

CanSat Leader Training Program (CLTP-7)

**Hokkaido University
Japan**

Final Presentation

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What is CanSat?

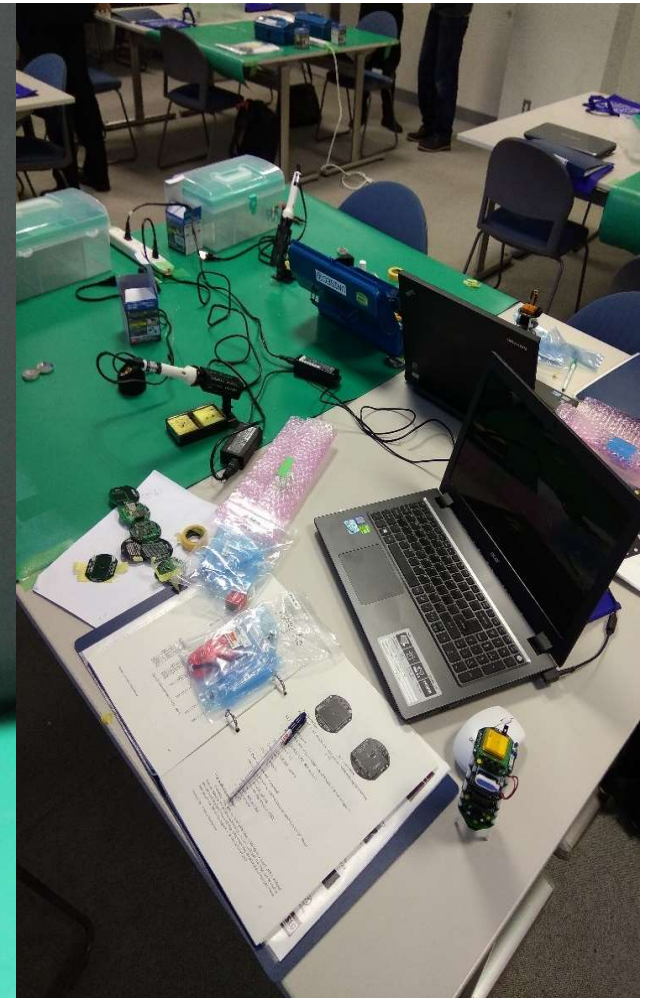
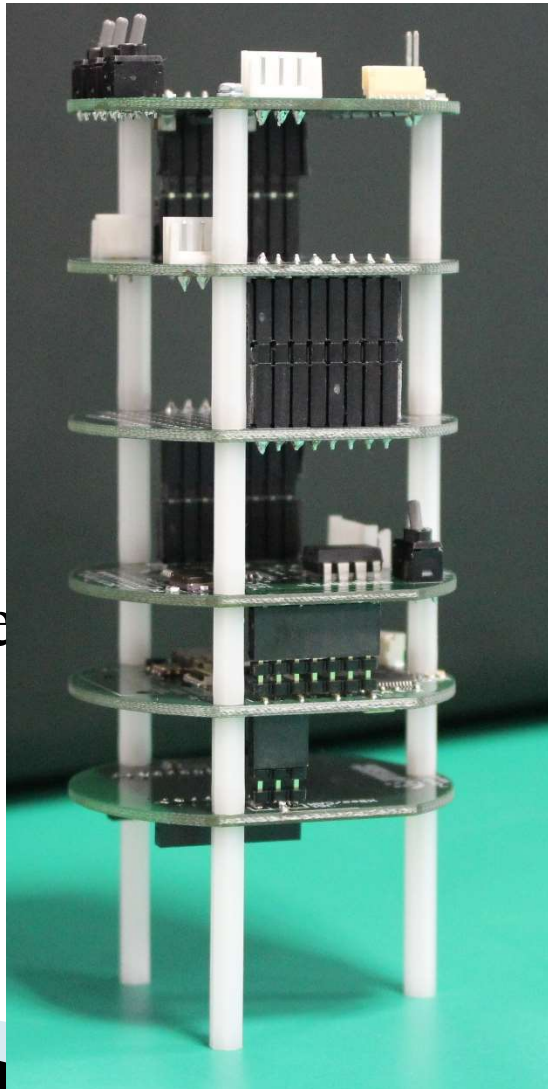
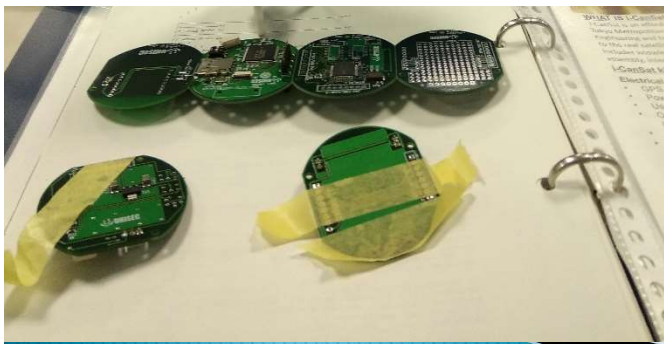
- ▶ **CanSat** is the miniature satellite includes all the subsystems that are similar to the real satellite function.
- ▶ Students can study the basic satellite systems engineering by using **CanSat**
- ▶ The **CanSat** includes knowledge about:
 - (1) System engineering
 - (2) On-Board-Computer (OBC)
 - (3) Sensors, Actuators,
 - (4) Assembly, Integration and Testing (AIT)
 - (5) Project Management



Configuration of i-CanSat Version-6

Circular Printed Circuit Boards(PCBs)-6

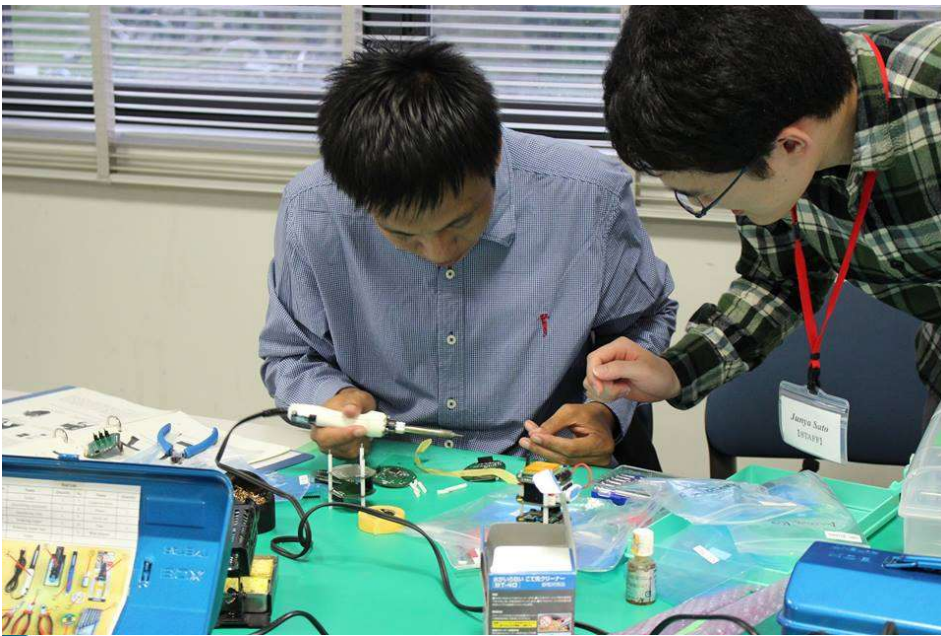
- 1.GPS board
- 2.Power Board
- 3.User Board
- 4.OBC Board
- 5.CAM board
- 6.Communication board(XBee Module)



CanSat Development

1.Soldering the i-CanSat Boards

-pre-installed parts and the parts need to be soldered



2. Board Continuity Test

-Before starting the assembly process, each board should be pass the continuity test.

