

EE 492 Biweekly Report 10

3/1/2021 – 3/15/2021

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 work period, our development PCB arrived which enabled us to begin testing our parts together. We soldered the parts on to the PCB using a solder oven provided by ETG, and we soldered the local oscillator onto its own board so that we could begin testing the code we have written for it. We began using the development board to test various parts for the final design; specifically, we tested the filters and were going to test the mixer but were prevented from doing so because we did not have inductors small enough to implement the test setup provided in the documentation.

With regard to the SNMP control circuit, testing began on the local oscillator, and the team was able to successfully set up a test circuit for the oscillator and verify its I2C address using a simple test script that probed all 128 possible address values. Several team members also

unsuccessfully attempted to implement the SNMP set command in SNMPv1. After talking to our client, we obtained permission to use SNMPv1 for our project's final deliverable instead of SNMPv3 because we were able to find an open-source library which implemented the get command in SNMPv1. Our plan is to improve on this library to eventually have the full functionality required for our project: the get and set SNMP commands.

Past Period Accomplishments:

- Set up LO test circuit – Ben, Stepan
- Found LO's I2C address w/test script – Ben
- Soldered dev PCB using oven – Marcelo, James, Caroline
- Additional RF simulation – Stepan
- Revised test plan – Marcelo, Stepan
- Filter testing – Marcelo, James, Michael

Pending Issues:

- Program LO to output at each required frequency – Ben
- Implement SNMP set command – Abbey, Caroline
- Test mixer – James, Marcelo, Caroline, Stepan
- Obtain high frequency test equipment - Michael

Individual Contributions:

Name	Individual Contributions	Hours this week	Hours cumulative
James R.	<ul style="list-style-type: none"> • Soldered dev PCB using reflow oven • Tested filters 	12	42
Caroline E.	<ul style="list-style-type: none"> • Soldered dev PCB • Reviewed datasheets 	12	43

	<ul style="list-style-type: none"> • Researched RF testing • Researched SNMP set command 		
Marcelo A.	<ul style="list-style-type: none"> • Soldered dev PCB • RF PCB research • Filter testing 	12	49
Michael K.	<ul style="list-style-type: none"> • Filter testing • RF PCB research • Revised test plans 	12	42
Ben W.	<ul style="list-style-type: none"> • Researched SNMP set command • Obtained LO's I2C address • Devised LO test circuit 	14	45
Abbey W.	<ul style="list-style-type: none"> • Wrote & debugged 1st iteration of SNMP set command • Researched solutions for SNMP set command 	12	42
Stepan Z.	<ul style="list-style-type: none"> • Revised test plan • RF simulation 	12	43

Plans for the Upcoming Period:

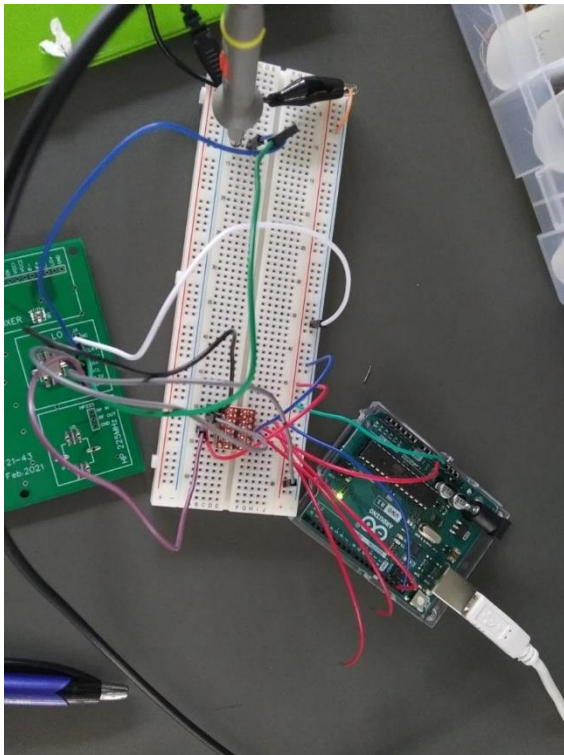
During the upcoming work period, we plan to finish writing the code for the local oscillator, finish testing our components on the dev PCB board (specifically the mixer), and hopefully implement the SNMP set command. We would then eventually like to begin integration testing once each of the radio's components are functioning individually.

