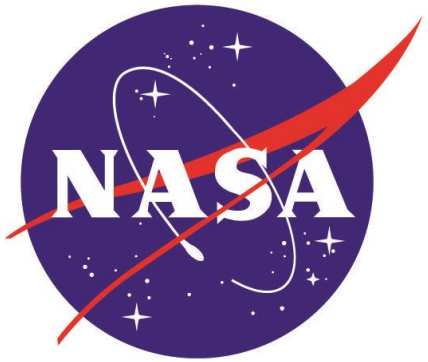
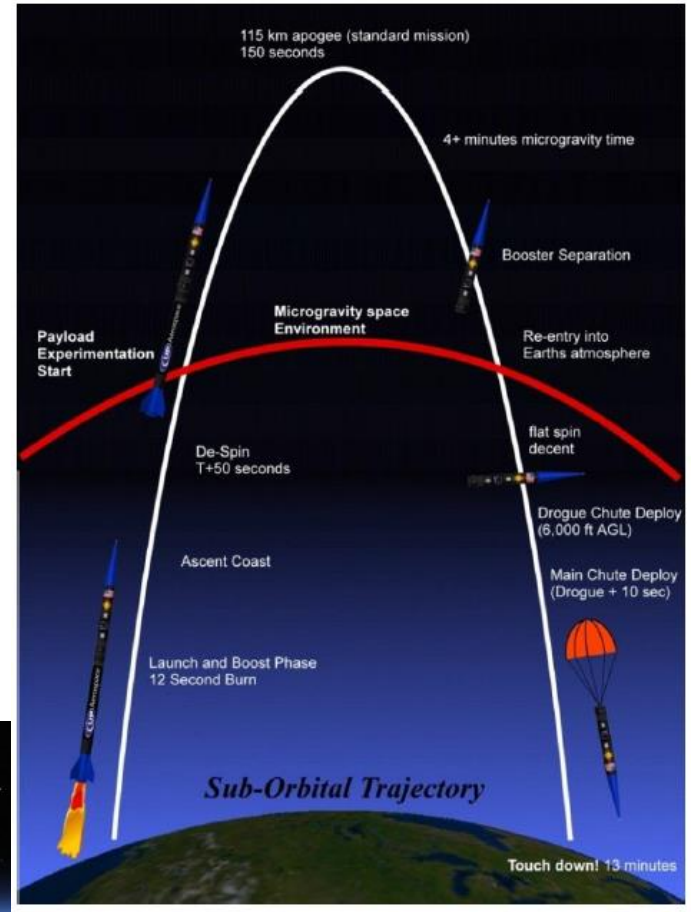
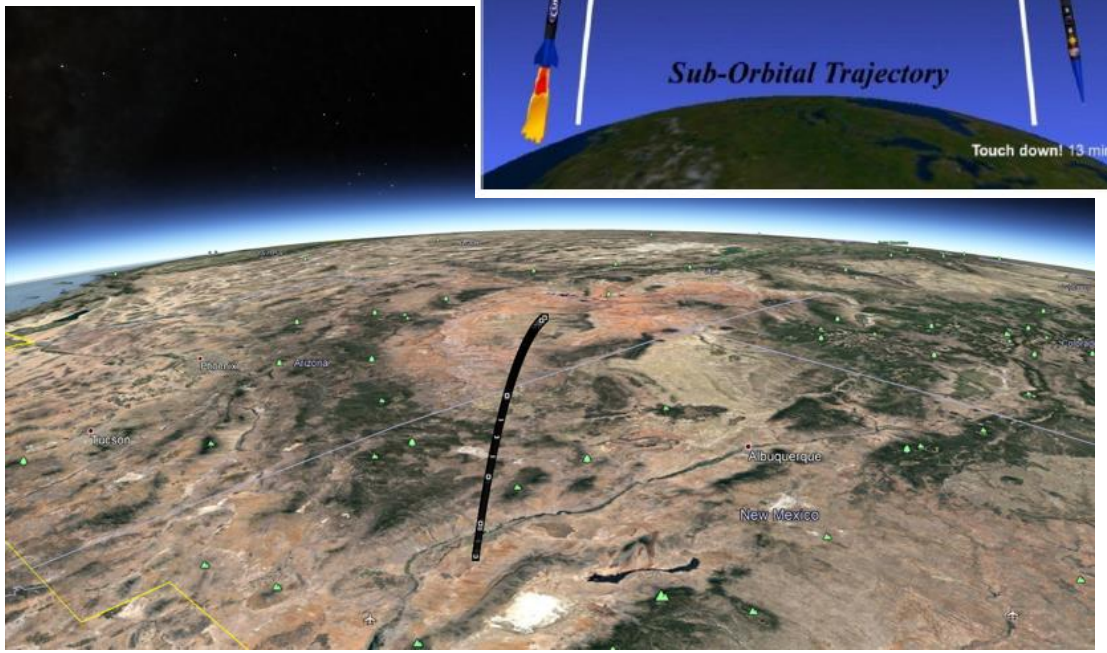