-Open Circuit

-Short Circuit

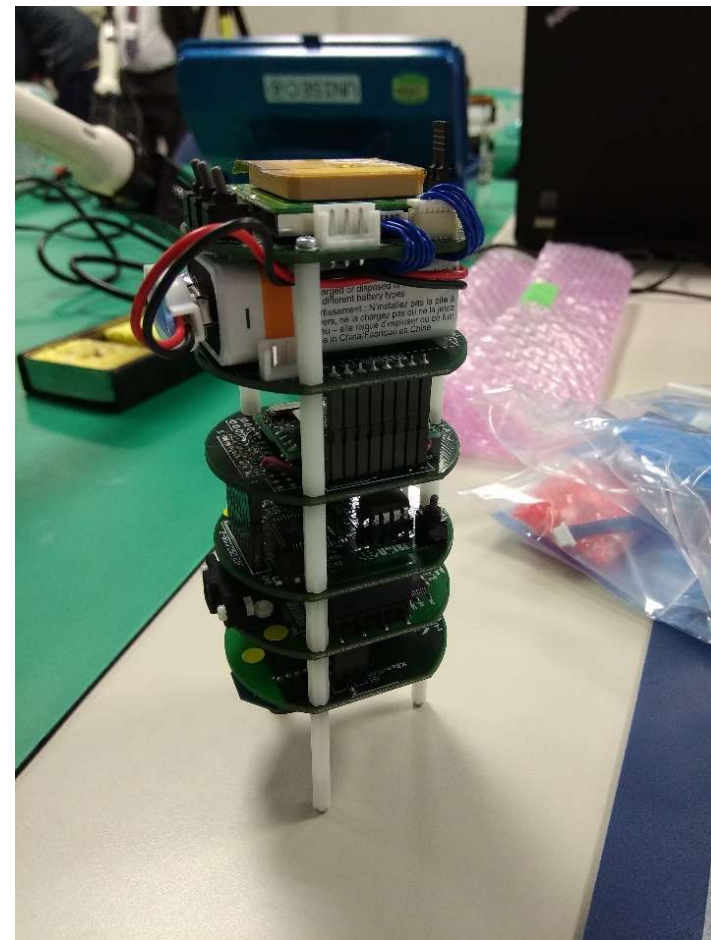
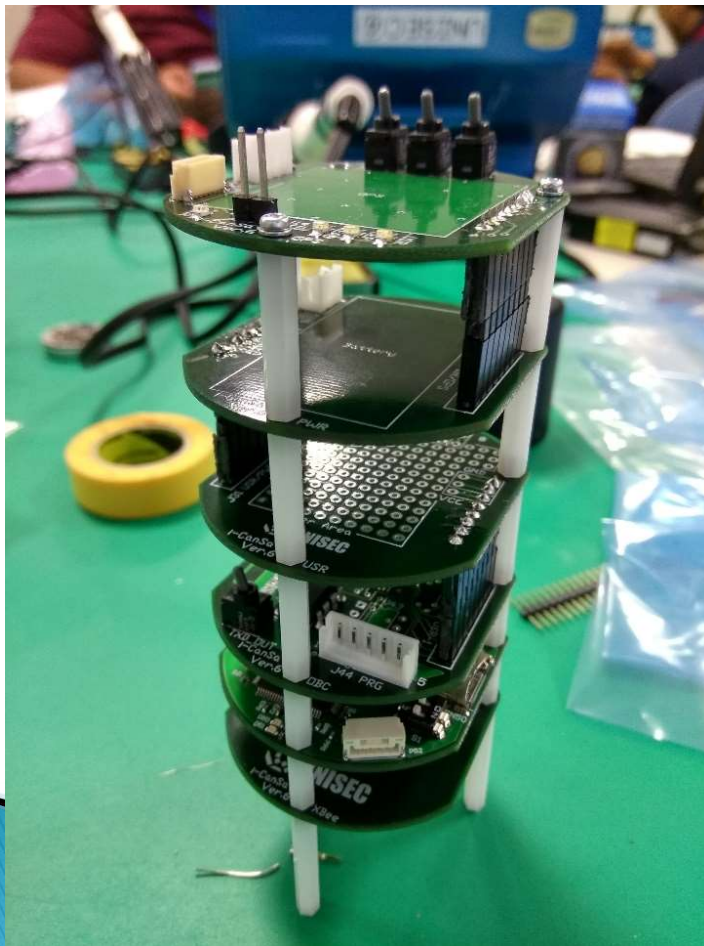
Short Circuit between VCC and GND is very important



short circuit test should be passed before assembly

3.Assembly and Integration

After passing the continuity test, the assembly and integration can be done.

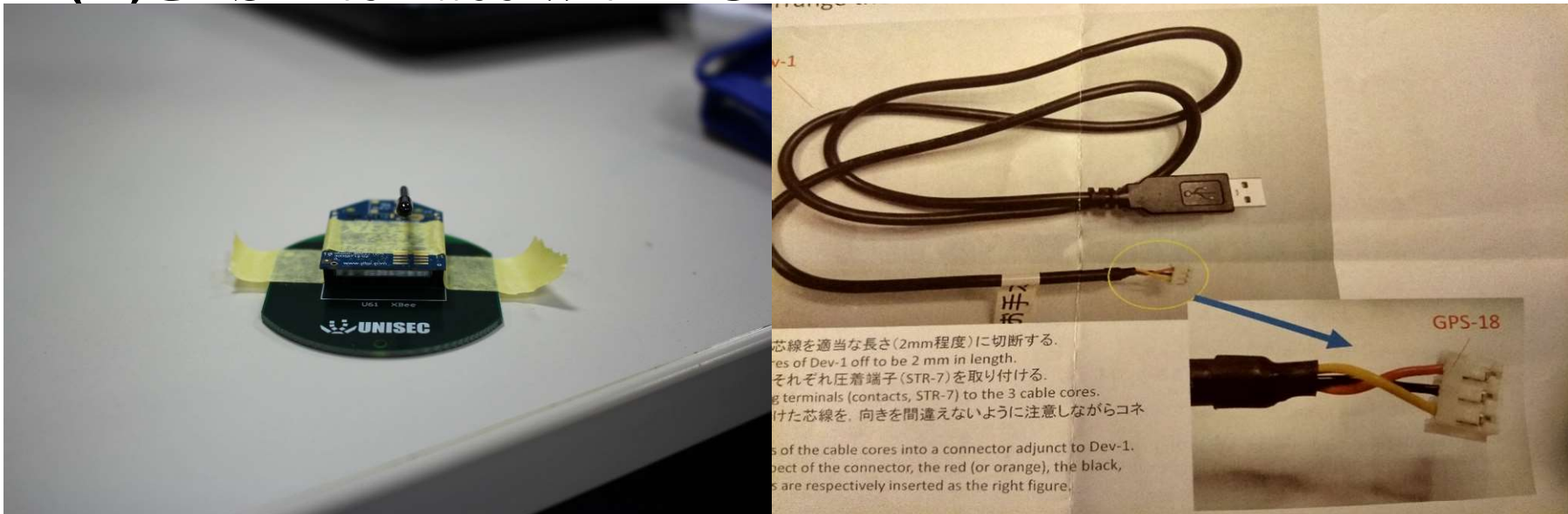


4. Testing of i-CanSat

(i) Functionality tests of different switches

(Power switch, Read switch, GPS-out switch, TXD-out switch)

(ii) GPS interface with PC



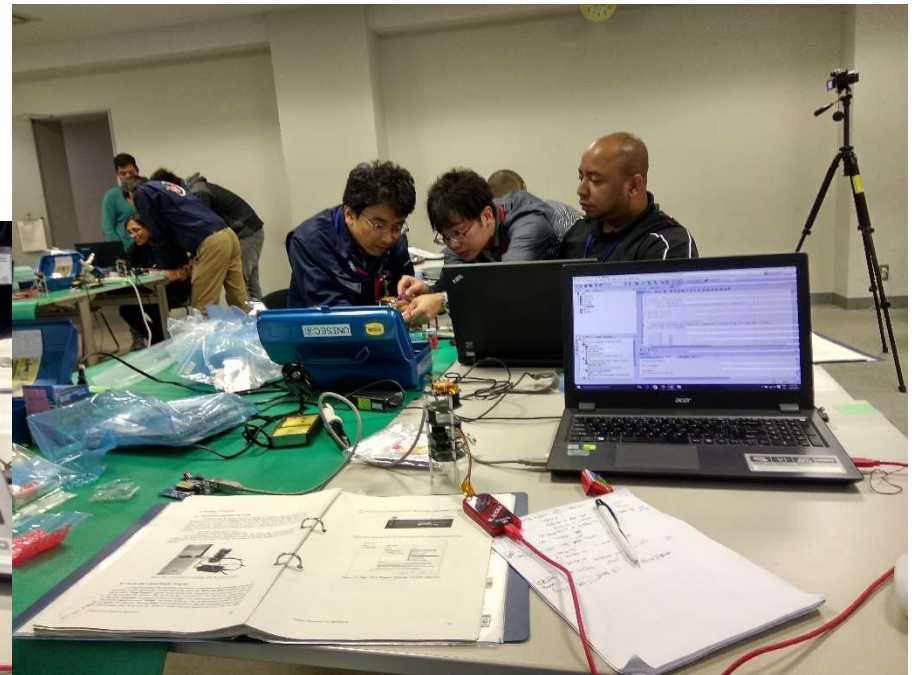
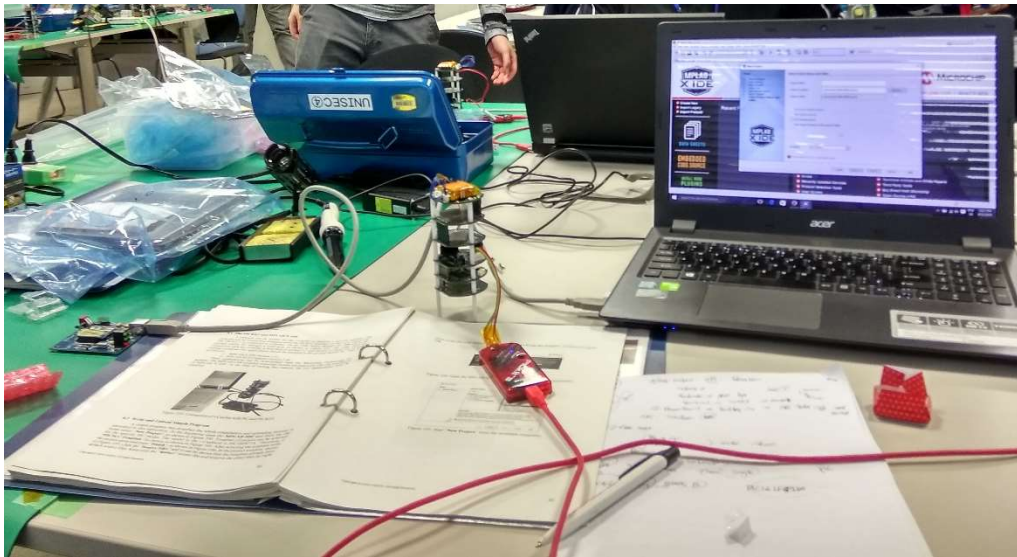
(iii) Configuration of the XBee (by using X-CUT)

the paring process of the XBee communication module in the i-CanSat and XBee communication module in the Ground Station interface board

