

APPLICATION FOR EARTH STATION SPECIAL TEMPORARY AUTHORITY

APPLICANT INFORMATION Enter a description of this application to identify it on the main menu:
NIMIQ-2

1. Applicant

Name:	Universal Space Network, Inc.	Phone Number:	215-328-9130
DBA Name:		Fax Number:	215-328-9132
Street:	417 Caredean Drive Suite A	E-Mail:	jpgreet@uspacenet.com
City:	Horsham	State:	PA
Country:	USA	Zipcode:	19044
Attention:	Joanne Greet		



File # SES-TF-20160328-00300

Call Sign 4-12-116 Grant Date 4-12-116
(or other identifier)

From: 4-15-16 Term Dates To: 5-15-16

Approved: Paul E. Allen

Application: Universal Space Network, Inc.
File No.: SES-STA-20160328-00300
Call Sign: None
Special Temporary Authority

Universal Space Network, Inc. ("USN") is granted a special temporary authority ("STA"), under the following conditions, for 90 days, beginning April 15, 2016, to operate a 13 meter antenna located at its Naalehu (Ka'u), HI teleport to support telemetry and tracking (downlink only) with the Nimiq-2 satellite at orbital location 148° E.L. licensed by Canada, using the following center frequencies: 12202.50 MHz and 12695.00 MHz (space-to-Earth) during in-orbit testing .

1. All operations under this grant of STA shall be on an unprotected and non-harmful interference basis. USN's shall not cause harmful interference to, and shall not claim protection from interference caused to it by, any other lawfully operating radio communication system.
2. This is not a grant of market access for the Nimiq-2 spacecraft.
2. In the event of any harmful interference under this grant of STA, USN must cease operations immediately upon notification of such interference, and must inform the Commission, in writing, immediately of such an event.
3. Grant of this authorization is without prejudice to any determination that the Commission may make regarding pending or future USN's applications.
4. Any action taken or expense incurred as a result of operations pursuant to this STA is solely at USN's risk.
5. This action is issued pursuant to Section 0.261 of the Commission's rules on delegated authority, 47 C.F.R. §0.261, and is effective immediately.



File # SES-STA-20160328-00300

Call Sign _____ Grant Date 4-15-16
(or other identifier)

Term Dates
From: 4-15-16 To: 5-15-16

Approved: Paul E. Miller

2. Contact	
Name:	Universal Space Network, Inc. Phone Number: 215-328-9130
Company:	417 Caredean Drive Fax Number: 215-328-9132
Street:	Suite A E-Mail: jgreet@uspacenet.com
City:	Horsham State: PA
Country:	USA Zipcode: 19044 -
Attention:	Relationship: Same
(If your application is related to an application filed with the Commission, enter either the file number or the IB Submission ID of the related application. Please enter only one.)	
3. Reference File Number or Submission ID	
4a. Is a fee submitted with this application?	
<input checked="" type="radio"/> If Yes, complete and attach FCC Form 159. If No, indicate reason for fee exemption (see 47 C.F.R. Section 1.1114).	
<input type="radio"/> Governmental Entity <input type="radio"/> Noncommercial educational licensee	
<input type="radio"/> Other (please explain):	
4b. Fee Classification CGX – Fixed Satellite Transmit/Receive Earth Station	
5. Type Request	
<input checked="" type="radio"/> Use Prior to Grant <input type="radio"/> Change Station Location <input type="radio"/> Other	
6. Requested Use Prior Date	
04/15/2016	
7. City Naalehu	
8. Latitude	
(dd mm ss.s h) 19 0 50.3 N	

