



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

Name: O3B LIMITED

Call Sign: E130098
File Number: SES-MOD-20140814-00655

Authorization Type: Modification of License
Non Common Carrier Grant Date: 01/22/2015 Expiration Date: 05/13/2029

Nature of Service: Fixed Satellite Service
Other

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)	Maritime Vessels	Coastal Reg. of the US: 7°-50° N.Lat. O3b				NA	

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 Tuesday, May 13, 2014 (3 AM Eastern Standard Time) and ending Sunday, May 13, 2029 (3 AM Eastern Standard Time). The required date of completion of construction and commencement of operation is Friday, January 22, 2016 (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	5M12G7D	T	57.53	26.46	Orb1.2	Various Modulations up to 32APSK; Digital Data Link	
2)	28600.0000 - 29100.0000	L,R	216MG7D	T	64.52	17.20	Orb1.2	Various Modulations up to 32APSK; Digital Data Link	
3)	18800.0000 - 19300.0000	L,R	5M12G7D	R			Orb1.2	Various Modulations up to 32APSK; Digital Data Link	
4)	18800.0000 - 19300.0000	L,R	216MG7D	R			Orb1.2	Various Modulations up to 32APSK; Digital Data Link	
5)	28600.0000 - 29100.0000	L,R	5M12G7D	T	61.49	30.42	Orb2.2	Various Modulations up to 32APSK; Digital Data Link	
6)	28600.0000 - 29100.0000	L,R	216MG7D	T	70.52	23.20	Orb2.2	Various Modulations up to 32APSK; Digital Data Link	
7)	18800.0000 - 19300.0000	L,R	5M12G7D	R			Orb2.2	Various Modulations up to 32APSK; Digital Data Link	
8)	18800.0000 - 19300.0000	L,R	216MG7D	R			Orb2.2	Various Modulations up to 32APSK; Digital Data Link	

C) Frequency Coordination

#	Frequency Limits(MHz)	Satellite Arc (Deg. Long.) East West Limit Limit	Elevation (Degrees) East West Limit Limit	Azimuth (Degrees) East West Limit Limit	Max EIRP Density toward Horizon (dBW/4kHz)	Associated Antenna(s)
1)	18800.0000 - 19300.0000	NGSO	10.0 - 10.0	0.0 - 0.0		Orb1.2



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2)	28600.0000 - 29100.0000	NGSO	10.0 - 10.0	0.0 - 0.0	-11.05	Orb1.2
3)	18800.0000 - 19300.0000	NGSO	10.0 - 10.0	0.0 - 0.0		Orb2.2
4)	28600.0000 - 29100.0000	NGSO	10.0 - 10.0	0.0 - 0.0	-11.05	Orb2.2

D) Point of Communications

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

1) Maritime Vessels 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)
Maritime Vessels	Orb1.2	100	1.2	Orbit Communications	AL-7103-Ka		0.0 AGL	
Max Gains(s):42.9 dBi @ 17.8000 GHz 48.5 dBi @ 29.1000 GHz								
Maximum total input power at antenna flange (Watts) = 40.0								
Maximum aggregate output EIRP for all carriers (dBW)64.52								
Maritime Vessels	Orb2.2	100	2.2	Orbit Communications	AL-7107-Ka		0.0 AGL	
Max Gains(s):48.4 dBi @ 19.2000 GHz 54.5 dBi @ 29.1000 GHz								
Maximum total input power at antenna flange (Watts) = 40.0								
Maximum aggregate output EIRP for all carriers (dBW)70.52								

F) Remote Control

Maritime Vessels	8000 Gainsford Court Bristow, Prince William, VA, 20136 703-366-1500	Call Sign:
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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:

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



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H) Special and General Provisions

