

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

EXPERIMENTAL

(Nature of Service)

XD FX MO

(Class of Station)

WE2XBE

(Call Sign)

0372-EX-CR-2019

(File Number)

NAME ViaSat, Inc.

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(d, f, i) of the Commission's Rules

Station Locations

- (1) Gaithersburg (MONTGOMERY), MD - NL 39-11-43; WL 77-15-28; MOBILE:
Gaithersburg and surrounding area, Gaithersburg, MD, within 100 km, centered around
NL 39-11-43; WL 77-15-28
- (2) Duluth (GWINNETT), GA - NL 33-57-46; WL 84-05-41
- (3) Carlsbad (SAN DIEGO), CA - NL 33-07-35; WL 117-16-30
- (4) MOBILE: US, US
- (5) Miami (DADE), FL - NL 25-55-02; WL 80-13-30
- (6) MOBILE: ATLANTIC OCEAN, US
- (7) MOBILE: PACIFIC OCEAN, US
- (8) MOBILE: GULF OF MEXICO, US

Frequency Information

Carlsbad (SAN DIEGO), CA - NL 33-07-35; WL 117-16-30

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
14000-14500 MHz	FX	36M0G7D	6 MW (ERP)	

This authorization effective August 01, 2019 and
will expire 3:00 A.M. EST August 01, 2021

**FEDERAL
COMMUNICATIONS
COMMISSION**



Frequency Information

MOBILE: US, US

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
14000-14500 MHz	MO	36M0G7D 36M0G7D	30 kW (ERP)	

Miami (DADE), FL - NL 25-55-02; WL 80-13-30

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
14000-14500 MHz	FX	36M0G7D	6 MW (ERP)	

MOBILE: ATLANTIC OCEAN, US

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
14000-14500 MHz	MO	36M0G7D	30 kW (ERP)	

MOBILE: PACIFIC OCEAN, US

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
14000-14500 MHz	MO	36M0G7D	30 kW (ERP)	

Frequency Information

MOBILE: GULF OF MEXICO, US

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
14000-14500 MHz	MO	36M0G7D	30 kW (ERP)	

Special Conditions:

- (1) Licensee should be aware that other stations may be licensed on these frequencies and if any interference occurs, the licensee of this authorization will be subject to immediate shut down.
- (2) In lieu of frequency tolerance, the occupied bandwidth of the emission shall not extend beyond the band limits set forth above.
- (3) Prior to activation, the applicant must coordinate with GSFC SPEC Manager at 301-286-5087.
- (4) All operations within 125 km of NASA White Sands Center (WSC), NM or Blossom Point Complex, MD shall be coordinated with the NASA GSFC Spectrum Manager, Scott Galbraith at 301-286-5089 or vincent.s.galbraith@nasa.gov, at least 7 days in advance of operation.
- (5) This operation must protect NASA earth stations.
- (6) Stop Buzzers: Daryl Hunter at (888) 272-7232 and Steve Hemple at (760) 476-4812.
- (7) Licensee is authorized to operate one 7.1m hub fixed ground antenna and up to 50 unites of 30 cm diameter antenna on board aircrafts (ESAA) using the 14.0-14.5 GHz frequency band.
- (8) The authorized ESAA 30cm station's antenna performance specifications do not comply with Section 25.209 of the FCC Rules. The operation of these antennas will not be protected from harmful interference caused by other geostationary satellite networks to the extent that harmful interference would not be expected to be caused to an antenna that is compliant with the antenna performance standards of Section 25.209.
- (9) Operations must be in compliance with the applicable ESAA's requirement set forth in Section 25.227 of the Commission's rules.
- (10) ESAAs in aircraft on the ground must not transmit at elevation angles less than three degrees. There is no minimum angle of antenna elevation for ESAAs while airborne.
- (11) When operating in airspace within line-of-sight of the territory of a foreign administration where Fixed Service networks have an allocation in the 14.0-14.5 GHz frequency band, the ESAAs must not exceed the following EIRP limits:

+40 dBW in any 1 MHz band if Theta is less than or equal to 0°

+40 + 3*Theta dBW in any 1 MHz band if Theta is greater than 0° but less than or equal to 5°

where Theta is the angle of elevation of the horizon viewed from the center of radiation of the antenna of the earth station and measured in degrees as positive above the horizontal plane and negative below it.

