

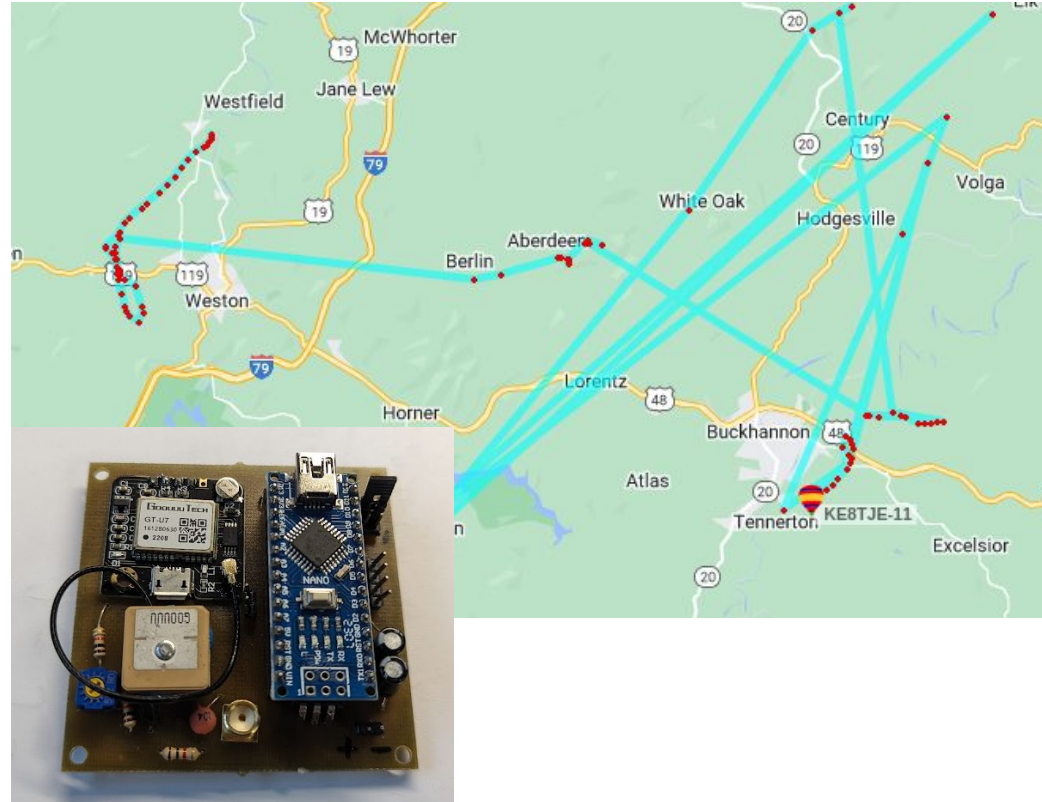
APRS payload - data

Test flight 01/10/23

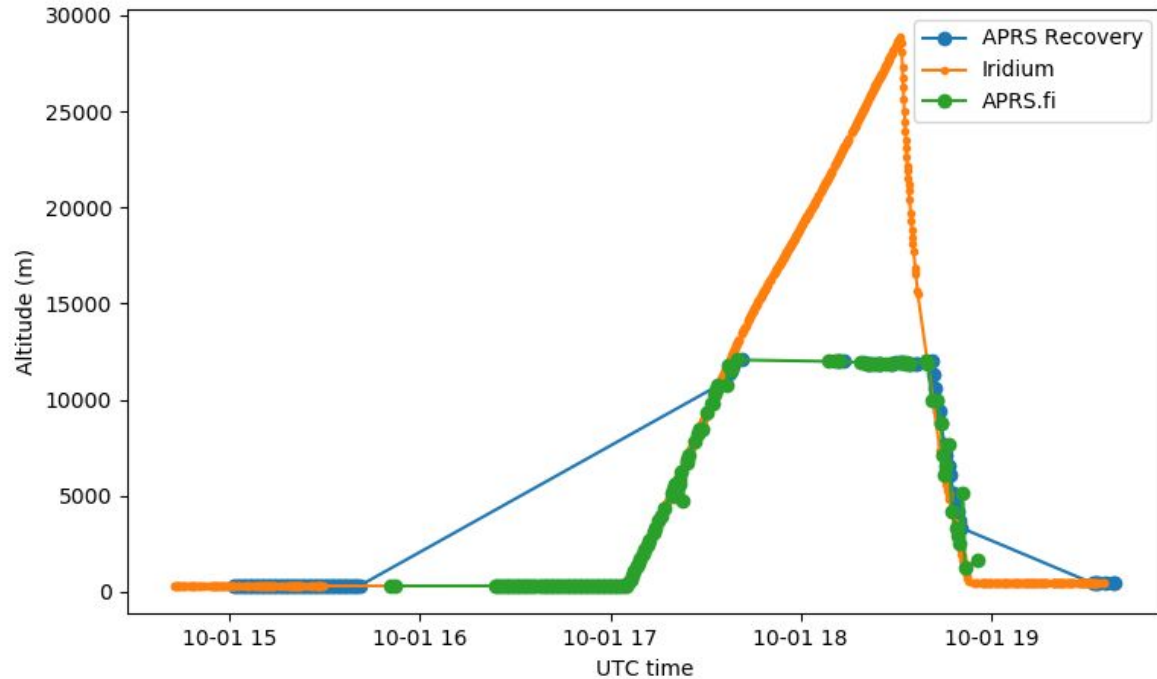
Hasith Perera - KE8TJE

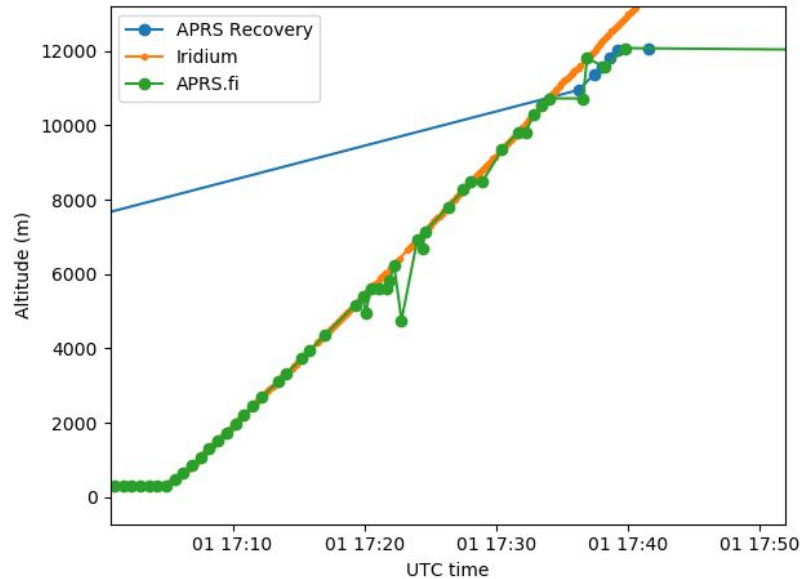
APRS Payload

- Current payload
 - Firmware version: v1.0
 - GPS module: Amazon GT-U7
 - RF: 1 W @ 144.390 MHz
 - Interval :~30 s
- Note: above 11 km location and altitude measurements were unusable

