



**UNITED STATES OF AMERICA  
FEDERAL COMMUNICATIONS COMMISSION  
RADIO STATION AUTHORIZATION**

Name: Denali 20020, LLC

Call Sign: E990069

Authorization Type: Modification of License

File Number: SES-MOD-20140630-00551

Non Common Carrier

Grant date: 01/27/2016

Expiration Date: 06/24/2024



Nature of Service: Earth Exploration Satellite Service

Class of Station: Fixed Earth Stations

**A) Site Location(s)**

#	Site ID	Address	Latitude	Longitude	Elevation (Meters)	Special Provisions NAD (Refer to Section H)
1)	1	P.O. BOX 430, 66C USEI DRIVE BREWSTER, OKANOGAN, WA 98812	48°8'48.8"N	119°42'4.2"W	382.8	83

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 June 24, 2009 (3 AM Eastern Standard Time) and ending June 24, 2024 (3 AM Eastern Standard Time) . The required date of completion of construction and commencement of operation is January 27, 2017 (3 AM Eastern Standard Time) . Grantee must file with the Commission a certification upon completion of construction and commencement of operation.*

**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)	8166.5850-8233.4150	H, V, L, R	66M8G1D	Rx			BREW-5		DIGITAL
2)	8099.5850-8166.4150	H, V, L, R	66M8G1D	Rx	0.00		BREW-5		DIGITAL
3)	7071.9000-7073.9000	L, R	250KG2D	Rx			BREW-5		TT&C
4)	7071.9000-7073.9000	L, R	250KG9D	Rx			BREW-5		TT&C
5)	7071.2000-7071.2000	R	NON	Rx			BREW-5		AFC
6)	7068.3000-7068.5000	L, R	75K0G1D	Rx			BREW-5		SRMS TELEMETRY
7)	7068.3000-7068.5000	L, R	75K0G1W	Rx			BREW-5		SRMS TELEMETRY
8)	7068.3000-7068.5000	L, R	75K0G7D	Rx			BREW-5		SRMS TELEMETRY
9)	7068.3000-7068.5000	L, R	75K0G7W	Rx			BREW-5		SRMS TELEMETRY



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10)	7017.3000-7017.5000	L,R	75K0G1D	Rx			BREW-5		SRMS TELEMETRY
11)	7017.3000-7017.5000	L,R	75K0G1W	Rx			BREW-5		SRMS TELEMETRY
12)	7017.3000-7017.5000	L,R	75K0G7D	Rx			BREW-5		SRMS TELEMETRY
13)	7017.3000-7017.5000	L,R	75K0G7W	Rx			BREW-5		SRMS TELEMETRY
14)	7015.1000-7015.1000	L	NON	Rx			BREW-5		AFC
15)	7011.0000-7013.0000	L,R	250KG2D	Rx			BREW-5		TT&C
16)	7011.0000-7013.0000	L,R	250KG9D	Rx			BREW-5		TT&C
17)	5242.5000-5244.5000	L,R	1M00F2D	Tx	81.00	70.20	BREW-5		TT&C-EMERGENCY ONLY
18)	5242.5000-5244.5000	L,R	1M00F9D	Tx	81.00	70.20	BREW-5		TT&C-EMERGENCY ONLY
19)	5242.5000-5244.5000	L,R	1M00F2D	Tx	66.00	55.20	BREW-5		TT&C-NORMAL OPERATION
20)	5242.5000-5244.5000	L,R	1M00F9D	Tx	66.00	55.20	BREW-5		TT&C-NORMAL OPERATION
21)	5241.2000-5241.2000	R	NON	Tx	42.00	42.00	BREW-5		AFC
22)	5237.3000-5238.2000	L,R	100KG1D	Tx	58.30	44.30	BREW-5		HPN COMMAND-DIGITAL
23)	5237.3000-5238.2000	L,R	100KG1W	Tx	58.30	44.30	BREW-5		HPN COMMAND-DIGITAL
24)	5237.3000-5238.2000	L,R	100KG7D	Tx	58.30	44.30	BREW-5		HPN COMMAND-DIGITAL
25)	5237.3000-5238.2000	L,R	100KG7W	Tx	58.30	44.30	BREW-5		HPN COMMAND-DIGITAL
26)	5236.9000-5237.3000	L,R	100KG1D	Tx	58.30	44.30	BREW-5		SRMS COMMAND-DIGITAL
27)	5236.9000-5237.3000	L,R	100KG1W	Tx	58.30	44.30	BREW-5		SRMS COMMAND-DIGITAL
28)	5236.9000-5237.3000	L,R	100KG7D	Tx	58.30	44.30	BREW-5		SRMS COMMAND-DIGITAL
29)	5236.9000-5237.3000	L,R	100KG7W	Tx	58.30	44.30	BREW-5		SRMS COMMAND-DIGITAL
30)	5186.7000-5187.1000	L,R	100KG1W	Tx	58.30	4.30	BREW-5		SRMS COMMAND-DIGITAL
31)	5186.7000-5187.1000	L,R	100KG1D	Tx	58.30	44.30	BREW-5		SRMS COMMAND-DIGITAL
32)	5186.7000-5187.1000	L,R	100KG7D	Tx	58.30	44.30	BREW-5		SRMS COMMAND-DIGITAL
33)	5186.7000-5187.1000	L,R	100KG7W	Tx	58.30	44.30	BREW-5		SRMS COMMAND-DIGITAL