Special Conditions:

- (12) Operation in the territory or airspace of any country other than the United States must comply with the applicable laws, regulations, and licensing procedures of that country, as well as with the conditions of this authorization.
- (13) The licensee shall comply with any pertinent limits established by the International Telecommunication Union to protect other services allocated internationally.
- (14) In accordance with Article 4.4 of the ITU Radio Regulations, the operations authorized herein shall not cause harmful interference to, and shall not claim protection from harmful interference caused by, a station operating in accordance with the provisions of the ITU Constitution, the ITU Convention, and the ITU Radio Regulations.

Special Conditions:

- (15) For communication between stations and GSO satellites, operations using the 14.0-14.5 GHz frequency band are subject to the following conditions:

POINT OF COMMUNICATION: Geostationary-satellite orbit (GSO) Ku-band satellites:

Satellite	Call Sign	Administration
New Skies Satellites B.V. NSS-7 at 20 WL	S2854	USA
TELSTAR 11N at 37.55 WL	S2357	USA
ESTRELA DO SUL 2 at 63 WL	S2821	Brazil
AMC-6 at 83 WL	S2347	USA
SES-2 at 87 WL	S2826	USA
AMC-15 at 105.05 WL	S2180	USA
EUTELSAT 117 WA (SATMEX 8) at 116.8 WL	S2873	France
AMC-21 at 124.9 WL	S2676	Gibraltar
Horizons 1 at 127 WL	S2475	Japan

a. The authorized fixed hub stations must be in compliance with the off-axis EIRP power spectral density ("PSD") standards (the "off-axis mask") set forth in 25.218(f) for fixed earth stations.

b. Operations of hub and ESAA stations must be in compliance with the requirements set forth in Section 25.212(c)(2) of the Commission's Rules: the input power spectral density into the antenna must not exceed -14 dBW/4 kHz.

c. Prior to commencement of operations with each satellite pursuant to this experimental license, ViaSat, Inc. (ViaSat) shall obtain a certification regarding the notification of all satellite operators with co-frequency operations within 6 degrees longitude of each satellite, generally describing the experimental operations authorized herein, including the term thereof, and providing a point of contact for the purpose of resolving any complaints of interference. ViaSat shall obtain a similar certification if, during the term of this experimental license, any of the satellites move orbit locations, or if a satellite operator commences co-frequency operations within 6 degrees longitude of each of the satellites. If the point of contact receives a complaint of harmful interference, the party receiving the complaint (if not ViaSat) will notify ViaSat, and ViaSat shall immediately cease such operations or adjust such operations to avoid harmful interference. ViaSat will submit a copy of these certification(s) to the Commission for incorporation into the record of this file.

d. The stations are authorized, on a non-protected and non-harmful interference basis, to transmit to the geostationary-orbit space stations using the 14.0-14.5 GHz frequency band that are authorized by the Commissions. The stations authorized herein must immediately terminate operations upon notification that such operation is causing harmful interference to any other radio system lawfully operating in the 14.0-14.5 GHz frequency band. The stations authorized herein cannot claim protection from harmful interference from any radio system lawfully operating in the 14.0-14.5 frequency band.

e. Operation pursuant to this authorization must be in compliance with the terms of coordination agreements between the authorized GSO Ku-band satellite operators operating in the 14.0-14.5 GHz frequency band and operators of other Ku-band geostationary space stations within six angular degrees of those space stations. In the event that another GSO FSS space station commences operation in the Ku-band at a location within six degrees of any of these space stations, earth

Special stations operating pursuant to this temporary authority shall cease transmitting to that space station unless and until such operation has been coordinated with the new space station's operator or Licensee demonstrates that such operation will not cause harmful interference to the new co-frequency space station.

f. Communications between authorized stations and ESTRELA DO SUL 2 space station must comport with all existing and future space station coordination agreements reached between the Brazil and other administrations. In the absence of a coordination agreement, such communications must comport with applicable provisions of the ITU Radio Regulations.

