EE/CprE/SE 492 BIWEEKLY REPORT 2

September 17 - September 27

Group number: 9

Project title: Arinc429 Portable Receiver APP and Firmware

Client &/Advisor: Colin Cox & Daji Qiao, Mathew Wymore

Team Members: Eduardo Contreras, Riley Millam, Nicholas Morgan, Jared Staskal, Nate Trotter

- **Summary**

For the flutter application, we are currently completing further testing on bluetooth low energy (BLE). This week we successfully connected, we are now just trying to streamline the connection process for the end user via filtering the BLE search results. For the firmware, we've been able to establish a BLE connection with a phone as well as transmit data. We have also been working on the ESP32 GATT server for the Arinc429 using the previously mentioned example. With this, we've added services and characteristics for the Arinc429. We have started working on receiving ARINC429 word bus from a testing device provided by our client.

- **Past weeks accomplishments/issues**
    - Label storage implementation started
        - User created labels will be stored in a json file with an array of label objects
        - A class diagram for the necessary classes was created
        - Classes were created
        - Testing still needs to be done
        - Auxiliary functions need to be done
    - Successful BLE connection from Flutter Application to ESP32
        - Using ESP32 Gatt server with hardcoded data
        - When connecting shows too many devices
        - Plan to filter devices by names to cut down on previous
    - Successful BLE connection from ESP32 to Mobile Device
        - Using given ESP32 example: nimBLE Heart Rate Example
        - Sent information from ESP32 to Mobile Device
        - Can read and write
    - Working on Gatt Server
        - Working off of nimBLE Heart Rate Example
        - Still in Progress
        - Added working services and characteristics using custom UUID 128 bits
        - Needs more testing
    - Working on receiving Arinc429 word bus on ESP32

        - Studying example ESP32 code given by client that receives ARINC429 word bus
        - Learning and testing HI-35981 methods in ESP32 to understand how to read ARINC429 word buses
    - Issues:
        - Running the Flutter app on iOS was being difficult due to iOS' restrictions on user actions
        - BLE on iOS causing problems, but the Flutter app is running fine now
        - Still learning Flutter ins and outs with widget types and states
        - Still learning how to use HI-35981 Receiver methods in ESP32 to read in ARINC429 word buses

- **Individual contributions**

NAME	**Individual Contributions** *(Quick list of contributions. This should be short.)*	**Bi-weekly Hours**	**HOURS cumulative**
Eduardo Contreras	• Continued working on gatt server • Fixed in issued with using UUID 128 bits in Gatt Server • Started working on receiving ARINC429 word from testing device and Holt IC • Acquired test hardware from the client	13	27
Riley Millam	• ESP32 programming • Continued working on gatt server • Successful testing of BLE Connection from ESP32 to Mobile Device • Started working on receiving BLE data from phone	7	7
Nicholas Morgan	• Testing BLE connectivity from flutter to ESP • Successfully connected to the ESP • Acquired test hardware from the client	14	28
Jared Staskal	• Implemented label storage classes • Began label storage auxiliary functions • Began label storage testing • Acquired test hardware from the client	12	24

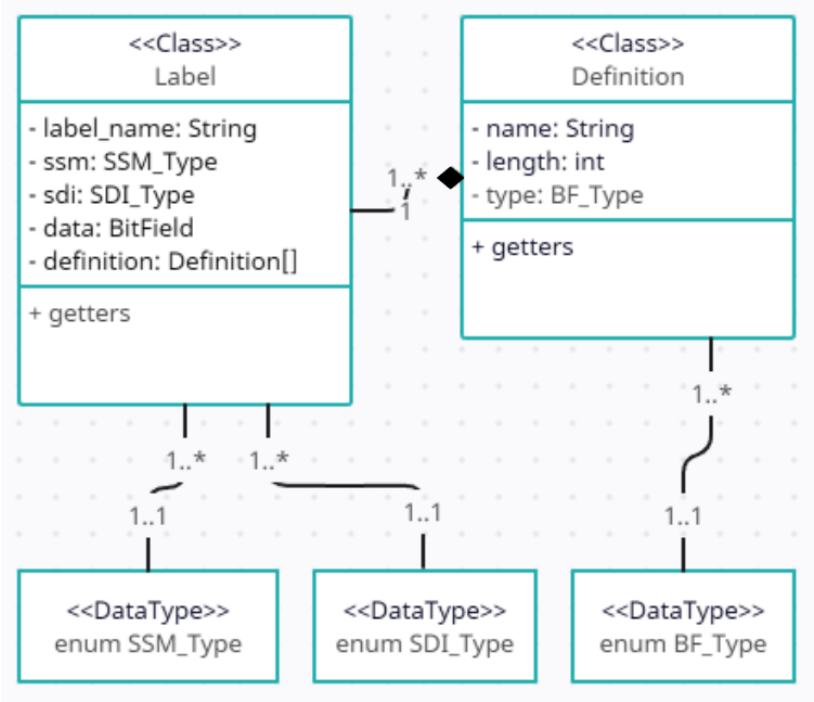
Nate Trotter	● Looked into Arinc429 code ● Analyzed how to receive word from testing device ● Has been in charge of communication with the client and advisors	13	25

- **<u>Plans for the upcoming weeks</u>**

  The flutter app side of the team will continue working on making progress with the app, specifically polishing connecting with the microcontroller via bluetooth and fully completing the label storage segments.

For the upcoming week, the firmware team intends to investigate Colin's C code for the Arinc429 and work from it to connect and transmit data to the ESP32. Additionally we'll work to improve and continue to build the GATT server. Eduardo and Nate plan to work on the code provided by Colin as well as continue working on the GATT server. Riley intends to assist the software team with Flutter UI as well as work on BLE GATT server.

- **Diagrams and Figures**



Class Diagram for Label Storage