

ATTACHMENT B

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
O3B Limited
SUNSET BEACH, HI
Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147
June 17, 2020

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1. CONCLUSIONS

An interference study considering all existing, proposed and prior coordinated microwave facilities within the coordination contours of the proposed earth station demonstrates that this site will operate satisfactorily with the common carrier microwave environment. Further, there will be no restrictions of its operation due to interference considerations.

2. SUMMARY OF RESULTS

A number of great circle interference cases were identified during the interference study of the proposed earth station. Each of the cases, which exceeded the interference objective on a line-of-sight basis, was profiled and the propagation losses estimated using NBS TN101 (Revised) techniques. The losses were found to be sufficient to reduce the signal levels to acceptable magnitudes in every case.

3. SUPPLEMENTAL SHOWING

Pursuant to Part 25.203(c) of the FCC Rules and Regulations, the satellite earth station proposed in this application was coordinated by Comsearch using computer techniques and in accordance with Part 25 of the FCC Rules and Regulations.

Coordination data for this earth station was sent to the below listed carriers with a letter dated 05/04/2020.

Company

AT&T Mobility Spectrum LLC - Hawaii
Cellco Partnership - Hawaii
Clearwire Hawaii Partners Spectrum LLC
Coral Wireless Licenses, LLC
County of Maui Dept of Water Supply
Hawaii, State of
Hawaiian Telcom, Inc.
Honolulu Board of Water Supply
Honolulu City & County Dept of Info Tech
Maui, County of
Oceanic Time Warner Cable LLC
Sprint Spectrum L.P.
Sprintcom, Inc
T-Mobile Lic LLC - Voicestream PCS BTA I
T-Mobile License LLC
Trex Broadband
US Internet Wireless
Verizon Wireless VAW LLC - (Hawaii)
Wavecom Solutions Corporation

4. EARTH STATION COORDINATION DATA

This section presents the data pertinent to frequency coordination of the proposed earth station that was circulated to all carriers within its coordination contours.

COMSEARCH

Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5500 <http://www.comsearch.com>

Date: 06/17/2020
Job Number: 200504COMSGE01

Administrative Information

Status ENGINEER PROPOSAL
Call Sign
Licensee Code P3210
Licensee Name O3B Limited

Site Information

SUNSET BEACH, HI
Venue Name
Latitude (NAD 83) 21° 40' 11.5" N
Longitude (NAD 83) 158° 1' 58.1" W
Climate Zone B
Rain Zone 4
Ground Elevation (AMSL) 138.89 m / 455.7 ft

Link Information

Satellite Type Medium Earth Orbit
Mode TR - Transmit-Receive
Modulation Digital
Minimum Elevation Angle 5.0°
Azimuth Range 0.0° to 360°
Antenna Centerline (AGL) 2.74 m / 9.0 ft

Antenna Information

		Receive - FCC32		Transmit - FCC32
Manufacturer		CGC 5.5m		CGC 5.5m
Model		Type 5-X/Y		Type 5-X/Y
Gain / Diameter		59.9 dBi / 5.5 m		62.6 dBi / 5.5 m
3-dB / 15-dB Beamwidth		0.50° / 1.00°		1.10° / 2.20°
Max Available RF Power	(dBW/4 kHz) (dBW/MHz)			-37.5 -13.5
Maximum EIRP	(dBW/4 kHz) (dBW/MHz)			25.1 49.1
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%

Frequency Information

	Receive 18.0 GHz	Transmit 28.0 GHz
Emission / Frequency Range (MHz)	54M0G7D - 850MG7D / 17700.0 - 20200.0	54M0G7D - 850MG7D / 27500.0 - 28350.0
Max Great Circle Coordination Distance	346.7 km / 215.4 mi	133.3 km / 82.8 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi	100.0 km / 62.1 mi

COMSEARCH

Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5500 <http://www.comsearch.com>

