

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Harris Corporation
COLORADO SPRINGS, CO
Satellite Earth Station
7.3 Meter C-Band

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147
August 09, 2010

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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

Abraham Divestiture Company LLC
Colorado Springs Utilities
Sprint Spectrum LP DBA Sprint PCS
State of Colorado
WWC Holding Co., Inc

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 07/20/2010.

Company

AT&T COMMUNICATIONS OF MOUNTAIN STATES
Abraham Divestiture Company LLC
Black Hills Corporation
CBS Communications Services
COLORADO INTERSTATE GAS COMPANY
Cellular Inc. Network Corporation
City of Colorado Springs
Colorado Springs Utilities
Comcast Cable Communications, LLC
ENTRAVISION HOLDINGS, LLC
Gray Television Licensee, Inc. (KKTU)
Great Western Communications, LLC
Intermountain Rural Electric Association
International Communications Group, Inc.
LB Tower Company LLC
METROPOLITAN AREA NETWORKS, INC.
N.E. Colorado Wireless Technologies, Inc
New Cingular Wireless PCS LLC -Colorado
Nex-Tech Wireless, LLC
Peach Acquisitions LLC
Pueblo, County of
QWEST CORPORATION
SAN ISABEL ELECTRIC ASSOCIATION
SANGRE DE CRISTO COMMUNICATIONS, INC.
Smoky Hill Cellular of Colorado LP
Sprint Spectrum LP DBA Sprint PCS
State of Colorado
Stelera Wireless, LLC
Tri State Generation & Transmission
Verizon Wireless - Mountain Region
WWC Holding Co., 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: 08/09/2010

Administrative Information

Licensee Name Harris Corporation

Site Information

COLORADO SPRINGS, CO

Latitude (NAD 83) 38° 45' 51.0" N
Longitude (NAD 83) 104° 40' 4.0" W
Climate Zone A
Rain Zone 2
Ground Elevation (AMSL) 1785.5 m / 5857.9 ft

Link Information

Satellite Type Geostationary
Mode TR - Transmit-Receive
Modulation Digital
Satellite Arc 34.5° W to 139° West Longitude
Azimuth Range 102.7° to 227.5°
Corresponding Elevation Angles 6.7° / 32.8°
Antenna Centerline (AGL) 4.3 m / 14.1 ft

Antenna Information

Receive

Transmit

Manufacturer
Gain / Diameter
3-dB / 15-dB Beamwidth

Vertex/RSI
48.5 dBi / 7.3 m
0.66° / 1.30°

Vertex/RSI
51.7 dBi / 7.3 m
0.42° / 0.84°

				<u>6M00F3W</u>	<u>51K2G7W - 36M0G7W</u>	
Max Available RF Power	(dBW/4 kHz)			-10.5	-14.0	-14.0
	(dBW/MHz)			13.5	2.93	10.0
Maximum EIRP	(dBW/4 kHz)			41.2	37.7	37.7
	(dBW/MHz)			65.2	48.77	48.77
	(dBW)			72.96	48.77	77.24
Interference Objectives:	Long Term	-156.0 dBW/MHz	20%	-154.0 dBW/4 kHz	20%	
	Short Term	-146.0 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)
6M00F3W / 3700.0 - 4200.0
51K2G7W - 36M0G7W / 3700.0 - 4200.0

6M00F3W / 5925.0 - 6425.0
51K2G7W - 36M0G7W / 5925.0 - 6425.0

Max Great Circle Coordination Distance 497.3 km / 309.0 mi 232.0 km / 144.2 mi
Precipitation Scatter Contour Radius 586.0 km / 364.1 mi 100.0 km / 62.1 mi