g. Communications between authorized stations and EUTELSAT 117 WA space station must comport with all existing and future space station coordination agreements reached between the France and other administrations. In the absence of a coordination agreement, such communications must comport with applicable provisions of the ITU Radio Regulations.

h. Communications between authorized stations and AMC-21 space station must comport with all existing and future space station coordination agreements reached between the Gibraltar and other administrations. In the absence of a coordination agreement, such communications must comport with applicable provisions of the ITU Radio Regulations.

i. Communications between authorized stations and Horizons 1 space station must comport with all existing and future space station coordination agreements reached between the Japan and other administrations. In the absence of a coordination agreement, such communications must comport with applicable provisions of the ITU Radio Regulations.

j. Communications between authorized station(s) and the Ku-band geostationary space stations must be in compliance with all existing and future space station coordination agreements reached 1) between the United States and other administrations, 2) between the Ku-band GSO operators, and 3) between the Ku-band GSO operators and Ku-band NGSO (non-geostationary space stations) operators.

Special Conditions:

- (16) For communication between stations and NGSO satellites, operations using the 14.0-14.5 GHz frequency band are subject to the following conditions:
POINT OF COMMUNICATION: Kepler Communications Inc. ("Kepler")'s non-geostationary-satellite orbit (NGSO) Ku-band satellites.

a. Operations in the 14.0-14.5 GHz frequency band must be in compliance with the equivalent power flux-density limit of 47 CFR § 25.208(k) and Article 22.5D of the ITU Radio Regulations and must be in compliance with the following:

14-14.5 GHz	34M0G7D	830W (ERP)	Maximum	31.3 dBW
14-14.5 GHz	36M0G7D	860W (ERP)	Maximum	31.5 dBW

b. To protect GSO satellite networks ESAA Earth stations transmitting to the Kepler NGSO satellites must maintain a 20° exclusion angle across all latitudes. This minimum separation angle ensures that inline events do not occur or avoiding transmission during inline events.

c. Prior to commencement of operations with each Kepler NGSO satellite pursuant to this experimental license, ViaSat shall obtain a certification regarding the notification of all GSO satellite operators with co-frequency operations within 6 degrees longitude of each satellite, generally describing the experimental operations authorized herein, including the term thereof, and providing a point of contact for the purpose of resolving any complaints of interference. ViaSat shall obtain a similar certification if, during the term of this experimental license, any of the satellites move orbit locations, or if a satellite operator commences co-frequency operations within 6 degrees longitude of each of the satellites. If the point of contact receives a complaint of harmful interference, the party receiving the complaint (if not ViaSat) will notify ViaSat, and ViaSat shall immediately cease such operations or adjust such operations to avoid harmful interference. ViaSat will submit a copy of these certification(s) to the Commission for incorporation into the record of this file.

d. Operation pursuant to this authorization must be in compliance with the terms of coordination agreements with operators of geostationary orbit Fixed Satellite Service space stations operating in the 14-14.5 GHz frequency band and operators of other Ku-band geostationary space stations within six angular degrees of those space stations. In the event that another GSO FSS space station commences operation in the Ku-band at a location within six degrees of any of these space stations, earth stations operating pursuant to this temporary authority shall cease transmitting to that space station unless and until such operation has been coordinated with the new space station's operator or Licensee demonstrates that such operation will not cause harmful interference to the new co-frequency space station.

e. ViaSat's ESAA earth stations authorized herein must be in compliance with the terms of coordination agreements with operators of non-geostationary orbit Fixed Satellite Service space stations operating in the 14-14.5 GHz frequency band. In the event another NGSO system commences operations in the U.S. market in the 14-14.5 GHz frequency band, ESAA earth stations operating pursuant to this authorization must cease operation unless and until such operation has been coordinated with the new NGSO system operator or Viasat demonstrates that such operation will not cause harmful interference to the new NGSO system.

f. Communications between authorized station(s) and the Kepler NGSO space

Special stations must comply with all existing and future coordination agreements reached between the Canada and other Administrations, including all coordination agreements reached between the Canada and the United States. In the absence of a coordination agreement, such communications must comply with applicable provisions of ITU Radio Regulations.

g. Communications between authorized station(s) and the Kepler NGSO space stations must comply with all existing and future coordination agreements reached between the Kepler NGSO and other NGSO Ku-band satellite operators.

