

EE / CprE / SE 491 –sdmay20-03

NOAA GEOS-R Satellite Receiver

Bi-Weekly Status Report 2

1/31/2020 – 2/13/2020

Client: N/A

Faculty Advisor: Nathan Neihart

Team Members:

Nick Butts — *Software Group*

Rudy Lim — *Software Group*

Jonathan Massner — *Systems and RF Group*

Ted Mathews IV — *RF Group*

Riley Stuart — *ADC Group*

Jordan Tillotson — *ADC Group*

Past Week Accomplishments

- Antenna Placement - Jonathan Massner
 - Performed antenna adjustments according to placement specs
 - Downloaded image decoding software from goestools to my Rpi
 - Tested goestools decoding software by aiming antenna; no signal received yet
- Communications development - Jordan Tillotson
 - Continued efforts to utilize IO pins on RPi4 through Python script
 - Researched methods for storing a continuous binary data stream to file
 - Attempted implementing code to write binary file
- ADC development - Riley Stuart
 - Created a list of sufficient ADC models.
 - Decided upon ADC for the group.
 - Rewrote ADC test plan.
- Frame synchronization and Viterbi - Nick Butts
 - Got frame synchronization code nearly working correctly and Viterbi decoder initialized
- Reed solomon coding - Rudy Lim
 - Worked on reed solomon error correction code
 - Figured out pathing problem
- ADRF Bom and LNB Schematic - Ted Mathews IV
 - Verified BOM and ordered ADRF Eval board components
 - Finished primary LNB schematic.
 - Verifying support component requirements (power supply).
 - ADRF6850 driver skeleton code written

Pending Issues

- Receive signal w/antenna
 - Use goestools to confirm signal is received
 - Cortyard is interfering with compasses and preventing accurate positioning.
 - PLL is not locking on sdr. Ambient temperature issue?

Individual Contributions

Team Member	Contribution	Weekly Hrs	Total Hrs
Jonathan Massner	Antenna adjustments and aiming	9	63
Nick Butts	Code for frame synchronization and Viterbi	10	75
Ted Mathews IV	Finished ADRF board layout, Verified BOM and ordered parts, Wrote skeleton code for 6850 driver, worked towards finishing LNB schematic and started its layout.	20	109
Jordan Tillotson	Script to implement ADC to RPi4 comm.	6	69
Rudy Lim	Reed solomon code	7	56
Riley Stuart	ADC model and test plan	4	58

Plans for Coming Week

- ADC/DSP - Jordan Tillotson
 - Continue working with code to compile correctly
 - Have a binary data file stored utilizing Python script
- ADC/DSP - Riley Stuart
 - Order ADC
 - Finish test plan
 - Work with Jordan on Pi side
- RF - Jonathan and Ted
 - Continue working to receive strong signal with small Viterbi error
 - Move the antenna from the courtyard so that it can be aimed properly to test the RX hardware.
 - Build and perform initial testing on ADRF6850
 - Finish LNB schematic, simulations, and progress with layout
- Software - Nick and Rudy
 - Continue working on reed solomon error correction
 - Revise existing code structure
 - Change functioning of code to analyze smaller subsets of data at a time