

# **EE 491 Senior Design Group Meeting**

## **Safe Communication Between Lead and Following Vehicle**

### **Week 9 Report**

#### **Team Members:**

Bradley Stiff- Software Lead, Project Lead

Justin Wheeler- Software Lead

Sanguk Park- Scribe Lead, Communication Lead

Zhize Ma- Scribe Lead, Hardware Lead

Junho Chun- Hardware Lead

Yifan Lu- Hardware Lead

Jose Candelario- Project Lead, Communication Lead

#### **This Week Accomplishments:**

This week, we took both of the Xbee units and went to Intrans to test the transmission on the lead car's GPS. Unfortunately, we were not able to receive any coordinates from the Xbee that was attached to the GPS and had to play around with the XCTU software to match the specifications of the GPS to the Xbee. We already knew that the GPS unit had a baud rate of 115200 and the Xbee could also match that. What we didn't know was that the Xbee only had a raw data transmission limit of 8 bits. The Gps output data is 16 bits and that is when we realized we will need an arduino in order for the Xbee to transmit the GPS serial data.

In this case, we needed to come up with a backup plan. Our backup plan was to implement a arduino to enable 16bit packages to be transmitted through the Xbee. This week, this is what we mainly worked on. We would try to utilize matlab to send dummy serial data through the arduino, and that data will go through the arduino to the Xbee. Our arduino code will match the baud rate of the gps and the Xbee will have to match that accordingly.

Our arduino code is mentioned below:

```
char rx_byte;

void setup() {

Serial.begin(9600); } void loop() {

if (Serial.available() > 0) {

    rx_byte = Serial.read();

    Serial.print("You Typed: ");

    Serial.println(rx_byte);

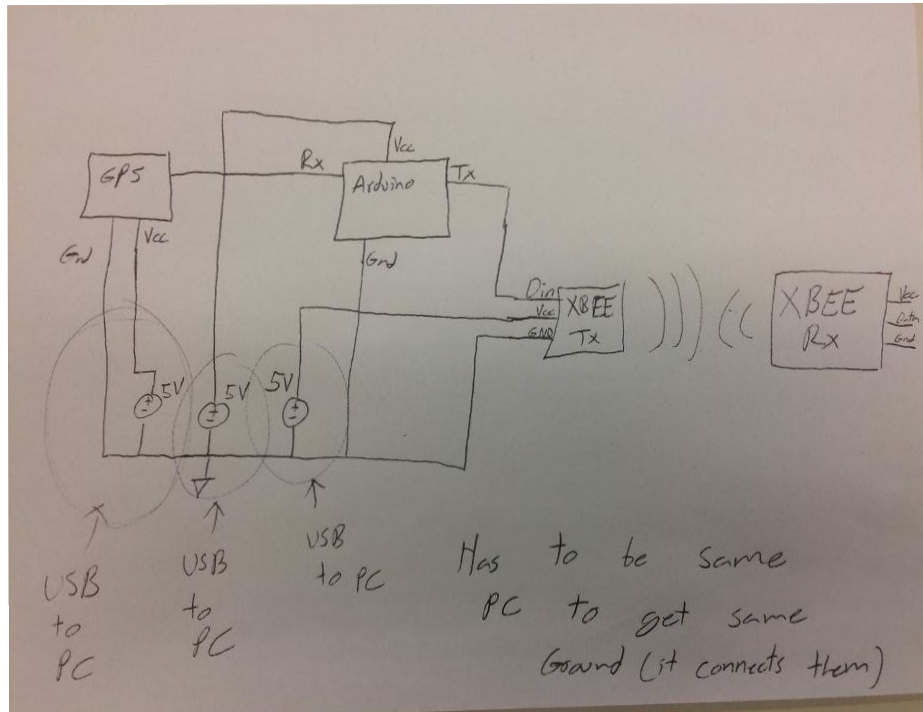
}

}
```

The code was successful in transmitting and receiving data. We first initialized this test by using Matlab to send dummy serial data to the arduino and then to the Xbee. The Matlab Code is shown below:

```
tep=serial('COM5', 'BaudRate', 115200);
fopen(tep);
fprintf(tep,'a');
fclose(tep);
```

The Matlab code successfully able send data and be transmitted through the Xbee. The receiving end of the Xbee received the data in 16 bit packages; however, when sending data such as "hi" or "abc", the receiving Xbee was unable to get the exact data and would give us random numbers instead. We looked into our code and changed it multiple times only to realize that it was not the code. This is where we had to have very intricate detail to hardware specifications. We were powering the Xbee and the arduino at the same time using a single USB port. The arduino and the Xbee had different operating current thresholds and thus were not getting enough current to operate properly. After having realized this, we each gave the components their own power source and both the transmitting and getting the correct data that is transmitted. The solution that we implemented to fix the problem above is shown below:



With this revamp, our group will need to make sure that the output ports of the GPS can connect with our arduino to ensure accurate transmission of data. We will have to go to INTRANS earlier on this week to see output port options and more importantly

## Individual Contributions (10/13~10/20)

Team Member	Contribution	Weekly Hours	Total Hours
Brad Stiff	Researched alternatives for 16 bit to 8 bit conversion for our transmission format. Went to Intrans to test GPS format.	4	35

Jose Candelario	Prepared presentation for client and received some parts. Tested to make sure that the parts worked.	4	47
Junho Chun	Tested the range of the Xbee models. Visit Intrans to test transmission between GPS and Xbee.	4	30
Justin Wheeler	Created a simple script in Python to receive serial data which was used for testing. Went to INTRANS to test and noticed there is an initial setup issue with the GPS unit which will need to be addressed.	3	29
Sang Uk Park	Wrote the weekly log. Tested the range of the Xbee models. Recorded the data format of the GPS from Intrans.	6	37
Yifan Lu	Getting ready for lightning talk #2. Went to intrans and help test transmission between Xbees.	3	31
Zhize Ma	Went to Intrans to help test GPS, soldered on power supply for the sending Xbee.	4	31

## Goals for Next Week

For next week, we will have to make sure that the modified transmission system operates and receives the data in 16-bit packages from the GPS. It is important that we go test it earlier on this week so that this way we know what other revamps must be done before we can finish up our prototype.