Coordination Values

SUNSET BEACH, HI

Licensee Name O3B Limited
Latitude (NAD 83) 21° 40' 11.5" N
Longitude (NAD 83) 158° 1' 58.1" W
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Antenna Model CGC 5.5m
Antenna Mode Receive 18.0 GHz Transmit 28.0 GHz
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Short Term -146.0 dBW/MHz 0.01% -128.0 dBW/4 kHz 0.0025%
Max Available RF Power -37.5 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.00	72.41	14.38	346.70	14.38	133.30
5	0.00	70.74	14.38	346.70	14.38	133.30
10	0.00	69.21	14.38	346.70	14.38	133.30
15	0.00	67.83	14.38	346.70	14.38	133.30
20	0.00	66.61	14.38	346.70	14.38	133.30
25	0.00	65.58	14.38	346.70	14.38	133.30
30	0.00	64.73	14.38	346.70	14.38	133.30
35	0.00	64.09	14.38	346.70	14.38	133.30
40	0.55	64.20	14.38	346.70	14.38	133.30
45	0.59	64.02	14.38	346.70	14.38	133.30
50	0.76	64.19	14.38	346.70	14.38	133.30
55	0.58	64.23	14.38	346.70	14.38	133.30
60	0.82	64.88	14.38	346.70	14.38	133.30
65	1.04	65.70	14.38	346.70	14.38	133.30
70	1.38	66.82	14.38	346.70	14.38	133.30
75	1.46	67.86	14.38	346.70	14.38	133.30
80	1.64	69.15	14.38	346.70	14.38	133.30
85	1.85	70.60	14.38	346.70	14.38	133.30
90	2.57	72.53	14.38	346.70	14.38	133.30
95	2.61	74.05	14.38	346.70	14.38	133.30
100	3.15	75.98	14.38	346.70	14.38	133.30
105	3.28	77.71	14.38	346.70	14.38	133.30
110	3.02	79.35	14.38	346.70	14.38	133.30
115	3.61	81.40	14.38	346.70	14.38	133.30
120	3.51	83.22	14.38	346.70	14.38	133.30
125	3.43	85.10	14.38	346.70	14.38	133.30
130	3.46	87.05	14.38	346.70	14.38	133.30
135	3.46	89.01	14.38	346.70	14.38	133.30
140	2.84	90.99	14.38	346.70	14.38	133.30
145	2.86	93.00	14.38	346.70	14.38	133.30
150	2.23	95.11	14.38	346.70	14.38	133.30
155	2.54	97.03	14.38	346.70	14.38	133.30
160	2.27	99.06	14.38	346.70	14.38	133.30
165	2.88	100.69	14.38	346.70	14.38	133.30
170	2.79	102.51	14.38	346.70	14.38	133.30
175	2.55	104.35	14.38	346.70	14.38	133.30
180	2.26	106.15	14.38	346.70	14.38	133.30
185	2.84	107.27	14.38	346.70	14.38	133.30

COMSEARCH

Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5500 <http://www.comsearch.com>

