

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Intelsat License LLC
HAGERSTOWN, MD
Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147
March 06, 2017

TABLE OF CONTENTS

1. CONCLUSIONS	3
2. SUMMARY OF RESULTS	4
3. SUPPLEMENTAL SHOWING	5
4. EARTH STATION COORDINATION DATA.....	8
5. CERTIFICATION.....	12

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

Maryland Public Broadcasting Commission

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 02/17/2017.

Company

3G Wireless, LLC
ACC License, LLC
AERIAL VIDEO SYSTEMS
Alascom Inc
American Broadcasting Companies, Inc.
Antietam Cable Television
Ascent Media Network Services, LLC
Bellsouth Telecommunications, Inc.
Borgeson, Tom R.
Broadcast Sports Inc.
C-SPAN
CBS TELEVISION LICENSES LLC
CNN America, Inc.
CTVN HARRISBURG, LLC
Carolina Telephone and Telegraph Co
Casper, John
CenturyTel of the Southwest, Inc.
Chicago Comnet Corp
Cincinnati Bell Wireless LLC
Citywide News Network, Inc.
Cohen, Elena
Cowboys Stadium LP
DCI II, INC.
Direct Broadcast Services, Inc.
F Corporation
GEORGE MASON UNIVERSITY INSTR FNDTION
Global Telecom & Technology Americas, In
Goodyear Tire & Rubber Company
HF Enterprises, Inc
HOWARD UNIVERSITY TELEVISION - (WHUT-TV)
Hallco Unlimited, Inc.
Hawaiian Telcom, Inc.
Heiden, William
Illinois Bell Telephone Company
Indiana Bell Telephone Company
Information & Display Systems, Inc.
Information Super Station, LLC
International Communications Group, Inc.
Kentucky RSA #3 Cellular General Partner
Kentucky RSA #4 Cellular General Partner

MERCURY COMMUNICATIONS
 Maryland Public Broadcasting Commission
 Media General Communications Holdings, L
 Michigan Bell Telephone Company
 Moreen, Steven K
 Multimedia Holdings Corporation
 NBC Telemundo License LLC
 NEW ENGLAND DIGITAL DISTRIBUTION, INC.
 NEW ENGLAND SATELLITE SYSTEMS INC
 NEXSTAR BROADCASTING, INC.
 NSM Surveillance
 National Cable Satellite Corporation
 Navajo Communications Company
 NorthWest Suburbs Community Access Corp
 OHIO BELL TELEPHONE COMPANY
 Onboard Images
 Pacific Bell Tel Com dba AT&T California
 Penn Service Microwave Co., Inc.
 Pennsylvania Educational Comm Systems
 Plateau Telecommunications, Inc.
 Plum TV, LLC
 Production & Satellite Services, Inc.
 QUICK LINK CONNECTIONS INC
 Qwest Corporation
 RCC Minnesota Inc. - MN NE ND SD
 REMOTE FACILITIES CONSULTING SERVICES
 RF Central, LLC
 RF Film, Inc
 Radiofone, Inc.
 Randy Hermes Production
 Remote Broadcasts, Inc.
 Southwestern Bell Telephone L.P.
 Speedshotz, Inc
 TTWN Networks, LLC
 Unisat, Inc.
 United Telephone - Southeast
 VERIZON SOUTH INC.
 Verizon California Inc.
 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 Virginia, Inc.
 Verizon Washington DC, Inc.
 Village Video Productions Inc
 Vyvx, LLC
 WBAL HEARST-ARGYLE TV, INC. (CA CORP.)
 WDCW, LLC
 WHP Licensee, LLC
 WITF Inc.
 WJAC Licensee, LLC
 WUSA-TV, Inc
 Westar Satellite Services LP

Western Technical Services
Wexler Video, Inc.
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: 03/06/2017
Job Number: 170217COMSGE02

Administrative Information

Status: ENGINEER PROPOSAL
Call Sign:
Licensee Code: INTELS
Licensee Name: Intelsat License LLC