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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
34)	5185.8000-5186.7000	L,R	100KG1D	Tx	58.30	44.30	BREW-5		HPN COMMAND-DIGITAL
35)	5185.8000-5186.7000	L,R	100KG1W	Tx	58.30	44.30	BREW-5		HPN COMMAND-DIGITAL
36)	5185.8000-5186.7000	L,R	100KG7D	Tx	58.30	44.40	BREW-5		HPN COMMAND-DIGITAL
37)	5185.8000-5186.7000	L,R	100KG7W	Tx	58.30	44.30	BREW-5		HPN COMMAND-DIGITAL
38)	5185.1000-5185.1000	L	NON	Tx	42.00	42.00	BREW-5		AFC
39)	5179.5000-5181.5000	L,R	1M00F2D	Tx	81.00	70.20	BREW-5		TT&C-EMERGENCY ONLY
40)	5179.5000-5181.5000	L,R	1M00F9D	Tx	81.00	70.20	BREW-5		TT&C-EMERGENCY ONLY
41)	5179.5000-5181.5000	L,R	1M00F2D	Tx	66.00	55.20	BREW-5		TT&C-NORMAL OPERATION
42)	5179.5000-5181.5000	L,R	1M00F9D	Tx	66.00	55.20	BREW-5		TT&C-NORMAL OPERATION
43)	2055.3450-2056.6550	H,V,L,R	1M31F1D	Tx	49.01	23.90	BREW-5		DIGITAL DATA CARRIER
44)	449.9700-450.0300	R	60K0F1D	Tx	25.48	13.72	UHF_YAGI		DIGITAL
45)	401.2700-401.3300	R	60K0F1D	Rx			UHF_YAGI		DIGITAL

**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)	5179.5000-5181.5000		NGSO		05.0-05.0		-000.0	21.4	BREW-5
2)	5242.5000-5244.5000		NGSO		05.0-05.0		-000.0	21.4	BREW-5
3)	7011.0000-7013.0000		NGSO		05.0-05.0		-000.0		BREW-5
4)	7071.9000-7073.9000		NGSO		05.0-05.0		-000.0		BREW-5
5)	5185.1000		NGSO		05.0-05.0		-000.0	0	BREW-5
6)	5241.2000		NGSO		05.0-05.0		-000.0	0	BREW-5
7)	5185.8000-5186.7000		NGSO		05.0-05.0		-000.0	0	BREW-5
8)	5186.7000-5187.1000		NGSO		05.0-05.0		-000.0		BREW-5
9)	5236.9000-5237.3000		NGSO		05.0-05.0		-000.0		BREW-5
10)	5237.3000-5238.2000		NGSO		05.0-05.0		-000.0		BREW-5



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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		
11)	7017.3000-7017.5000	NGSO		05.0-05.0					BREW-5
12)	7068.3000-7068.5000	NGSO		05.0-05.0					BREW-5
13)	7015.1000	NGSO		05.0-05.0					BREW-5
14)	7071.2000	NGSO		05.0-05.0					BREW-5
15)	8099.5850-8166.4150	NGSO		05.0-05.0		-360.0			BREW-5
16)	8166.5850-8233.4150	NGSO		05.0-05.0		-360.0			BREW-5
17)	2055.3450-2056.6550	NGSO		05.0-05.0		-360.0		-17.6	BREW-5
18)	401.2700-401.3300	NGSO		05.0-05.0		-360.0			UHF_YAGI
19)	449.9700-450.0300	NGSO		05.0-05.0		-360.0		-13.72	UHF_YAGI

**D) Points of Communications**

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

- 1) 1 to ICO MEO constellation of the United Kingdom satellite system. (Non-U.S.-licensed)
- 2) 1 to Planet Labs FLOCK 1(S2912) NGSO EESS (U.S.-licensed)

**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)
1	BREW-5	1	7.6	NEC	G2573C	382.8	11.9 AGL/ 394.7 AMSL	
		Max Gains(s):		41.5 dBi @ 2.0560 GHz	53.4 dBi @ 8.0000 GHz			
		Maximum total input power at antenna flange (Watts) =		1,175.00				
		Maximum aggregate output EIRP for all carriers (dBW) =		81.00				
1	UHF_YAGI	1	2.7	M2 INC.	450CP34/400CP30	382.8	3.8 AGL/ 386.6 AMSL	
		Max Gains(s):		16.5 dBi @ 0.4010 GHz	16.5 dBi @ 0.4500 GHz			
		Maximum total input power at antenna flange (Watts) =		7.90				
		Maximum aggregate output EIRP for all carriers (dBW) =		25.48				

