

# FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for  
**Comcast Cable Comm Management LLC**  
**JACKSONVILLE, FL**  
**Satellite Earth Station**

Prepared By:  
COMSEARCH  
19700 Janelia Farm Boulevard  
Ashburn, VA 20147  
June 20, 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**

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

### 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 06/20/2018.

Company

Comsearch

## **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: 06/20/2018  
Job Number: 180620COMSTW18

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### Administrative Information

Status ENGINEER PROPOSAL  
Call Sign  
Licensee Code CCCMGT  
Licensee Name Comcast Cable Comm Management LLC

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### Site Information JACKSONVILLE, FL

Venue Name  
Latitude (NAD 83) 30° 15' 44.0" N  
Longitude (NAD 83) 81° 36' 46.0" W  
Climate Zone A  
Rain Zone 1  
Ground Elevation (AMSL) 5.75 m / 18.9 ft

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### Link Information

Satellite Type Geostationary  
Mode RO - Receive-Only  
Modulation Digital  
Satellite Arc 60° W to 143° West Longitude  
Azimuth Range 141.8° to 254.6°  
Corresponding Elevation Angles 47.6° / 16.1°  
Antenna Centerline (AGL) 2.74 m / 9.0 ft

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### Antenna Information

Manufacturer AFC  
Model PR-23  
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%

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### Frequency Information Receive 4.0 GHz

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

Max Great Circle Coordination Distance 370.9 km / 230.4 mi  
Precipitation Scatter Contour Radius 594.1 km / 369.1 mi

# COMSEARCH

## Earth Station Data Sheet

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

### Coordination Values

### JACKSONVILLE, FL

Licensee Name Comcast Cable Comm Management LLC  
Latitude (NAD 83) 30° 15' 44.0" N  
Longitude (NAD 83) 81° 36' 46.0" W  
Ground Elevation (AMSL) 5.75 m / 18.9 ft  
Antenna Centerline (AGL) 2.74 m / 9.0 ft  
Antenna Model AFC PR-23  
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	104.76	-10.00	285.28
5	0.00	109.54	-10.00	285.28
10	0.00	114.32	-10.00	285.28
15	0.00	113.86	-10.00	285.28
20	0.00	110.85	-10.00	285.28
25	0.00	107.73	-10.00	285.28
30	0.00	104.53	-10.00	285.28
35	0.00	101.27	-10.00	285.28
40	0.00	97.95	-10.00	285.28
45	0.00	94.60	-10.00	285.28
50	0.00	91.23	-10.00	285.28
55	0.00	87.86	-10.00	285.28
60	0.00	84.50	-10.00	285.28
65	0.00	81.16	-10.00	285.28
70	0.00	77.85	-10.00	285.28
75	0.00	74.60	-10.00	285.28
80	0.00	71.42	-10.00	285.28
85	0.00	68.33	-10.00	285.28
90	0.00	65.35	-10.00	285.28
95	0.00	62.50	-10.00	285.28
100	0.00	59.81	-10.00	285.28
105	0.00	57.31	-10.00	285.28
110	0.00	55.02	-10.00	285.28
115	0.00	52.98	-10.00	285.28
120	0.00	51.21	-10.00	285.28
125	0.00	49.77	-10.00	285.28
130	0.00	48.66	-10.00	285.28
135	0.00	47.93	-10.00	285.28
140	0.00	47.59	-9.94	285.68
145	0.00	47.64	-9.95	285.60
150	0.00	48.09	-10.00	285.28
155	0.00	48.92	-10.00	285.28
160	0.00	50.12	-10.00	285.28
165	0.00	51.66	-10.00	285.28
170	0.00	53.30	-10.00	285.28
175	0.00	54.37	-10.00	285.28
180	0.00	54.73	-10.00	285.28
185	0.00	54.37	-10.00	285.28



# COMSEARCH

## Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147  
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### Coordination Values

