

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Sander Operating Co. I LLC dba WHAS TV
LOUISVILLE, KY
Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147
October 10, 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

There were no great circle interference cases identified during the interference study of the proposed earth station.

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 on 10/10/2018.

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: 10/10/2018
Job Number: 181010COMSTC09

Administrative Information

Licensee Code: BELKEN
Licensee Name: Sander Operating Co. I LLC dba WHAS TV

Site Information

LOUISVILLE, KY

Venue Name
Latitude (NAD 83): 38° 14' 56.0" N
Longitude (NAD 83): 85° 45' 38.0" W
Climate Zone: A
Rain Zone: 2
Ground Elevation (AMSL): 140.18 m / 459.9 ft

Link Information

Satellite Type: Geostationary
Mode: RO - Receive-Only
Modulation: Digital
Satellite Arc: 60° W to 143° West Longitude
Azimuth Range: 142.1° to 248.3°
Corresponding Elevation Angles: 38.2° / 16.8°
Antenna Centerline (AGL): 18.72 m / 61.4 ft

Antenna Information

Receive - A40731

Manufacturer: ANDREW CORPORATION
Model: ESA73-46
Gain / Diameter: 48.5 dBi / 7.3 m
3-dB / 15-dB Beamwidth: 0.60° / 1.22°

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: 393.5 km / 244.5 mi
Precipitation Scatter Contour Radius: 512.6 km / 318.5 mi

COMSEARCH

Earth Station Data Sheet

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

Coordination Values

LOUISVILLE, KY

Licensee Name Sander Operating Co. I LLC dba WHAS TV
Latitude (NAD 83) 38° 14' 56.0" N
Longitude (NAD 83) 85° 45' 38.0" W
Ground Elevation (AMSL) 140.18 m / 459.9 ft
Antenna Centerline (AGL) 18.72 m / 61.4 ft
Antenna Model Andrew Corporation ESA73-46
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)
0	0.00	110.75	-10.80	280.25
5	0.00	115.49	-12.80	268.12
10	0.00	120.22	-15.50	252.72
15	0.00	118.28	-14.47	258.47
20	0.00	114.66	-12.37	270.69
25	0.00	110.96	-10.88	279.73
30	0.00	107.17	-10.50	282.12
35	0.00	103.34	-10.50	282.12
40	0.00	99.46	-10.50	282.12
45	0.00	95.55	-10.50	282.12
50	0.00	91.62	-9.82	286.40
55	0.00	87.69	-9.63	287.65
60	0.00	83.77	-9.54	288.24
65	0.00	79.87	-9.57	288.01
70	0.00	75.99	-9.53	288.31
75	0.00	72.17	-9.65	287.54
80	0.00	68.40	-9.61	287.80
85	0.00	64.70	-9.58	287.99
90	0.00	61.11	-9.55	288.13
95	0.00	57.63	-9.53	288.28
100	0.00	54.30	-9.50	288.47
105	0.00	51.16	-9.58	287.97
110	0.00	48.24	-8.79	293.07
115	0.00	45.58	-7.73	300.11
120	0.00	43.25	-6.80	306.46
125	0.00	41.29	-6.02	311.89
130	0.00	39.77	-5.41	316.79
135	0.00	38.74	-5.00	319.71
140	0.00	38.24	-4.79	321.15
145	0.00	38.28	-4.81	321.01
150	0.00	38.88	-5.05	319.31
155	0.00	40.00	-5.50	316.14
160	0.00	41.60	-6.14	311.02
165	0.00	43.33	-6.83	306.22
170	0.00	44.62	-7.35	302.70
175	0.00	45.42	-7.67	300.55
180	0.00	45.69	-7.78	299.83
185	0.00	45.42	-7.67	300.55