Coordination Values

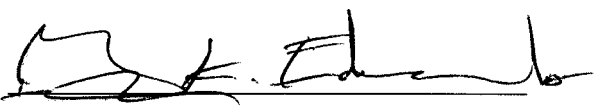
SUNSET BEACH, HI

Licensee Name O3B Limited
Latitude (NAD 83) 21° 40' 11.5" N
Longitude (NAD 83) 158° 1' 58.1" W
Ground Elevation (AMSL) 138.89 m / 455.7 ft
Antenna Centerline (AGL) 2.74 m / 9.0 ft
Antenna Model CGC 5.5m
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 -37.5 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	2.73	108.71	14.38	346.70	14.38	133.30
195	2.45	110.17	14.38	346.70	14.38	133.30
200	2.39	111.32	14.38	346.70	14.38	133.30
205	2.13	112.49	14.38	346.70	14.38	133.30
210	2.09	113.29	14.38	346.70	14.38	133.30
215	1.21	114.73	14.38	346.70	14.38	133.30
220	0.93	115.42	14.38	346.70	14.38	133.30
225	0.89	115.67	14.38	346.70	14.38	133.30
230	0.46	116.11	14.38	346.70	14.38	133.30
235	0.78	115.58	14.38	346.70	14.38	133.30
240	0.55	115.39	14.38	346.70	14.38	133.30
245	0.31	114.98	14.38	346.70	14.38	133.30
250	0.00	114.43	14.38	346.70	14.38	133.30
255	0.00	113.40	14.38	346.70	14.38	133.30
260	0.00	112.19	14.38	346.70	14.38	133.30
265	0.39	110.52	14.38	346.70	14.38	133.30
270	0.46	108.96	14.38	346.70	14.38	133.30
275	0.42	107.35	14.38	346.70	14.38	133.30
280	0.55	105.51	14.38	346.70	14.38	133.30
285	0.56	103.65	14.38	346.70	14.38	133.30
290	0.79	101.61	14.38	346.70	14.38	133.30
295	0.96	99.54	14.38	346.70	14.38	133.30
300	1.37	97.37	14.38	346.70	14.38	133.30
305	1.37	95.31	14.38	346.70	14.38	133.30
310	1.37	93.20	14.38	346.70	14.38	133.30
315	1.17	91.09	14.38	346.70	14.38	133.30
320	0.96	88.93	14.38	346.70	14.38	133.30
325	0.54	86.73	14.38	346.70	14.38	133.30
330	0.00	84.45	14.38	346.70	14.38	133.30
335	0.00	82.28	14.38	346.70	14.38	133.30
340	0.00	80.15	14.38	346.70	14.38	133.30
345	0.00	78.08	14.38	346.70	14.38	133.30
350	0.00	76.10	14.38	346.70	14.38	133.30
355	0.00	74.20	14.38	346.70	14.38	133.30

5. CERTIFICATION

I HEREBY CERTIFY THAT I AM THE TECHNICALLY QUALIFIED PERSON RESPONSIBLE FOR THE PREPARATION OF THE FREQUENCY COORDINATION DATA CONTAINED IN THIS APPLICATION, THAT I AM FAMILIAR WITH PARTS 101 AND 25 OF THE FCC RULES AND REGULATIONS, THAT I HAVE EITHER PREPARED OR REVIEWED THE FREQUENCY COORDINATION DATA SUBMITTED WITH THIS APPLICATION, AND THAT IT IS COMPLETE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

BY: 

Gary K. Edwards
Senior Manager
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147

DATED: June 17, 2020

Ka-Band Earth Station – Sunset Beach, HI

Frequency Coordination Report

28 GHz



Prepared on Behalf of
O3B LIMITED

June 17, 2020



COMSEARCH
A CommScope Company

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1. Summary of Results

On behalf of O3B LIMITED, Comsearch performed a coordination notice under Section 25.203(c) and Section 25.136(a)(4) of the FCC’s rules for all existing and proposed terrestrial licenses within the coordination contours of their proposed Ka-Band earth station in Sunset Beach, HI, which will transmit at 28 GHz¹. 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 June 15, 2020.

No objections were received from any of the incumbent 28 GHz licensees.

2. 28 GHz Common Carrier and LTTS Coordination

In accordance with FCC Rules and Regulations, the Ka-Band earth station in Sunset Beach, HI 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. These licensees are authorized to operate temporary fixed operations from 27.5 – 29.5 GHz on a nationwide basis or local basis.

Licensee	Authorized Geographic Area
Frontier	Nationwide

A notification letter and datasheets for the Ka-Band earth station in Sunset Beach, HI were also sent to the following 28 GHz local television transmission licensee. This licensee is authorized to operate temporary fixed operations from 27.5 – 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.

¹ The proposed earth station will operate in the 27.5 – 28.35 GHz portion of the Ka-Band.

3. 28 GHz UMFUS Coordination

There were three 28 GHz UMFUS licensees identified within the coordination distance of the proposed earth station. The proposed earth station will operate on frequencies that overlap Channel L1 & L2 of the UMFUS service. The total frequency allocation for Channels L1 & L2 of the UMFUS spectrum appears below.