### JACKSONVILLE, FL

Licensee Name Comcast Cable Comm Management LLC  
Latitude (NAD 83) 30° 15' 44.0" N  
Longitude (NAD 83) 81° 36' 46.0" W  
Ground Elevation (AMSL) 5.75 m / 18.9 ft  
Antenna Centerline (AGL) 2.74 m / 9.0 ft  
Antenna Model AFC PR-23  
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	53.30	-10.00	285.28
195	0.00	51.61	-10.00	285.28
200	0.00	49.37	-10.00	285.28
205	0.00	46.68	-9.73	287.02
210	0.00	43.63	-8.99	291.76
215	0.00	40.29	-8.13	297.46
220	0.00	36.72	-7.12	304.24
225	0.00	32.98	-5.96	312.94
230	0.00	29.10	-4.60	322.56
235	0.00	25.17	-3.02	333.96
240	0.00	21.60	-1.36	346.26
245	0.00	18.67	0.22	358.29
250	0.00	16.71	1.42	367.62
255	0.00	16.08	1.84	370.90
260	0.00	16.93	1.28	366.53
265	0.00	19.06	-0.00	356.59
270	0.00	22.10	-1.61	344.40
275	0.00	25.74	-3.27	332.18
280	0.00	29.75	-4.84	320.84
285	0.00	34.00	-6.29	309.99
290	0.00	38.42	-7.61	300.92
295	0.00	42.94	-8.82	292.88
300	0.00	47.55	-9.93	285.74
305	0.00	52.21	-10.00	285.28
310	0.00	56.91	-10.00	285.28
315	0.00	61.64	-10.00	285.28
320	0.00	66.40	-10.00	285.28
325	0.00	71.17	-10.00	285.28
330	0.00	75.96	-10.00	285.28
335	0.00	80.75	-10.00	285.28
340	0.00	85.56	-10.00	285.28
345	0.00	90.36	-10.00	285.28
350	0.00	95.16	-10.00	285.28
355	0.00	99.96	-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: \_\_\_\_\_

Twila Meyer  
DB Technician IV  
COMSEARCH  
19700 Janelia Farm Boulevard  
Ashburn, VA 20147

DATED: June 20, 2018

# FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for  
**Comcast Cable Communications, LLC**  
**JACKSONVILLE, FL**  
**Satellite Earth Station**

Prepared By:  
COMSEARCH  
19700 Janelia Farm Boulevard  
Ashburn, VA 20147  
July 17, 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.

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 receive-only earth station.

### Company

<Companies Responding with Cases>

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 07/17/2018.

Company

## **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: 07/17/2018  
Job Number: 180717COMSTW04

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### Administrative Information

Status ENGINEER PROPOSAL  
Call Sign  
Licensee Code ZCATEC  
Licensee Name Comcast Cable Communications, LLC

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### Site Information JACKSONVILLE, FL

Venue Name  
Latitude (NAD 83) 30° 15' 44.0" N  
Longitude (NAD 83) 81° 36' 46.0" W  
Climate Zone A  
Rain Zone 1  
Ground Elevation (AMSL) 5.75 m / 18.9 ft

---

### Link Information

Satellite Type Geostationary  
Mode RO - Receive-Only  
Modulation Digital  
Satellite Arc 60° W to 143° West Longitude  
Azimuth Range 141.8° to 254.6°  
Corresponding Elevation Angles 47.6° / 16.1°  
Antenna Centerline (AGL) 0.91 m / 3.0 ft

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### Antenna Information Receive - S40452

Manufacturer SCIENTIFIC-ATLANTA, INC  
Model 8345 4.5 METER  
Gain / Diameter 43.3 dBi / 4.5 m  
3-dB / 15-dB Beamwidth 1.20° / 2.50°

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

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### Frequency Information Receive 4.0 GHz

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

Max Great Circle Coordination Distance 298.9 km / 185.7 mi  
Precipitation Scatter Contour Radius 594.1 km / 369.1 mi

# COMSEARCH

## Earth Station Data Sheet

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### Coordination Values

### JACKSONVILLE, FL

Licensee Name Comcast Cable Communications, LLC  
Latitude (NAD 83) 30° 15' 44.0" N  
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Antenna Centerline (AGL) 0.91 m / 3.0 ft  
Antenna Model SCIENTIFIC-ATLANTA, INC 8345 4.5 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)
0	0.00	104.76	-9.70	287.20
5	0.00	109.54	-10.61	281.44
10	0.00	114.32	-14.15	260.25
15	0.00	113.86	-13.79	262.34
20	0.00	110.85	-11.38	276.67
25	0.00	107.73	-10.25	283.72
30	0.00	104.53	-9.70	287.20
35	0.00	101.27	-9.70	287.20
40	0.00	97.95	-9.70	287.20
45	0.00	94.60	-9.70	287.20
50	0.00	91.23	-9.70	287.20
55	0.00	87.86	-9.70	287.20
60	0.00	84.50	-9.70	287.20
65	0.00	81.16	-9.70	287.20
70	0.00	77.85	-9.70	287.20
75	0.00	74.60	-9.70	287.20
80	0.00	71.42	-9.70	287.20
85	0.00	68.33	-9.70	287.20
90	0.00	65.35	-9.70	287.20
95	0.00	62.50	-9.70	287.20
100	0.00	59.81	-9.70	287.20
105	0.00	57.31	-9.70	287.20
110	0.00	55.02	-9.70	287.20
115	0.00	52.98	-9.70	287.20
120	0.00	51.21	-9.70	287.20
125	0.00	49.77	-9.70	287.20
130	0.00	48.66	-9.70	287.20
135	0.00	47.93	-9.70	287.20
140	0.00	47.59	-9.70	287.20
145	0.00	47.64	-9.70	287.20
150	0.00	48.09	-9.70	287.20
155	0.00	48.92	-9.72	287.05
160	0.00	50.12	-9.73	287.02
165	0.00	51.66	-9.77	286.74
170	0.00	53.30	-10.70	280.87
175	0.00	54.37	-10.70	280.87
180	0.00	54.73	-10.70	280.87
185	0.00	54.37	-10.70	280.87