COMSEARCH

Earth Station Data Sheet

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Coordination Values

LOUISVILLE, KY

Licensee Name Sander Operating Co. I LLC dba WHAS TV
Latitude (NAD 83) 38° 14' 56.0" N
Longitude (NAD 83) 85° 45' 38.0" W
Ground Elevation (AMSL) 140.18 m / 459.9 ft
Antenna Centerline (AGL) 18.72 m / 61.4 ft
Antenna Model Andrew Corporation ESA73-46
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	44.62	-7.35	302.70
195	0.00	43.33	-6.83	306.23
200	0.00	41.59	-6.14	311.04
205	0.00	39.45	-5.28	317.68
210	0.00	36.98	-4.29	324.75
215	0.00	34.21	-3.18	332.78
220	0.00	31.20	-1.98	341.64
225	0.00	28.00	-0.70	351.28
230	0.00	24.63	0.72	362.19
235	0.00	21.31	2.71	377.78
240	0.00	18.70	4.02	387.67
245	0.00	17.13	4.65	392.78
250	0.00	16.91	4.74	393.50
255	0.00	18.08	4.27	389.67
260	0.00	20.41	3.25	382.12
265	0.00	23.55	1.37	367.20
270	0.00	27.22	-0.39	353.63
275	0.00	31.25	-2.00	341.52
280	0.20	35.41	-3.66	329.14
285	0.00	39.89	-5.46	316.44
290	0.00	44.40	-7.26	303.30
295	0.26	48.92	-9.07	283.73
300	0.00	53.63	-9.59	287.91
305	0.00	58.32	-9.54	288.23
310	0.00	63.03	-9.54	288.22
315	0.00	67.77	-9.60	287.86
320	0.00	72.53	-9.53	288.27
325	0.00	77.30	-9.54	288.22
330	0.00	82.08	-9.58	287.99
335	0.00	86.86	-9.57	288.05
340	0.00	91.65	-9.83	286.36
345	0.00	96.43	-10.50	282.12
350	0.00	101.21	-10.50	282.12
355	0.00	105.99	-10.50	282.12

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.



Timothy O. Crutcher
Frequency Planner
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147

DATED: October 10, 2018

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COMSEARCH

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

Date: 10/10/2018
Job Number: 181010COMSTC10

Administrative Information

Licensee Code BELKEN
Licensee Name Sander Operating Co. I LLC dba WHAS TV

Site Information LOUISVILLE, KY

Venue Name
Latitude (NAD 83) 38° 14' 56.0" N
Longitude (NAD 83) 85° 45' 38.0" W
Climate Zone A
Rain Zone 2
Ground Elevation (AMSL) 140.18 m / 459.9 ft

Link Information

Satellite Type Geostationary
Mode RO - Receive-Only
Modulation Digital
Satellite Arc 60° W to 143° West Longitude
Azimuth Range 142.1° to 248.3°
Corresponding Elevation Angles 38.2° / 16.8°
Antenna Centerline (AGL) 14.72 m / 48.3 ft

Antenna Information Receive - A40451

Manufacturer ANDREW CORPORATION
Model ESA45-46A
Gain / Diameter 43.9 dBi / 4.5 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

Max Great Circle Coordination Distance 350.0 km / 217.5 mi
Precipitation Scatter Contour Radius 512.6 km / 318.5 mi

COMSEARCH

Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147
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Coordination Values

