus-2/GSW-backend/issues>
 - <https://github.com/cmu-argus-2/Comms-GS-Database-Interface/issues>

Individual Progress:

- Akshat Sahay:
 - Merged FSW updates for the v2 mainboards to main branch
 - <https://github.com/cmu-argus-2/FSW-mainboard/pull/61>
 - Contained HAL changes, driver changes and improved modularity within the comms task
 - Issues in other subsystems blocked merge and required some bug fixes, issue has been created to address these bugs
 - Started comms + CDH integration
 - Planned [GS commands for CDH](#) added in [comms message database](#)
 - Met with CDH FSW people (Ibrahima and Alexis) to discuss interfacing
- Adrian Walker:
 - Got GPS code onto FSW repo
 - Need to still create PR and merge
 - Mounted the GPS module to a current main board
 - Still need to test
 - Started trying to understand the licensing needed for the cubesat launch
 - Started reviewing board designs
 - Reviewed Battery Board V3

Week 2

Team Progress:

- More progress on FSW integration for the GPS subsystem
- Integrated FSW and GSW for processing new CDH commands (more details in FSW report)

Individual Progress:

- Adrian Walker:
 - FSW - GPS Integration
 - Initial HIL test completed

- Need to get data as ints rather than strings for logging and latency
- Avionics - Battery Board reviewed
- Avionics - XY Board reviewed
- Akshat Sahay:
 - Integrated CDH with comms through the CommandQueue and ResponseQueue made by Alexis, with redesigned (better) comms state management
 - <https://github.com/cmu-argus-2/FSW-mainboard/pull/109>
 - https://github.com/cmu-argus-2/GSW-backend/tree/cdh_integration
 - GS code is pretty far from a PR right now, currently very hacked together
 - Added significant error handling into the comms application to discard faulty packets
 - Fixed telemetry frame on the SC and updated unpacking on the GS
 - Helped Ankita a little with MAX17205 hardware bring-up and FSW integration

Week 3

Team Progress:

- Even more progress on FSW integration for the GPS subsystem

Individual Progress:

- Adrian Walker:
 - FSW - GPS Integration
 - Made GPS driver changes
 - HIL testing?
 - Reviewed XY Board
 - Reviewed Z+ Board
- Swati Anshu:
 - Onboarded
 - Read through GSW-backend repository
 - Read through FSW-mainboard state machine protocol
 - Created preliminary state machine for GS
 - Coding in progress for the GS state machine
 - Brainstormed ways to increase data transmission rate with Akshat
- Akshat Sahay:
 - Organization
 - Centralized all GS issues (hardware and software) into the GS software repo: <https://github.com/cmu-argus-2/GSW-backend/issues>
 - Onboarded Swati, full system and comms overview, initial TODOs assigned
 - Started integrating file transfers into the new comms FSW state machine
 - Brainstormed ways to increase data transmission rate with Swati
 - Current protocol has robust error detection but poor data rate
 - If packets are dropped in the middle of a pass, the SC defaults to heartbeat mode and the full cycle of a ground pass needs to repeat

- Still no good solution for increasing data rate reliably with missed packets