

CICERO Constellation Overview

Now delivering live to NOAA

Only company delivering for this order

Deliveries started March 17

Currently contracted for 1300 occultations per day meeting requirements:

- Above 200 v/v

- Delivered in < 140 minutes

Delivering smoothly with margin

CICERO Constellation

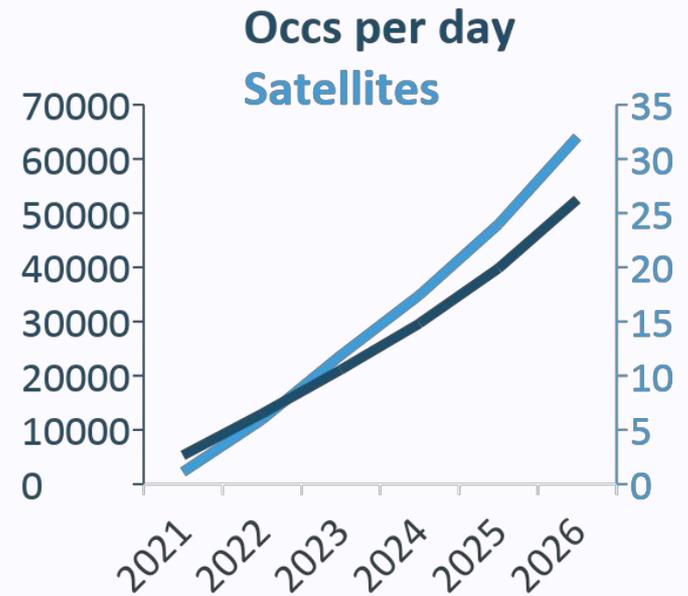
First launch (2018)



6U satellites



3 satellites now;
many on the way



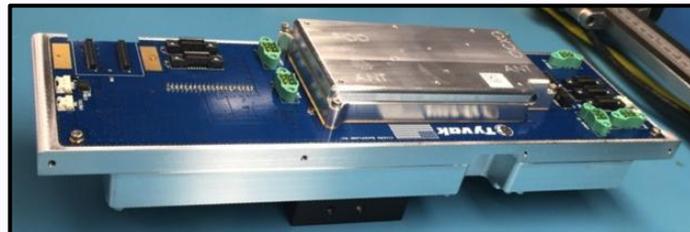
Cion instrument



Developed by JPL, based on TriG



Implemented by Tyvak and JPL using a System on Module (SoM) combining processor, FPGA and peripherals





Cion features

All open-loop tracking for occultations

GPS and Glonass tracking on orbit currently, Galileo shortly

Ultra-stable oscillator (Allen deviation $< 2.2E-12$ in 0.01 – 2 second) allows “zero-difference” processing without a reference GNSS satellite

