Kristi Key, 1 Rocket Road, Hawthorne, CA 90250,

United States of America
FEDERAL COMMUNICATIONS COMMISSION
EXPERIMENTAL
SPECIAL TEMPORARY AUTHORIZATION

EXPERIMENTAL	WF9XGI
(Nature of Service)	(Call Sign)
XT MO	1390-EX-ST-2020
(Class of Station)	(File Number)

NAME Space Exploration Technologies Corp.

This Special Temporary Authorization is granted upon the express condition that it may be terminated by the Commission at any time without advance notice or hearing if in its discretion the need for such action arises. Nothing contained herein shall be construed as a finding by the Commission that the authority herein granted is or will be in the public interest beyond the express terms hereof.

This Special Temporary Authorization shall not vest in the grantee any right to operate the station nor any right in the use of the frequencies designated in the authorization beyond the term hereof, nor in any other manner than authorized herein. Neither the authorization nor the right granted hereunder shall be assigned or otherwise transferred in violation of the Communications Act of 1934. This authorization is subject to the right of use of control the Government of the United States conferred by Section 706 of the Communications Act of 1934.

Special Temporary Authority is hereby granted to operate the apparatus described below:

Purpose Of Operation:
STA is required for spacecraft communications for a SpaceX CRS mission (an ISS commercial re-supply mission for the NASA).

Station Locations
(1) MOBILE: Space: Dragon S-Band Directional Array, centered around NL 28-36-30; WL 80-36-15

Frequency Information

MOBILE: Space: Dragon S-Band Directional Array, centered around NL 28-36-30; WL 80-36-15

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
2203.2 MHz	MO		39 W (ERP)	0.001 %
		4M20G1D		
		4M15G1D		
2216 MHz	MO		77 W (ERP)	0.001 %
		2M73F1D		
		4M65F1D		

This authorization effective November 01, 2020 and
will expire 3:00 A.M. EST May 01, 2021

FEDERAL COMMUNICATIONS COMMISSION

Frequency Information

MOBILE: Space: Dragon S-Band Directional Array, centered around NL 28-36-30; WL 80-36-15

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
2287.5 MHz	MO	4M80G1D	77 W (ERP)	0.001 %

Special Conditions:

(1) Operation is subject to prior coordination with the Society of Broadcast Engineers, Inc. (SBE); ATTN: Executive Director; 9102 North Meridian Street, Suite 305; Indianapolis, IN 46260; telephone, (866) 632-4222; FAX, (317) 846-9120; e-mail, executivedir @ sbe.org; information, www.sbe.org.

(2) SpaceX shall be aware that future non-federal on-orbit operations will be considered on a case-by-case basis, especially for requests in the band 2200-2290 MHz, and SpaceX shall have no expectations that future on-orbit operations will be approved.

(3) As soon as possible, but no later than 60 business days prior to the planned launch, SpaceX is required to provide, as a minimum, launch date/time/window and planned Dragon 2 trajectory from launch to capture by the International Space Station (ISS), and transmission frequencies with associated duration/cut-off time to Jimmy Nguyen (jimmy.nguyen@us.af.mil, AFSMO), Shaobei Xu (shaobei.xu.1@us.af.mil, AFSMO), Felipe Arroyo (felipe.arroyo-1@nasa.gov, NASA/WFF), NASA GSFC Spectrum Office (nasa-dl-gsfc-spectrum-management@mail.nasa.gov), Scott Galbraith (vincent.s.galbraith@nasa.gov, NASA/GSFC), Stephen Horan (stephen.j.horan@nasa.gov, NASA/LaRC),), Kenneth Dudley (kenneth.l.dudley@nasa.gov, NASA/LaRC), NOAA Satellite Operations Control Center (matt.g.sullivan@noaa.gov), Richard Ontiveros, (richard.ontiveros1@navy.mil, NMSC), and Cathy Sham (catherine.c.sham@nasa.gov). In the event of last-minute changes, 48-hour notice is required.

(4) The STOP BUZZER POC information for all operations shall be provided to NTIA (ravery@ntia.doc.gov). This phone shall be manned 24/7.

(5) SpaceX shall keep a log of all transmissions in the band 2200-2290 MHz that shall be provided to the NTIA after the mission. This log shall include, at a minimum, the date, time, frequency, e.i.r.p density, pointing direction of the antennae. The log shall be provided to the following NTIA personnel no later than three (3) weeks after completion of the mission:
Rob Avery at ravery@ntia.gov
Ed Drocella at edrocella@ntia.gov

(6) This STA is limited to a single Dragon2 capsule telemetry, tracking, and command operations for the upcoming SpaceX Dragon2 mission to the International Space Station (ISS). This STA will expire when the Dragon2 completes its re-entry/splashdown operation or 1 May 2021, whichever occurs first. Any future missions shall submit new applications to the FCC to be re-coordinated with the NTIA.

