

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
February 24, 2017

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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-receive earth station.

Company

AT&T Corp.
Washington Gas Light Company
WV DHHR BPH, Office of EMS, Com. Div.

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 02/09/2017.

Company

AB Services LLC
AT&T Communications of Virginia, LLC
AT&T Corp.
Adams County Department of Emergency Svc
Affiniti PA, LLC
Appalachia Engineering Services
Argos Engineering, LLC
Atlantic Broadband (Penn), LLC
Atlantic City Electric Company
BLAIR COUNTY 911
Baltimore County of Maryland
Baltimore Gas and Electric Company
Beaver Springs Faith Baptist Church, Inc
Bedford County of
Believe Wireless, LLC
CNG Transmission Corporation
Calvert, County of
Cambria, County of
Capital Communications of America
Carroll, County of
Cellco Partnership - Bridgeville, PA/WV
Cellco Partnership-WDC/Baltimore
Cellco Prtnrshp - Phil. Tri-State Rgn
Centre Communications Inc.
Centre, County of
Charles, County of
Columbia Gas Transmission, LLC
Commonwealth of Pennsylvania-Radio Proj.
Comprehensive Wireless LLC
Conterra Ultra Broadband, LLC
County of Fayette
County of Frederick
County of York
DAUPHIN COUNTY EMERGENCY MANAGEMENT
Delaware Division of Communications
Delmarva Power and Light Company
ECW Wireless, LLC
Eastern MLG LLC
Enoch Pratt Free Library
Exelon Generation Company, LLC

FELHC, INC
Frederick County
Fulton County of (PA)
Fundamental Broadcasting LLC
GETWIRELESS.NET
Garden State Transmissions
HUNTINGDON COUNTY, PA
Hardy Cellular Telephone Company
Hardy County OEM/E911
Harrisonburg-Rockingham ECC
High Voltage Communications LLC (CFN)
Juniata County Emergency Services
Lancaster County-Wide Communications
Limitless Mobile, LLC
Loudoun, County of
MCI Communications Services Inc.
Maryland Public Broadcasting Commission
Maryland State Highway Administration
Maryland, State of - Dept. of Info & Tech
Mountain State Communications, llc
New Cingular Wireless PCS - Maryland
New Cingular Wireless PCS LLC - DC
New Cingular Wireless PCS LLC - VA
New Cingular Wireless PCS LLC - WV,NC,SC
New Cingular Wireless PCS, LLC - PA
New Jersey, State of -NJ Transit
New Line Networks, LLC
Norfolk Southern Railway
Open Line Communications
PA Communications
PRESTON COUNTY OFFICE OF EMERGENCY MANAG
PSEG Services Corporation
Peco Energy Company
Pennsylvania Turnpike Commission
Pepco Holdings Inc.
Perry, County of
Perseus Technology Holdings USA Inc.
Pittsburgh SMSA Limited Partnership
Prince George's County
Prince William, County of
Radio One Inc
Rappahannock Electric Cooperative
Rural Broadband Network Services LLC
SHENANDOAH VALLEY ELECTRIC COOPERATIVE
Shenandoah Personal Communications, LLC
Somerset, County of
South Central Task Force (SCTFNET)
Southern Maryland Electric Cooperative I
Stafford, County of
State of Maryland, MIEMSS
T-Mobile License LLC
Texas Eastern Communications, LLC
Thought Transmissions, LLC
Transcontinental Gas Pipeline Corp.
US Cellular Operating Company, LLC (WI)
USCOC of Cumberland, Inc.

