Ka-Band Earth Station – Talkeetna, AK

Frequency Coordination Report

28 GHz

Prepared on Behalf of
WorldVu Satellites
Limited

May 22, 2018

COMSEARCH®
A CommScope Company

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1. Summary of Results

On behalf of WorldVu Satellites Limited, Comsearch performed a coordination notice for all existing and proposed terrestrial licenses within the coordination contours of their proposed Ka-Band earth station in Talkeetna, AK, which will transmit at 28 GHz[1]. Prior-notification letters were sent to the licensees and a copy of the notification data is provided in section four of this report. The earth station coordination was finalized on May 14, 2018.

No objections were received from any of the incumbent 28 GHz licensees. Our notification to the incumbents was performed under the assumption that the earth station would be operating on a secondary basis to LMDS Block A operations and a contact at WorldVu Satellites Limited has been provided in case any concerns may arise in the future.

2. 28 GHz Common Carrier and LTTS Coordination

In accordance with FCC Rules and Regulations, the Ka-Band earth station in Talkeetna, AK was prior-coordinated by Comsearch. A notification letter and datasheets for this earth station were sent to the following 28 GHz common carrier fixed microwave licensees. These licensees are authorized to operate temporary fixed operations from 27.5 – 29.5 GHz on a nationwide basis or local basis.

Licensee	Authorized Geographic Area
Alascom	Alaska
Frontier Southwest Incorporated	Nationwide
The Alaska Wireless Network, LLC	Alaska

A notification letter and datasheets for the Ka-Band earth station in Talkeetna, AK were also sent to the following 28 GHz local television transmission licensee. This licensee is authorized to operate temporary fixed operations from 27.5 – 29.5 GHz on a nationwide basis.

Licensee	Authorized Geographic Area
Information Super Station, LLC	Nationwide

No objections were received from the common carrier or local television transmission service incumbents.

[1] The proposed earth station will operate in the 27.5 – 29.1, 29.5 – 30.0 GHz portion of the Ka-Band.

3. 28 GHz LMDS Coordination

A Notification letter was sent to the following 28 GHz LMDS licensees. The proposed earth station will operate on frequencies that overlap Block A of the LMDS service. The total frequency allocation for Block A of the LMDS spectrum appears below.

Block A: 27.500-28.350 GHz
29.100-29.250 GHz
31.075-31.225 GHz

Licensee	Market	Market Name
Sprint	BTA014	Anchorage, AK

No objections were received from LMDS licensees.

4. Earth Station Coordination Data

This section presents the data pertinent to the proposed Ka-Band earth station in Talkeetna, AK. This data was circulated to all incumbent licensees in the shared 28 GHz frequency ranges.

Date:	04/06/2018
Job Number:	180406COMSGE04

Administrative Information	
Status	ENGINEER PROPOSAL
Call Sign	
Licensee Code	WORSAT
Licensee Name	WorldVu Satellites Limited

Site Information	**TALKEETNA, AK**
Venue Name	
Latitude (NAD 83)	62° 19' 59.1" N
Longitude (NAD 83)	150° 1' 52.4" W
Climate Zone	A
Rain Zone	2
Ground Elevation (AMSL)	148.0 m / 485.6 ft

Link Information	
Satellite Type	Low Earth Orbit
Mode	TR - Transmit-Receive
Modulation	Digital
Minimum Elevation Angle	10.0°
Azimuth Range	0.0° to 360°
Antenna Centerline (AGL)	2.44 m / 8.0 ft

Antenna Information		**Receive -**		**Transmit -**	
Manufacturer		CPI		CPI	
Model		3.5 meter		3.5 meter	
Gain / Diameter		54.6 dBi / 3.5 m		58.0 dBi / 3.5 m	
3-dB / 15-dB Beamwidth		0.32° / 0.36°		0.21° / 0.23°	
Max Available RF Power	(dBW/4 kHz)			-39.6	
	(dBW/MHz)			-15.6	
Maximum EIRP	(dBW/4 kHz)			18.4	
	(dBW/MHz)			42.4	
Interference Objectives:	Long Term	-152.4 dBW/MHz	20%	-151.0 dBW/4 kHz	20%
	Short Term	-142.4 dBW/MHz	0.01%	-128.0 dBW/4 kHz	0.0025%

