

Licensee certifies antenna(s) comply with gain patterns specified in Section 25.209



UNITED STATES OF AMERICA FEDERAL COMMUNICATIONS COMMISSION

EARTH STATION AUTHORIZATION

Name: SpaceX Services, Inc.

Call Sign: E230081

Authorization Type: License

File Number: SES-LIC-20230525-01106

Grant Date: 2024-12-23 **Expiration Date:** 2039-12-23

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 Monday, December 23, 2024 (3 AM Eastern Standard Time) and ending Friday, December 23, 2039 (3 AM Eastern Standard Time). The required date of completion of construction and commencement of operation is [Grant Date / Construction Commencement Date not found]. Grantee must file with the Commission a certification upon completion of construction and commencement of operation.

B) Particulars of Operation

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)	Associated Antenna	Special Provisions (Refer to Section H)	Modulation/ Services
1	81000 - 86000		1G20D7W	Earth- to- Space	70.9	16.1	32		BPSK up to 64 QAM; Digital Data
2	71000 - 76000		1G20D7W	Space- to- Earth			32		BPSK up to 64 QAM; 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	81000 - 86000	0	360	25	25	0	360	-36	32
2	71000 - 76000		360	25	25	0	360		32



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D) Points of Communications

#	Common Name	ITU Name	Orbit Location	Country	Destination Points	Permitted List
1	SPACEX GEN2 (S3069)	SpaceX GEN2 (S3069)	NGSO			False



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E) Antenna Facilities

#	Site ID	Antenna ID	Units	Manufacturer	Model Number	Site Elevation (Meters)	Max Antenna Height (Meters)	Special Provisions (Refer to Section H)
1	Piscataway Gateway	CO-1	32	SpaceX	1.85M	0	1.7	

Max Gains(s):

Maximum aggregate output EIRP for all carriers(dBW): 40

Maximum total input power at antenna flange(Watts): 76.9

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 EARTH 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 Communications Filing System (ICFS) using the "Pleadings and Comments" link on the ICFS homepage within 10 days of the change.
- 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.
- 22 --- The values for the "Max EIRP Density toward the Horizon" specified in Section C of this license reflect the maximum aggregate EIRP density toward the Horizon for all antennas at the site.
- 90900 --- Grant of the instant application is subject to the terms and condition of all associated current or future space station authorization(s) or grant(s) of market access. Operations pursuant to the instant authorization must be consistent with the associated space station(s) authorizations(s) or grant(s) of market access.
- 90907 --- Operations shall not exceed the operational power limits and parameters requested and coordinated with National Aeronautics and Space Administration (NASA).
- 90911 --- Licensee must coordinate its proposed frequency use for operations in the 71.0-76.0 GHz (space-to-Earth) and 81.0-86.0 GHz (Earth-to-space) frequency bands with any existing U.S. licensees or U.S. market access grantees in the Fixed-Satellite Service whose facilities could be affected by SpaceX's E-band operations, in terms of frequency interference or restricted capacity, and licensee must cooperate fully with other future co-frequency Fixed-Satellite Service satellites or satellite systems in coordinating operations in these bands.
- 90913 --- Prior to commencing operations of downlink and uplink operations in the 71.0-76.0 GHz and 81.0-86.0 GHz frequency bands, respectively, Licensee must demonstrate compliance with operational conditions as prescribed and coordinated with NTIA and the U.S. Federal Fixed Satellite Service (FSS) systems. Downlink and uplink operations in the 71.0-76.0 GHz and 81.0-86.0 GHz frequency bands, respectively, must be in accordance with any signed coordination agreement between Licensee and U.S. Federal FSS operators. Two weeks prior to the start of any operations in the 71.0-76.0 GHz and 81.0-86.0 GHz bands, Licensee must provide contact information for a 24/7 point of contact for the resolution of any harmful interference to Jimmy Nguyen, Email: Jimmy.Nguyen@us.af.mil.
- 90955 --- In order to protect Earth exploration-satellite service operations in the 86-92 GHz band, the received unwanted emission power from all adjacent-band interference sources, including

SpaceX gateways, shall be limited to -169 dBW per 100 MHz within the 86-92 GHz passive band, as described in Recommendation ITU-R RS.2017-0.

- 90959 --- Uplink transmissions from user terminals to the SpaceX Gen2 system (S3069) are expressly prohibited in the 81-86 GHz frequency band.
- 90960 --- All future requests for modification or renewal of this gateway authorization, as well as any requests for new gateway locations, shall be provided to the National Telecommunications and Information Administration (NTIA) for coordination with Federal agencies and are subject to re-evaluation, which may result in updated unwanted emission power levels and/or operational restrictions for the gateway under consideration as well as previously authorized gateway locations.
- 90961 --- Consideration of subsequent SpaceX Services, Inc. license requests for additional gateway stations will examine all active short-term and long-term authorizations to ensure that the maximum gateway deployment density thresholds are not exceeded.
- 90962 --- SpaceX shall keep data logs of all transmissions in the 81-86 GHz band that include the following parameters, at a minimum: timestamp, which gateways sites were actively transmitting during a given timestamp, and the azimuth and elevation pointing angles for all antennas within an actively transmitting gateway site. These data logs shall be retained for at least 90 days following operations and shall be made available to Federal agencies upon request.
- 90963 --- All operations pursuant to this grant are subject to the terms and conditions of the in-force version of any signed Memorandum of Agreement(s) (MOA) established between SpaceX and Federal Agencies. In the event the conditions above conflict with the terms of the in-force version of a signed MOA between SpaceX and Federal Agencies, then such terms of the MOA shall prevail, and these conditions will be deemed to be amended accordingly.
- 91040 --- The unwanted emission power level per gateway uplink beam, as measured at the antenna port, shall not exceed:
- a. $-41.2 - 16.3(f - 86)$ dBW/100 MHz for $(86.05 \leq f \leq 87.00 \text{ GHz})$
 - b. -57.5 dBW/100 MHz for $(87.00 < f \leq 91.95 \text{ GHz})$
- where f is the center frequency of the 100 MHz reference bandwidth expressed in GHz. Additionally, SpaceX shall ensure that the unwanted emission limits provided above are met during all gateway transmissions. This mask is based upon the 81-86 GHz ground sites being individually authorized and having a minimum antenna diameter of 1.8 meters.
- 91041 --- SpaceX Services Inc. must be aware the unwanted emission power level per gateway uplink beam specified in condition 91040 is subject to change based on many factors (e.g., updates to SpaceX Services Inc. deployment characteristics, updates to deployment characteristics by other operators in the band, future considerations during the World Radiocommunication Conference 2027 (WRC-27) study cycle, etc.), and SpaceX Services Inc. must have no expectation that the specified limit is sufficient to address long-term gateway earth station uplink operations. Any subsequent request for gateway earth station uplink operation is subject to re-evaluation by federal agencies and may result in an updated unwanted emission power level.
- 91042 --- Gateway earth station uplink operations in the 81-86 GHz band must comply with the following conditions:
- a. Maximum of 32 total simultaneously transmitting uplink beams;
 - b. Minimum elevation angle of 25 degrees with respect to the local horizontal plane per uplink beam for sites below 62 degrees north latitude.
- In Addition, SpaceX assumes the risk that this grant may be subject to additional conditions, modification, or cancellation to bring it into conformance with (i) the above operational restrictions or (ii) any rules or policies that may result from future Commission action.

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 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.