USOC of Pennsylvania RSA No 10 B2 Inc.
Uniti Fiber PEG, LLC
Verizon Wireless (VAW) LLC - Maryland
Verizon Wireless (VAW) LLC - W/B/V Mkts
Verizon Wireless (VAW) LLC-Pennsylvania
Virginia Department of State Police
Virginia Electric & Power Company
WV DHHR BPH, Office of EMS, Com. Div.
Washington Gas Light Company
Washington Suburban Sanitary Commission
Webline Holdings LLC
Westmoreland, County of
Wireless Internetwork LLC
World Class Wireless, LLC
YAB Mobile
iSignal

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: 02/08/2017
Job Number: 170209COMSGE01

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' 54.6" N
Longitude (NAD 83): 77° 45' 18.1" W
Climate Zone: A
Rain Zone: 2
Ground Elevation (AMSL): 169.56 m / 556.3 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): 5.79 m / 19.0 ft

Antenna Information

Receive - FCC32

Transmit - FCC32

Manufacturer	ASC Signal	ASC Signal
Model	9 Meter	9 Meter
Gain / Diameter	49.9 dBi / 9.0 m	53.7 dBi / 9.0 m
3-dB / 15-dB Beamwidth	0.65° / 1.00°	0.36° / 0.67°

Max Available RF Power	(dBW/4 kHz)	-11.8
	(dBW/MHz)	12.2

Maximum EIRP	(dBW/4 kHz)	41.9
	(dBW/MHz)	65.9

Interference Objectives:	Long Term	-156.0 dBW/MHz	20%	-154.0 dBW/4 kHz	20%
	Short Term	-146.0 dBW/MHz	0.01%	-131.0 dBW/4 kHz	0.0025%

Frequency Information

Receive 4.0 GHz

Transmit 6.1 GHz

Emission / Frequency Range (MHz)	22M0G7W - 34M0G7W / 3700.0 - 4200.0	22M0G7W - 34M0G7W / 5925.0 - 6425.0
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Max Great Circle Coordination Distance	658.9 km / 409.4 mi	310.0 km / 192.6 mi
Precipitation Scatter Contour Radius	613.5 km / 381.2 mi	100.0 km / 62.1 mi

COMSEARCH

Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5500 <http://www.comsearch.com>

Coordination Values		HAGERSTOWN, MD			
Licensee Name		Intelsat License LLC			
Latitude (NAD 83)		39° 35' 54.6" N			
Longitude (NAD 83)		77° 45' 18.1" W			
Ground Elevation (AMSL)		169.56 m / 556.3 ft			
Antenna Centerline (AGL)		5.79 m / 19.0 ft			
Antenna Model		ASC Signal 9 meter			
Antenna Mode		Receive 4.0 GHz		Transmit 6.1 GHz	
Interference Objectives: Long Term		-156.0 dBW/MHz	20%	-154.0 dBW/4 kHz	20%
Short Term		-146.0 dBW/MHz	0.01%	-131.0 dBW/4 kHz	0.0025%
Max Available RF Power		-11.8 (dBW/4 kHz)			

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 4.0 GHz		Transmit 6.1 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.34	101.82	-10.00	268.57	-10.00	127.67
5	0.57	96.84	-10.00	244.99	-10.00	111.15
10	0.47	91.86	-10.00	253.00	-10.00	116.84
15	0.36	86.88	-10.00	265.63	-10.00	125.66
20	0.31	81.90	-10.00	271.82	-10.00	129.87
25	0.31	76.92	-10.00	271.39	-10.00	129.58
30	0.31	71.94	-10.00	271.50	-10.00	129.65
35	0.28	66.96	-10.00	274.90	-10.00	131.94
40	0.45	61.98	-10.00	255.64	-10.00	118.71
45	0.55	57.00	-10.00	246.66	-10.00	112.36
50	0.31	52.04	-10.00	271.09	-10.00	129.38
55	0.39	47.06	-9.82	263.42	-9.82	123.87
60	0.24	42.12	-8.61	289.30	-8.61	138.34
65	0.27	37.16	-7.25	294.34	-7.25	139.63
70	0.24	32.23	-5.70	308.82	-5.70	147.33
75	0.27	27.30	-3.90	318.56	-3.90	150.67
80	0.25	22.41	-1.76	336.01	-1.76	159.75
85	0.29	17.57	0.88	350.96	0.88	165.77
90	0.00	12.98	4.17	388.86	4.17	190.25
95	0.00	8.67	8.55	426.05	8.55	205.39
100	0.00	5.62	13.26	658.90	13.26	309.96
105	0.00	6.15	12.28	509.26	12.28	234.43
110	0.00	9.60	7.45	416.38	7.45	202.80
115	0.00	13.27	3.93	387.54	3.93	189.33
120	0.00	16.89	1.31	366.72	1.31	179.23
125	0.00	20.41	-0.75	350.91	-0.75	171.25
130	0.00	23.83	-2.43	338.33	-2.43	163.11
135	0.00	27.11	-3.83	328.09	-3.83	157.89
140	0.00	30.23	-5.01	319.61	-5.01	153.67
145	0.00	33.14	-6.01	311.94	-6.01	150.24
150	0.00	35.82	-6.85	306.10	-6.85	147.43
155	0.00	38.20	-7.55	301.33	-7.55	145.16
160	0.00	40.26	-8.12	297.51	-8.12	143.36
165	0.00	41.93	-8.56	294.59	-8.56	142.00
170	0.00	43.16	-8.88	292.52	-8.88	141.03
175	0.00	43.92	-9.07	291.29	-9.07	140.46
180	0.00	44.18	-9.13	290.88	-9.13	140.27
185	0.00	43.92	-9.07	291.29	-9.07	140.46

