

# FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for  
**UltiSat**  
**OAHU, HI**  
**Satellite Earth Station**

Prepared By:  
COMSEARCH  
19700 Janelia Farm Boulevard  
Ashburn, VA 20147  
June 16, 2016

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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

HONOLULU CITY & COUNTY DEPT OF INFO TECH

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 06/02/2016.

Company

AT&T Corp.

County of Kauai Department of Police

HONOLULU CITY & COUNTY DEPT OF INFO TECH

Hawaii State

Hawaiian Electric Company, Inc

Hawaiian Telcom, Inc.

LIN License Company, LLC

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: 06/16/2016  
Job Number: 160602COMSGE05

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### Administrative Information

Status ENGINEER PROPOSAL  
Call Sign  
Licensee Code ULITSA  
Licensee Name UltiSat

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### Site Information OAHU, HI

Venue Name  
Latitude (NAD 83) 21° 31' 22.1" N  
Longitude (NAD 83) 157° 59' 43.2" W  
Climate Zone B  
Rain Zone 4  
Ground Elevation (AMSL) 393.82 m / 1292.1 ft

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### Link Information

Satellite Type Geostationary  
Mode TR - Transmit-Receive  
Modulation Digital  
Satellite Arc 177° W to 177° West Longitude  
Azimuth Range 223.2° to 223.2°  
Corresponding Elevation Angles 56.8° / 56.8°  
Antenna Centerline (AGL) 2.74 m / 9.0 ft

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### Antenna Information

		Receive - FCC32		Transmit - FCC32	
Manufacturer		Prodelin		Prodelin	
Model		1251		1251	
Gain / Diameter		38.0 dBi / 2.4 m		42.0 dBi / 2.4 m	
3-dB / 15-dB Beamwidth		2.30° / 4.60°		1.36° / 2.72°	
Max Available RF Power	(dBW/4 kHz) (dBW/MHz)			-10.0 14.0	
Maximum EIRP	(dBW/4 kHz) (dBW/MHz)			32.0 56.0	
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%

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### Frequency Information

	Receive 4.0 GHz	Transmit 6.1 GHz
Emission / Frequency Range (MHz)	87K0G7D - 100KG7D / 3700.0 - 4200.0	87K0G7D - 100KG7D / 5925.0 - 5988.0 87K0G7D - 100KG7D / 6028.0 - 6047.0 87K0G7D - 100KG7D / 6120.0 - 6126.0 87K0G7D - 100KG7D / 6179.0 - 6366.0 87K0G7D - 100KG7D / 6399.0 - 6425.0
Max Great Circle Coordination Distance	412.2 km / 256.1 mi	162.9 km / 101.2 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi	100.0 km / 62.1 mi

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## Earth Station Data Sheet

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### Coordination Values

### OAHU, HI

Licensee Name UltiSat  
Latitude (NAD 83) 21° 31' 22.1" N  
Longitude (NAD 83) 157° 59' 43.2" W  
Ground Elevation (AMSL) 393.82 m / 1292.1 ft  
Antenna Centerline (AGL) 2.74 m / 9.0 ft  
Antenna Model Prodelin 2.4 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 -10.0 (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	0.84	114.06	-10.00	272.44	-10.00	111.21
5	1.24	116.36	-10.00	239.78	-10.00	100.00
10	1.57	118.47	-10.00	221.26	-10.00	100.00
15	1.47	120.05	-10.00	227.03	-10.00	100.00
20	1.83	121.81	-10.00	207.71	-10.00	100.00
25	1.53	122.72	-10.00	223.72	-10.00	100.00
30	2.27	124.35	-10.00	189.52	-10.00	100.00
35	2.40	125.14	-10.00	184.58	-10.00	100.00
40	2.52	125.61	-10.00	180.42	-10.00	100.00
45	2.71	125.84	-10.00	173.88	-10.00	100.00
50	2.34	125.21	-10.00	186.76	-10.00	100.00
55	2.90	125.17	-10.00	167.84	-10.00	100.00
60	2.97	124.36	-10.00	165.38	-10.00	100.00
65	2.81	123.04	-10.00	170.66	-10.00	100.00
70	3.07	121.83	-10.00	162.74	-10.00	100.00
75	3.07	120.14	-10.00	162.75	-10.00	100.00
80	2.71	117.97	-10.00	173.91	-10.00	100.00
85	2.51	115.76	-10.00	180.79	-10.00	100.00
90	2.10	113.27	-10.00	195.54	-10.00	100.00
95	1.64	110.66	-10.00	217.79	-10.00	100.00
100	1.37	108.07	-10.00	232.56	-10.00	100.00
105	1.35	105.52	-10.00	233.35	-10.00	100.00
110	1.53	102.95	-10.00	223.56	-10.00	100.00
115	1.72	100.28	-10.00	213.56	-10.00	100.00
120	1.26	97.41	-10.00	238.83	-10.00	100.00
125	1.09	94.60	-10.00	248.29	-10.00	101.33
130	0.76	91.78	-10.00	283.05	-10.00	114.97
135	0.51	89.00	-10.00	320.33	-10.00	126.17
140	0.20	86.26	-10.00	411.13	-10.00	162.44
145	0.00	83.57	-10.00	412.20	-10.00	162.88
150	0.00	80.90	-10.00	412.20	-10.00	162.88
155	0.00	78.28	-10.00	412.20	-10.00	162.88
160	0.00	75.72	-10.00	412.20	-10.00	162.88
165	0.00	73.25	-10.00	412.20	-10.00	162.88
170	0.00	70.87	-10.00	412.20	-10.00	162.88
175	0.00	68.62	-10.00	412.20	-10.00	162.88
180	0.00	66.50	-10.00	412.20	-10.00	162.88
185	0.00	64.54	-10.00	412.20	-10.00	162.88



