# Nakuja Internship

# Avionics Progress Report

# Week 4
# Junn Hope

# Tasks completed this week

- [#Issue 31] : Research on apogee detection logic

- [#Issue 83] : Power Management – In Progress

- [#Issue 26] : Improve on Kalman filter performance – In progress

# [#Issue 31] : Research on apogee detection logic

- We found that the most efficient means of apogee detection were:
  - Zero Velocity logic – By use of the MPU6050, we could use the acceleration values received from the accelerometer  to detect apogee when the velocity, area under the acceleration curve, reaches zero. As soon as the velocity reaches zero, apogee is detected and thus the parachute is deployed.

  - Positive Air Pressure logic – The BMP180 measures air pressure and detects changes in air pressure in order to determine the height of the rocket. Apogee will be detected at the first instance when the air pressure stops decreasing, and begins to increase.

# [#Issue 83] : Power Management- In Progress

- We realized that the different boards as well as the camera had varying power consumption needs. The required voltages being **12v, 9V, 7.4V, 5V** and **3.3V** with supply sourced from a 12V battery.
- It is thus necessary to create a Power Distribution Board that will safely distribute required power to all components.
- The board is currently under design

# Tasks in this week

- [#Issue 83] : Power Management

- [#Issue 26] : Improve on Kalman filter performance

- [#Issue 34] : Program Flight Computer

## Timeline

| Month | Intern week | Tasks |
|---|---|---|
| Jan | Week 1 | Onboarding<br>Getting acquainted with avionics and telemetry resources |
| | Week 2 | Research on ground station & ground station dashboard<br>Research on camera module<br>Research on Data transmission |
| | Week 3 | Avionics bay design<br>Launch pad design |
| Feb | Week 4 | Research on apogee detection logic<br>Improve Kalman filter performance |
| | Week 5 | Program Avionics and Telemetry boards |
| | Week 6 | Test the boards |
| | Week 7 | Testing and launch of N2 |