COMSEARCH

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Coordination Values

COLORADO SPRINGS, CO

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Longitude (NAD 83) 104° 40' 4.0" W
Ground Elevation (AMSL) 1785.5 m / 5857.9 ft
Antenna Centerline (AGL) 4.3 m / 14.1 ft
Antenna Mode Receive 4.0 GHz Transmit 6.1 GHz
Interference Objectives: Long Term -156.0 dBW/MHz 20% -154.0 dBW/4 kHz 20%
Short Term -146.0 dBW/MHz 0.01% -131.0 dBW/4 kHz 0.0025%
Max Available RF Power -10.5 (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	1.27	102.67	-10.00	211.97	-10.00	100.00
5	1.02	97.69	-10.00	219.73	-10.00	100.00
10	0.77	92.71	-10.00	233.05	-10.00	105.64
15	0.72	87.74	-10.00	236.02	-10.00	107.92
20	0.57	82.77	-10.00	245.16	-10.00	114.76
25	0.51	77.80	-10.00	248.83	-10.00	117.44
30	0.40	72.83	-10.00	261.46	-10.00	126.30
35	0.61	67.86	-10.00	242.53	-10.00	112.82
40	0.51	62.90	-10.00	248.83	-10.00	117.44
45	0.42	57.94	-10.00	258.90	-10.00	124.52
50	0.44	52.99	-10.00	256.55	-10.00	122.86
55	0.48	48.03	-10.00	251.82	-10.00	119.50
60	0.44	43.10	-8.86	263.39	-8.86	125.96
65	0.53	38.15	-7.54	262.39	-7.54	123.25
70	0.54	33.24	-6.04	271.65	-6.04	127.35
75	0.63	28.33	-4.31	276.52	-4.31	127.93
80	0.56	23.50	-2.28	295.93	-2.28	136.21
85	0.53	18.74	0.18	316.62	0.18	145.54
90	0.49	14.14	3.24	344.27	3.24	159.88
95	0.34	9.99	7.01	393.48	7.01	192.05
100	0.24	7.01	10.85	441.56	10.85	216.09
105	0.22	6.86	11.09	497.32	11.09	232.04
110	0.00	9.88	7.13	413.68	7.13	204.93
115	0.00	13.61	3.66	385.34	3.66	193.28
120	0.00	17.28	1.06	364.81	1.06	183.30
125	0.00	20.85	-0.98	349.15	-0.98	175.40
130	0.00	24.32	-2.65	336.69	-2.65	168.90
135	0.00	27.66	-4.05	326.51	-4.05	161.90
140	0.00	30.83	-5.22	318.08	-5.22	157.54
145	0.00	33.80	-6.22	310.44	-6.22	153.97
150	0.00	36.53	-7.07	304.62	-7.07	151.05
155	0.00	38.98	-7.77	299.86	-7.77	148.69
160	0.00	41.08	-8.34	296.05	-8.34	146.81
165	0.00	42.79	-8.78	293.13	-8.78	145.38
170	0.00	44.07	-9.10	291.05	-9.10	144.37
175	0.00	44.85	-9.29	289.82	-9.29	143.76
180	0.00	45.11	-9.36	289.40	-9.36	143.56
185	0.30	44.55	-9.22	277.96	-9.22	135.20

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Latitude (NAD 83) 38° 45' 51.0" N
Longitude (NAD 83) 104° 40' 4.0" W
Ground Elevation (AMSL) 1785.5 m / 5857.9 ft
Antenna Centerline (AGL) 4.3 m / 14.1 ft
Antenna Mode Receive 4.0 GHz Transmit 6.1 GHz
Interference Objectives: Long Term -156.0 dBW/MHz 20% -154.0 dBW/4 kHz 20%
Short Term -146.0 dBW/MHz 0.01% -131.0 dBW/4 kHz 0.0025%
Max Available RF Power -10.5 (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	0.43	43.65	-9.00	263.90	-9.00	126.52
195	0.48	42.35	-8.67	259.44	-8.67	122.91
200	0.50	40.64	-8.22	260.38	-8.22	122.88
205	0.63	38.45	-7.62	255.44	-7.62	118.47
210	0.71	36.07	-6.93	254.52	-6.93	116.78
215	0.97	33.93	-6.27	242.68	-6.27	107.23
220	1.30	32.26	-5.72	233.51	-5.72	100.00
225	1.31	31.55	-5.48	234.53	-5.48	100.00
230	0.97	31.90	-5.59	246.50	-5.59	109.03
235	0.93	32.63	-5.84	247.50	-5.84	110.14
240	1.15	33.77	-6.21	235.64	-6.21	101.84
245	1.37	35.52	-6.76	225.42	-6.76	100.00
250	1.57	37.81	-7.44	215.86	-7.44	100.00
255	1.68	40.59	-8.21	209.03	-8.21	100.00
260	1.85	43.67	-9.00	203.06	-9.00	100.00
265	2.04	47.02	-9.81	194.43	-9.81	100.00
270	1.88	50.76	-10.00	197.64	-10.00	100.00
275	1.74	54.64	-10.00	201.44	-10.00	100.00
280	1.60	58.62	-10.00	205.39	-10.00	100.00
285	1.65	62.63	-10.00	204.08	-10.00	100.00
290	1.74	66.71	-10.00	201.43	-10.00	100.00
295	2.04	70.81	-10.00	193.64	-10.00	100.00
300	2.08	75.03	-10.00	192.75	-10.00	100.00
305	2.32	79.26	-10.00	187.27	-10.00	100.00
310	2.15	83.56	-10.00	191.20	-10.00	100.00
315	1.80	87.87	-10.00	199.92	-10.00	100.00
320	1.75	92.16	-10.00	201.34	-10.00	100.00
325	1.68	96.43	-10.00	203.21	-10.00	100.00
330	1.49	100.67	-10.00	205.98	-10.00	100.00
335	1.39	104.89	-10.00	208.60	-10.00	100.00
340	1.18	109.04	-10.00	214.68	-10.00	100.00
345	1.19	113.18	-10.00	214.38	-10.00	100.00
350	1.25	112.62	-10.00	212.73	-10.00	100.00
355	1.20	107.64	-10.00	214.24	-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.