Writing Program and Upload Program

- ▶ A program can be written and debugged using the PICKit 3 interface kit
- ▶ To start writing a program, two application should be installed in the ground station PC

1. MPLAB X IDE
2. MPLAB XC8 Compiler

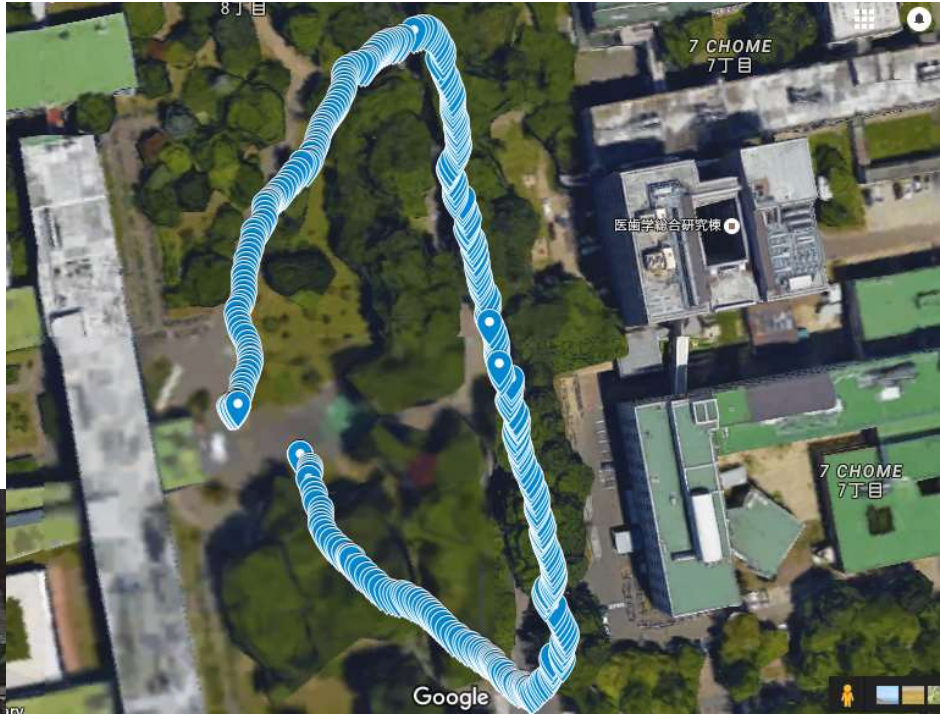


Camera Operation Test

- ▶ The image can be viewed by CANCEM convector



GPS Test



Making Parachute and Deployment Test

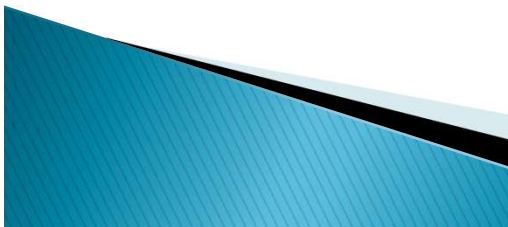
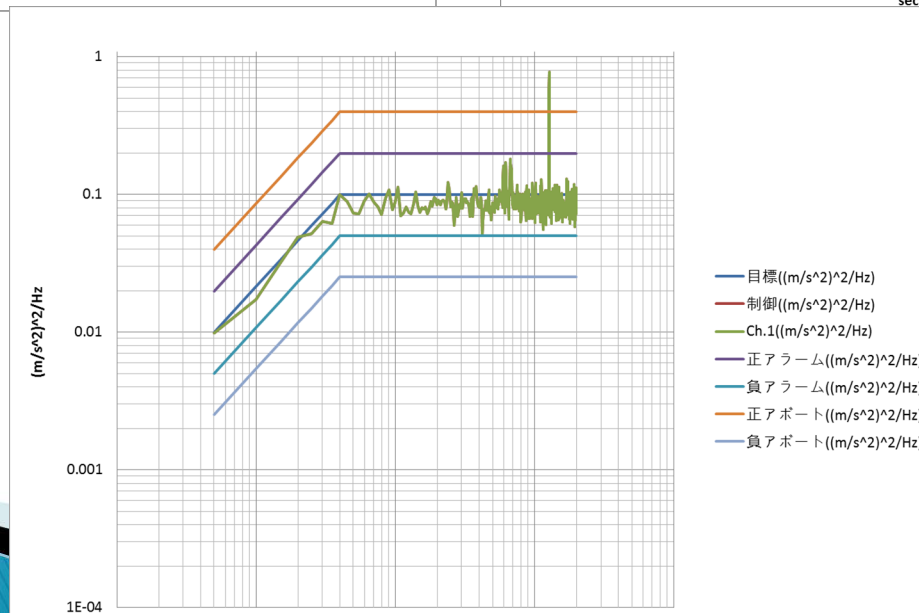
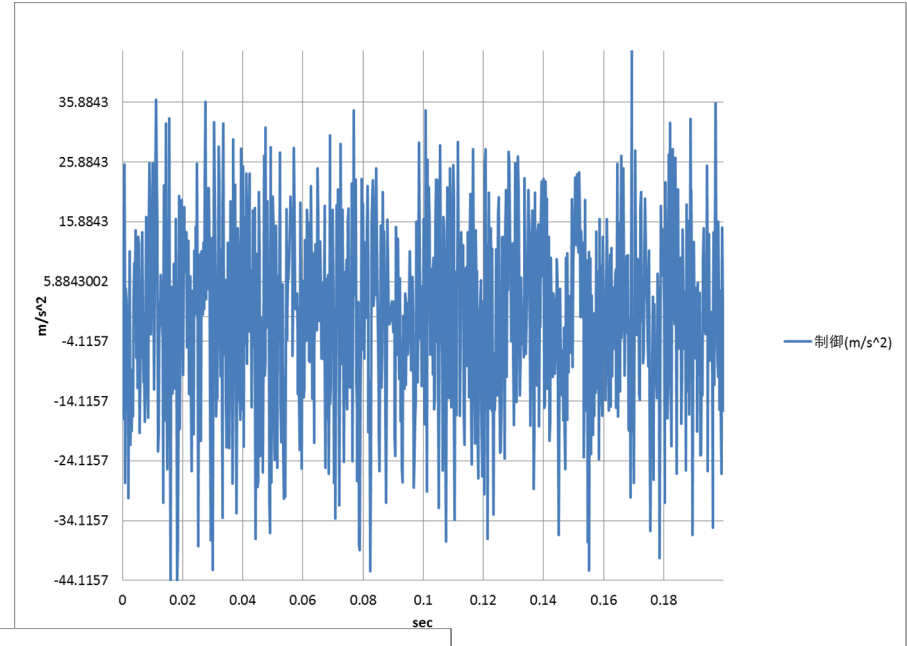
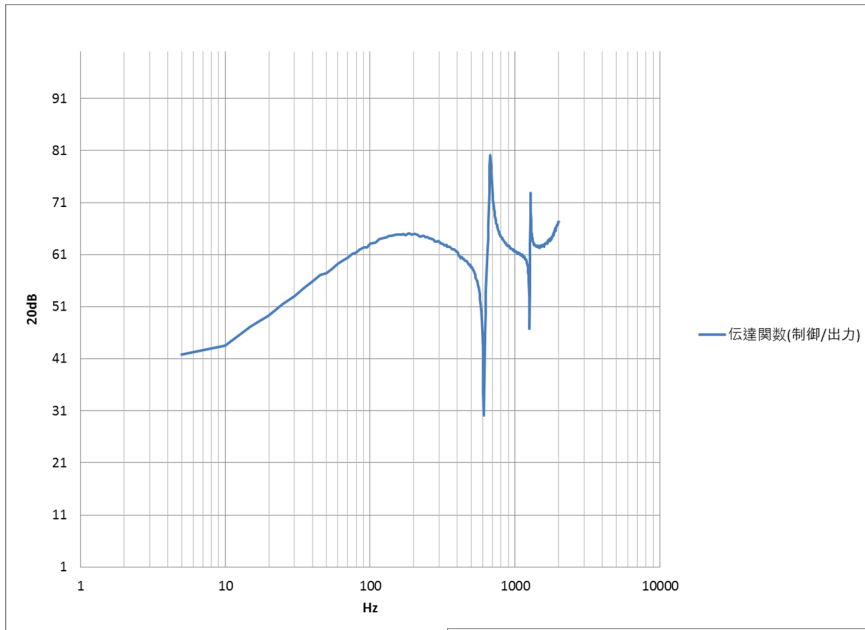


