

Request for Experimental Authorization

Ground Control Systems, Inc herein requests experimental authority to demonstrate and test earth station facilities in connection with Iridium Satellite LLC's non-geostationary satellite orbit space station constellation (Call Sign S2110) in the manner described below.

Ground Control Systems, Inc seeks authority for a period of twenty-four (24) months.

The 4 earth station terminals are experimental proto-type terminals at a single location, fixed to the building. The antennas are low-gain omni-directional antennas with a hemispheric coverage having a maximum +3 dBi Gain.

Necessary Bandwidth Description

The necessary bandwidth is determined by the frequency channelization that Iridium uses and is filed with other Iridium licenses. The frequency of a center of an Iridium channel can be calculated by this equation. There are 270 channels numbered 1 to 270 for transmit and 7 more that are receive only.

$$chan_{frequency} = 1616 \times 10^6 + ((41.6666 \times 10^3) \times ((chan_{number} - 1) + 0.5)) \text{ MHz}$$

Ground Station Locations

- Building Name – Ground Control Head Quarters
- Latitude longitude (degrees, minutes, seconds format): 35°30'21.1"N 120°41'31.9"W
- Postal Address: 3100 El Camino Real, Atascadero, CA 94322
- Antenna Elevation - Mean Sea level (in meters) = 3
- Antenna Elevation - Absolute Ground Level (in meters) = 274

Table 1: Particulars of Operation

Lower Freq MHz	Upper Freq MHz	Input Power (watts) ¹	ERP (watts) ²	Mean /Peak	Freq. Tolerance (%)	Station Class
1618.725	1626.0	1.8	4.8	M	0.0021	FX
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1618.725	1626.0	6.0	9.0	M	0.0021	FX

1 NOTE: defined as the nominal mean power input from the 9770 into the antenna

2 NOTE: ERP(dBW) = EIRP(dBW) – 2.15 dB.

Table 2: Emission Data

Emission Designator	Modulating Signal	Necessary Bandwidth (KHz)
41K7Q7W	25,000	41.7
41K7Q7W	30,000	41.7
83K0Q7W	60,000	83.0
333KQ7W	175,000	333.33

Table 3: Waveforms and types of antennas used as well as the number of carriers

Waveform	Modulation Scheme	Antenna Type	Number of Carriers
B1 (Block 1)	DEQPSK	LGA	1
C1 (NEXT)	QPSK	LGA	1
C2 (NEXT)	QPSK	LGA	1
1XC8 (NEXT)	QPSK	LGA	1

Table 4: Beamwidth and Antenna Gain

	3dB Beamwidth (degrees)	Gain (dBi)
Transmit	Hemisphere Omni	3.0
Receive	Hemisphere Omni	3.0