LOUISVILLE, KY

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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	110.75	-10.40	282.75
5	0.00	115.49	-12.40	270.50
10	0.00	120.22	-15.14	254.68
15	0.00	118.28	-14.07	260.74
20	0.00	114.66	-11.97	273.09
25	0.00	110.96	-10.48	282.23
30	0.00	107.17	-7.84	299.40
35	0.00	103.34	-6.10	311.30
40	0.00	99.46	-6.10	311.30
45	0.00	95.55	-6.10	311.30
50	0.00	91.62	-6.10	311.30
55	0.00	87.69	-6.10	311.30
60	0.00	83.77	-6.10	311.30
65	0.00	79.87	-6.10	311.30
70	0.00	75.99	-6.10	311.30
75	0.00	72.17	-6.10	311.30
80	0.00	68.40	-6.10	311.30
85	0.00	64.70	-6.10	311.30
90	0.00	61.11	-6.10	311.30
95	0.00	57.63	-6.10	311.30
100	0.00	54.30	-6.10	311.30
105	0.00	51.16	-6.10	311.30
110	0.00	48.24	-6.10	311.30
115	0.00	45.58	-6.10	311.30
120	0.00	43.25	-6.10	311.30
125	0.00	41.29	-6.10	311.30
130	0.00	39.77	-6.10	311.30
135	0.00	38.74	-6.10	311.30
140	0.00	38.24	-6.10	311.30
145	0.00	38.28	-6.10	311.30
150	0.00	38.88	-6.10	311.30
155	0.00	40.00	-7.59	301.07
160	0.00	41.60	-8.42	295.53
165	0.00	43.33	-8.77	293.25
170	0.00	44.62	-9.02	291.56
175	0.00	45.42	-9.18	290.52
180	0.00	45.69	-9.24	290.18
185	0.00	45.42	-9.18	290.52

COMSEARCH

Earth Station Data Sheet

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

Coordination Values

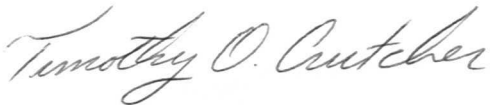
LOUISVILLE, KY

Licensee Name Sander Operating Co. I LLC dba WHAS TV
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Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 4.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	44.62	-9.02	291.56
195	0.00	43.33	-8.77	293.25
200	0.00	41.59	-8.42	295.54
205	0.00	39.45	-7.99	298.38
210	0.00	36.98	-7.50	301.71
215	0.00	34.21	-6.78	306.56
220	0.00	31.20	-5.58	315.56
225	0.00	28.00	-4.70	321.82
230	0.00	24.63	-3.95	327.21
235	0.00	21.31	-2.63	336.87
240	0.00	18.70	-1.58	344.65
245	0.00	17.13	-0.95	349.36
250	0.00	16.91	-0.86	350.03
255	0.00	18.08	-1.33	346.49
260	0.00	20.41	-2.26	339.55
265	0.00	23.55	-3.52	330.32
270	0.00	27.22	-4.54	322.93
275	0.00	31.25	-5.60	315.45
280	0.23	35.40	-6.10	307.32
285	0.00	39.89	-6.10	311.30
290	0.00	44.40	-6.10	311.30
295	0.29	48.92	-6.10	299.55
300	0.00	53.63	-6.10	311.30
305	0.00	58.32	-6.10	311.30
310	0.00	63.03	-6.10	311.30
315	0.00	67.77	-6.10	311.30
320	0.00	72.53	-6.10	311.30
325	0.00	77.30	-6.10	311.30
330	0.00	82.08	-6.10	311.30
335	0.00	86.86	-6.10	311.30
340	0.00	91.65	-6.10	311.30
345	0.00	96.43	-6.10	311.30
350	0.00	101.21	-6.10	311.30
355	0.00	105.99	-6.89	305.83

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.

A handwritten signature in cursive script that reads "Timothy O. Crutcher".

Timothy O. Crutcher
Frequency Planner
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147

DATED: October 10, 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

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

Date: 10/10/2018
Job Number: 181010COMSTC13

Administrative Information

Licensee Code BELKEN
Licensee Name Sander Operating Co. I LLC dba WHAS TV

Site Information

LOUISVILLE, KY

Venue Name
Latitude (NAD 83) 38° 14' 56.0" N
Longitude (NAD 83) 85° 45' 38.0" W
Climate Zone A
Rain Zone 2
Ground Elevation (AMSL) 140.18 m / 459.9 ft

Link Information

Satellite Type Geostationary
Mode RO - Receive-Only
Modulation Digital
Satellite Arc 60° W to 143° West Longitude
Azimuth Range 142.1° to 248.3°
Corresponding Elevation Angles 38.2° / 16.8°
Antenna Centerline (AGL) 24.81 m / 81.4 ft

