



**UNITED STATES OF AMERICA  
FEDERAL COMMUNICATIONS COMMISSION**

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**RADIO STATION AUTHORIZATION**

**Name:** X2nSat

**Call Sign:** E140069

**Authorization Type:** Modification of License

**File Number:** SES-MOD-20200506-00500

**Common Carrier**

**Grant date:** 11/12/2020

**Expiration Date:** 09/15/2029

**Nature of Service:** Fixed Satellite Service

**Class of Station:** VSAT Network

**A) Site Location(s)**

#	Site ID	Address	Latitude	Longitude	Elevation (Meters)	Special Provisions NAD (Refer to Section H)
1)	HUB 2	8811 TRIGG LOOP Alternative HUB-(7.6M.) LAS CRUCES, NM 88007	32°15'30.0"N	106°54'30.0"W	1200	83
		Licensee certifies antenna(s) comply with gain patterns specified in Section 25.209				
2)	HUB-1	1310 Redwood Way (6.1M. HUB-1310PET) Petaluma, Sonoma, CA 94954	38°16'27.2"N	122°39'48.5"W	11.5	83
		Licensee certifies antenna(s) comply with gain patterns specified in Section 25.209				
3)	Remote12	1.2M. VSAT(3000UNITS) Conus, AK,HI,PR VI,				NA
		Licensee certifies antenna(s) comply with gain patterns specified in Section 25.209				
4)	Remote18	1.8M. VSAT(1000UNITS) Conus, AK,HI,PR VI,			0	NA
		Licensee certifies antenna(s) comply with gain patterns specified in Section 25.209				
5)	Remote75	.75M. VSAT(2000UNITS) Conus, AK,HI,PR VI,				NA
		Licensee certifies antenna(s) comply with gain patterns specified in Section 25.209				

*Subject to the provisions of the Communications Act of 1934, The Communications Satellite Act of 1962, subsequent acts and treaties, and all present and future regulations made by this Commission, and further subject to the conditions and requirements set forth in this license, the grantee is authorized to construct, use and operate the radio facilities described below for radio communications for the term beginning September 15, 2014 (3 AM Eastern Standard Time) and ending September 15, 2029 (3 AM Eastern Standard Time) . The required date of completion of construction and commencement of operation is November 12, 2021 (3 AM Eastern Standard Time) . Grantee must file with the Commission a certification upon completion of construction and commencement of operation.*



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**B) Particulars of Operations**

The General Provision 1010 applies to all receiving frequency bands.

The General Provision 1900 applies to all transmitting frequency bands.

For the text of these provisions, refer to Section H.

#	Frequency (MHz)	Polarization Code	Emission	Tx/Rx Mode	Max EIRP /Carrier (dBW)	Max EIRP Density /Carrier (dBW/4kHz)	Associated Antenna	Special Provisions (Refer to Section H)	Modulation/ Services
1)	14000.0000-14500.0000	H, V	1M50G7D	Tx	55.50	29.70	PET-Ku-3		16APSK, Data
2)	14000.0000-14500.0000	H, V	4M57G7D	Tx	60.50	29.90	PET-Ku-3		16APSK, Data
3)	11700.0000-12200.0000	H, V	128KG7D	Rx	0.00	0.00	PET-Ku-3		4CPM, DATA
4)	11700.0000-12200.0000	H, V	1M50G7D	Rx	0.00	0.00	PET-Ku-3		4CPM, Data
5)	11700.0000-12200.0000	H, V	256KG7D	Rx	0.00	0.00	PET-Ku-3		4CPM, Data
6)	11700.0000-12200.0000	H, V	2M00G7D	Rx	0.00	0.00	PET-Ku-3		4CPM, Data
7)	11700.0000-12200.0000	H, V	3M00G7D	Rx	0.00	0.00	PET-Ku-3		4CPM, Data
8)	11700.0000-12200.0000	H, V	512KG7D	Rx	0.00	0.00	PET-Ku-3		4CPM, Data
9)	11700.0000-12200.0000	H, V	768KG7D	Rx	0.00	0.00	PET-Ku-3		4CPM, Data
10)	14000.0000-14500.0000	H, V	128KG7D	Tx	38.00	22.90	Remote0.75		4CPM, Data
11)	14000.0000-14500.0000	H, V	256KG7D	Tx	38.00	19.90	Remote0.75		4CPM, Data
12)	14000.0000-14500.0000	H, V	512KG7D	Tx	38.00	16.90	Remote0.75		4CPM, Data
13)	14000.0000-14500.0000	H, V	768KG7D	Tx	38.00	15.10	Remote0.75		4CPM, Data
14)	11700.0000-12200.0000	H, V	1M50G7D	Rx	0.00	0.00	Remote0.75		16APSK, Data
15)	11700.0000-12200.0000	H, V	4M57G7D	Rx	0.00	0.00	Remote0.75		16APSK, Data
16)	14000.0000-14500.0000	H, V	128KG7D	Tx	37.00	21.90	Remote1.2		4CPM, Data
17)	14000.0000-14500.0000	H, V	1M50G7D	Tx	48.00	22.20	Remote1.2		4CPM, Data
18)	14000.0000-14500.0000	H, V	256KG7D	Tx	40.00	21.90	Remote1.2		4CPM, Data
19)	14000.0000-14500.0000	H, V	512KG7D	Tx	43.00	21.90	Remote1.2		4CPM, Data
20)	14000.0000-14500.0000	H, V	768KG7D	Tx	45.00	22.10	Remote1.2		4CPM, Data
21)	11700.0000-12200.0000	H, V	1M50G7D	Rx	0.00	0.00	Remote1.2		16APSK, Data
22)	11700.0000-12200.0000	H, V	4M57G7D	Rx	0.00	0.00	Remote1.2		16APSK, Data
23)	14000.0000-14500.0000	H, V	128KG7D	Tx	37.50	22.40	Remote1.8		4CPM, Data
24)	14000.0000-14500.0000	H, V	1M50G7D	Tx	48.50	22.70	Remote1.8		4CPM, Data



