

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Harte Satellite Consultants
COLORADO SPRINGS, CO
Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147
August 26, 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.

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 05/12/2021.

Company

3G Wireless, LLC
AC BidCO LLC
Adams County IT Department
ADCOM911, Inc
Aerial Video Systems
Aerux LLP
Alascom Inc
Anadarko Petroleum Corporation
Arvada Police Dept.
Arvada, City of
Ascent Media Network Services, LLC
Aspen Skiing Co LLC
AT&T Mobility Spectrum LLC - CO
AU Wireless
Baca Valley Telephone Co
Bellsouth Telecommunications, Inc.
Black Hawk Police Department
Blanca Telephone Company
Bloomfield City & County
Borgeson, Tom R.
Brainstorm Internet
Broadcast Sports Inc.
BySky Inc.
Carolina Telephone and Telegraph Co
Casper, John
Castle Rock, Town
CBS Communications Services Inc
CBS Television Stations
Cellco Partnership - CO/ID/MT/WY/UT
Cellco Partnership-AZ/CO/NM/NV/UT
Cellular Inc. Network Corporation
Cellular, Inc. Financial Corporation
Centennial Water & Sanitation District
CenturyTel Broadband Services
CenturyTel of Eagle, Inc.
CenturyTel of the Southwest, Inc.
Chaffee County Telecom, LLC
Chicago Comnet Corp
Cincinnati Bell Wireless LLC
City and County of Denver - (DIA)

City of Arvada, Water T&D Division
City of Aurora
City of Aurora, Water Department
City of Colorado Springs
City of Federal Heights
City of Lakewood, CO
City of Westminster - Public Works
City of Westminster Dept Info Technology
Cityless Internet Services, LLC
Citywide News Network, Inc.
Clear Creek, County of
Clearnetworkx LLC
Clearwire Spectrum Holdings III, LLC
Colorado 7-Saguache Limited Partnership
Colorado Callcomm
Colorado Central Telecom, Inc
Colorado Public Television
Colorado RSA No. 3 Limited Partnership
Colorado Springs Utilities
Combined Regional Communications Auth
Commnet Four Corners, LLC
Communications Holdings of Colorado, LLC
County of Pueblo
Cowboys Stadium LP
DCI II, INC.
Delta County Tele-Comm, Inc.
Denver City and County of Denver Water
Denver, City and County of
Direct Broadcast Services, Inc.
Directlink, LLC
Diverse Datum, Inc.
Douglas County Sheriff's Office (CO)
DPE, LLC
Eagle River Water & Sanitation District
Edge Internet
Educational Comm of Colorado Springs
El Paso County Sheriffs Office
Elbert County Communications Authority
Eldora Mountain Resort
Elite Broadband LLC
Entravision Holdings, LLC
Evergreen Fire Protection District
Fones West Digital Systems Inc.
Frontier California Inc.
Fundamental Holdings, Corp.
Futurum Communications Corporation
Gilpin County Sheriff's Office
Global Telecom & Technology Americas, In
Grand County Internet Services Inc.
Gray Television Licensee LLC (Gray TV)
Hallco Unlimited, Inc.
Hawaiian Telecom Inc.
Heiden, William
HF Enterprises, Inc
Hilltop Broadband
Holy Cross Electric Association, Inc.

