Senior Design Progress Report

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| **Student**: | Brian Dye | **Team**: | 20 ENIGMA |
| **Semester**: | Spring 2022 | **Position**: | Team Leader |
| **Week**: | **5** | **Hours**: | 15 |

# Progress Description

This week I interfaced the STM32 with the MSP2022 TFT LCD screen. I used the family reference manual and data sheet of the STM32F091RCT to determine what pins to map the SPI functionality to. I also created the image that we plan to display. A picture is demonstrated below:

A circuit board with wires

Description automatically generated with low confidenceI created a strategy for how my team will utilize the LCD display. First, we plan on creating a push button interrupt that turns the LCD screen on. Using a push button interrupt, we can save power by not leaving the LCD screen on which saves us an enormous amount of power. Second, I created the image for the LCD display. My plan is to display the network status (connected or not connected) and the last GPS reading from the SAM-M8Q. Finally, I want to display the battery status of the device using a battery icon which is demonstrated in the photo.

This week, I also worked on setting up the RFM69 Radio module. I once again referenced the data sheet and family reference manual to determine which pins on the STM32 I can use to communicate with the RFM69 module using SPI. I had to select an SPI channel that was different from the channel I selected to communicate with the LCD screen. We worked on setting up the RFM69 for a few hours and my team and I had to refresh our understanding of utilizing SPI to communicate with peripheral devices. This weekend, I plan to continue interfacing the STM32 with the RFM69.

# PSCC Finalize

My team and I came to a final understanding our PSCCs. We made them broader and finalized the hardware periphals that we plan on utilizing to achieve our project goals. Instead of using the HC-05 bluetooth module, we plan on using a lower powered and newer module called the HM-19 which utilizes BLE and comes with an app for testing. Instead of using the Spanning Tree Protocol to route packets, we will implement a more generalized best-effort data link layer protocol.