

# 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  
April 22, 2014

## TABLE OF CONTENTS

1. CONCLUSIONS .....	3
2. SUMMARY OF RESULTS .....	4
3. SUPPLEMENTAL SHOWING .....	5
4. EARTH STATION COORDINATION DATA.....	8
5. CERTIFICATION.....	12

## 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 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 April 7, 2014.

#### Company

3G Wireless, LLC  
AERIAL VIDEO SYSTEMS  
America's Cup Event Authority, LLC  
AT&T California  
Alascom Inc  
Ascent Media Network Services, LLC  
Bellsouth Telecommunications, Inc.  
Borgeson, Tom R.  
Broadcast Sports Inc.  
CNG Communications, Inc.  
Carolina Telephone and Telegraph Co  
Casper, John  
CenturyTel of the Southwest, Inc.  
Chicago Comnet Corp  
Cincinnati Bell Wireless LLC  
Circuit of the Americas, LLC  
Citywide News Network, Inc.  
Cohen, Elana  
Cowboys Stadium LP  
CP Communications, LLC  
DCI II, INC.  
Direct Broadcast Services, Inc.  
Express Lane Traffic LLC  
Fishman Brothers Enterprises  
GOODYEAR TIRE AND RUBBER COMPANY  
GSN New, Inc  
Global Microwave Systems Inc  
HAWAII PUBLIC TELEVISION FOUNDATION  
HF Enterprises, Inc  
Hallco Unlimited, Inc.  
Hawaiian Telcom, Inc.  
Hearst -Argyle Stations, Inc (KITV-TV)  
Heiden, William

Company (Continued)

Illinois Bell Telephone Company  
Indiana Bell Telephone Company  
Information & Display Systems, Inc.  
Information Super Station, LLC  
International Communications Group, Inc.  
KHNL/KGMB License Subsidiary, LLC  
Kentucky RSA #3 Cellular General Partner  
Kentucky RSA #4 Cellular General Partner  
Lancellotti, Inc.  
Lin License Company - Hawaii  
Loop, Inc,  
MERCURY COMMUNICATIONS  
Metro Networks Communications, Inc.  
Metrosat Communications Inc.  
Michigan Bell Telephone Company  
Moreen, Steven K  
NEW ENGLAND DIGITAL DISTRIBUTION, INC.  
NEW ENGLAND SATELLITE SYSTEMS INC  
NSM Surveillance  
Navajo Communications Company  
NorthWest Suburbs Community Access Corp  
Oceanic Time Warner Cable  
Ohio Bell Telephone Company  
On Scene Video Production  
Onboard Images  
Pacific Television Center  
Penn Service Microwave Co., Inc.  
Plateau Telecommunications, Inc.  
Plum TV, LLC  
Production & Satellite Services, Inc.  
Public Television Communications Center  
QUICK LINK CONNECTIONS INC  
Qwest Corporation  
RCC Minnesota Inc. - MN NE ND SD  
REMOTE FACILITIES CONSULTING SERVICES  
RF Central, LLC  
RF Film, Inc  
RF Technology, LLC  
Radiofone, Inc.  
Randy Hermes Production  
Regulus Media Services, Inc.  
Remote Broadcasts, Inc.  
Society of Broadcast Engineers – State of Hawaii Representative  
Southwestern Bell Telephone L.P.  
Speedshotz, Inc  
Steinert, Christine  
Telemovil del Caribe Inc.  
Total RF Marketing Inc  
Unisat, Inc.  
United Telephone - Southeast

Company (Continued)

VERIZON SOUTH INC.  
Verizon California Inc.  
Verizon Maryland, Inc.  
Verizon New England Inc.  
Verizon New Jersey, Inc.  
Verizon New York, Inc.  
Verizon North Inc.  
Verizon Northwest Inc.  
Verizon Pennsylvania, Inc.  
Verizon Virginia, Inc.  
Verizon Washington DC, Inc.  
Village Video Productions Inc  
Vyvx, LLC  
Westar Satellite Services LP  
Western Technical Services  
Wexler Video, Inc.  
Winged Vision Inc  
Wisconsin Bell, Inc.  
Wolfe Air Aviation

## **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: 04/22/2014  
Job Number: 140407COMSJC03

---

### 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 TO - Transmit-Only  
Modulation Digital  
Minimum Elevation Angle 5.0°  
Azimuth Range 0.0° to 360°  
Antenna Centerline (AGL) 8.54 m / 28.0 ft

---

### Antenna Information

#### Transmit

Manufacturer Datron  
Model 13.0 Meter  
Gain / Diameter 45.9 dBi / 13.0 m  
3-dB / 15-dB Beamwidth 0.76° / 1.46°

