

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Harte Satellite Consultants
SALT LAKE CT, UT
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 07/22/2021.

Company

3G Wireless, LLC
AC BidCO LLC
Adrem Ventures, LLC
Aerial Video Systems
Affinity Technology Solutions LLC
AirTouch Cellular - N California/Nevada
Alascom Inc
Albion Telephone Company
All West Communications, Inc.
All Wireless Communications LLC
AllTech Fiber LLC
Alpha Communications Inc.
Andeavor Logistics
Arizona Nevada Tower Corp
Ascent Media Network Services, LLC
AT&T Mobility Spectrum LLC - CO
AT&T Mobility Spectrum LLC - ID, MT, WY
AT&T Mobility Spectrum LLC - Reno, NV
AT&T Mobility Spectrum LLC - Utah
Azteca Broadcasting Corporation
Bear River Communications, LLC
Beehive Telephone Company, Inc.
BEH Communications, LLC
Bellsouth Telecommunications, Inc.
Bonneville International Corporation
Borgeson, Tom R.
Bridger Valley Electric Association
Brigham Young University
Broadcast Sports Inc.
Broadway Media, LLC
Business Only Broadband, LLC
Cache County Utah
Cache Valley Transit District
Caerus Piceance LLC
Caerus Uinta LLC
Carbon County
Carolina Telephone and Telegraph Co
Casper, John
Cellco Partnership - CO/ID/MT/WY/UT
Cellco Partnership - N CA/NV

Cellco Partnership-AZ/CO/NM/NV/UT
 Cellular, Inc. Financial Corporation
 Central Utah Telephone, Inc
 CenturyTel of the Southwest, Inc.
 Chicago Comnet Corp
 Cincinnati Bell Wireless LLC
 Citizens Telecommunications Co of Utah
 Citizens Telecommunications of Nevada
 City of Bountiful
 City of Elko
 Citywide News Network, Inc.
 Clearwire Spectrum Holdings III, LLC
 College of Southern Idaho
 Colorado RSA No. 3 Limited Partnership
 Commnet Four Corners, LLC
 Commnet of Nevada, LLC
 Cowboys Stadium LP
 Data Solutions Inc
 DCI II, INC.
 Deseret Generation and Transmission Coop
 Digis LLC
 Direct Broadcast Services, Inc.
 Direct Communications
 Dish Wholesale
 DW Holdings, LLC
 Echo Broadband LLC
 Elite Broadband LLC
 Elko County School District
 Elko Television District
 Emery Telephone
 Emery County Sheriff's Office
 Emery Telcom Video LLC
 Encana Oil & Gas (USA) Inc.
 Encana Oil and Gas
 Envision Networks LLC
 Farm Bureau Insurance Company of Idaho
 Fatbeam, LLC
 FIF Utah LLC
 Filer Mutual Telephone Company
 First Digital Telecom
 Frontier California Inc.
 Futurum Communications Corporation
 Fybercom
 Galandin, Vitaliy
 Garfield County
 Global Telecom & Technology Americas, In
 Hallco Unlimited, Inc.
 Hawaiian Telecom Inc.
 HC2 Broadcasting Inc.
 Heiden, William
 HF Enterprises, Inc
 Hilcorp Energy Company
 HJ LLC
 Hot Spot Broadband, Inc
 Idaho 6 Clark Limited Partnership
 Idaho Communications, LLC