Site Information HAGERSTOWN, MD

Venue Name:
Latitude (NAD 83): 39° 35' 53.8" N
Longitude (NAD 83): 77° 45' 20.8" W
Climate Zone: A
Rain Zone: 2
Ground Elevation (AMSL): 168.69 m / 553.4 ft

Link Information

Satellite Type: Geostationary
Mode: TR - Transmit-Receive
Modulation: Digital
Satellite Arc: 6° W to 149° West Longitude
Azimuth Range: 101.9° to 257.8°
Corresponding Elevation Angles: 5.3° / 5.7°
Antenna Centerline (AGL): 5.49 m / 18.0 ft

Antenna Information

Receive - FCC32

Manufacturer: GD Satcom
Model: 13.1 meter
Gain / Diameter: 62.3 dBi / 13.1 m
3-dB / 15-dB Beamwidth: 0.10° / 0.26°

Transmit - FCC32

GD Satcom
13.1 meter
63.6 dBi / 13.1 m
0.12° / 0.24°

Max Available RF Power	(dBW/4 kHz)	(1) -4.3	(2) 5.4		
	(dBW/MHz)	19.7	29.4		
Maximum EIRP	(dBW/4 kHz)	59.3	69.0		
	(dBW/MHz)	83.3	93.0		
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%

Frequency Information

Receive 11.0 GHz

Emission / Frequency Range (MHz):
1M00G7W - 62M5G7W / 11459.2 - 11720.0
1M00G7W - 62M5G7W / 11832.2 - 11943.5

Transmit 14.0 GHz

(1) 1M00G7W - 62M5G7W / 12750.0 - 13250.0
(2) 1M00G7D 13249.5 (center)

Max Great Circle Coordination Distance	702.1 km / 436.2 mi	406.3 km / 252.5 mi
Precipitation Scatter Contour Radius	602.2 km / 374.1 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

HAGERSTOWN, MD

Licensee Name	Intelsat License LLC				
Latitude (NAD 83)	39° 35' 53.8" N				
Longitude (NAD 83)	77° 45' 20.8" W				
Ground Elevation (AMSL)	168.69 m / 553.4 ft				
Antenna Centerline (AGL)	5.49 m / 18.0 ft				
Antenna Model	GD Satcom 13.1 meter				
Antenna Mode	Receive 11.0 GHz		Transmit 14.0 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			-4.3 (dBW/4 kHz)		

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 11.0 GHz		Transmit 14.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.27	101.82	-10.00	224.32	-10.00	133.87
5	0.23	96.84	-10.00	228.21	-10.00	137.39
10	0.21	91.86	-10.00	230.79	-10.00	139.77
15	0.20	86.88	-10.00	231.06	-10.00	140.02
20	0.22	81.90	-10.00	229.66	-10.00	138.72
25	0.20	76.92	-10.00	230.88	-10.00	139.85
30	0.00	71.95	-10.00	231.37	-10.00	140.30
35	0.00	66.97	-10.00	231.37	-10.00	140.30
40	0.23	61.99	-10.00	228.65	-10.00	137.78
45	0.00	57.03	-10.00	231.37	-10.00	140.30
50	0.00	52.06	-10.00	231.37	-10.00	140.30
55	0.00	47.10	-9.82	232.14	-9.82	140.84
60	0.00	42.14	-8.62	237.52	-8.62	144.65
65	0.00	37.19	-7.26	243.77	-7.26	149.13
70	0.00	32.26	-5.72	251.28	-5.72	154.50
75	0.00	27.35	-3.92	260.19	-3.92	161.10
80	0.00	22.47	-1.79	271.23	-1.79	170.71
85	0.00	17.66	0.83	285.47	0.83	180.65
90	0.00	12.98	4.17	301.96	4.17	193.34
95	0.00	8.67	8.55	332.90	8.55	209.34
100	0.00	5.62	13.26	702.05	13.26	406.33
105	0.00	6.15	12.27	472.11	12.27	272.53
110	0.00	9.60	7.45	324.46	7.45	204.99
115	0.00	13.27	3.93	300.47	3.93	192.43
120	0.00	16.89	1.31	288.17	1.31	182.48
125	0.00	20.41	-0.75	276.81	-0.75	174.67
130	0.00	23.83	-2.43	267.88	-2.43	168.29
135	0.00	27.11	-3.83	260.66	-3.83	161.46
140	0.00	30.23	-5.01	254.75	-5.01	157.06
145	0.00	33.14	-6.01	249.86	-6.01	153.46
150	0.00	35.82	-6.85	245.83	-6.85	150.53
155	0.00	38.20	-7.55	242.41	-7.55	148.15
160	0.00	40.26	-8.12	239.78	-8.12	146.26
165	0.00	41.93	-8.56	237.77	-8.56	144.82
170	0.00	43.16	-8.88	236.35	-8.88	143.81
175	0.00	43.92	-9.07	235.50	-9.07	143.21
180	0.00	44.18	-9.13	235.21	-9.13	143.01
185	0.00	43.92	-9.07	235.49	-9.07	143.21