Max Available RF Power (dBW/4 kHz) 5.1  
(dBW/MHz) 29.1

Maximum EIRP (dBW/4 kHz) 51.0  
(dBW/MHz) 75.0  
(dBW) 68.0

Interference Objectives: Long Term -154.0 dBW/4 kHz 20%  
Short Term -131.0 dBW/4 kHz 0.0025%

---

### Frequency Information

#### Transmit 2.0 GHz

Emission / Frequency Range (MHz) 200KG2D / 2046.051  
200KG2D / 2048.887  
200KG2D / 2060.181

Max Great Circle Coordination Distance 760.0 km / 472.2 mi  
Precipitation Scatter Contour Radius 176.0 km / 109.3 mi

# COMSEARCH

## Earth Station Data Sheet

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

### 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 13.0 Meter  
Antenna Mode Transmit 2.0 GHz  
Interference Objectives: Long Term -154.0 dBW/4 kHz 20%  
Short Term -131.0 dBW/4 kHz 0.0025%  
Max Available RF Power 5.1 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Transmit 2.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)
0	2.78	76.33	4.50	365.00
5	2.62	74.59	4.50	374.40
10	2.39	72.89	4.50	388.60
15	2.30	71.39	4.50	394.30
20	2.17	69.98	4.50	403.00
25	2.03	68.70	4.50	412.70
30	1.68	67.37	4.50	439.30
35	0.90	65.80	4.50	517.90
40	0.33	64.56	4.50	619.40
45	0.00	63.74	4.50	760.00
50	0.00	63.44	4.50	760.00
55	0.00	63.37	4.50	760.00
60	0.00	63.51	4.50	760.00
65	0.00	63.87	4.50	760.00
70	0.00	64.44	4.50	760.00
75	0.00	65.22	4.50	760.00
80	0.00	66.19	4.50	760.00
85	0.00	67.34	4.50	760.00
90	0.00	68.67	4.50	760.00
95	0.00	70.15	4.50	760.00
100	0.00	71.77	4.50	760.00
105	0.00	73.53	4.50	760.00
110	0.00	75.39	4.50	760.00
115	0.00	77.35	4.50	760.00
120	0.00	79.39	4.50	760.00
125	0.00	81.51	4.50	760.00
130	0.00	83.67	4.50	760.00
135	0.00	85.87	4.50	760.00
140	0.00	88.10	4.50	760.00
145	0.00	90.34	4.50	760.00
150	0.00	92.58	4.50	760.00
155	0.00	94.80	4.50	760.00
160	0.00	96.99	4.50	760.00
165	0.00	99.14	4.50	760.00
170	0.00	101.24	4.50	760.00
175	0.00	103.26	4.50	760.00
180	0.00	105.19	4.50	760.00

# COMSEARCH

## Earth Station Data Sheet

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

### Coordination Values

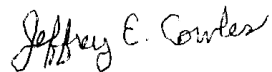
### NAALEHU, HI

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 13.0 Meter  
Antenna Mode Transmit 2.0 GHz  
Interference Objectives: Long Term -154.0 dBW/4 kHz 20%  
Short Term -131.0 dBW/4 kHz 0.0025%  
Max Available RF Power 5.1 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Transmit 2.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)
185	0.00	107.02	4.50	760.00
190	0.00	108.73	4.50	760.00
195	0.00	110.32	4.50	760.00
200	0.00	111.75	4.50	760.00
205	0.00	113.03	4.50	760.00
210	0.00	114.13	4.50	760.00
215	0.00	115.04	4.50	760.00
220	0.00	115.75	4.50	760.00
225	0.00	116.26	4.50	760.00
230	0.00	116.56	4.50	760.00
235	0.00	116.63	4.50	760.00
240	0.00	116.49	4.50	760.00
245	0.00	116.13	4.50	760.00
250	0.00	115.56	4.50	760.00
255	0.00	114.78	4.50	760.00
260	0.00	113.81	4.50	760.00
265	0.34	112.37	4.50	616.80
270	0.54	110.91	4.50	573.30
275	0.79	109.28	4.50	532.80
280	1.04	107.54	4.50	500.90
285	0.98	105.89	4.50	508.00
290	1.14	104.01	4.50	489.70
295	1.30	102.06	4.50	473.20
300	1.42	100.07	4.50	461.80
305	1.68	97.99	4.50	439.30
310	1.86	95.92	4.50	425.20
315	2.05	93.83	4.50	411.30
320	2.17	91.75	4.50	403.00
325	2.35	89.69	4.50	391.10
330	2.46	87.64	4.50	384.10
335	2.59	85.64	4.50	376.20
340	2.68	83.67	4.50	370.80
345	2.73	81.74	4.50	367.90
350	3.10	80.01	4.50	347.30
355	2.96	78.15	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  
Ashburn, Va. 20147

DATED: April 22, 2014