GARHEO Mission on SL-14

GARHEO SL-14 payload, Mission Objectives

- To develop a device that can record GPS and Galileo signals on a sounding rocket for Software Defined Radio (SDR) post processing
- This allows:
  - The in depth observations of high dynicamics effects directly on the recorded signal, including observed interferences
  - The possibility to reproduce an infinite number of times the realistic signal effects observed by the antenna

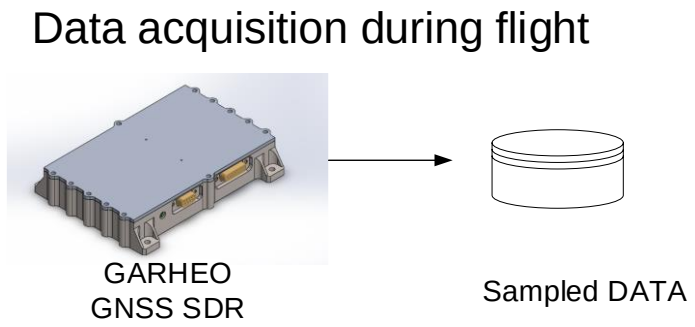


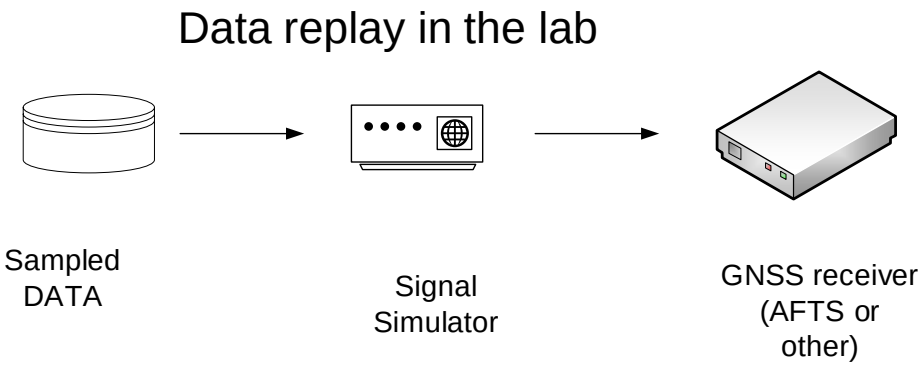


Spirent Simulated

The benefit of the SDR approach

- The real interest for SDR is the possibility to change an infinite number of times the parameters of the receiver (both for acquisition and tracking stages) in order to find the optimal settings (a number of receivers loose lock for the high accelarations, up to 18G)
- Furthemore, differently from a GNSS signal simulator, the acquisition of the real RF signal allows direct observations of antenna effects (the rocket rotates quickly) and interferences (S band telemetry and other effects)
- Once acquired the signal can be reproduced an infinite number of times