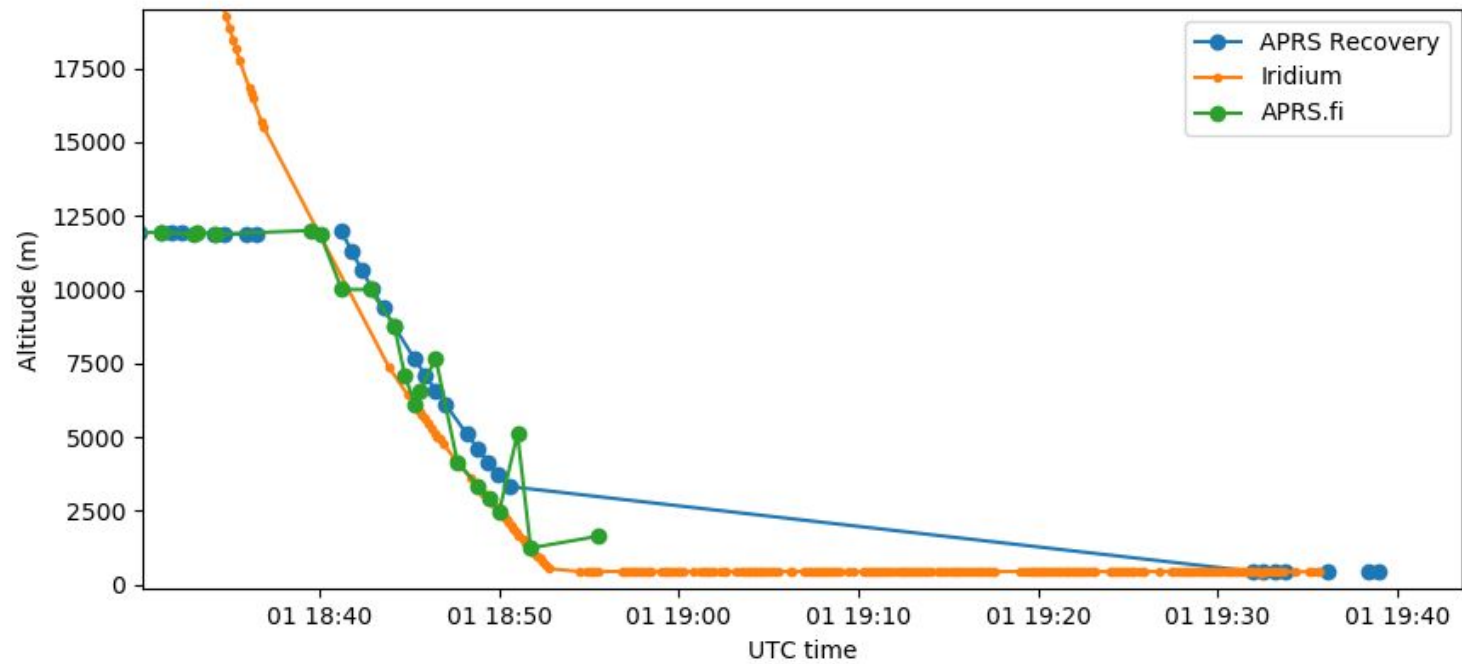


- GPS module maximum operation limit 11 km
- Higher than that lock was not achieved

