

**United States of America
FEDERAL COMMUNICATIONS COMMISSION
EXPERIMENTAL
RADIO STATION CONSTRUCTION PERMIT
AND LICENSE**

EXPERIMENTAL
(Nature of Service)

WL2XXS
(Call Sign)

XT FX MO
(Class of Station)

0308-EX-CN-2021
(File Number)

NAME Space Exploration Holdings, LLC

Subject to the provisions of the Communications Act of 1934, subsequent acts, and treaties, and all regulations heretofore or hereafter made by this Commission, and further subject to the conditions and requirements set forth in this license, the licensee hereof is hereby authorized to use and operate the radio transmitting facilities hereinafter described for radio communications in accordance with the program of experimentation described by the licensee in its application for license.

Operation: In accordance with Sec. 5.3(j) of the Commission's Rules

Station Locations

- (1) MOBILE: US territorial waters in the Pacific Ocean, within 22.22 km, centered around NL 33-43-12; WL 118-16-12
- (2) Port of Los Angeles (LOS ANGELES), CA - NL 33-43-12; WL 118-16-12
- (3) MOBILE: US territorial waters in the Gulf of Mexico
- (4) Port Canaveral, FL - NL 28-24-45; WL 80-37-10
- (5) Port of Brownsville, TX - NL 25-58-12; WL 97-21-36
- (6) Pascagoula, MS - NL 30-20-24; WL 88-30-36
- (7) MOBILE: Boca Chica Village, TX: max altitude 41,000 ft. AGL, within 5 km, centered around NL 26-00-00; WL 97-09-36

Frequency Information

MOBILE: US territorial waters in the Pacific Ocean, within 22.22 km, centered around NL 33-43-12; WL 118-16-12

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
14000-14500 MHz	MO	60M0D7W	4.06 W (Output Power)	0.001 %

This authorization effective August 04, 2021 and will expire 3:00 A.M. EST August 01, 2023

**FEDERAL
COMMUNICATIONS
COMMISSION**



Frequency Information

Port of Los Angeles (LOS ANGELES), CA - NL 33-43-12; WL 118-16-12

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
14000-14500 MHz	FX	60M0D7W	4.06 W (Output Power)	0.001 %

MOBILE: US territorial waters in the Gulf of Mexico

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
14000-14500 MHz	MO	60M0D7W	4.06 W (Output Power)	0.001 %

Port Canaveral, FL - NL 28-24-45; WL 80-37-10

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
14000-14500 MHz	FX	60M0D7W	4.06 W (Output Power)	0.001 %

Port of Brownsville, TX - NL 25-58-12; WL 97-21-36

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
14000-14500 MHz	FX	60M0D7W	4.06 W (Output Power)	0.001 %

Frequency Information

Pascagoula, MS - NL 30-20-24; WL 88-30-36

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
14000-14500 MHz	FX	60M0D7W	4.06 W (Output Power)	0.001 %

MOBILE: Boca Chica Village, TX: max altitude 41,000 ft. AGL, within 5 km, centered around NL 26-00-00; WL 97-09-36

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
14000-14500 MHz	MO	60M0D7W	4.06 W (Output Power)	0.001 %

Special Conditions:

- (1) The station identification requirements of Section 5.115 of the Commission's Rules are waived.
- (2) The occupied bandwidth of the emission shall not extend beyond the band limits set forth above.
- (3) Licensee is authorized to conduct tests on 10 units of 0.48m SpaceX UTA-201 earth stations in the 14-14.5 GHz via SpaceX's NGSO satellites. These ten earth stations will be a) aboard vessels (ESV) and operate:
 - 1) at Port of Los Angeles, LOS ANGELES, CA and within 22.22 km of U.S. territorial waters in the Pacific Ocean- centered around NL 33-43-12; WL 118-16-12;
 - 2) at port of Canaveral, FL, and within 22.22 km of US territorial waters in the Gulf of Mexico -centered around NL 28-24-45; WL 80-37-10;
 - 3) at port of Brownsville, TX and within 22.22 km of US territorial waters in the Gulf of Mexico - centered around NL 25-58-12; WL 97-21-36;
 - 4) at Port of Pascagoula, MS and US territorial waters in the Gulf of Mexico - within 22.22 km, centered around NL 30-20-24; WL 88-30-36.
 b) aboard aircraft vehicles (ESAA) and operate a max altitude 41,000 ft. AGL, within 5 km of Boca Chica Village, TX, (26.00°N, -97.16°W).
- (4) Points of Communication: Space Exploration Holdings, LLC ("SpaceX")'s non-geostationary orbit ("NGSO") satellites (call sign S2983/S3018) using the 14-14.5 GHz frequency band.
- (5) Operations in the 14.0-14.5 GHz frequency band must compliance with the equivalent power flux-density limit (-160 dBW/m²/40 kHz) of Article 22.5D of the ITU Radio Regulations.
- (6) The authorized SpaceX's ESV and ESAA must not transmit signals until SpaceX's NGSO satellites in view at an elevation angle of at least 25 degrees.

Special Conditions:

- (7) The direction of the authorized SpaceX's ESV or ESAA earth station transmit beam and the GSO arc is separated by less than 18°. Operations in the Ku-band (14-14.5 GHz) must always maintain +/- 18° of avoidance angle (exclusion zone) with the GSO arc. As the earth station is tracking SpaceX's NGSO satellites, it must not radiate within +/-18° of the GSO arc
- (8) ESV's operations authorized pursuant to this license are operations by U.S.-registered ships.
- (9) ESAA in aircraft on the ground must not transmit at elevation angles less than three degrees. There is no minimum angle of antenna elevation for ESAA while airborne.
- (10) ESAA's operations authorized pursuant to this license are operations by U.S.-registered aircraft.
- (11) ESAA authorized herein must not be used to provide air traffic control communications.
- (12) The ESV and ESAA (ESIMs) must be self-monitoring and, should a condition occur that causes it to exceed EIRP, EIRP density or EIRP mask limits, the ESIMs will automatically cease transmissions within 100 milliseconds and not resume transmissions until the condition that caused the experimental ESIMs to exceed those limits is corrected.
- (13) Operations of the authorized ESIMs are subject to the footnote NG527A(c) of Section 2.106 of the Commission rules. In the band 14.0-14.5 GHz (Earth-to-space), ESIMs authorized to communicate with SpaceX's non-geostationary satellites must not cause unacceptable interference to, or claim protection from, geostationary-satellite networks.
- (14) Operations of the authorized ESIMs operating in the 14.14.5 GHz frequency band must be compliance with the following additional conditions:
 - a. Licensee's ESIMs must employ a tracking algorithm that is resistant to capturing and tracking adjacent satellite signals, and each station must be capable of inhibiting its own transmission in the event it detects unintended satellite tracking.
 - b. Licensee's ESIMs must be monitored and controlled by a ground-based network control and monitoring center. Such stations must be able to receive "enable transmission" and "disable transmission" commands from the network control center and must cease transmission immediately after receiving a "parameter change" command until receiving an "enable transmission" command from the network control center. The network control center must monitor operation of each earth station to determine if it is malfunctioning, and each earth station must self-monitor and automatically cease transmission on detecting an operational fault that could cause harmful interference to a fixed satellite service network.
 - c. Licensee must maintain a point of contact available 24 hours per day, seven days per week, with the authority and ability to terminate operations authorized herein, for discussing interference concerns with other licensees, and must submit a letter to be included in its license file with the name and telephone number of the point of contact prior to commencing operation.