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**B) Particulars of Operations**

The General Provision 1010 applies to all receiving frequency bands.

The General Provision 1900 applies to all transmitting frequency bands.

For the text of these provisions, refer to Section H.

#	Frequency (MHz)	Polarization Code	Emission	Tx/Rx Mode	Max EIRP /Carrier (dBW)	Max EIRP Density /Carrier (dBW/4kHz)	Associated Antenna	Special Provisions (Refer to Section H)	Modulation/ Services
25)	14000.0000-14500.0000	H, V	256KG7D	Tx	40.50	22.40	Remotel.8		4CPM, Data
26)	14000.0000-14500.0000	H, V	2M00G7D	Tx	49.50	22.50	Remotel.8		4CPM, Data
27)	14000.0000-14500.0000	H, V	3M00G7D	Tx	51.50	22.70	Remotel.8		4CPM, Data
28)	14000.0000-14500.0000	H, V	512KG7D	Tx	43.50	22.40	Remotel.8		4CPM, Data
29)	14000.0000-14500.0000	H, V	768KG7D	Tx	45.50	22.60	Remotel.8		4CPM, Data
30)	11700.0000-12200.0000	H, V	1M50G7D	Rx	0.00	0.00	Remotel.8		16APSK, Data
31)	11700.0000-12200.0000	H, V	4M57G7D	Rx	0.00	0.00	Remotel.8		16APSK, Data
32)	14000.0000-14500.0000	H, V	1M50G7D	Tx	57.00	31.20	W26		16APSK, Data
33)	14000.0000-14500.0000	H, V	4M57G7D	Tx	62.00	31.40	W26		16APSK, Data
34)	11700.0000-12200.0000	H, V	128KG7D	Rx			W26		4CPM, Data
35)	11700.0000-12200.0000	H, V	1M50G7D	Rx			W26		4CPM, Data
36)	11700.0000-12200.0000	H, V	256KG7D	Rx			W26		4CPM, Data
37)	11700.0000-12200.0000	H, V	2M00G7D	Rx			W26		4CPM, Data
38)	11700.0000-12200.0000	H, V	3M00G7D	Rx			W26		4CPM, Data
39)	11700.0000-12200.0000	H, V	512KG7D	Rx			W26		4CPM, Data
40)	11700.0000-12200.0000	H, V	768KG7D	Rx			W26		4CPM, Data

**C) Frequency Coordination Limits**

#	Frequency Limits (MHz)	Satellite Arc (Deg. Long.)		Elevation (Degrees)		Azimuth (Degrees)		Max EIRP Density toward Horizon (dBW/4kHz)	Associated Antenna(s)
		East Limit	West Limit	East Limit	West Limit	East Limit	West Limit		
1)	11700.0000-12200.0000	58.0W	-139.0W	11.2	-42.5	106.3	-205.3	0	PET-Ku-3
2)	14000.0000-14500.0000	58.0W	-139.0W	11.2	-42.5	106.3	-205.3	9.4	PET-Ku-3
3)	11700.0000-12200.0000	58.0W	-139.0W	05.0	-05.0	000.0	-000.0	0	Remotel.8
4)	14000.0000-14500.0000	58.0W	-139.0W	05.0	-05.0	000.0	-000.0	7	Remotel.8



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**C) Frequency Coordination Limits**