9. State HI	10. Longitude (dd mm ss.s h) 155 39 46.6 W
11. Please supply any need attachments. Attachment 1: FCC312 NIMI-Q-2 Attachment 2: Waiver for NIMI-Q-2 Attachment 3: NIMI-Q-2 Support	
12. Description. (If the complete description does not appear in this box, please go to the end of the form to view it in its entirety.) Support Telemetry & Tracking (downlink only) during the drift of the NIMI-Q-2 spacecraft for 90 days starting on April 15, 2016	
13. By checking Yes, the undersigned certifies that neither applicant nor any other party to the application is subject to a denial of Federal benefits that includes FCC benefits pursuant to Section 5301 of the Anti-Drug Act of 1988, 21 U.S.C. Section 862, because of a conviction for possession or distribution of a controlled substance. See 47 CFR 1.2002(b) for the meaning of "party to the application" for these purposes. Yes <input checked="" type="radio"/> No <input type="radio"/>	
14. Name of Person Signing Joanne Greet	15. Title of Person Signing Manager of Compliance
WILLFUL FALSE STATEMENTS MADE ON THIS FORM ARE PUNISHABLE BY FINE AND / OR IMPRISONMENT (U.S. Code, Title 18, Section 1001), AND/OR REVOCATION OF ANY STATION AUTHORIZATION (U.S. Code, Title 47, Section 312(a)(1)), AND/OR FORFEITURE (U.S. Code, Title 47, Section 503).	

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THE FOREGOING NOTICE IS REQUIRED BY THE PAPERWORK REDUCTION ACT OF 1995, PUBLIC LAW 104-13, OCTOBER 1, 1995, 44 U.S.C. SECTION 3507.

FEDERAL COMMUNICATIONS COMMISSION
APPLICATION FOR SATELLITE SPACE AND EARTH STATION AUTHORIZATIONS
Technical and Operational Description
(Place an "X" in one of the blocks below)

License of New Station Registration of new Domestic Receive-Only Station Amendment to a Pending Application Modification of License/Registration Notification of Minor Modification

B1. Location of Earth Station Site. If temporary-fixed, mobile, or VSAT remote facility, specify area of operation and point of contact. If VSAT hub station, give its location For VSAT networks attach individual Schedule B, Page 1 sheets for each hub station and each remote station. Individually provide the Location, Points of Communications, and Destination Points for each hub and remote station.

B1a. Station Call Sign USHI01	B1b. Site identifier (HUB, REMOTE1, etc.)	B1c. Telephone Number (808) 929-8069	B1j. Geographic Coordinates N/S, Deg. - Min. - Sec. - E/W Lat. <u>19°</u> <u>00'</u> <u>50.3"</u> N Lon. <u>155°</u> <u>39'</u> <u>46.6"</u> W	B1k. Lat./Lon. Coordinates are: <input type="checkbox"/> NAD-27 <input checked="" type="checkbox"/> NAD-83
B1d. Mailing Street Address of Station or Area of Operation 93-1704 South Point Road		B1e. Name of Contact Person Joanne Greet	B1l. Site Elevation (AMSL) 378.0 meters	
B1f. City Naalehu	B1g. County Ka'u	B1h. State HI	B1i. Zip Code 96772-0842	

B2. Points of Communications: List the names and orbit locations of all satellites with which this earth station will communicate. The entry "ALSAT" is sufficient to identify the names and locations of all satellite facilities licensed by the U.S. All non-U.S. licensed satellites must be listed individually.

Satellite Name and Orbit Location	Satellite Name and Orbit Location
NIMIQ-2 moving to 148 deg East	

B3. Destination points for communications using non-U.S. licensed satellites. For each non-U.S. licensed satellite facility identified in section B2 above, specify the destination point(s) (countries) where the services will be provided by this earth station via each non-U.S. license satellite system. Use additional sheets as needed.

Satellite Name	List of Destination Points
TelSat NIMIQ-2	Canada

FEDERAL COMMUNICATIONS COMMISSION
APPLICATION FOR SATELLITE SPACE AND EARTH STATION AUTHORIZATIONS
FCC Form 312 - Schedule B: (Technical and Operational Description)

B4. Earth Station Antenna Facilities: Use additional pages as needed.