Illinois Bell Telephone Company
Indiana Bell Telephone Company
Information & Display Systems, Inc.
Information Super Station, LLC
Intermountain Rural Electric Association
International Communications Group, Inc.
Jade Communications, LLC
Jefferson, County of
Kellin Communications
Kentucky RSA #3 Cellular General Partner
Kentucky RSA #4 Cellular General Partner
KLZ Radio, Inc.
KWGN, LLC
L3Harris Technologies, Inc
Live Wire Networks, Inc.
LP Broadband, Inc.
McAtee, Robert E
MERCURY COMMUNICATIONS
MHO Networks
Michigan Bell Telephone Company
Moreen, Steven K
Mountain Broadband LLC
Mountain Broadband Networks
Mountain iNet, Inc.
Mountain Parks Electric Inc.
Mountain View Electric Association, Inc.
Multimedia Holdings Corporation
Multimedia Holdings Corporation
Navajo Communications Company
NE Colorado Cellular, Inc.
NETEO Inc
Netlive Networks
New Cingular Wireless PCS LLC -Colorado
NEW ENGLAND DIGITAL DISTRIBUTION, INC.
Nexstar Media Inc.
Nex-Tech Wireless, LLC
Nextel West Corporation
Niwot Corporation
NorthWest Suburbs Community Access Corp
NSM Surveillance
Nucla Naturita Telephone Company
Ohio Bell GTelephone Company
Olympic Wireless, LLC
Onboard Images
Pacific Bell Tel Com dba AT&T California
Park County Government
Parker Fire Protection District
Parker Water & Sanitation District
PathFinder LLC
PCI Broadband
Penn Service Microwave Co., Inc.
Pikes Peak Television, Inc.
Pitkin County
Plateau Telecommunications, Inc.
Plum TV, LLC
Production & Satellite Services, Inc.

Pueblo, City of
Quick Link Connections Inc.
Qwest Corporation
Radiofone, Inc.
Randy Hermes Production
RCC Minnesota Inc. - MN NE ND SD
Rebeltec Communications LLC
Remote Broadcasts, Inc.
REMOTE FACILITIES CONSULTING SERVICES
ResortNet, LLC
RF Central, LLC
RF Film, Inc
Rocky Mountain Public Media Inc
Roggen Enterprises Broadband LLC
Rye Telephone Company, Inc.
Salem Media of Colorado, Inc.
San Isabel Cellular Of Colorado L.P.
San Isabel Electric Association, Inc
San Luis Valley Rural Electric Coop Inc
Scripps Broadcasting Holdings, LLC
Scripps Media, Inc. - KMGH TV
SIMCHAT TORAH BEIT MIDRASH
SkyWerx Industries, LLC
SmartSky Microwave, LLC
South Metro WISE Authority
South Park Telephone
South Park, LLC
Southeast Colorado Power Association
Southwestern Bell Telephone L.P.
Speedshotz, Inc
Sprint Spectrum LLC
Sprint Spectrum LP DBA Sprint PCS
State of Colorado
Summit, County of
Taosnet LLC
Teller County
TellerWifi LLC
Telos Online Inc.
Telstar Communications, Inc
T-Mobile License LLC
Tribune Broadcasting Company II, LLC
Tri-State Generation & Transmission Assn
TTWN Networks, LLC
TXWI Net LLC
Union Pacific Railroad Company
Union Telephone Company, Inc.
Unisat, Inc.
United Power
United Telephone - Southeast
United Wireless Communications, Inc.
University Corp for Atmospheric Research
University of Colorado at Boulder Police
University of Colorado Health
Verizon Maryland, Inc.
Verizon New England Inc.
Verizon New Jersey, Inc.

Verizon New York, Inc.
Verizon North Inc.
Verizon Northwest Inc.
Verizon Pennsylvania, Inc.
VERIZON SOUTH INC.
Verizon Virginia, Inc.
Verizon Washington DC, Inc.
Vision Wireless Communication
Visionary Communications, Inc.
VYVX, LLC
Weld County Colorado
West Metro Fire Protection District
Westar Satellite Services LP
Wheatland Electric Cooperative, Inc
Winged Vision Inc
Wisconsin Bell Telephone Company
Wolfe Air Aviation
Xcel Energy Services, Inc.
Xiber, LLC
Xtream Internet LLC
Zayo Group, 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: 05/12/2021
Job Number: 210512COMSGE03

Administrative Information

Status: ENGINEER PROPOSAL
Call Sign:
Licensee Code: HARSAT
Licensee Name: Harte Satellite Consultants

