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 FX MO	1096-EX-ST-2019
(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 capsule communications for SpaceX Commercial Crew vehicle demonstration mission to the ISS.

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

Frequency Information

Cape Canaveral (BREVARD), FL - NL 28-36-30; WL 80-36-15; MOBILE: Space: Dragon S-Band Directional Array, centered a

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
2203.2 MHz	MO		193 W (ERP)	0.001 %
		4M20G1D		
		4M15G1D		
2216 MHz	MO		193 W (ERP)	0.001 %
		2M73F1D		
		4M65F1D		

This authorization effective November 01, 2019 and
will expire 3:00 A.M. EST May 01, 2020

FEDERAL COMMUNICATIONS COMMISSION

Frequency Information

Cape Canaveral (BREVARD), FL - NL 28-36-30; WL 80-36-15; MOBILE: Space: Dragon S-Band Directional Array, centered a

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
2287.5 MHz	MO	4M80G1D	193 W (ERP)	0.001 %

Special Conditions:

(1) 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.

(2) 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 first- and second-stage trajectory, Dragon 2 trajectory from launch to capture by the International Space Station (ISS), transmission frequencies with associated duration/cut-off time to Jimmy Nguyen (jimmy.nguyen@us.af.mil, AFSMO), Felipe Arroyo (felipe.arroyo-1@nasa.gov, NASA/WFF), Scott Galbraith (vincent.s.galbraith@nasa.gov, NASA/GSFC), Kevin Vipavetz (kevin.g.vipavetz@nasa.gov, NASA/LaRC), Stephen Horan (stephen.j.horan@nasa.gov, NASA/LaRC), NOAA Satellite Operations Control Center (philip.l.whaley@noaa.gov, NOAA/SOCC), Richard Ontiveros, (richard.ontiveros1@navy.mil, NMSC), and Cathy Sham (catherine.c.sham@nasa.gov, NASA/JSC). In the event of last-minute changes, 48-hour notice is required.

(3) 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: Brandon Mitchell at bmitchell@ntia.doc.gov and Ed Drocella at edrocella@ntia.doc.gov.

(4) All operations shall be limited to Dragon 2 capsule telemetry, tracking, and command, for the upcoming SpaceX Commercial Crew vehicle demonstration mission to the International Space Station. This STA will expire as soon as the launch and mission have been completed or 1 May 2020, whichever occurs first. Any future launches will need to submit applications to the FCC to be re-coordinated with the NTIA.

(5) 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.

Special Conditions:

(6) During Dragon 2 on-orbit mission phase (after lift-off/ascent, free flight, or attached to the International Space Station), SpaceX shall provide the Radio frequency plan for in-orbit rendezvous with the ISS operations shall be provided to NASA/JSC Spectrum Manager, Cathy Sham (catherine.c.sham@nasa.gov) for coordination with authorized users prior to scheduling. Requests shall be provided at least 7 business days prior to any planned transmission.

(7) Prior to transmitting at Cape Canaveral AFS Florida, SpaceX shall coordinate and schedule their operations with Range Scheduling Office, 321- 853-5941, email: 1ropschd@us.af.mil, Jamie Bjornbak (James.P.Bjornbak@nasa.gov, 321-867-6905, NASA KSC SMO) and NASA GSFC SMO, Scott Galbraith vincent.s.galbraith@nasa.gov, 301-286-5089

(8) Due to potential harmful interference to the Deep Space Network (DSN) ground stations, Dragon 2 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.

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

(10) For Dragon 2 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.

(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 of this demonstration mission.

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

(13) In order to mitigate the potential for interference with these naval activities, four blackout zones (BOZs) shall be assumed as follows: (1) 1500 nautical mile radius centered at 22N160W; (2) 1500 nautical mile radius centered at 33.25N119.57W; (3) 1500 nautical mile radius centered at 4.11N175.2W; and (4) 1500 nautical mile radius centered at 57.46N152.38W. These BOZs shall be implemented, unless otherwise coordinated and agreed to by the Naval Surface Warfare Center, Dahlgren Division (NSWCDD). In addition, SpaceX must also comply with any and all restrictions that may be levied by NSWCDD. Coordination of the SpaceX operations schedule and timeline, and all restrictions levied by NSWCDD, including imposition and implementation of any BOZs, shall be coordinated through NASA JSC Spectrum Manager, Cathy Sham (catherine.c.sham@nasa.gov).

Special Conditions:

(14) 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, only.