

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Emerging Markets Communications, Inc.
KAPOLEI, HI
(E980250)
Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147
August 04, 2017

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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

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 05/23/2017.

Company

AT&T Corp.

Hawaii Electric Light Co Inc

Hawaii State

Hawaiian Electric Company, Inc

Hawaiian Telcom, Inc.

Honolulu City & County Dept of Info Tech

NEXSTAR BROADCASTING, INC.

New Cingular Wireless PCS LLC - Hawaii

University of 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: 05/23/2017
Job Number: 170523COMSGE04

Administrative Information

Status: ENGINEER PROPOSAL
Call Sign: E980250
Licensee Code: EMEMAR
Licensee Name: Emerging Markets Communications, Inc.

Site Information

KAPOLEI, HI
Venue Name
Latitude (NAD 83): 21° 20' 12.6" N
Longitude (NAD 83): 158° 5' 21.1" W
Climate Zone: B
Rain Zone: 4
Ground Elevation (AMSL): 39.59 m / 129.9 ft

Link Information

Satellite Type: Geostationary
Mode: TR - Transmit-Receive
Modulation: Digital
Satellite Arc: 120° W to 232° West Longitude
Azimuth Range: 114.9° to 264.0°
Corresponding Elevation Angles: 40.5° / 6.3°
Antenna Centerline (AGL): 6.71 m / 22.0 ft

Antenna Information

Manufacturer
Model
Gain / Diameter
3-dB / 15-dB Beamwidth

Receive - FCC32

Vertex
13 KPC
53.3 dBi / 13.0 m
0.20° / 0.30°

Transmit - FCC32

Vertex
13 KPC
56.3 dBi / 13.0 m
0.12° / 0.24°

Max Available RF Power (dBW/4 kHz)
(dBW/MHz)

(1) -19.6 (2) -15.8
4.4 8.2

Maximum EIRP (dBW/4 kHz)
(dBW/MHz)

36.7 **40.5**
60.7 64.5

Interference Objectives: Long Term -156.0 dBW/MHz 20%
Short Term -146.0 dBW/MHz 0.01%

-154.0 dBW/4 kHz 20%
-131.0 dBW/4 kHz 0.0025%

Frequency Information

Emission / Frequency Range (MHz)

Receive 4.0 GHz

50K0G1W - 36M0G7W / 3700.0 - 4200.0

Transmit 6.1 GHz

(1) 50K0G1W - 36M0G7W / 5925.0 - 6425.0
(2) 50K0G1W - 36M0G7W / 6425.0 - 6650.0
(2) 50K0G1W - 36M0G7W / 6587.0 - 6687.0
(2) 50K0G1W - 36M0G7W / 6689.0 - 6699.0

Max Great Circle Coordination Distance
Precipitation Scatter Contour Radius

787.1 km / 489.0 mi
418.4 km / 259.9 mi

249.9 km / 155.3 mi
100.0 km / 62.1 mi

COMSEARCH

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Coordination Values		KAPOLEI, HI		
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Longitude (NAD 83)		158° 5' 21.1" W		
Ground Elevation (AMSL)		39.59 m / 129.9 ft		
Antenna Centerline (AGL)		6.71 m / 22.0 ft		
Antenna Model		Vertex 13 meter		
Antenna Mode		Receive 4.0 GHz		Transmit 6.1 GHz
Interference Objectives:	Long Term	-156.0 dBW/MHz	20%	-154.0 dBW/4 kHz 20%
	Short Term	-146.0 dBW/MHz	0.01%	-131.0 dBW/4 kHz 0.0025%
Max Available RF Power		-19.6 (dBW/4 kHz)		