COMSEARCH

Earth Station Data Sheet

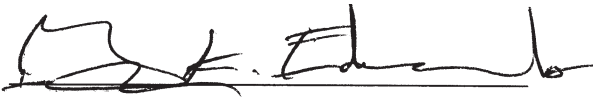
19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5500 <http://www.comsearch.com>

Coordination Values		HAGERSTOWN, MD			
Licensee Name		Intelsat License LLC			
Latitude (NAD 83)		39° 35' 54.6" N			
Longitude (NAD 83)		77° 45' 18.1" W			
Ground Elevation (AMSL)		169.56 m / 556.3 ft			
Antenna Centerline (AGL)		5.79 m / 19.0 ft			
Antenna Model		ASC Signal 9 meter			
Antenna Mode		Receive 4.0 GHz		Transmit 6.1 GHz	
Interference Objectives: Long Term		-156.0 dBW/MHz	20%	-154.0 dBW/4 kHz	20%
Short Term		-146.0 dBW/MHz	0.01%	-131.0 dBW/4 kHz	0.0025%
Max Available RF Power		-11.8 (dBW/4 kHz)			

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 4.0 GHz		Transmit 6.1 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.28	42.89	-8.81	282.25	-8.81	133.83
195	0.00	41.93	-8.56	294.59	-8.56	142.00
200	0.39	39.92	-8.03	274.86	-8.03	128.96
205	0.24	38.00	-7.49	296.34	-7.49	141.45
210	0.39	35.50	-6.76	283.20	-6.76	132.53
215	0.37	32.85	-5.91	290.58	-5.91	134.83
220	0.66	29.73	-4.83	270.99	-4.83	121.25
225	0.56	26.70	-3.66	285.97	-3.66	129.38
230	0.65	23.37	-2.22	290.19	-2.22	129.72
235	0.78	19.87	-0.45	293.44	-0.45	128.76
240	0.78	16.36	1.66	309.38	1.66	133.83
245	1.07	12.55	4.53	314.85	4.53	132.75
250	1.16	8.82	8.36	343.78	8.36	142.99
255	1.18	5.30	13.90	482.05	13.90	210.47
260	1.16	5.04	14.44	632.35	14.44	294.05
265	0.95	8.62	8.61	355.68	8.61	150.92
270	0.84	13.13	4.04	325.14	4.04	139.06
275	0.76	17.89	0.69	303.17	0.69	132.94
280	0.67	22.75	-1.92	290.33	-1.92	129.31
285	0.64	27.65	-4.04	278.02	-4.04	124.72
290	0.56	32.58	-5.82	271.34	-5.82	123.07
295	0.44	37.53	-7.36	272.36	-7.36	126.21
300	0.35	42.49	-8.71	275.36	-8.71	130.33
305	0.40	47.44	-9.90	261.64	-9.90	122.76
310	0.44	52.40	-10.00	256.76	-10.00	119.50
315	0.49	57.37	-10.00	250.66	-10.00	115.17
320	0.47	62.34	-10.00	252.62	-10.00	116.56
325	0.34	67.32	-10.00	267.95	-10.00	127.24
330	0.33	72.30	-10.00	269.61	-10.00	128.37
335	0.53	77.27	-10.00	247.88	-10.00	113.25
340	0.43	82.25	-10.00	257.28	-10.00	119.86
345	0.42	87.23	-10.00	258.81	-10.00	120.94
350	0.34	92.21	-10.00	268.40	-10.00	127.55
355	0.45	97.19	-10.00	255.49	-10.00	118.60

