



UNITED STATES OF AMERICA
FEDERAL COMMUNICATIONS COMMISSION
RADIO STATION AUTHORIZATION
Current Authorization : FCC WEB Reproduction
 Unofficial Copy

Name: SOLO SATELLITE COMMUNICATIONS LTD

Call Sign: E060002
 File Number: SES-LIC-20060105-00008

Authorization Type: License
 Non Common Carrier Grant Date: 02/16/2006 Expiration Date: 02/16/2021

Nature of Service: Domestic Fixed Satellite Service

Class of Station: Temporary Fixed Earth Station

A) Site Location(s)

# Site ID	Address	Latitude	Longitude	Elevation (Meters)	NAD	Special Provisions (Refer to Section H)
1) 1	VARIOUS				NA	

Licensee certifies antenna(s) do not comply with Section 25.209. Please refer to Section E for special conditions placed upon antennas at this site.

Subject to the provisions of the Communications Act of 1934, The Communications Satellite Act of 1962, subsequent acts and treaties, and all present and future regulations made by this Commission, and further subject to the conditions and requirements set forth in this license, the grantee is authorized to construct, use and operate the radio facilities described below for radio communications for the term beginning Thursday, February 16, 2006 (3 AM Eastern Standard Time) and ending Tuesday, February 16, 2021 (3 AM Eastern Standard Time). The required date of completion of construction and commencement of operation is Friday, February 16, 2007 (3 AM Eastern Standard Time). Grantee must file with the Commission a certification upon completion of construction and commencement of operation.

B) Particulars of Operations

The General Provision 1010 applies to all receiving frequency bands.
 The General Provision 1900 applies to all transmitting frequency bands.
 For the text of these provisions, refer to Section H.

# Frequency	Polarization	Emission	Tx/Rx Mode	Max EIRP /Carrier	Max EIRP Density	Associated Antenna	Special Provisions (Refer to Section H)	Modulation/ Services
1) 5925.0000 - 6425.0000	H,V	51K2G7W	T	43.15	32.08	1C		DIGITAL TRAFFIC, VARIOUS INFORMATION, VARIOUS DATA RATES, VARIOUS FEC & MODULATION
2) 5925.0000 - 6425.0000	H,V	36M0G7W	T	71.62	32.08	1C		DIGITAL TRAFFIC, VARIOUS INFORMATION, VARIOUS DATA RATES, VARIOUS FEC & MODULATION
3) 14000.0000 - 14500.0000	H,V	51K2G7W	T	49.77	38.70	1K		DIGITAL TRAFFIC, VARIOUS INFORMATION, VARIOUS DATA RATES, VARIOUS FEC, VARIOUS MODULATION
4) 14000.0000 - 14500.0000	H,V	36M0G7W	T	78.42	38.70	1K		DIGITAL TRAFFIC, VARIOUS INFORMATION, VARIOUS DATA RATES, VARIOUS FEC, VARIOUS MODULATION
5) 14000.0000 - 14500.0000	H,V	36M0F3F	T	78.82	51.83	1K		STANDARD ANALOG VIDEO

C) Frequency Coordination

#	Frequency Limits(MHz)	Satellite Arc (Deg. Long.) East West Limit Limit	Elevation (Degrees) East West Limit Limit	Azimuth (Degrees) East West Limit Limit	Max EIRP Density toward Horizon (dBW/4kHz)	Associated Antenna(s)
1)	5925.0000 - 6425.0000	58.0W-143.0W	5.0 - 5.0	0.0 - 0.0	-1.5	1C



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2) 14000.0000 - 14500.0000 58.0W-143.0W 5.0 - 5.0 0.0 - 0.0 12.0 1K

D) Point of Communications

The following stations located in the Satellite orbits consistent with Sections B and C of this Entry:

- 1) 1 to All authorized U.S. Domestic (ALSAT) Satellites.

E) Antenna Facilites

Site ID	Antenna ID	Units	Diameter (Meters)	Manufacturer	Model Number	Site Elevation	Max Antenna Height (Meters)	Special Provisions (Refer to Section H)
1	1C	1	3.7	GIGASAT	FA370		3.3 AGL / 0.0 AMSL	
Max Gains(s):45.6 dBi @ 6.1750 GHz								
Maximum total input power at antenna flange (Watts) = 400.0								
Maximum aggregate output EIRP for all carriers (dBW)71.62								
1	1K	1	3.7	GIGASAT	FA370		3.3 AGL / 0.0 AMSL	
Max Gains(s):52.8 dBi @ 14.2500 GHz								
Maximum total input power at antenna flange (Watts) = 400.0								
Maximum aggregate output EIRP for all carriers (dBW)78.82								

G) Antenna Structure marking and lighting requirements:

None unless otherwise specified under Special and General Provisions

H) Special and General Provisions

A) This RADIO STATION AUTHORIZATION is granted subject to the following special-provisions and general conditions:

- 1900 Applicable to all transmitting frequency bands. Authority is granted to transmit any number of RF carriers with the specified parameters on any discrete frequencies within associated band in accordance with the other terms and conditions of this authorization, subject to any additional limitations that may be required to avoid unacceptable levels of inter-satellite interference.
- 2010 This authorization is issued pursuant to the Commission's Second Report and Order adopted June 16, 1972 (35 FCC 2d 844) and Memorandum, Opinion and Order adopted December 21, 1972 (38 FCC 2d 665) in Docket No. 16495 and is subject to the policies adopted in that proceeding.
- 2617 The applicant certifies that they are familiar with Parts 101 and 25 of the FCC Rules and Regulations regarding the frequency coordination process. The applicant is aware of and agrees to perform an analysis and notification to potentially affected carriers prior to transmitting at each location. Failure to perform successful prior frequency coordination will result in the cancellation of your station license herein. Copies of all coordination notices shall be forwarded to the FCC Operations Center Office in Columbia, Maryland.
- 2810 The grantee shall maintain on file with the Commission's current list or plan of the precise frequencies in actual use at this station, specifying for each such frequency: the r.f. center frequency, polarization, emission designator, EIRP (dBW), EIRP density (dBW/4kHz), and receiving earth station(s). This list or plan may be submitted either on a station-by-station basis or on a system-wide basis, and shall be updated within seven days of any changes in frequency usage at this station. Temporary usage of frequencies for periods of less than seven days need not be notified to the Commission if accurate station records are maintained of the times and particulars of such temporary frequency usage.
- 2916 Transmitter(s) must be turned off during antenna maintenance to ensure compliance with the FCC-specified safety guidelines for human exposure to radiofrequency radiation in the region between the antenna feed and the reflector. Appropriate measures must also be taken to restrict access to other regions in which the earth station's power flux density levels exceed the specified guidelines.



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H) Special and General Provisions

- 3219 All existing transmitting facilities, operations and devices regulated by the Commission must be in compliance with the Commission's radiofrequency (RF) exposure guidelines, pursuant to Section 1.1307(b)(1) through (b)(3) of the Commission's rules, or if not in compliance, file an Environmental Assessment (EA) as specified in Section 1.1311. See 47 CFR 1.1307 (b) (5).
- 5208 The licensee shall take all necessary measures to ensure that the antenna does not create potential exposure of humans to radiofrequency radiation in excess of the FCC exposure limits defined in 47 CFR 1.1307(b) and 1.1310 wherever such exposures might occur. Measures must be taken to ensure compliance with limits for both occupational/controlled exposure and for general population/uncontrolled exposure, as defined in these rule sections. Compliance can be accomplished in most cases by appropriate restrictions such as fencing. Requirements for restrictions can be determined by predictions based on calculations, modeling or by field measurements. The FCC's OET Bulletin 65 (available on-line at www.fcc.gov/oet/rfsafety) provides information on predicting exposure levels and on methods for ensuring compliance, including the use of warning and alerting signs and protective equipment for workers.
- 5216 All operations shall be on a non-common carrier basis.



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H) Special and General Provisions

B) This RADIO STATION AUTHORIZATION is granted subject to the additional conditions specified below:

This authorization is issued on the grantee's representation that the statements contained in the application are true and that the undertakings described will be carried out in good faith.

This authorization shall not be construed in any manner as a finding by the Commission on the question of marking or lighting of the antenna system should future conditions require. The grantee expressly agrees to install such marking or lighting as the Commission may require under the provisions of Section 303(q) of the Communications Act, 47 U.S.C. § 303(q).

Neither this authorization nor the right granted by this authorization shall be assigned or otherwise transferred to any person, firm, company or corporation without the written consent of the Commission. This authorization is subject to the right of use or control by the government of the United States conferred by Section 706 of the Communications Act, 47 U.S.C. § 706. Operation of this station is governed by Part 25 of the Commission's Rules, 47 C.F.R. Part 25.

This authorization shall not vest in the licensee any right to operate this station nor any right in the use of the designated frequencies beyond the term of this license, nor in any other manner than authorized herein.

This authorization is issued on the grantee's representation that the station is in compliance with environmental requirements set forth in Section 1.1307 of the Commission's Rules, 47 C.F.R. § 1.1307.

This authorization is issued on the grantee's representation that the station is in compliance with the Federal Aviation Administration (FAA) requirements as set forth in Section 17.4 of the Commission's Rules, 47 C.F.R. § 17.4.

The following condition applies when this authorization permits construction of or modifies the construction permit of a radio station.

This authorization shall be automatically forfeited if the station does not meet each required construction deadline by the required date of completion unless, before such date(s), a specific application is timely filed to request an extension of the construction deadline(s), supported with good cause why that failure to construct by the required date was due to factors not under control of the grantee.