#	Frequency Limits (MHz)	Satellite Arc (Deg. Long.)		Elevation (Degrees)		Azimuth (Degrees)		Max EIRP Density toward Horizon (dBW/4kHz)	Associated Antenna(s)
		East Limit	West Limit	East Limit	West Limit	East Limit	West Limit		
5)	14000.0000-14500.0000	58.0W	139.0W	05.0	05.0	000.0	000.0	7	Remote1.2
6)	11700.0000-12200.0000	58.0W	139.0W	05.0	05.0	000.0	000.0	0	Remote1.2
7)	14000.0000-14500.0000	58.0W	139.0W	05.0	05.0	000.0	000.0	6.8	Remote0.75
8)	11700.0000-12200.0000	58.0W	139.0W	05.0	05.0	000.0	000.0	0	Remote0.75
9)	14000.0000-14500.0000	33.5W	180.0W	05.0	05.6	099.0	261.0	9.4	W26
10)	11700.0000-12200.0000	33.5W	180.0W	05.0	05.6	099.0	261.0	0	W26

**D) Points of Communications**

The following stations located in the Satellite orbits consistent with Sections B and C of this Entry:

- 1) HUB-1 to SES-2 @ 87 ° W.L. (U.S.-licensed satellite)
- 2) Remote18 to SES-2 @ 87 ° W.L. (U.S.-licensed satellite)
- 3) Remote12 to SES-2 @ 87 ° W.L. (U.S.-licensed satellite)
- 4) Remote75 to SES-2 @ 87 ° W.L. (U.S.-licensed satellite)
- 5) HUB 2 to Permitted Space Station List

**E) Antenna Facilities**

Site ID	Antenna ID	Units	Diameter (meters)	Manufacturer	Model number	Site Elevation (Meters)	Max Antenna Height (Meters)	Special Provisions (Refer to Section H)
HUB-1	PET-Ku-3	1	6.1	Viasat	6.1m Ku 8060	11.5	4.5 AGL/ 15.5 AMSL	
	Max Gains(s):	55.8 dBi @	11.9500 GHz	57.0 dBi @	14.2500 GHz			
	Maximum total input power at antenna flange (Watts) =				30.00			
	Maximum aggregate output EIRP for all carriers (dBW) =				72.00			
Remote75	Remote0.75	2000	0.75	Newtec	75cm		1.5 AGL/ 0 AMSL	
	Max Gains(s):	37.5 dBi @	11.7000 GHz	39.0 dBi @	14.0000 GHz			
	Maximum total input power at antenna flange (Watts) =				.80			
	Maximum aggregate output EIRP for all carriers (dBW) =				38.00			



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**E) Antenna Facilities**

Site ID	Antenna ID	Units	Diameter (meters)	Manufacturer	Model number	Site Elevation (Meters)	Max Antenna Height (Meters)	Special Provisions (Refer to Section H)
Remote12	Remote1.2	3000	1.2	Skyware Global	1.2MKU		2 AGL/ 0 AMSL	
Max Gains(s):		41.8 dBi @	12.0000 GHz	43.3 dBi @	14.3000 GHz			
Maximum total input power at antenna flange (Watts) =					4.00			
Maximum aggregate output EIRP for all carriers (dBW) =					48.00			
Remote18	Remote1.8	1000	1.8	Skyware Global	1.8MKU	0	2 AGL/ 0 AMSL	
Max Gains(s):		45.3 dBi @	12.0000 GHz	46.8 dBi @	14.3000 GHz			
Maximum total input power at antenna flange (Watts) =					4.00			
Maximum aggregate output EIRP for all carriers (dBW) =					51.50			
HUB 2	W26	1	7.6	Andrew	ES76K-1	1200	8 AGL/ 1208 AMSL	
Max Gains(s):		57.0 dBi @	11.9500 GHz	59.0 dBi @	14.2500 GHz			
Maximum total input power at antenna flange (Watts) =					20.00			
Maximum aggregate output EIRP for all carriers (dBW) =					72.00			

**G) Antenna Structure marking and lighting requirements:**

None unless otherwise specified under Special and General Provisions

**H) Special and General Provisions**

A) This RADIO STATION AUTHORIZATION is granted subject to the following special provisions and general conditions:

- 4 --- Licensee must ensure that a current listing of the name, title, mailing address, email address, and telephone number of the responsible point of contact are on file at the FCC. Any changes must be filed electronically in the International Bureau Filing System (MyIBFS) using the "Pleadings and Comments" link on the MyIBFS homepage within 10 days of the change.
- 6 --- Licensee must comply with the license modification and notification requirements of 47 CFR § 25.118 to change the coordinates of its authorized earth station.
- 8 --- Licensee must notify the Commission when all earth stations operating under this authorization are no longer operational or when they have not been used to provide any service during any 6-month operation.

