

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
COMCAST OF MASSACHUSETTS/VIRGINIA, INC
RICHMOND, VA
Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147
September 11, 2018

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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 09/10/2018.

Company

MCI Communications Services Inc.

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: 09/11/2018
Job Number: 180910COMSGE11

Administrative Information

Status ENGINEER PROPOSAL
Call Sign WK71
Licensee Code S24148
Licensee Name COMCAST OF MASSACHUSETTS/VIRGINIA, INC

Site Information

RICHMOND, VA
Venue Name
Latitude (NAD 83) 37° 37' 21.0" N
Longitude (NAD 83) 77° 3' 2.0" W
Climate Zone A
Rain Zone 2
Ground Elevation (AMSL) 23.65 m / 77.6 ft

Link Information

Satellite Type Geostationary
Mode RO - Receive-Only
Modulation Digital
Satellite Arc 70° W to 140° West Longitude
Azimuth Range 168.5° to 252.7°
Corresponding Elevation Angles 45.8° / 12.6°
Antenna Centerline (AGL) 3.96 m / 13.0 ft

Antenna Information

Receive - S40505
Manufacturer SCIENTIFIC-ATLANTA, INC
Model 8008 5.0 METER
Gain / Diameter 44.5 dBi / 5.0 m
3-dB / 15-dB Beamwidth 0.86° / 2.00°

Interference Objectives: Long Term -156.0 dBW/MHz 20%
Short Term -146.0 dBW/MHz 0.01%

Frequency Information

Receive 4.0 GHz
Emission / Frequency Range (MHz) 36M0G7W / 3700.0 - 4200.0

Max Great Circle Coordination Distance 385.4 km / 239.5 mi
Precipitation Scatter Contour Radius 528.0 km / 328.0 mi

COMSEARCH

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Coordination Values

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Interference Objectives: Long Term -156.0 dBW/MHz 20%
Short Term -146.0 dBW/MHz 0.01%

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 4.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)
0	0.00	106.88	-9.50	288.48
5	0.00	111.75	-9.85	286.24
10	0.00	116.60	-11.78	274.20
15	0.00	121.44	-15.08	255.05
20	0.00	126.27	-16.50	247.20
25	0.00	124.14	-16.15	249.05
30	0.00	121.53	-15.11	254.87
35	0.00	118.73	-13.48	264.10
40	0.00	115.77	-11.12	278.28
45	0.00	112.68	-10.04	285.05
50	0.00	109.48	-9.50	288.48
55	0.00	106.18	-9.50	288.48
60	0.00	102.82	-9.50	288.48
65	0.00	99.41	-9.50	288.48
70	0.00	95.95	-9.50	288.48
75	0.00	92.48	-9.50	288.48
80	0.00	88.99	-9.50	288.48
85	0.00	85.50	-9.50	288.48
90	0.00	82.04	-9.50	288.48
95	0.00	78.61	-9.50	288.48
100	0.00	75.22	-9.50	288.48
105	0.00	71.90	-9.50	288.48
110	0.00	68.65	-9.50	288.48
115	0.00	65.51	-9.50	288.48
120	0.00	62.50	-9.50	288.48
125	0.00	59.63	-9.50	288.48
130	0.00	56.94	-9.50	288.48
135	0.00	54.45	-9.50	288.48
140	0.00	52.21	-9.50	288.48
145	0.00	50.24	-9.50	288.48
150	0.00	48.60	-9.50	288.48
155	0.00	47.30	-9.50	288.48
160	0.00	46.38	-9.50	288.48
165	0.00	45.87	-9.50	288.48
170	0.00	45.78	-9.50	288.48
175	0.00	46.12	-9.50	288.48
180	0.00	46.39	-9.50	288.48
185	0.00	46.12	-9.50	288.48

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Antenna Mode Receive 4.0 GHz
Interference Objectives: Long Term -156.0 dBW/MHz 20%
Short Term -146.0 dBW/MHz 0.01%

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 4.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	45.30	-9.50	288.48
195	0.00	43.98	-9.30	289.79
200	0.00	42.21	-8.94	292.10
205	0.00	40.03	-8.51	294.96
210	0.00	37.51	-8.00	298.30
215	0.00	34.70	-7.38	302.48
220	0.00	31.65	-6.16	310.88
225	0.00	28.41	-4.86	320.66
230	0.00	25.00	-3.50	330.49
235	0.00	21.45	-1.37	346.21
240	0.00	17.82	0.81	362.81
245	0.00	14.75	2.75	378.10
250	0.00	12.90	3.60	384.86
255	0.00	12.83	3.67	385.43
260	0.00	14.56	2.94	379.58
265	0.00	17.57	0.96	364.00
270	0.00	21.32	-1.29	346.82
275	0.00	25.48	-3.69	329.07
280	0.00	29.89	-5.46	316.46
285	0.00	34.44	-7.28	303.19
290	0.00	39.10	-8.32	296.19
295	0.00	43.82	-9.26	290.01
300	0.00	48.58	-9.50	288.48
305	0.00	53.38	-9.50	288.48
310	0.00	58.20	-9.50	288.48
315	0.00	63.04	-9.50	288.48
320	0.00	67.89	-9.50	288.48
325	0.00	72.76	-9.50	288.48
330	0.00	77.63	-9.50	288.48
335	0.00	82.50	-9.50	288.48
340	0.00	87.38	-9.50	288.48
345	0.00	92.26	-9.50	288.48
350	0.00	97.14	-9.50	288.48
355	0.00	102.01	-9.50	288.48

