Nakuja Internship

Week 7 Progress Report

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Tasks completed last week

- Purchased GPS NEO 6M module
- Managed to get coordinates from the NEO 6M module
- Researched on long range transmission(LoRa module)
- Static test

Tasks to complete this week

- Prepare the launchpad for the water rocket(Rodney)
- Continue implementing GPS and embed google maps in order to track
- Work with avoinics team to get MPU sensor data
- PCB etching

GPS Data

- GPS send data in NMEA format
- It sends strings where you can extract the data for latitude, longitude and altitude.
- We are use the GPGGA string, which contains the coordinates.

```
pi@raspberrypi:~ $ clear
pi@raspberrypi:~ $ sudo cat /dev/ttyAMA0

$GPGLL,0649.0846,N,00327.1015,E,172206.000,A,A*5B

$GPGSA,A,3,09,06,19,23,28,03,22,30,01,17,,,2.0,0.9,1.8*3B

$GPGSV,3,1,12,01,17,147,17,02,09,322,,03,23,085,17,06,50,320,31*7A

$GPGSV,3,2,12,07,74,060,,09,30,011,30,17,28,218,24,19,30,244,20*7A

$GPGSV,3,3,12,22,11,103,15,23,13,035,28,28,17,176,18,30,66,194,28*73

$GPRMC,172206.000,A,0649.0846,N,00327.1015,E,0.00,102.80,021017,,,A*62

$GPVTG,102.80,T,,M,0.00,N,0.00,K,A*36

$GPZDA,172206.000,02,10,2017,00,00*51

$GPTXT,01,01,01,ANTENNA OK*35

$GPGGA,172207.000,0649.0846,N,00327.1016,E,1,10,0.9,57.6,M,0.0,M,,*50

$GPGLL,0649.0846,N,00327.1016,E,172207.000,A,A*59
```

Field No.	Name	Description	Example
0	$GPGGA	Message ID, RMC Protocol Header	$GPGGA
1	hhmmss:ss	UTC Time, Time of position fix	125330:00 i.e. 12:53:30:00 UTC
2	Latitude	Latitude of GPS position	2651.92606, N
3	Longitude	Longitude of GPS position	07546.73750, E
4	FS (Fix Status)	Position of fix status indicator - 0 - Invalid 1 - GPS Fix 2 - DGPS Fix 6 - Estimated Fix	1
5	NoSV	Number of satellites used	5
6	HDOP	Horizontal dilution of precision	3.97
7	Alt,m	MSL altitude and its unit (meters). The unit field is fixed field.	409.6,M,
8	Altref,m	Height of geoid and its unit (meters). The unit field is a fixed field.	-45.6
9	DiffAge	Age of differential corrections, Black or NULL when DGPS station is not used.	
10	DGPSstation	DGPS reference station ID	
11	CS	Checksum	*7E
12	CR LF	Carriage Return and Line Feed	\r\n

Extracting data from GPS

- Pynmea2 library – sudo pip install pynmea2
- Parses the data from GPS

Limitations of the NEO 6M module

- One has to be in an open place in order for it to get data from at least 3 satellites

Timeline

Month	Week	Tasks
March	Week1	Design and fabrication of nozzle
	Week2	Design and fabrication of test stand
	Week3	Casting propellant
	Week4	Testing the model rocket on motor
April	**Week1**	**Avionics bay development**
	Week2	Payload Camera research
	Week3	Integration and testin with propulsion
	Week4	Launch of N-1 rocket