Ground Test-Vibration Test

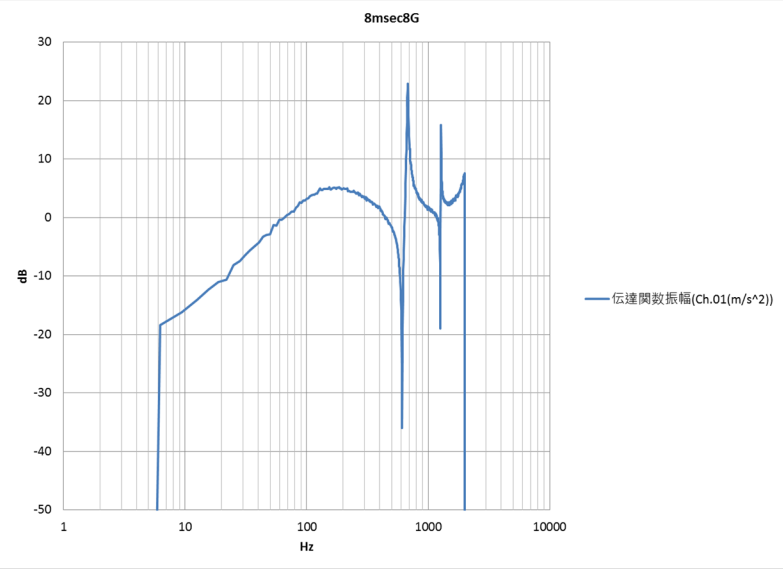
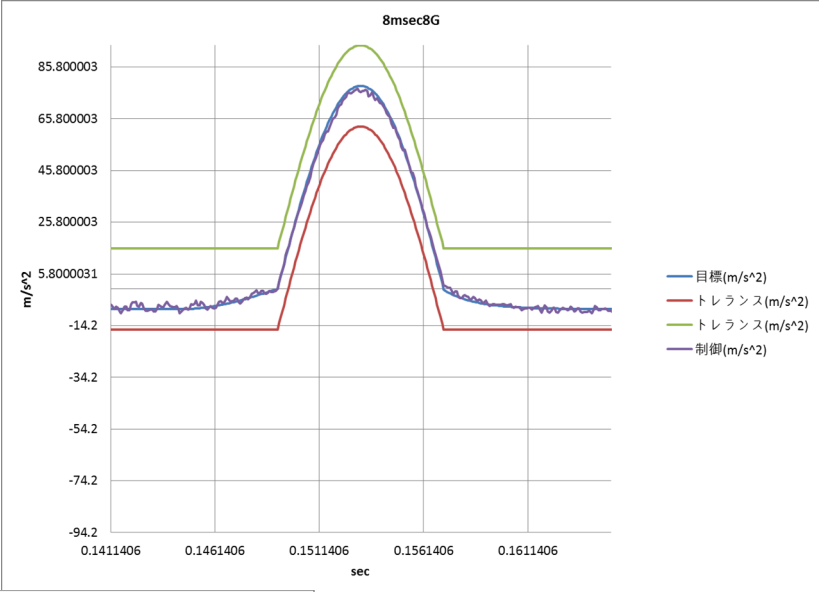
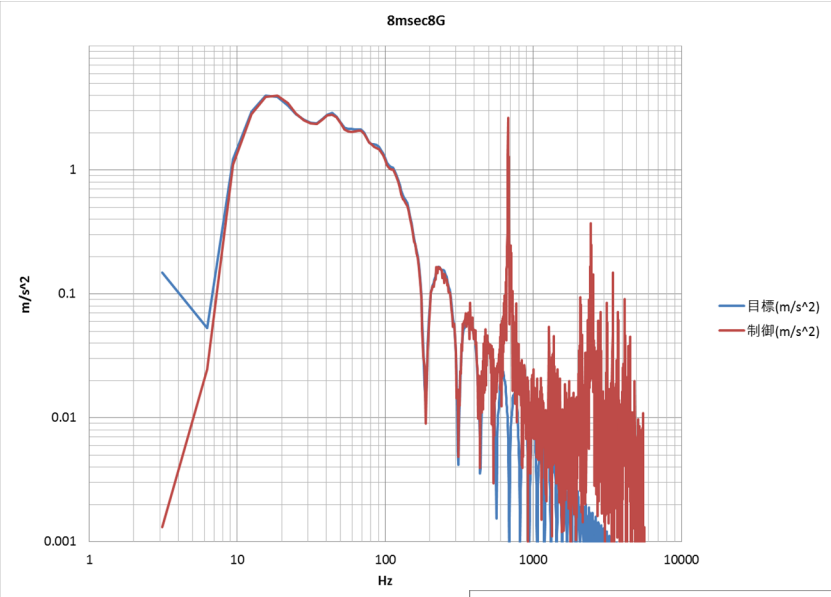
- ▶ **Sine Wave Vibration Test**
- ▶ **Random Vibration Test**
- ▶ **Shock Test**