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

None unless otherwise specified under Special and General Provisions



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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:

- 1010 --- Applicable to all receiving frequency bands. Emission designator indicates the maximum bandwidth of received signal at associated station(s). Maximum EIRP and maximum EIRP density are not applicable to receive operations.
- 1900 --- Applicable to all transmitting frequency bands. Authority is granted to transmit any number of RF carriers with the specified parameters on any discrete frequencies within associated band in accordance with the other terms and conditions of this authorization, subject to any additional limitations that may be required to avoid unacceptable levels of inter-satellite interference.
- 2916 --- Transmitter(s) must be turned off during antenna maintenance to ensure compliance with the FCC-specified safety guidelines for human exposure to radiofrequency radiation in the region between the antenna feed and the reflector. Appropriate measures must also be taken to restrict access to other regions in which the earth station's power flux density levels exceed the specified guidelines.
- 3212 --- The licensee shall take extraordinary measures to ensure that multiple antennas co-located at the same site do not create potential exposure to radiofrequency radiation in excess of FCC safety guidelines. Antennas shall be surrounded by a fence, at least 2 meters tall with a locked gate, to prevent human exposure in excess of the FCC-specified safety limit of 1 mW/cm<sup>2</sup>. Warning signs, such as those discussed in the FCC's OET Bulletin 65, shall be posted informing members of the public to keep outside the locked area. All operations must be in compliance with Section 1.1307 (b)(3) of the Commission's Rules. (See 47 CFR 1.1307 (b) (3)).
- 3214 --- All operations must be in compliance with Section 1.1307 (b)(3) of the Commission's Rules. (See 47 CFR 1.1307 (b) (3))
- 3217 --- This authorization is issued pursuant to and is subject to the conditions and terms set forth in the Commission's Orders and Authorizations, DA 99-1249 (released June 24, 1999) and DA 00-547 (released March 10, 2000).
- 3219 --- All existing transmitting facilities, operations and devices regulated by the Commission must be in compliance with the Commission's radiofrequency (RF) exposure guidelines, pursuant to Section 1.1307(b)(1) through (b)(3) of the Commission's rules, or if not in compliance, file an Environmental Assessment (EA) as specified in Section 1.1311. See 47 CFR § 1.1307 (b) (5).
- 5011 --- The Licensee(s) shall maintain on file with the Commission a current list or plan of the precise frequencies in use at the station, specifying for each frequency the RF center frequency, polarization, emission designator, nominal EIRP (in dBW) and maximum EIRP density (in dBW/4kHz). This list or plan may be submitted either on a station-by-station basis or on a system-wide basis and shall be updated within seven (7) days of any changes in frequency usage at this station. The Licensee(s) need not notify the Commission of temporary usage of frequencies for periods of less than seven (7) days. However, the Licensee(s) shall maintain accurate station records of the times and particulars of such temporary frequency usage.
- 5012 --- The authority granted here is limited to the operation of the facilities described above and does not include any authority to install and operate channelizing equipment or any other authority under Section 214 of the Communications Act of 1934, as amended, to establish channels of communications.
- 5014 --- With respect to potential co-channel interference to or from terrestrial microwave radio stations, the transmit and receive frequency bands listed in this license have been cleared for transmissions to and from satellites located in the geostationary or non-geostationary orbit for the emissions designated in Section B of this license.



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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:

- 5015 --- Upon completion of construction, each licensee must file with the Commission a certification including the following information: name of the licensee, file number of the application, call sign of the antenna, date of the license and certification that the facility as authorized has been completed, that each antenna facility has been tested and is within 2 dB of the pattern specified in Section 25.209 and that the station is operational including the date of commencement of service and will remain operational during the license period unless the license is submitted for cancellation.
- 5017 --- Operation of this station is governed by the terms, conditions and limitations in Part 25 of the Commission's Rules and Regulations and the following additional conditions: 1. This license shall not vest in the Licensee(s) any right to operate the station or any right in the use of the frequencies designated in the license beyond its term or in any other manner than authorized in the license; 2. Neither the license nor the right granted under it shall be assigned or otherwise transferred in violation of the Commission's Rules and Regulations issued under it; and 3. This station is subject to the right of use or control conferred by Section 706 of the Communications Act of 1934, as amended.
- 5018 --- This license shall be forfeited automatically if this station is not ready for operation within the time specified unless, prior to the expiration date of this license, the Commission receives an Application for Additional Time to Construct a Radio Station (FCC Form 701) filed by the Licensee(s) showing good cause why the Licensee(s) could not complete construction on time.
- 5019 --- This authorization is not to be construed as permitting the provision of any service between earth station locations within the United States.
- 5208 --- The licensee shall take all necessary measures to ensure that the antenna 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 wherever such exposures might occur. 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.
- 5216 --- All operations shall be on a non-common carrier basis.



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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 is not ready for operation by the required date of completion of construction unless an application for modification of authorization to request additional time to complete construction is filed by that date, together with a showing that failure to complete construction 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.**