Antenna Information

Receive

Manufacturer Andrew
Gain / Diameter 45.3 dBi / 5.6 m
3-dB / 15-dB Beamwidth 1.40° / 2.80°

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 366.6 km / 227.8 mi
Precipitation Scatter Contour Radius 512.6 km / 318.5 mi

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Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 4.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)
0	0.00	110.75	-10.00	285.28
5	0.00	115.49	-10.00	285.28
10	0.00	120.22	-10.00	285.28
15	0.00	118.28	-10.00	285.28
20	0.00	114.66	-10.00	285.28
25	0.00	110.96	-10.00	285.28
30	0.00	107.17	-10.00	285.28
35	0.00	103.34	-10.00	285.28
40	0.00	99.46	-10.00	285.28
45	0.00	95.55	-10.00	285.28
50	0.00	91.62	-10.00	285.28
55	0.00	87.69	-10.00	285.28
60	0.00	83.77	-10.00	285.28
65	0.00	79.87	-10.00	285.28
70	0.00	75.99	-10.00	285.28
75	0.00	72.17	-10.00	285.28
80	0.00	68.40	-10.00	285.28
85	0.00	64.70	-10.00	285.28
90	0.00	61.11	-10.00	285.28
95	0.00	57.63	-10.00	285.28
100	0.00	54.30	-10.00	285.28
105	0.00	51.16	-10.00	285.28
110	0.00	48.24	-10.00	285.28
115	0.00	45.58	-9.47	288.68
120	0.00	43.25	-8.90	292.38
125	0.00	41.29	-8.40	295.69
130	0.00	39.77	-7.99	298.39
135	0.00	38.74	-7.70	300.31
140	0.00	38.24	-7.56	301.26
145	0.00	38.28	-7.58	301.17
150	0.00	38.88	-7.74	300.04
155	0.00	40.00	-8.05	297.98
160	0.00	41.60	-8.48	295.15
165	0.00	43.33	-8.92	292.24
170	0.00	44.62	-9.24	290.17
175	0.00	45.42	-9.43	288.93
180	0.00	45.69	-9.50	288.51
185	0.00	45.42	-9.43	288.92

COMSEARCH

Earth Station Data Sheet

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

Coordination Values

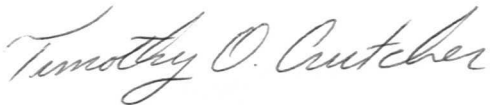
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Interference Objectives: Long Term -156.0 dBW/MHz 20%
Short Term -146.0 dBW/MHz 0.01%

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 4.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	44.62	-9.24	290.16
195	0.00	43.33	-8.92	292.24
200	0.00	41.59	-8.48	295.16
205	0.00	39.45	-7.90	298.97
210	0.00	36.98	-7.20	303.73
215	0.00	34.21	-6.35	309.54
220	0.00	31.20	-5.36	317.16
225	0.00	28.00	-4.18	325.57
230	0.00	24.63	-2.78	335.70
235	0.00	21.31	-1.22	347.37
240	0.00	18.70	0.21	358.18
245	0.00	17.13	1.15	365.52
250	0.00	16.91	1.30	366.63
255	0.00	18.08	0.57	360.98
260	0.00	20.41	-0.75	350.92
265	0.00	23.55	-2.30	339.28
270	0.00	27.22	-3.87	327.75
275	0.00	31.25	-5.37	317.06
280	0.00	35.49	-6.75	306.77
285	0.00	39.89	-8.02	298.17
290	0.00	44.40	-9.19	290.51
295	0.21	48.94	-10.00	283.68
300	0.00	53.63	-10.00	285.28
305	0.00	58.32	-10.00	285.28
310	0.00	63.03	-10.00	285.28
315	0.00	67.77	-10.00	285.28
320	0.00	72.53	-10.00	285.28
325	0.00	77.30	-10.00	285.28
330	0.00	82.08	-10.00	285.28
335	0.00	86.86	-10.00	285.28
340	0.00	91.65	-10.00	285.28
345	0.00	96.43	-10.00	285.28
350	0.00	101.21	-10.00	285.28
355	0.00	105.99	-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.

