**BME Capstone Design Project Weekly Progress Report**

**Project Title:** KK01: Design of extremely small satellite

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**Reporting Week:** Jan 28 - Feb 1

**Project Manager of the Week:** Ho Yin Samuel Yeung

**Tasks Outlined in Previous Progress Report:**

* Continue work on issues with satellite
* Conduct Receiver range test as soon as possible

**Progress made in Reporting Week:**

* Reverse Engineered Communication System
* Replicated Transmission Test of Communication system from a year ago
* Created proper documentation (Schematic, Test Setup, Source code for testing, Transceiver Module Operating Manual, etc.) for Communication System Configuration

The main goals for this week was to continue finishing as much work as possible for the remaining issues on the satellite. For this week we were able to get the transmission setup for the transceiver understood and running, successfully confirming that our serial message was safely received on the other end by our radio module.

Due to the running timeline of the tubesat project(5 years and counting) and revolving team members, the documentation, source code, board layout, circuit diagram and other system documents have not been kept up to date, or did not exist at all. As such, it was imperative that the transceiver module and its configuration on the tubesat were properly understood before doing any testing. In addition, the previous setup and source code loaded on the tubesat had been changed, so it was not possible to test the transmission setup without properly understanding the setup.

After spending the entirety of Thursday, the transmitter connections were properly understood and wired, and the transmitter test source code was created and functioning. The messages were received on the other end (a radio connected to a local computer) as a packets.

Afterwords, the system setup of the transmission mode, the transceiver pinout and operating mode configurations, transmission test source code and transmission test procedure was documented for future design revisions.

A communication protocol is still to be determined, as it must be ensured that all packets must be successfully received if an image file is to be reconstructed and recovered by the ground station. Currently, programming an AR protocol (Address Resolution) source code for the arduino is being done. Once finished, two tests must be performed before the payload and communication systems can be confirmed working together. This includes

* Test for properly received packets (order and total)
* Tests for error handling (eg. handshale protocol)

A test for receiver functionality still needs to be done. From this weeks progress in the transmitter work, an RSSI and Squelch pin on the transceiver can be used to determine

* Received Signal Strength
* Expected Environmental Noise floor

During reception tests. However, a currently operating tubesat at our frequency must still be determined before doing so.

**Tasks for Next Week:**

* Create Algorithm for secure packet transmission
* Incorporate transmission code with Payload team Source code to begin testing on image packet sending
* Conduct Receiver range test as soon as possible