**EE 492 Biweekly Report 8**

2/9/21 – 2/22/21

**Group Number:** SD May 21-43

**Project Title:** Emergency! Need backup!

**Client / Advisor:** Collins Aerospace / Andrew Bolstad

**Team Members / Role**:

James Curtis / Meeting Scribe

Caroline Easley / Meeting Facilitator

Marcelo Abrantes / Engineer (Power Systems)

Michael Kuehn / Communications Director

Benjamin Welte / Project Documentation

Abbey Wilder / Test Engineer

Stepan Zelenin / Engineer (Communication Systems)


**Period Summary:**

During this period, the design team created a schematic for a printed circuit board (PCB) which will be used to test the functionality of the receiver and transmitter architectures without software control of the local oscillator. The team also attempted to access lab space to use for testing the local oscillator, PCB, and other parts at high frequencies, but was temporarily prevented from doing so due to an ill-timed vacation by the lab's supervisor. Because lab space was not readily available, the team researched various parts that could be used as substitutes if the current design fails. The SNMP control team also did additional research into various approaches for testing SNMP communication with the Arduino as well as I2C communication between the Arduino and the local oscillator. Testing was delayed for the code written to program the local oscillator due to the unavailability of lab space.

**Past Period Accomplishments:**

- Researched Arduino I2C libraries – Ben

- Read local oscillator documentation – Ben

- Developed rough draft of I2C code for Arduino – Ben

- Researched alternative receiver/transmitter parts – James, Caroline, Marcelo, Michael, Stepan

- Improved receiver/transmitter test plan – James, Michael

- Researched PCB design practices – Caroline, Marcelo, Stepan

- Created PCB design – Michael, Marcelo

- Reviewed PCB design – Stepan, Caroline

- Completed SNMP tutorials – Abbey


**Pending Issues:**

- Coordinate with ETG to set up weekly times to use high frequency labs – Michael

- Solder leads on the local oscillator package so it can be tested on a breadboard – Ben, Marcelo, Michael

- Fix issue with ground plane on the receiver/transmitter PCB – Marcelo, Michael, Abbey, Stepan, Caroline

- Send PCB design to ETG to have it fabricated – Marcelo, Michael, Abbey, Stepan, Caroline

- Draft SNMP code – Abbey,

- Test local oscillator & associated I2C code when lab space is available - Ben

**Individual Contributions:**

| Name | Individual Contributions | Hours this period | Hours cumulative |
|---|---|---|---|
| James C. | <ul><li>Parts Research</li><li>Developed receiver/transmitter test plan</li></ul> | 12 | 24 |
| Caroline E. | <ul><li>Part Research</li><li>Part Testing</li><li>Researched PCB design</li><li>Reviewed PCB design</li></ul> | 13 | 25 |
| Marcelo A. | <ul><li>Transmitter parts selection</li><li>Parts testing</li><li>PCB schematic development</li></ul> | 15 | 31 |
| Michael K. | <ul><li>Component level testing</li><li>Reevaluated component-level testing plan</li><li>Organized access to high frequency lab equipment</li><li>Researched PCB design</li><li>Developed PCB design</li></ul> | 12 | 24 |
| Ben W. | <ul><li>Studied local oscillator documentation</li><li>Developed testing plan for local oscillator</li><li>Studied I2C libraries for Arduino</li></ul> | 12 | 25 |

| | | | |
|---|---|---|---|
| | • Drafted I2C code for Arduino | | |
| Abbey W. | • Completed SNMP tutorials<br>• Researched Arduino SNMP libraries<br>• Explored Wireshark & open source MIB software for SNMP | 12 | 24 |
| Stepan Z. | • Selected receiver parts<br>• Researched low-noise amplifier technology<br>• Researched PCB design<br>• Reviewed PCB design | 12 | 25 |

**Plans for the Upcoming Period:**

Regarding the upcoming work period, the team plans to continue researching alternative parts and tweaking the current test plan until a high frequency lab is available to test the PCB and the local oscillator. The team also needs to resolve a recently discovered issue with the ground plane in the PCB design and then send it to ETG for fabrication. After the PCB is manufactured, the team will need to solder the individual parts onto the board. Leads also need to be soldered onto the local oscillator package so that it can be tested using a breadboard. Progress controlling the Arduino with SNMP needs to happen as soon as possible.

**Advisor Meeting Summary:**

During the team's meetings with Dr. Bolstad, various testing ideas were discussed as alternatives to the PCB since it will be time-consuming to fabricate and assemble, especially if there is a mistake during the creation of the original board. The team also discussed details of the SNMP protocol and possible implementations of it with Dr. Bolstad because the team member assigned

to write the SNMP code is really struggling to both understand its operation conceptually and create a concrete plan to realize it in the final radio design.  After these discussions it was concluded that there is no good alternative to the PCB so the team will need to simply wait for it to arrive and that team members should reach out to the instructor and TA for 492 for additional help with the SNMP protocol if necessary.