(a) Site ID*	(b) Antenna ID**	(c) Quantity	(d) Manufacturer	(e) Model	(f) Antenna Size (meters)	(g) Antenna Gain Transmit and/or Receive (dBi at GHz)
USHI01	HI-13M	1	Datron	1453	13.0	62.0 dBi at 12.5 GHz

B5. Antenna Heights and Maximum Power Limits: (The corresponding Antenna ID in tables B4 and B5 applies to the same antenna)

(a) Antenna ID**	(b) Antenna Structure Registration No.	Maximum Antenna Height		(e) Building Height Above Ground Level (meters)***	(f) Maximum Antenna Height Above Rooftop (meters)***	(g) Total Input Power at antenna flange (Watts)	(h) Total EIRP for all carriers (dBW)
		(c) Above Ground Level (meters)	(d) Above Mean Sea Level (meters)				
HI-13M		20.0	398.0				

Notes: * If this is an application for a VSAT network, identify the site (Item B1b, Schedule B, Page 1) where each antenna is located. Also include this Site-ID on Schedule B, Page 5.
** Identify each antenna in VSAT network or multi-antenna station with a unique identifier, such as HUB, REMOTE1, A1, A2, 10M, 12M, 7M, etc. Use this same antenna ID throughout tables B4, B5, B6, and B7 when referring to the same antenna.
*** Attach sketch of site or exemption, See 47 CFR Part 17.

APPLICATION FOR SATELLITE SPACE AND EARTH STATION AUTHORIZATIONS FCC Form 312 - Schedule B: (Technical and Operational Description)

B6. Frequency Coordination Limits: Use additional pages as needed.

(a) Antenna ID*	(b) Frequency Limits (MHz)	(c) Range of Satellite Arc Eastern Limit**	(d) Range of Satellite Arc Western Limit**	(e) Antenna Elevation Angle Eastern Limit	(f) Antenna Elevation Angle Western Limit	(g) Earth Station Azimuth Angle Eastern Limit	(h) Earth Station Azimuth Angle Western Limit	(i) Maximum EIRP Density toward the Horizon (dBW/4kHz)
HI-13M	12202.500	0.0° W.L.	360.0° W.L.	5.0°	5.0°			
HI-13M	12695.000	0.0° W.L.	360.0° W.L.	5.0°	5.0°			

Notes:
 * Provide the ANTENNA-ID from table B4 to identify the antenna to which each frequency band and orbital arc range is associated.
 ** If operating with geostationary satellites, give the orbital arc limits and the associated elevation and azimuth angles. If operating with non-geostationary satellites, give the notation "NON-GEO" for the satellite arc and give the minimum operational elevation angle and the maximum azimuth angle range.

FEDERAL COMMUNICATIONS COMMISSION
 APPLICATION FOR SATELLITE SPACE AND EARTH STATION AUTHORIZATIONS
 FCC Form 312 - Schedule B: (Technical and Operational Description)

B7. Particulars of Operation (Full particulars are required for each r.f. carrier): Use additional pages as needed.

(a) Antenna ID*	(b) Frequency Limits (MHz)	(c) T/R Mode **	(d) Antenna Polarization (H,V,L,R)	(e) Emission Designator	(f) Maximum EIRP per Carrier (dBW)	(g) Maximum EIRP Density per Carrier (dBW/4kHz)	(h) Description of Modulation and Services
HI-13M	12202.500	R	L, R	100KG2D		4 kbps data is PSK modulated into a 49.152 kHz subcarrier	
HI-13M	12695.000	R	L, R	150KG2D		4 kbps data is PSK modulated into a 73.728 kHz subcarrier	

Notes: * Provide the ANTENNA-ID from table B4 to identify the antenna to which each frequency band and emission is associated. For VSAT networks, include frequencies and emissions for all HUB and REMOTE units.
 ** Indicate whether the earth station transmits or receives in each frequency band.

**FEDERAL COMMUNICATIONS COMMISSION
APPLICATION FOR SATELLITE SPACE AND EARTH STATION AUTHORIZATIONS
FCC Form 312 - Schedule B: (Technical and Operational Description)**

If VSAT Network, provide the SITE-ID (Item B1b) of the station that B8-B13 are in response to (HUB, REMOTE1, etc.): _____

