



Gravitational Reference Advanced Technology Test in Space

Title: Experimental Earth Station Transmitter
Attachment for Part 5 Applications

Document Type: Reference

Document Number: GRATTIS-TN-103

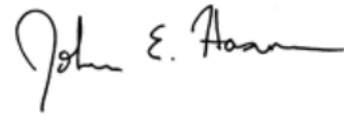
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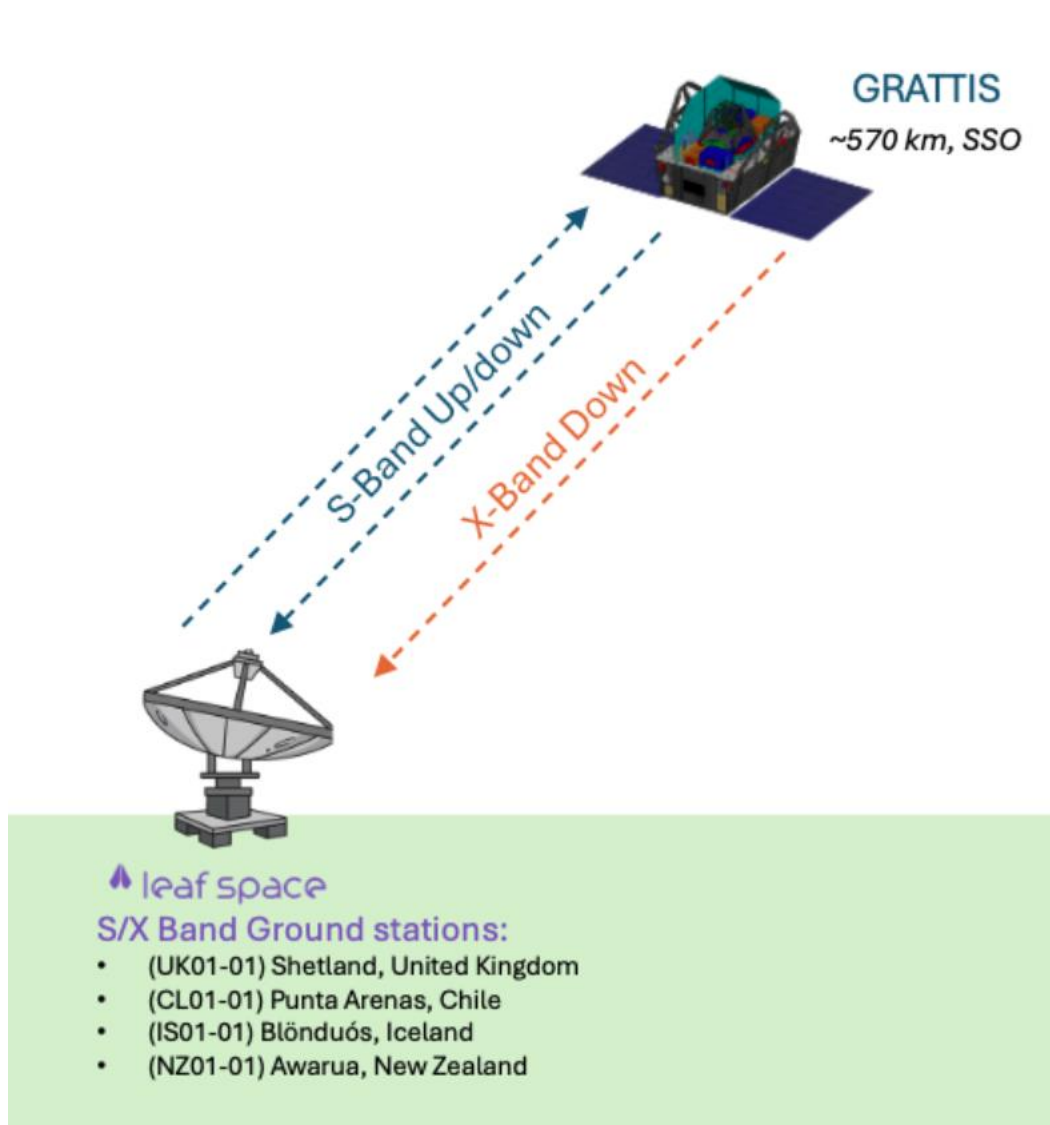
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Reference: Below is an image that summarizes the comm links defined in this document. GRATTIS will be utilizing Leaf Space commercial ground stations. Note: the S/X band antenna are identical at each Ground station location.



