

# Ka-Band Earth Station – Oceanside, CA

## Frequency Coordination Report

28 GHz



Prepared on Behalf of  
O3b Networks USA, LLC

January 11, 2016





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## 1. Summary of Results

On behalf of O3b Networks, Comsearch performed a coordination notice for all existing and proposed terrestrial licenses within the coordination contours of their proposed experimental Ka-Band earth station in Oceanside, California, which will transmit at 28 GHz<sup>1</sup>. Prior-notification letters were sent to the licensees and a copy of the notification data is provided in section four of this report. The earth station coordination was finalized on January 8, 2016

No objections were received from any of the incumbent 28 GHz licensees. Our notification to the LMDS incumbents was performed under the assumption that the earth station would be operating on a non-interference basis in relation to primary LMDS Block A operations. A contact at O3b Networks has been provided in case any concerns may arise in the future.

## 2. 28 GHz Common Carrier and LTTS Coordination

In accordance with FCC Rules and Regulations, the Ka-Band earth station in Oceanside, California was prior-coordinated by Comsearch. A notification letter and datasheets for this earth station were sent to the following 28 GHz common carrier fixed microwave licensees on November 23, 2015. These licensees are authorized to operate temporary fixed operations from 27.5 to 29.5 GHz on a statewide or nationwide basis.

Licensee	Authorized Geographic Area
M.U.T. Licensing	Statewide: California
Verizon	Continental US

A notification letter and datasheets for the Ka-Band earth station in Oceanside, California were also sent to the following 28 GHz local television transmission licensee on November 23, 2015. This licensee is authorized to operate temporary fixed operations from 27.5 to 29.5 GHz on a nationwide basis.

Licensee	Authorized Geographic Area
Information Super Station, LLC	Continental US

No objections were received from the common carrier or local television transmission service incumbents.

<sup>1</sup> The proposed earth station will operate in the 27.6 – 28.35 GHz portion of the Ka-Band.

### 3. 28 GHz LMDS Coordination

A Notification letter was sent to the following 28 GHz LMDS licensees on November 23, 2015. The proposed earth station will operate on frequencies that overlap Block A of the LMDS service. The total frequency allocation for Block A of the LMDS spectrum appears below.

**Block A:** 27.500-28.350 GHz  
29.100-29.250 GHz  
31.075-31.225 GHz

Licensee	Market	Market Name
Nextlink / XO	BTA262	Los Angeles, CA
T-Mobile <sup>2</sup>	BTA262	Los Angeles, CA
TelePacific Communications <sup>3</sup>	BTA262	Los Angeles, CA
Towerstream Corporation <sup>4</sup>	BTA262	Los Angeles, CA
EchoStar	BTA402 <sup>5</sup>	San Diego, CA
Nextlink / XO <sup>6</sup>	BTA402	San Diego, CA

No objections were received from the LMDS incumbents.

<sup>2</sup> T-Mobile has acquired spectrum from Nextlink / XO in the Los Angeles, CA Basic Trading Area (BTA).

<sup>3</sup> TelePacific Communications is leasing spectrum from Nextlink / XO in the Los Angeles, CA BTA.

<sup>4</sup> Towerstream Corporation is leasing spectrum from Nextlink / XO in the Los Angeles, CA BTA.

<sup>5</sup> The proposed earth station will be located inside BTA402.

<sup>6</sup> Nextlink / XO is leasing spectrum from EchoStar in the San Diego, CA BTA.

## **4. Earth Station Coordination Data**

This section presents the data pertinent to the proposed Ka-Band earth station in Oceanside, California. This data was circulated to all incumbent licensees in the shared 28 GHz frequency ranges.

Date: 11/20/2015  
Job Number: 151120COMSGE04

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**Administrative Information**

Status ENGINEER PROPOSAL  
Call Sign  
Licensee Code O3BNET  
Licensee Name O3b Networks USA, LLC.

