

May 31, 2019

VIA ELECTRONIC FILING

Hung Le
Experimental Licensing Branch Chief, Office of Engineering and Technology
Federal Communications Commission
445 12th Street, SW
Washington, D.C. 20554

Re: Request for Further Information; Call Sign WH2XRV; File No. SAT-0219-EX-CR-2019; Reference Number: 47984

Dear Mr. Sangani:

O3b Limited ("O3b") files this letter in response to a request for further information regarding its pending application for a renewal of the above reference experimental license. O3b has provided its answers to the Commission's inquiries below:

1) For operations of AvL 0.85m and AvL 2.4m Ka-band antennas, please demonstrate that your proposed operations in the 27.6-28.4 GHz frequency band via O3b Limited's NGSO satellites will be in compliance with the equivalent power Flux-density limit (-162 dBW/m²/40 KHz) in Article 22.5D of the ITU Radio Regulations (see Annex B of attachment and O3b Limited's epfd demonstration in its experimental application 0712-EX-ST-2019 for reference).

In the attached Annex A, O3b provides detailed calculations using each terminals typical operating power levels that demonstrate compliance with Article 22.5D of the ITU Radio Regulations at O3b's test site in Manassas, VA. O3b can provide additional calculations for other locations within the United States as needed but can certify that its operations of these terminals at any location within the footprint of the above referenced testing license will comply with Article 22.5D.

If the Commission would like to review an EPFD compliance demonstration similar to the one provided in application 0712-EX-ST-2019, O3b requests an additional time in order to prepare such a showing for both terminals.

2) For operations of AvL 0.85m and AvL 2.4m Ka-band antennas, please provide the detail calculation, data/number/value and formula that used to calculate the EPFD for the 27.6-28.4 GHz frequency band, emission (216M0G7D) and its associated powers (745kW (ERP) and 70.79MW (ERP)).

O3b would like to clarify that the power levels authorized in the previous authorizations under the above referenced call sign are beyond the operational power levels for each terminal model, respectively. These power levels were requested in the original 2015 application¹ due to a mistake in converting the operational power levels to watts.

The maximum power levels of the terminals are much closer to approximately 661 kilowatts (for the AvL .85m terminal) and 10 Megawatts (for the AvL 2.4m terminal). These values are generally consistent with the International Bureau FCC licenses issued for the .85m² and 2.4m³ AvL terminals. O3b has attached those licenses here in Annex B for the Commission's reference. O3b would like to amend its application to request authorization at 661 kilowatts for the .85m AvL terminal and 10 megawatts for the 2.4m AvL terminal.

If the Commission would still like detailed calculations, beyond what is presented in Annex A, for these terminals at the lower power limits, O3b can provide them. However, O3b requests additional time in order to prepare such a showing for both terminals.

3) Please certify that your proposed operations and communication between earth stations (user terminals) and satellites are in compliance with all existing and future coordination agreements between United Kingdom and other administrations, GSO and NGSO satellite operators.

¹ *O3b Limited*, File No.: 0119-EX-PL-2015; Call Sign: WH2XRV; Granted May 1, 2015.

² *O3b Limited*, File No.: SES-LIC-20160712-00638; Call Sign: E160128; Granted November 7, 2016.

³ *O3b Limited*, File No.: SES-LIC-20160712-00640; Call Sign: E160129; Granted November 7, 2016.

O3b certifies that its proposed operations will comply with all existing or future coordination agreements between O3b and other satellite operators and will abide by all the terms and conditions of the O3b Market Access Grant.⁴ In addition, as stated in its application, O3b will coordinate with local terrestrial operators prior to transmitting in any bands that are shared with terrestrial services.

Respectfully submitted,

SES Networks

/s/ Will Lewis

Will Lewis

Senior Legal Counsel

900 17th Street NW

Suite 300

Washington D.C. 20006

(202) 813-4033

Attachment

⁴ *O3b Limited*, Order and Declaratory Ruling, Call Sign S2935, FCC 18-70 at ¶ 20 (rel. June 6, 2018).

Annex A – EPFDup Calculations

The EPFD(up) limits in No. 22.5D of the ITU Radio Regulations take the form of a single EPFD(up) value that must never be exceeded ($-162 \text{ dBW/m}^2/40 \text{ kHz}$ in the 27.5-28.6 GHz band). O3b complies with this limit, in the O3b frequency ranges where such EPFD limits apply, by controlling the maximum power spectral density into transmitting earth stations as a function of their latitude and their antenna size and off-axis gain towards the GSO. Below, O3b has provided detailed calculations for earth stations hypothetically sited at its antenna testing facility in Manassas, VA (“Randolph Ridge”) which is located at: $38^\circ 47' 46.6'' \text{ N}$; $77^\circ 34' 37.4'' \text{ W}$.