- (17) In the 14.47-14.5 GHz band, operations are subject to footnote US342 to the U.S. Table of Frequency Allocations, 47 CFR § 2.106, and all practicable steps must be taken to protect the radio astronomy service from harmful interference.
- (18) The licensee shall not operate in the band 14.0-14.2 GHz within 125 km of the NASA TDRSS facilities on: Guam (latitude 13°36'55" N, longitude 144°51'22" E); White Sands, New Mexico (latitude 32°20'59" N, longitude 106°36'31" W and latitude 32°32'40" N, longitude 106°36'48" W); Blossom Point, Maryland (latitude 38° 25' 44" N, longitude 77° 05' 02" W.L.) unless and until it enters into an agreement with NASA that NTIA has approved. The licensee must conform its operations to the terms of any coordination agreement with NASA.
- (19) The licensee shall not operate in the band 14.47-14.50 GHz within (a) 45 km of the radio observatory on St. Croix, Virgin Islands (located at latitude 17°46' N, longitude 64°35' W); (b) 125 km of the radio observatory on Mauna Kea, Hawaii (located at latitude 19°48' N, longitude 155°28' W); and (c) 90 km of the Arecibo Observatory on Puerto Rico (located at latitude 18°20'46" N, longitude 66°45'11" W) unless and until the licensee enters into an agreement with the National Science Foundation that has been approved by NTIA. The licensee must conform its operations to the terms of any coordination agreement with the National Science Foundation.
- (20) The licensee shall not operate in the vicinity of radio observatories of Radio Astronomy Service (RAS) in the band 14.47-14.50 GHz unless and until the licensee enters into an agreement with the National Science Foundation that has been approved by NTIA. The licensee must conform its operations to the terms of any coordination agreement with the National Science Foundation. The appropriate NSF contact point to initiate coordination is Electromagnetic Spectrum Manager, NSF, 4201 Wilson Blvd., Suite 1045, Arlington, VA 22203, fax 703-292-9034, e-mail esm@nsf.gov. See also a list of each applicable RAS site, its location, and the applicable coordination zone on Table-1: Applicable RAS Facilities and Associated Coordination Distances, 47 C.F.R. 25.226(d)(2).
- (21) Licensee's ESAs 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.

Special Conditions:

- (22) Licensee's ESAA's 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.
- (23) 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.
- (24) The licensee must maintain records of the following data for each operating ESAA: location (latitude, longitude, altitude); aircraft attitude (pitch, yaw, roll); transmit frequency and occupied bandwidth; data rate; EIRP; and target satellite. This data must be recorded at intervals of no more than one minute while an ESAA is transmitting and every 30 seconds when aircraft roll angle is greater than 10 degrees. The licensee must also record instances when ESAA pointing error exceeds 0.2 degrees. The licensee must make this data available upon request to a fixed-satellite service system operator or the Commission within 24 hours after receiving the request.
- (25) ESAA's authorized herein must not be used for air traffic control communications.
- (26) Operations authorized pursuant to this license are operations by U.S.-registered aircraft anywhere within the coverage area identified in the application and the authorized frequency bands for the satellites listed as points of communication. Operations authorized pursuant to this license also include operations by non-U.S.-registered aircraft within U.S. territory, including territorial waters.
- (27) ESAA's must be in compliance with the Federal Aviation Administration (FAA) requirements as set forth in Section 17.4 of the Commission's Rules.
- (28) ESAA's must be in compliance with environmental requirement set forth in Section 1.1307 of the Commission's Rules.
- (29) Experimental station shall use the minimum power level necessary to establish communications links to minimize potential interference to licensed users.
- (30) This authorization is without prejudice to any determination that the Commission may make regarding pending or future experimental satellite earth station applications.
- (31) Operations are on a non-interference basis (NIB) and shall not cause harmful interference to, and shall not claim protection from, interference caused to it by any other lawfully operating station and it shall cease transmission(s) immediately upon notice of such interference and notify the FCC in writing.
- (32) Operations in Gaithersburg, MD and Duluth, GA are required to separate into four records including geostationary and non- geostationary in a new application.