



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

Name: O3b Limited

Call Sign: E130107

Authorization Type: Modification of License

File Number: SES-MOD-20160712-00641

Non Common Carrier

Grant date: 10/19/2016

Expiration Date: 06/24/2030



Nature of Service: Fixed 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)	MANASSAS	12811 RANDOLPH RIDGE LANE MANASSAS, MANASSAS, VA 20109	38°47'46.6"N	77°34'37.4"W	103.5	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, 2015 (3 AM Eastern Standard Time) and ending June 24, 2030 (3 AM Eastern Standard Time) . The required date of completion of construction and commencement of operation is October 19, 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)	28600.0000-29100.0000	L,R	1M00G7D	Tx	48.60	24.60	Ant 1-2		QPSK, 8PSK, 16PSK, 32PSK and Internet
2)	28600.0000-29100.0000	L,R	216MG7D	Tx	70.75	23.40	Ant 1-2		QPSK, 8PSK, 16PSK, 32PSK and Internet
3)	27600.0000-28400.0000	L,R	1M00G7D	Tx	48.60	24.60	Ant 1-2		QPSK, 8PSK, 16PSK, 32PSK and Internet
4)	27600.0000-28400.0000	L,R	216MG7D	Tx	70.75	23.40	Ant 1-2		QPSK, 8PSK, 16PSK, 32PSK and Internet
5)	18800.0000-19300.0000	L,R	1M00G7D	Rx	0.00	0.00	Ant 1-2		QPSK, 8PSK, 16PSK, 32PSK and Internet
6)	18800.0000-19300.0000	L,R	216MG7D	Rx	0.00	0.00	Ant 1-2		QPSK, 8PSK, 16PSK, 32PSK and Internet
7)	17800.0000-18600.0000	L,R	1M00G7D	Rx	0.00	0.00	Ant 1-2		QPSK, 8PSK, 16PSK, 32PSK and Internet



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8)	17800.0000-18600.0000	L,R	216MG7D	Rx	0.00	0.00	Ant 1-2		QPSK, 8PSK, 16PSK, 32PSK and Internet

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)	18800.0000-19300.0000		NGSO	07.0	07.0	122.2	238.5	0	Ant 1-2
2)	27600.0000-28400.0000		NGSO	07.0	07.0	122.2	238.5	-21.9	Ant 1-2
3)	17800.0000-18600.0000		NGSO	07.0	07.0	122.2	238.5	0	Ant 1-2
4)	28600.0000-29100.0000		NGSO	07.0	07.0	122.2	238.5	-21.9	Ant 1-2

D) Points of Communications

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

- 1) MANASSAS to O3b Limited NGSO satellite system (S2935) (UK-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)
MANASSAS	Ant 1-2	2	2.4	GENERAL DYNAMICS SATCOM	GDST 2.4M	103.5	9.6 AGL/ 112.7 AMSL	

Max Gains(s): 51.4 dBi @ 18.5615 GHz 55.2 dBi @ 28.3615 GHz
 Maximum total input power at antenna flange (Watts) = 40.00
 Maximum aggregate output EIRP for all carriers (dBW) = 70.75



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F) Remote Control Point:

MANASSAS L-6815 Chateau de Betzdorf, BACKUP NOC
Betzdorf, Grevenmacher,
+352 710 725 82

Call Sign: N/A

MANASSAS 12811 RANDOLPH RIDGE LANE
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.
- 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.
- 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.



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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:

- 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.
- 6657 --- For operations pursuant to this authorization, in the band 27.6-28.35 GHz, the minimum elevation angle of the direction of maximum radiation of the O3b antenna with respect to the horizontal plane at which O3b's earth stations may transmit is 10 degrees.
- 6658 --- Transmissions between earth station call sign E130107 and O3b Limited NGSO space stations are limited to the provision of satellite monitoring (not including telemetry, tracking and control), network troubleshooting, testing, and demonstration services in the 17.8-18.6 GHz and 18.8-19.3 GHz (space-to-Earth) and the 27.6-28.4 GHz and 28.6-29.1 GHz (Earth-to-space) frequency bands. This authorization is limited to a single earth station employing two 2.4 meter antennas located within an area of one second latitude by one second longitude, and does not permit O3b Limited to operate ubiquitously deployed terminals in these frequency bands. See 47 C.F.R. § 25.103; Rulemaking to Amend Parts 1, 2, 21, and 25 of the Commission's Rules to Redesignate the 27.5-29.5 GHz Frequency Band, to Reallocate the 29.5-30.0 GHz Frequency Band, to Establish Rules and Policies for Local Multipoint Distribution Service and for Fixed Satellite Services, Third Report and Order, 12 FCC Rcd. 22310, 22327 para. 42 (1997).
- 6659 --- This grant does not authorize the licensee to provide commercial fixed satellite service operations in the 17.8-18.3 GHz band within the United States.
- 6660 --- Grant of this application and operations under this license are based upon and subject to the conditions, waivers, and findings specified for Call Sign S2935. Hughes Network Systems, LLC and EchoStar Satellite Operating Corporation filed comments in this proceeding suggesting that the Commission place certain conditions on the operations of this earth station to ensure that those services with a primary allocation in the United States Table of Frequency Allocations are adequately protected in the frequency bands requested by O3b Limited. See Hughes Network Systems, LLC and EchoStar Satellite Operating Corporation, Comments, filed January 17, 2014. O3b Limited's operations have been conditioned to protect other services in the authorization associated with Call Sign S2935, incorporated here by reference, and therefore no further action is necessary to address these concerns. In addition, the comments suggested that O3b Limited had not completed coordination according to its United Kingdom space station authorization. *Id.* We decline to address this issue because the United Kingdom remains the authority for any coordination required under its authorization. See Amendment of the Commission's Regulatory Policies to Allow Non-U.S.-Licensed Space Stations to Provide Domestic and International Satellite Service in the United States, Report and Order, 12 FCC Rcd 24094, 24174 para. 188 (1997).
- 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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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.