A handwritten signature in cursive script that reads "Timothy O. Crutcher".

Timothy O. Crutcher
Frequency Planner
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147

DATED: October 10, 2018

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Sander Operating Co. I LLC dba WHAS TV
LOUISVILLE, KY
Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147
October 10, 2018

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1. CONCLUSIONS	3
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4. EARTH STATION COORDINATION DATA.....	6
5. CERTIFICATION.....	10

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

There were no great circle interference cases identified during the interference study of the proposed earth station.

No 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 on dated 10/10/2018.

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: 10/10/2018
Job Number: 181010COMSTC12

Administrative Information

Licensee Code BELKEN
Licensee Name Sander Operating Co. I LLC dba WHAS TV

Site Information

LOUISVILLE, KY
Venue Name
Latitude (NAD 83) 38° 14' 56.0" N
Longitude (NAD 83) 85° 45' 38.0" W
Climate Zone A
Rain Zone 2
Ground Elevation (AMSL) 140.18 m / 459.9 ft

Link Information

Satellite Type Geostationary
Mode RO - Receive-Only
Modulation Digital
Satellite Arc 60° W to 143° West Longitude
Azimuth Range 142.1° to 248.3°
Corresponding Elevation Angles 38.2° / 16.8°
Antenna Centerline (AGL) 24.81 m / 81.4 ft

Antenna Information

Receive
Manufacturer Patriot
Gain / Diameter 42.9 dBi / 3.8 m
3-dB / 15-dB Beamwidth 1.40° / 2.80°

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 366.6 km / 227.8 mi
Precipitation Scatter Contour Radius 512.6 km / 318.5 mi

COMSEARCH

Earth Station Data Sheet

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

Coordination Values

LOUISVILLE, KY

Licensee Name Sander Operating Co. I LLC dba WHAS TV
Latitude (NAD 83) 38° 14' 56.0" N
Longitude (NAD 83) 85° 45' 38.0" W
Ground Elevation (AMSL) 140.18 m / 459.9 ft
Antenna Centerline (AGL) 24.81 m / 81.4 ft
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)
0	0.00	110.75	-10.00	285.28
5	0.00	115.49	-10.00	285.28
10	0.00	120.22	-10.00	285.28
15	0.00	118.28	-10.00	285.28
20	0.00	114.66	-10.00	285.28
25	0.00	110.96	-10.00	285.28
30	0.00	107.17	-10.00	285.28
35	0.00	103.34	-10.00	285.28
40	0.00	99.46	-10.00	285.28
45	0.00	95.55	-10.00	285.28
50	0.00	91.62	-10.00	285.28
55	0.00	87.69	-10.00	285.28
60	0.00	83.77	-10.00	285.28
65	0.00	79.87	-10.00	285.28
70	0.00	75.99	-10.00	285.28
75	0.00	72.17	-10.00	285.28
80	0.00	68.40	-10.00	285.28
85	0.00	64.70	-10.00	285.28
90	0.00	61.11	-10.00	285.28
95	0.00	57.63	-10.00	285.28
100	0.00	54.30	-10.00	285.28
105	0.00	51.16	-10.00	285.28
110	0.00	48.24	-10.00	285.28
115	0.00	45.58	-9.47	288.68
120	0.00	43.25	-8.90	292.38
125	0.00	41.29	-8.40	295.69
130	0.00	39.77	-7.99	298.39
135	0.00	38.74	-7.70	300.31
140	0.00	38.24	-7.56	301.26
145	0.00	38.28	-7.58	301.17
150	0.00	38.88	-7.74	300.04
155	0.00	40.00	-8.05	297.98
160	0.00	41.60	-8.48	295.15
165	0.00	43.33	-8.92	292.24
170	0.00	44.62	-9.24	290.17
175	0.00	45.42	-9.43	288.93
180	0.00	45.69	-9.50	288.51
185	0.00	45.42	-9.43	288.92