COMSEARCH

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Coordination Values

HAGERSTOWN, MD

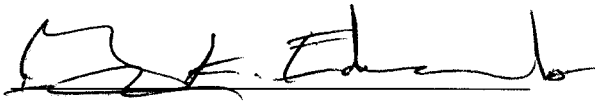
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Interference Objectives: Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz	20%	
Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz	0.0025%	
Max Available RF Power			-4.3 (dBW/4 kHz)		

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 11.0 GHz		Transmit 14.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	43.16	-8.88	236.35	-8.88	143.81
195	0.00	41.93	-8.56	237.77	-8.56	144.82
200	0.00	40.26	-8.12	239.78	-8.12	146.26
205	0.00	38.20	-7.55	242.41	-7.55	148.15
210	0.00	35.81	-6.85	245.83	-6.85	150.53
215	0.24	32.95	-5.95	245.98	-5.95	149.55
220	0.29	30.01	-4.93	245.91	-4.93	148.20
225	0.45	26.78	-3.70	236.56	-3.70	137.98
230	0.36	23.57	-2.31	251.82	-2.31	150.41
235	0.23	20.25	-0.66	273.71	-0.66	171.49
240	0.20	16.75	1.40	288.53	1.40	182.68
245	0.22	13.13	4.04	299.27	4.04	191.24
250	0.35	9.36	7.72	308.05	7.72	193.12
255	0.29	6.07	12.41	483.06	12.41	277.22
260	0.33	5.80	12.92	672.93	12.92	388.29
265	0.39	8.94	8.21	306.51	8.21	191.18
270	0.35	13.31	3.89	286.81	3.89	177.32
275	0.35	18.00	0.62	268.09	0.62	163.87
280	0.36	22.81	-1.96	254.30	-1.96	152.35
285	0.26	27.71	-4.07	252.79	-4.07	153.81
290	0.00	32.66	-5.85	250.63	-5.85	154.03
295	0.00	37.59	-7.38	243.24	-7.38	148.74
300	0.00	42.53	-8.72	237.07	-8.72	144.33
305	0.22	47.46	-9.91	229.52	-9.91	138.50
310	0.31	52.41	-10.00	220.65	-10.00	130.63
315	0.00	57.40	-10.00	231.37	-10.00	140.30
320	0.00	62.36	-10.00	231.37	-10.00	140.30
325	0.00	67.33	-10.00	231.37	-10.00	140.30
330	0.00	72.31	-10.00	231.37	-10.00	140.30
335	0.36	77.27	-10.00	216.72	-10.00	128.47
340	0.28	82.25	-10.00	223.21	-10.00	132.87
345	0.27	87.23	-10.00	224.20	-10.00	133.76
350	0.21	92.20	-10.00	230.66	-10.00	139.65
355	0.35	97.18	-10.00	217.65	-10.00	129.28

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: March 06, 2017