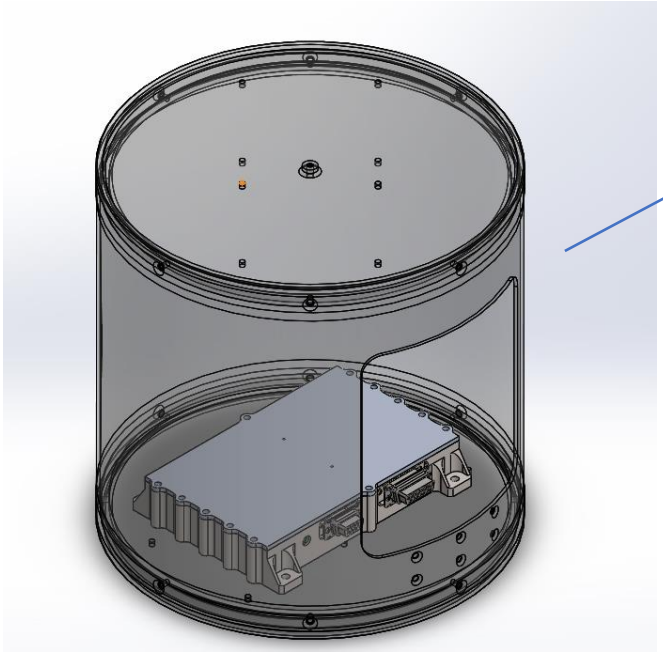


A space designed SDR electronics has been developed with specific requirements for the high accelarations and vibrations of the sounding rocket

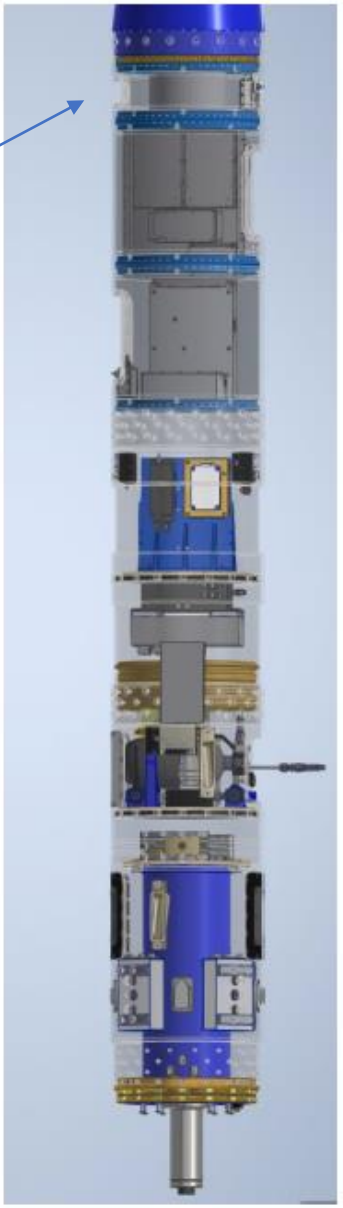
Payload Bay
36 kg payload mass
172,070 cubic centimeters
25.4 cm max diameter
242 cm max length

Event	Time (seconds)	Altitude (feet, MSL)
Liftoff	0.0	4,506
Booster Burnout	12.1	36,802
Despin deploy	55.0	282,500
Booster separation	58.0	294,800
Begin ACS GNC	60.0	306,200
End ACS GNC	91.0	327,000
ACS Begin Re-Spin	93.0	TBS
ACS End Re-Spin	108.0	TBS
Stage 2 Ignition	110.0	TBS
Stage 2 Burnout	114.3	TBS
Apogee	163.5	394,662
Drogue deployment	476.1	12,105
Main parachute deployment	486.1	10,702
Touch Down	906.0	4,080

Non-standard mission events



The GARHEO Payload



Preliminary results

- Launch has been a success and all payloads have been recovered
- Preliminary information from GSFC inspection reports full acquisition of the data as expected
- 11GB of data has been recorded that will be availble for post processing analysis
- Results will be available after transmission of data to the payload provider and formal processing of the data

Payload Recovery