Frequency Information	**Receive 18.0 GHz**	**Transmit 28.0 GHz**
Emission / Frequency Range (MHz)	2M16G7D - 18M0G7D / 17800.0 - 18600.0	230MG7D / 27500.0 - 29100.0
	2M16G7D - 18M0G7D / 18800.0 - 19300.0	230MG7D / 29500.0 - 30000..0
Max Great Circle Coordination Distance	120.0 km / 74.6 mi	100.0 km / 62.1 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi	100.0 km / 62.1 mi

Coordination Values	**TALKEETNA, AK**			
Licensee Name	WorldVu Satellites Limited			
Latitude (NAD 83)	62° 19' 59.1" N			
Longitude (NAD 83)	150° 1' 52.4" W			
Ground Elevation (AMSL)	148.0 m / 485.6 ft/Antenna Centerline (AGL)		2.44 m / 8.0 ft	
Antenna Model	CPI 3.5 meter			
Interference Objectives: Long Term	-152.4 dBW/MHz	20%	-151.0 dBW/4 kHz	20%
Short Term	-142.4 dBW/MHz	0.01%	-128.0 dBW/4 kHz	0.0025%
Max Available RF Power		-39.6 (dBW/4 kHz)		

			Receive 18.0 GHz		Transmit 28.0 GHz	
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.00	44.18	7.00	120.00	8.76	100.00
5	0.00	40.97	7.00	120.00	8.76	100.00
10	0.00	38.07	7.00	120.00	8.76	100.00
15	0.00	35.56	7.00	120.00	8.76	100.00
20	0.00	33.53	7.00	120.00	8.76	100.00
25	0.00	32.08	7.00	120.00	8.76	100.00
30	0.00	31.29	7.00	120.00	8.76	100.00
35	0.00	31.21	7.00	120.00	8.76	100.00
40	0.00	31.84	7.00	120.00	8.76	100.00
45	0.00	33.15	7.00	120.00	8.76	100.00
50	0.00	35.05	7.00	120.00	8.76	100.00
55	0.00	37.46	7.00	120.00	8.76	100.00
60	0.00	40.27	7.00	120.00	8.76	100.00
65	0.00	43.43	7.00	120.00	8.76	100.00
70	0.00	46.84	7.00	120.00	8.76	100.00
75	0.00	50.46	7.00	120.00	8.76	100.00
80	0.00	54.24	7.00	120.00	8.76	100.00
85	0.00	58.15	7.00	120.00	8.76	100.00
90	0.00	62.16	7.00	120.00	8.76	100.00
95	0.00	66.25	7.00	120.00	8.76	100.00
100	0.00	70.41	7.00	120.00	8.76	100.00
105	0.00	74.61	7.00	120.00	8.76	100.00
110	0.00	78.84	7.00	120.00	8.76	100.00
115	0.00	83.10	7.00	120.00	8.76	100.00
120	0.00	87.37	7.00	120.00	8.76	100.00
125	0.00	91.65	7.00	120.00	8.76	100.00
130	0.00	95.93	7.00	120.00	8.76	100.00
135	0.00	100.19	7.00	120.00	8.76	100.00
140	0.00	104.43	7.00	120.00	8.76	100.00
145	0.00	108.64	7.00	120.00	8.76	100.00
150	0.00	112.80	7.00	120.00	8.76	100.00
155	0.00	116.91	7.00	120.00	8.76	100.00
160	0.00	120.94	7.00	120.00	8.76	100.00
165	0.00	124.88	7.00	120.00	8.76	100.00
170	0.00	128.69	7.00	120.00	8.76	100.00
175	0.00	132.35	7.00	120.00	8.76	100.00
180	0.00	135.82	7.00	120.00	8.76	100.00
185	0.00	139.03	7.00	120.00	8.76	100.00

