



**UNITED STATES OF AMERICA  
FEDERAL COMMUNICATIONS COMMISSION**

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**RADIO STATION AUTHORIZATION**

SpaceX Services, Inc.

Call Sign: E190649

**Authorization Type:** License  
Non Common Carrier

**File Number:** SES-LIC-20190816-01063

**Grant date:** 05/14/2021      **Expiration Date:** 05/14/2036

**Nature of Service:** Fixed Satellite Service

**Class of Station:** Fixed Earth Stations

**A) Site Location(s)**

#	Site ID	Address	Latitude	Longitude	Elevation (Meters)	Special Provisions NAD (Refer to Section H)
1)	1	1500 ME-8 (Loring ME Gateway) Limestone, Aroostook, ME 04750	46°54'53.7"N	67°55'10.3"W	205.48	83

*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 May 14, 2021 (3 AM Eastern Standard Time) and ending May 14, 2036 (3 AM Eastern Standard Time) . The required date of completion of construction and commencement of operation is May 14, 2022 (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 (MHz)	Polarization Code	Emission	Tx/Rx Mode	Max EIRP /Carrier (dBW)	Max EIRP Density /Carrier (dBW/4kHz)	Associated Antenna	Special Provisions (Refer to Section H)	Modulation/ Services
1)	29500.0000-30000.0000	L,R	480MD7W	Tx	60.50	9.70	LO-1		BPSK up to 64QAM; Digital Data
2)	27500.0000-29100.0000	L,R	480MD7W	Tx	60.50	9.70	LO-1		BPSK up to 64QAM; Digital Data
3)	18800.0000-19300.0000	L,R	480MD7W	Rx	0.00	0.00	LO-1		BPSK up to 64QAM; Digital Data
4)	17800.0000-18600.0000	L,R	480MD7W	Rx	0.00	0.00	LO-1		BPSK up to 64QAM; Digital Data



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**C) Frequency Coordination Limits**

#	Frequency Limits (MHz)	Satellite Arc (Deg. Long.)		Elevation (Degrees)		Azimuth (Degrees)		Max EIRP Density toward Horizon (dBW/4kHz)	Associated Antenna(s)
		East Limit	West Limit	East Limit	West Limit	East Limit	West Limit		
1)	17800.0000-18600.0000		NGSO	25.0	-25.0	000.0	-360.0	0	LO-1
2)	18800.0000-19300.0000		NGSO	25.0	-25.0	000.0	-360.0	0	LO-1
3)	27500.0000-29100.0000		NGSO	25.0	-25.0	000.0	-360.0	-42.8	LO-1
4)	29500.0000-30000.0000		NGSO	25.0	-25.0	000.0	-360.0	-42.8	LO-1

**D) Points of Communications**

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

- 1) 1 to SPACEX (2983/S3018) Non-Geo (U.S.-licensed satellite) [ 550 x 550km @ 53° & 53.8° Incl, 32 planes per inclination & @ 74° Incl, 18 planes inclination

**E) Antenna Facilities**

Site ID	Antenna ID	Units	Diameter (meters)	Manufacturer	Model number	Site Elevation (Meters)	Max Antenna Height (Meters)	Special Provisions (Refer to Section H)
1	LO-1	8	1.47	SpaceX	1.47M	205.48	3.2 AGL/ 206.39 AMSL	
Max Gains(s):		49.5 dBi @ 28.0000 GHz	46.9 dBi @ 19.0000 GHz					
		30.0000 GHz	47.0 dBi @ 18.0000 GHz					
Maximum total input power at antenna flange (Watts) =					50.00			
Maximum aggregate output EIRP for all carriers (dBW) =					66.50			

**F) Remote Control Point:**

1                    23020 NE Alder Crest Drive                    **Call Sign: N/A**  
  
                         Redmond, King, WA 98053  
  
                         310-682-2553

**G) Antenna Structure marking and lighting requirements:**

None unless otherwise specified under Special and General Provisions



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## H) Special and General Provisions