Illinois Bell Telephone Company
 Indiana Bell Telephone Company
 Infinite Q Networks
 Information & Display Systems, Inc.
 Information Super Station, LLC
 InfoWest, Inc
 InnovativeAir, LLC.
 IntelliPOP, LLC
 Intermountain Health Care
 International Communications Group, Inc.
 JC Mickelson Inc.
 Jordan Valley Water Conservancy District
 Kellin Communications
 Kennecott Utah Copper LLC
 Kentucky RSA #3 Cellular General Partner
 Kentucky RSA #4 Cellular General Partner
 KG Mining (Bald Mountain) Inc.
 Kiosk Wireless
 KJZZ Licensee, LLC
 KSB Industries, LLC
 KUTV Licensee, LLC
 KZMU Moab Public Radio
 L3Harris Technologies, Inc
 Laramie Energy, LLC
 LasVegas.Net
 Liberty Broadband LLC
 Listeners Community Radio of Utah Inc.
 LP Broadband, Inc.
 LR Communications
 Lyman Communications
 MDW Pan LLP
 MERCURY COMMUNICATIONS
 Michigan Bell Telephone Company
 Miles Wireless
 MK Communications
 Moreen, Steven K
 Natures Sunshine Products, Inc.
 Navajo Communications Company
 NBC Telemundo License Co. - KSTS
 NBC Telemundo License LLC
 Nevada Bell Tel dba AT&T Nevada
 Nevada Gold Mines LLC
 Nevada Power Co dba NV Energy
 New Cingular Wireless PCS - ID, WY
 New Cingular Wireless PCS LLC -Colorado
 New Cingular Wireless PCS LLC-Reno, NV
 New Cingular Wireless PCS LLC-Utah
 NEW ENGLAND DIGITAL DISTRIBUTION, INC.
 Nexstar Media Inc.
 NGL Connection
 North Shore Exploration and Production,
 Northwest Pipeline GP
 NorthWest Suburbs Community Access Corp
 NSM Surveillance
 Ogden, City of
 Ohio Bell GTelephone Company

Olympic Wireless, LLC
 Onboard Images
 Optic Loop Communications
 Optimus Communications, LLC
 Pacific Bell Tel Com dba AT&T California
 PacifiCorp
 Peak Wireless Services, LLC
 Penn Service Microwave Co., Inc.
 Plateau Telecommunications, Inc.
 Plum TV, LLC
 Prestige Broadband LLC
 Production & Satellite Services, Inc.
 Project Mutual Telephone Co-op Assoc
 QEP Resources, Inc.
 Questar Infocomm, Inc.
 Quick Link Connections Inc.
 Quicklink Internet LLC
 Qwest Corporation
 Radiofone, Inc.
 Randy Hermes Production
 Rapidwave, LLC
 RC Wireless Inc.
 RCC Minnesota Inc. - MN NE ND SD
 Remote Broadcasts, Inc.
 REMOTE FACILITIES CONSULTING SERVICES
 RF Central, LLC
 RF Film, Inc
 Rio Blanco, County of
 Riverbend Communications, LLC
 RMEcom/ Silver Lake Internet, LLC
 Royces Electronics Inc
 Safelink Internet
 Salt Lake City of
 SALT LAKE CITY CORPORATION
 Salt Lake City, City of
 Salt Lake, County of
 Sanpete County Broadcasting, Co.
 SBT Internet
 Scripps Broadcasting Holdings, LLC,
 Senawave, LLC
 Signal West LLC
 Silver Star Telephone Company, Inc.
 SmartSky Microwave, LLC
 South Central Communications, Inc.
 South Central Utah Telephone Company
 Southwestern Bell Telephone L.P.
 SpeedConnect, LLC
 Speedshotz, Inc
 Sprint Spectrum LLC
 Sprintcom, Inc
 State Board of Education State of Idaho
 State of Idaho
 State of Nevada Department of Correction
 State of Nevada, Dept of Transportation
 State of Nevada, Enterprise IT Services
 State Of Wyoming

