

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Harte Satellite Consultants
SAN DIEGO, CA
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

3D Communications
3G Wireless, LLC
ABC Holding Company Inc.
AC BidCO LLC
Advanced Career College, Inc
Aerial Video Systems
Aerioconnect Inc
Aerionet, Inc.
Air Sites 2000 LLC
Airlink Internet Inc.
Alarmlink, Inc.
Alascom Inc
Anacapa Micro Products, Inc.
Antelecom, Inc.
Antilles Wireless LLC
Arizona Telephone Company
Arizona, State Of
Ascent Media Network Services, LLC
AT&T Corp.
AT&T Mobility Spectrum LLC - AZ
AT&T Mobility Spectrum LLC - N CA
AT&T Mobility Spectrum LLC - Southern CA
Beacon West Energy Group, LLC
Bel Air Internet, LLC
Bell Gardens, City of
Bellsouth Telecommunications, Inc.
Beta Operating Company LLC
BNSF Railway Company
Board of Trustees for San Diego Univ
Borgeson, Tom R.
Broadcast Sports Inc.
Burbank, City of
Butterfield Wireless
California Internet Solutions, Inc.
California Internet, L.P
California Lutheran University
California Resources Corporation
California Water Service Company
California, State of
CamTech Broadband

Carolina Telephone and Telegraph Co
Casper, John
Catalina Broadband Solutions, LLC
CBS Broadcasting Inc
Cellco Partnership - N CA/NV
Cellco Partnership - Southern California
Cellco Partnership-AZ/CO/NM/NV/UT
CenturyTel of the Southwest, Inc.
Channel 51 of San Diego, Inc.
Chicago Comnet Corp
Cincinnati Bell Wireless LLC
City of Hemet
City Of Huntington Beach
City of Huntington Park Police Dept
City of Los Angeles Dept Water & Power
City of Monrovia
City of Montebello
City of Newport Beach
City of Oceanside
City of Pasadena, California
City of West Covina
City of Whittier
City of Yuma
Citywide News Network, Inc.
Clearwire Spectrum Holdings III, LLC
Coachella Valley Water District
Commnet Four Corners, LLC
Communication Services Inc.
Confire, JPA
Conterra Ultra Broadband, LLC
Corona, City of, Dept of Water & Power
Cosmo Network Solutions
County of Los Angeles (ISD)
Cowboys Stadium LP
Cox Communications - San Diego Mkt
DCI II, INC.
Direct Broadcast Services, Inc.
DM Ventures, Inc. dba Warp2Biz
DRS Global Enterprise Solutions, Inc.
Eastern Municipal Water District
Eastern Riverside County Interoperable C
EDF Renewable Services, Inc.
Educational Media Foundation
Entercom License, LLC
Entravision Holdings, LLC
Financial Partners Credit Union
Fireline Network Solutions Inc.
First Solar
Franklin Technology Systems, Inc.
Frazier Mountain Internet Service, Inc.
Fresno MSA Limited Partnership
Frontier California Inc.
Gila Electronics of Yuma, Inc
Gilcomm, LLC
Gilmond, Daniel
Glendale City California

Global Telecom & Technology Americas
 Go Creative Wireless
 GovNET Licenses LLC
 Hallco Unlimited, Inc.
 Hawaiian Telecom Inc.
 Heiden, William
 HF Enterprises, Inc
 HPWREN University of California, San Die
 iHM Licenses, LLC
 Illinois Bell Telephone Company
 Imperial Irrigation District
 Imperial Valley Telecommunications Auth
 Imperial, City of
 Indiana Bell Telephone Company
 Information & Display Systems, Inc.
 Information Super Station, LLC
 International Communications Group, Inc.
 Irvine Ranch Water District
 JetWire, Inc.
 Kentucky RSA #3 Cellular General Partner
 Kentucky RSA #4 Cellular General Partner
 Kern Ed Telecom Consortium
 Kern, County of
 KFMB-TV, LLC
 Kimtron, Inc.
 L3Harris Technologies, Inc
 Lemon Grove School District
 Lightwave Broadband LLC
 Lockheed Martin Corp - California
 Long Beach Public Transportation Company
 Long Beach, City of (WCD)
 Los Angeles City Info Technology Agency
 Los Angeles County Dept of Public Works
 Los Angeles County FCC Licensing Section
 Los Angeles County Metro Transit Auth
 Los Angeles Regional Interoperable Comm
 Los Angeles SMSA Ltd. Partnership
 Los Angeles Unified School District
 Los Angeles, City of (ITA)
 LT-WR, LLC
 Mellon Farms, Inc.
 MERCURY COMMUNICATIONS
 Metropolitan Water Dist of So California
 MHO Networks
 Michigan Bell Telephone Company
 MiTec Solutions
 MJM Telecom Corp
 Moreen, Steven K
 Navajo Communications Company
 New Cingular Wireless PCS LLC - AZ
 New Cingular Wireless PCS - Los Angeles
 New Cingular Wireless PCS LLC -San Diego
 New Cingular Wireless PCS, LLC - S/E CAL
 NEW ENGLAND DIGITAL DISTRIBUTION, INC.
 Nextweb Inc
 North County Transit District

