

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for

**Universal Space Network, Inc.
North Pole, Alaska**

Satellite Earth Station

Prepared By:
COMSEARCH

19700 Janelia Farm Boulevard
Ashburn, Virginia 20147
November 9, 2009

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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 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-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 emailed and sent to the below listed carriers with a letter dated November 4, 2009.

Company

ANCHORAGE BROADCAST TV CONSORTIUM, INC.
Alaska Broadcasting Company, Inc
Alaska Public Telecommunications, Inc.
ALASKA STATE
Channel 2 Broadcasting Co. - KTUU TV
FIREWEED COMMUNICATIONS CORP
Piedmont Television of Anchorage License
Smith Media License Holdings, LLC
Society of Broadcast Engineers Representative
State of Alaska

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: 11/09/2009
Job Number: 091104COMSJC03

Administrative Information

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

Site Information

NORTH POLE, ALASKA

Venue Name
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) 140.66 m / 461.5 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) 8.54 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) (dBW/MHz)			5.1 22.1	
Maximum EIRP	(dBW/4 kHz) (dBW/MHz) (dBW)			51.0 68.0 68.0	
Interference Objectives:	Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz	20%
	Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz	0.0025%

Frequency Information

	Receive 2.2 GHz	Transmit 2.0 GHz
Emission / Frequency Range (MHz)	200KG2D / 2206.529	200KG2D / 2031.846
Max Great Circle Coordination Distance	559.9 km / 347.9 mi	476.4 km / 296.0 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi	100.0 km / 62.1 mi

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Coordination Values

NORTH POLE, AK

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Latitude (NAD 83) 64° 48' 15.3" N
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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% -151.0 dBW/4 kHz 20%
Short Term -146.0 dBW/MHz 0.01% -128.0 dBW/4 kHz 0.0025%
Max Available RF Power 5.1 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 2.2 GHz		Transmit 2.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.85	5.00	4.50	436.30	4.50	340.80
5	1.20	5.00	4.50	414.80	4.50	317.10
10	1.19	5.00	4.50	415.30	4.50	317.70
15	1.02	5.00	4.50	425.10	4.50	328.60
20	0.94	5.00	4.50	430.20	4.50	331.10
25	0.76	5.00	4.50	422.90	4.50	348.10
30	0.75	5.00	4.50	443.60	4.50	348.90
35	0.48	5.00	4.50	467.90	4.50	375.60
40	0.32	5.00	4.50	487.20	4.50	396.90
45	0.00	5.00	4.50	559.90	4.50	476.40
50	0.00	5.00	4.50	559.90	4.50	476.40
55	0.00	5.00	4.50	559.90	4.50	476.40
60	0.00	5.00	4.50	559.90	4.50	476.40
65	0.00	5.00	4.50	559.90	4.50	476.40
70	0.00	5.00	4.50	559.90	4.50	476.40
75	0.00	5.00	4.50	559.90	4.50	476.40
80	0.00	5.00	4.50	559.90	4.50	476.40
85	0.00	5.00	4.50	559.90	4.50	476.40
90	0.00	5.00	4.50	559.90	4.50	476.40
95	0.00	5.00	4.50	559.90	4.50	476.40
100	0.00	5.00	4.50	559.90	4.50	476.40
105	0.00	5.00	4.50	559.90	4.50	476.40
110	0.00	5.00	4.50	559.90	4.50	476.40
115	0.00	5.00	4.50	559.90	4.50	476.40
120	0.00	5.00	4.50	559.90	4.50	476.40
125	0.00	5.00	4.50	559.90	4.50	476.40
130	0.00	5.00	4.50	559.90	4.50	476.40
135	0.00	5.00	4.50	559.90	4.50	476.40
140	0.00	5.00	4.50	559.90	4.50	476.40
145	0.00	5.00	4.50	559.90	4.50	476.40
150	0.00	5.00	4.50	559.90	4.50	476.40
155	0.00	5.00	4.50	559.90	4.50	476.40
160	0.00	5.00	4.50	559.90	4.50	476.40
165	0.00	5.00	4.50	559.90	4.50	476.40
170	0.00	5.00	4.50	559.90	4.50	476.40
175	0.00	5.00	4.50	559.90	4.50	476.40
180	0.00	5.00	4.50	559.90	4.50	476.40
185	0.00	5.00	4.50	559.90	4.50	476.40

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Coordination Values

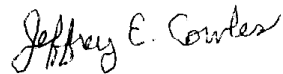
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Short Term -146.0 dBW/MHz 0.01% -128.0 dBW/4 kHz 0.0025%
Max Available RF Power 5.1 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 2.2 GHz		Transmit 2.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	5.00	4.50	559.90	4.50	476.40
200	0.00	5.00	4.50	559.90	4.50	476.40
205	0.00	5.00	4.50	559.90	4.50	476.40
210	0.00	5.00	4.50	559.90	4.50	476.40
215	0.00	5.00	4.50	559.90	4.50	476.40
220	0.00	5.00	4.50	559.90	4.50	476.40
225	0.00	5.00	4.50	559.90	4.50	476.40
230	0.00	5.00	4.50	559.90	4.50	476.40
235	0.00	5.00	4.50	559.90	4.50	476.40
240	0.00	5.00	4.50	559.90	4.50	476.40
245	0.00	5.00	4.50	559.90	4.50	476.40
250	0.00	5.00	4.50	559.90	4.50	476.40
255	0.00	5.00	4.50	559.90	4.50	476.40
260	0.00	5.00	4.50	559.90	4.50	476.40
265	0.00	5.00	4.50	559.90	4.50	476.40
270	0.00	5.00	4.50	559.90	4.50	476.40
275	0.00	5.00	4.50	559.90	4.50	476.40
280	0.00	5.00	4.50	559.90	4.50	476.40
285	0.00	5.00	4.50	559.90	4.50	476.40
290	0.00	5.00	4.50	559.90	4.50	476.40
295	0.00	5.00	4.50	559.90	4.50	476.40
300	0.00	5.00	4.50	559.90	4.50	476.40
305	0.00	5.00	4.50	559.90	4.50	476.40
310	0.35	5.00	4.50	483.20	4.50	392.50
315	0.96	5.00	4.50	428.90	4.50	327.70
320	0.60	5.00	4.50	456.10	4.50	362.70
325	0.80	5.00	4.50	439.90	4.50	344.80
330	0.82	5.00	4.50	438.40	4.50	343.20
335	0.69	5.00	4.50	448.40	4.50	354.20
340	0.94	5.00	4.50	430.20	4.50	334.10
345	1.16	5.00	4.50	417.00	4.50	319.50
350	1.18	5.00	4.50	415.90	4.50	318.30
355	1.23	5.00	4.50	413.10	4.50	315.30

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
Principal Frequency Planner
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, Va. 20147

DATED: November 9, 2009