

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for

**Universal Space Network, Inc.
Naalehu, Hawaii**

Satellite Earth Station

Prepared By:
COMSEARCH

19700 Janelia Farm Boulevard
Ashburn, Virginia 20147
September 1, 2011

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1. CONCLUSIONS

An interference study considering all existing, proposed and prior coordinated microwave facilities within the coordination contours of the 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 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-only earth station.

Company

None

No 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.

Expedited coordination data for this earth station was sent to the below listed carriers with a letter dated August 6, 2011.

Company

HITV License Subsidiary, Inc.
HO'ONA'AUAO COMMUNITY TV, INC.
Hearst -Argyle Stations, Inc (KITV-TV)
Ho Ona Auao Community TV, Inc
ION MEDIA HAWAII LICENSE, INC.
KHLS INC
KHNL/KGMB License Subsidiary, LLC
Kaiser Ind Corp
NVT Hawaii Licensee, LLC
ONE LOVE OUTREACH, INC.
Society of Broadcast Engineers – State of Hawaii Representative
Time Warner Entertainment Company L.P.
Trinity Broadcasting Network Inc
Village Video Production Inc.
NSM Surveillance
Information Super Station, LLC
Metrosat Communications, Inc.
Fishman Brothers Enterprises
Randy Hermes Productions Inc.
Global Microwave Systems Inc.
Broadcast Sports Inc.
RF Central, LLC
UniSat, Inc.
Casper, John
Regulus Media Services, Inc.
CNG Communications, Inc.
Winged Vision Inc.
Goodyear Tire & Rubber Company
CP Communications PA, LLC
DC II, Inc.
3G Wireless, LLC
BFI Licenses, LLC
Cohen, Elena
RF Film, Inc
Citywide News Network, Inc.
Remote Facilities Consulting Services Inc.

Company (Continued)

Heiden, Mr. William
Wolfe Air Aviation
RF Technology, LLC
Onboard Images
GSN News, Inc.
Cowboys Stadium L

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: 09/01/2011
Job Number: 110806COMSJC01

Administrative Information

Status ENGINEER PROPOSAL
Call Sign NAALEHU
Licensee Code UNSPNE
Licensee Name Universal Space Network, Inc.

Site Information NAALEHU, HAWAII

Venue Name
Latitude (NAD 83) 19° 0' 50.3" N
Longitude (NAD 83) 155° 39' 46.6" W
Climate Zone C
Rain Zone 4
Ground Elevation (AMSL) 378.0 m / 1240.2 ft

Link Information

Satellite Type Low Earth Orbit
Mode TR – Transmit/Receive
Modulation Digital
Minimum Elevation Angle 5.0°
Azimuth Range 0.0° to 360°
Antenna Centerline (AGL) 8.53 m / 28.0 ft

Antenna Information

	Receive	Transmit
Manufacturer	Datron	Datron
Model	1453	1453
Gain / Diameter	46.9 dBi / 13.0 m	57.1 dBi / 13.0 m
3-dB / 15-dB Beamwidth	0.78° / 1.46°	0.24° / 0.45°
Max Available RF Power (dBW/4 kHz)		10.9
(dBW/MHz)		27.9
Maximum EIRP (dBW/4 kHz)		68.0
(dBW/MHz)		85.0
(dBW)		85.0
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%

Frequency Information

	Receive 2.2 GHz	Transmit 7.0 GHz
Emission / Frequency Range (MHz)	200KG2D / 2321.5	200KG2D / 7062.293 200KG2D / 7070.207
Max Great Circle Coordination Distance	1050.1 km / 652.4 mi	760.0 km / 472.2 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi	330.4 km / 205.3 mi