Summit County
Sun Valley Radio, Inc.
Tanner Memorial Clinic
Tesoro Companies, Inc.
The Tahlequah, LLC
T-Mobile License LLC
Town of Rangely
TPT SpeedConnect, LLC
TTWN Networks, LLC
TXOX Communications LLC
UBTA-UBETCommunications, Inc.
Uinta County School District #6
Uintah Basin Elec Telecom dba Strata Net
Unified Fire Authority
Union Pacific Railroad Company
Union Telephone Company, Inc.
Unisat, Inc.
United Telephone - Southeast
University of Utah - Education Network
University Of Utah Health Care (AirMed)
University of Utah- KUER
US Satellite Corporation
Utah Broadband LLC
Utah Communications Authority
Utah Gas Op LTD
Utah Transit Authority, State of Utah
Utah, County of
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.
Verizon Wireless (VAW) LLC - Idaho
Vision WiFi, Inc
Visionary Communications, Inc.
VYVX, LLC
Waldron, Adam
Wasatch County Commissioners
Wasatch Utah RSA No. 2 Ltd Partnership
Weigel Broadcasting Company
Wells Rural Electric Company
Westar Satellite Services LP
White Cloud Communications
Wi-Fiber, Inc.
Williams Energy Services
Winged Vision Inc
Wisconsin Bell Telephone Company
Wolfe Air Aviation

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: 07/22/2021
Job Number: 210722COMSGE09

Administrative Information

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

Site Information

SALT LAKE CT, UT

Venue Name:
Latitude (NAD 83): 40° 44' 37.3" N
Longitude (NAD 83): 111° 55' 17.4" W
Climate Zone: B
Rain Zone: 5
Ground Elevation (AMSL): 1289.06 m / 4229.2 ft

Link Information

Satellite Type: Geostationary
Mode: TR - Transmit-Receive
Modulation: Digital
Satellite Arc: 43° W to 163° West Longitude
Azimuth Range: 104.1° to 242.2°
Corresponding Elevation Angles: 7.2° / 20.3°
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	412.0 km / 256.0 mi	135.7 km / 84.3 mi
Precipitation Scatter Contour Radius	398.8 km / 247.8 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

SALT LAKE CT, UT

Licensee Name	Harte Satellite Consultants		
Latitude (NAD 83)	40° 44' 37.3" N		
Longitude (NAD 83)	111° 55' 17.4" W		
Ground Elevation (AMSL)	1289.06 m / 4229.2 ft		
Antenna Centerline (AGL)	1.49 m / 4.9 ft		
Antenna Model	TTI 0.45 meter		
Antenna Mode	Receive 11.0 GHz		
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	Transmit 13.0 GHz
Short Term	-146.0 dBW/MHz	0.01%	-151.0 dBW/4 kHz 20%
Max Available RF Power		-20.1 (dBW/4 kHz)	-128.0 dBW/4 kHz 0.0025%

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	0.00	104.01	-10.00	307.68	-10.00	106.21
5	0.00	99.05	-10.00	307.68	-10.00	106.21
10	2.06	94.11	-10.00	146.00	-10.00	100.00
15	2.97	89.13	-10.00	126.49	-10.00	100.00
20	3.84	84.13	-10.00	112.85	-10.00	100.00
25	4.23	79.14	-10.00	108.77	-10.00	100.00
30	3.29	74.16	-10.00	120.81	-10.00	100.00
35	2.62	69.19	-10.00	134.19	-10.00	100.00
40	3.48	64.18	-10.00	117.52	-10.00	100.00
45	3.10	59.21	-10.00	124.02	-10.00	100.00
50	2.72	54.25	-10.00	131.90	-10.00	100.00
55	2.18	49.31	-10.00	144.79	-10.00	100.00
60	2.10	44.35	-9.17	148.25	-9.17	100.00
65	1.73	39.44	-7.90	167.61	-7.90	100.00
70	1.52	34.53	-6.46	185.59	-6.46	100.00
75	1.42	29.64	-4.80	204.29	-4.80	100.00
80	1.28	24.79	-2.86	224.12	-2.86	100.00
85	1.19	20.01	-0.53	244.43	-0.53	100.00
90	1.06	15.37	2.33	268.48	2.33	100.00
95	0.91	11.05	5.91	312.38	5.91	102.06
100	0.78	7.61	9.96	372.88	9.96	122.67
105	0.65	6.59	11.53	412.04	11.53	135.72
110	0.62	8.80	8.39	383.13	8.39	127.04
115	0.61	12.39	4.67	347.01	4.67	115.68
120	0.54	15.97	1.92	331.05	1.92	110.60
125	0.47	19.47	-0.23	325.56	-0.23	109.42
130	0.40	22.85	-1.97	326.37	-1.97	110.41
135	0.22	26.18	-3.45	360.76	-3.45	124.17
140	0.00	29.39	-4.70	354.96	-4.70	122.52
145	0.00	32.22	-5.70	345.40	-5.70	119.35
150	0.00	34.82	-6.55	337.57	-6.55	116.73
155	0.00	37.14	-7.25	331.46	-7.25	114.59
160	0.00	39.12	-7.81	326.42	-7.81	112.87
165	0.00	40.73	-8.25	322.57	-8.25	111.31
170	0.00	41.92	-8.56	319.86	-8.56	110.39
175	0.00	42.65	-8.75	318.24	-8.75	109.83
180	0.00	42.90	-8.81	317.71	-8.81	109.65
185	0.00	42.65	-8.75	318.24	-8.75	109.83