Coordination Values	**TALKEETNA, AK**			
Licensee Name	WorldVu Satellites Limited			
Latitude (NAD 83)	62° 19' 59.1" N			
Longitude (NAD 83)	150° 1' 52.4" W			
Ground Elevation (AMSL)	148.0 m / 485.6 ft/Antenna Centerline (AGL)		2.44 m / 8.0 ft	
Antenna Model	CPI 3.5 meter			
Antenna Mode	Receive 18.0 GHz		Transmit 28.0 GHz	
Interference Objectives: Long Term	-152.4 dBW/MHz	20%	-151.0 dBW/4 kHz	20%
Short Term	-142.4 dBW/MHz	0.01%	-128.0 dBW/4 kHz	0.0025%
Max Available RF Power		-39.6 (dBW/4 kHz)		

			Receive 18.0 GHz		Transmit 28.0 GHz	
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	141.93	7.00	120.00	8.76	100.00
195	0.00	144.44	7.00	120.00	8.76	100.00
200	0.00	146.47	7.00	120.00	8.76	100.00
205	0.00	147.92	7.00	120.00	8.76	100.00
210	0.00	148.71	7.00	120.00	8.76	100.00
215	0.00	148.79	7.00	120.00	8.76	100.00
220	0.00	148.16	7.00	120.00	8.76	100.00
225	0.00	146.85	7.00	120.00	8.76	100.00
230	0.00	144.95	7.00	120.00	8.76	100.00
235	0.00	142.54	7.00	120.00	8.76	100.00
240	0.00	139.73	7.00	120.00	8.76	100.00
245	0.00	136.57	7.00	120.00	8.76	100.00
250	0.00	133.16	7.00	120.00	8.76	100.00
255	0.00	129.54	7.00	120.00	8.76	100.00
260	0.00	125.76	7.00	120.00	8.76	100.00
265	0.00	121.85	7.00	120.00	8.76	100.00
270	0.00	117.84	7.00	120.00	8.76	100.00
275	0.00	113.75	7.00	120.00	8.76	100.00
280	0.00	109.59	7.00	120.00	8.76	100.00
285	0.00	105.39	7.00	120.00	8.76	100.00
290	0.00	101.16	7.00	120.00	8.76	100.00
295	0.00	96.90	7.00	120.00	8.76	100.00
300	0.00	92.63	7.00	120.00	8.76	100.00
305	0.00	88.35	7.00	120.00	8.76	100.00
310	0.00	84.07	7.00	120.00	8.76	100.00
315	0.00	79.81	7.00	120.00	8.76	100.00
320	0.00	75.57	7.00	120.00	8.76	100.00
325	0.00	71.36	7.00	120.00	8.76	100.00
330	0.00	67.20	7.00	120.00	8.76	100.00
335	0.00	63.09	7.00	120.00	8.76	100.00
340	0.00	59.06	7.00	120.00	8.76	100.00
345	0.00	55.12	7.00	120.00	8.76	100.00
350	0.00	51.31	7.00	120.00	8.76	100.00
355	0.00	47.65	7.00	120.00	8.76	100.00

5. Contact Information

For questions or information regarding the 28 GHz Frequency Coordination Report, please contact:

Contact person:	Dennis Jimeno
Title:	Engineer III, Telecommunications
Company:	Comsearch
Address:	19700 Janelia Farm Blvd., Ashburn, VA 20147
Telephone:	703-726-5858
Fax:	703-726-5599
Email:	DJimeno@Comsearch.com
Web site:	www.comsearch.com

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
WorldVu Satellites Limited
TALKEETNA, AK
Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147
May 15, 2018

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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.

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-receive earth station.

Company
GCI Communications Corp.

No other 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.

Coordination data for this earth station was sent to the below listed carriers with a letter dated 04/06/2018.