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: February 24, 2017

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Lancaster County-Wide Communications
Loudoun, County of
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Maryland Public Broadcasting Commission
Maryland State Highway Administration
Maryland, State of - Dept.of Info & Tech
Mountain State Communications, llc
New Cingular Wireless PCS - Maryland
New Cingular Wireless PCS LLC - DC
New Cingular Wireless PCS LLC - VA
New Cingular Wireless PCS LLC - WV,NC,SC
New Cingular Wireless PCS, LLC - PA
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Norfolk Southern Railway
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PA Communications
Pennsylvania Turnpike Commission
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Perseus Technology Holdings USA Inc.
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Prince William, County of
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Rain Zone: 2
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Link Information

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Manufacturer	ASC Signal	ASC Signal			
Model	9 meter	9 meter			
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3-dB / 15-dB Beamwidth	0.52° / 1.06°	0.38° / 0.78°			
Max Available RF Power (dBW/4 kHz)		-16.7			
		(dBW/MHz) 7.3			
Maximum EIRP (dBW/4 kHz)		37.0			
		(dBW/MHz) 61.0			
Interference Objectives:	Long Term	-156.0 dBW/MHz	20%	-154.0 dBW/4 kHz	20%
	Short Term	-146.0 dBW/MHz	0.01%	-131.0 dBW/4 kHz	0.0025%

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Transmit 6.1 GHz

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Short Term		-146.0 dBW/MHz	0.01%	-131.0 dBW/4 kHz	0.0025%
Max Available RF Power		-16.7 (dBW/4 kHz)			

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 4.0 GHz		Transmit 6.1 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.24	101.82	-10.00	280.02	-10.00	122.23
5	0.21	96.84	-10.00	283.76	-10.00	124.67
10	0.20	91.86	-10.00	284.68	-10.00	125.26
15	0.00	86.88	-10.00	285.28	-10.00	125.65
20	0.00	81.90	-10.00	285.28	-10.00	125.65
25	0.00	76.93	-10.00	285.28	-10.00	125.65
30	0.00	71.95	-10.00	285.28	-10.00	125.65
35	0.20	66.97	-10.00	284.91	-10.00	125.41
40	0.00	62.00	-10.00	285.28	-10.00	125.65
45	0.00	57.03	-10.00	285.28	-10.00	125.65
50	0.00	52.06	-10.00	285.28	-10.00	125.65
55	0.00	47.10	-9.83	286.40	-9.83	126.12
60	0.00	42.14	-8.62	294.22	-8.62	129.32
65	0.00	37.19	-7.26	303.29	-7.26	132.95
70	0.00	32.26	-5.72	314.61	-5.72	135.93
75	0.00	27.35	-3.92	327.40	-3.92	141.20
80	0.00	22.47	-1.79	343.07	-1.79	147.96
85	0.00	17.66	0.83	362.97	0.83	157.00
90	0.00	12.98	4.17	388.85	4.17	171.30
95	0.00	8.67	8.55	426.04	8.55	188.27
100	0.00	5.62	13.26	658.84	13.26	268.64
105	0.00	6.15	12.27	509.22	12.27	209.78
110	0.00	9.60	7.45	416.38	7.45	184.02
115	0.00	13.27	3.93	387.53	3.93	170.37
120	0.00	16.89	1.31	366.72	1.31	158.76
125	0.00	20.41	-0.75	350.91	-0.75	151.46
130	0.00	23.83	-2.43	338.33	-2.43	145.88
135	0.00	27.11	-3.83	328.09	-3.83	141.49
140	0.00	30.23	-5.01	319.61	-5.01	137.96
145	0.00	33.14	-6.01	311.94	-6.01	135.11
150	0.00	35.82	-6.85	306.10	-6.85	134.05
155	0.00	38.20	-7.55	301.33	-7.55	132.17
160	0.00	40.26	-8.12	297.51	-8.12	130.64
165	0.00	41.93	-8.56	294.59	-8.56	129.47
170	0.00	43.16	-8.88	292.52	-8.88	128.63
175	0.00	43.92	-9.07	291.29	-9.07	128.12
180	0.00	44.18	-9.13	290.88	-9.13	127.96
185	0.00	43.92	-9.07	291.28	-9.07	128.12