.85m AvL Terminal:

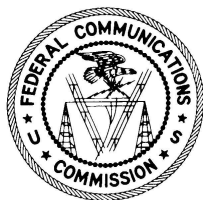
The maximum EIRP density transmitted by the Randolph Ridge .85m Earth Station is 34.2 dBW/4kHz , which is equivalent to 29.3 dBW/40kHz (*i.e.*, the reference bandwidth used for the EPFD(up) limit). The peak earth station transmit antenna gain is 46 dBi, giving a maximum input power spectral density of -18.7 dBW/40kHz . From the Randolph Ridge .85m Earth Station, which is at a latitude of $38^\circ 47' 46.6'' \text{ N}$, the minimum separation angle between the GSO and O3b orbits varies from 12.3° to 16.7° depending on the difference in longitude between Randolph Ridge and the GSO/O3b satellites. The lower value applies to the case in which the GSO and O3b satellites are at very low elevation angles ($\sim 8^\circ$ for the GSO and 0° for the O3b orbit) as viewed from Randolph Ridge. For the minimum separation angle of 12.3° , the off-axis gain of the transmitting earth station is 4.7 dBi, assuming a $32-25\log(\theta)$ gain mask. That results in a worst-case off-axis EIRP density towards the GSO of -14 dBW/40kHz (*i.e.*, $-20.6+4.7$). Taking the range to the GSO orbit from Randolph Ridge corresponding to a zero degree elevation angle (41,382.7 km), the spreading loss to the GSO would be 163.3 dB, resulting in a worst case EPFD(up) level at the GSO of $-177.3 \text{ dBW/m}^2/40\text{kHz}$. This is below the EPFD(up) limit value of $-162 \text{ dBW/m}^2/40\text{kHz}$ specified in No. 22.5D of the ITU’s Radio Regulations, so compliance exists with margin for this low-elevation case. At higher elevation angles the increase in the separation angle between the GSO and the O3b orbit more than offsets the reduced path length to the GSO, resulting in even more margin relative to the EPFD(up) limit.

2.4m AvL Terminal:

The maximum EIRP density transmitted by the Randolph Ridge 2.4m Earth Station is 38.9 dBW/4kHz , which is equivalent to 48.9 dBW/40kHz (*i.e.*, the reference bandwidth used for the EPFD(up) limit). The peak earth station transmit antenna gain is 54.7 dBi, giving a maximum input power spectral density of -5.8 dBW/40kHz . From the Randolph Ridge 2.4m Earth Station, which is at a latitude of $38^\circ 47' 46.6'' \text{ N}$, the minimum separation angle between the GSO and O3b orbits varies from 13.1° to 16.7° depending on the difference in longitude between Randolph Ridge and the GSO/O3b satellites. The lower value applies to the case in which the GSO and O3b satellites are at very low elevation angles ($\sim 5^\circ$ for the GSO

and $\sim 5^\circ$ for the O3b orbit) as viewed from Randolph Ridge. For the minimum separation angle of 13.1° , the off-axis gain of the transmitting earth station is 4.1 dBi, assuming a $32-25\log(\theta)$ gain mask. That results in a worst-case off-axis EIRP density towards the GSO of -1.7 dBW/40kHz (i.e., $-5.8+4.1$). Taking the range to the GSO orbit from Randolph Ridge corresponding to a five-degree elevation angle (42,174 km), the spreading loss to the GSO would be 163.3 dB, resulting in a worst case EPFD(up) level at the GSO of -165 dBW/m²/40kHz. This is below the EPFD(up) limit value of -162 dBW/m²/40kHz specified in No. 22.5D of the ITU's Radio Regulations, so compliance exists with margin for this low-elevation case. At higher elevation angles the increase in the separation angle between the GSO and the O3b orbit more than offsets the reduced path length to the GSO, resulting in even more margin relative to the EPFD(up) limit.