NorthWest Suburbs Community Access Corp
 NSM Surveillance
 Ohio Bell GTelephone Company
 Olympic Wireless, LLC
 Onboard Images
 One Ring Networks, Inc.
 Orange County Public Works
 Orange County Transportation Authority
 Orange, County of, CA
 Pacific Bell Tel Com dba AT&T California
 Pacific Lightwave Inc
 Palomar Broadband
 Penn Service Microwave Co., Inc.
 Pima County Arizona
 Plateau Telecommunications, Inc.
 Plum TV, LLC
 Polly Butte Networks
 Port of Los Angeles
 Production & Satellite Services, Inc.
 Public Media Group of Southern Californi
 Quick Link Connections Inc.
 Qwest Corporation
 Radiofone, Inc.
 Randy Hermes Production
 RCC Minnesota Inc. - MN NE ND SD
 Regional 3Cs
 Remote Broadcasts, Inc.
 REMOTE FACILITIES CONSULTING SERVICES
 RF Central, LLC
 RF Film, Inc
 Riverside, City of
 Riverside, County of
 Rowland Water District
 RPM Wireless Internet, LLC
 San Antonio Regional Hospital
 San Bernardino Community Col Dis KVCR-TV
 San Bernardino Community College KVCR-FM
 San Bernardino County of California
 San Bernardino Valley Municipal Water Di
 San Diego Broadband
 San Diego County Super. of Schools
 San Diego Gas & Electric Company
 San Diego Unified School District
 San Diego, City of
 San Diego, County of
 Santa Fe Irrigation District
 Santa Monica Malibu Unified School Dist
 Santa Monica, City of
 Scripps Media, Inc. - KGTV
 SDWISP
 Sentinel Peak Resources California LLC
 Siteserver, Inc.
 Skyriver Communications
 South Bay Regional Public Comm Authority
 South Gate, City of - Police Dept
 Southern California Edison Company

Southern California Gas Company
Southern California Regional Rail Auth.
Southern California Telephone Company
Southern Company Services, Inc.
Southwestern Bell Telephone L.P.
Sovryn Holdings, Inc.
Spectrum Pacific West, LLC
Speedshotz, Inc
Sprint Spectrum LLC
Sprint Telephony PCS, L.P.
Station Venture Operations, LP
Table Top Telephone Company
Te Conectamos LLC dba Tekwerks
Tehachapi Cummings County Water System
Tejon Ranch Co
Temecula Valley Real Estate, Inc
Thira Solutions, Inc.
Thousand Oaks, City of
T-Mobile License LLC
Towerstream Corp.
Tribune Media Company
TTWN Networks, LLC
Turn Wireless, LLC
TV Microwaves Company
Ultimate Internet Access, Inc
Union Pacific Railroad Company
Unisat, Inc.
United States Gypsum Co
United Telephone - Southeast
United Water Conservation District
unWired Broadband, Inc
Ventura County Office of Education
Ventura Regional Sanitation District
Ventura, County of
Venture Technologies Group, LLC
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 (Southern CA)
Vernon City of
VYVX, LLC
W Cody
Wander, Inc
Westar Satellite Services LP
Western Broadband Inc.
Wiline Spectrum Holdings LLC
WiLogic, Inc
Winged Vision Inc
WirelessGuys, Inc.

Wisconsin Bell Telephone Company
Wisprenn
Wolfe Air Aviation
WT Consulting Group, LLC
Yuma County Water Users Association
ZRay Technologies Corporation

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: 07/21/2021
Job Number: 210722COMSGE06

Administrative Information

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

Site Information

SAN DIEGO, CA
Venue Name:
Latitude (NAD 83): 32° 42' 15.8" N
Longitude (NAD 83): 117° 9' 55.0" W
Climate Zone: B
Rain Zone: 4
Ground Elevation (AMSL): 5.81 m / 19.1 ft

Link Information

Satellite Type: Geostationary
Mode: TR - Transmit-Receive
Modulation: Digital
Satellite Arc: 44° W to 190° West Longitude
Azimuth Range: 99.3° to 260.5°
Corresponding Elevation Angles: 5.4° / 5.7°
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 - 13024.9 7M00G7W / 13050.1 - 13250.0
Max Great Circle Coordination Distance	484.8 km / 301.2 mi	158.5 km / 98.4 mi
Precipitation Scatter Contour Radius	417.5 km / 259.4 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

