FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Comcast Cable Communications, LLC
LITTLETON, CO
(E020325)
Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147
March 18, 2021

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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-only earth station.

Company

MHO Networks
Directlink, LLC
Union Pacific Railroad Company

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 03/08/2021.

Company
AC BidCO LLC
AT&T Mobility Spectrum LLC - CO
Aerux LLP
AirLife Denver
Arvada Police Dept.
BNSF Railway Company
Black Hawk Police Department
Black Hills Power and Light
Blue Ocean Enterprises, Inc.
Bonanza Creek Energy Inc
Boulder, County of
CBS Television Stations
CableLabs
Cellco Partnership - CO/ID/MT/WY/UT
Cellular Inc. Network Corporation
Cellular, Inc. Financial Corporation
City of Aurora
City of Colorado Springs
City of Lakewood, CO
Colorado Callcomm
Colorado Interstate Gas Company
Colorado Springs Utilities
County of Pueblo
Denver, City and County of
Directlink, LLC
Douglas County Sheriff's Office (CO)
Elbert County Communications Authority
Entravision Holdings, LLC
Fones West Digital Systems Inc.
Gilpin County Sheriff's Office
Gray Television Licensee, LLC
Grazi Communications, LLC
Industrial Tower and Wireless, LLC
Intermountain Rural Electric Association
Inventive Wireless of Nebraska, LLC
Jefferson, County of
KSE Radio Ventures, LLC
Kellin Communications
LP Broadband, Inc.
Live Wire Networks, Inc.

MHO Networks
Mountain Parks Electric Inc.
Mountain View Electric Assocation, Inc.
NE Colorado Cellular, Inc.
New Cingular Wireless PCS LLC -Colorado
Olympic Wireless, LLC
Public Broadcasting of Colorado, Inc.
Qwest Corporation
Roggen Enterprises Broadband LLC
Scripps Broadcasting Holdings, LLC,
Sprint Spectrum L.P.
Sprint Spectrum LP DBA Sprint PCS
State of Colorado
T-Mobile License LLC
Tallgrass Operations, LLC
Tri-State Generation & Transmission Assn
Tribune Broadcasting Company II, LLC
Union Pacific Railroad Company
Union Telephone Company, Inc.
University Corp for Atmospheric Research
Weld County Colorado
Xbar7 Communications, LLC
Xcel Energy Services, Inc.
iHM Licenses, 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:	03/18/2021
Job Number:	210308COMSGE03

Administrative Information

Status	ENGINEER PROPOSAL
Call Sign	E020325
Licensee Code	ZCATEC
Licensee Name	Comcast Cable Communications, LLC

Site Information — LITTLETON, CO

Venue Name	
Latitude (NAD 83)	39° 30' 50.0" N
Longitude (NAD 83)	105° 1' 27.5" W
Climate Zone	A
Rain Zone	2
Ground Elevation (AMSL)	1687.0 m / 5534.8 ft

Link Information

Satellite Type	Geostationary
Mode	TO - Transmit-Only
Modulation	Digital
Satellite Arc	60° W to 145° West Longitude
Azimuth Range	122.4° to 232.8°
Corresponding Elevation Angles	25.2° / 28.6°
Antenna Centerline (AGL)	13.0 m / 42.7 ft

Antenna Information — Transmit - FCC32

Manufacturer		Vertex
Model		13 KPK
Gain / Diameter		56.8 dBi / 13.0 m
3-dB / 15-dB Beamwidth		0.26° / 0.52°
Max Available RF Power	(dBW/4 kHz)	-5.4
	(dBW/MHz)	18.6
Maximum EIRP	(dBW/4 kHz)	51.4
	(dBW/MHz)	75.4
Interference Objectives:	Long Term	-154.0 dBW/4 kHz 20%
	Short Term	-131.0 dBW/4 kHz 0.0025%

Frequency Information — Transmit 6.1 GHz

Emission / Frequency Range (MHz)	21M7G7W - 36M0G7W / 5925.0 - 6425.0
Max Great Circle Coordination Distance	160.2 km / 99.5 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi

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Antenna Centerline (AGL)	13.0 m / 42.7 ft
Antenna Model	Vertex 13 meter
Antenna Mode	Transmit 6.1 GHz
Interference Objectives: Long Term	-154.0 dBW/4 kHz 20%
Short Term	-131.0 dBW/4 kHz 0.0025%
Max Available RF Power	-5.4 (dBW/4 kHz)

Transmit 6.1 GHz

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
0	1.24	119.37	-10.00	103.53
5	1.66	115.00	-10.00	100.00
10	2.04	110.56	-10.00	100.00
15	2.47	106.06	-10.00	100.00
20	2.91	101.51	-10.00	100.00
25	3.24	96.91	-10.00	100.00
30	3.37	92.27	-10.00	100.00
35	3.53	87.63	-10.00	100.00
40	3.63	82.98	-10.00	100.00
45	3.62	78.34	-10.00	100.00
50	3.80	73.69	-10.00	100.00
55	3.95	69.05	-10.00	100.00
60	3.91	64.46	-10.00	100.00
65	3.84	59.92	-10.00	100.00
70	3.48	55.51	-10.00	100.00
75	3.24	51.15	-10.00	100.00
80	2.86	46.95	-9.79	100.00
85	2.60	42.85	-8.80	100.00
90	2.73	38.75	-7.71	100.00
95	3.20	34.62	-6.48	100.00
100	3.41	30.87	-5.24	100.00
105	3.33	27.69	-4.06	100.00
110	2.82	25.43	-3.13	100.00
115	2.73	23.59	-2.32	100.00
120	2.29	23.01	-2.05	103.01
125	1.78	23.53	-2.29	113.52
130	1.63	24.67	-2.80	115.48
135	1.30	26.80	-3.70	120.87
140	0.99	29.57	-4.77	125.71
145	0.91	32.50	-5.80	126.46
150	0.61	35.39	-6.72	135.96
155	0.27	38.05	-7.51	160.22
160	0.45	39.94	-8.04	141.36
165	0.71	41.36	-8.41	127.37
170	0.87	42.42	-8.69	119.61
175	1.11	42.92	-8.82	110.41
180	1.11	43.16	-8.88	110.12
185	1.19	42.83	-8.79	108.27

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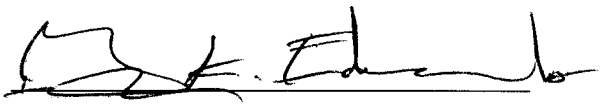
Max Available RF Power	-5.4 (dBW/4 kHz)

Transmit 6.1 GHz

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
190	1.35	41.95	-8.57	104.97
195	1.37	40.74	-8.25	105.27
200	1.31	39.18	-7.83	108.09
205	1.18	37.28	-7.29	113.13
210	1.07	35.02	-6.61	118.05
215	1.03	32.45	-5.78	121.64
220	1.02	30.21	-5.00	124.32
225	1.03	28.58	-4.40	125.68
230	0.89	27.86	-4.12	132.46
235	0.96	27.73	-4.07	129.21
240	0.93	28.54	-4.38	129.89
245	0.89	30.10	-4.96	129.88
250	0.67	32.45	-5.78	136.20
255	0.73	35.08	-6.63	131.88
260	0.60	38.26	-7.57	133.64
265	0.88	41.50	-8.45	119.69
270	1.12	45.04	-9.34	108.64
275	1.09	48.93	-10.00	107.37
280	1.03	52.97	-10.00	109.13
285	0.29	57.35	-10.00	149.83
290	0.00	61.60	-10.00	158.91
295	0.00	65.83	-10.00	158.91
300	0.00	70.11	-10.00	158.91
305	0.00	74.43	-10.00	158.91
310	0.00	78.78	-10.00	158.91
315	0.00	83.16	-10.00	158.91
320	0.00	87.54	-10.00	158.91
325	0.00	91.93	-10.00	158.91
330	0.00	96.32	-10.00	158.91
335	0.00	100.69	-10.00	158.91
340	0.00	105.04	-10.00	158.91
345	0.42	109.45	-10.00	138.09
350	0.86	113.86	-10.00	116.10
355	1.06	118.19	-10.00	108.17

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
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DATED: March 18, 2021