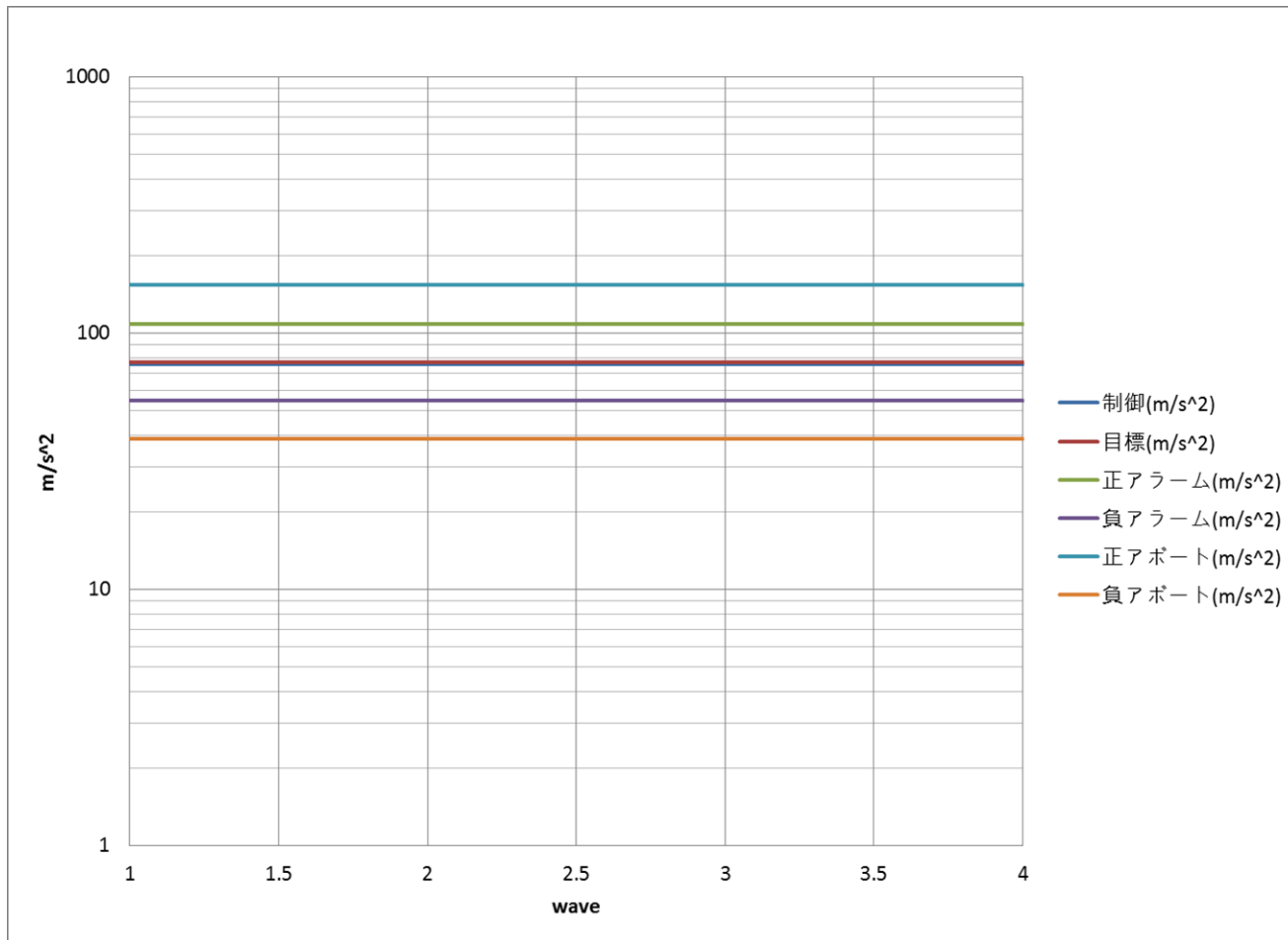
Random Vibration Test Results



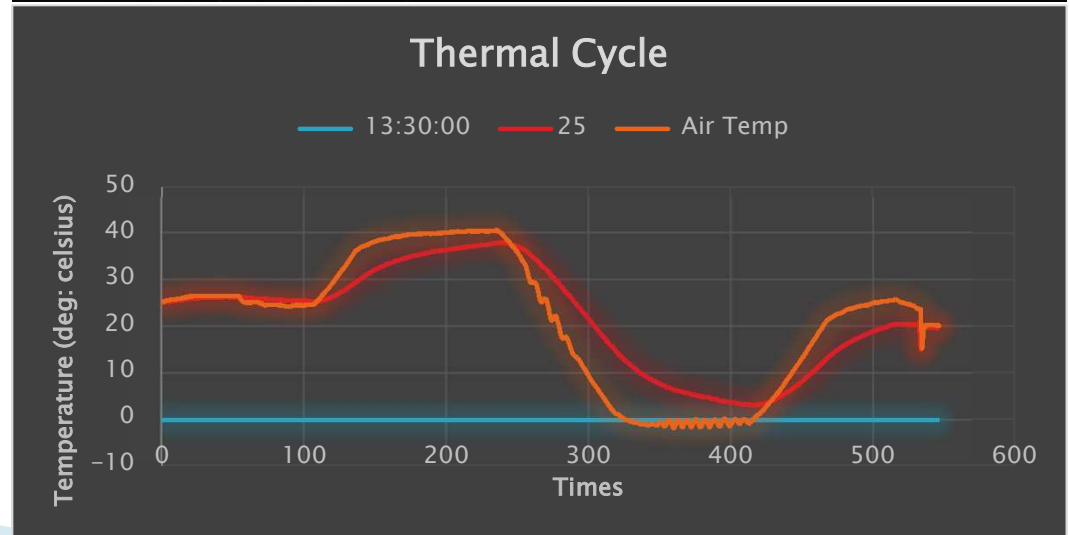
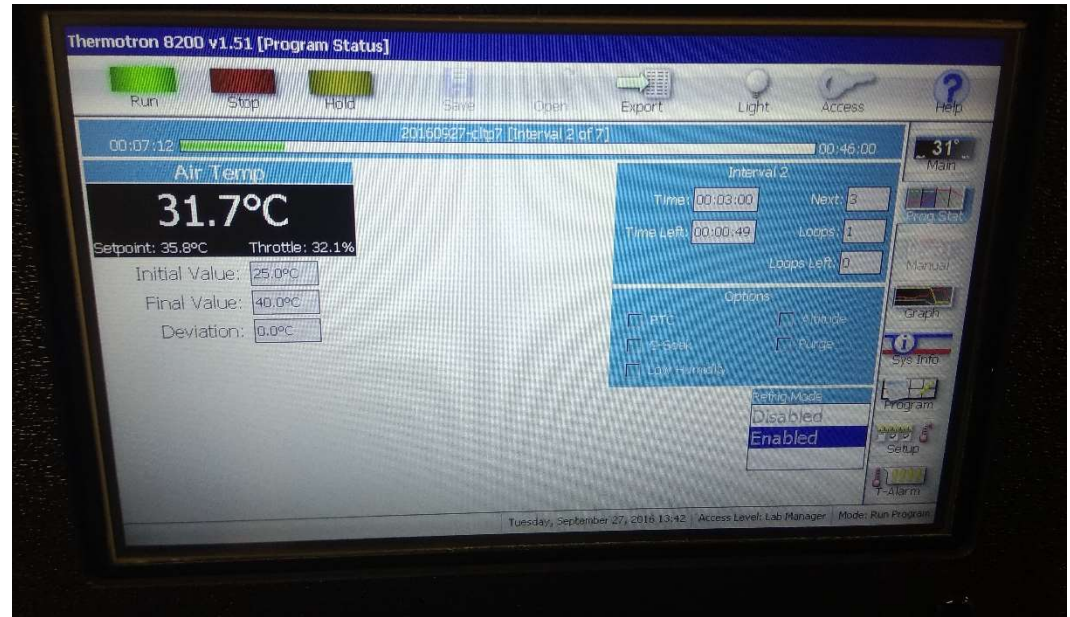
Shock Vibration Test Results