Licensees are required to pay annual regulatory fees related to this authorization. The requirement to collect annual regulatory fees from regulates is contained in Public Law 103-66, "The Omnibus Budget Reconciliation Act of 1993". These regulatory fees, which are likely to change each fiscal year, are used to offset costs associated with the Commission's enforcement, public service, international and policy and rulemaking activities. The Commission issues a Report and Order each year, setting the new regulatory fee rates. Receive only earth stations are exempt from payment of regulatory fees.

Analysis of Non-Ionizing Radiation for a 3.7-Meter Earth Station System

This report analyzes the non-ionizing radiation levels for a 3.7-meter earth station system. The analysis and calculations performed in this report comply with the methods described in the FCC Office of Engineering and Technology Bulletin, No. 65 first published in 1985 and revised in 1997 in Edition 97-01. The radiation safety limits used in the analysis are in conformance with the FCC R&O 96-326. Bulletin No. 65 and the FCC R&O specifies that there are two separate tiers of exposure limits that are dependant on the situation in which the exposure takes place and/or the status of the individuals who are subject to the exposure. The Maximum Permissible Exposure (MPE) limits for persons in a General Population/Uncontrolled environment are shown in Table 1. The General Population/Uncontrolled MPE is a function of transmit frequency and is for an exposure period of thirty minutes or less. The MPE limits for persons in an Occupational/Controlled environment are shown in Table 2. The Occupational MPE is a function of transmit frequency and is for an exposure period of six minutes or less. The purpose of the analysis described in this report is to determine the power flux density levels of the earth station in the far-field, near-field, transition region, between the subreflector or feed and main reflector surface, at the main reflector surface, and between the antenna edge and the ground and to compare these levels to the specified MPEs.

Table 1. Limits for General Population/Uncontrolled Exposure (MPE)

Frequency Range (MHz)	Power Density (mW/cm ²)
30-300	0.2
300-1500	Frequency (MHz)*(0.8/1200)
1500-100,000	1.0

Table 2. Limits for Occupational/Controlled Exposure (MPE)

Frequency Range (MHz)	Power Density (mW/cm ²)
30-300	1.0
300-1500	Frequency (MHz)*(4.0/1200)
1500-100,000	5.0

Table 3. Formulas and Parameters Used for Determining Power Flux Densities

Parameter	Symbol	Formula	Value	Units
Antenna Diameter	D	Input	3.7	m
Antenna Surface Area	A _{surface}	$\pi D^2 / 4$	10.75	m ²
Feed Flange Diameter	D _{fa}	Input	19.0	cm
Area of Feed Flange	A _{fa}	$\pi D_{fa}^2 / 4$	283.53	cm ²
Frequency	F	Input	14250	MHz
Wavelength	λ	300 / F	0.021053	m
Transmit Power	P	Input	400.00	W
Antenna Gain (dBi)	G _{es}	Input	52.8	dBi
Antenna Gain (factor)	G	10 ^{Ges/10}	190546.1	n/a
Pi	π	Constant	3.1415927	n/a
Antenna Efficiency	η	$G\lambda^2 / (\pi^2 D^2)$	0.63	n/a

Radiation Hazard Report

1. Far Field Distance Calculation

The distance to the beginning of the far field can be determined from the following equation:

$$\begin{array}{ll} \text{Distance to the Far Field Region} & R_{ff} = 0.60 D^2 / \lambda \\ & = 390.2 \text{ m} \end{array} \quad (1)$$

The maximum main beam power density in the far field can be determined from the following equation:

$$\begin{array}{ll} \text{On-Axis Power Density in the Far Field} & S_{ff} = G P / (4 \pi R_{ff}^2) \\ & = 39.843 \text{ W/m}^2 \\ & = 3.984 \text{ mW/cm}^2 \end{array} \quad (2)$$

2. Near Field Calculation

Power flux density is considered to be at a maximum value throughout the entire length of the defined Near Field region. The region is contained within a cylindrical volume having the same diameter as the antenna. Past the boundary of the Near Field region, the power density from the antenna decreases linearly with respect to increasing distance.