Site Information

COLORADO SPR, CO
Venue Name:
Latitude (NAD 83): 38° 47' 21.5" N
Longitude (NAD 83): 104° 46' 40.4" W
Climate Zone: A
Rain Zone: 2
Ground Elevation (AMSL): 1777.33 m / 5831.1 ft

Link Information

Satellite Type: Geostationary
Mode: TR - Transmit-Receive
Modulation: Digital
Satellite Arc: 33° W to 177° West Longitude
Azimuth Range: 101.7° to 258.6°
Corresponding Elevation Angles: 5.4° / 5.1°
Antenna Centerline (AGL): 1.49 m / 4.9 ft

Antenna Information

	Receive - FCC32	Transmit - FCC32
Manufacturer	TTI	TTI
Model	27E01-1000-A	27E01-1000-A
Gain / Diameter	30.1 dBi / 0.45 m	30.6 dBi / 0.45 m
3-dB / 15-dB Beamwidth	4.40° / 9.00°	3.9° / 7.6°
Max Available RF Power (dBW/4 kHz) (dBW/MHz)		-20.1 3.9
Maximum EIRP (dBW/4 kHz) (dBW/MHz)		10.5 34.5
Interference Objectives:	Long Term Short Term	-156.0 dBW/MHz 20% -146.0 dBW/MHz 0.01%
		-151.0 dBW/4 kHz 20% -128.0 dBW/4 kHz 0.0025%

Frequency Information

	Receive 11.0 GHz	Transmit 13.0 GHz
Emission / Frequency Range (MHz)	25M0G7W / 10700.0 - 10950.0 25M0G7W / 11200.0 - 11450.0	7M00G7W / 12750.0 - 13250.0
Max Great Circle Coordination Distance	327.6 km / 203.5 mi	154.0 km / 95.7 mi
Precipitation Scatter Contour Radius	606.3 km / 376.7 mi	100.0 km / 62.1 mi

COMSEARCH

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19700 Janelia Farm Boulevard, Ashburn, VA 20147
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Coordination Values

COLORADO SPR, CO

Licensee Name	Harte Satellite Consultants				
Latitude (NAD 83)	38° 47' 21.5" N				
Longitude (NAD 83)	104° 46' 40.4" W				
Ground Elevation (AMSL)	1777.33 m / 5831.1 ft				
Antenna Centerline (AGL)	1.49 m / 4.9 ft				
Antenna Model	TTI 0.45 meter				
Antenna Mode	Receive 11.0 GHz		Transmit 13.0 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			-20.1 (dBW/4 kHz)		

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 11.0 GHz		Transmit 13.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	2.36	101.35	-10.00	138.47	-10.00	100.00
5	1.93	96.64	-10.00	148.65	-10.00	100.00
10	1.96	91.65	-10.00	147.69	-10.00	100.00
15	2.66	86.66	-10.00	132.26	-10.00	100.00
20	2.62	81.67	-10.00	133.05	-10.00	100.00
25	2.81	76.67	-10.00	130.91	-10.00	100.00
30	3.02	71.67	-10.00	127.01	-10.00	100.00
35	2.81	66.68	-10.00	130.92	-10.00	100.00
40	3.46	61.67	-10.00	119.29	-10.00	100.00
45	3.33	56.68	-10.00	121.47	-10.00	100.00
50	2.51	51.72	-10.00	135.36	-10.00	100.00
55	1.64	46.77	-9.75	158.73	-9.75	100.00
60	1.12	41.84	-8.54	184.71	-8.54	100.00
65	0.96	36.89	-7.17	196.43	-7.17	100.00
70	0.93	31.94	-5.61	204.26	-5.61	100.00
75	0.89	27.01	-3.79	211.33	-3.79	100.00
80	0.85	22.11	-1.62	223.07	-1.62	100.00
85	0.81	17.27	1.07	238.62	1.07	107.42
90	0.71	12.57	4.52	262.84	4.52	121.30
95	0.74	8.15	9.22	289.38	9.22	132.39
100	0.68	5.05	14.43	327.59	14.43	153.99
105	0.62	5.87	12.78	318.53	12.78	150.64
110	0.54	9.51	7.54	290.62	7.54	136.41
115	0.48	13.28	3.92	273.67	3.92	130.45
120	0.42	16.98	1.25	264.64	1.25	127.55
125	0.37	20.59	-0.84	258.85	-0.84	126.12
130	0.31	24.09	-2.55	255.88	-2.55	126.17
135	0.00	27.64	-4.04	259.60	-4.04	129.71
140	0.00	30.81	-5.22	253.72	-5.22	127.90
145	0.00	33.78	-6.22	248.86	-6.22	125.34
150	0.00	36.51	-7.06	244.84	-7.06	123.19
155	0.00	38.96	-7.76	241.43	-7.76	121.40
160	0.00	41.06	-8.33	238.80	-8.33	119.97
165	0.29	42.51	-8.71	228.68	-8.71	112.30
170	0.46	43.59	-8.99	211.59	-8.99	100.00
175	0.36	44.47	-9.20	220.07	-9.20	105.74
180	0.43	44.65	-9.25	213.28	-9.25	100.01
185	0.70	44.13	-9.12	200.86	-9.12	100.00

