

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Space Exploration Holdings
OAHU, HI
Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147
May 13, 2021

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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.

The following companies reported potential great circle interference conflicts that did not meet the objectives on a line-of-sight basis. When over-the-horizon losses are considered on the interfering paths, sufficient blockage exists to negate harmful interference from occurring with the proposed transmit-receive earth station.

Company

Hawaii, State of
Hawaiian Electric Company, Inc.

No other carriers reported potential interference cases.

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 04/08/2021.

Company

AT&T Corp.
Cellco Partnership - Hawaii
Clearway Energy Group LLC
Clearwire Hawaii Partners Spectrum LLC
Clearwire Spectrum Holdings III, LLC
Cliffnet, Inc.
Coral Wireless Licenses, LLC
County of Kauai Department of Police
County of Maui Dept of Water Supply
Harmer Radio and Electronics, Inc.
Hawaii Dialogix Telecom LLC
Hawaii Electric Light Co Inc
Hawaii, State of
Hawaiian Electric Company, Inc.
Hawaiian Telcom, Inc.
Honolulu Board of Water Supply
Honolulu City & County Dept of Info Tech
Hot Spot Broadband, Inc
KALO TV, Inc.
L3Harris Technologies, Inc
Maui Electric Company Ltd
Maui Wellness Group LLC
Maui, County of
Mid Pacific Communications Inc.
NPCR, Inc.
New Cingular Wireless PCS LLC - Hawaii
Olympic Wireless, LLC
RNN National, LLC
Servpac, Inc
Spectrum Oceanic, LLC
Sprint Spectrum L.P.
Sprintcom, Inc
T-Mobile License LLC
Trex Broadband
Trilew LLC.
University of Hawaii
Verizon Wireless VAW LLC - (Hawaii)

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: 05/13/2021
Job Number: 210408COMSGE05

Administrative Information

Status ENGINEER PROPOSAL
Call Sign
Licensee Code SPACEX
Licensee Name Space Exploration Holdings

Site Information

OAHU, HI

Venue Name
Latitude (NAD 83) 21° 18' 54.0" N
Longitude (NAD 83) 157° 51' 59.1" W
Climate Zone B
Rain Zone 4
Ground Elevation (AMSL) 1.0 m / 3.3 ft

Link Information

Satellite Type Low Earth Orbit
Mode TR - Transmit-Receive
Modulation Digital
Minimum Elevation Angle 25.0°
Azimuth Range 0.0° to 360°
Antenna Centerline (AGL) 0.91 m / 3.0 ft

Antenna Information

Receive - FCC32

Transmit - FCC32

Manufacturer	Cobham	Cobham	
Model	MK3 series	MK3 series	
Gain / Diameter	39.3 dBi / 1.0 m	40.1 dBi / 1.0 m	
3-dB / 15-dB Beamwidth	1.50° / 3.40°	1.20° / 2.80°	
Max Available RF Power (dBW/4 kHz)		-37.4	
(dBW/MHz)		-13.5	
Maximum EIRP (dBW/4 kHz)		2.7	
(dBW/MHz)		26.6	
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 11.0 GHz

Transmit 14.0 GHz

Emission / Frequency Range (MHz)	240MD7W / 10700.0 - 12700.0	62M5D7W - 240MD7W / 14000.0 - 14500.0
Max Great Circle Coordination Distance	265.5 km / 165.0 mi	202.3 km / 125.7 mi
Precipitation Scatter Contour Radius	356.3 km / 221.4 mi	100.0 km / 62.1 mi