COMSEARCH

Earth Station Data Sheet

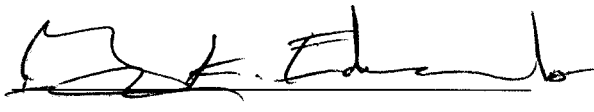
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Antenna Model		TTI 0.45 meter		
Antenna Mode		Receive 11.0 GHz		Transmit 13.0 GHz
Interference Objectives: Long Term		-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz 20%
Short Term		-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz 0.0025%
Max Available RF Power			-20.1 (dBW/4 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)
190	0.00	41.92	-8.56	319.86	-8.56	110.39
195	0.00	40.73	-8.25	322.57	-8.25	111.31
200	0.00	39.12	-7.81	326.42	-7.81	112.87
205	0.00	37.14	-7.25	331.46	-7.25	114.59
210	0.00	34.82	-6.55	337.56	-6.55	116.73
215	0.00	32.22	-5.70	345.40	-5.70	119.35
220	0.00	29.39	-4.71	354.95	-4.71	122.52
225	0.00	26.35	-3.52	366.66	-3.52	126.35
230	0.00	23.53	-2.29	379.21	-2.29	130.42
235	0.00	21.46	-1.29	389.71	-1.29	133.79
240	0.00	20.38	-0.73	395.72	-0.73	135.70
245	0.00	20.45	-0.77	395.32	-0.77	135.58
250	0.00	21.66	-1.39	388.66	-1.39	133.46
255	0.00	23.82	-2.43	377.80	-2.43	129.97
260	0.00	26.72	-3.67	365.14	-3.67	125.86
265	0.00	30.14	-4.98	352.32	-4.98	121.65
270	0.00	33.92	-6.26	340.21	-6.26	117.62
275	0.00	37.95	-7.48	329.36	-7.48	113.88
280	0.00	42.16	-8.62	319.33	-8.62	110.20
285	0.00	46.50	-9.69	310.29	-9.69	107.11
290	0.00	50.93	-10.00	307.68	-10.00	106.21
295	0.00	55.44	-10.00	307.68	-10.00	106.21
300	0.00	60.00	-10.00	307.68	-10.00	106.21
305	0.00	64.60	-10.00	307.68	-10.00	106.21
310	0.00	69.23	-10.00	307.68	-10.00	106.21
315	0.00	73.89	-10.00	307.68	-10.00	106.21
320	0.00	78.56	-10.00	307.68	-10.00	106.21
325	0.00	83.24	-10.00	307.68	-10.00	106.21
330	0.00	87.93	-10.00	307.68	-10.00	106.21
335	0.00	92.62	-10.00	307.68	-10.00	106.21
340	0.00	97.31	-10.00	307.68	-10.00	106.21
345	0.00	101.99	-10.00	307.68	-10.00	106.21
350	0.00	106.66	-10.00	307.68	-10.00	106.21
355	0.00	108.97	-10.00	307.68	-10.00	106.21

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