

EE / CprE / SE 491 –sdmay20-03

NOAA GEOS-R Satellite Receiver

Weekly Report 4

10/27/2019 – 11/09/2019

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

- I/Q Demodulator Schematics - Jonathan Massner
 - Chose components for I/Q Demodulator test board
 - Created schematics in KiCad for I/Q Demodulator
- MC Research & Development - Jordan Tillotson
 - Researched MC to Raspberry Pi4 communication
 - Downloaded ARM software and MC initialization software
- MC Research & Development - Riley Stuart
 - Researched microcontroller implementation.
 - Downloaded STM32CubeMX software.
- Began looking through code from the OpenSat project - Nick Butts
 - Decided that implementing the code ourselves is outside of our skill set
- Figured data packet structure for space packet - Rudy Lim
 - Figured out how each part of the packet structure works
- Software Licenses and Schematics - Ted Mathews IV
 - Worked with ETG to get antenna, tripod, and misc parts ordered
 - Worked on LNB schematic and component selection

Pending Issues

- Need to build platform for tripod to rest on
- Refine component selection for LNB board
- Transition ADRF board from KiCad to Altium
- Begin PCB layout for rev1 boards

Individual Contributions

Team Member	Contribution	Weekly Hrs	Total Hrs
Jonathan Massner	I/Q Demod breakout board design and schematics	7.5	33
Nick Butts	Helped figure out what we will do about implementing the back-end software	16	51
Ted Mathews IV	Board design and part ordering	12	55
Jordan Tillotson	Determined interfacing method for MC to Pi4 (UART, I2C)	16	42
Rudy Lim	Researched data packet structure and OSI	6	28
Riley Stuart	Researched and tested SPI communication from microcontroller, began testing plans for ADC and information out to Pi.	10	35

Plans for Coming Week

- ADC/DSP - Jordan Tillotson
 - Interface MC to Pi4 and produce output with arbitrary input signal
- ADC/DSP - Riley Stuart
 - Test plans for ADC, finish SPI implementation.
 - Communicate with RF team about configuration from microcontroller.
- RF - Jonathan and Ted
 - Create I/Q Demodulator schematic in Kicad and begin PCB layout
 - Begin LNB layout and work on component selection
 - Rematch RF matching networks on LNB for LNA and Mixer.
 - Assemble antenna
- Software - Nick and Rudy
 - Get Raspberry Pi set up and start getting code onto it for testing
 - Figured out data packet structure for space packet.