Advisor Meeting Summary:

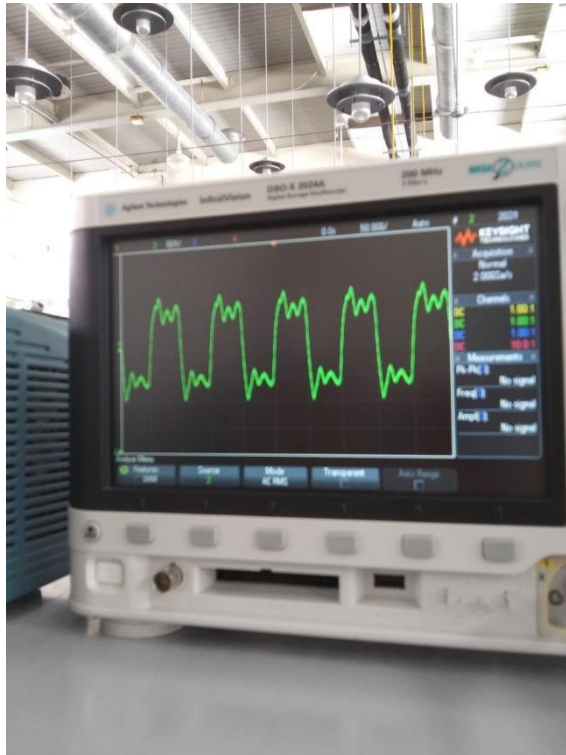
While meeting with Dr. Bolstad, we discussed several of the roadblocks our team faced during the past report period including not being able to test our parts until the development PCB arrived and the lack of success implementing the SNMP set command. After discussing with Dr. Bolstad, the decision was made to ask our client's permission to use SNMPv1 instead of SNMPv3 for our project's final deliverable because version 1 has better open source libraries available.

Appendix (Images):

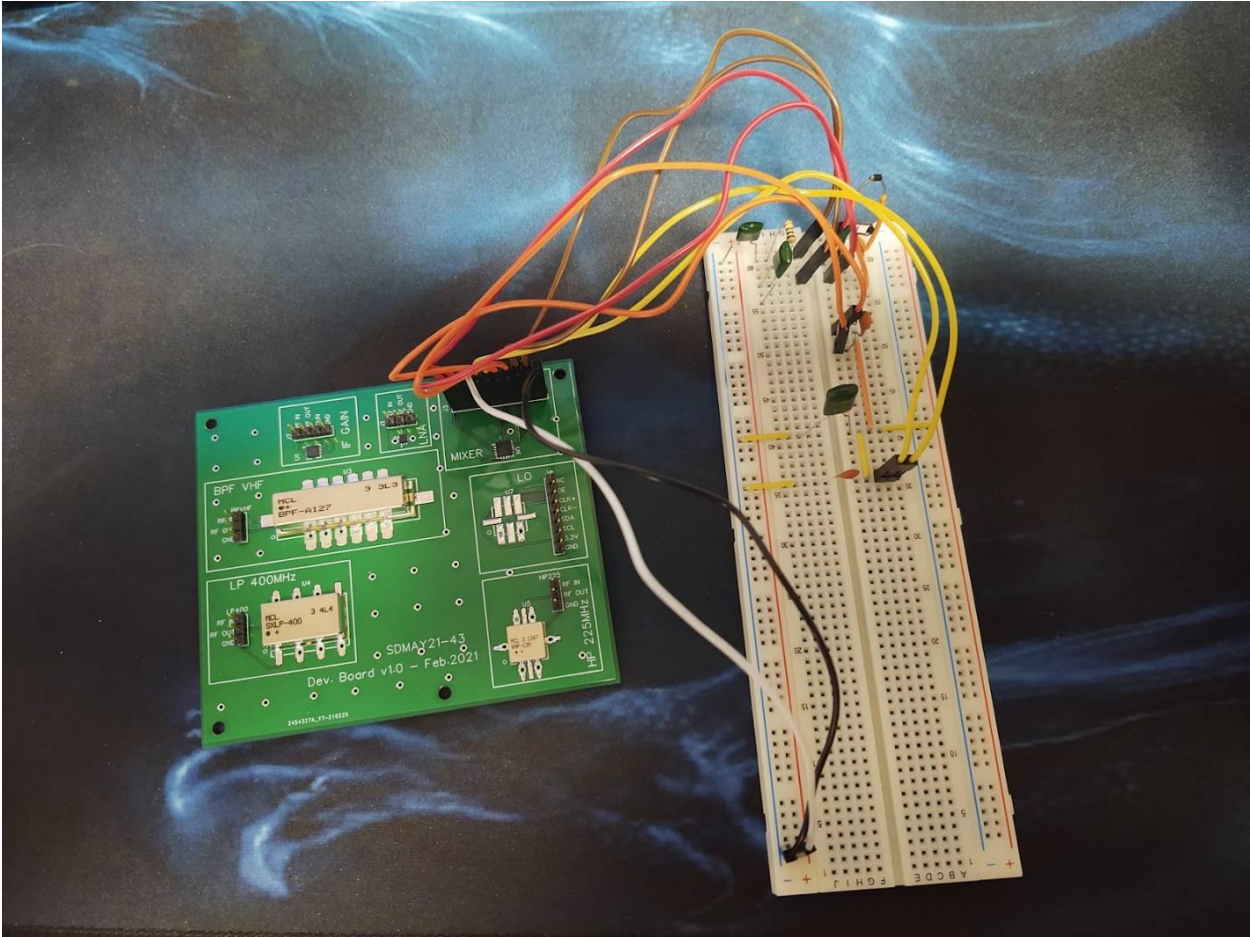
Local Oscillator Test Circuit:



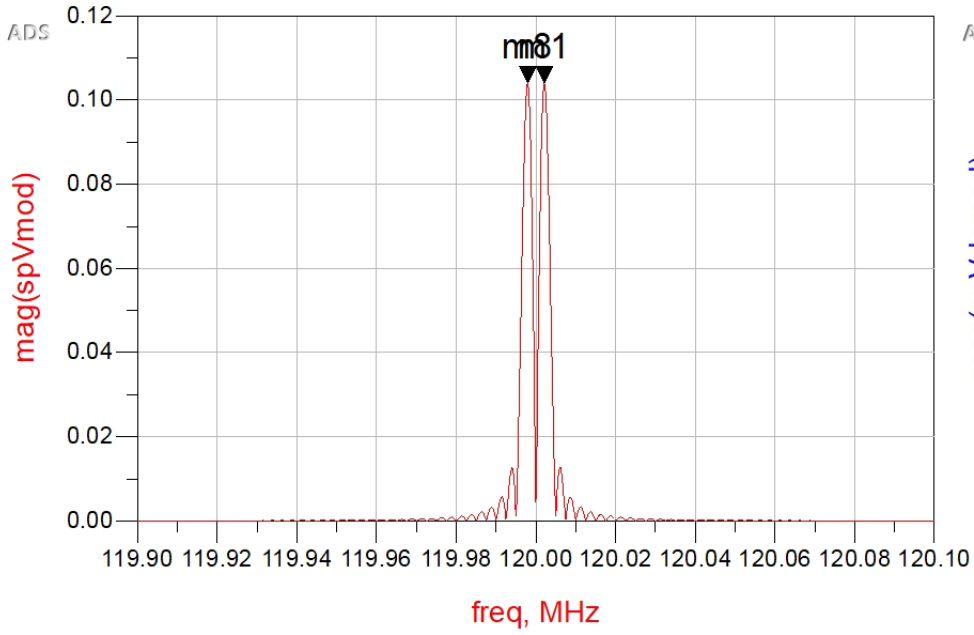
Local Oscillator Output Signal:



Mixer Test Circuit:



RF Mixer Output (transmitter signal chain):



RF Mixer Output (receiver signal chain):