Special Conditions:

(7) All transmissions in the band 2200-2290 MHz shall comply with national and international power flux density limits (PFD), except in cases where expected exceedance are pre-coordinated and agreed. PFD analysis and exceedances shall be included in the FCC STA application and provided in the request to the NTIA for US Government review and assessment.

(8) For Dragon2 departure/re-entry operations, including pre-departure checkout, requests for coordination shall be provided to NASA JSC Spectrum Manager, Cathy Sham (catherine.c.sham@nasa.gov) for coordination with authorized users at least 14 business days prior to communications activation related to pre-departure checkout, departure preparation, or departure operation. Requests for coordination shall include, at a minimum, planned communication timelines with start/end time, receiving station location, transmit/receive parameters/power/bandwidth, and spacecraft trajectory/orbital locations.

(9) Prior to transmitting at Cape Canaveral AFS, Florida, SpaceX shall coordinate and schedule their operations with Range Scheduling, COMM: (321) 853-5941, email: 1ropschd@us.af.mil, NASA KSC Spectrum Management Office, Jamie Bjornbak at 321.867.6905 or James.P.Bjornbak@nasa.gov, and NASA GSFC Spectrum Office (nasa-dl-gsfc-spectrum-management@mail.nasa.gov). SpaceX shall provide a copy of all FCC licenses supporting operations to the 45th Space Wing Spectrum Management Office, (321)-853-8408, email: 45sw.erfmo@us.af.mil with Cc'ing DoD EAFC (321)-853-8426, email: 45sw.dodeafc@us.af.mil.

(10) All SpaceX operations granted on an experimental basis shall be on an unprotected, non-interference basis to authorized federal stations.

(11) Transmission using a frequency of 2216.0 MHz and an emission designator of 4M65F1D shall be limited to ascent and re-entry mission phases. Transmission using a frequency of 2216.0 MHz and an emission designator of 4M65F1D is strictly prohibited for use during on-orbit operations.

(12) Transmission using a frequency of 2203 MHz shall be limited to space-to-space communication with the International Space Station (ISS) during approach and departure mission phases while within 30 km of the ISS.

(13) In the event that any changes occur to the mission's parameters, NSWCDD/E3 requires that SpaceX provide updated documentation and parameters to be submitted NLT 60 days prior to launch to the Naval Surface Warfare Center, Dahlgren Division (NSWCDD). In the event that these changes result in any potential harmful interference to Navy and DoD operations, SpaceX must comply with any and all restrictions that may be levied by the Naval Surface Warfare Center, Dahlgren Division.

The primary contacts for frequency coordination:
Mr. James Moneyhon, (540) 653-3477- james.moneyhon@navy.mil, Mr. A. Jason Verdugo, (540) 653-9590 - Anthony.J.Verdugo@navy.mil, and/or Mr. Phillip B. Scyphers, (540) 653-6071 - Phillip.scyphers@navy.mil. Group email box - W_DLGR_NSWC_FTMA_FM@navy.mil.
Coordination of the SpaceX operations schedule and timeline, and any and all restrictions that may be levied by the NSWCDD, including imposition and implementation of a BOZ, shall be coordinated through NASA JSC Spectrum Manager, Cathy Sham (catherine.c.sham@nasa.gov).

Special Conditions:

(14) During Dragon2 lift-off/ascent (from launch to launch + 13 minutes) and on-orbit mission phases (after lift-off/ascent, free flight, or attached to the International Space Station), SpaceX shall provide the radio frequency operation plan to NASA JSC Spectrum Manager, Cathy Sham (catherine.c.sham@nasa.gov) for coordination with authorized users prior to scheduling. The request for use of lift-off/ascent communications shall be provided at least 30 days prior to launch, and the request for on-orbit operations shall be provided at least 7 business days prior to any planned transmission operation.

(15) Due to potential harmful interference to the Deep Space Network (DSN) ground stations, Dragon2 transmissions using 2203.2 MHz, 2216 MHz, or 2287.5 MHz shall not occur when the Dragon 2 is in view of the following deep space earth stations from horizon to horizon: Goldstone Deep Space Communications Complex (GDSCC) [35° 25’ 32.84" N, 116° 53’ 22.09" W], Madrid Deep Space Communications Complex (MDSCC) [40° 25’ 52.37" N, 04° 14’ 52.8" W], Canberra Deep Space Communications Complex (CDSCC) [35° 24’ 08.96" S, 148° 58’ 52.93" E], and New Norcia Station [31° 02’ 53.61" S, 116° 11’ 29.4" E]. Coordination requests for clearance to transmit shall be provided to the NASA JSC Spectrum Manager, Cathy Sham (catherine.c.sham@nasa.gov) at least 7 business days prior to communication system activation.

(16) SpaceX should cease transmissions to select SpaceX ground stations located in Newfoundland, Cape Canaveral, Bermuda, and South Texas when the Dragon Capsule is within a conjunction angle of 15 degrees of the DSCOVR satellite as measured at the Wallops ground station.