<p>B8. If the proposed antenna(s) operate in the Fixed Satellite Service (FSS) with geostationary satellites, do(es) the proposed antenna(s) comply with the antenna gain patterns specified in Section 25.209(a) and (b) as demonstrated by the manufacturer's qualification measurements? If NO, provide as an exhibit, a technical analysis showing compliance with two-degree spacing policy. <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A</p> <p>B9. If the proposed antenna(s) do not operate in the Fixed Satellite Service (FSS), or if they operate in the Fixed Satellite Service (FSS) with non-geostationary satellites, do(es) the proposed antenna(s) comply with the antenna gain patterns specified in Section 25.209(a2) and (b) as demonstrated by the manufacturer's qualification measurement? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO</p> <p>B10. Is the facility operated by remote control? If YES, provide the location and telephone number of the control point. <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO</p>									
<p align="center">Remote Control Point Location:</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:40%; padding: 2px;">B10a. Street Address 417 Caredean Drive Suite A</td> <td style="width:20%; padding: 2px;">B10d. State/Country PA</td> <td style="width:40%; padding: 2px;">B10e. Zip Code 19044</td> </tr> <tr> <td style="padding: 2px;">B10b. City Horsham</td> <td style="padding: 2px;">B10c. County Montgomery</td> <td style="padding: 2px;">B10g. Call Sign of Control Station (if appropriate)</td> </tr> <tr> <td style="padding: 2px;">B10f. Telephone Number 215-328-9130</td> <td colspan="2"></td> </tr> </table>	B10a. Street Address 417 Caredean Drive Suite A	B10d. State/Country PA	B10e. Zip Code 19044	B10b. City Horsham	B10c. County Montgomery	B10g. Call Sign of Control Station (if appropriate)	B10f. Telephone Number 215-328-9130		
B10a. Street Address 417 Caredean Drive Suite A	B10d. State/Country PA	B10e. Zip Code 19044							
B10b. City Horsham	B10c. County Montgomery	B10g. Call Sign of Control Station (if appropriate)							
B10f. Telephone Number 215-328-9130									
<p>B11. Is frequency coordination required? If YES, attach a frequency coordination report as an exhibit. <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO</p>									
<p>B12. Is coordination with another country required? If YES, attach the name of the country(ies) and plot of coordination contours as an exhibit. <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO</p>									
<p>B13. FAA Notification - (See 47 CFT Part 17 and 47 CFT Part 25.113(c)) Where FAA notification is required, have you attached a copy of a completed FCC Form 854 and/or the FAA's study regarding the potential hazard of the structure to aviation? FAILURE TO COMPLY WITH 47 CFT PARTS 17 AND 25 WILL RESULT IN THE RETURN OF THIS APPLICATION <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO</p>									

Exhibit C
PETITION FOR WAIVER OF SECTION 25.137 AND 25.114

I. TO THE EXTENT THEY APPLY, GOOD CAUSE EXISTS FOR A WAIVER OF CERTAIN PORTIONS OF SECTIONS 25.137 AND 25.114

Universal Space Network, Inc. (USN) is provided limited legal and technical information for the Telesat NIMIQ-2 geostationary communications spacecraft.¹ Pursuant to Section 25.137 of the Federal Communications Commission's ("Commission" or "FCC") rules, the same technical information required by Section 25.114 for U.S.-licensed space station, and certain legal information, must be submitted by earth station applicants "requesting authority to operate with a non-U.S. licensed space station to serve the United States..."² USN seeks authority to support the needed Telemetry and Tracking during and just after a drift from 66° East to 148° East. This support would be conducted just like a Launch and Early Orbit operation ("LEOP"), not commercial service to the United States, and thus believes that Section 25.137 does not apply.

To the extent the Commission determines, however, that USN's request for authority to provide LEOP type services on a special temporary basis is a request to serve the United States with a non-U.S.-licensed satellite, USN respectfully requests a waiver of Sections 25.137 and 25.114 of the Commission's rules, to the extent that USN has not herein provided the information required by these rules.³ The Commission may grant a waiver for good cause shown.⁴ A waiver is therefore appropriate if special circumstances warrant a deviation from the general rule, and such a deviation will serve the public interest.

In this case, good cause for a waiver of portions of Section 25.114 exists. USN seeks authority only to conduct LEOP support for Telesat NIMIQ-2. Thus, any information sought by Section 25.114 that is not relevant to the LEOP – e.g., antenna patterns, energy and propulsion and orbital debris - USN does not have. In addition, USN would not easily be able to obtain such information because USN is not the operator of the Telesat NIMIQ-2 satellites, rather, USN has been contracted by Telesat to support the drift maneuver and subsequent on orbit testing in Ku-band of the satellite prior to its new orbital slot operations.