Timothy O. Crutcher
Frequency Planner
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147

DATED: August 09, 2010

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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.

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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 receive-only earth station.

Company

FiberTower Network Services Corp
International Communications Group, Inc.
New Cingular Wireless PCS LLC -Colorado
Verizon Wireless - Mountain Region

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 07/20/2010.

Company

AIRCELL, LLC
Adcom 911
Arvada, City of
Boulder, County of
CHEETAH ACCESS TECHNOLOGIES, INC
Castle Rock, Town of - Utilities
City of Aurora
City of Aurora, Water Department
Clearwire Spectrum Holdings III, LLC
Colorado 7-Saguache Limited Partnership
Commnet Four Corners, LLC
DENVER, CITY AND COUNTY OF
Denver Educational Broadcasting Inc.
ENTRAVISION HOLDINGS, LLC
Eastern Colorado Independent Networks
El Paso County InformationTechnologies
Elbert County School District C-1
FiberTower Network Services Corp.
Intermountain Rural Electric Association
International Communications Group, Inc.
KLZ RADIO, INC.
LAKEWOOD, CITY OF
LP Broadband, Inc.
MESA NETWORKS, INC
METROPOLITAN AREA NETWORKS, INC.
MHO Networks
Motorola, Inc.
N.E. Colorado Wireless Technologies, Inc
National Digital TV Ctr - Comcast Media
New Cingular Wireless PCS LLC -Colorado
Nex-Tech Wireless, LLC
Open Range Communications
Peach Acquisitions LLC
Pueblo Cellular, Inc
Pueblo, City of
QWEST CORPORATION
RED ROCKS DATA CENTER
San Isabel Cellular Of Colorado L.P.
Sangre DeCristo Cellular Inc.
Smoky Hill Cellular of Colorado LP
Sprint Communications Co., LP
State of Colorado
Stelera Wireless, LLC
UNITED WIRELESS COMMUNICATIONS INC
Union Telephone Company, Inc.
Verizon Wireless - Mountain Region
Vyvx , LLC - Colorado
WESTMINSTER CITY COLORADO
WISPER TELECOMMUNICATIONS
West Metro Fire Protection District
Wheatland Electric Cooperative

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
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Date: 08/09/2010

Administrative Information

Licensee Name Harris Corporation

Site Information

COLORADO SPRINGS, CO

Latitude (NAD 83) 38° 45' 51.0" N
Longitude (NAD 83) 104° 40' 4.0" W
Climate Zone A
Rain Zone 2
Ground Elevation (AMSL) 1785.5 m / 5857.9 ft

Link Information

Satellite Type Geostationary
Mode RO - Receive-Only
Modulation Digital
Satellite Arc 34.5° W to 58° West Longitude
Azimuth Range 102.7° to 120.6°
Corresponding Elevation Angles 6.7° / 24.4°
Antenna Centerline (AGL) 4.3 m / 14.1 ft

Antenna Information

Receive

Manufacturer Vertex/RSI
Gain / Diameter 56.9 dBi / 7.3 m
3-dB / 15-dB Beamwidth 0.22° / 0.52°

Interference Objectives: Long Term -156.0 dBW/MHz 20%
Short Term -146.0 dBW/MHz 0.01%