SAN DIEGO, CA

Licensee Name	Harte Satellite Consultants		
Latitude (NAD 83)	32° 42' 15.8" N		
Longitude (NAD 83)	117° 9' 55.0" W		
Ground Elevation (AMSL)	5.81 m / 19.1 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			-128.0 dBW/4 kHz 0.0025%
			-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	1.09	99.26	-10.00	185.54	-10.00	100.00
5	1.31	94.28	-10.00	175.19	-10.00	100.00
10	1.40	89.29	-10.00	171.18	-10.00	100.00
15	1.43	84.30	-10.00	169.76	-10.00	100.00
20	1.28	79.32	-10.00	176.58	-10.00	100.00
25	1.33	74.33	-10.00	174.03	-10.00	100.00
30	1.35	69.34	-10.00	173.15	-10.00	100.00
35	1.41	64.36	-10.00	170.48	-10.00	100.00
40	1.20	59.38	-10.00	180.24	-10.00	100.00
45	1.02	54.41	-10.00	189.07	-10.00	100.00
50	1.11	49.43	-10.00	184.60	-10.00	100.00
55	1.19	44.45	-9.20	185.52	-9.20	100.00
60	1.15	39.48	-7.91	198.37	-7.91	100.00
65	1.15	34.52	-6.45	207.66	-6.45	100.00
70	0.99	29.59	-4.78	227.10	-4.78	100.00
75	0.96	24.67	-2.81	243.49	-2.81	100.00
80	0.64	19.85	-0.45	295.94	-0.45	100.00
85	0.39	15.14	2.50	373.41	2.50	126.25
90	0.53	10.50	6.47	378.21	6.47	126.17
95	0.57	6.49	11.70	429.26	11.70	141.61
100	0.48	5.02	14.49	484.75	14.49	158.46
105	0.35	7.65	9.91	471.41	9.91	156.28
110	0.22	11.77	5.23	454.84	5.23	152.79
115	0.00	15.98	1.91	425.30	1.91	145.01
120	0.00	19.99	-0.52	398.02	-0.52	136.43
125	0.00	23.93	-2.47	377.31	-2.47	129.81
130	0.00	27.78	-4.09	360.94	-4.09	124.49
135	0.00	31.51	-5.46	347.71	-5.46	120.12
140	0.00	35.09	-6.63	336.80	-6.63	116.48
145	0.00	38.48	-7.63	328.02	-7.63	113.42
150	0.00	41.64	-8.49	320.49	-8.49	110.60
155	0.00	44.51	-9.21	314.29	-9.21	108.48
160	0.00	47.02	-9.81	309.29	-9.81	106.76
165	0.00	49.09	-10.00	307.68	-10.00	106.21
170	0.00	50.65	-10.00	307.68	-10.00	106.21
175	0.00	51.62	-10.00	307.68	-10.00	106.21
180	0.00	51.95	-10.00	307.68	-10.00	106.21
185	0.00	51.62	-10.00	307.68	-10.00	106.21

COMSEARCH

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19700 Janelia Farm Boulevard, Ashburn, VA 20147
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Coordination Values

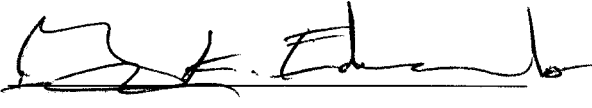
SAN DIEGO, CA

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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	-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	50.65	-10.00	307.68	-10.00	106.21
195	0.00	49.09	-10.00	307.68	-10.00	106.21
200	0.00	47.02	-9.81	309.29	-9.81	106.76
205	0.00	44.51	-9.21	314.29	-9.21	108.48
210	0.00	41.64	-8.49	320.49	-8.49	110.60
215	0.22	38.34	-7.59	324.25	-7.59	111.73
220	0.00	35.09	-6.63	336.81	-6.63	116.48
225	0.00	31.51	-5.46	347.71	-5.46	120.12
230	0.00	27.78	-4.09	360.95	-4.09	124.49
235	0.00	23.93	-2.47	377.30	-2.47	129.81
240	0.29	19.82	-0.43	371.49	-0.43	126.83
245	0.71	15.56	2.20	308.20	2.20	101.99
250	0.66	11.52	5.46	345.42	5.46	114.75
255	0.70	7.46	10.18	388.34	10.18	128.06
260	0.80	4.95	14.64	420.61	14.64	137.16
265	0.73	6.70	11.34	395.72	11.34	130.11
270	0.73	10.70	6.26	342.50	6.26	113.32
275	0.75	15.29	2.39	305.42	2.39	100.89
280	0.65	20.10	-0.58	293.33	-0.58	100.00
285	0.54	24.99	-2.94	290.13	-2.94	100.00
290	0.49	29.90	-4.89	282.18	-4.89	100.00
295	0.46	34.83	-6.55	275.94	-6.55	100.00
300	0.40	39.78	-7.99	277.49	-7.99	100.00
305	0.37	44.73	-9.27	273.75	-9.27	100.00
310	0.36	49.69	-10.00	270.69	-10.00	100.00
315	0.22	54.67	-10.00	303.09	-10.00	104.48
320	0.00	59.65	-10.00	307.68	-10.00	106.21
325	0.00	64.61	-10.00	307.68	-10.00	106.21
330	0.00	69.58	-10.00	307.68	-10.00	106.21
335	0.53	74.54	-10.00	244.34	-10.00	100.00
340	0.80	79.52	-10.00	213.92	-10.00	100.00
345	0.86	84.50	-10.00	207.29	-10.00	100.00
350	0.95	89.48	-10.00	198.16	-10.00	100.00
355	0.90	94.46	-10.00	202.89	-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