No coordination was conducted by Comsearch as there will be no uplink to the spacecraft and thus no potential to affect other terrestrial operators. Moreover, as with any STA, USN will conduct the LEOP type activity on an unprotected, non-interference basis to government operations.

¹ FCC Form 312 Section B

² 47 C.F.R. § 25.137(a)

³ 47 C.F.R. §§25.137 and 25.114

⁴ 47 C.F.R. §1.3

Because it is not relevant to the service for which USN seeks authorization, and because obtaining the information would be a hardship, USN seeks a waiver of all the technical and legal information required by Section 25.114, to the extent it is not provided herein. As noted above, USN has provided the required information to the extent that it is relevant to the LEOP service for which USN seeks authorization.

Good cause also exists to waive portions of Section 25.137, to the extent the information required is not herein provided. Section 25.137 is designed to ensure that “U.S.-licensed satellite systems have effective competitive opportunities to provide analogous services” in other countries. Here, there is no service being provided by the satellite; USN is providing TT&C while the satellite is drifting and subsequent on orbit testing. Thus, the purpose of the information required by Section 25.137 is not implicated here. For example, Section 25.137(d) requires earth station applicants requesting authority to operate with a non-U.S.-licensed space station that is not in orbit and operating to post a bond.⁵ The underlying purpose in having to post a bond – i.e., to prevent warehousing of orbital locations by operators seeking to serve the United States – would not be served by requiring USN to post a bond in order to conduct up to 90 days of support of the Telesat NIMIQ-2 satellite.

It is USN’s understanding that Telesat NIMIQ-2 is licensed by Canada. Telesat NIMIQ-2 is a communication satellite. The spacecraft is primarily meant to serve Canada. Thus, the purpose of Section 25.137 – to ensure that U.S. satellite operators enjoy “effective competitive opportunities” to serve foreign markets and to prevent warehousing of orbital locations service the United States – will not be undermined by grant of this waiver request.

Finally, USN notes that it expects to communicate with the Telesat NIMIQ-2 satellite using its U.S. earth station for a period of 90 days. Requiring USN to obtain technical and legal information from an unrelated party, where there is no risk of interference and the operation will cease within 90 days would pose undue hardship without serving underlying policy objectives. Given these particular facts, the waiver sought herein is appropriate.

⁵ 47 C.F.R. §25.137(d)(4)

⁶ 47 C.F.R. §2.106

⁷ Previously approved STA’s for Universal Space Network SES-STA-20020725-01174; SES-STA-20021112-02008; SES-STA-20040315-00475

Drift support of NIMIQ-2 from USN's Hawaii ground station

NIMIQ-2 is a Telesat Canada communications satellite being drifted from 66° East to 148° East. USN has been contracted to support the NIMIQ-2 spacecraft geo spacecraft for a period of up to 90 days as it is drifted to its new orbital position and then a subsequent test period before it becomes operational in its new slot.

The Hawaii ground station will have visibility of the spacecraft as it approaches 127° East on its way to 148° East over the western Pacific ocean. Hawaii will be called on to support several hours to days at a time during the drift and orbital checkout. Support will be receive only.

	Downlink	Uplink
NIMIQ-2	12202.500 MHz	NA
NIMIQ-2	12695.000 MHz	NA

Flux Density impinging on the ground in Hawaii from NIMIQ-2

The Flux density is calculated as:

$$\text{Flux density} = \text{EIRP} \div (4 \pi Rse^2)$$

Where *Rse* is the distance from spacecraft to the ground?

Where *EIRP* is the Effective Isotropic Radiated Power of the spacecraft?

Data from the spacecraft owner indicates that the nominal EIRP for the spacecraft is +8.20 dBW. Being a near circular orbit geo orbit the altitude (and thus the closest distance to earth during an overhead pass) is = 35,800 Km.

Converting +8.20 dBW to scalar watts = 6.606 watts transmitted at 12202.5 MHz

Therefor:

$$\text{Flux density} = 6.606 \div (4 \pi * 35,800,000 \text{ meters}^2)$$

$$\text{Flux density} = 4.102 \times 10^{-16} \text{ Watts/meter}^2$$

Or

$$\text{Flux density} = 4.102 \times 10^{-17} \text{ mW/cm}^2$$