# COMSEARCH

## Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147  
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### Coordination Values

### JACKSONVILLE, FL

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Latitude (NAD 83) 30° 15' 44.0" N  
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Ground Elevation (AMSL) 5.75 m / 18.9 ft  
Antenna Centerline (AGL) 0.91 m / 3.0 ft  
Antenna Model SCIENTIFIC-ATLANTA, INC 8345 4.5 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	53.30	-12.43	270.32
195	0.00	51.61	-12.24	271.41
200	0.00	49.37	-11.04	278.76
205	0.00	46.68	-10.70	280.87
210	0.00	43.63	-10.70	280.87
215	0.00	40.29	-10.70	280.87
220	0.00	36.72	-10.70	280.87
225	0.00	32.98	-10.62	281.36
230	0.00	29.10	-8.70	293.68
235	0.00	25.17	-8.70	293.68
240	0.00	21.60	-8.70	293.68
245	0.00	18.67	-8.43	295.43
250	0.00	16.71	-8.04	298.04
255	0.00	16.08	-7.92	298.88
260	0.00	16.93	-8.09	297.75
265	0.00	19.06	-8.51	294.92
270	0.00	22.10	-8.70	293.68
275	0.00	25.74	-8.70	293.68
280	0.00	29.75	-8.70	293.68
285	0.00	34.00	-9.70	287.20
290	0.00	38.42	-9.70	287.20
295	0.00	42.94	-9.70	287.20
300	0.00	47.55	-9.70	287.20
305	0.00	52.21	-9.70	287.20
310	0.00	56.91	-9.70	287.20
315	0.00	61.64	-9.70	287.20
320	0.00	66.40	-9.70	287.20
325	0.00	71.17	-9.70	287.20
330	0.00	75.96	-9.70	287.20
335	0.00	80.75	-9.70	287.20
340	0.00	85.56	-9.70	287.20
345	0.00	90.36	-9.70	287.20
350	0.00	95.16	-9.70	287.20
355	0.00	99.96	-9.70	287.20

## 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: \_\_\_\_\_

Twila Meyer  
DB Technician IV  
COMSEARCH  
19700 Janelia Farm Boulevard  
Ashburn, VA 20147

DATED: July 17, 2018

# FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for  
**Comcast Cable Communications, LLC**  
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Prepared By:  
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July 17, 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**

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



### 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 07/17/2018.

Company

Comsearch

## **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: 07/17/2018  
Job Number: 180717COMSTW03

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### Administrative Information

Status ENGINEER PROPOSAL  
Call Sign  
Licensee Code ZCATEC  
Licensee Name Comcast Cable Communications, LLC

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### Site Information JACKSONVILLE, FL

Venue Name  
Latitude (NAD 83) 30° 15' 44.0" N  
Longitude (NAD 83) 81° 36' 46.0" W  
Climate Zone A  
Rain Zone 1  
Ground Elevation (AMSL) 5.75 m / 18.9 ft

---

### Link Information

Satellite Type Geostationary  
Mode RO - Receive-Only  
Modulation Digital  
Satellite Arc 60° W to 143° West Longitude  
Azimuth Range 141.8° to 254.6°  
Corresponding Elevation Angles 47.6° / 16.1°  
Antenna Centerline (AGL) 0.91 m / 3.0 ft

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### 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%

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### Frequency Information Receive 4.0 GHz

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

Max Great Circle Coordination Distance 370.7 km / 230.3 mi  
Precipitation Scatter Contour Radius 594.1 km / 369.1 mi