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 4.0 GHz		Transmit 6.1 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	15.72	95.91	-10.00	100.00	-10.00	100.00
5	15.20	100.86	-10.00	100.00	-10.00	100.00
10	15.35	103.46	-10.00	100.00	-10.00	100.00
15	14.86	98.92	-10.00	100.00	-10.00	100.00
20	14.78	94.42	-10.00	100.00	-10.00	100.00
25	14.07	89.91	-10.00	100.00	-10.00	100.00
30	13.27	85.47	-10.00	100.00	-10.00	100.00
35	12.90	81.07	-10.00	100.83	-10.00	100.00
40	12.76	76.68	-10.00	101.46	-10.00	100.00
45	12.50	72.35	-10.00	102.59	-10.00	100.00
50	11.80	68.17	-10.00	105.73	-10.00	100.00
55	11.03	64.13	-10.00	109.17	-10.00	100.00
60	10.42	60.18	-10.00	111.85	-10.00	100.00
65	10.16	56.25	-10.00	113.02	-10.00	100.00
70	10.21	52.32	-10.00	112.82	-10.00	100.00
75	9.10	49.13	-10.00	115.76	-10.00	100.00
80	8.69	45.85	-9.53	118.05	-9.53	100.00
85	7.68	43.27	-8.91	120.50	-8.91	100.00
90	7.01	40.89	-8.29	124.14	-8.29	100.00
95	6.80	38.58	-7.66	126.83	-7.66	100.00
100	5.77	37.47	-7.34	132.69	-7.34	100.00
105	4.40	37.30	-7.29	147.87	-7.29	100.00
110	3.44	37.39	-7.32	166.03	-7.32	100.00
115	0.00	40.55	-8.20	435.17	-8.20	132.24
120	0.00	40.81	-8.27	434.25	-8.27	132.00
125	0.00	41.58	-8.47	431.63	-8.47	131.34
130	0.00	42.81	-8.79	427.52	-8.79	130.29
135	0.00	44.47	-9.20	422.22	-9.20	128.95
140	0.00	46.52	-9.69	416.05	-9.69	127.41
145	0.00	48.90	-10.00	412.20	-10.00	126.45
150	0.00	51.56	-10.00	412.20	-10.00	126.45
155	0.00	54.46	-10.00	412.20	-10.00	126.45
160	0.00	57.56	-10.00	412.20	-10.00	126.45
165	0.00	60.55	-10.00	412.20	-10.00	126.45
170	0.00	62.92	-10.00	412.20	-10.00	126.45
175	0.00	64.46	-10.00	412.20	-10.00	126.45
180	0.00	65.00	-10.00	412.20	-10.00	126.45
185	0.00	64.46	-10.00	412.20	-10.00	126.45

COMSEARCH

Earth Station Data Sheet

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

Coordination Values		KAPOLEI, HI				
Licensee Name		Emerging Markets Communications, Inc.				
Latitude (NAD 83)		21° 20' 12.6" N				
Longitude (NAD 83)		158° 5' 21.1" W				
Ground Elevation (AMSL)		39.59 m / 129.9 ft				
Antenna Centerline (AGL)		6.71 m / 22.0 ft				
Antenna Model		Vertex 13 meter				
Antenna Mode		Receive 4.0 GHz		Transmit 6.1 GHz		
Interference Objectives:		Long Term	-156.0 dBW/MHz	20%	-154.0 dBW/4 kHz	20%
		Short Term	-146.0 dBW/MHz	0.01%	-131.0 dBW/4 kHz	0.0025%
Max Available RF Power		-19.6 (dBW/4 kHz)				
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 4.0 GHz		Transmit 6.1 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	62.92	-10.00	412.20	-10.00	126.45
195	0.00	60.55	-10.00	412.20	-10.00	126.45
200	0.00	57.56	-10.00	412.20	-10.00	126.45
205	0.00	54.11	-10.00	412.20	-10.00	126.45
210	0.00	50.34	-10.00	412.20	-10.00	126.45
215	0.00	46.33	-9.65	416.61	-9.65	127.55
220	0.00	42.15	-8.62	429.68	-8.62	130.84
225	0.00	37.85	-7.45	445.08	-7.45	134.78
230	0.00	33.46	-6.11	463.42	-6.11	139.56
235	0.00	29.00	-4.56	485.01	-4.56	145.44
240	0.00	24.48	-2.72	512.72	-2.72	152.74
245	0.00	19.92	-0.48	548.44	-0.48	162.50
250	0.00	15.34	2.36	597.06	2.36	176.04
255	0.00	10.98	5.98	663.86	5.98	195.21
260	0.00	7.47	10.16	749.72	10.16	220.06
265	0.00	6.39	11.86	787.10	11.86	249.89
270	0.00	8.70	8.52	714.89	8.52	210.15
275	0.00	12.66	4.44	634.45	4.44	186.81
280	0.00	17.16	1.13	575.71	1.13	170.06
285	0.00	21.88	-1.50	531.91	-1.50	157.96
290	0.57	26.58	-3.61	373.79	-3.61	115.64
295	0.93	31.41	-5.43	298.90	-5.43	100.00
300	6.03	35.99	-6.91	131.60	-6.91	100.00
305	6.85	41.00	-8.32	124.43	-8.32	100.00
310	8.63	46.04	-9.58	118.06	-9.58	100.00
315	10.53	51.12	-10.00	111.40	-10.00	100.00
320	13.92	56.33	-10.00	100.00	-10.00	100.00
325	14.06	61.28	-10.00	100.00	-10.00	100.00
330	15.02	66.29	-10.00	100.00	-10.00	100.00
335	15.80	71.26	-10.00	100.00	-10.00	100.00
340	15.65	76.18	-10.00	100.00	-10.00	100.00
345	15.78	81.12	-10.00	100.00	-10.00	100.00
350	16.25	86.05	-10.00	100.00	-10.00	100.00
355	16.04	90.98	-10.00	100.00	-10.00	100.00

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Date: 05/23/2017
Job Number: 170523COMSGE03

Administrative Information

Status: ENGINEER PROPOSAL
Call Sign: E980250
Licensee Code: EMEMAR
Licensee Name: Emerging Markets Communications, Inc.