Sine Vibration Test Results



Ground Test-Thermal Cycle Test



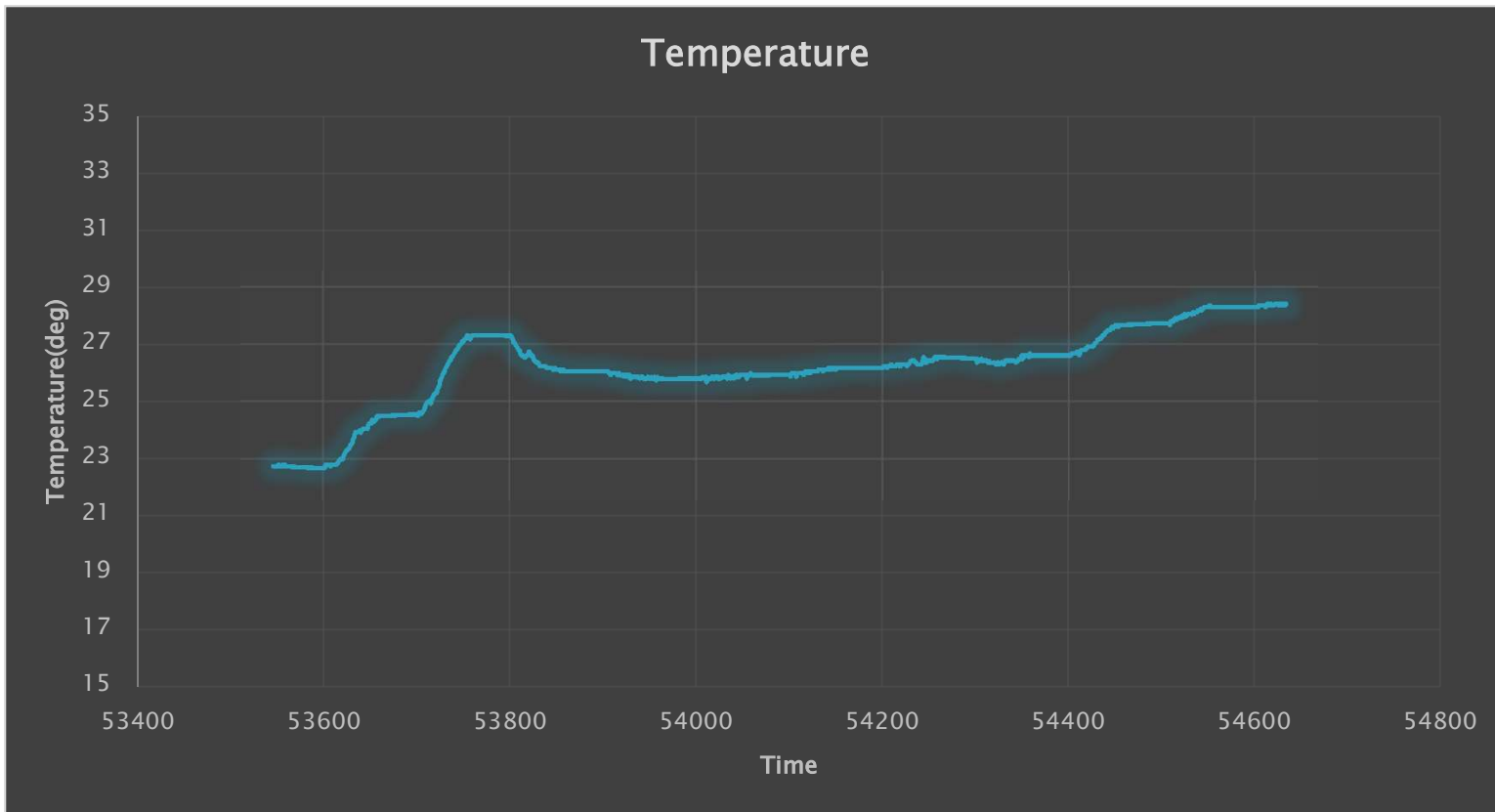
Manufacturing of Paper Rocket



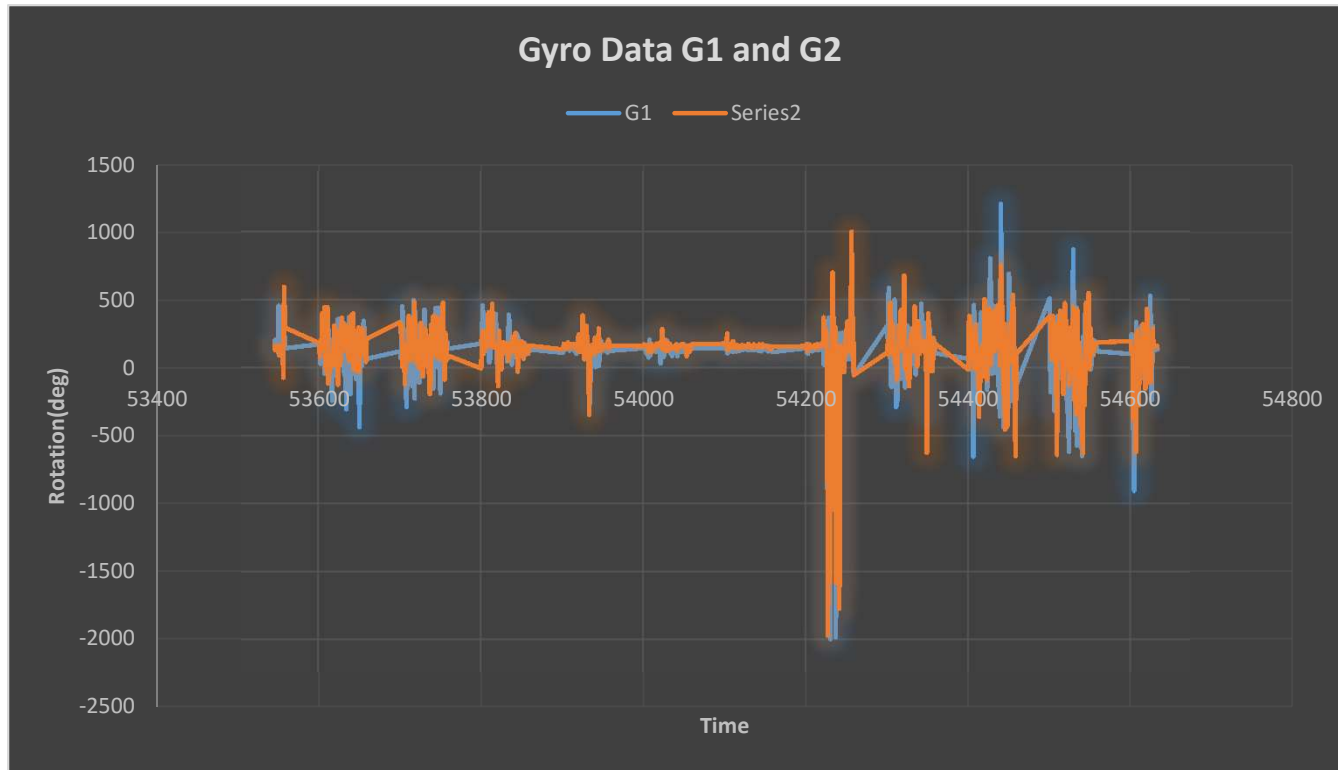
First Test Launch by Paper Rocket



Temperature Test Results

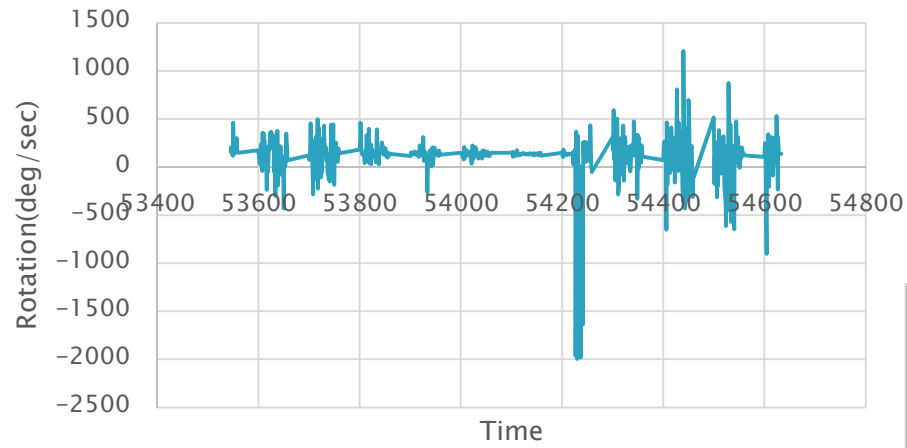


Gyro Results

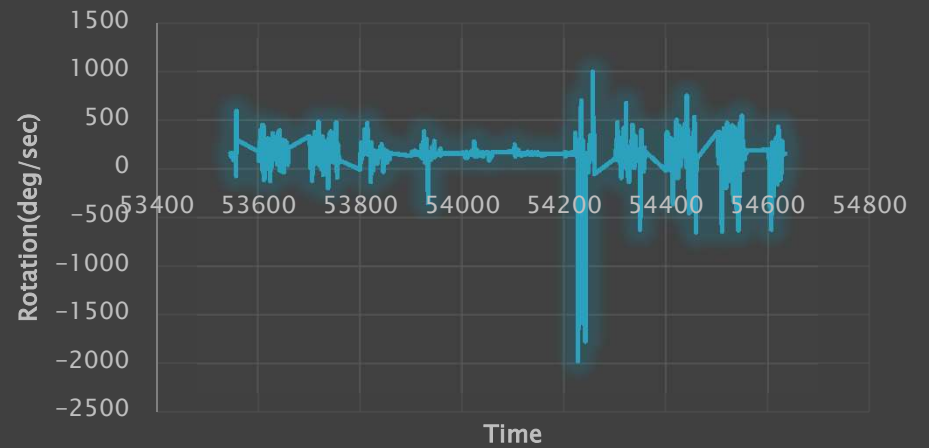


Gyro Results

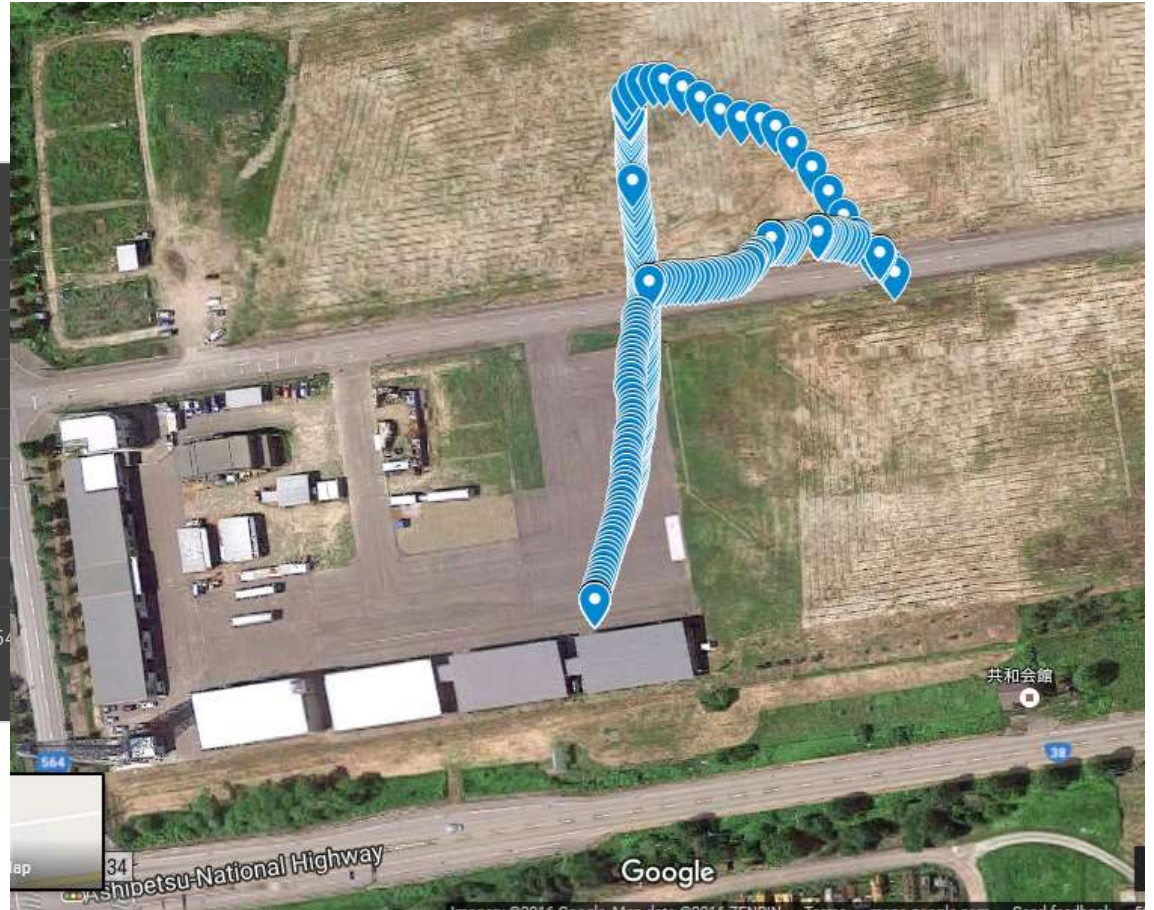
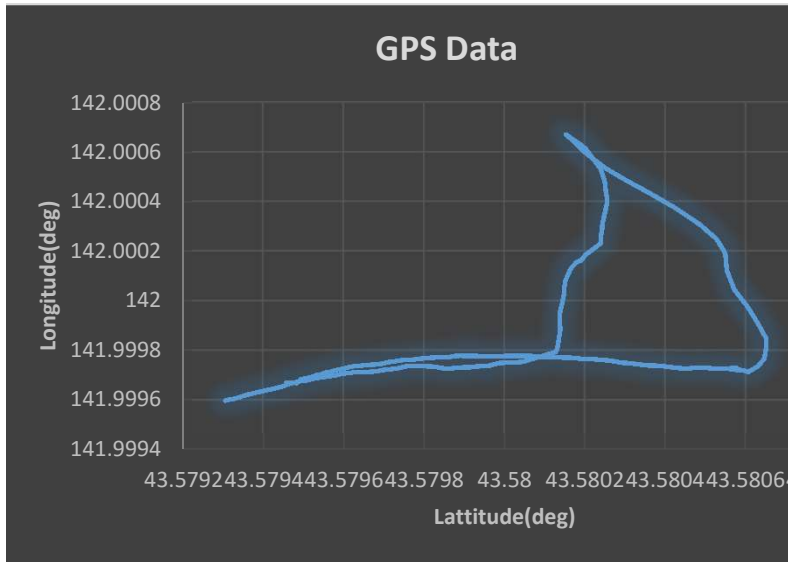
Gyro G1



