

# FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for  
**Comcast Cable Communications, LLC**  
**BLAIRSVILLE, PA**  
**(4.5 meter)**  
**Satellite Earth Station**

Prepared By:  
COMSEARCH  
19700 Janelia Farm Boulevard  
Ashburn, VA 20147  
May 23, 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 05/23/2018.

Company

Mountain State Communications, Ilc

## **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: 05/23/2018  
Job Number: 180523COMSGE09

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### Administrative Information

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

---

### Site Information

**BLAIRSVILLE, PA**  
Venue Name  
Latitude (NAD 83) 40° 26' 12.8" N  
Longitude (NAD 83) 79° 56' 55.0" W  
Climate Zone A  
Rain Zone 2  
Ground Elevation (AMSL) 244.62 m / 802.6 ft

---

### Link Information

Satellite Type Geostationary  
Mode RO - Receive-Only  
Modulation Digital  
Satellite Arc 60° W to 143° West Longitude  
Azimuth Range 150.8° to 251.7°  
Corresponding Elevation Angles 38.9° / 11.7°  
Antenna Centerline (AGL) 2.74 m / 9.0 ft

---

### Antenna Information

**Receive - S40452**  
Manufacturer SSE  
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%

---

### Frequency Information

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

Max Great Circle Coordination Distance 183.2 km / 113.8 mi  
Precipitation Scatter Contour Radius 532.2 km / 330.6 mi

# COMSEARCH

## Earth Station Data Sheet

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

### Coordination Values

### BLAIRSVILLE, PA

Licensee Name Comcast Cable Communications, LLC  
Latitude (NAD 83) 40° 26' 12.8" N  
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Antenna Model SSE 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	9.63	108.24	-10.35	100.00
5	10.70	113.25	-13.30	100.00
10	9.61	118.23	-15.99	100.00
15	10.73	123.25	-18.00	100.00
20	11.50	125.43	-18.70	100.00
25	10.25	120.85	-17.04	100.00
30	11.54	117.02	-15.51	100.00
35	11.20	112.64	-12.81	100.00
40	11.78	108.40	-10.38	100.00
45	10.83	103.87	-9.70	100.00
50	11.35	99.54	-9.70	100.00
55	10.29	95.06	-9.70	100.00
60	9.16	90.67	-9.70	100.00
65	6.46	86.43	-9.70	121.30
70	6.17	82.25	-9.70	124.51
75	6.56	78.02	-9.70	120.23
80	7.18	73.74	-9.70	113.64
85	7.83	69.43	-9.70	106.71
90	7.94	65.25	-9.70	105.60
95	6.27	61.73	-9.70	123.43
100	4.89	58.39	-9.70	136.20
105	4.77	54.75	-9.70	137.88
110	5.97	50.54	-9.70	126.67
115	8.25	45.75	-9.70	102.75
120	9.90	41.30	-9.70	100.00
125	11.19	37.15	-9.70	100.00
130	13.26	32.57	-9.70	100.00
135	13.35	29.76	-8.70	100.00
140	13.46	27.51	-8.70	100.00
145	13.37	26.15	-8.70	100.00
150	13.57	25.37	-8.70	100.00
155	13.51	25.74	-8.70	100.00
160	13.42	27.00	-8.70	100.00
165	13.11	28.54	-8.70	100.00
170	13.09	29.44	-8.70	100.00
175	12.61	30.45	-9.15	100.00
180	12.50	30.74	-9.44	100.00
185	12.18	30.88	-9.58	100.00



# COMSEARCH

## Earth Station Data Sheet

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

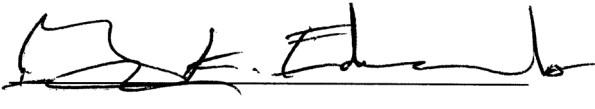
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Antenna Model SSE 8345 4.5 METER  
Antenna Mode Receive 4.0 GHz  
Interference Objectives: Long Term -156.0 dBW/MHz 20%  
Short Term -146.0 dBW/MHz 0.01%