Frequency Information

Receive 11.0 GHz

Emission / Frequency Range (MHz) 51K2G7W - 36M0G7W / 10950.0 - 11200.0
51K2G7W - 36M0G7W / 11450.0 - 11700.0

Max Great Circle Coordination Distance 434.0 km / 269.6 mi
Precipitation Scatter Contour Radius 575.5 km / 357.6 mi

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Coordination Values **COLORADO SPRINGS, CO**

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Antenna Mode Receive 11.0 GHz
Interference Objectives: Long Term -156.0 dBW/MHz 20%
Short Term -146.0 dBW/MHz 0.01%

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 11.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)
0	1.27	102.67	-10.00	172.56
5	1.02	97.69	-10.00	180.99
10	0.77	92.71	-10.00	193.57
15	0.72	87.74	-10.00	196.10
20	0.57	82.77	-10.00	203.41
25	0.51	77.80	-10.00	203.78
30	0.40	72.83	-10.00	213.13
35	0.61	67.86	-10.00	201.38
40	0.51	62.90	-10.00	203.78
45	0.42	57.94	-10.00	211.21
50	0.44	52.99	-10.00	209.44
55	0.48	48.03	-10.00	205.91
60	0.44	43.10	-8.86	214.05
65	0.53	38.15	-7.54	212.68
70	0.54	33.24	-6.04	218.91
75	0.63	28.33	-4.31	221.74
80	0.56	23.50	-2.28	235.36
85	0.53	18.74	0.18	249.22
90	0.49	14.14	3.24	268.59
95	0.34	9.99	7.01	303.41
100	0.24	7.01	10.85	346.23
105	0.22	6.86	11.09	434.00
110	0.00	9.88	7.13	322.15
115	0.00	13.61	3.66	298.80
120	0.00	17.28	1.06	286.79
125	0.00	20.85	-0.98	275.56
130	0.00	24.32	-2.65	266.72
135	0.00	27.66	-4.05	259.56
140	0.00	30.83	-5.22	253.69
145	0.00	34.01	-6.29	248.51
150	0.00	37.54	-7.36	243.31
155	0.00	41.33	-8.41	238.48
160	0.00	45.31	-9.41	233.99
165	0.00	49.45	-10.00	231.37
170	0.00	53.69	-10.00	231.37
175	0.00	58.02	-10.00	231.37
180	0.00	62.41	-10.00	231.37
185	0.30	66.80	-10.00	221.98

COMSEARCH

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Coordination Values

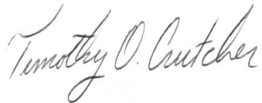
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Interference Objectives: Long Term -156.0 dBW/MHz 20%
Short Term -146.0 dBW/MHz 0.01%

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 11.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)
190	0.43	71.28	-10.00	210.43
195	0.48	75.80	-10.00	205.69
200	0.50	80.35	-10.00	204.40
205	0.63	84.90	-10.00	200.49
210	0.71	89.48	-10.00	196.55
215	0.97	94.06	-10.00	183.42
220	1.30	98.66	-10.00	171.66
225	1.31	103.25	-10.00	171.28
230	0.97	107.76	-10.00	183.24
235	0.93	112.29	-10.00	185.43
240	1.15	116.83	-10.00	176.57
245	1.37	121.34	-10.00	169.28
250	1.57	125.82	-10.00	159.86
255	1.68	130.20	-10.00	156.37
260	1.85	134.54	-10.00	150.90
265	2.04	138.77	-10.00	145.54
270	1.88	142.67	-10.00	149.95
275	1.74	146.33	-10.00	154.25
280	1.60	149.64	-10.00	158.94
285	1.65	152.63	-10.00	157.36
290	1.74	155.09	-10.00	154.23
295	2.04	156.96	-10.00	145.66
300	2.08	157.64	-10.00	144.74
305	2.32	157.32	-10.00	139.33
310	2.15	152.38	-10.00	143.17
315	1.80	147.40	-10.00	152.50
320	1.75	142.45	-10.00	154.12
325	1.68	137.49	-10.00	156.32
330	1.49	132.51	-10.00	162.61
335	1.39	127.54	-10.00	168.59
340	1.18	122.56	-10.00	175.61
345	1.19	117.59	-10.00	175.28
350	1.25	112.62	-10.00	173.43
355	1.20	107.64	-10.00	175.12

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.



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