The distance to the end of the Near Field can be determined from the following equation:

$$\begin{array}{ll} \text{Extent of the Near Field} & R_{nf} = D^2 / (4 \lambda) \\ & = 162.6 \text{ m} \end{array} \quad (3)$$

The maximum power density in the Near Field can be determined from the following equation:

$$\begin{array}{ll} \text{Near Field Power Density} & S_{nf} = 16.0 \eta P / (\pi D^2) \\ & = 93.011 \text{ W/m}^2 \\ & = 9.301 \text{ mW/cm}^2 \end{array} \quad (4)$$

3. Transition Region Calculation

The Transition region is located between the Near and Far Field regions. The power density begins to decrease linearly with increasing distance in the Transition region. While the power density decreases inversely with distance in the Transition region, the power density decreases inversely with the square of the distance in the Far Field region. The maximum power density in the Transition region will not exceed that calculated for the Near Field region. The power density calculated in Section 1 is the highest power density the antenna can produce in any of the regions away from the antenna. The power density at a distance R_t can be determined from the following equation:

$$\begin{array}{ll} \text{Transition Region Power Density} & S_t = S_{nf} R_{nf} / R_t \\ & = 9.301 \text{ mW/cm}^2 \end{array} \quad (5)$$

4. Region between the Feed Assembly and the Antenna Reflector

Transmissions from the feed assembly are directed toward the antenna reflector surface, and are confined within a conical shape defined by the type of feed assembly. The most common feed assemblies are waveguide flanges, horns or subreflectors. The energy between the feed assembly and reflector surface can be calculated by determining the power density at the feed assembly surface. This can be determined from the following equation:

$$\begin{aligned} \text{Power Density at the Feed Flange} \quad S_{fa} &= 4000 P / A_{fa} & (6) \\ &= 5643.167 \text{ mW/cm}^2 \end{aligned}$$

5. Main Reflector Region

The power density in the main reflector is determined in the same manner as the power density at the feed assembly. The area is now the area of the reflector aperture and can be determined from the following equation:

$$\begin{aligned} \text{Power Density at the Reflector Surface} \quad S_{\text{surface}} &= 4 P / A_{\text{surface}} & (7) \\ &= 148.808 \text{ W/m}^2 \\ &= 14.881 \text{ mW/cm}^2 \end{aligned}$$

6. Region between the Reflector and the Ground

Assuming uniform illumination of the reflector surface, the power density between the antenna and the ground can be determined from the following equation:

$$\begin{aligned} \text{Power Density between Reflector and Ground} \quad S_g &= P / A_{\text{surface}} & (8) \\ &= 37.202 \text{ W/m}^2 \\ &= 3.720 \text{ mW/cm}^2 \end{aligned}$$

Radiation Hazard Report

7. Summary of Calculations

Table 4. Summary of Expected Radiation levels for Uncontrolled Environment

Region	Calculated Maximum Radiation Power Density Level (mW/cm ²)		Hazard Assessment
	Symbol	Value	
1. Far Field ($R_{ff} = 390.2$ m)	S_{ff}	3.984	Potential Hazard
2. Near Field ($R_{nf} = 162.6$ m)	S_{nf}	9.301	Potential Hazard
3. Transition Region ($R_{nf} < R_t < R_{ff}$)	S_t	9.301	Potential Hazard
4. Between Feed Assembly and Antenna Reflector	S_{fa}	5643.167	Potential Hazard
5. Main Reflector	$S_{surface}$	14.881	Potential Hazard
6. Between Reflector and Ground	S_g	3.720	Potential Hazard

Table 5. Summary of Expected Radiation levels for Controlled Environment

Region	Calculated Maximum Radiation Power Density Level (mW/cm ²)		Hazard Assessment
	Symbol	Value	
1. Far Field ($R_{ff} = 390.2$ m)	S_{ff}	3.984	Satisfies FCC MPE
2. Near Field ($R_{nf} = 162.6$ m)	S_{nf}	9.301	Potential Hazard
3. Transition Region ($R_{nf} < R_t < R_{ff}$)	S_t	9.301	Potential Hazard
4. Between Feed Assembly and Antenna Reflector	S_{fa}	5643.167	Potential Hazard
5. Main Reflector	$S_{surface}$	14.881	Potential Hazard
6. Between Reflector and Ground	S_g	3.720	Satisfies FCC MPE

It is the applicant's responsibility to ensure that the public and operational personnel are not exposed to harmful levels of radiation.

8. Conclusions

Based on the above analysis it is concluded that the FCC MPE guidelines have been exceeded (or met) in the regions of Table 4 and 5. The applicant proposes to comply with the MPE limits by one or more of the following methods.

Means of Compliance Uncontrolled Areas

The antenna will be located on top of a truck. The bottom lip of the dish will be 3.30 meters above ground level. The general public will not have access to areas within ½ diameter from the edge of the antenna.

Since one diameter removed from the main beam of the antenna or ½ diameter removed from the edge of the antenna the RF levels are reduced by a factor of 100 or 20 dB. None of the areas exceeding the MPE levels will be accessible by the general public.

Radiation Hazard Report

Radiation hazard signs will be posted while this earth station is in operation.

The applicant will ensure that no buildings or other obstacles will be in the areas that exceed the MPE levels.

Means of Compliance Controlled Areas

The earth station's operational personnel will not have access to the areas that exceed the MPE levels while the earth station is in operation.

The transmitters will be turned off during antenna maintenance.