Company
ACS Wireless License Sub, Inc.
AT&T Mobility Spectrum LLC - AK
Alaska Wireless Network, LLC
Anchorage, Municipality of
Fixed Wireless Holdings, LLC
GCI Communications Corp.
Matanuska Telephone Association, Inc.
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:	05/15/2018
Job Number:	180406COMSGE04

Administrative Information

Status	ENGINEER PROPOSAL
Call Sign	
Licensee Code	WORSAT
Licensee Name	WorldVu Satellites Limited

Site Information — TALKEETNA, AK

Venue Name	
Latitude (NAD 83)	62° 19' 59.1" N
Longitude (NAD 83)	150° 1' 52.4" W
Climate Zone	A
Rain Zone	2
Ground Elevation (AMSL)	148.0 m / 485.6 ft

Link Information

Satellite Type	Low Earth Orbit
Mode	TR - Transmit-Receive
Modulation	Digital
Minimum Elevation Angle	10.0°
Azimuth Range	0.0° to 360°
Antenna Centerline (AGL)	2.44 m / 8.0 ft

Antenna Information		Receive - FCC32		Transmit - FCC32	
Manufacturer		CPI		CPI	
Model		3.5 meter		3.5 meter	
Gain / Diameter		54.6 dBi / 3.5 m		58.0 dBi / 3.5 m	
3-dB / 15-dB Beamwidth		0.32° / 0.36°		0.21° / 0.23°	
Max Available RF Power	(dBW/4 kHz)			-35.0	
	(dBW/MHz)			-11.0	
Maximum EIRP	(dBW/4 kHz)			23.0	
	(dBW/MHz)			47.0	
Interference Objectives:	Long Term	-152.4 dBW/MHz	20%	-151.0 dBW/4 kHz	20%
	Short Term	-142.4 dBW/MHz	0.01%	-128.0 dBW/4 kHz	0.0025%

Frequency Information	Receive 18.0 GHz	Transmit 28.0 GHz
Emission / Frequency Range (MHz)	2M16G7D - 18M0G7D / 17800.0 - 18600.0	230MG7D / 27500.0 - 29100.0
	2M16G7D - 18M0G7D / 18800.0 - 19300.0	230MG7D / 29500.0 - 29500.0
Max Great Circle Coordination Distance	120.0 km / 74.6 mi	100.0 km / 62.1 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi	100.0 km / 62.1 mi

COMSEARCH

Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147
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Coordination Values	**TALKEETNA, AK**			
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Interference Objectives: Long Term	-152.4 dBW/MHz	20%	-151.0 dBW/4 kHz	20%
Short Term	-142.4 dBW/MHz	0.01%	-128.0 dBW/4 kHz	0.0025%
Max Available RF Power			-35.0 (dBW/4 kHz)	

			Receive 18.0 GHz		Transmit 28.0 GHz	
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.00	44.18	7.00	120.00	8.76	100.00
5	0.00	40.97	7.00	120.00	8.76	100.00
10	0.00	38.07	7.00	120.00	8.76	100.00
15	0.00	35.56	7.00	120.00	8.76	100.00
20	0.00	33.53	7.00	120.00	8.76	100.00
25	0.00	32.08	7.00	120.00	8.76	100.00
30	0.00	31.29	7.00	120.00	8.76	100.00
35	0.00	31.21	7.00	120.00	8.76	100.00
40	0.00	31.84	7.00	120.00	8.76	100.00
45	0.00	33.15	7.00	120.00	8.76	100.00
50	0.00	35.05	7.00	120.00	8.76	100.00
55	0.00	37.46	7.00	120.00	8.76	100.00
60	0.00	40.27	7.00	120.00	8.76	100.00
65	0.00	43.43	7.00	120.00	8.76	100.00
70	0.00	46.84	7.00	120.00	8.76	100.00
75	0.00	50.46	7.00	120.00	8.76	100.00
80	0.00	54.24	7.00	120.00	8.76	100.00
85	0.00	58.15	7.00	120.00	8.76	100.00
90	0.00	62.16	7.00	120.00	8.76	100.00
95	0.00	66.25	7.00	120.00	8.76	100.00
100	0.00	70.41	7.00	120.00	8.76	100.00
105	0.00	74.61	7.00	120.00	8.76	100.00
110	0.00	78.84	7.00	120.00	8.76	100.00
115	0.00	83.10	7.00	120.00	8.76	100.00
120	0.00	87.37	7.00	120.00	8.76	100.00
125	0.00	91.65	7.00	120.00	8.76	100.00
130	0.00	95.93	7.00	120.00	8.76	100.00
135	0.00	100.19	7.00	120.00	8.76	100.00
140	0.00	104.43	7.00	120.00	8.76	100.00
145	0.00	108.64	7.00	120.00	8.76	100.00
150	0.00	112.80	7.00	120.00	8.76	100.00
155	0.00	116.91	7.00	120.00	8.76	100.00
160	0.00	120.94	7.00	120.00	8.76	100.00
165	0.00	124.88	7.00	120.00	8.76	100.00
170	0.00	128.69	7.00	120.00	8.76	100.00
175	0.00	132.35	7.00	120.00	8.76	100.00
180	0.00	135.82	7.00	120.00	8.76	100.00
185	0.00	139.03	7.00	120.00	8.76	100.00