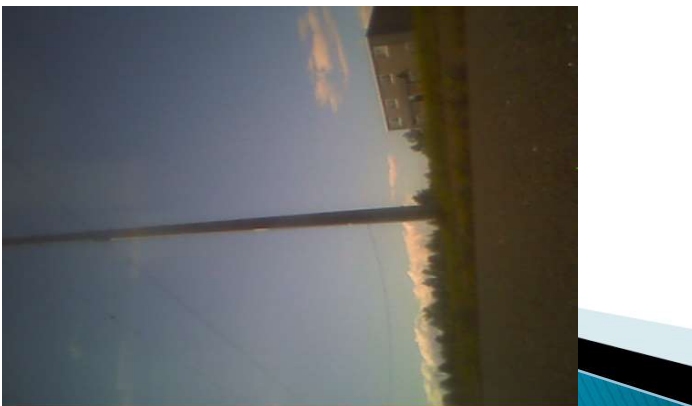
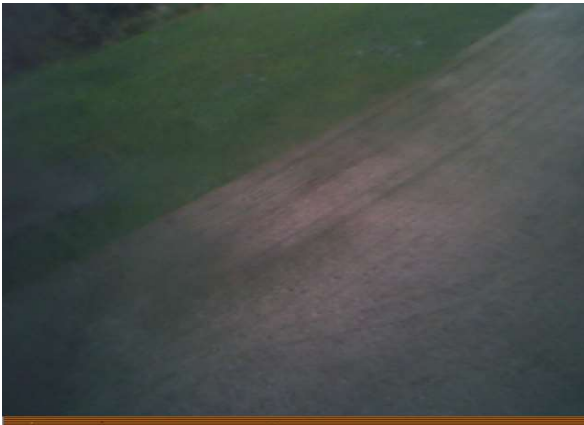
Gyro G2