# COMSEARCH

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### Coordination Values

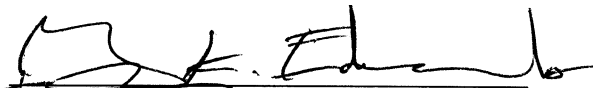
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Antenna Mode	Receive 4.0 GHz		Transmit 6.1 GHz	
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	-154.0 dBW/4 kHz	20%
Short Term	-146.0 dBW/MHz	0.01%	-131.0 dBW/4 kHz	0.0025%
Max Available RF Power			-10.0 (dBW/4 kHz)	

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	62.76	-10.00	412.20	-10.00	162.88
195	0.00	61.18	-10.00	412.20	-10.00	162.88
200	0.00	59.82	-10.00	412.20	-10.00	162.88
205	0.00	58.70	-10.00	412.20	-10.00	162.88
210	0.00	57.83	-10.00	412.20	-10.00	162.88
215	0.00	57.23	-10.00	412.20	-10.00	162.88
220	0.00	56.91	-10.00	412.20	-10.00	162.88
225	0.00	56.87	-10.00	412.20	-10.00	162.88
230	0.00	57.11	-10.00	412.20	-10.00	162.88
235	0.00	57.64	-10.00	412.20	-10.00	162.88
240	0.00	58.43	-10.00	412.20	-10.00	162.88
245	0.00	59.49	-10.00	412.20	-10.00	162.88
250	0.00	60.79	-10.00	412.20	-10.00	162.88
255	0.00	62.31	-10.00	412.20	-10.00	162.88
260	0.00	64.03	-10.00	412.20	-10.00	162.88
265	0.00	65.94	-10.00	412.20	-10.00	162.88
270	0.00	68.02	-10.00	412.20	-10.00	162.88
275	0.00	70.24	-10.00	412.20	-10.00	162.88
280	0.00	72.58	-10.00	412.20	-10.00	162.88
285	0.00	75.03	-10.00	412.20	-10.00	162.88
290	0.00	77.56	-10.00	412.20	-10.00	162.88
295	0.00	80.17	-10.00	412.20	-10.00	162.88
300	0.00	82.83	-10.00	412.20	-10.00	162.88
305	0.00	85.53	-10.00	412.20	-10.00	162.88
310	0.00	88.26	-10.00	412.20	-10.00	162.88
315	0.00	90.99	-10.00	412.20	-10.00	162.88
320	0.00	93.72	-10.00	412.20	-10.00	162.88
325	0.00	96.43	-10.00	412.20	-10.00	162.88
330	0.00	99.10	-10.00	412.20	-10.00	162.88
335	0.00	101.72	-10.00	412.20	-10.00	162.88
340	0.00	104.28	-10.00	412.20	-10.00	162.88
345	0.21	106.85	-10.00	407.34	-10.00	160.90
350	0.39	109.33	-10.00	351.35	-10.00	138.62
355	0.51	111.69	-10.00	319.44	-10.00	125.84

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

DATED: June 16, 2016