Site Information

KAPOLEI, HI

Venue Name
Latitude (NAD 83): 21° 20' 12.6" N
Longitude (NAD 83): 158° 5' 21.1" W
Climate Zone: B
Rain Zone: 4
Ground Elevation (AMSL): 39.59 m / 129.9 ft

Link Information

Satellite Type: Geostationary
Mode: TR - Transmit-Receive
Modulation: Digital
Satellite Arc: 83° W to 232° West Longitude
Azimuth Range: 95.5° to 264.0°
Corresponding Elevation Angles: 5.2° / 6.3°
Antenna Centerline (AGL): 6.71 m / 22.0 ft

Antenna Information

Receive - FCC32

Transmit - FCC32

Manufacturer: Vertex
Model: 13 KPC
Gain / Diameter: 53.3 dBi / 13.0 m
3-dB / 15-dB Beamwidth: 0.20° / 0.30°

Vertex
13 KPC
53.3 dBi / 13.0 m
0.20° / 0.30°

Vertex
13 KPC
56.3 dBi / 13.0 m
0.12° / 0.24°

Max Available RF Power (dBW/4 kHz)
(dBW/MHz)

(1) -19.6 (2) -15.8
4.4 8.2

Maximum EIRP (dBW/4 kHz)
(dBW/MHz)

36.7 40.5
60.7 64.5

Interference Objectives: Long Term -156.0 dBW/MHz 20%
Short Term -146.0 dBW/MHz 0.01%

-154.0 dBW/4 kHz 20%
-131.0 dBW/4 kHz 0.0025%

Frequency Information

Receive 4.0 GHz

Transmit 6.1 GHz

Emission / Frequency Range (MHz): 50K0G1W - 36M0G7W / 3700.0 - 4200.0

(1) 50K0G1W - 36M0G7W / 5925.0 - 5978.0
(1) 50K0G1W - 36M0G7W / 6031.0 - 6097.0
(1) 50K0G1W - 36M0G7W / 6150.0 - 6425.0
(2) 50K0G1W - 36M0G7W / 6425.0 - 6629.0
(2) 50K0G1W - 36M0G7W / 6689.0 - 6699.0

Max Great Circle Coordination Distance: 787.1 km / 489.0 mi
Precipitation Scatter Contour Radius: 430.9 km / 267.7 mi

265.9 km / 165.2 mi
100.0 km / 62.1 mi

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Earth Station Data Sheet

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Licensee Name		Emerging Markets Communications, Inc.			
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Ground Elevation (AMSL)		39.59 m / 129.9 ft			
Antenna Centerline (AGL)		6.71 m / 22.0 ft			
Antenna Model		Vertex 13 meter			
Antenna Mode		Receive 4.0 GHz		Transmit 6.1 GHz	
Interference Objectives:		Long Term	-156.0 dBW/MHz	20%	-154.0 dBW/4 kHz 20%
		Short Term	-146.0 dBW/MHz	0.01%	-131.0 dBW/4 kHz 0.0025%
Max Available RF Power		-19.6 (dBW/4 kHz)			