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

- 4 --- Licensee must ensure that a current listing of the name, title, mailing address, email address, and telephone number of the responsible point of contact are on file at the FCC. Any changes must be filed electronically in the International Bureau Filing System (MyIBFS) using the "Pleadings and Comments" link on the MyIBFS homepage within 10 days of the change.
- 6 --- Licensee must comply with the license modification and notification requirements of 47 CFR § 25.118 to change the coordinates of its authorized earth station.
- 8 --- Licensee must notify the Commission when all earth stations under this authorization are no longer operational or when they have not been used to provide service during any continuous six-month period.
- 9662 --- The 17.8 - 20.2 GHz band is shared with U.S. Government space stations and associated earth stations in the fixed-Satellite Services. Services within the United States over the satellite network of which this is a cooperating earth station are subject to coordination under US334 and operation of the earth station(s) authorized herein will be subject to any technical constraints resulting from this coordination. See 47 C.F.R. Section 2.106, Footnote US334.
- 90398 --- Changes to previously authorized transmitting facilities, operations and devices regulated by the Commission that may have significant environmental impact, and are not excluded by §1.1306, require the preparation of an Environmental Assessment (EA) by the licensee. (See 47 C.F.R. §§1.1307, 1.1308 and 1.1311)
- 90399 --- The licensee shall, at all times, take all necessary measures to ensure that operation of this (these) authorized earth station(s) 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. Physical 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](http://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.
- 90491 --- Operations in the 27.5-28.35 GHz (Earth-to-space) frequency band are authorized based on a demonstration of compliance with 47 CFR § 25.136(a)(4). Consequently, this earth station may operate without providing any additional interference protection to stations in the Upper Microwave Flexible Use Service (UMFUS) in the 27.5-28.35 GHz frequency band.
- 90530 --- The earth station licensee is required to take corrective action to mitigate interference in the 27.5-28.35 GHz frequency band if the actual PFD, at ten meters above ground level, exceeds -77 .6 dBm/m2/MHz anywhere outside the contour specified in the application.
- 90572 --- Since the PFD contour was calculated based on a power density at the input of the earth station antenna which is 3.9 dB lower than the maximum power density specified in the application, this reduced power density is the maximum level that can be used.
- 90573 --- To the extent that the actual gain pattern of the antenna ultimately deployed by the licensee exceeds the antenna mask used in the calculation of the PFD contour, the contour resulting from the actual antenna pattern must continue to meet all of the criteria specified in 47 CFR § 25.136(a)(4)(i-iv).



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## H) Special and General Provisions

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

- 90581 --- NG62 In the bands 28.5-29.1 GHz and 29.25-29.5 GHz, stations in the fixed-satellite service shall not cause harmful interference to, or claim protection from, stations in the fixed service operating under the following call signs: KEB35, KGB72, KGC79, KIL20, KME49, KQG58, KQH74, KSA96, KSE73, KVH83, KYJ33, KZS88, WAX78, WLT380, WMK817, WML443, WMP367, and WSL69.
- 90582 --- NG165 In the bands 18.8-19.3 GHz and 28.6-29.1 GHz, geostationary-satellite networks in the fixed-satellite service shall not cause harmful interference to, or claim protection from, non-geostationary-satellite systems in the fixed-satellite service.
- 90623 --- Operations in the 17.8-18.3 GHz frequency band are on a secondary basis to the Fixed Service (FS). Licensee must accept any interference from existing and future FS transmissions in the 17.8-18.3 GHz frequency band."
- 900626 --- SpaceX Services, Inc. ("SpaceX Services") is granted this license, beginning May 14, 2021, to operate its fixed earth station located at geographical coordinates 46°54'53.7" N/67°55' 10.3"W in Loring, ME with non-geosynchronous orbit ("NGSO") satellite constellation SpaceX Starlink (Call Sign S2983/3018) on frequency bands: 27500-29100 MHz and 29500-30000 MHz (Earth-to-space), 17800-18600 MHz, 18800-19300 MHz (space-to-Earth).
- 900627 --- Grant of operations in the 27.5-28.35 GHz frequency band is based on the applicant's calculation of the aggregate population affected, under 47 CFR §25.136(a)(4)(ii), using the "actual area method." For Aroostook County, in the State of Maine, the estimated aggregate population affected was determined to be 328 people, out of a maximum of 450 people allowed to be affected in this County, based on the decennial 2010 U.S. Census Population information.
- 900628 --- Worldvu Satellites Limited (OneWeb) filed comments regarding this application. The issues raised however, are applicable to the SpaceX NGSO satellite system as a whole and not unique to this particular earth station application. See Comments of Worldvu Satellites Limited (filed Oct. 25, 2019). Further, we note that these issues were addressed in a SpaceX modification order. See Space Exploration Holdings, LLC, Order and Authorization and Order on Reconsideration, FCC 21-48 (April 23, 2021) at paras. 20, 21, and 97(o). As a result, we dismiss these comments as moot.



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**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 is not ready for operation by the required date of completion of construction unless an application for modification of authorization to request additional time to complete construction is filed by that date, together with a showing that failure to complete construction 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 regulatees 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.**