90398 --- Changes to previously authorized transmitting facilities, operations and devices regulated by the Commission that may have significant environmental impact, and are not excluded by §1.1306, require the preparation of an Environmental Assessment (EA) by the licensee. (See 47 C.F.R. §§1.1307, 1.1308 and 1.1311)



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## H) Special and General Provisions

A) This RADIO STATION AUTHORIZATION is granted subject to the following special provisions and general conditions:

90399 --- The licensee shall, at all times, take all necessary measures to ensure that operation of this (these) authorized earth station(s) does not create potential exposure of humans to radiofrequency radiation in excess of the FCC exposure limits defined in 47 CFR §§ 1.1307(b) and 1.1310. Physical measures must be taken to ensure compliance with limits for both occupational/controlled exposure and for general population/uncontrolled exposure, as defined in these rule sections. Compliance can be accomplished in most cases by appropriate restrictions, such as fencing. Requirements for restrictions can be determined by predictions based on calculations, modeling, or by field measurements. The FCC's OET Bulletin 65 (available on-line at [www.fcc.gov/oet/rfsafety](http://www.fcc.gov/oet/rfsafety)) provides information on predicting exposure levels and on methods for ensuring compliance, including the use of warning and alerting signs and protective equipment for workers.

900407 --- The Permitted Space Station List (Permitted List) is a list of all geostationary space stations providing fixed-satellite service pursuant to a Commission license or grant of U.S. market access. The Permitted List currently includes the following frequency bands per §25.103 and §25.115(k)(1):

- 3600-4200 MHz (space-to-Earth)
- 5850-6725 MHz (Earth-to-space)
- 10.95-11.2 GHz (space-to-Earth)
- 11.45-12.2 GHz (space-to-Earth)
- 13.75-14.5 GHz (Earth-to-space)
- 18.3-18.8 GHz (space-to-Earth)
- 19.7-20.2 GHz (space-to-Earth)
- 24.75-25.25 GHz (Earth-to-space)
- 28.35-28.6 GHz (Earth-to-space)
- 29.25-30.0 GHz (Earth-to-space).

Earth stations with "Permitted List" designated as a point of communication may access any space station on the Permitted List, provided the operations comply with the applicable "routine" uplink and downlink limits, are within the specific frequency bands authorized in the earth station license, have completed coordination with terrestrial stations pursuant to §25.203, and otherwise comply with all terms and conditions of both the earth station license and the space station grant.



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**B) This RADIO STATION AUTHORIZATION is granted subject to the additional conditions specified below:**

This authorization is issued on the grantee's representation that the statements contained in the application are true and that the undertakings described will be carried out in good faith.

This authorization shall not be construed in any manner as a finding by the Commission on the question of marking or lighting of the antenna system should future conditions require. The grantee expressly agrees to install such marking or lighting as the Commission may require under the provisions of Section 303(q) of the Communications Act. 47 U.S.C. § 303(q).

Neither this authorization nor the right granted by this authorization shall be assigned or otherwise transferred to any person, firm, company or corporation without the written consent of the Commission. This authorization is subject to the right of use or control by the government of the United States conferred by Section 706 of the Communications Act. 47 U.S.C. § 706. Operation of this station is governed by Part 25 of the Commission's Rules. 47 C.F.R. Part 25.

This authorization shall not vest in the licensee any right to operate this station nor any right in the use of the designated frequencies beyond the term of this license, nor in any other manner than authorized herein.

This authorization is issued on the grantee's representation that the station is in compliance with environmental requirements set forth in Section 1.1307 of the Commission's Rules. 47 C.F.R. § 1.1307.

This authorization is issued on the grantee's representation that the station is in compliance with the Federal Aviation Administration (FAA) requirements as set forth in Section 17.4 of the Commission's Rules. 47 C.F.R. § 17.4.

The following condition applies when this authorization permits construction of or modifies the construction permit of a radio station.

This authorization shall be automatically forfeited if the station does not meet each required construction deadline by the required date of completion unless, before such date(s), a specific application is timely filed to request an extension of the construction deadline(s), supported with good cause why that failure to construct by the required date was due to factors not under control of the grantee.

**Licensees are required to pay annual regulatory fees related to this authorization. The requirement to collect annual regulatory fees from regulatees is contained in Public Law 103-66, "The Omnibus Budget Reconciliation Act of 1993." These regulatory fees, which are likely to change each fiscal year, are used to offset costs associated with the Commission's enforcement, public service, international and policy and rulemaking activities. The Commission issues a Report and Order each year, setting the new regulatory fee rates. Receive only earth stations are exempt from payment of regulatory fees.**