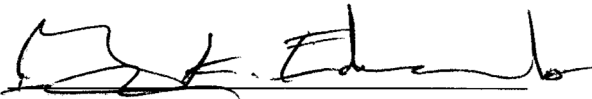
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Earth Station Data Sheet

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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: September 11, 2018

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1. CONCLUSIONS

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(703)726-5500 <http://www.comsearch.com>

Date: 09/11/2018
Job Number: 180910COMSGE10

Administrative Information

Status ENGINEER PROPOSAL
Call Sign WK71
Licensee Code S24148
Licensee Name COMCAST OF MASSACHUSETTS/VIRGINIA, INC

Site Information

RICHMOND, VA
Venue Name
Latitude (NAD 83) 37° 37' 21.0" N
Longitude (NAD 83) 77° 3' 2.0" W
Climate Zone A
Rain Zone 2
Ground Elevation (AMSL) 23.65 m / 77.6 ft

Link Information

Satellite Type Geostationary
Mode RO - Receive-Only
Modulation Digital
Satellite Arc 70° W to 140° West Longitude
Azimuth Range 168.5° to 252.7°
Corresponding Elevation Angles 45.8° / 12.6°
Antenna Centerline (AGL) 3.96 m / 13.0 ft

Antenna Information

Receive - S40701
Manufacturer SCIENTIFIC-ATLANTA, INC
Model 8010
Gain / Diameter 47.5 dBi / 7.0 m
3-dB / 15-dB Beamwidth 0.70° / 1.30°

Interference Objectives: Long Term -156.0 dBW/MHz 20%
Short Term -146.0 dBW/MHz 0.01%

Frequency Information

Receive 4.0 GHz
Emission / Frequency Range (MHz) 36M0G7W / 3700.0 - 4200.0

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15	0.00	121.44	-13.08	266.47
20	0.00	126.27	-15.26	254.04
25	0.00	124.14	-14.15	260.24
30	0.00	121.53	-13.11	266.27
35	0.00	118.73	-11.99	272.93
40	0.00	115.77	-10.81	280.19
45	0.00	112.68	-10.50	282.12
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115	0.00	65.51	-10.50	282.12
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125	0.00	59.63	-10.50	282.12
130	0.00	56.94	-10.50	282.12
135	0.00	54.45	-10.50	282.12
140	0.00	52.21	-10.50	282.12
145	0.00	50.24	-10.50	282.12
150	0.00	48.60	-10.22	283.89
155	0.00	47.30	-9.96	285.54
160	0.00	46.38	-9.78	286.71
165	0.00	45.87	-9.67	287.36
170	0.00	45.78	-9.66	287.48
175	0.00	46.12	-9.72	287.05
180	0.00	46.39	-9.78	286.69
185	0.00	46.12	-9.72	287.05

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Coordination Values

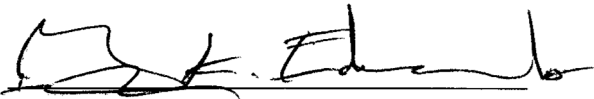
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			Horizon Gain (dBi)	Coordination Distance (km)
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220	0.00	31.65	-5.16	318.54
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260	0.00	14.56	2.94	379.58
265	0.00	17.57	0.96	364.00
270	0.00	21.32	-1.03	348.80
275	0.00	25.48	-2.69	336.38
280	0.00	29.89	-4.46	323.57
285	0.00	34.44	-6.28	310.06
290	0.00	39.10	-8.14	297.39
295	0.00	43.82	-9.26	290.01
300	0.00	48.58	-10.22	283.91
305	0.00	53.38	-10.50	282.12
310	0.00	58.20	-10.50	282.12
315	0.00	63.04	-10.50	282.12
320	0.00	67.89	-10.50	282.12
325	0.00	72.76	-10.50	282.12
330	0.00	77.63	-10.50	282.12
335	0.00	82.50	-10.50	282.12
340	0.00	87.38	-10.50	282.12
345	0.00	92.26	-10.50	282.12
350	0.00	97.14	-10.50	282.12
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Rain Zone 2
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Link Information

Satellite Type Geostationary
Mode RO - Receive-Only
Modulation Digital
Satellite Arc 70° W to 140° West Longitude
Azimuth Range 168.5° to 252.7°
Corresponding Elevation Angles 45.8° / 12.6°
Antenna Centerline (AGL) 3.96 m / 13.0 ft

