

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

EXPERIMENTAL

(Nature of Service)

XT MO

(Class of Station)

WH2XTJ

(Call Sign)

0128-EX-CM-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(i) of the Commission's Rules

Station Locations

- (1) MOBILE: CONUS, HI, PR, U.S. Virgin Islands
- (2) MOBILE: CONUS, HI, PR, U.S. Virgin Islands

Frequency Information

MOBILE: CONUS, HI, PR, U.S. Virgin Islands

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
28350-29100 MHz	MO	10M0G7D 15M0G7D	30620 W (ERP)	
29500-30000 MHz	MO	15M0G7D	30620 W (ERP)	

This authorization effective May 23, 2019 and
will expire 3:00 A.M. EST July 01, 2021

**FEDERAL
COMMUNICATIONS
COMMISSION**



Frequency Information

MOBILE: CONUS, HI, PR, U.S. Virgin Islands

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
28350-30000 MHz	MO	24M0G7D	193000 W (ERP)	
28350-30000 MHz	MO	80M0G7D 160MG7D 320MG7D	354730 W (ERP)	1.0E-6 %
28350-30000 MHz	MO	80M0G7D 160MG7D 320MG7D	3508780 W (ERP)	1.0E-6 %

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) All customers participating in the experiment shall be informed that this operation is for experimental purposes only and can be cancelled at any time.
- (3) In lieu of frequency tolerance, the occupied bandwidth of the emission shall not extend beyond the band limits set forth above.
- (4) POINT-OF-COMMUNICATIONS: ViaSat-1, WildBlue-1, ANIK-F2, AMC-15, AMC-16, O3b, ViaSat-2 and Galaxy-28 satellites.
- (5) The designated point-of-contact to terminate transmissions if interference occurs can be reached at 1-720-493-7300.
- (6) Operation is subject to prior coordination with the existing and future Fixed Microwave Service licensees in accordance with 47 CFR, Part 101.103(d).
- (7) Viasat must maintain records of the following data for each ESAA station operating pursuant to this authorization: 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 two minutes while an earth station is transmitting and every 30 seconds when aircraft roll angle is greater than 10 degrees. Viasat must also record antenna pointing error at 30-second intervals when the error exceeds 0.25 degrees. Viasat shall make this data available upon request to an FSS system operator or the Commission within 24 hours after receiving the request.

Special Conditions:

- (8) Operation pursuant to this authorization must be in compliance with the terms of coordination agreements between the operators of the AMC-16, AMC-15, ANIK-F2, WB-1, ViaSat-1 and ViaSat-2 space stations and operators of other Ka-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 Ka-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 Viasat demonstrates that such operation will not cause harmful interference to the new co-frequency space station.
- (9) Communications between Viasat's ESAA's and the O3B space stations must be in compliance with all existing and future space station coordination agreements reached between United Kingdom and other administrations.
- (10) Viasat's ESAA 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.
- (11) Viasat's ESAA 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.
- (12) Viasat 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.
- (13) ESAA authorized herein must not be used for air traffic control communications.
- (14) Aircraft operations are limited to U.S.-registered aircraft.
- (15) Prior to operation, licensee must successfully coordinate with the existing and future Fixed Microwave Service licensees in accordance with 47 CFR, Part 101.103(d).
- (16) Operation is subject to prior coordination with Local Multipoint Distribution Service (LMDS) licenses in the area.
- (17) Prior to the operation, licensee must coordinate with DirecTV satellites operating at the 99°-103° WL and obtain a written consent from DirecTV. Operations between ESAA's and ViaSat-2 must be in compliance with the terms of coordination agreements between the operators of the DirecTV satellites and Licensee.
- (18) For transmissions of emissions 80M0G7D, 1600M0G7D, and 320M0G7D, the maximum EIRP transmitting from earth station Global Mantarray GM40 mounted on aircraft to ViaSat-2 space station (S2902) located at 69.9 ° W.L. is limited to 55.5 dBW.

Special Conditions:

- (19) For transmissions of emissions 10M0G7D, 15M0G7D, and 24M0G7D, the maximum EIRP transmitting from earth station Mantarray M40 mounted on aircraft to ViaSat-1, WildBlue-1, ANIK-F2, AMC-15, AMC-16, O3b, and ViaSat-2 satellites action is limited to 43.5 dBW.
- (20) The aircraft earth stations (ESAAs) are authorized, on a non-protected and non-harmful interference basis, to transmit to the following geostationary-orbit space stations: VIASAT-1 (Call Sign S2747) at 115.1° W.L. using the 28.35-29.1 GHz and 29.5-30.0 GHz frequency bands; WildBlue-1 (Call Sign S2355) at 111.1° W.L. using the 29.5-30.0 GHz frequency band; ANIK-F2 (Call Sign S2472) at 111.1° W.L. using the 29.5-30.0 GHz frequency band; and VIASAT-2 (Call Sign S2902) at 69.9° W.L. using the 28.35-28.6 GHz and 29.5-30.0 GHz frequency bands. The aircraft earth 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 28.35-29.1 GHz and 29.5-30.0 GHz frequency bands. The aircraft earth stations authorized herein cannot claim protection from harmful interference from any radio system lawfully operating in the 28.35-29.1 GHz and 29.5-30.0 GHz frequency bands.
- (21) Communications between Viasat's ESAAs and the ANIK-F2 and WB-1 space stations must be in compliance with all existing and future space station coordination agreements reached between Canada and other administrations.
- (22) Communication between ESAAs and NGSO O3B space station is limited to the 28.6-29.1 GHz frequency band. Operations in the 28.6-29.1 GHz frequency band are subject to the sharing method specified in Establishment of Policies and Service Rules for the Non-Geostationary Satellite Orbit, Fixed Satellite Service in the Ka-band, Report and Order, IB Docket 02-19, 18 FCC Rcd 14708 (2003) and 47 C.F.R. §25.261. The aircraft earth 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 28.6-29.1 GHz frequency band. The aircraft earth stations authorized herein cannot claim protection from harmful interference from any radio system lawfully operating in the 28.6-29.1 GHz frequency band.
- (23) ESAAs must cease transmissions when the antenna-to-GSO skew angle for antenna Model M40 and GM40, exceeds 60° and the off-axis EIRP spectral density emissions risk harmful interference to a GSO space station. The ESAA may resume transmissions once the risk of harmful interference has passed.
- (24) The authorized station's antenna performance specifications do not comply with Sections 25.138(a) and 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.

