

# FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for  
**Universal Space Network, Inc.**  
**NAALEHU, HI**  
**Satellite Earth Station**

Prepared By:  
COMSEARCH  
19700 Janelia Farm Boulevard  
Ashburn, VA 20147  
March 21, 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.

### 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 02/10/2017.

Company

3G Wireless, LLC  
AERIAL VIDEO SYSTEMS  
Alascom Inc  
Ascent Media Network Services, LLC  
Bellsouth Telecommunications, Inc.  
Borgeson, Tom R.  
Broadcast Sports Inc.  
Carolina Telephone and Telegraph Co  
Casper, John  
CenturyTel of the Southwest, Inc.  
Chicago Comnet Corp  
Cincinnati Bell Wireless LLC  
Citywide News Network, Inc.  
Cohen, Elena  
Cowboys Stadium LP  
DCI II, INC.  
Direct Broadcast Services, Inc.  
Global Telecom & Technology Americas, In  
Goodyear Tire & Rubber Company  
HF Enterprises, Inc  
Hallco Unlimited, Inc.  
Hawaii Public Television Foundation  
Hawaiian Telcom, Inc.  
Heiden, William  
Illinois Bell Telephone Company  
Indiana Bell Telephone Company  
Information & Display Systems, Inc.  
Information Super Station, LLC  
International Communications Group, Inc.  
KITV, Inc  
Kentucky RSA #3 Cellular General Partner  
Kentucky RSA #4 Cellular General Partner  
Khnl/Kgmb License Subsidiary, LLC  
MERCURY COMMUNICATIONS  
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  
OHIO BELL TELEPHONE COMPANY  
Onboard Images  
Pacific Bell Tel Com dba AT&T California  
Penn Service Microwave Co., Inc.  
Plateau Telecommunications, Inc.  
Plum TV, LLC  
Production & Satellite Services, Inc.  
Quick Link Connections Inc.  
Qwest Corporation  
RCC Minnesota Inc. - MN NE ND SD  
REMOTE FACILITIES CONSULTING SERVICES  
RF Central, LLC  
RF Film, Inc  
Radiofone, Inc.  
Randy Hermes Production  
Remote Broadcasts, Inc.  
Southwestern Bell Telephone L.P.  
Speedshotz, Inc  
TTWN Networks, LLC  
Unisat, Inc.  
United Telephone - Southeast  
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 Telephone Company  
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: 03/21/2017  
Job Number: 170210COMSGE06

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### Administrative Information

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

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### Site Information

**NAALEHU, HI**  
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) 355.09 m / 1165.0 ft

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### 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

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### Antenna Information

**Transmit - FCC32**  
Manufacturer Datron  
Model 1453  
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%

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### Frequency Information

**Transmit 2.0 GHz**  
Emission / Frequency Range (MHz) 40K0G2D / 2072.011

Max Great Circle Coordination Distance 293.2 km / 182.2 mi  
Precipitation Scatter Contour Radius 176.0 km / 109.3 mi



# COMSEARCH

## Earth Station Data Sheet

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### Coordination Values

### NAALEHU, HI

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Longitude (NAD 83) 155° 39' 46.6" W  
Ground Elevation (AMSL) 355.09 m / 1165.0 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	2.94	76.42	4.50	293.25
5	2.79	74.70	4.50	293.25
10	2.59	73.03	4.50	293.25
15	2.48	71.52	4.50	293.25
20	2.30	70.08	4.50	293.25
25	2.09	68.75	4.50	293.25
30	1.85	67.52	4.50	293.25
35	1.08	65.97	4.50	293.25
40	0.70	64.92	4.50	293.25
45	0.44	64.17	4.50	293.25
50	0.00	63.44	4.50	293.25
55	0.00	63.37	4.50	293.25
60	0.00	63.51	4.50	293.25
65	0.00	63.87	4.50	293.25
70	0.00	64.44	4.50	293.25
75	0.00	65.22	4.50	293.25
80	0.00	66.19	4.50	293.25
85	0.00	67.34	4.50	293.25
90	0.00	68.67	4.50	293.25
95	0.00	70.15	4.50	293.25
100	0.00	71.77	4.50	293.25
105	0.00	73.53	4.50	293.25
110	0.00	75.39	4.50	293.25
115	0.00	77.35	4.50	293.25
120	0.00	79.39	4.50	293.25
125	0.00	81.51	4.50	293.25
130	0.00	83.67	4.50	293.25
135	0.00	85.87	4.50	293.25
140	0.00	88.10	4.50	293.25
145	0.00	90.34	4.50	293.25
150	0.00	92.58	4.50	293.25
155	0.00	94.80	4.50	293.25
160	0.00	96.99	4.50	293.25
165	0.00	99.14	4.50	293.25
170	0.00	101.24	4.50	293.25
175	0.00	103.26	4.50	293.25
180	0.00	105.19	4.50	293.25
185	0.00	107.02	4.50	293.25

# COMSEARCH

## Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147  
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### Coordination Values

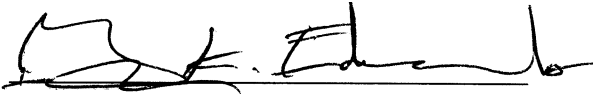
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Max Available RF Power 5.1 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Transmit 2.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	108.73	4.50	293.25
195	0.00	110.32	4.50	293.25
200	0.00	111.75	4.50	293.25
205	0.00	113.03	4.50	293.25
210	0.00	114.13	4.50	293.25
215	0.21	114.85	4.50	293.25
220	0.32	115.45	4.50	293.25
225	0.47	115.80	4.50	293.25
230	0.68	115.88	4.50	293.25
235	0.87	115.76	4.50	293.25
240	1.06	115.43	4.50	293.25
245	1.28	114.88	4.50	293.25
250	1.44	114.18	4.50	293.25
255	1.62	113.29	4.50	293.25
260	1.74	112.28	4.50	293.25
265	1.92	111.06	4.50	293.25
270	2.05	109.73	4.50	293.25
275	2.21	108.25	4.50	293.25
280	2.34	106.68	4.50	293.25
285	2.40	105.05	4.50	293.25
290	2.42	103.34	4.50	293.25
295	2.42	101.56	4.50	293.25
300	2.41	99.70	4.50	293.25
305	2.41	97.77	4.50	293.25
310	2.36	95.80	4.50	293.25
315	2.52	93.76	4.50	293.25
320	2.62	91.72	4.50	293.25
325	2.69	89.69	4.50	293.25
330	2.80	87.68	4.50	293.25
335	2.86	85.68	4.50	293.25
340	2.90	83.72	4.50	293.25
345	2.95	81.81	4.50	293.25
350	3.34	80.10	4.50	293.25
355	3.11	78.22	4.50	293.25

## 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: March 21, 2017