COMSEARCH

Earth Station Data Sheet

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

Coordination Values

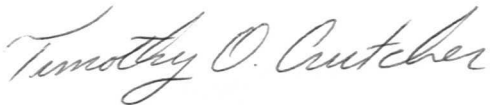
LOUISVILLE, KY

Licensee Name Sander Operating Co. I LLC dba WHAS TV
Latitude (NAD 83) 38° 14' 56.0" N
Longitude (NAD 83) 85° 45' 38.0" W
Ground Elevation (AMSL) 140.18 m / 459.9 ft
Antenna Centerline (AGL) 24.81 m / 81.4 ft
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	44.62	-9.24	290.16
195	0.00	43.33	-8.92	292.24
200	0.00	41.59	-8.48	295.16
205	0.00	39.45	-7.90	298.97
210	0.00	36.98	-7.20	303.73
215	0.00	34.21	-6.35	309.54
220	0.00	31.20	-5.36	317.16
225	0.00	28.00	-4.18	325.57
230	0.00	24.63	-2.78	335.70
235	0.00	21.31	-1.22	347.37
240	0.00	18.70	0.21	358.18
245	0.00	17.13	1.15	365.52
250	0.00	16.91	1.30	366.63
255	0.00	18.08	0.57	360.98
260	0.00	20.41	-0.75	350.92
265	0.00	23.55	-2.30	339.28
270	0.00	27.22	-3.87	327.75
275	0.00	31.25	-5.37	317.06
280	0.00	35.49	-6.75	306.77
285	0.00	39.89	-8.02	298.17
290	0.00	44.40	-9.19	290.51
295	0.21	48.94	-10.00	283.68
300	0.00	53.63	-10.00	285.28
305	0.00	58.32	-10.00	285.28
310	0.00	63.03	-10.00	285.28
315	0.00	67.77	-10.00	285.28
320	0.00	72.53	-10.00	285.28
325	0.00	77.30	-10.00	285.28
330	0.00	82.08	-10.00	285.28
335	0.00	86.86	-10.00	285.28
340	0.00	91.65	-10.00	285.28
345	0.00	96.43	-10.00	285.28
350	0.00	101.21	-10.00	285.28
355	0.00	105.99	-10.00	285.28

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A handwritten signature in cursive script that reads "Timothy O. Crutcher".

Timothy O. Crutcher
Frequency Planner
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147

DATED: October 10, 2018

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Sander Operating Co. I LLC dba WHAS TV
LOUISVILLE, KY
Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147
October 10, 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

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Coordination data for this earth station was sent on dated 10/10/2018.

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: 10/10/2018
Job Number: 181010COMSTC11

Administrative Information

Licensee Code BELKEN
Licensee Name Sander Operating Co. I LLC dba WHAS TV

Site Information

LOUISVILLE, KY
Latitude (NAD 83) 38° 14' 56.0" N
Longitude (NAD 83) 85° 45' 38.0" W
Climate Zone A
Rain Zone 2
Ground Elevation (AMSL) 140.18 m / 459.9 ft

Link Information

Satellite Type Geostationary
Mode RO - Receive-Only
Modulation Digital
Satellite Arc 60° W to 143° West Longitude
Azimuth Range 142.1° to 248.3°
Corresponding Elevation Angles 38.2° / 16.8°
Antenna Centerline (AGL) 24.81 m / 81.4 ft

Antenna Information

Receive - C40381
Manufacturer COMTECH ANTENNA SYSTEMS
Model 3.8 METER PF
Gain / Diameter 42.9 dBi / 3.8 m
3-dB / 15-dB Beamwidth 1.40° / 2.80°