Channel: **L1** 27.500 - 27.925 GHz
 L2 27.925 - 28.350 GHz

Licensee	Authorized Geographic Area
McBride Spectrum Partners	Market-Based
T-Mobile	Market-Based
Verizon	Market-Based

No objections were received from the UMFUS incumbents.

4. Earth Station Coordination Data

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



O3B LIMITED
Ka-Band Earth Station – Sunset Beach, HI
Frequency Coordination Report
28 GHz

Job Number: 200504COMSGE01

Administrative Information

Status ENGINEER PROPOSAL
 Call Sign
 Licensee Code P3210
 Licensee Name O3B Limited

Site Information

Venue Name **SUNSET BEACH, HI**
 Latitude (NAD 83) 21° 40' 11.5" N
 Longitude (NAD 83) 158° 1' 58.1" W
 Climate Zone B
 Rain Zone 4
 Ground Elevation (AMSL) 138.89 m / 455.7 ft

Link Information

Satellite Type Medium Earth Orbit
 Mode TR - Transmit-Receive
 Modulation Digital
 Minimum Elevation Angle 5.0°
 Azimuth Range 0.0° to 360°
 Antenna Centerline (AGL) 2.74 m / 9.0 ft

Antenna Information

	Receive - FCC32	Transmit - FCC32
Manufacturer	CGC 5.5m	CGC 5.5m
Model	Type 5-X/Y	Type 5-X/Y
Gain / Diameter	59.9 dBi / 5.5 m	62.6 dBi / 5.5 m
3-dB / 15-dB Beamwidth	0.50° / 1.00°	1.10° / 2.20°
Max Available RF Power	(dBW/4 kHz) (dBW/MHz)	-37.5 -13.5
Maximum EIRP	(dBW/4 kHz) (dBW/MHz)	25.1 49.1
Interference Objectives:	Long Term Short Term	-156.0 dBW/MHz 20% -146.0 dBW/MHz 0.01%
		-151.0 dBW/4 kHz 20% -128.0 dBW/4 kHz 0.0025%

Frequency Information

	Receive 18.0 GHz	Transmit 28.0 GHz
Emission / Frequency Range (MHz)	54M0G7D - 850MG7D / 17700.0 - 20200.0	54M0G7D - 850MG7D / 27500.0 - 28350.0
Max Great Circle Coordination Distance	346.7 km / 215.4 mi	133.3 km / 82.8 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi	100.0 km / 62.1 mi



O3B LIMITED
Ka-Band Earth Station – Sunset Beach, HI
Frequency Coordination Report
28 GHz

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Licensee Name	O3B Limited		
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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		-37.5 (dBW/4 kHz)	

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.00	72.41	14.38	346.70	14.38	133.30
5	0.00	70.74	14.38	346.70	14.38	133.30
10	0.00	69.21	14.38	346.70	14.38	133.30
15	0.00	67.83	14.38	346.70	14.38	133.30
20	0.00	66.61	14.38	346.70	14.38	133.30
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30	0.00	64.73	14.38	346.70	14.38	133.30
35	0.00	64.09	14.38	346.70	14.38	133.30
40	0.55	64.20	14.38	346.70	14.38	133.30
45	0.59	64.02	14.38	346.70	14.38	133.30
50	0.76	64.19	14.38	346.70	14.38	133.30
55	0.58	64.23	14.38	346.70	14.38	133.30
60	0.82	64.88	14.38	346.70	14.38	133.30
65	1.04	65.70	14.38	346.70	14.38	133.30
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75	1.46	67.86	14.38	346.70	14.38	133.30
80	1.64	69.15	14.38	346.70	14.38	133.30
85	1.85	70.60	14.38	346.70	14.38	133.30
90	2.57	72.53	14.38	346.70	14.38	133.30
95	2.61	74.05	14.38	346.70	14.38	133.30
100	3.15	75.98	14.38	346.70	14.38	133.30
105	3.28	77.71	14.38	346.70	14.38	133.30
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115	3.61	81.40	14.38	346.70	14.38	133.30
120	3.51	83.22	14.38	346.70	14.38	133.30
125	3.43	85.10	14.38	346.70	14.38	133.30
130	3.46	87.05	14.38	346.70	14.38	133.30
135	3.46	89.01	14.38	346.70	14.38	133.30
140	2.84	90.99	14.38	346.70	14.38	133.30
145	2.86	93.00	14.38	346.70	14.38	133.30
150	2.23	95.11	14.38	346.70	14.38	133.30
155	2.54	97.03	14.38	346.70	14.38	133.30
160	2.27	99.06	14.38	346.70	14.38	133.30
165	2.88	100.69	14.38	346.70	14.38	133.30
170	2.79	102.51	14.38	346.70	14.38	133.30
175	2.55	104.35	14.38	346.70	14.38	133.30
180	2.26	106.15	14.38	346.70	14.38	133.30
185	2.84	107.27	14.38	346.70	14.38	133.30