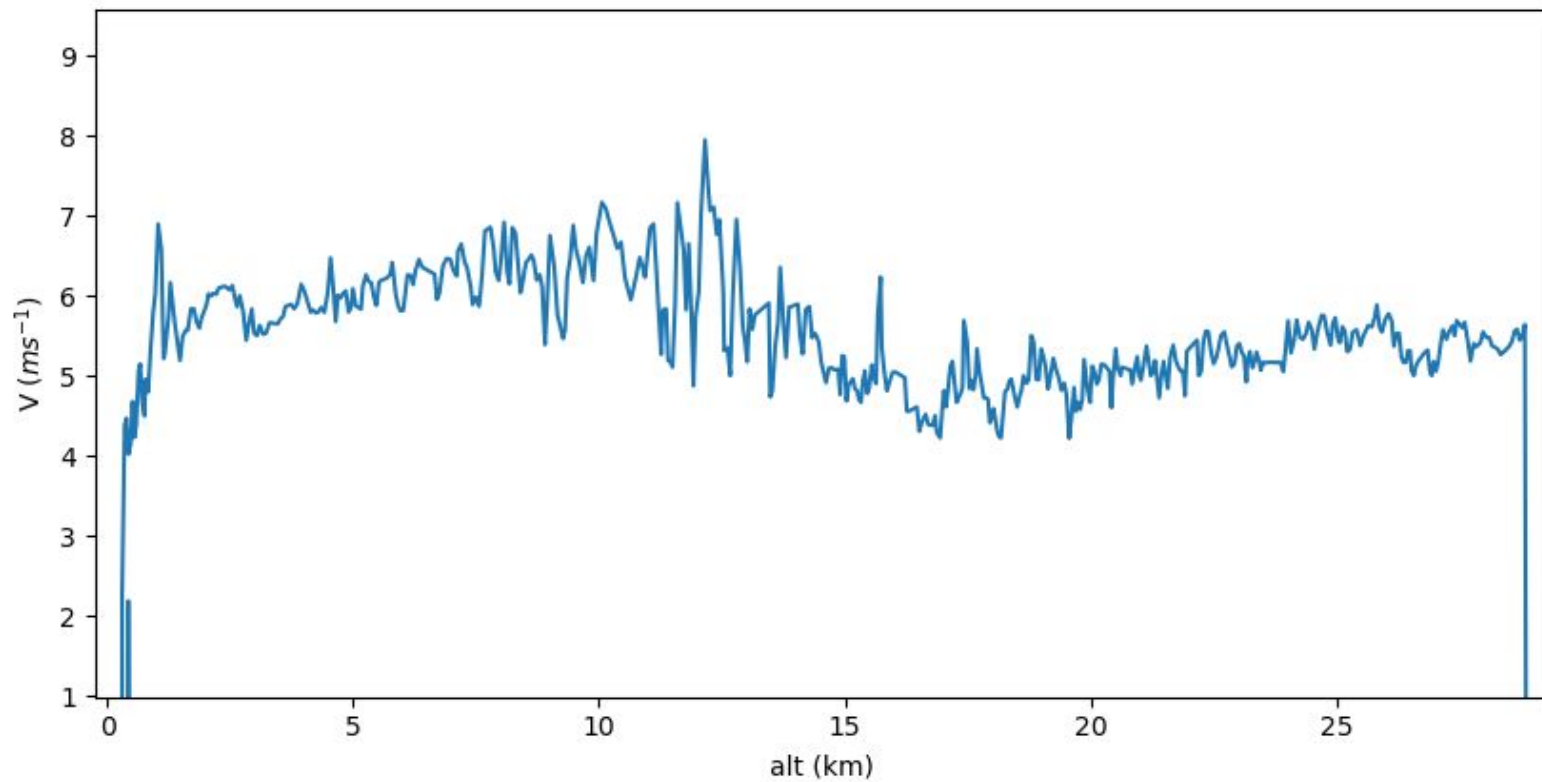




- APRS.fi based data shows abnormal variations. Cause was identified as long path packets
- Recovery vehicle system was not activated during the ascent stage (Data loss in blue)

