

# 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  
April 18, 2019

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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 03/21/2019.

Company

3G Wireless, LLC  
AERIAL VIDEO SYSTEMS  
Alascom Inc  
Borgeson, Tom R.  
Broadcast Sports Inc.  
Casper, John  
Chicago Comnet Corp  
Cincinnati Bell Wireless LLC  
Citywide News Network, Inc.  
CP Communications, LLC  
Cowboys Stadium LP  
DCI II, INC.  
Direct Broadcast Services, Inc.  
Frontier California Inc.  
Gray Televisions Licensee, LLC ( KTVF)  
HF Enterprises, Inc  
Hallco Unlimited, Inc.  
Heiden, William  
im360 Entertainment  
Information & Display Systems, Inc.  
Information Super Station, LLC  
International Communications Group, Inc.  
International Electronic Information Services, Inc.  
Interlink Network Corp.  
Loop, Inc.  
MERCURY COMMUNICATIONS  
Microwave Video systems, LLC  
Moreen, Steven K  
NEW ENGLAND DIGITAL DISTRIBUTION, INC.  
NSM Surveillance  
Navajo Communications Company  
Onboard Images  
Penn Service Microwave Co., Inc.  
Plateau Telecommunications, Inc.  
Plum TV, LLC  
Production & Satellite Services, Inc.  
REMOTE FACILITIES CONSULTING SERVICES  
RF Central, LLC  
RF Film, Inc  
Radiofone, Inc.  
Randy Hermes Production

Remote Broadcasts, Inc.  
SBE Coordinator  
Speedshotz, Inc  
TTWN Networks, LLC  
Unisat, Inc.  
United Telephone – Southeast  
Vitec Broadcast Services, Inc  
Vyvx, LLC  
Westar Satellite Services LP  
Winged Vision 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: 04/18/2019  
Job Number: 190321COMSGE01

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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) -1.1  
(dBW/MHz) 22.9

Maximum EIRP (dBW/4 kHz) 44.8  
(dBW/MHz) 68.8  
(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) 826KG2D / 2104.104

Max Great Circle Coordination Distance 293.2 km / 182.2 mi  
Precipitation Scatter Contour Radius 100.0 km / 62.1 mi



# COMSEARCH

## Earth Station Data Sheet

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<b>Coordination Values</b>	<b>NAALEHU, HI</b>
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)	355.09 m / 1165.0 ft
Antenna Centerline (AGL)	8.54 m / 28.0 ft
Antenna Model	Datron 13 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	-1.1 (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

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### Coordination Values

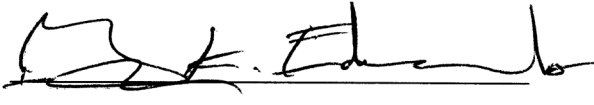
### NAALEHU, HI

Licensee Name Universal Space Network, Inc.  
Latitude (NAD 83) 19° 0' 50.3" N  
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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 -1.1 (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: April 18, 2019