

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Universal Space Network, Inc.
NORTH POLE, AK
Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147
December 14, 2016

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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 11/30/2016.

Company

3G Wireless, LLC
Alascom Inc
AT&T Corp
Borgeson, Tom R.
Broadcast Sports Inc.
CHENA BROADCASTING, LLC
Casper, John
Citywide News Network, Inc.
Cohen, Elena
Cowboys Stadium LP
DCI II, INC.
Interlink Network Corp
International Electronic Information Service
Im360 Entertainment
Goodyear Tire & Rubber Company
Heiden, William
Information Super Station, LLC
International Communications Group, Inc.
Loop Inc
MERCURY COMMUNICATIONS
Microwave Video Systems, LLC
Moreen, Steven K
NEW ENGLAND SATELLITE SYSTEMS INC
NSM Surveillance
NorthWest Suburbs Community Access Corp
Onboard Images
Pacific Television Center
Penn Service Microwave Co., Inc.
Plateau Telecommunications, Inc.
Plum TV, LLC
Production & Satellite Services, Inc.
QUICK LINK CONNECTIONS INC
Qwest Corporation
REMOTE FACILITIES CONSULTING SERVICES
RF Central, LLC
RF Film, Inc
RF Technology, LLC
Randy Hermes Production
Remote Broadcasts, Inc.
Speedshotz, Inc

The Alaska Wireless Network, LLC
Unisat, Inc.
United Telephone - Southeast
Verizon Maryland, Inc.
Verizon New England Inc.
Verizon North Inc.
Verizon Northwest Inc.
Vitec Broadcast Services, Inc.
Westar Satellite Services LP
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: 11/30/2016
Job Number: 161130COMSGE01

Administrative Information

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

Site Information

NORTH POLE, AK
Venue Name SENTINELS-2A
Latitude (NAD 83) 64° 48' 15.3" N
Longitude (NAD 83) 147° 30' 0.8" W
Climate Zone A
Rain Zone 2
Ground Elevation (AMSL) 140.67 m / 461.5 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) 8.53 m / 28.0 ft

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) 2.1
(dBW/MHz) 26.1

Maximum EIRP (dBW/4 kHz) 48.0
(dBW/MHz) 72.0

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) 400KG1D / 2075.65 - 2075.65

Max Great Circle Coordination Distance 293.2 km / 182.2 mi
Precipitation Scatter Contour Radius 188.5 km / 117.1 mi

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Earth Station Data Sheet

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Coordination Values	NORTH POLE, AK	
Licensee Name	Universal Space Network, Inc.	
Latitude (NAD 83)	64° 48' 15.3" N	
Longitude (NAD 83)	147° 30' 0.8" W	
Ground Elevation (AMSL)	140.67 m / 461.5 ft	
Antenna Centerline (AGL)	8.53 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	2.1 (dBW/4 kHz)	

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Transmit 2.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)
0	0.00	44.16	4.50	293.20
5	0.00	40.65	4.50	293.20
10	0.00	37.42	4.50	293.20
15	0.00	34.54	4.50	293.20
20	0.00	32.12	4.50	293.20
25	0.00	30.27	4.50	293.20
30	0.00	29.09	4.50	293.20
35	0.00	28.67	4.50	293.20
40	0.00	29.04	4.50	293.20
45	0.00	30.18	4.50	293.20
50	0.00	31.99	4.50	293.20
55	0.00	34.38	4.50	293.20
60	0.00	37.23	4.50	293.20
65	0.00	40.45	4.50	293.20
70	0.00	43.94	4.50	293.20
75	0.00	47.65	4.50	293.20
80	0.00	51.53	4.50	293.20
85	0.00	55.55	4.50	293.20
90	0.00	59.66	4.50	293.20
95	0.00	63.85	4.50	293.20
100	0.00	68.11	4.50	293.20
105	0.00	72.41	4.50	293.20
110	0.00	76.74	4.50	293.20
115	0.00	81.10	4.50	293.20
120	0.00	85.48	4.50	293.20
125	0.00	89.87	4.50	293.20
130	0.00	94.25	4.50	293.20
135	0.00	98.63	4.50	293.20
140	0.00	102.99	4.50	293.20
145	0.00	107.33	4.50	293.20
150	0.00	111.64	4.50	293.20
155	0.00	115.89	4.50	293.20
160	0.00	120.09	4.50	293.20
165	0.00	124.21	4.50	293.20
170	0.00	128.23	4.50	293.20
175	0.00	132.12	4.50	293.20
180	0.00	135.84	4.50	293.20
185	0.00	139.35	4.50	293.20

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Earth Station Data Sheet

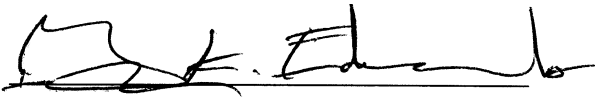
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Antenna Centerline (AGL)	8.53 m / 28.0 ft	
Antenna Model	Datron 13 Meter	
Antenna Mode	Transmit 2.0 GHz	
Interference Objectives: Long Term	-154.0 dBW/4 kHz	20%
Short Term	-131.0 dBW/4 kHz	0.0025%
Max Available RF Power	2.1 (dBW/4 kHz)	

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Transmit 2.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	142.58	4.50	293.20
195	0.00	145.46	4.50	293.20
200	0.00	147.88	4.50	293.20
205	0.00	149.73	4.50	293.20
210	0.00	150.91	4.50	293.20
215	0.00	151.33	4.50	293.20
220	0.00	150.96	4.50	293.20
225	0.00	149.82	4.50	293.20
230	0.00	148.01	4.50	293.20
235	0.00	145.62	4.50	293.20
240	0.00	142.77	4.50	293.20
245	0.00	139.55	4.50	293.20
250	0.00	136.06	4.50	293.20
255	0.00	132.35	4.50	293.20
260	0.00	128.47	4.50	293.20
265	0.00	124.45	4.50	293.20
270	0.00	120.34	4.50	293.20
275	0.00	116.15	4.50	293.20
280	0.00	111.89	4.50	293.20
285	0.00	107.59	4.50	293.20
290	0.00	103.26	4.50	293.20
295	0.00	98.90	4.50	293.20
300	0.00	94.52	4.50	293.20
305	0.00	90.13	4.50	293.20
310	0.00	85.75	4.50	293.20
315	0.00	81.37	4.50	293.20
320	0.00	77.01	4.50	293.20
325	0.00	72.67	4.50	293.20
330	0.00	68.36	4.50	293.20
335	0.00	64.11	4.50	293.20
340	0.00	59.91	4.50	293.20
345	0.00	55.79	4.50	293.20
350	0.00	51.77	4.50	293.20
355	0.00	47.88	4.50	293.20

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: December 14, 2016