

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

EXPERIMENTAL

(Nature of Service)

XT FX

(Class of Station)

WK2XGK

(Call Sign)

0222-EX-CN-2019

(File Number)

NAME WorldVu Satellites Limited

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(J) of the Commission's Rules

Station Locations

- (1) US, US
- (2) US, US
- (3) US, US
- (4) US, US

Frequency Information

US, US

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
14-14.5 GHz	FX	113MG7D	7.67 kW (ERP)	0.0001 %

US, US

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
27.5-29.1 GHz	FX	113MG7D	153.1 kW (ERP)	0.0001 %

This authorization effective July 25, 2019 and
will expire 3:00 A.M. EST August 01, 2020

**FEDERAL
COMMUNICATIONS
COMMISSION**



Frequency Information

US, US

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
29.5-30 GHz	FX	113MG7D	153.1 kW (ERP)	0.0001 %

US, US

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
14-14.5 GHz	FX	113MG7D	58 kW (ERP)	0.0001 %

US, US

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
27.5-29.1 GHz	FX	250MG7D	193 kW (ERP)	0.0001 %
29.5-30 GHz	FX	216MG7D	193 kW (ERP)	0.0001 %

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) The occupied bandwidth of the emission shall not extend beyond the band limits set forth above.
- (3) WorldVu Satellites Limited is required to coordinate with the Fixed Microwave Service licensees in accordance with 47 C.F.R. Part 101.103(d) prior to operation in 27.5-30 GHz band
- (4) PER CLEARANCE-PRIOR TO ACTIVATION, APPLICANT MUST COORDINATE WITH BLOSSOM POINT,MD
- (5) PER CLEARANCE-PRIOR TO ACTIVATION, APPLICANT MUST COORDINATE WITH WHITE SANDS,NM

Special Conditions:

- (6) COORDINATION OF OPERATIONS WITH THE NASA GSFC SPECTRUM MANAGER, SCOTT GALBRAITH AT 301-286-5089 or VINCENT.S.GALBRAITH(AT)NASA.GOV, IS REQUIRED AT LEAST 7 DAYS IN ADVANCE OF OPERATION FOR ANY OPERATIONS OCCURING WITHIN 125KM OF NASA WHITE SANDS CENTER (WSC), NM OR BLOSSOM POINT COMPLEX, MD.
- (7) THE FOLLOWING CONDITION APPLIED TO THE OPERATION IN THE 14.0-14.5 GHz FREQUENCY BAND.
 - A) PER CLEARANCE-UPON NOTIFICATION FROM THE FCC, OPERATION ON THIS ASSIGNMENT IS SUBJECT TO IMMEDIATE CESSATION, IF IT CAUSES HARMFUL INTERFERENCE TO FEDERAL OPERATIONS
- (8) POINT OF COMMUNICATION: WorldVu Satellites Limited (OneWeb)'s Ku-band and Ka-band non-geostationary-satellite orbit (NGSO) satellites.
- (9) The designated point-of-contact to terminate transmissions if interference occurs is OneWeb On-Duty Mission Director Phone: 571-336-8249
- (10) Licensee is authorized to operate and conduct demonstration on a KVH and an Intellian Ku-band antennas using the 14.0-14.5 GHz (E-s) frequency band and a KVH and an Intellian Ka-band antennas using the 27.5-29.1 GHz and 29.5-30 GHz (E-s) frequency bands in fixed mode and mobile mode (VMES).

Special Conditions:

- (11) The fixed and VMES stations are authorized to conduct tests using the 14.0-14.5 GHz frequency band. The operations are subject to the following conditions:
- a. Operations in the 14.0-14.5 GHz frequency band must be in compliance with the equivalent power flux-density limit (-160 dBW/m²/40 KHz) of 47 CFR § 25.208(k) and Article 22.5D of the ITU Radio Regulations.
 - b. Operations in the Ku-band must maintain +/-6° of avoidance angle (exclusion zone) with the GSO arc at all times. As the earth station is tracking OneWeb's NGSO satellites, it must not radiate within +/-6° of the GSO arc. The maximum EIRP density radiated towards a victim GSO satellite at any point on the GSO arc must not exceed -6.5 dBW/40 KHz.
 - c. 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.
 - d. 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.L. 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.
 - e. 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.
 - f. 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).

Special Conditions:

- (12) The fixed and VMES stations are authorized to conduct tests using the 27.5-29.1 GHz and 29.5-30 GHz (E-s) frequency bands. The operations are subject to the following conditions:
- a. Operations in the 27.5-28.6 GHz and 29.5-30 GHz (Earth-to-space) must be in compliance with the equivalent power flux-density limit (-162 dBW/m²/40 KHz) in Article 22.5D of the ITU Radio Regulations.
 - b. Operations in the Ka-band must maintain +/-6° of avoidance angle (exclusion zone) with the GSO arc at all times. As the earth station is tracking OneWeb's NGSO satellites, it must not radiate within +/-6° of the GSO arc. The maximum EIRP density radiated towards a victim GSO satellite at any point on the GSO arc must not exceed -7.5 dBW/40 KHz.
- (13) The stations are authorized, on a non-protected and non-harmful interference basis, to transmit to the non-geostationary-orbit space stations using the 14.0-14.5 GHz and 27.5-29.1 GHz and 29.5-30 GHz frequency bands 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 and 27.5-29.1 GHz and 29.5-30 GHz frequency bands. The stations authorized herein cannot claim protection from harmful interference from any radio system lawfully operating in the 14.0-14.5 GHz and 27.5-29.1 GHz and 29.5-30 GHz frequency bands.
- (14) Communications between the authorized stations and OneWeb space stations must be in compliance with all existing and future space station coordination agreements reached between the United Kingdom and other administrations. In the absence of a coordination agreement, such communications must comport with applicable provisions of the ITU Radio Regulations.

Special Conditions:

- (15) Operations of the authorized VMES stations must be in compliance with the following additional conditions:
- a. Licensee's VMES 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.
 - b. Licensee's VMES 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.
 - c. 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.
- (16) This authorization is without prejudice to any determination that the Commission may make regarding pending or future experimental satellite earth station applications.
- (17) This authorization SUPERSEDES the previously issued authorization with the same call sign and file number: amended condition.