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Coordination Values

NAALEHU, HI

Licensee Name Universal Space Network, Inc.
Latitude (NAD 83) 19° 0' 50.3" N
Longitude (NAD 83) 155° 39' 46.6" W
Ground Elevation (AMSL) 378.0 m / 1240.2 ft
Antenna Centerline (AGL) 8.53 m / 28.0 ft
Antenna Model Datron 1453
Antenna Mode Receive 2.2 GHz Transmit 7.0 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 10.9 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 2.2 GHz		Transmit 7.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	2.78	5.0	4.50	662.10	4.50	365.00
5	2.62	5.0	4.50	671.20	4.50	374.40
10	2.39	5.0	4.50	685.10	4.50	388.60
15	2.30	5.0	4.50	690.80	4.50	394.30
20	2.17	5.0	4.50	699.20	4.50	403.00
25	2.03	5.0	4.50	708.80	4.50	412.70
30	1.68	5.0	4.50	734.80	4.50	439.30
35	0.90	5.0	4.50	811.80	4.50	517.90
40	0.33	5.0	4.50	911.20	4.50	619.40
45	0.00	5.0	4.50	1050.10	4.50	760.00
50	0.00	5.0	4.50	1050.10	4.50	760.00
55	0.00	5.0	4.50	1050.10	4.50	760.00
60	0.00	5.0	4.50	1050.10	4.50	760.00
65	0.00	5.0	4.50	1050.10	4.50	760.00
70	0.00	5.0	4.50	1050.10	4.50	760.00
75	0.00	5.0	4.50	1050.10	4.50	760.00
80	0.00	5.0	4.50	1050.10	4.50	760.00
85	0.00	5.0	4.50	1050.10	4.50	760.00
90	0.00	5.0	4.50	1050.10	4.50	760.00
95	0.00	5.0	4.50	1050.10	4.50	760.00
100	0.00	5.0	4.50	1050.10	4.50	760.00
105	0.00	5.0	4.50	1050.10	4.50	760.00
110	0.00	5.0	4.50	1050.10	4.50	760.00
115	0.00	5.0	4.50	1050.10	4.50	760.00
120	0.00	5.0	4.50	1050.10	4.50	760.00
125	0.00	5.0	4.50	1050.10	4.50	760.00
130	0.00	5.0	4.50	1050.10	4.50	760.00
135	0.00	5.0	4.50	1050.10	4.50	760.00
140	0.00	5.0	4.50	1050.10	4.50	760.00
145	0.00	5.0	4.50	1050.10	4.50	760.00
150	0.00	5.0	4.50	1050.10	4.50	760.00
155	0.00	5.0	4.50	1050.10	4.50	760.00
160	0.00	5.0	4.50	1050.10	4.50	760.00
165	0.00	5.0	4.50	1050.10	4.50	760.00
170	0.00	5.0	4.50	1050.10	4.50	760.00
175	0.00	5.0	4.50	1050.10	4.50	760.00
180	0.00	5.0	4.50	1050.10	4.50	760.00
185	0.00	5.0	4.50	1050.10	4.50	760.00

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Coordination Values

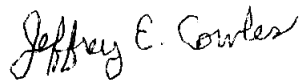
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Max Available RF Power 10.9 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 2.2 GHz		Transmit 7.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	5.0	4.50	1050.10	4.50	760.00
195	0.00	5.0	4.50	1050.10	4.50	760.00
200	0.00	5.0	4.50	1050.10	4.50	760.00
205	0.00	5.0	4.50	1050.10	4.50	760.00
210	0.00	5.0	4.50	1050.10	4.50	760.00
215	0.00	5.0	4.50	1050.10	4.50	760.00
220	0.00	5.0	4.50	1050.10	4.50	760.00
225	0.00	5.0	4.50	1050.10	4.50	760.00
230	0.00	5.0	4.50	1050.10	4.50	760.00
235	0.00	5.0	4.50	1050.10	4.50	760.00
240	0.00	5.0	4.50	1050.10	4.50	760.00
245	0.00	5.0	4.50	1050.10	4.50	760.00
250	0.00	5.0	4.50	1050.10	4.50	760.00
255	0.00	5.0	4.50	1050.10	4.50	760.00
260	0.00	5.0	4.50	1050.10	4.50	760.00
265	0.34	5.0	4.50	908.60	4.50	616.80
270	0.54	5.0	4.50	866.00	4.50	573.30
275	0.79	5.0	4.50	826.30	4.50	532.80
280	1.04	5.0	4.50	795.00	4.50	500.90
285	0.98	5.0	4.50	802.00	4.50	508.00
290	1.14	5.0	4.50	784.10	4.50	489.70
295	1.30	5.0	4.50	768.00	4.50	473.20
300	1.42	5.0	4.50	757.00	4.50	461.80
305	1.68	5.0	4.50	734.80	4.50	439.30
310	1.86	5.0	4.50	721.00	4.50	425.20
315	2.05	5.0	4.50	707.40	4.50	411.30
320	2.17	5.0	4.50	699.20	4.50	403.00
325	2.35	5.0	4.50	687.60	4.50	391.10
330	2.46	5.0	4.50	681.00	4.50	384.10
335	2.59	5.0	4.50	673.00	4.50	376.20
340	2.68	5.0	4.50	667.80	4.50	370.80
345	2.73	5.0	4.50	664.90	4.50	367.90
350	3.10	5.0	4.50	644.70	4.50	347.30
355	2.96	5.0	4.50	652.20	4.50	354.90

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.



Jeffrey E. Cowles
Engineer III, Telecommunications
COMSEARCH
19700 Janelia Farm Boulevard
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DATED: September 1, 2011