

Ground Station	Site:	North Pole, AK			Invercargill, New Zealand	
	Address	1625 Richardson Highway North Pole, AK 99705, USA			781 Colyer Road Awarua Plains 9877, New Zealand	
	Latitude, Longitude:	64° 47' 38" N 147° 32' 09" W			46° 31' 43" S 168° 22' 52" E	
	Site elevation AMSL	144 m			24 m	
	City	North Pole			Invercargil, Southland	
	State	Alaska, USA			New Zealand	
		UHF Uplink (transmit)	S-band Uplink - Primary (transmit)	S-band Uplink - Backup (transmit)	UHF Uplink (transmit)	S-band Uplink (transmit)
	Antena manufacturer/model	M2 Antenna 450 CP34	Viasat-7.3m	Viasat-9.1 m	M2 Antenna 450 CP34	Orbit GAIA-100-3.7-SX
	Number of antennas	1	1	1	1	1
	polarization	RHCP	RHCP	RHCP	RHCP	RHCP
	Ground antenna orientation	Varies -- LEO tracking antenna	Varies -- LEO tracking antenna	Varies -- LEO tracking antenna	Varies -- LEO tracking antenna	Varies -- LEO tracking antenna
	Dimensions	Yagi-style, 120" boom length	7.3 m diameter	9.1 m	Yagi-style, 120" boom length	3.7 m diameter
	Gain (dBi)	12.7 dBi	41 dBi	42.6 dBi	12.7 dBi	34.4 dBi
	Beamwidth	30 deg	1.2 deg	1.0 deg	30 deg	approx 2.7 deg
	Azimuth (degrees clockwise from true north):	0 to 360 deg (LEO-tracking)	0 to 360 deg (LEO-tracking)	0 to 360 deg (LEO-tracking)	0 to 360 deg (LEO-tracking)	0 to 360 deg (LEO-tracking)
	Elevation (angle relative to horizon):	5 to 90 deg (LEO-tracking)	5 to 90 deg (LEO-tracking)	5 to 90 deg (LEO-tracking)	5 to 90 deg (LEO-tracking)	5 to 90 deg (LEO-tracking)
	Height Above ground level	8 m	7.3 m	9.1 m	1 m	1 m
	Center Frequency	450.2 MHz	2071.875 MHz	2071.875 MHz	450.2 MHz	2071.875 MHz
	Bandwidth	22 kHz	176 kHz	176 kHz	22 kHz	176 kHz
	Emission Designator	22K0F1D	176KF1D	176KF1D	22K0F1D	176KF1D
	Modulating Signal	GMSK	GMSK	GMSK	GMSK	GMSK
	Output Power	20 W	0.9 W	0.6 W	20 W	12.5 W
	EIRP	22.8 dBW	43 dBW	43 dBW	22.8 dBW	43 dBW
	ERP (dBW)	20.65 dBW	40.85 dBW	40.85 dBW	20.65 dBW	40.85 dBW
	ERP (W)	116 W	12.2 kW	12.2 kW	116 W	12.2 kW

Space Station		UHF Uplink (receive)	S-band uplink (receive)	S-band uplink (receive)	UHF Uplink (receive)	S-band uplink (receive)
	Antena manufacturer/model	Spaceflight Industries	AntDevCo	Single space station S-band receive -- identical to other column	Single space station UHF receive -- identical to other column	Single space station S-band receive -- identical to other column
	Number of antennas	1	1			
	polarization	linear	RHCP			
	Antenna orientation	varies	varies			
	Dimensions	whip antenna, 8" length	patch, 4" x 4"			
	Gain (dBi)	1.1 dBiC peak*, -5 dBiC for 95% spherical	6 dBiC			
	Beamwidth	Not applicable. Approximately	70 deg			

* note that the UHF antenna on the spacecraft is linear, but it's gain is reported in dBiC because it was characterized against a RHCP (circularly-polarized) ground antenna