

## Table of Contents

Requirements.....	.1
Design.....	.1
Implementation.....	.1
Demo.....	.2
References.....	.2

## Requirements

This project requires adding a GPS module to a raspberry pi on a flight capable drone. The GPS module should capture GPS data, send the data over wifi, and be displayed on a host device.

## Design

Using the flight capable drone from previous assignment, the raspberry pi, power bank, and Gmouse GPS module are secured to the drone and connected over USB. On the pi, GPS packages are installed and while the drone and pi are powered, the GPS data is sent to the remote host using ssh to remote into the pi.

## Implementation

In order to use the GPS module we first need to install some packages and verify devices.

*// remotely connect to pi e.g.*

\$ ssh user@IP

*// make note of tty address to verify the gps module is connected and functioning*

\$ ls /dev/tty\*

> */dev/ttyACM0 is present after inserting the gps module*

*// install relevant packages for gps data*

\$ sudo apt install gpsd gpsd-clients

*//restart the pi*

\$ sudo reboot now

// connect to the pi again and view gps data remotely on the host

\$ cgps -s

Time:	2024-04-04T20:02:46.000Z (18)
Latitude:	41.65721650 N
Longitude:	73.91317220 W
Alt (HAE, MSL):	263.448, 375.292 ft
Speed:	0.00 mph
Track (true, var):	70.6, -13.1 deg
Climb:	0.00 ft/min
Status:	3D FIX (70 secs)
Long Err (XDOP, EPX):	1.21, +/- 59.6 ft
Lat Err (YDOP, EPY):	1.01, +/- 49.6 ft
Alt Err (VDOP, EPV):	1.95, +/- 863 ft
2D Err (HDOP, CEP):	1.58, +/- 2017 ft
3D Err (PDOP, SEP):	2.51, +/- 6232 ft
Time Err (TDOP):	1.37 I
Geo Err (GDOP):	2.86
ECEF X, VX:	1322998.250 m -0.180 m/s
ECEF Y, VY:	-4584422.310 m -0.020 m/s
ECEF Z, VZ:	4218280.550 m 0.040 m/s
Speed Err (EPS):	+/- 2.1 mph
Track Err (EPD):	n/a
Time offset:	0.057856301 s
Grid Square:	FN31bp07

  

GNSS	PRN	Elev	Azim	SNR	Use
GP 3	3	21.0	42.0	31.0	Y
GP 6	6	75.0	300.0	25.0	Y
GP 11	11	41.0	252.0	23.0	Y
GP 14	14	16.0	162.0	32.0	Y
GP 19	19	72.0	53.0	29.0	Y
GP 4	4	8.0	79.0	16.0	N
GP 9	9	7.0	117.0	20.0	N
GP 12	12	25.0	315.0	9.0	N
GP 17	17	50.0	93.0	27.0	N
GP 20	20	15.0	203.0	14.0	N
GP 22	22	n/a	0.0	26.0	N
GP 24	24	7.0	265.0	0.0	N
SB120	33	15.0	112.0	0.0	N
SB133	46	36.0	214.0	0.0	N
SB138	51	31.0	225.0	0.0	N
QZ 1	193	n/a	0.0	0.0	N
QZ 3	195	n/a	0.0	0.0	N

## Demo

The flight capable drone had to be benched due to wind and rain, but the gps module works perfectly when pointed out a window.

[https://drive.google.com/file/d/1bZFdHpuU\\_0rdDhxGUd\\_88utLs4X3bIN/view?usp=sharing](https://drive.google.com/file/d/1bZFdHpuU_0rdDhxGUd_88utLs4X3bIN/view?usp=sharing)

## References

<https://raspberrypi.stackexchange.com/questions/68816/how-can-i-set-up-my-g-mouse-usb-gps-for-use-with-raspbian>