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Coordination Values

OAHU, HI

Licensee Name Space Exploration Holdings
Latitude (NAD 83) 21° 18' 54.0" N
Longitude (NAD 83) 157° 51' 59.1" W
Ground Elevation (AMSL) 1.0 m / 3.3 ft
Antenna Centerline (AGL) 0.91 m / 3.0 ft
Antenna Model Cobham 1 meter
Antenna Mode Receive 11.0 GHz Transmit 14.0 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 -37.4 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 11.0 GHz		Transmit 14.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	3.68	75.04	-5.50	265.50	-5.50	202.30
5	4.11	73.89	-5.50	265.50	-5.50	202.30
10	4.04	72.55	-5.50	265.50	-5.50	202.30
15	4.10	71.43	-5.50	265.50	-5.50	202.30
20	4.18	70.47	-5.50	265.50	-5.50	202.30
25	4.20	69.60	-5.50	265.50	-5.50	202.30
30	4.74	69.40	-5.50	265.50	-5.50	202.30
35	5.13	69.24	-5.50	265.50	-5.50	202.30
40	5.18	68.93	-5.50	265.50	-5.50	202.30
45	4.12	67.68	-5.50	265.50	-5.50	202.30
50	2.66	66.19	-5.50	265.50	-5.50	202.30
55	2.70	66.39	-5.50	265.50	-5.50	202.30
60	5.15	69.13	-5.50	265.50	-5.50	202.30
65	4.93	69.41	-5.50	265.50	-5.50	202.30
70	6.09	71.12	-5.50	265.50	-5.50	202.30
75	4.76	70.70	-5.50	265.50	-5.50	202.30
80	4.53	71.47	-5.50	265.50	-5.50	202.30
85	3.97	72.14	-5.50	265.50	-5.50	202.30
90	3.93	73.38	-5.50	265.50	-5.50	202.30
95	4.27	75.00	-5.50	265.50	-5.50	202.30
100	4.33	76.51	-5.50	265.50	-5.50	202.30
105	3.22	77.50	-5.50	265.50	-5.50	202.30
110	1.63	78.54	-5.50	265.50	-5.50	202.30
115	1.08	80.26	-5.50	265.50	-5.50	202.30
120	0.58	82.15	-5.50	265.50	-5.50	202.30
125	0.42	84.23	-5.50	265.50	-5.50	202.30
130	0.42	86.40	-5.50	265.50	-5.50	202.30
135	0.42	88.59	-5.50	265.50	-5.50	202.30
140	0.41	90.78	-5.50	265.50	-5.50	202.30
145	0.31	92.99	-5.50	265.50	-5.50	202.30
150	0.21	95.19	-5.50	265.50	-5.50	202.30
155	0.00	97.40	-5.50	265.50	-5.50	202.30
160	0.00	99.52	-5.50	265.50	-5.50	202.30
165	0.00	101.59	-5.50	265.50	-5.50	202.30
170	0.00	103.58	-5.50	265.50	-5.50	202.30
175	0.21	105.37	-5.50	265.50	-5.50	202.30
180	0.00	107.28	-5.50	265.50	-5.50	202.30
185	0.00	108.96	-5.50	265.50	-5.50	202.30

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Coordination Values

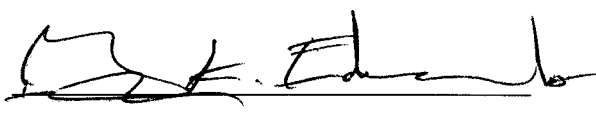
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Short Term -146.0 dBW/MHz 0.01% -128.0 dBW/4 kHz 0.0025%
Max Available RF Power -37.4 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 11.0 GHz		Transmit 14.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	110.51	-5.50	265.50	-5.50	202.30
195	0.00	111.90	-5.50	265.50	-5.50	202.30
200	0.00	113.14	-5.50	265.50	-5.50	202.30
205	0.00	114.19	-5.50	265.50	-5.50	202.30
210	0.00	115.06	-5.50	265.50	-5.50	202.30
215	0.00	115.73	-5.50	265.50	-5.50	202.30
220	0.00	116.19	-5.50	265.50	-5.50	202.30
225	0.00	116.44	-5.50	265.50	-5.50	202.30
230	0.00	116.47	-5.50	265.50	-5.50	202.30
235	0.00	116.28	-5.50	265.50	-5.50	202.30
240	0.00	115.88	-5.50	265.50	-5.50	202.30
245	0.00	115.27	-5.50	265.50	-5.50	202.30
250	0.00	114.46	-5.50	265.50	-5.50	202.30
255	0.00	113.46	-5.50	265.50	-5.50	202.30
260	0.00	112.28	-5.50	265.50	-5.50	202.30
265	0.00	110.93	-5.50	265.50	-5.50	202.30
270	0.00	109.42	-5.50	265.50	-5.50	202.30
275	0.00	107.78	-5.50	265.50	-5.50	202.30
280	0.00	106.01	-5.50	265.50	-5.50	202.30
285	0.00	104.14	-5.50	265.50	-5.50	202.30
290	0.00	102.17	-5.50	265.50	-5.50	202.30
295	0.00	100.13	-5.50	265.50	-5.50	202.30
300	0.00	98.01	-5.50	265.50	-5.50	202.30
305	0.55	95.74	-5.50	265.50	-5.50	202.30
310	0.64	93.57	-5.50	265.50	-5.50	202.30
315	0.25	91.42	-5.50	265.50	-5.50	202.30
320	0.64	89.22	-5.50	265.50	-5.50	202.30
325	0.69	87.05	-5.50	265.50	-5.50	202.30
330	0.92	84.95	-5.50	265.50	-5.50	202.30
335	1.29	82.94	-5.50	265.50	-5.50	202.30
340	1.62	81.02	-5.50	265.50	-5.50	202.30
345	2.23	79.34	-5.50	265.50	-5.50	202.30
350	2.77	77.77	-5.50	265.50	-5.50	202.30
355	3.05	76.22	-5.50	265.50	-5.50	202.30

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: May 13, 2021