Annex B – International Bureau License Grants for the AvL .85m and 2.4m Terminals



UNITED STATES OF AMERICA
FEDERAL COMMUNICATIONS COMMISSION
RADIO STATION AUTHORIZATION
Current Authorization : FCC WEB Reproduction
Unofficial Copy

Name: O3B LIMITED

Call Sign: E160128
File Number: SES-LIC-20160712-00638

Authorization Type: License
Non Common Carrier Grant Date: 11/07/2016 Expiration Date: 11/07/2031

Nature of Service: Fixed Satellite Service

Class of Station: Fixed Earth Stations

A) Site Location(s)

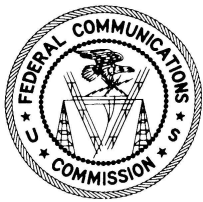
#	Site ID	Address	Latitude	Longitude	Elevation (Meters)	NAD	Special Provisions (Refer to Section H)
1)	Randolph Ridge	12811 Randolph Ridge Lane (0.85M) Manassas, Manassas, VA, 20109	38° 47' 46.6" N	77° 34' 37.4" W	103.0	83	

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 Monday, November 07, 2016 (3 AM Eastern Standard Time) and ending Friday, November 07, 2031 (3 AM Eastern Standard Time). The required date of completion of construction and commencement of operation is Tuesday, November 07, 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	Polarization	Emission	Tx/Rx Mode	Max EIRP /Carrier	Max EIRP Density	Associated Antenna	Special Provisions (Refer to Section H)	Modulation/ Services
1)	28600.0000 - 29100.0000	L,R	216MG7D	T	58.20	10.90	AvL85cm		Modulation and Services QPSK, 8PSK, 16PSK, 32PSK and Internet
2)	28600.0000 - 29100.0000	L,R	1M00G7D	T	58.20	30.20	AvL85cm		Modulation and Services QPSK, 8PSK, 16PSK, 32PSK and Internet
3)	27600.0000 - 28400.0000	L,R	216MG7D	T	58.20	10.90	AvL85cm		Modulation and Services QPSK, 8PSK, 16PSK, 32PSK and Internet
4)	27600.0000 - 28400.0000	L,R	1M00G7D	T	58.20	30.20	AvL85cm		Modulation and Services QPSK, 8PSK, 16PSK, 32PSK and Internet
5)	18800.0000 - 19300.0000	L,R	216MG7D	R			AvL85cm		Modulation and Services QPSK, 8PSK, 16PSK, 32PSK and Internet
6)	18800.0000 - 19300.0000	L,R	1M00G7D	R			AvL85cm		Modulation and Services QPSK, 8PSK, 16PSK, 32PSK and Internet
7)	17800.0000 - 18600.0000	L,R	216MG7D	R			AvL85cm		Modulation and Services QPSK, 8PSK, 16PSK, 32PSK and Internet
8)	17800.0000 - 18600.0000	L,R	1M00G7D	R			AvL85cm		Modulation and Services QPSK, 8PSK, 16PSK, 32PSK and Internet



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Call Sign: E160128
 File Number: SES-LIC-20160712-00638

Authorization Type: License
 Non Common Carrier Grant Date: 11/07/2016 Expiration Date: 11/07/2031

C) Frequency Coordination

#	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)	17800.0000 - 18600.0000	NGSO		7.0 - 7.0		121.0 - 239.0		0.0	AvL85cm
2)	18800.0000 - 19300.0000	NGSO		7.0 - 7.0		121.0 - 239.0		0.0	AvL85cm
3)	27600.0000 - 28400.0000	NGSO		7.0 - 7.0		121.0 - 239.0		-2.0	AvL85cm
4)	28600.0000 - 29100.0000	NGSO		7.0 - 7.0		121.0 - 239.0		-2.0	AvL85cm

D) Point of Communications

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

- 1) Randolph Ridge to O3b Limited NGSO satellite system (S2935) (UK-licensed)

E) Antenna Facilities

Site ID	Antenna ID	Units	Diameter (Meters)	Manufacturer	Model Number	Site Elevation	Max Antenna Height (Meters)	Special Provisions (Refer to Section H)
Randolph Ridge	AvL85cm	2	0.85	AvL Technologies	85CMO3B	103.05	8.2 AGL/ 111.3 AMSL	

Max Gains(s):46.0 dBi @ 28.3000 GHz 42.3 dBi @ 18.5600 GHz

Maximum total input power at antenna flange (Watts) = 20.0

Maximum aggregate output EIRP for all carriers (dBW)58.2

F) Remote Control

Randolph Ridge	L-6815 Chateau de Betz Backup NOC Betzdorf, Grevenmacher +352 710 725 82	Call Sign:	N/A
Randolph Ridge	12811 Randolph Ridge Road Manassas, Manassas, VA, 20109 703-366-1500	Call Sign:	N/A

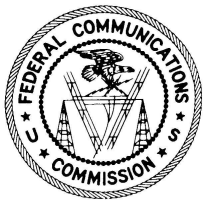
G) Antenna Structure marking and lighting requirements:

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:

- 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.
- 2010 This authorization is issued pursuant to the Commission's Second Report and Order adopted June 16, 1972 (35 FCC 2d 844) and Memorandum, Opinion and Order adopted December 21, 1972 (38 FCC 2d 665) in Docket No. 16495 and is subject to the policies adopted in that proceeding.