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 4.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)
190	10.31	32.18	-10.88	100.00
195	7.74	33.72	-12.42	100.00
200	3.54	36.24	-12.70	144.75
205	2.35	35.40	-12.70	173.15
210	2.81	32.76	-11.46	166.64
215	2.88	30.17	-8.87	179.94
220	3.97	26.53	-8.70	154.65
225	4.06	23.50	-8.70	153.07
230	4.05	20.37	-8.70	153.24
235	5.82	15.77	-7.85	134.18
240	6.41	11.97	-4.70	141.22
245	6.49	8.43	-3.70	145.00
250	6.24	5.69	2.22	183.24
255	6.27	6.29	1.01	175.63
260	6.40	9.78	-4.48	142.44
265	6.19	14.32	-7.02	135.03
270	6.21	19.02	-8.50	128.79
275	5.99	23.90	-8.70	130.44
280	5.76	28.81	-8.70	132.63
285	5.40	33.77	-9.70	132.18
290	4.82	38.77	-9.70	137.17
295	4.49	43.73	-9.70	141.80
300	4.23	48.68	-9.70	145.73
305	4.00	53.63	-9.70	149.28
310	3.76	58.59	-9.70	154.29
315	4.09	63.50	-9.70	147.80
320	4.12	68.45	-9.70	147.36
325	3.70	73.42	-9.70	155.45
330	3.90	78.36	-9.70	151.38
335	3.72	83.32	-9.70	155.03
340	5.65	88.26	-9.70	129.70
345	8.50	93.25	-9.70	100.59
350	9.47	98.25	-9.70	100.00
355	9.80	103.25	-9.70	100.00

## 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: May 23, 2018

# **COMSEARCH**

## **Earth Station Data Sheet**

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

# **FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT**

Prepared for  
**Comcast Cable Communications, LLC**  
**BLAIRSVILLE, PA**  
**(Prodelin 3.7 meter)**  
**Satellite Earth Station**

Prepared By:  
COMSEARCH  
19700 Janelia Farm Boulevard  
Ashburn, VA 20147  
May 23, 2018

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3. SUPPLEMENTAL SHOWING ..... 5  
4. EARTH STATION COORDINATION DATA..... 6  
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# COMSEARCH

## Earth Station Data Sheet

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

## 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.

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**Earth Station Data Sheet**  
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### 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 05/23/2018.

Company  
Mountain State Communications, llc

## **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: 05/23/2018  
Job Number: 180523COMSGE10

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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

**BLAIRSVILLE, PA**  
Venue Name  
Latitude (NAD 83) 40° 26' 12.8" N  
Longitude (NAD 83) 79° 56' 55.0" W  
Climate Zone A  
Rain Zone 2  
Ground Elevation (AMSL) 244.62 m / 802.6 ft

---

### Link Information

Satellite Type Geostationary  
Mode RO - Receive-Only  
Modulation Digital  
Satellite Arc 60° W to 143° West Longitude  
Azimuth Range 150.8° to 251.7°  
Corresponding Elevation Angles 38.9° / 11.7°  
Antenna Centerline (AGL) 2.74 m / 9.0 ft

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### Antenna Information

**Receive - P40372**  
Manufacturer PRODELIN CORPORATION  
Model 136-750-06  
Gain / Diameter 41.7 dBi / 3.7 m  
3-dB / 15-dB Beamwidth 1.50° / 3.00°

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 229.9 km / 142.8 mi  
Precipitation Scatter Contour Radius 532.2 km / 330.6 mi

