

Nakuja Project

Week 6 Progress Report

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Tasks this week

- ▶ [#] : Test Payload
- ▶ [#Issue 83] : Power Management
- ▶ Flight computer programming and documentation

[#] : Test Payload

- ▶ We performed payload tests on Friday, 25th Feb.
- ▶ Signal strength was also severely affected as we got RSSI values as low as -88, which was below our estimated range of -50 to -70
- ▶ The test brought to light factors we had not looked into:
 - ▶ 1) Electromagnetic interference - The data received from the sensors gave negative result, a result of the interference. The drone rotors motion caused an electromagnetic field which affected the sensors operation-particularly the BMP 180.
 - ▶ 2) signal interference - the RF signals from the drone interfered with the RF signals within our Wi-Fi network.

[#] : Test Payload



The screenshot shows a terminal window titled 'COM7' with a 'Send' button. It displays a series of sensor readings including RSSI, Altitude, and Acceleration (Acc-x, Acc-y, Acc-z). A blue line graph is overlaid on the data, showing a curve that rises and then levels off. The graph starts at a low altitude and rises to a peak around the middle of the data set, then levels off. The RSSI values are consistently low, around -80 to -90 dBm. The Altitude values range from approximately -7316.12 to 1477.21. The Acceleration values are also shown for each reading. At the bottom of the terminal, there is a timestamp 'ets Jun 8 2016 00:22:57' and some boot information.

```
RSSI:-86
Altitude: -7316.12, Acc-x: 2.85, Acc-y: -2.33, Acc-z: -9.43

RSSI:-91
Altitude: -4907.55, Acc-x: 0.00, Acc-y: -28.76, Acc-z: 16.55

RSSI:-89
Altitude: 1477.21, Acc-x: 2.54, Acc-y: -2.23, Acc-z: -9.45

RSSI:-89
Altitude: 4036.24, Acc-x: 0.00, Acc-y: -28.76, Acc-z: 16.55

RSSI:-89
Altitude: 1477.12, Acc-x: 2.84, Acc-y: -2.38, Acc-z: -9.46

RSSI:-90
Altitude: -1230.91, Acc-x: 3.91, Acc-y: -1.37, Acc-z: -8.04

RSSI:-89
Altitude: 1476.26, Acc-x: 2.94, Acc-y: -2.37, Acc-z: -9.66

RSSI:-91
Altitude: -308.37, Acc-x: 2.89, Acc-y: -2.33, Acc-z: -9.48

RSSI:-91
Altitude: 1476.55, Acc-x: 2.89, Acc-y: -2.35, Acc-z: -9.61

RSSI:-90
Altitude: 1475.31, Acc-x: 2.86, Acc-y: -2.33, Acc-z: -9.35

RSSI:-88
Error code: -5
--
ets Jun 8 2016 00:22:57

rst:0x1 (POWERON_RESET),boot:0x13 (SPI_FAST_FLASH_BOOT)
configip: 0, SPIWP:0xee
clk_drv:0x00,q_drv:0x00,d_drv:0x00,cs0_drv:0x00,hd_drv:0x00,wp_drv:0x00
mode:DIO, clock div:1
load:0x3fff0018,len:4
load:0x3fff001c,len:1044
```

Some data received on ground
But none during flight

Very low RSSI Wifi signal values
Better antenna power needed

Flight computer programming and documentation

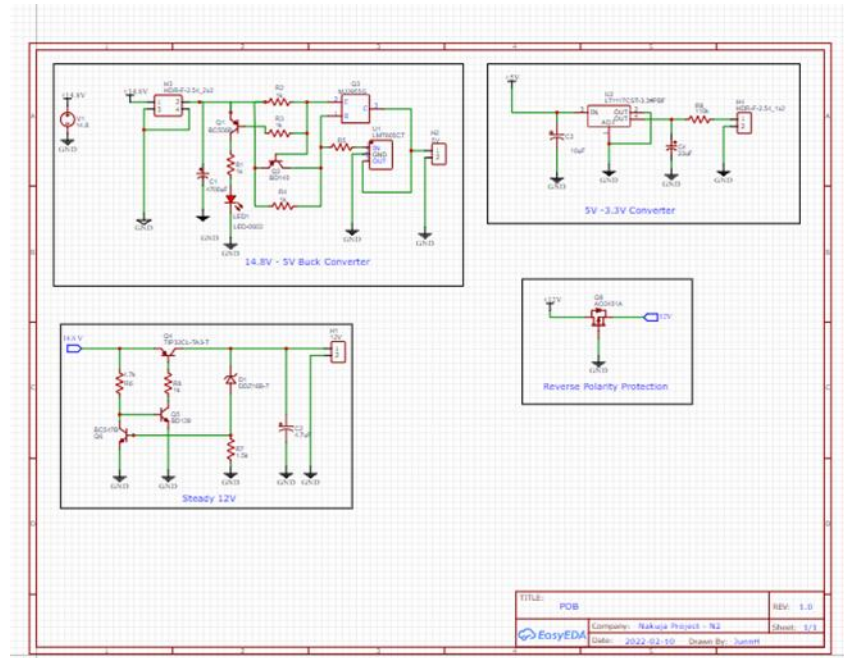
- ▶ Ongoing programming of flight computer
- ▶ Restructuring code as a state machine
- ▶ Every interval is a state. E.g

State	Description	Waiting for event
0	Launch	Waiting for lift-off
1	Lift-off detected	Waiting for apogee

- ▶ This will help in scaling the software for future versions
- ▶ Observation: need to have a means of restarting the flight computer remotely

[#Issue 83] : Power Management

- The design of the power distribution board is done and is currently under review



Tasks this week

- ▶ [#Issue 26] : Improve on Kalman filter performance
- ▶ [#Issue 103] : Build Wi-Fi Amplifier
- ▶ [#Issue 34] : Programming the Flight Computer
- ▶ [#Issue 18] : Launch pad design