

# 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  
March 2, 2007

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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, based upon the restrictions noted in the Summary of Results Section 2.

## 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 proposed transmit-only earth station. Further the transmit and receive spectrums will be limited to frequencies 2053.4580 MHz, and 2230.0000 MHz, respectively.

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 e-mailed and/or faxed to the below listed carriers with a letter dated February 22, 2007.

#### Company

Society of Broadcast Engineers (SBE) Representative  
Federal Communication Commission (Columbia, MD)  
Alaska Broadcasting Company, Inc  
Alaska Public Telecommunications, Inc.  
Channel 2 Broadcasting Co. - KTUU TV  
FIREWEED COMMUNICATIONS CORP  
Piedmont Television of Anchorage License  
STATE OF ALASKA  
Smith Media License Holdings, LLC

## **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: 03/02/2007  
Job Number: 070222COMSJC01

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### Administrative Information

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

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### 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

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### Link Information

Satellite Type Low Earth Orbit  
Mode TR - Transmit-Receive  
Modulation Digital  
Minimum Elevation Angle 5.0°  
Azimuth Range 0.0° to 360.0°  
Antenna Centerline (AGL) 8.54 m / 28.0 ft

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### Antenna Information

	<b>Receive</b>	<b>Transmit</b>
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)		5.1
(dBW/MHz)		22.1
Maximum EIRP (dBW/4 kHz)		51.0
(dBW/MHz)		68.0
(dBW)		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%

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### Frequency Information

	<b>Receive 2.2 GHz</b>	<b>Transmit 2.0 GHz</b>
Emission / Frequency Range (MHz)	200KG2D / 2230.0000	200KG2D / 2053.4580
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

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) 140.66 m / 461.5 ft  
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



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### Coordination Values

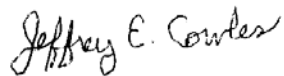
### NORTH POLE, AK

Licensee Name	Universal Space Network, Inc.			
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Ground Elevation (AMSL)	140.66 m / 461.5 ft			
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)
185	0.00	5.00	4.50	559.90	4.50	476.40
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  
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DATED: March 2, 2007