

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Intelsat License LLC
CASTLE ROCK, CO
(E881304)
Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147
June 15, 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 05/02/2016.

Company

AT&T Corp.
AT&T Mobility Spectrum LLC - CO
AirLife Denver
Arvada Police Dept.
BNSF Railway Company
Black Hawk Police Department
Black Hills Corporation
Boulder, County of
CBS Communication Services Inc
CBS Television Stations
Cellular Inc. Network Corporation
City of Aurora
City of Colorado Springs
City of Lakewood, CO
Colorado Interstate Gas Company
Colorado Springs Utilities
County of Pueblo
Directlink, LLC
Douglas County Sheriff's Office
Entravision Holdings, LLC
FONES WEST DIGITAL SYSTEMS INC.
Gilpin County Sheriff's Office
Gogo LLC
Gray Television Licensee, LLC
Infrastructure Networks, Inc.
Intermountain Rural Electric Association
Kellin Communications
Live Wire Networks, Inc.
MHO Networks
Multimedia Holdings Corporation
NE Colorado Cellular, Inc.
New Cingular Wireless PCS LLC -Colorado
Nex-Tech Wireless, LLC
Olympic Wireless, LLC
Qwest Corporation
Roggen Telephone Enterprises, Inc.
Sangre de Cristo Communications, LLC
Sprint Communications Company, LP
Sprint Spectrum L.P.
Sprint Spectrum LP DBA Sprint PCS

State of Colorado
Tallgrass Operations, LLC
Tri-State Generation & Transmission Assn
Tribune Broadcasting Denver License, LLC
University Corp for Atmospheric Research
Verizon Wireless (VAW) LLC -CO/ID/MTWY
Xcel Energy Services, Inc.

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: 06/15/2016
Job Number: 160502COMSGE02

Administrative Information

Status ENGINEER PROPOSAL
Call Sign E881304
Licensee Code INTELS
Licensee Name Intelsat License LLC

Site Information CASTLE ROCK, CO

Venue Name
Latitude (NAD 83) 39° 16' 34.0" N
Longitude (NAD 83) 104° 48' 27.0" W
Climate Zone A
Rain Zone 2
Ground Elevation (AMSL) 2084.83 m / 6840.0 ft

Link Information

Satellite Type Geostationary
Mode TR - Transmit-Receive
Modulation Analog and Digital
Satellite Arc 50° W to 139° West Longitude
Azimuth Range 114.1° to 227.0°
Corresponding Elevation Angles 18.2° / 32.5°
Antenna Centerline (AGL) 6.0 m / 19.7 ft

Antenna Information

Receive - FCC32

Transmit - FCC32

Manufacturer	ViaSat	ViaSat
Model	8009A	8009A
Gain / Diameter	50.3 dBi / 9.0 m	53.8 dBi / 9.0 m
3-dB / 15-dB Beamwidth	0.60° / 1.20°	0.30° / 0.60°
Max Available RF Power (dBW/4 kHz)		3.7
(dBW/MHz)		27.7
Maximum EIRP (dBW/4 kHz)		57.5
(dBW/MHz)		81.5
(dBW)		80.8
Interference Objectives: Long Term	-158.0 dBW/MHz 20%	-154.0 dBW/4 kHz 20%
Short Term	-148.0 dBW/MHz 0.01%	-131.0 dBW/4 kHz 0.0025%

Frequency Information

Receive 4.0 GHz

Transmit 6.1 GHz

Emission / Frequency Range (MHz)	300KFXD - 300KFXD / 3700.0 - 4200.0	850KFXD - 1M20FXD / 6422.0 - 6424.5
Max Great Circle Coordination Distance	370.3 km / 230.1 mi	232.9 km / 144.7 mi
Precipitation Scatter Contour Radius	510.5 km / 317.2 mi	267.2 km / 166.0 mi