# COMSEARCH

## Earth Station Data Sheet

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

### Coordination Values

### JACKSONVILLE, FL

Licensee Name Comcast Cable Communications, LLC  
Latitude (NAD 83) 30° 15' 44.0" N  
Longitude (NAD 83) 81° 36' 46.0" W  
Ground Elevation (AMSL) 5.75 m / 18.9 ft  
Antenna Centerline (AGL) 0.91 m / 3.0 ft  
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	104.76	-8.10	297.65
5	0.00	109.54	-8.10	297.65
10	0.00	114.32	-8.10	297.65
15	0.00	113.86	-8.10	297.65
20	0.00	110.85	-8.10	297.65
25	0.00	107.73	-8.10	297.65
30	0.00	104.53	-8.10	297.65
35	0.00	101.27	-8.10	297.65
40	0.00	97.95	-8.10	297.65
45	0.00	94.60	-8.10	297.65
50	0.00	91.23	-8.10	297.65
55	0.00	87.86	-8.10	297.65
60	0.00	84.50	-8.10	297.65
65	0.00	81.16	-8.10	297.65
70	0.00	77.85	-8.10	297.65
75	0.00	74.60	-8.10	297.65
80	0.00	71.42	-8.10	297.65
85	0.00	68.33	-8.10	297.65
90	0.00	65.35	-8.10	297.65
95	0.00	62.50	-8.10	297.65
100	0.00	59.81	-8.10	297.65
105	0.00	57.31	-8.10	297.65
110	0.00	55.02	-8.10	297.65
115	0.00	52.98	-8.10	297.65
120	0.00	51.21	-8.10	297.65
125	0.00	49.77	-8.10	297.65
130	0.00	48.66	-8.10	297.65
135	0.00	47.93	-8.10	297.65
140	0.00	47.59	-8.10	297.65
145	0.00	47.64	-8.57	294.55
150	0.00	48.09	-9.72	287.08
155	0.00	48.92	-9.88	286.01
160	0.00	50.12	-10.10	284.64
165	0.00	51.66	-10.10	284.64
170	0.00	53.30	-10.10	284.64
175	0.00	54.37	-10.10	284.64
180	0.00	54.73	-10.10	284.64
185	0.00	54.37	-10.10	284.64

# COMSEARCH

## Earth Station Data Sheet

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

### Coordination Values

### JACKSONVILLE, FL

Licensee Name Comcast Cable Communications, LLC  
Latitude (NAD 83) 30° 15' 44.0" N  
Longitude (NAD 83) 81° 36' 46.0" W  
Ground Elevation (AMSL) 5.75 m / 18.9 ft  
Antenna Centerline (AGL) 0.91 m / 3.0 ft  
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)
190	0.00	53.30	-10.10	284.64
195	0.00	51.61	-10.10	284.64
200	0.00	49.37	-9.97	285.45
205	0.00	46.68	-9.44	288.90
210	0.00	43.63	-8.55	294.67
215	0.00	40.29	-7.21	303.62
220	0.00	36.72	-6.44	308.91
225	0.00	32.98	-6.10	311.30
230	0.00	29.10	-5.74	314.45
235	0.00	25.17	-4.17	325.64
240	0.00	21.60	-2.74	336.02
245	0.00	18.67	-0.77	350.71
250	0.00	16.71	1.19	365.78
255	0.00	16.08	1.82	370.72
260	0.00	16.93	0.97	364.09
265	0.00	19.06	-1.16	347.80
270	0.00	22.10	-2.94	334.55
275	0.00	25.74	-4.40	324.00
280	0.00	29.75	-6.00	312.00
285	0.00	34.00	-6.10	311.30
290	0.00	38.42	-6.78	306.56
295	0.00	42.94	-8.10	297.65
300	0.00	47.55	-8.10	297.65
305	0.00	52.21	-8.10	297.65
310	0.00	56.91	-8.10	297.65
315	0.00	61.64	-8.10	297.65
320	0.00	66.40	-8.10	297.65
325	0.00	71.17	-8.10	297.65
330	0.00	75.96	-8.10	297.65
335	0.00	80.75	-8.10	297.65
340	0.00	85.56	-8.10	297.65
345	0.00	90.36	-8.10	297.65
350	0.00	95.16	-8.10	297.65
355	0.00	99.96	-8.10	297.65

## 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: \_\_\_\_\_

Twila Meyer  
DB Technician IV  
COMSEARCH  
19700 Janelia Farm Boulevard  
Ashburn, VA 20147

DATED: July 17, 2018