1. ES Identifying Information:

Leaf Space (UK01-01) Unst, Shetland, United Kingdom

Call Sign: N/A

Address: Shetland, United Kingdom

Coordinates:

Latitude: 60° 44' 54.1" N

Longitude: 0° 51' 30.4" W

Reference File Number: N/A

Leaf Space (CL01-01) Punta Arenas, Chile

Call Sign: N/A

Address: Punta Arenas, Chile

Coordinates:

Latitude: 53° 2' 29.6" S

Longitude: 70° 50' 49" W

Reference File Number: N/A

Leaf Space (IS01-01) Blönduós, Iceland

Call Sign: N/A

Address: Punta Arenas, Chile

Coordinates:

Latitude: 65° 38' 49.9" N

Longitude: 20° 14' 42.4" W

Reference File Number: N/A

Leaf Space (NZ01-01) Awarua, New Zealand

Call Sign: N/A

Address: Awarua, New Zealand

Coordinates:

Latitude: 46° 31' 41.1" S

Longitude: 168° 22' 44.9" E

Reference File Number: N/A

2. List all points of communication with any relevant callsigns

Note: this section is not applicable since the ground stations are outside of the US.

Leaf Space: UK01-01 Unst, Shetland, United Kingdom

Call Sign: N/A

POC: N/A

Leaf Space: CL01-01 Punta Arenas, Chile

Call Sign: N/A

POC: N/A

Leaf Space: IS01-01 Blönduós, Iceland

Call Sign: N/A

POC: N/A

Leaf Space: NZ01-01 Awarua, New Zealand

Call Sign: N/A

POC: N/A

3. Provide the antenna:

All ground stations (below) utilize the same GAIA100 (3.7m) antenna:

- Leaf Space: UK01-01 Unst, Shetland, United Kingdom
- Leaf Space: CL01-01 Punta Arenas, Chile
- Leaf Space: IS01-01 Blönduós, Iceland
- Leaf Space: NZ01-01 Awarua, New Zealand

GAIA100 (3.7m) S-Band & X-Band antenna specifications:

- Manufacturer: Orbit Communications Systems
- Quantity: 1 for each ground station location
- Size (meters): 3.7 m
- Single or Multibeam: Single
- Azimuth / Elevation Range:
 - Azimuth: 0 deg - 360 deg
 - Elevation: 5 deg - 175 deg
- Tracking Velocity: 5 deg/sec (maximum)
- Traffic Type (e.g. payload, telemetry, telecommand): Telemetry, Telecommand, and Payload

4. For each uplink provide:

All ground stations (below) utilize the same uplink/TX characteristics

- Leaf Space: UK01-01 Unst, Shetland, United Kingdom
- Leaf Space: CL01-01 Punta Arenas, Chile
- Leaf Space: IS01-01 Blönduós, Iceland
- Leaf Space: NZ01-01 Awarua, New Zealand

GAIA100 (3.7m) S-band Uplink Characteristics:

- Center Frequency: 2250 MHz
- Channel Bandwidth: 600 kHz
- Emission Designator: 199KG1D
- Uplink Polarization (e.g. RHCP, LHCP, dual): Dual
- Beamwidth: 2.76 deg
- Total Input Power at antenna flange (Watts): 31.62 W
- Antenna Gain (dBi at a specified frequency): 35 dBi
- Max EIRP Per Carrier (dBW): 50 dBW
- Max EIRP Density per Carrier: 200 dBW/4 kHz

5. For each downlink provide:

All ground stations (below) utilize the same downlink/RX characteristics

- Leaf Space: UK01-01 Unst, Shetland, United Kingdom
- Leaf Space: CL01-01 Punta Arenas, Chile
- Leaf Space: IS01-01 Blönduós, Iceland
- Leaf Space: NZ01-01 Awarua, New Zealand

GAIA100 (3.7m) S-band Downlink Characteristics:

- Center Frequency: 2250 MHz
- Emission Designator: 199KG1D
- Downlink Polarization (e.g. RHCP, LHCP, dual): Dual
- Antenna Gain (dBi at a specified frequency): 34.6 dBi
- G/T:
 - 12.53 dB/K @ 5 deg
 - 12.93 dB/K @ 10 deg

GAIA100 (3.7m) X-band Downlink Characteristics:

- Center Frequency: 8212.5 MHz
- Emission Designator: 38M4G1D
- Downlink Polarization (e.g. RHCP, LHCP, dual): Dual
- Antenna Gain (dBi at a specified frequency): 47.0 dBi
- G/T:
 - 24.65 dB/K @ 5 deg
 - 25.45 dB/K @ 10 deg