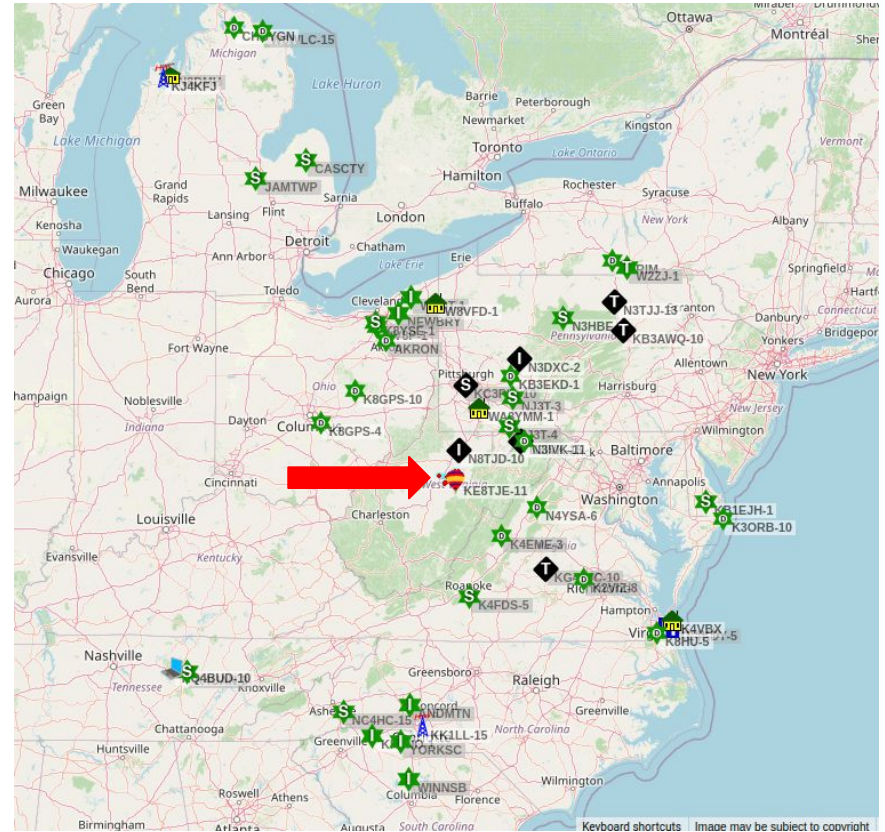


Ascend velocity



Receive rage during flight

- Red arrow shows launch location (Jackson's Mill WV)
- All other indicated stations are stations that picked up at least one packet during flight
- Radio was operated at 1W