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Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 4.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)
0	9.63	108.24	-10.30	100.00
5	10.70	113.25	-10.30	100.00
10	9.61	118.23	-10.30	100.00
15	10.73	123.25	-10.30	100.00
20	11.50	125.43	-10.30	100.00
25	10.25	120.85	-10.30	100.00
30	11.54	117.02	-10.30	100.00
35	11.20	112.64	-10.30	100.00
40	11.78	108.40	-10.30	100.00
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50	11.35	99.54	-10.30	100.00
55	10.29	95.06	-10.30	100.00
60	9.16	90.67	-10.30	100.00
65	6.46	86.43	-10.30	118.94
70	6.17	82.25	-10.30	122.16
75	6.56	78.02	-10.30	117.88
80	7.18	73.74	-10.30	111.28
85	7.83	69.43	-10.30	104.35
90	7.94	65.25	-10.30	103.24
95	6.27	61.73	-10.30	121.08
100	4.89	58.39	-10.30	135.08
105	4.77	54.75	-10.30	135.46
110	5.97	50.54	-10.30	124.32
115	8.25	45.75	-9.45	103.74
120	9.90	41.30	-8.56	100.00
125	11.19	37.15	-7.16	100.00
130	13.26	32.57	-5.81	100.00
135	13.35	29.76	-5.21	100.00
140	13.46	27.51	-4.30	100.00
145	13.37	26.15	-3.76	100.00
150	13.57	25.37	-3.45	100.00
155	13.51	25.74	-3.60	100.00
160	13.42	27.00	-4.10	100.00
165	13.11	28.54	-4.72	100.00
170	13.09	29.44	-5.08	100.00
175	12.61	30.45	-5.39	100.00
180	12.50	30.74	-5.45	100.00
185	12.18	30.88	-5.48	100.00

# COMSEARCH

## Earth Station Data Sheet

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

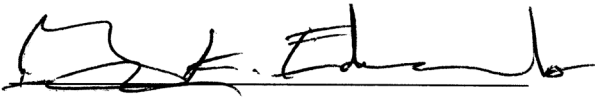
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Antenna Centerline (AGL) 2.74 m / 9.0 ft  
Antenna Model PRODELIN CORPORATION 136-750-06  
Antenna Mode Receive 4.0 GHz  
Interference Objectives: Long Term -156.0 dBW/MHz 20%  
Short Term -146.0 dBW/MHz 0.01%

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 4.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)
190	10.31	32.18	-5.74	101.56
195	7.74	33.72	-6.04	122.46
200	3.54	36.24	-6.79	175.76
205	2.35	35.40	-6.46	203.49
210	2.81	32.76	-5.85	196.41
215	2.88	30.17	-5.33	197.46
220	3.97	26.53	-3.91	181.52
225	4.06	23.50	-2.40	187.94
230	4.05	20.37	-0.52	198.05
235	5.82	15.77	2.24	188.67
240	6.41	11.97	5.70	201.31
245	6.49	8.43	7.70	209.70
250	6.24	5.69	10.31	229.87
255	6.27	6.29	9.12	221.72
260	6.40	9.78	6.92	206.20
265	6.19	14.32	3.38	190.72
270	6.21	19.02	0.29	172.14
275	5.99	23.90	-2.64	156.79
280	5.76	28.81	-4.82	148.27
285	5.40	33.77	-6.05	146.43
290	4.82	38.77	-7.81	145.34
295	4.49	43.73	-9.05	144.67
300	4.23	48.68	-10.04	144.24
305	4.00	53.63	-10.30	146.56
310	3.76	58.59	-10.30	151.46
315	4.09	63.50	-10.30	145.11
320	4.12	68.45	-10.30	144.69
325	3.70	73.42	-10.30	152.60
330	3.90	78.36	-10.30	148.62
335	3.72	83.32	-10.30	152.18
340	5.65	88.26	-10.30	127.35
345	8.50	93.25	-10.30	100.00
350	9.47	98.25	-10.30	100.00
355	9.80	103.25	-10.30	100.00

## 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: 

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Senior Manager  
COMSEARCH  
19700 Janelia Farm Boulevard  
Ashburn, VA 20147

DATED: May 23, 2018

# **COMSEARCH**

## **Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147  
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Prepared for  
**Comcast Cable Communications, LLC**  
**BLAIRSVILLE, PA**  
**(Patriot 3.8 meter)**  
**Satellite Earth Station**

Prepared By:  
COMSEARCH  
19700 Janelia Farm Boulevard  
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May 23, 2018

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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.

