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
August 31, 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 transmit/receive 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 18, 2011.

Company

HAWAII PUBLIC TELEVISION FOUNDATION
Hearst -Argyle Stations, Inc (KITV-TV)
KHNL/KGMB License Subsidiary, LLC
NVT Hawaii Licensee, LLC
Society of Broadcast Engineers – State of Hawaii Representative
Time Warner Entertainment Company L.P.
VICTOR AGMATA, JR.
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
Metro Networks Communications, Inc.
Borgeson, Tom R.
UniSat, Inc.
Casper, John
Alltel Communications, LLC
Regulus Media Services, Inc.
Kentucky RSA 3 Cellular General Partnership
Kentucky RSA 4 Cellular General Partnership
Winged Vision Inc.
Goodyear Tire & Rubber Company
CenturyTel of the Southwest Inc.
CP Communications PA, LLC
Telemovil Del Caribe Inc.
Western Technical Services
DC II, Inc.
Steinhert, Christine
3G Wireless, LLC
Cohen, Elena
Express Lane Traffic LLC

Company (Continued)

Ryan, Anthony J
Lancellotti, Inc.
Total Video Houston, LLC
Remote Facilities Consulting Inc.
RF Film, Inc.
Citywide News Network, Inc.
Heiden, Mr. William
Wolfe Air Aviation
RF Technology, LLC
Onboard Images
GSN News, Inc.
Cowboys Stadium LP

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:	08/31/2011
Job Number:	110818COMSJC03

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		45.9 dBi / 13.0 m	
3-dB / 15-dB Beamwidth		0.78° / 1.46°		0.76° / 1.46°	
Max Available RF Power	(dBW/4 kHz)			5.1	
	(dBW/MHz)			22.1	
Maximum EIRP	(dBW/4 kHz)			51.0	
	(dBW/MHz)			68.0	
	(dBW)			68.0	
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 2.0 GHz
Emission / Frequency Range (MHz)	510KG2D / 2221.9560	200KG2D / 2046.051
	510KG2D / 2234.2320	200KG2D / 2057.355
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	176.0 km / 109.3 mi

COMSEARCH

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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)	8.54 m / 28.0 ft			
Antenna Model	Datron 1453			
Antenna Mode	Receive 2.2 GHz		Transmit 2.0 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			5.1 (dBW/4 kHz)	

			Receive 2.2 GHz		Transmit 2.0 GHz	
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	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

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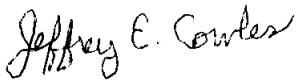
Max Available RF Power			5.1 (dBW/4 kHz)	

			Receive 2.2 GHz		Transmit 2.0 GHz	
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
185	0.00	5.0	4.50	1050.10	4.50	760.00
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
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DATED: August 30, 2011