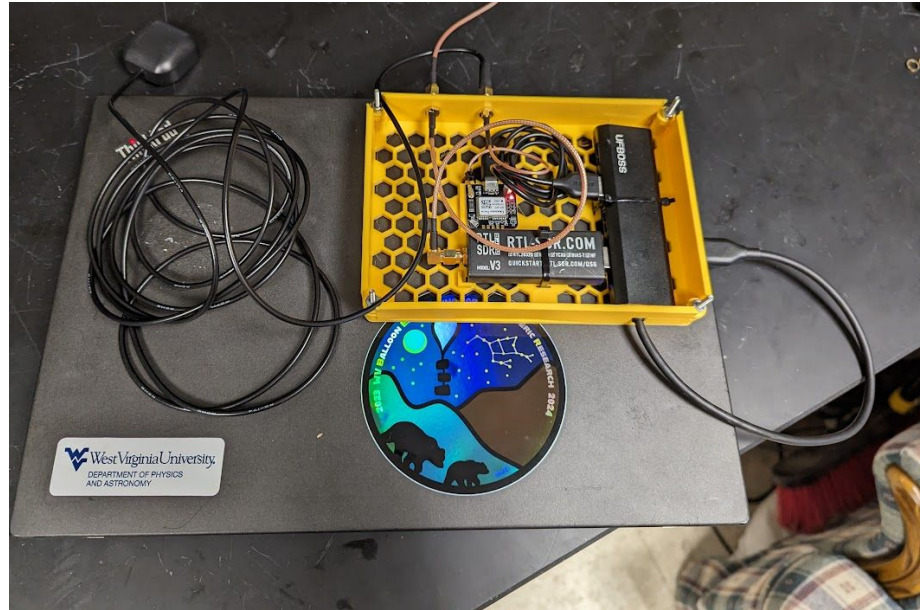
Bug

- GPS location packet generated from incorrect text
- 50 packets were recorded with this error

```
1,10,0.79,alt=10040.0M [Invalid uncompressed location]
2023-10-01 13:34:34 EDT: KE8TJE-11>HYMTR,WIDE1-1,WIDE2-2,qAR,K4FDS-5:=390.943,/8030.837,ONEBP WV:1,10,0.79,alt=10950.9M [Invalid uncompressed location]
2023-10-01 13:35:37 EDT: KE8TJE-11>HYMTR,NJ3T-4*,K3SMT-4*,NJ3T-3*,N3DXC-2*,WIDE2*,qAR,KB3EKD-1:=3902.67N/0030.268,ONEBP WV:1,10,0.79,alt=9572.5M [Invalid uncompressed location]
2023-10-01 13:35:43 EDT: KE8TJE-11>HYMTR,WIDE1-1,WIDE2-2,qAR,N8TJD-10:=390.073,/8030.604,ONEBP WV:1,10,0.79,alt=11377.9M [Invalid uncompressed location]
2023-10-01 13:36:22 EDT: KE8TJE-11>HYMTR,W4RAT-5*,WIDE1*,WIDE2-2,qAR,AE40K-1:=390.073,/8030.604,ONEBP WV:1,10,0.79,alt=11377.9M [Invalid uncompressed location]
2023-10-01 13:37:30 EDT: KE8TJE-11>HYMTR,WIDE1-1,WIDE2-2,qAR,K4FDS-5:=303.364,/8030.874,ONEBP WV:1,09,0.87,alt=12011.4M [Invalid uncompressed location]
2023-10-01 13:38:46 EDT: KE8TJE-11>HYMTR,NEWBRY*,WIDE1*,W8QT-1*,K8YSE-1*,WIDE2*,qAR,NV8P-1:=303.364,/8030.874,ONEBP WV:1,09,0.87,alt=12011.4M [Invalid uncompressed location]
2023-10-01 13:40:26 EDT: KE8TJE-11>HYMTR,W3VO-1*,WIDE1*,K3NQT-3*,NJ3T-3*,N3DXC-2*,WIDE2*,qAR,KB3EKD-1:=390.073,/8030.604,ONEBP WV:1,10,0.79,alt=11377.9M [Invalid uncompressed location]
2023-10-01 13:42:06 EDT: KE8TJE-11>HYMTR,WIDE1-1,WIDE2-2,qAR,KB3EKD-1:=303.364,/8030.874,ONEBP WV:1,09,0.87,alt=12011.4M [Invalid uncompressed location]
2023-10-01 13:59:08 EDT: KE8TJE-11>HYMTR,WIDE1-1,WIDE2-2,qAR,N8TJD-10:=3902.75N/08021.44,ONEBP WV:,,alt=[Invalid uncompressed location]
2023-10-01 13:59:41 EDT: KE8TJE-11>HYMTR,WIDE1-1,WIDE2-2,qAR,N3IVK-15:=3902.75N/08021.44,ONEBP WV:,,alt=[Invalid uncompressed location]
2023-10-01 14:00:23 EDT: KE8TJE-11>HYMTR,CASCTY*,WIDE1*,MIO*,W8COL*,WIDE2,qAR,KJ4KFJ:=3902.75N/08021.44,ONEBP WV:,,alt=[Invalid uncompressed location]
2023-10-01 14:03:16 EDT: KE8TJE-11>HYMTR,NEWBRY,WIDE1,W8QT-1,JAMTWP,WIDE2*,qAR,HOLLY:=303.364,/8030.874,ONEBP WV:1,09,0.87,alt=12011.4M [Invalid uncompressed location]
2023-10-01 14:04:04 EDT: KE8TJE-11>HYMTR,WIDE1-1,WIDE2-2,qAR,KB3EKD-1:=3902.75N/08021.44,ONEBP WV:,,alt=[Invalid uncompressed location]
2023-10-01 14:04:36 EDT: KE8TJE-11>HYMTR,WIDE1-1,WIDE2-2,qAR,KB3EKD-1:=3902.75N/08021.44,ONEBP WV:,,alt=[Invalid uncompressed location]
2023-10-01 14:10:00 EDT: KE8TJE-11>HYMTR,WIDE1-1,WIDE2-2,qAR,KB1EJH-1:=3903.13N/0018.936,ONEBP WV:,,alt=[Invalid uncompressed location]
```


Recovery Vehicle setup

- Direwolf and YAAC
- RTL SDR v3.0 is used
- Packets were logged by YAAC
- Worked well



Conclusions

- The specific module used is limited to 11 km altitude
- Recovery vehicle setup worked well.
- One existing bug was observed in the raw packets
- Hope to test a better GPS module for TX (from Adafruit. Thanks to Candy/SG)