Christopher Wilkins, 1 Rocket Road, Hawthorne, CA 20005,

United States of America
FEDERAL COMMUNICATIONS COMMISSION
EXPERIMENTAL
SPECIAL TEMPORARY AUTHORIZATION

EXPERIMENTAL	WF9XGI
(Nature of Service)	(Call Sign)
XT FX MO	0023-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 spacecraft communications for a SpaceX CRS mission (an ISS commercial re-supply mission for the NASA).

Station Locations

(1) Cape Canaveral AFS (BREVARD), FL - NL 28-33-42; WL 80-34-38; MOBILE: Space: Dragon S-Band Directional Array, centered around NL 28-33-42; WL 80-34-38
(2) Cape Canaveral AFS (BREVARD), FL - NL 28-33-42; WL 80-34-38; MOBILE: Space: Dragon S-Band Omni, centered around NL 28-33-42; WL 80-34-38
(3) Cape Canaveral AFS (BREVARD), FL - NL 28-33-42; WL 80-34-38; MOBILE: Space: Dragon CUCU Patch Hemispherical, centered around NL 28-33-42; WL 80-34-38

Frequency Information

Cape Canaveral AFS (BREVARD), FL - NL 28-33-42; WL 80-34-38; MOBILE: Space: Dragon S-Band Directional Array, cente

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
2287.5 MHz	MO	4M80G1D	300 W (ERP)	0.00003 %

This authorization effective April 12, 2019 and
will expire 3:00 A.M. EST October 12, 2019

FEDERAL COMMUNICATIONS COMMISSION

Frequency Information

Cape Canaveral AFS (BREVARD), FL - NL 28-33-42; WL 80-34-38; MOBILE: Space: Dragon S-Band Omni, centered around

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
2216 MHz	MO	406KF1D 1M76F1D	40 W (ERP)	2.0E-7 %
2287.5 MHz	MO	4M80G1D	40 W (ERP)	0.00003 %

Cape Canaveral AFS (BREVARD), FL - NL 28-33-42; WL 80-34-38; MOBILE: Space: Dragon CUCU Patch Hemispherical, ce

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
400.5 MHz	MO	338KG1D	2.5 W (ERP)	

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, Dragon 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), Felipe Arroyo (felipe.arroyo-1@nasa.gov, NASA/WFF), Scott Galbraith (vincent.s.galbraith@nasa.gov, NASA/GSFC), Stephen Horan (stephen.j.horan@nasa.gov, NASA/LaRC), Kevin Vipavetz (kevin.g.vipavetz@nasa.gov, NASA/LaRC), NOAA Satellite Operations Control Center (philip.l.whaley@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 (bmitchell@ntia.doc.gov). This phone shall be manned 24/7.

Special Conditions:

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

(6) Due to potential harmful interference to naval activities, SpaceX RF operations plan shall be submitted, at least 60 days prior to planned launch date, to the Naval Surface Warfare Center, Dahlgren Division (NSWCDD), Mr. James Moneyhon (540)653-3477, or james.moneyhon@navy.mil, for assessment. Four blackout zones (BOZs) shall be assumed as follows: (1) 1500 nautical mile radius centered at 22° N 160° W; (2) 1500 nautical mile radius centered at 33.25° N 119.57° W; (3) 1500 nautical mile radius centered at 4.11° N 175.2° W; and (4) 1500 nautical mile radius centered at 57.46° N 152.38° W, shall be assumed, unless otherwise coordinated with, and agreed to, by the NSWCDD. SpaceX must comply with any and all restrictions that may be levied by the NSWCDD. 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).

(7) This STA is limited to a single Dragon capsule telemetry, tracking, and command operations for the upcoming SpaceX CRS mission to the International Space Station (ISS). This STA will expire when the Dragon completes its re-entry/splashdown operation or 12 October 2019, whichever occurs first. Any future missions shall submit new applications to the FCC to be re-coordinated with the NTIA.

(8) 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.

(9) During Dragon on-orbit mission phase (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 at least 7 business days prior to any planned transmission operation.

(10) For Dragon 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) 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 SMO, Jamie Bjornbak James.P.Bjornbak@nasa.gov, 321.867.6905, and NASA GSFC SMO, Scott Galbraith vincent.s.galbraith@nasa.gov, 301-286-5089.

Special Conditions:

(12) Dragon transmissions using 2287.5 MHz shall be limited to use of the omni-directional antenna with a maximum effective isotropic radiated power (EIRP) of 12 dBW when 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].