Special Conditions:

- (25) For communication between ESAA stations and GSO satellites, the operations are subject to the following conditions:
- a. POINT OF COMMUNICATION: AMC-15 @ 105.05° WL (S2180), AMC-16 @ 85° WL (S2181), WildBlue-1 @ 111.1° W.L (E040213), ANIK-F2 @ 111.1° W.L (S2472), ViaSat-1 @ 115.1° WL (S2747), ViaSat-2 @ 69.9° WL (S2902), and Galaxy-28 @ 89° W.L. (Call Sign: S2160) GSO satellites.
 - b. The ESAA stations are authorized to conduct tests via AMC-15 and AMSC-16 satellites in the 28.4-28.6 GHz and 29.5-30 GHz bands.
 - c. The ESAA stations are authorized to conduct tests via WildBlue-1 satellite in the 28.35-28.6 GHz (E-s) and 29.5-30 GHz (E-s) bands
 - d. The ESAA stations are authorized to conduct tests via ANIK-F2 satellite in the 28.35-28.6 GHz (E-s) band.
 - e. The ESAA stations are authorized to conduct tests via ViaSat-1 and ViaSat-2 satellites in the 28.35-29.1 GHz (E-s) and 29.5-30 GHz (E-s) bands.
 - f. The ESAA stations are authorized to conduct tests via Galaxy-28 satellite in the 29.5-30 GHz (E-s) bands.
 - g. Operations must be in compliance with the applicable ESAAs requirements set forth in Section 25.227 of the Commission's Rules.
 - h. Operations of the authorized stations via ViaSat-1 and ViaSat-2 satellites must be in compliance with the terms and conditions specified in the VIASAT, INC. earth station (call sign E170088).
 - i. The maximum EIRP transmitting from ESAA stations (Global Mantarray GM40) is limited to 55.5 dBW.
 - j. The maximum EIRP transmitting from ESAA stations (Mantarray M40) is limited to 43.5 dBW.
 - k. Operation pursuant to this authorization must be in compliance with the terms of coordination agreements between the operators of the AMC-15, AMC-16, WildBlue-1, ANIK-F2, ViaSat-1, ViaSat-2 and Galaxy-28 space stations and operators of other Ka-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 Ka-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 Viasat demonstrates that such operation will not cause harmful interference to the new co-frequency space station.
 - l. Viasat must maintain records of the following data for each earth station operating pursuant to this authorization: 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 two minutes while an earth station is transmitting and every 30 seconds when aircraft roll angle is

Special: greater than 10 degrees. Viasat must also record antenna pointing error at 30-second intervals when the error exceeds 0.25 degrees. Viasat shall make this data available upon request to an FSS system operator or the Commission within 24 hours after receiving the request.

m. Communications between Viasat's earth stations and the ANIK-F2 and WildBlue-1 space stations must be in compliance with all existing and future space station coordination agreements reached between Canada and other administrations

(26) Licensee is authorized to conduct tests on 25 units of VR-12Ka, 25 units of Mantarray, and 25 units of TBD ka-band ESAA antennas using the 28.6-29.1 GHz frequency bands. The operations are subject to the following conditions:

a. POINT OF COMMUNICATION: O3b Limited's NGSO (non-geostationary orbit space stations) satellites.

b. 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

c. O3b Limited's earth stations on maritime vessels 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 28.6-29.1 GHz frequency band. In the event another NGSO system commences operations in the U.S. market in the 28.6-29.1 GHz frequency bands, maritime 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 O3b Limited demonstrates that such operation will not cause harmful interference to the new NGSO system.

d. Communications between authorized station(s) and the O3b NGSO space stations must comply with all existing and future coordination agreements reached between the United Kingdom and other Administrations, including all coordination agreements reached between the United Kingdom and the United States. In the absence of a coordination agreement, such communications must comply with applicable provisions of ITU Radio Regulations.

(27) The authorized stations must be in compliance with the Federal Aviation Administration (FAA) requirements as set forth in Section 17.4 of the Commission's Rules.

(28) The authorized stations must be in compliance with environmental requirement set forth in Section 1.1307 of the Commission's Rules.

(29) This authorization is without prejudice to any determination that the Commission may make regarding pending or future experimental satellite earth station applications.

(30) 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.