- 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).
- 5216 All operations shall be on a non-common carrier basis.
- 6599 When the earth station network on maritime vessels is put into operation, the 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 antennas, date of the license and certification that the network was put into operation and will remain operational during the license period unless the license is submitted for cancellation.
- 6600 The licensee shall take all necessary measures to ensure that the earth stations on maritime vessels do not create potential exposure of humans to radiofrequency radiation in excess of the FCC exposure limits defined in 47 C.F.R §§ 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. 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/lrfsafety) 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. The licensee shall ensure installation of terminals on the maritime vessels by qualified installers who have an understanding of the antenna's radiation environment and the measures best suited to maximize protection of the general public and persons operating the maritime vessel and equipment. A terminal exhibiting radiation exposure levels exceeding 1.0 mW/cm² in accessible areas, such as at the exterior surface of the radome, shall have a label attached to the surface of the terminal warning about the radiation hazard and shall include thereon a diagram showing the regions around the terminal where the radiation levels could exceed 1.0 mW/cm². Transmitter(s) must be turned off during antenna maintenance to ensure compliance with FCC-specified safety guidelines for human exposure to radiofrequency radiation in the region between the antenna feed and the reflector.
- 6601 O3b Limited's earth stations on maritime vessels authorized herein must employ a tracking algorithm that is resistant to capturing and tracking adjacent satellite signals, and each station must be capable of inhibiting its own transmission in the event it detects unintended satellite tracking.
- 6602 O3b Limited's earth stations on maritime vessels authorized herein must be monitored and controlled by a ground-based network control and monitoring center. Such stations must be able to receive "enable transmission" and "disable transmission" commands from the network control center and must cease transmission immediately after receiving a "parameter change" command until receiving an "enable transmission" command from the network control center. The network control center must monitor operation of each earth station to determine if it is malfunctioning, and each earth station on maritime vessels must self-monitor and automatically cease transmission within 100 milliseconds on detecting an operational fault that could cause harmful interference.
- 6603 Operation in the territorial waters of any country other than the United States must be in compliance with the applicable laws, regulations, and licensing procedures of that country, as well as with the conditions of this authorization.
- 6604 Antenna elevation for all operations must be at least 5 degrees above the geographic horizon.
- 6606 Transmissions from O3b Limited's NGSO space stations to earth stations under call sign E130098 in the 18.8-19.3 GHz frequency band (space-to-Earth) must comply with the power flux-density requirements of 47 C.F.R § 25.208(e) and Article 21 of the International Telecommunication Union Radio Regulations.
- 6609 The licensee must comply with any pertinent limits and provisions established by the International Telecommunication Union to protect other services allocated internationally.
- 6610 O3b Limited is granted a waiver of the Table of Frequency Allocations, Section 2.106 of the Commission's rules, and a waiver of the Ka-band Plan, see 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 Services and for Fixed Satellite Services, First Report and Order and Fourth Notice of Proposed Rulemaking, 11 FCC Rcd 19005 (1996). O3b Limited is authorized to operate in the 18.8-19.3 GHz and 28.6 -29.1 GHz frequency bands for maritime use, on a non-harmful interference basis, that is, O3b Limited must not cause harmful interference to, and must not claim protection from interference caused to it by, any other lawfully operating station, and must cease transmission(s) immediately upon notice of such interference. O3b provided an analysis that it will not cause interference to any GSO satellite network operating in these bands and will accept interference from any terrestrial users. Based on the information on file with the Commission, the proposed operations do not pose a risk of interference to other users of the band.



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- 6612 O3b Limited's earth stations on maritime vessels authorized herein must be in compliance with the terms of coordination agreements with operators of non-geostationary orbit Fixed Satellite Service space stations operating in the 18.8-19.3 GHz and 28.6-29.1 GHz frequency band. In the event another NGSO system commences operations in the U.S. market in the 18.8-19.3 GHz and 28.6-29.1 GHz frequency bands, maritime earth stations operating pursuant to this authorization must cease operation unless and until such operation has been coordinated with the new NGSO system operator or O3b Limited demonstrates that such operation will not cause harmful interference to the new NGSO system.
- 6613 The licensee must maintain the following records for each antenna on maritime vessels: a record of the ship location (i.e., latitude and longitude), transmit frequency, channel bandwidth and satellite used. These records shall be time annotated and maintained for a period of not less than 1 year. Records will be obtained at time intervals of no greater than every 20 minutes while the antenna is transmitting. The licensee will make this data available upon request to a coordinator, fixed system operator, fixed satellite system operator, or the Commission within 24 hours of the request.
- 6614 The grant of this application, as amended, and accompanying waivers, is without prejudice to any action on any pending or future applications or waiver requests filed to provide additional services to, from, or within the United States using O3b Limited's NGSO system. The authorization is limited to the earth station(s) and antenna(s) included in Section E above and to the particulars of operations/identified frequencies included in Section B above (and the licensee's application) and does not permit O3b's NGSO system to communicate with any other earth station(s) in the United States.
- 6615 O3b Limited is authorized to operate up to one-hundred 2.2 meter earth stations, and up to one-hundred 1.2 meter earth stations on maritime vessels to communicate with O3b Limited's NGSO system, licensed by the United Kingdom, using the 18.8-19.3 GHz (space-to-Earth) and 28.6-29.1 GHz (Earth-to-space) frequency bands. O3b Limited may operate up to three earth stations on each maritime vessel. The remote control point is a material term of the license and may not be changed without prior authorization under Section 25.117 of the Commission's rules. Public Notice "The International Bureau provides Guidance Concerning the Relocation of Earth Station Remote Control Points," DA 06-978 (rel. May 4, 2006).
- 6616 O3b Limited must submit to the Commission a yearly report indicating the number of earth stations actually brought into service under its blanket licensing authority. The annual report is due to the Commission no later than the first day of April of each year and shall indicate the deployment figures for the preceding calendar year. See 47 C.F.R. § 25.145(f)(1)(iv)(2).
- 90094 The licensee must maintain a U.S. point of contact available 24 hours per day, seven days per week, with the authority and ability to terminate operations authorized herein.
- 90193 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.



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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.