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Coordination Values

CASTLE ROCK, CO

Licensee Name: Intelsat License LLC
Latitude (NAD 83): 39° 16' 34.0" N
Longitude (NAD 83): 104° 48' 27.0" W
Ground Elevation (AMSL): 2084.83 m / 6840.0 ft
Antenna Centerline (AGL): 6.0 m / 19.7 ft
Antenna Model: ViaSat 9 Meter
Antenna Mode: Receive 4.0 GHz
Interference Objectives: Long Term: -158.0 dBW/MHz 20%
Short Term: -148.0 dBW/MHz 0.01%
Transmit 6.1 GHz: -154.0 dBW/4 kHz 20%
-131.0 dBW/4 kHz 0.0025%
Max Available RF Power: 3.7 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 4.0 GHz		Transmit 6.1 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	4.48	113.33	-10.00	149.67	-10.00	100.00
5	4.52	108.50	-10.00	149.02	-10.00	100.00
10	4.70	103.66	-10.00	146.25	-10.00	100.00
15	4.82	98.81	-10.00	144.48	-10.00	100.00
20	4.55	93.95	-10.00	148.54	-10.00	100.00
25	4.02	89.09	-10.00	157.05	-10.00	100.00
30	3.53	84.26	-10.00	169.58	-10.00	100.00
35	3.52	79.42	-10.00	169.87	-10.00	100.00
40	3.44	74.60	-10.00	171.58	-10.00	100.00
45	2.89	69.84	-10.00	184.17	-10.00	100.00
50	2.15	65.15	-10.00	200.50	-10.00	109.71
55	1.88	60.44	-10.00	204.49	-10.00	115.58
60	1.39	55.82	-10.00	218.45	-10.00	127.85
65	1.10	51.23	-10.00	227.63	-10.00	134.04
70	0.00	46.96	-9.79	299.70	-9.79	196.15
75	0.00	42.48	-8.71	307.10	-8.71	200.31
80	0.00	38.11	-7.53	315.96	-7.53	204.80
85	0.00	33.88	-6.25	325.05	-6.25	208.08
90	0.00	29.86	-4.88	335.02	-4.88	213.56
95	0.26	25.97	-3.36	338.36	-3.36	213.99
100	0.24	22.70	-1.90	352.14	-1.90	222.25
105	0.27	20.06	-0.56	358.87	-0.56	225.42
110	0.23	18.44	0.36	370.32	0.36	232.89
115	0.31	17.95	0.65	362.24	0.65	226.19
120	0.47	18.70	0.20	338.27	0.20	209.15
125	0.29	20.93	-1.02	352.33	-1.02	221.14
130	0.64	23.57	-2.31	304.44	-2.31	190.38
135	0.45	27.00	-3.78	309.59	-3.78	195.93
140	0.51	30.07	-4.96	294.37	-4.96	185.84
145	0.52	32.99	-5.96	286.61	-5.96	180.90
150	0.72	35.51	-6.76	267.60	-6.76	164.16
155	0.90	37.75	-7.42	252.18	-7.42	151.67
160	1.01	39.68	-7.97	242.10	-7.97	143.93
165	1.09	41.26	-8.39	236.92	-8.39	140.10
170	1.51	42.05	-8.59	221.92	-8.59	129.58
175	1.45	42.84	-8.80	222.79	-8.80	130.45
180	1.56	42.97	-8.83	219.19	-8.83	127.54
185	1.79	42.50	-8.71	213.06	-8.71	122.28

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Coordination Values

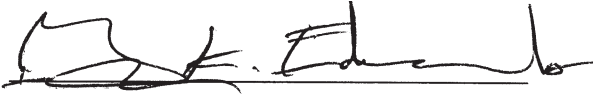
CASTLE ROCK, CO

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Antenna Mode	Receive 4.0 GHz		Transmit 6.1 GHz	
Interference Objectives: Long Term	-158.0 dBW/MHz	20%	-154.0 dBW/4 kHz	20%
Short Term	-148.0 dBW/MHz	0.01%	-131.0 dBW/4 kHz	0.0025%
Max Available RF Power			3.7 (dBW/4 kHz)	

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 4.0 GHz		Transmit 6.1 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	1.75	41.83	-8.54	215.26	-8.54	124.03
195	1.84	40.55	-8.20	214.31	-8.20	122.97
200	1.89	38.90	-7.75	215.24	-7.75	123.41
205	2.48	36.39	-7.03	205.04	-7.03	113.94
210	2.70	33.91	-6.26	206.45	-6.26	112.54
215	3.11	31.53	-5.47	201.76	-5.47	107.78
220	3.19	30.06	-4.95	202.83	-4.95	108.41
225	2.67	29.88	-4.88	211.64	-4.88	118.34
230	2.96	29.66	-4.80	205.77	-4.80	113.14
235	3.06	30.39	-5.07	204.81	-5.07	110.28
240	2.99	31.99	-5.63	203.62	-5.63	109.55
245	3.16	33.98	-6.28	196.79	-6.28	103.88
250	3.06	36.69	-7.11	194.81	-7.11	102.67
255	3.14	39.66	-7.96	188.69	-7.96	100.00
260	3.25	42.95	-8.82	182.01	-8.82	100.00
265	3.22	46.56	-9.70	178.18	-9.70	100.00
270	3.45	50.24	-10.00	171.50	-10.00	100.00
275	3.52	54.15	-10.00	169.88	-10.00	100.00
280	4.02	58.04	-10.00	157.06	-10.00	100.00
285	4.65	62.04	-10.00	147.03	-10.00	100.00
290	4.36	66.38	-10.00	151.56	-10.00	100.00
295	4.44	70.68	-10.00	150.28	-10.00	100.00
300	4.59	75.01	-10.00	147.87	-10.00	100.00
305	4.64	79.39	-10.00	147.18	-10.00	100.00
310	4.29	83.82	-10.00	152.72	-10.00	100.00
315	4.02	88.22	-10.00	157.08	-10.00	100.00
320	4.76	92.64	-10.00	145.40	-10.00	100.00
325	5.39	97.10	-10.00	137.79	-10.00	100.00
330	5.90	101.59	-10.00	134.08	-10.00	100.00
335	5.83	106.01	-10.00	134.81	-10.00	100.00
340	5.42	110.34	-10.00	137.57	-10.00	100.00
345	4.54	114.49	-10.00	148.69	-10.00	100.00
350	4.10	118.61	-10.00	155.72	-10.00	100.00
355	4.20	118.11	-10.00	154.10	-10.00	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: June 15, 2016