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**Site Information**

**OCEANSIDE, CA**  
Venue Name  
Latitude (NAD 83) 33° 14' 53.5" N  
Longitude (NAD 83) 117° 25' 30.7" W  
Climate Zone A  
Rain Zone 4  
Ground Elevation (AMSL) 13.96 m / 45.8 ft

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**Link Information**

Satellite Type Medium Earth Orbit  
Mode TR - Transmit-Receive  
Modulation Digital  
Minimum Elevation Angle 10.0°  
Azimuth Range 0.0° to 360°  
Antenna Centerline (AGL) 2.74 m / 9.0 ft

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**Antenna Information**

		<b>Receive - FCC32</b>		<b>Transmit - FCC32</b>
Manufacturer		AVL		AVL
Model		2.4 meter		2.4 meter
Gain / Diameter		51.3 dBi / 2.4 m		54.7 dBi / 2.4 m
3-dB / 15-dB Beamwidth		0.23° / 0.60°		0.14° / 0.32°
Max Available RF Power	(dBW/4 kHz) (dBW/MHz)			-23.5 0.5
Maximum EIRP	(dBW/4 kHz) (dBW/MHz)			31.2 55.2
Interference Objectives:	Long Term Short Term	-156.0 dBW/MHz -146.0 dBW/MHz	20% 0.01%	-151.0 dBW/4 kHz 20% -128.0 dBW/4 kHz 0.0025%

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**Frequency Information**

	<b>Receive 18.0 GHz</b>	<b>Transmit 28.0 GHz</b>
Emission / Frequency Range (MHz)	216MG7D / 17800.0 - 18300.0	216MG7D / 27600.0 - 28350.0
Max Great Circle Coordination Distance	100.0 km / 62.1 mi	121.9 km / 75.7 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi	100.0 km / 62.1 mi

<b>Coordination Values</b>		<b>OCEANSIDE, CA</b>			
Licensee Name		O3b Networks USA, LLC.			
Latitude (NAD 83)		33° 14' 53.5" N			
Longitude (NAD 83)		117° 25' 30.7" W			
Ground Elevation (AMSL)		13.96 m / 45.8 ft			
Antenna Centerline (AGL)		2.74 m / 9.0 ft			
Antenna Model		AVL 2.4 meter			
Antenna Mode		Receive 18.0 GHz		Transmit 28.0 GHz	
Interference Objectives: Long Term		-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz	20%
Short Term		-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz	0.0025%
Max Available RF Power		-23.5 (dBW/4 kHz)			

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz		Coordination Distance (km)
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)	
0	0.00	76.32	-10.00	100.00	-10.00	100.00	100.00
5	0.00	72.05	-10.00	100.00	-10.00	100.00	100.00
10	0.00	67.83	-10.00	100.00	-10.00	100.00	100.00
15	0.00	63.66	-10.00	100.00	-10.00	100.00	100.00
20	0.00	59.56	-10.00	100.00	-10.00	100.00	100.00
25	0.00	55.54	-10.00	100.00	-10.00	100.00	100.00
30	0.00	51.64	-10.00	100.00	-10.00	100.00	100.00
35	0.00	47.88	-10.00	100.00	-10.00	100.00	100.00
40	0.00	44.30	-10.00	100.00	-10.00	100.00	100.00
45	0.00	40.95	-10.00	100.00	-10.00	100.00	100.00
50	0.00	37.90	-10.00	100.00	-10.00	100.00	100.00
55	0.00	35.23	-10.00	100.00	-10.00	100.00	100.00
60	0.00	33.03	-8.97	100.00	-8.97	100.00	100.00
65	0.00	31.39	-7.68	100.00	-7.68	100.00	100.00
70	0.00	30.42	-6.25	100.00	-6.25	100.00	100.00
75	0.00	30.18	-4.61	100.00	-4.61	100.00	100.00
80	0.00	30.68	-2.70	100.00	-2.70	100.00	100.00
85	0.00	31.90	-0.51	100.00	-0.51	100.00	100.00
90	0.00	33.74	2.00	100.00	2.00	100.00	100.00
95	0.00	36.12	4.92	100.00	4.92	100.00	100.00
100	0.00	38.94	7.29	100.00	7.29	100.00	100.00
105	0.00	42.10	7.45	100.00	7.45	100.00	100.00
110	0.00	45.53	5.22	100.00	5.22	100.00	100.00
115	0.00	49.18	2.32	100.00	2.32	100.00	100.00
120	0.00	53.00	-0.25	100.00	-0.25	100.00	100.00
125	0.00	56.94	-2.24	100.00	-2.24	100.00	100.00
130	0.00	60.99	-3.90	100.00	-3.90	100.00	100.00
135	0.00	65.12	-5.34	100.00	-5.34	100.00	100.00
140	0.00	69.31	-6.51	100.00	-6.51	100.00	100.00
145	0.00	73.55	-7.52	100.00	-7.52	100.00	100.00
150	0.00	77.82	-8.37	100.00	-8.37	100.00	100.00
155	0.00	82.12	-9.09	100.00	-9.09	100.00	100.00
160	0.00	86.44	-9.68	100.00	-9.68	100.00	100.00
165	0.00	90.76	-10.00	100.00	-10.00	100.00	100.00
170	0.00	95.08	-10.00	100.00	-10.00	100.00	100.00
175	0.00	99.39	-10.00	100.00	-10.00	100.00	100.00
180	0.00	103.68	-10.00	100.00	-10.00	100.00	100.00
185	0.00	107.95	-10.00	100.00	-10.00	100.00	100.00