O3B LIMITED
Ka-Band Earth Station – Sunset Beach, HI
Frequency Coordination Report
28 GHz

Coordination Values	SUNSET BEACH, HI		
Licensee Name	O3B Limited		
Latitude (NAD 83)	21° 40' 11.5" N		
Longitude (NAD 83)	158° 1' 58.1" W		
Ground Elevation (AMSL)	138.89 m / 455.7 ft		
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Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz 0.0025%
Max Available RF Power		-37.5 (dBW/4 kHz)	

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	2.73	108.71	14.38	346.70	14.38	133.30
195	2.45	110.17	14.38	346.70	14.38	133.30
200	2.39	111.32	14.38	346.70	14.38	133.30
205	2.13	112.49	14.38	346.70	14.38	133.30
210	2.09	113.29	14.38	346.70	14.38	133.30
215	1.21	114.73	14.38	346.70	14.38	133.30
220	0.93	115.42	14.38	346.70	14.38	133.30
225	0.89	115.67	14.38	346.70	14.38	133.30
230	0.46	116.11	14.38	346.70	14.38	133.30
235	0.78	115.58	14.38	346.70	14.38	133.30
240	0.55	115.39	14.38	346.70	14.38	133.30
245	0.31	114.98	14.38	346.70	14.38	133.30
250	0.00	114.43	14.38	346.70	14.38	133.30
255	0.00	113.40	14.38	346.70	14.38	133.30
260	0.00	112.19	14.38	346.70	14.38	133.30
265	0.39	110.52	14.38	346.70	14.38	133.30
270	0.46	108.96	14.38	346.70	14.38	133.30
275	0.42	107.35	14.38	346.70	14.38	133.30
280	0.55	105.51	14.38	346.70	14.38	133.30
285	0.56	103.65	14.38	346.70	14.38	133.30
290	0.79	101.61	14.38	346.70	14.38	133.30
295	0.96	99.54	14.38	346.70	14.38	133.30
300	1.37	97.37	14.38	346.70	14.38	133.30
305	1.37	95.31	14.38	346.70	14.38	133.30
310	1.37	93.20	14.38	346.70	14.38	133.30
315	1.17	91.09	14.38	346.70	14.38	133.30
320	0.96	88.93	14.38	346.70	14.38	133.30
325	0.54	86.73	14.38	346.70	14.38	133.30
330	0.00	84.45	14.38	346.70	14.38	133.30
335	0.00	82.28	14.38	346.70	14.38	133.30
340	0.00	80.15	14.38	346.70	14.38	133.30
345	0.00	78.08	14.38	346.70	14.38	133.30
350	0.00	76.10	14.38	346.70	14.38	133.30
355	0.00	74.20	14.38	346.70	14.38	133.30



5. Contact Information

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

Contact person:	Dennis Jimeno
Title:	Engineer III, Telecommunications
Company:	Comsearch
Address:	19700 Janelia Farm Blvd., Ashburn, VA 20147
Telephone:	703-726-5858
Fax:	703-726-5599
Email:	DJimeno@Comsearch.com
Web site:	www.comsearch.com