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 4.0 GHz		Transmit 6.1 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	15.72	95.44	-10.00	100.00	-10.00	100.00
5	15.20	90.53	-10.00	100.00	-10.00	100.00
10	15.35	85.61	-10.00	100.00	-10.00	100.00
15	14.86	80.67	-10.00	100.00	-10.00	100.00
20	14.78	75.74	-10.00	100.00	-10.00	100.00
25	14.07	70.78	-10.00	100.00	-10.00	100.00
30	13.27	65.79	-10.00	100.00	-10.00	100.00
35	12.90	60.83	-10.00	100.83	-10.00	100.00
40	12.76	55.88	-10.00	101.46	-10.00	100.00
45	12.50	50.92	-10.00	102.59	-10.00	100.00
50	11.80	45.91	-9.55	107.09	-9.55	100.00
55	11.03	40.88	-8.29	114.27	-8.29	100.00
60	10.42	35.87	-6.87	119.45	-6.87	100.00
65	10.16	30.90	-5.25	126.04	-5.25	100.00
70	10.21	25.99	-3.37	132.62	-3.37	100.00
75	9.10	20.89	-1.00	146.32	-1.00	100.00
80	8.69	15.91	1.96	160.64	1.96	100.00
85	7.68	10.82	6.14	186.58	6.14	100.00
90	7.01	5.82	12.87	231.96	12.87	100.00
95	6.80	1.13	30.68	723.10	30.68	265.94
100	5.77	3.92	17.18	273.34	17.18	100.00
105	4.40	9.05	8.09	235.38	8.09	100.00
110	3.44	14.01	3.34	229.92	3.34	100.00
115	0.00	19.92	-0.48	548.46	-0.48	162.50
120	0.00	24.48	-2.72	512.72	-2.72	152.74
125	0.00	29.00	-4.56	485.00	-4.56	145.43
130	0.00	33.46	-6.11	463.42	-6.11	139.56
135	0.00	37.85	-7.45	445.08	-7.45	134.79
140	0.00	42.16	-8.62	429.68	-8.62	130.84
145	0.00	46.33	-9.65	416.61	-9.65	127.55
150	0.00	50.34	-10.00	412.20	-10.00	126.45
155	0.00	54.11	-10.00	412.20	-10.00	126.45
160	0.00	57.56	-10.00	412.20	-10.00	126.45
165	0.00	60.55	-10.00	412.20	-10.00	126.45
170	0.00	62.92	-10.00	412.20	-10.00	126.45
175	0.00	64.46	-10.00	412.20	-10.00	126.45
180	0.00	65.00	-10.00	412.20	-10.00	126.45
185	0.00	64.46	-10.00	412.20	-10.00	126.45

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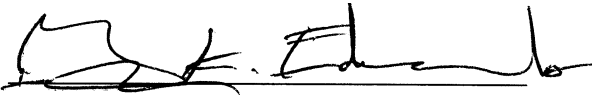
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Antenna Model		Vertex 13 meter				
Antenna Mode		Receive 4.0 GHz		Transmit 6.1 GHz		
Interference Objectives:		Long Term	-156.0 dBW/MHz	20%	-154.0 dBW/4 kHz	20%
		Short Term	-146.0 dBW/MHz	0.01%	-131.0 dBW/4 kHz	0.0025%
Max Available RF Power		-19.6 (dBW/4 kHz)				
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 4.0 GHz		Transmit 6.1 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	62.92	-10.00	412.20	-10.00	126.45
195	0.00	60.55	-10.00	412.20	-10.00	126.45
200	0.00	57.56	-10.00	412.20	-10.00	126.45
205	0.00	54.11	-10.00	412.20	-10.00	126.45
210	0.00	50.34	-10.00	412.20	-10.00	126.45
215	0.00	46.33	-9.65	416.61	-9.65	127.55
220	0.00	42.15	-8.62	429.68	-8.62	130.84
225	0.00	37.85	-7.45	445.08	-7.45	134.78
230	0.00	33.46	-6.11	463.42	-6.11	139.56
235	0.00	29.00	-4.56	485.01	-4.56	145.44
240	0.00	24.48	-2.72	512.72	-2.72	152.74
245	0.00	19.92	-0.48	548.44	-0.48	162.50
250	0.00	15.34	2.36	597.06	2.36	176.04
255	0.00	10.98	5.98	663.86	5.98	195.21
260	0.00	7.47	10.16	749.72	10.16	220.06
265	0.00	6.39	11.86	787.10	11.86	249.89
270	0.00	8.70	8.52	714.89	8.52	210.15
275	0.00	12.66	4.44	634.45	4.44	186.81
280	0.00	17.16	1.13	575.71	1.13	170.06
285	0.00	21.88	-1.50	531.91	-1.50	157.96
290	0.57	26.58	-3.61	373.79	-3.61	115.64
295	0.93	31.41	-5.43	298.90	-5.43	100.00
300	6.03	35.99	-6.91	131.60	-6.91	100.00
305	6.85	41.00	-8.32	124.43	-8.32	100.00
310	8.63	46.04	-9.58	118.06	-9.58	100.00
315	10.53	51.12	-10.00	111.40	-10.00	100.00
320	13.92	56.33	-10.00	100.00	-10.00	100.00
325	14.06	61.28	-10.00	100.00	-10.00	100.00
330	15.02	66.29	-10.00	100.00	-10.00	100.00
335	15.80	71.26	-10.00	100.00	-10.00	100.00
340	15.65	76.18	-10.00	100.00	-10.00	100.00
345	15.78	81.12	-10.00	100.00	-10.00	100.00
350	16.25	86.05	-10.00	100.00	-10.00	100.00
355	16.04	90.98	-10.00	100.00	-10.00	100.00

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: August 04, 2017