Senior Design Progress Report

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| **Student**: | Brian Dye | **Team**: | 20 ENIGMA |
| **Semester**: | Spring 2022 | **Position**: | Team Leader |
| **Week**: | **9** | **Hours**: | 21 |

# Progress Description

We hit another milestone this week by successfully interfacing with a Bluetooth module using UART. The Bluetooth module can write directly into the STM32 memory without the STM32 CPU getting involved. An issue that occurred was the Bluetooth module expected an asynchronous communication, so it was writing to the STM32 without the STM32 knowing that it was writing to it. To fix this issue, I implemented DMA on the USART channel to allow the Bluetooth module to write directly into the STM32 memory. For our ManLab demonstration, we sent a message from an iPhone to the Bluetooth module, from the Bluetooth module to the STM32, from the STM32 to the RFM69 radio module, from an RFM69 radio module to another RFM69 radio module, from an RFM69 radio module to another STM32, then finally from that STM32 to an LCD screen. The communication can be demonstrated using the following diagram:

Diagram, schematic

Description automatically generated

The next step in the development process will be to integrate more than two nodes. With this demonstration, we have successfully completed PSSC #1, #3, #5.

# I2C Development

Over spring break, I will be integrating the GPS and battery babysitter. Both modules require I2C serial communication. They will share the same I2C bus. I’ve had a lot of experience with I2C so I don’t expect it will take long.

# Printed Circuit Board (PCB)

Hanyu and I finished the PCB. We decided to restart from scratch because the location of each module did not suffice. The GPS, RFM69, and HM-19 now have separate areas on the PCB. The GPS and RFM69 also have separate ground planes connected to the main ground via a small trace. Final PCB design is on our website.