

Link:	UHF uplink		UHF downlink		S-band uplink		X-band downlink	
Center frequency:	450.2 MHz		401.5 MHz		2071.875 MHz		8125 MHz	
Ground Station Used:	Invercargill, New Zealand	North Pole, AK	Invercargill, New Zealand	North Pole, AK	Invercargill, New Zealand	North Pole, AK	Invercargill, New Zealand	North Pole, AK
Transmitter Antenna:								
Location:	ground-based (details below)	ground-based (details below)	low-earth orbit		ground-based (details below)	ground-based (details below)	low-earth orbit	
Latitude , Longitude:	46° 31' 43" S 168° 22' 52" E	64° 47' 38" N 147° 32' 09" W	n/a		46° 31' 43" S 168° 22' 52" E	64° 47' 38" N 147° 32' 09" W	n/a	
City:	Invercargill, Southland	North Pole	n/a		Invercargill, Southland	North Pole	n/a	
State:	(New Zealand)	Alaska, USA	n/a		(New Zealand)	Alaska, USA	n/a	
Apogee & Perigee:	n/a	n/a	500-550 km apogee (TBD) 500-500 km perigee (TBD) circular		n/a	n/a	500-550 km apogee (TBD) 500-500 km perigee (TBD) circular	
Polarization:	RHCP	RHCP	Linear		RHCP	RHCP	Linear	
Orientation:	varies -- LEO tracking antenna	varies -- LEO tracking antenna	varies (in-orbit)		varies -- LEO tracking antenna	varies -- LEO tracking antenna	varies (in-orbit)	
Dimensions:	yagi-style, 120" boom length	yagi-style, 120" boom length	whip antenna, 8" length		3.7 m diameter	7.3 m diameter	patch antenna, 4.1" x 5.9"	
Gain (dBi):	12.7 dBiC	12.7 dBiC	1.1 dBiC peak*, -5 dBiC for 95% spherical coverage		34.4 dBi	41 dBi	15 dBiC	
Beamwidth (deg):	30 deg	30 deg	not applicable. Apporoximately omnidirectional		approx 2.7 deg	1.2 deg	16 x 30 deg full width	
Azimuth (degrees clockwise from true north):	0 to 360 deg (LEO-tracking)	0 to 360 deg (LEO-tracking)	n/a		0 to 360 deg (LEO-tracking)	0 to 360 deg (LEO-tracking)	n/a	
Elevation (angle relative to horizon):	5 to 90 deg (LEO-tracking)	5 to 90 deg (LEO-tracking)	n/a		5 to 90 deg (LEO-tracking)	5 to 90 deg (LEO-tracking)	n/a	
Site Height (in meter above MSL):	24	144	n/a		24	144	n/a	
Antenna Height (in meter AGL):	1	8			3.7	7.3		
Receiver Antenna:								
Location:	low-Earth orbit (LEO)				low-Earth orbit (LEO)			
Latitude , Longitude:	n/a		ground-based (details below)	ground-based (details below)	n/a		ground-based (details below)	ground-based (details below)
City:	n/a		46° 31' 43" S 168° 22' 52" E	64° 47' 38" N 147° 32' 09" W	n/a		46° 31' 43" S 168° 22' 52" E	64° 47' 38" N 147° 32' 09" W
State:	n/a		Invercargil, Southland	North Pole	n/a		Invercargil, Southland	North Pole
Polarization:	Linear		New Zealand	Alaska, USA	RHCP		New Zealand	Alaska, USA

Orientation:	Varies	varies -- LEO tracking antenna	varies -- LEO tracking antenna	Varies	varies -- LEO tracking antenna	varies -- LEO tracking antenna
Dimensions:	whip antenna, 8" length	yagi-style, 133 inch boom length	yagi-style, 133 inch boom length	patch, 4" x 4"	7.3 m diameter	3.7 m diameter
Gain (dBi):	1.1 dBiC peak*, -5 dBiC for 95% spherical coverage	13 dBiC	13 dBiC	6 dBiC	55 dBiC	43 dBiC
Beamwidth (deg):	not applicable. Apporoximately omnidirectional	30 deg	30 deg	70 deg	0.3 deg	approx 0.7 deg
Azimuth (degrees clockwise from true north):	n/a	0 to 360 deg (LEO-tracking)	0 to 360 deg (LEO-tracking)	n/a	0 to 360 deg (LEO-tracking)	0 to 360 deg (LEO-tracking)
Elevation (meter above MSL):	n/a	5 to 90 deg (LEO-tracking)	5 to 90 deg (LEO-tracking)	n/a	5 to 90 deg (LEO-tracking)	5 to 90 deg (LEO-tracking)
Site Height (in meter above MSL):	n/a	24	144	n/a	24	144
Antenna Height (in meter AGL):	n/a	1	8	n/a	7.3	3.7

* 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