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 364.2 km / 226.3 mi
Precipitation Scatter Contour Radius 512.6 km / 318.5 mi

COMSEARCH

Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147
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Coordination Values

LOUISVILLE, KY

Licensee Name Sander Operating Co. I LLC dba WHAS TV
Latitude (NAD 83) 38° 14' 56.0" N
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Antenna Model COMTECH ANTENNA SYSTEMS 3.8 METER PF
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)
0	0.00	110.75	-8.10	297.65
5	0.00	115.49	-8.30	296.34
10	0.00	120.22	-10.14	284.37
15	0.00	118.28	-9.41	289.05
20	0.00	114.66	-8.10	297.65
25	0.00	110.96	-8.10	297.65
30	0.00	107.17	-8.10	297.65
35	0.00	103.34	-8.10	297.65
40	0.00	99.46	-8.10	297.65
45	0.00	95.55	-8.10	297.65
50	0.00	91.62	-8.10	297.65
55	0.00	87.69	-8.10	297.65
60	0.00	83.77	-8.10	297.65
65	0.00	79.87	-8.10	297.65
70	0.00	75.99	-8.10	297.65
75	0.00	72.17	-8.10	297.65
80	0.00	68.40	-8.10	297.65
85	0.00	64.70	-8.10	297.65
90	0.00	61.11	-8.10	297.65
95	0.00	57.63	-8.10	297.65
100	0.00	54.30	-8.10	297.65
105	0.00	51.16	-8.10	297.65
110	0.00	48.24	-8.10	297.65
115	0.00	45.58	-8.10	297.65
120	0.00	43.25	-8.10	297.65
125	0.00	41.29	-7.62	300.90
130	0.00	39.77	-7.05	304.71
135	0.00	38.74	-6.85	306.12
140	0.00	38.24	-6.75	306.81
145	0.00	38.28	-6.76	306.75
150	0.00	38.88	-6.88	305.93
155	0.00	40.00	-7.10	304.40
160	0.00	41.60	-7.74	300.06
165	0.00	43.33	-8.43	295.44
170	0.00	44.62	-8.95	292.05
175	0.00	45.42	-9.18	290.52
180	0.00	45.69	-9.24	290.18
185	0.00	45.42	-9.18	290.52

COMSEARCH

Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147
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Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 4.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	44.62	-8.95	292.05
195	0.00	43.33	-8.43	295.44
200	0.00	41.59	-7.74	300.08
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210	0.00	36.98	-6.50	308.55
215	0.00	34.21	-6.10	311.30
220	0.00	31.20	-6.10	311.30
225	0.00	28.00	-5.30	317.57
230	0.00	24.63	-3.95	327.21
235	0.00	21.31	-2.63	336.87
240	0.00	18.70	-0.80	350.53
245	0.00	17.13	0.77	362.52
250	0.00	16.91	0.99	364.24
255	0.00	18.08	-0.18	355.21
260	0.00	20.41	-2.26	339.55
265	0.00	23.55	-3.52	330.32
270	0.00	27.22	-4.99	319.75
275	0.00	31.25	-6.10	311.30
280	0.00	35.49	-6.20	310.61
285	0.00	39.89	-7.08	304.54
290	0.00	44.40	-8.10	297.65
295	0.21	48.94	-8.10	296.02
300	0.00	53.63	-8.10	297.65
305	0.00	58.32	-8.10	297.65
310	0.00	63.03	-8.10	297.65
315	0.00	67.77	-8.10	297.65
320	0.00	72.53	-8.10	297.65
325	0.00	77.30	-8.10	297.65
330	0.00	82.08	-8.10	297.65
335	0.00	86.86	-8.10	297.65
340	0.00	91.65	-8.10	297.65
345	0.00	96.43	-8.10	297.65
350	0.00	101.21	-8.10	297.65
355	0.00	105.99	-8.10	297.65

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Timothy O. Crutcher
Frequency Planner
COMSEARCH
19700 Janelia Farm Boulevard
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DATED: October 10, 2018