Closed loop tracking for POD, averaging >20 satellites in view



Cion performance from NOAA report

NOAA found average SNRs of 649 v/v, including the entire antenna pattern

Peak L1 SNRs of 900-1100

Small biases and excellent low altitude performance



Ground network and data

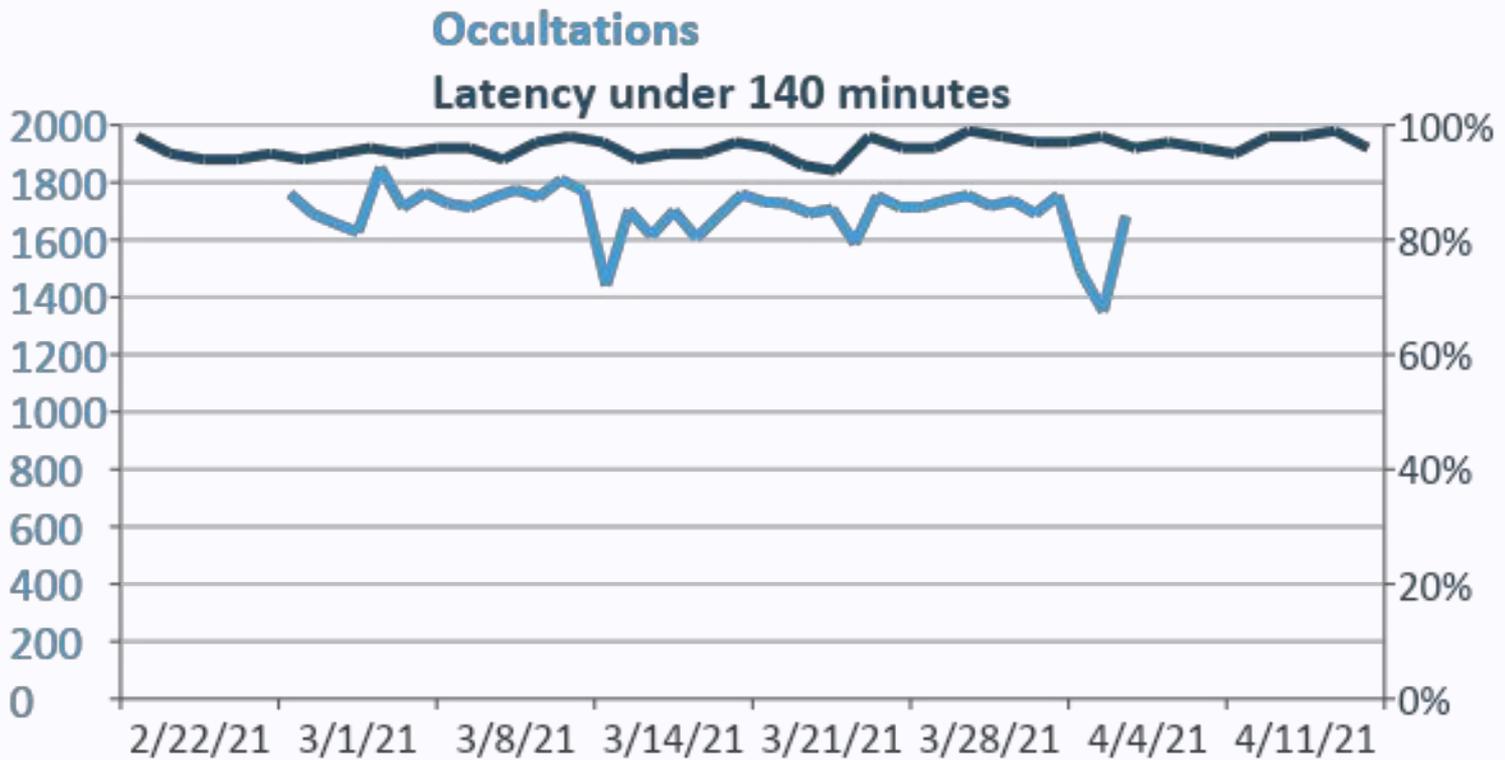
16-18 downlinks per satellite per day (~1 per orbit)

Redundant and forward-error corrected transmission

Real-time live streaming to cloud computing

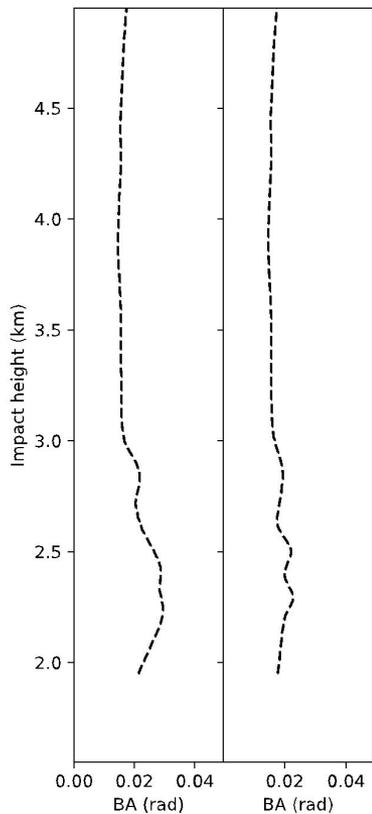
Data collated, processed to Level 1a and delivered by 1-3 minutes after pass

Operational Performance



GeoPRO

GeoOptics Processor for Radio Occultation



Phase-matching for bending angle inversion

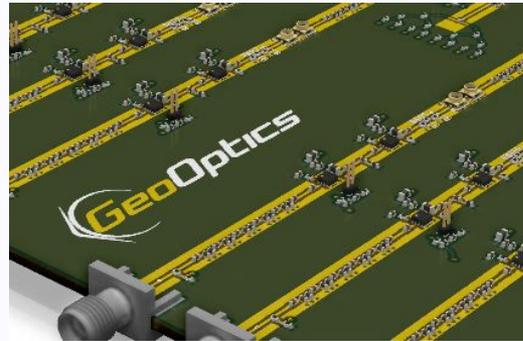
Near-real-time processing performed on ephemeral massively parallel cloud computing platform

Python, with NumPy, SciPy etc.

Quality control and profile cutoff independent of external models

Cion 2.0 is coming

GNSS RO
+ reflections
+ polarimetric RO



A satellite view of Earth from space, showing the curvature of the planet and various cloud patterns over the continents. The image is in shades of blue and white, with a dark blue background at the top.

We are hiring

We were founded by scientists and engineers
to make remarkable things happen.

Come help us!

Questions?

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