

**United States of America
FEDERAL COMMUNICATIONS COMMISSION
EXPERIMENTAL
SPECIAL TEMPORARY AUTHORIZATION**

EXPERIMENTAL

(Nature of Service)

WF9XGI

(Call Sign)

XT FX MO

(Class of Station)

1395-EX-ST-2016

(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 CRS-10 mission, an ISS commercial re-supply mission for NASA customer.

Station Locations

- (1) Kennedy Space Center (BREVARD), FL - NL 28-36-29; WL 80-36-14; MOBILE: Space: Dragon S-Band Directional Array, centered around NL 28-36-29; WL 80-36-14
- (2) Kennedy Space Center (BREVARD), FL - NL 28-36-29; WL 80-36-14; MOBILE: Space: Dragon S-Band Omni, centered around NL 28-36-29; WL 80-36-14
- (3) Kennedy Space Center (BREVARD), FL - NL 28-36-29; WL 80-36-14; MOBILE: Space: Dragon CUCU Patch Hemispherical, centered around NL 28-36-29; WL 80-36-14
- (4) Kennedy Space Center, FL - NL 28-37-24; WL 80-41-11
- (5) Kennedy Space Center, FL - NL 28-32-37; WL 80-35-24
- (6) Vandenberg AFB, CA - NL 34-43-09; WL 120-31-52

Frequency Information

Kennedy Space Center (BREVARD), FL - NL 28-36-29; WL 80-36-14; MOBILE: Space: Dragon S-Band Directional Array, cen

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
2216 MHz	MO	546KG1D	167 W (ERP)	

This authorization effective October 14, 2016 and will expire 3:00 A.M. EST April 10, 2017

**FEDERAL
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Frequency Information

Kennedy Space Center (BREVARD), FL - NL 28-36-29; WL 80-36-14; MOBILE: Space: Dragon S-Band Omni, centered around

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
2205.5 MHz	MO	567KF1D 2M45F1D	30 W (ERP)	
2216 MHz	MO	12K4G1D	33 W (ERP)	

Kennedy Space Center (BREVARD), FL - NL 28-36-29; WL 80-36-14; MOBILE: Space: Dragon CUCU Patch Hemispherical, r

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

Kennedy Space Center, FL - NL 28-37-24; WL 80-41-11

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
2040.5675 MHz	FX	5K60G1D	175000 W (ERP)	

Kennedy Space Center, FL - NL 28-32-37; WL 80-35-24

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
2040.5675 MHz	FX	5K60G1D	15300 W (ERP)	

Frequency Information

Vandenberg AFB, CA - NL 34-43-09; WL 120-31-52

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
2040.5675 MHz	FX	5K60G1D	15300 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) All SpaceX operations granted on an experimental basis shall be on an unprotected, non-interference basis to authorized federal stations.
- (3) 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.
- (4) 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, 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), Johnnie Best, (johnnie.w.best1@navy.mil, NMSC) and Cathy Sham (catherine.c.sham@nasa.gov). In the event of last-minute changes, 48-hour notice is required.
- (5) 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, 2 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.
- (6) The STOP BUZZER POC information for all operations shall be provided to NTIA (bmitchell@ntia.doc.gov). This phone shall be manned 24/7.
- (7) 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
Ed Drocella at edrocella@ntia.doc.gov

Special Conditions:

- (8) 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. A blackout zone of 1500 nautical mile radius, centered at 22N160W, 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).
- (9) This STA is limited to a single Dragon capsule telemetry, tracking, and command operations for the upcoming SpaceX CRS-10 mission (SpX-10) to the International Space Station (ISS). This STA will expire when the Dragon completes its re-entry/splashdown operation or 10 Apr 2017, whichever occurs first. Any future missions shall submit new applications to the FCC to be re-coordinated with the NTIA.
- (10) 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.
- (11) 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.
- (12) 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.
- (13) Due to harmful interference expected to U.S. Government systems and operation, SpaceX uplink (2040.5675 MHz) from Vandenberg AFB, CA (NL 34-43-09; WL120-31-52, CA) during Dragon integrated or attached operations with the International Space Station shall be coordinated through NASA JSC Spectrum Manager, Cathy Sham (catherine.c.sham@nasa.gov) at least 7 business days prior to any planned transmission.
- (14) Prior to operating at Vandenberg Air Force Base, CA in California, SpaceX shall ensure proper UDS documentation is established to support operations and send a letter to 2 ROPS/DOS officially appointing schedulers to interface with the Western Range Scheduling Office. After this documentation is in place, SpaceX schedulers can coordinate and schedule operations by contacting the Western Range Scheduling Office, 2 DOPS/DOS, at 2ROPS.DOS@us.af.mil or (805) 606-8825.