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## Earth Station Data Sheet

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

Date: 05/23/2018  
Job Number: 180523COMSGE08

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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

**BLAIRSVILLE, PA**

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Rain Zone 2  
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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 150.8° to 251.7°  
Corresponding Elevation Angles 38.9° / 11.7°  
Antenna Centerline (AGL) 2.74 m / 9.0 ft

---

### Antenna Information

**Receive - P40381**

Manufacturer Patriot  
Model 380  
Gain / Diameter 42.1 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 225.9 km / 140.4 mi  
Precipitation Scatter Contour Radius 532.2 km / 330.6 mi

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10	9.61	118.23	-9.90	100.00
15	10.73	123.25	-9.90	100.00
20	11.50	125.43	-9.90	100.00
25	10.25	120.85	-9.90	100.00
30	11.54	117.02	-9.90	100.00
35	11.20	112.64	-9.90	100.00
40	11.78	108.40	-9.90	100.00
45	10.83	103.87	-9.90	100.00
50	11.35	99.54	-9.90	100.00
55	10.29	95.06	-9.90	100.00
60	9.16	90.67	-9.90	100.00
65	6.46	86.43	-9.90	120.51
70	6.17	82.25	-9.90	123.73
75	6.56	78.02	-9.90	119.45
80	7.18	73.74	-9.90	112.85
85	7.83	69.43	-9.90	105.92
90	7.94	65.25	-9.90	104.81
95	6.27	61.73	-9.90	122.65
100	4.89	58.39	-9.90	135.40
105	4.77	54.75	-9.90	137.07
110	5.97	50.54	-9.90	125.89
115	8.25	45.75	-9.05	105.33
120	9.90	41.30	-8.16	100.00
125	11.19	37.15	-7.33	100.00
130	13.26	32.57	-5.93	100.00
135	13.35	29.76	-4.81	100.00
140	13.46	27.51	-3.90	100.00
145	13.37	26.15	-3.36	100.00
150	13.57	25.37	-3.05	100.00
155	13.51	25.74	-3.20	100.00
160	13.42	27.00	-3.70	100.00
165	13.11	28.54	-4.32	100.00
170	13.09	29.44	-4.68	100.00
175	12.61	30.45	-5.08	100.00
180	12.50	30.74	-5.20	100.00
185	12.18	30.88	-5.25	100.00

# COMSEARCH

## Earth Station Data Sheet

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

### Coordination Values

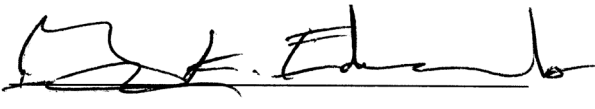
### BLAIRSVILLE, PA

Licensee Name Comcast Cable Communications, LLC  
Latitude (NAD 83) 40° 26' 12.8" N  
Longitude (NAD 83) 79° 56' 55.0" W  
Ground Elevation (AMSL) 244.62 m / 802.6 ft  
Antenna Centerline (AGL) 2.74 m / 9.0 ft  
Antenna Model Patriot 3.8 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	10.31	32.18	-5.77	101.41
195	7.74	33.72	-6.39	121.04
200	3.54	36.24	-7.15	173.91
205	2.35	35.40	-6.98	201.04
210	2.81	32.76	-6.00	195.67
215	2.88	30.17	-4.97	199.25
220	3.97	26.53	-3.51	183.65
225	4.06	23.50	-2.30	188.47
230	4.05	20.37	-1.05	195.25
235	5.82	15.77	1.64	185.20
240	6.41	11.97	5.13	198.02
245	6.49	8.43	8.10	212.18
250	6.24	5.69	9.71	225.94
255	6.27	6.29	8.81	219.70
260	6.40	9.78	7.32	208.58
265	6.19	14.32	2.78	187.22
270	6.21	19.02	-0.31	166.80
275	5.99	23.90	-2.46	157.76
280	5.76	28.81	-4.42	150.23
285	5.40	33.77	-6.41	144.78
290	4.82	38.77	-7.65	146.04
295	4.49	43.73	-8.65	146.47
300	4.23	48.68	-9.64	146.01
305	4.00	53.63	-9.90	148.36
310	3.76	58.59	-9.90	153.33
315	4.09	63.50	-9.90	146.89
320	4.12	68.45	-9.90	146.46
325	3.70	73.42	-9.90	154.49
330	3.90	78.36	-9.90	150.45
335	3.72	83.32	-9.90	154.07
340	5.65	88.26	-9.90	128.91
345	8.50	93.25	-9.90	100.00
350	9.47	98.25	-9.90	100.00
355	9.80	103.25	-9.90	100.00

## 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: May 23, 2018