Antenna Information Receive - FCC32

Manufacturer Patriot
Model 4.8 meter
Gain / Diameter 43.9 dBi / 4.8 m
3-dB / 15-dB Beamwidth 1.20° / 2.40°

Interference Objectives: Long Term -156.0 dBW/MHz 20%
Short Term -146.0 dBW/MHz 0.01%

Frequency Information Receive 4.0 GHz

Emission / Frequency Range (MHz) 36M0G7W / 3700.0 - 4200.0

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5	0.00	111.75	-10.00	285.28
10	0.00	116.60	-10.00	285.28
15	0.00	121.44	-10.00	285.28
20	0.00	126.27	-10.00	285.28
25	0.00	124.14	-10.00	285.28
30	0.00	121.53	-10.00	285.28
35	0.00	118.73	-10.00	285.28
40	0.00	115.77	-10.00	285.28
45	0.00	112.68	-10.00	285.28
50	0.00	109.48	-10.00	285.28
55	0.00	106.18	-10.00	285.28
60	0.00	102.82	-10.00	285.28
65	0.00	99.41	-10.00	285.28
70	0.00	95.95	-10.00	285.28
75	0.00	92.48	-10.00	285.28
80	0.00	88.99	-10.00	285.28
85	0.00	85.50	-10.00	285.28
90	0.00	82.04	-10.00	285.28
95	0.00	78.61	-10.00	285.28
100	0.00	75.22	-10.00	285.28
105	0.00	71.90	-10.00	285.28
110	0.00	68.65	-10.00	285.28
115	0.00	65.51	-10.00	285.28
120	0.00	62.50	-10.00	285.28
125	0.00	59.63	-10.00	285.28
130	0.00	56.94	-10.00	285.28
135	0.00	54.45	-10.00	285.28
140	0.00	52.21	-10.00	285.28
145	0.00	50.24	-10.00	285.28
150	0.00	48.60	-10.00	285.28
155	0.00	47.30	-9.87	286.10
160	0.00	46.38	-9.66	287.46
165	0.00	45.87	-9.54	288.23
170	0.00	45.78	-9.52	288.37
175	0.00	46.12	-9.60	287.86
180	0.00	46.39	-9.66	287.45
185	0.00	46.12	-9.60	287.86

COMSEARCH

Earth Station Data Sheet

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

Coordination Values

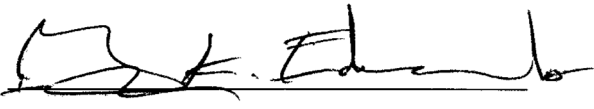
RICHMOND, VA

Licensee Name COMCAST OF MASSACHUSETTS/VIRGINIA, INC
Latitude (NAD 83) 37° 37' 21.0" N
Longitude (NAD 83) 77° 3' 2.0" W
Ground Elevation (AMSL) 23.65 m / 77.6 ft
Antenna Centerline (AGL) 3.96 m / 13.0 ft
Antenna Model Patriot 4.8 meter
Antenna Mode Receive 4.0 GHz
Interference Objectives: Long Term -156.0 dBW/MHz 20%
Short Term -146.0 dBW/MHz 0.01%

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 4.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	45.30	-9.40	289.10
195	0.00	43.98	-9.08	291.18
200	0.00	42.21	-8.63	294.11
205	0.00	40.03	-8.06	297.92
210	0.00	37.51	-7.35	302.67
215	0.00	34.70	-6.51	308.45
220	0.00	31.65	-5.51	316.07
225	0.00	28.41	-4.34	324.43
230	0.00	25.00	-2.95	334.51
235	0.00	21.45	-1.29	346.84
240	0.00	17.82	0.72	362.19
245	0.00	14.75	2.78	378.34
250	0.00	12.90	4.23	389.38
255	0.00	12.83	4.29	389.87
260	0.00	14.56	2.92	379.43
265	0.00	17.57	0.88	363.40
270	0.00	21.32	-1.22	347.36
275	0.00	25.48	-3.16	332.98
280	0.00	29.89	-4.89	320.48
285	0.00	34.44	-6.43	309.02
290	0.00	39.10	-7.80	299.63
295	0.00	43.82	-9.04	291.45
300	0.00	48.58	-10.00	285.28
305	0.00	53.38	-10.00	285.28
310	0.00	58.20	-10.00	285.28
315	0.00	63.04	-10.00	285.28
320	0.00	67.89	-10.00	285.28
325	0.00	72.76	-10.00	285.28
330	0.00	77.63	-10.00	285.28
335	0.00	82.50	-10.00	285.28
340	0.00	87.38	-10.00	285.28
345	0.00	92.26	-10.00	285.28
350	0.00	97.14	-10.00	285.28
355	0.00	102.01	-10.00	285.28

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: September 11, 2018