

# CySat Senior Design Team

sdmay21-25

Report Period: September 14 - September 27

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## Team Members:

Alexis Aurandt - OBC Lead and Payload Sub-Lead  
Alex Constant - Ground Station Front-End Lead  
Chandler Jurenic - Payload Lead and OBC Sub-Lead  
Jeffrey Richardson - ADCS Lead/Team Lead  
John Lenz - Radio Lead  
Scott Dressler - EPS Lead

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## Summary of Progress in this Period:

### Team

- Completed Lightning Talk about Project Plans
- Design process document (Class assignment)
- Designated Monday and Wednesday nights as group working hours
- Discussed additional team members for each subsystem

### OBC

- Fixed build errors; last group left the OBC-SDK unbuildable. Changes have been pushed to OBC branch on GITLAB.
- Met with Bryan to discuss the structure of the discoboard\_no\_rtos and OBC\_SDK projects
- Switched from System Workbench for STM32 to STM32CubeIDE
- Ran discoboard\_no\_rtos on discovery board
- Toggled one of the LED pins

### Ground Station Front-End

- Set up personal virtuan env on GSFE/doc branch
- Removed env/ directory and .idea/ from git tracking. Added GSFE specific .gitignore
- Created requirements.txt to track dependencies
- Documented practice of setting up virtual environment
- Researched TKinter and looked at a few other Python GUIs (Kivy, etc.)
- Read through Ground Station Subsystem Next Steps pdf
- Research into 3D rendering libraries for Python
- Looked into Cartopy, a Python cartography library for plotting globes

## Payload

- Covered all the SDR getting started pages, as well as started the lessons for the SDR tutorial that was provided by link in the payload archive
- Got a hold of Matt Nelson, almost finished with SDR tutorials. Supposed to meet with Matt regarding the Payload to cover anything not mentioned in the getting started docs.

## EPS

- Reviewed EPS data sheets
- Learning the I<sup>2</sup>C commands provided in the 2.2 manual revision
- In process of cross-referencing the newer I2C commands and the old commands to see which ones need to be updated
- Reviewed most of the EPS related code

## Radio

- Compiled UHF
- Integration with the OBC
- UHF data sheets
- Went through packet structure
- Went through the UHF code functions
- Tried connecting to VDI

## ADCS

- Contacted Dr. Lee and previous ADCS lead. Asking to set up a meeting regarding previous ADCS progress and testing.
- Reading through ADCS user manual.
- Went through high level task list for ADCS to try and define what possible tests would look like

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## Pending Issues:

### ADCS

- Haven't heard any word from last year's lead, is there some other way besides his old ISU email I could try to reach him?

### Ground Station Front End

- Listed on the next steps for the ground station is "Logging Data Externally" which references logging of commands and SDR data to a database. Where/what is this database?
  - Next steps also lists a "3D render of the current satellite positioning". Is this simply the position of the satellite with respect to the earth? It is listed under the "Attitude System" so it sounds as though it may be a bit more related to attitude control visualization, which would make the render much more difficult.
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## Individual Contributions:

<b>Team Member</b>	<b>Contributions</b>	<b>Hours Worked</b>	<b>Total Hours</b>
Alexis Aurandt	Fixed the build of the OBC-SDK and pushed to OBC branch on GITLAB, Lightning Talk, met with Bryan, and got familiar with the IDE	9	14
Alex Constant	Environment setup and documentation, Lightning talk, Ground Station Next Steps document, researched Python globe implementations	3	12
Chandler Jurenic	Contacted go to payload members, lightning talk started, read through the getting started info for SDR, started SDR tutorial Contacted Matthew Nelson, worked on SDR tutorials, practiced Linux usage	4	10
Jeffrey Richardson	Contacted Dr. Lee and previous ADCS lead. Reading through ADCS user manual. Design thinking document Setting up a meeting time with Dr. Lee, meet with M2I	2	8
John Lenz	Compiled UHF, contacted last year's radio lead and contacted radio club Lightning Talk, Packet structure, UHF code functions, talked to Dylan about connecting issues with VDI	3	8
Scott Dressler	Focused on learning I <sup>2</sup> C, contacted previous EPS lead Lightning Talk, Updating I2C commands	5	12

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## Plans for Upcoming Reporting Period:

### Team:

- Complete Version 1 of Design Document

### OBC:

- Update discoboard\_no\_rtos code with changes from last team
- Get familiar with the datasheet
- Work on fixing the build errors/warnings
- Create document for installing the STM32CubeIDE

### Ground Station Front-End:

- Reach out to M2I for answers to questions listed in Pending
- Look into Python 3d globe rendering (seems pretty shallow)

### EPS:

- Continue updating I2C commands
- Look into making the values from the I2C functions pass by pointer

### Payload:

- Finish tutorial for the SDR, meet with Matt.

### Radio:

- Get into the VDI workspace and hopefully run hello world

### ADCS

- Start designing testing environment, defining milestones of the ADCS. These will necessarily be done in conjunction with each other.