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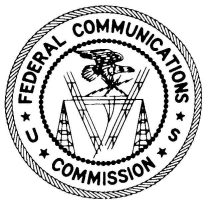
Name: O3B LIMITED

Call Sign: E160128
File Number: SES-LIC-20160712-00638

Authorization Type:	License
Non Common Carrier	Grant Date: 11/07/2016 Expiration Date: 11/07/2031

H) Special and General Provisions

- 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.
- 2938 Upon completion of construction, each licensee must file with the Commission a certification including the following information: (1) name of the licensee, (2) file number of the application, (3) call sign of the antenna, (4) date of the license, (5) certification that the facility as authorized has been completed, (6) certification that each antenna facility has been tested and is within 2 dB of the pattern specified in Section 25.209, and (7) certification 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.
- 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).
- 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) 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.
- 90364 Any transmissions in the 27.5-28.35 GHz (Earth-to-space) frequency band are on a secondary basis with respect to LMDS until the provisions adopted in FCC 16-89 go into force. After that, this earth station is considered grandfathered in this band pursuant to 47 CFR § 25.136(a)(2) or (a)(3).



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Authorization Type:	License
Non Common Carrier	Grant Date: 11/07/2016 Expiration Date: 11/07/2031

H) Special and General Provisions

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.

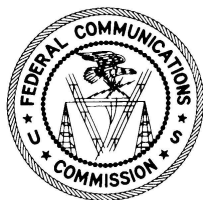
This authorization is issued on the grantee's representation that the station is in compliance with environmental requirements set forth in Section 1.1307 of the Commission's Rules. 47 C.F.R. § 1.1307.

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 regulates 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.



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Name: O3B LIMITED

Call Sign: E160129
File Number: SES-LIC-20160712-00640

Authorization Type: License
Non Common Carrier Grant Date: 11/07/2016 Expiration Date: 11/07/2031

Nature of Service: Fixed Satellite Service

Class of Station: Fixed Earth Stations

A) Site Location(s)

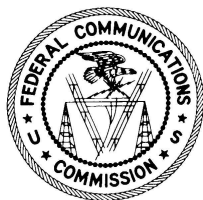
#	Site ID	Address	Latitude	Longitude	Elevation (Meters)	NAD	Special Provisions (Refer to Section H)
1)	Randolph Ridge	12811 Randolph Ridge Lane (2.4M) Manassas, Manassas, VA, 20109	38° 47' 46.6" N	77° 34' 37.4" W	103.5	83	

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 Monday, November 07, 2016 (3 AM Eastern Standard Time) and ending Friday, November 07, 2031 (3 AM Eastern Standard Time). The required date of completion of construction and commencement of operation is Tuesday, November 07, 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	Polarization	Emission	Tx/Rx Mode	Max EIRP /Carrier	Max EIRP Density	Associated Antenna	Special Provisions (Refer to Section H)	Modulation/ Services
1)	28600.0000 - 29100.0000	L,R	216MG7D	T	70.00	22.70	AvL2.4m.		Modulation and Services QPSK, 8PSK, 16PSK, 32PSK and Internet
2)	28600.0000 - 29100.0000	L,R	1M00G7D	T	70.00	38.90	AvL2.4m.		Modulation and Services QPSK, 8PSK, 16PSK, 32PSK and Internet
3)	27600.0000 - 28400.0000	L,R	216MG7D	T	70.00	22.70	AvL2.4m.		Modulation and Services QPSK, 8PSK, 16PSK, 32PSK and Internet
4)	27600.0000 - 28400.0000	L,R	1M00G7D	T	70.00	38.90	AvL2.4m.		Modulation and Services QPSK, 8PSK, 16PSK, 32PSK and Internet
5)	18800.0000 - 19300.0000	L,R	216MG7D	R			AvL2.4m.		Modulation and Services QPSK, 8PSK, 16PSK, 32PSK and Internet
6)	18800.0000 - 19300.0000	L,R	1M00G7D	R			AvL2.4m.		Modulation and Services QPSK, 8PSK, 16PSK, 32PSK and Internet
7)	17800.0000 - 18600.0000	L,R	216MG7D	R			AvL2.4m.		Modulation and Services QPSK, 8PSK, 16PSK, 32PSK and Internet
8)	17800.0000 - 18600.0000	L,R	1M00G7D	R			AvL2.4m.		Modulation and Services QPSK, 8PSK, 16PSK, 32PSK and Internet