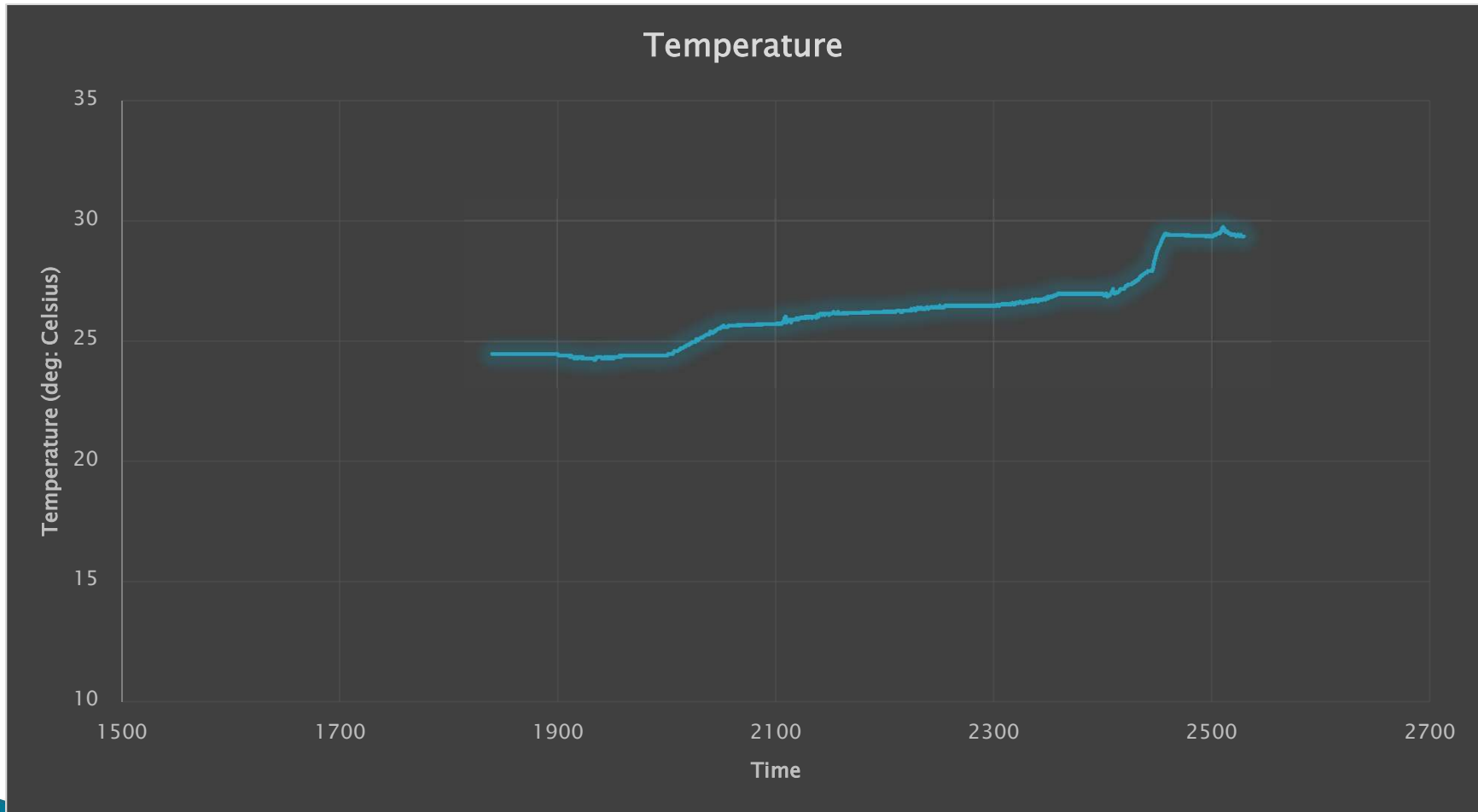
GPS Results



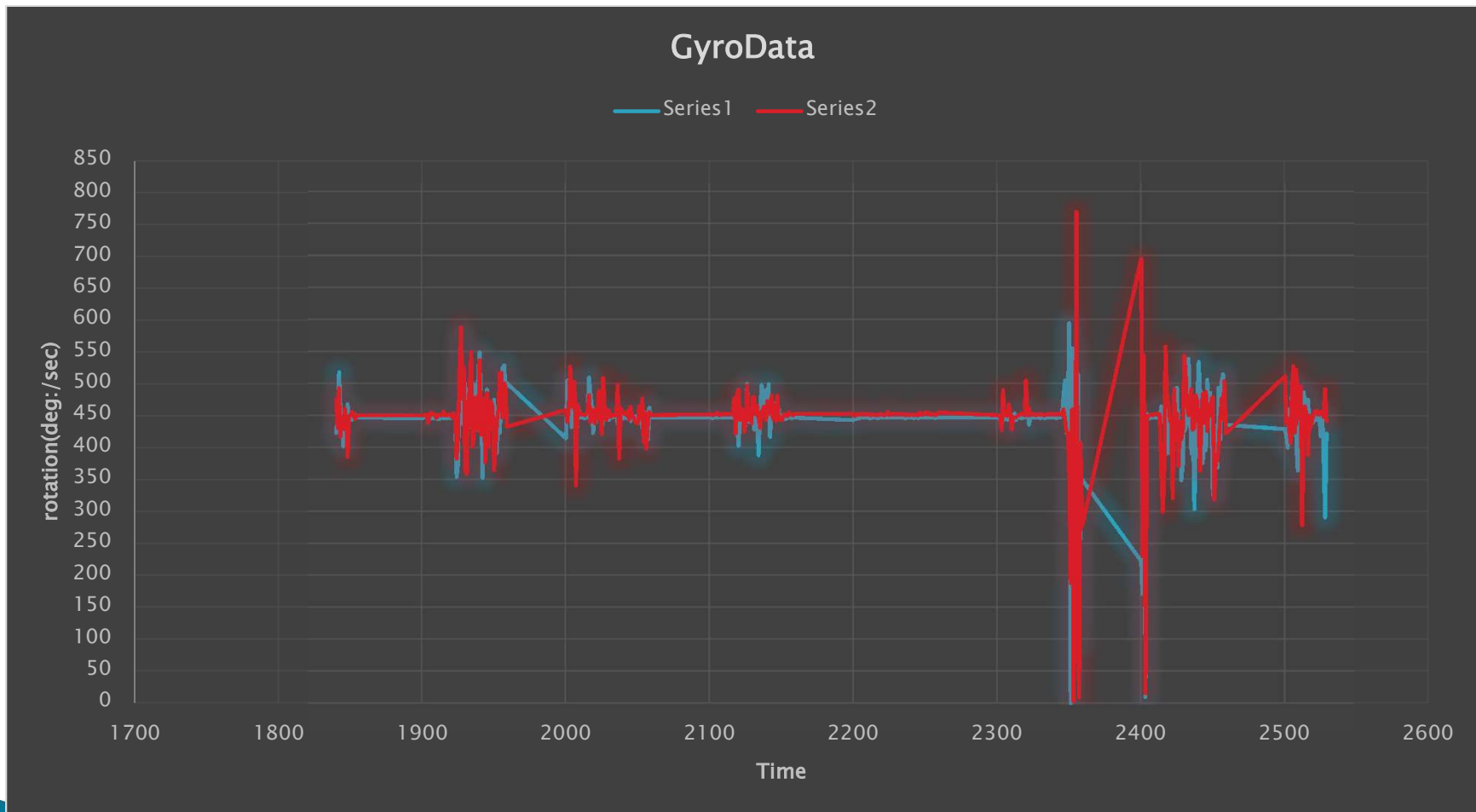
Camera Results



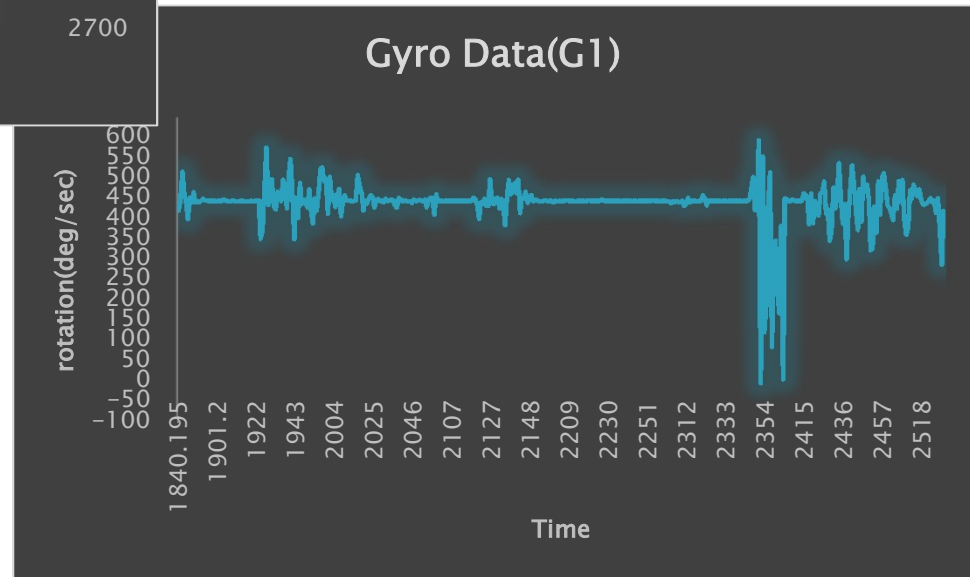
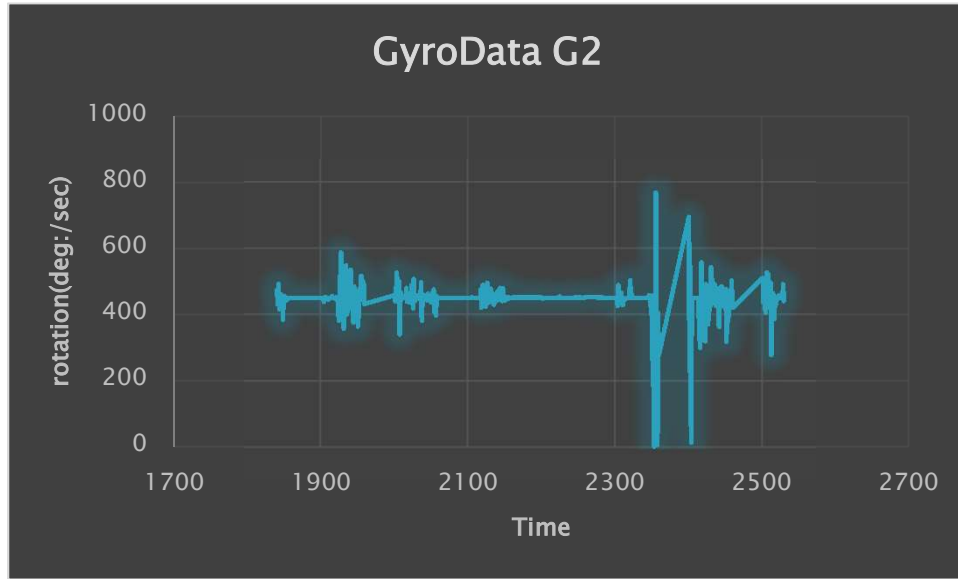
Second Launch Temperature Results



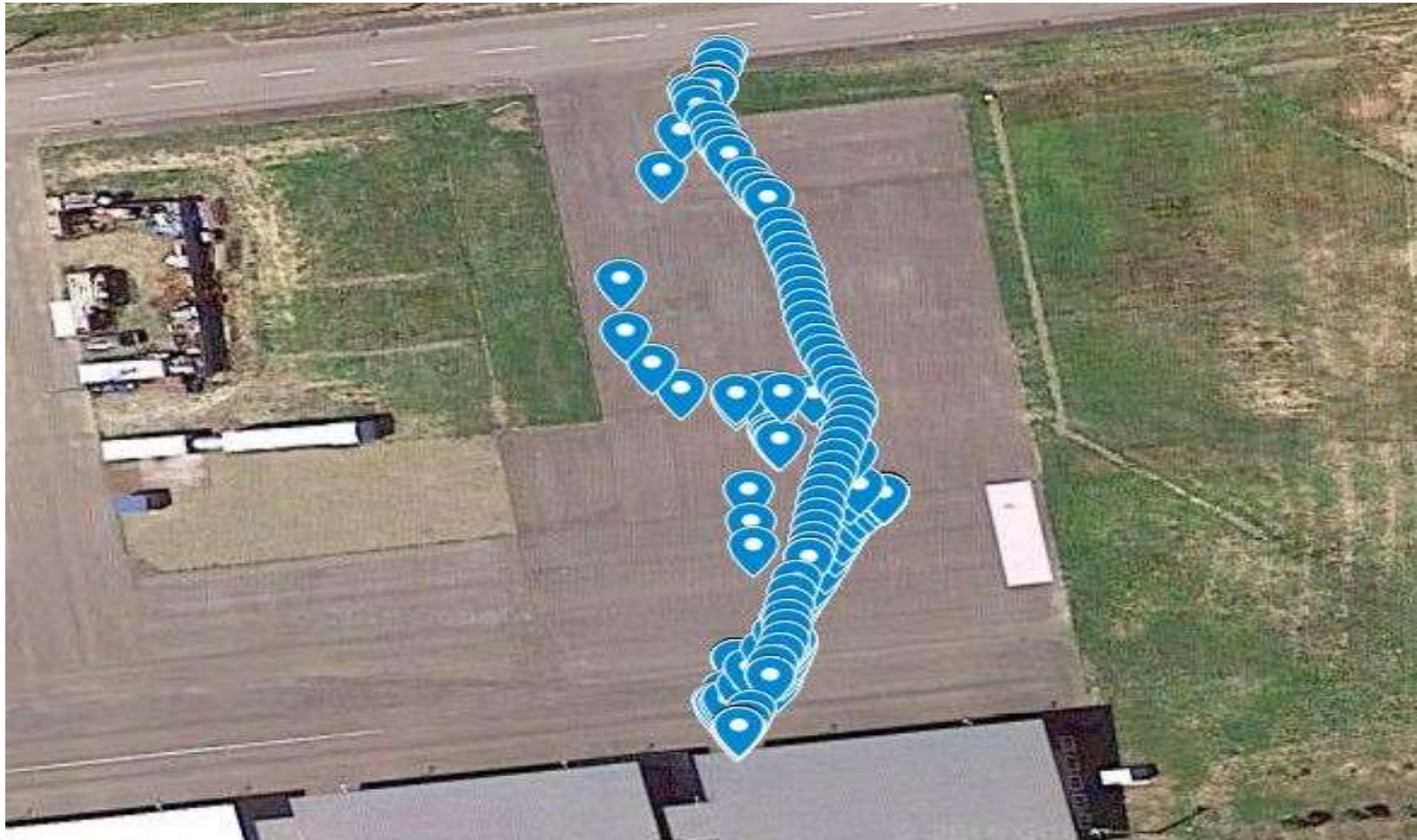
Second Launch Gyro Results



Second Launch Gyro Results



Second Launch GPS Results



Statement of Purpose

Can-Sat is the first step of space activities for developing countries , so this program is a good opportunity to applied satellite education.

- 1.To learn how to design a small satellite and necessary information about constructing a satellite laboratory
- 2.To improve our space education level and teaching method in aerospace engineering educations
- 3.To get information about Japanese space systems engineering for small satellite design.



Feedback of CLTP

1. CanSat hand-on training was very effective. I have learned a lot of knowledge for space engineering and being in CLTP was a wonderful experience.
2. I was able to learn the whole process of making CanSat .
3. This is another new experience I got from the CLTP. The knowledge of sensors, different techniques of sensor interfacing and data collection are very much helpful for future CanSat development.
4. This program provided me the opportunity of building the relationship of space science related activities with people from different countries.

Plan after CLTP

- ▶ CanSat is the best way to start our space activities in Myanmar

After CLTP:

1. I will introduce the CanSat Japanese based space education concept to the students of MAEU.
2. I will take this experience to offer similar training program to lecturers in in our university(MAEU).
3. And then, I will try to invite other Technological Universities in Myanmar to joint such course.
4. Finally, this will be expanded to other Universities in Myanmar.

Knowledge is not enough **without**
Experience!!!

THANK YOU!