COMSEARCH

Earth Station Data Sheet

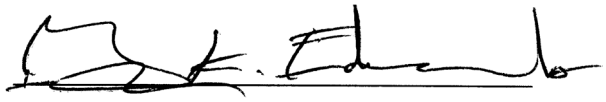
19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5500 http://www.comsearch.com

Coordination Values	**TALKEETNA, AK**			
Licensee Name	WorldVu Satellites Limited			
Latitude (NAD 83)	62° 19' 59.1" N			
Longitude (NAD 83)	150° 1' 52.4" W			
Ground Elevation (AMSL)	148.0 m / 485.6 ft			
Antenna Centerline (AGL)	2.44 m / 8.0 ft			
Antenna Model	CPI 3.5 meter			
Antenna Mode	Receive 18.0 GHz		Transmit 28.0 GHz	
Interference Objectives: Long Term	-152.4 dBW/MHz	20%	-151.0 dBW/4 kHz	20%
Short Term	-142.4 dBW/MHz	0.01%	-128.0 dBW/4 kHz	0.0025%
Max Available RF Power			-35.0 (dBW/4 kHz)	

			Receive 18.0 GHz		Transmit 28.0 GHz	
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	141.93	7.00	120.00	8.76	100.00
195	0.00	144.44	7.00	120.00	8.76	100.00
200	0.00	146.47	7.00	120.00	8.76	100.00
205	0.00	147.92	7.00	120.00	8.76	100.00
210	0.00	148.71	7.00	120.00	8.76	100.00
215	0.00	148.79	7.00	120.00	8.76	100.00
220	0.00	148.16	7.00	120.00	8.76	100.00
225	0.00	146.85	7.00	120.00	8.76	100.00
230	0.00	144.95	7.00	120.00	8.76	100.00
235	0.00	142.54	7.00	120.00	8.76	100.00
240	0.00	139.73	7.00	120.00	8.76	100.00
245	0.00	136.57	7.00	120.00	8.76	100.00
250	0.00	133.16	7.00	120.00	8.76	100.00
255	0.00	129.54	7.00	120.00	8.76	100.00
260	0.00	125.76	7.00	120.00	8.76	100.00
265	0.00	121.85	7.00	120.00	8.76	100.00
270	0.00	117.84	7.00	120.00	8.76	100.00
275	0.00	113.75	7.00	120.00	8.76	100.00
280	0.00	109.59	7.00	120.00	8.76	100.00
285	0.00	105.39	7.00	120.00	8.76	100.00
290	0.00	101.16	7.00	120.00	8.76	100.00
295	0.00	96.90	7.00	120.00	8.76	100.00
300	0.00	92.63	7.00	120.00	8.76	100.00
305	0.00	88.35	7.00	120.00	8.76	100.00
310	0.00	84.07	7.00	120.00	8.76	100.00
315	0.00	79.81	7.00	120.00	8.76	100.00
320	0.00	75.57	7.00	120.00	8.76	100.00
325	0.00	71.36	7.00	120.00	8.76	100.00
330	0.00	67.20	7.00	120.00	8.76	100.00
335	0.00	63.09	7.00	120.00	8.76	100.00
340	0.00	59.06	7.00	120.00	8.76	100.00
345	0.00	55.12	7.00	120.00	8.76	100.00
350	0.00	51.31	7.00	120.00	8.76	100.00
355	0.00	47.65	7.00	120.00	8.76	100.00

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: May 15, 2018