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Name: O3B LIMITED

Call Sign: E160129
 File Number: SES-LIC-20160712-00640

Authorization Type: License
 Non Common Carrier Grant Date: 11/07/2016 Expiration Date: 11/07/2031

C) Frequency Coordination

#	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)	17800.0000 - 18600.0000	NGSO		7.0 - 7.0		121.0 - 239.0		0.0	AvL2.4m.
2)	18800.0000 - 19300.0000	NGSO		7.0 - 7.0		121.0 - 239.0		0.0	AvL2.4m.
3)	27600.0000 - 28400.0000	NGSO		7.0 - 7.0		121.0 - 239.0		-23.3	AvL2.4m.
4)	28600.0000 - 29100.0000	NGSO		7.0 - 7.0		121.0 - 239.0		-23.3	AvL2.4m.

D) Point of Communications

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

- 1) Randolph Ridge to O3b Limited NGSO satellite system (S2935) (UK-licensed)

E) Antenna Facilities

Site ID	Antenna ID	Units	Diameter (Meters)	Manufacturer	Model Number	Site Elevation	Max Antenna Height (Meters)	Special Provisions (Refer to Section H)
Randolph Ridge	AvL2.4m.	2	2.4	AvL Technologies	2.4MO3B	103.5	9.6 AGL/ 112.7 AMSL	

Max Gains(s):54.7 dBi @ 28.3000 GHz 51.0 dBi @ 18.5600 GHz

Maximum total input power at antenna flange (Watts) = 40.0

Maximum aggregate output EIRP for all carriers (dBW)73.0

F) Remote Control

Randolph Ridge	12811 Randolph Ridge Road Manassas, Manassas, VA, 20109 703-366-1500	Call Sign:	N/A
Randolph Ridge	L-6815 Chateau de Betz Backup NOC Betzdorf, Grevenmacher +352 710 725 82	Call Sign:	N/A

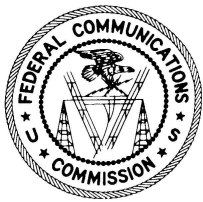
G) Antenna Structure marking and lighting requirements:

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:

- | | |
|------|---|
| 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. |



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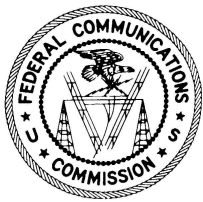
Name: O3B LIMITED

Call Sign: E160129
File Number: SES-LIC-20160712-00640

Authorization Type:	License
Non Common Carrier	Grant Date: 11/07/2016 Expiration Date: 11/07/2031

H) Special and General Provisions

- 2300 Authority is granted to operate this station by remote control provided that: (1) the parameters of the transmissions of this station monitored at the remote control point, and the operational functions sufficient to ensure that the operations of this station are in full compliance with the station authorization at all times; (2) upon detection by the grantee, or upon notification from the Commission, of a deviation of the operation of this station, transmissions shall be immediately suspended until the deviation is corrected, except that transmissions concerning the immediate safety of life or property may be conducted for the duration of such emergency; and (3) the grantee shall have available, at all times, the technical personnel necessary to perform the technical servicing and maintenance of this station expeditiously. See also Public Notice "The International Bureau Provides Guidance Concerning the Relocation of Earth Station Remote Control Points", DA 06-978 (rel. May 4, 2006).
- 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.
- 2938 Upon completion of construction, each licensee must file with the Commission a certification including the following information: (1) name of the licensee, (2) file number of the application, (3) call sign of the antenna, (4) date of the license, (5) certification that the facility as authorized has been completed, (6) certification that each antenna facility has been tested and is within 2 dB of the pattern specified in Section 25.209, and (7) certification 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.
- 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).
- 90364 Any transmissions in the 27.5-28.35 GHz (Earth-to-space) frequency band are on a secondary basis with respect to LMDS until the provisions adopted in FCC 16-89 go into force. After that, this earth station is considered grandfathered in this band pursuant to 47 CFR § 25.136(a)(2) or (a)(3).



UNITED STATES OF AMERICA
FEDERAL COMMUNICATIONS COMMISSION
RADIO STATION AUTHORIZATION
Current Authorization : FCC WEB Reproduction
Unofficial Copy

Name: O3B LIMITED

Call Sign: E160129
File Number: SES-LIC-20160712-00640

Authorization Type:	License
Non Common Carrier	Grant Date: 11/07/2016 Expiration Date: 11/07/2031

H) Special and General Provisions

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 regulates 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.