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Antenna Model		AVL 2.4 meter			
Antenna Mode		Receive 18.0 GHz		Transmit 28.0 GHz	
Interference Objectives: Long Term		-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz	20%
Short Term		-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz	0.0025%
Max Available RF Power		-23.5 (dBW/4 kHz)			

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz		Coordination Distance (km)
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)	
190	0.00	112.17	-10.00	100.00	-10.00	100.00	100.00
195	0.00	116.34	-10.00	100.00	-10.00	100.00	100.00
200	0.00	120.44	-9.68	100.00	-9.68	100.00	100.00
205	0.00	124.46	-9.09	100.00	-9.09	100.00	100.00
210	0.00	128.36	-8.37	100.00	-8.37	100.00	100.00
215	0.00	132.12	-7.52	100.00	-7.52	100.00	100.00
220	0.00	135.70	-6.51	100.00	-6.51	100.00	100.00
225	0.00	139.05	-5.34	100.00	-5.34	100.00	100.00
230	0.00	142.10	-3.97	100.00	-3.97	100.00	100.00
235	0.00	144.77	-2.35	100.00	-2.35	100.00	100.00
240	0.00	146.97	-0.39	100.00	-0.39	100.00	100.00
245	0.00	148.61	2.04	100.00	2.04	106.50	106.50
250	0.00	149.58	4.70	100.00	4.70	115.60	115.60
255	0.00	149.82	6.69	100.00	6.69	121.90	121.90
260	0.00	149.32	6.57	100.00	6.57	121.50	121.50
265	0.00	148.10	4.44	100.00	4.44	114.70	114.70
270	0.00	146.26	1.78	100.00	1.78	105.60	105.60
275	0.00	143.88	-0.69	100.00	-0.69	100.00	100.00
280	0.00	141.06	-2.84	100.00	-2.84	100.00	100.00
285	0.00	137.90	-4.70	100.00	-4.70	100.00	100.00
290	0.00	134.47	-6.32	100.00	-6.32	100.00	100.00
295	0.00	130.82	-7.74	100.00	-7.74	100.00	100.00
300	0.00	127.00	-9.01	100.00	-9.01	100.00	100.00
305	0.00	123.06	-10.00	100.00	-10.00	100.00	100.00
310	0.00	119.01	-10.00	100.00	-10.00	100.00	100.00
315	0.00	114.88	-10.00	100.00	-10.00	100.00	100.00
320	0.00	110.69	-10.00	100.00	-10.00	100.00	100.00
325	0.00	106.45	-10.00	100.00	-10.00	100.00	100.00
330	0.00	102.18	-10.00	100.00	-10.00	100.00	100.00
335	0.00	97.88	-10.00	100.00	-10.00	100.00	100.00
340	0.00	93.56	-10.00	100.00	-10.00	100.00	100.00
345	0.00	89.24	-10.00	100.00	-10.00	100.00	100.00
350	0.00	84.92	-10.00	100.00	-10.00	100.00	100.00
355	0.00	80.61	-10.00	100.00	-10.00	100.00	100.00





## **5. Contact Information**

For questions or information regarding the 28 GHz Frequency Coordination Report, please contact:

Contact person: Joanna Lynch  
Title: Manager, Spectrum & Data Solutions  
Company: Comsearch  
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