COMSEARCH

Earth Station Data Sheet

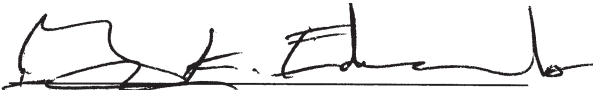
19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5500 <http://www.comsearch.com>

Coordination Values		HAGERSTOWN, MD			
Licensee Name		Intelsat License LLC			
Latitude (NAD 83)		39° 35' 54.6" N			
Longitude (NAD 83)		77° 45' 18.1" W			
Ground Elevation (AMSL)		169.56 m / 556.3 ft			
Antenna Centerline (AGL)		5.49 m / 18.0 ft			
Antenna Model		ASC Signal 9 meter			
Antenna Mode		Receive 4.0 GHz		Transmit 6.1 GHz	
Interference Objectives:	Long Term	-156.0 dBW/MHz	20%	-154.0 dBW/4 kHz	20%
	Short Term	-146.0 dBW/MHz	0.01%	-131.0 dBW/4 kHz	0.0025%
Max Available RF Power		-16.7 (dBW/4 kHz)			

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 4.0 GHz		Transmit 6.1 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	43.16	-8.88	292.52	-8.88	128.63
195	0.00	41.93	-8.56	294.59	-8.56	129.47
200	0.00	40.26	-8.12	297.51	-8.12	130.64
205	0.00	38.20	-7.55	301.32	-7.55	132.16
210	0.00	35.81	-6.85	306.10	-6.85	134.05
215	0.00	33.14	-6.01	311.94	-6.01	135.11
220	0.00	30.22	-5.01	319.62	-5.01	137.96
225	0.00	27.11	-3.83	328.08	-3.83	141.49
230	0.25	23.65	-2.35	331.95	-2.35	141.21
235	0.00	20.42	-0.75	350.90	-0.75	151.46
240	0.00	16.89	1.31	366.75	1.31	158.77
245	0.20	13.22	3.97	387.60	3.97	170.31
250	0.00	10.88	6.09	404.75	6.09	178.76
255	0.22	10.14	6.85	447.26	6.85	186.92
260	0.21	11.89	5.12	395.31	5.12	173.90
265	0.22	15.14	2.50	373.92	2.50	161.44
270	0.23	19.14	-0.05	352.57	-0.05	151.09
275	0.29	23.50	-2.27	327.77	-2.27	138.22
280	0.24	28.09	-4.22	320.02	-4.22	136.79
285	0.00	32.85	-5.91	313.22	-5.91	135.38
290	0.00	37.61	-7.38	302.48	-7.38	132.62
295	0.00	42.41	-8.69	293.77	-8.69	129.13
300	0.00	47.25	-9.86	286.17	-9.86	126.02
305	0.00	52.11	-10.00	285.28	-10.00	125.65
310	0.00	56.99	-10.00	285.28	-10.00	125.65
315	0.00	61.88	-10.00	285.28	-10.00	125.65
320	0.00	66.78	-10.00	285.28	-10.00	125.65
325	0.00	71.69	-10.00	285.28	-10.00	125.65
330	0.21	76.59	-10.00	283.53	-10.00	124.52
335	0.24	81.51	-10.00	279.72	-10.00	122.04
340	0.27	86.44	-10.00	276.64	-10.00	120.01
345	0.21	91.36	-10.00	283.44	-10.00	124.46
350	0.20	96.28	-10.00	284.99	-10.00	125.47
355	0.26	101.21	-10.00	278.30	-10.00	121.10

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: February 24, 2017