COMSEARCH

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Coordination Values

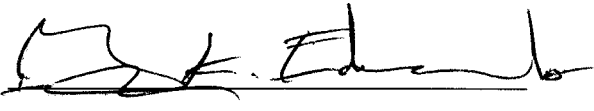
COLORADO SPR, CO

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Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz	0.0025%	
Max Available RF Power			-20.1 (dBW/4 kHz)		

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 11.0 GHz		Transmit 13.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.80	43.27	-8.90	196.69	-8.90	100.00
195	0.77	42.06	-8.60	199.59	-8.60	100.00
200	0.67	40.47	-8.18	203.61	-8.18	100.00
205	0.77	38.31	-7.58	203.63	-7.58	100.00
210	0.57	36.05	-6.92	213.30	-6.92	100.00
215	1.11	32.93	-5.94	196.59	-5.94	100.00
220	1.57	29.64	-4.80	188.65	-4.80	100.00
225	2.29	25.98	-3.37	175.84	-3.37	100.00
230	3.73	21.66	-1.39	148.67	-1.39	100.00
235	4.73	17.55	0.89	142.19	0.89	100.00
240	4.79	14.00	3.35	153.72	3.35	100.00
245	4.86	10.34	6.64	174.40	6.64	100.00
250	5.76	6.06	12.44	196.49	12.44	100.00
255	4.99	2.84	20.68	257.57	20.68	100.00
260	3.43	2.16	23.66	318.86	23.66	124.49
265	2.35	6.93	10.98	244.65	10.98	100.00
270	1.27	11.98	5.04	241.03	5.04	103.48
275	1.55	16.73	1.41	214.57	1.41	100.00
280	1.53	21.64	-1.38	205.18	-1.38	100.00
285	1.36	26.61	-3.62	199.82	-3.62	100.00
290	1.10	31.59	-5.49	198.95	-5.49	100.00
295	0.91	36.57	-7.08	199.12	-7.08	100.00
300	0.74	41.55	-8.46	201.52	-8.46	100.00
305	0.77	46.52	-9.69	194.92	-9.69	100.00
310	0.39	51.51	-10.00	213.86	-10.00	101.37
315	0.60	56.48	-10.00	201.80	-10.00	100.00
320	0.97	61.44	-10.00	183.14	-10.00	100.00
325	0.81	66.43	-10.00	191.30	-10.00	100.00
330	0.99	71.41	-10.00	181.95	-10.00	100.00
335	1.36	76.39	-10.00	169.79	-10.00	100.00
340	1.67	81.38	-10.00	156.47	-10.00	100.00
345	2.27	86.36	-10.00	140.35	-10.00	100.00
350	1.89	91.36	-10.00	149.75	-10.00	100.00
355	1.74	96.35	-10.00	154.38	-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: August 26, 2021