

# FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for  
**Wake Forest University**  
**WINSTON-SALEM, NC**  
**Satellite Earth Station**

Prepared By:  
COMSEARCH  
19700 Janelia Farm Boulevard  
Ashburn, VA 20147  
May 06, 2016

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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 03/23/2016.

Company

General Dynamics - OTS, 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: 05/06/2016  
Job Number: 160323COMSGE07

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### Administrative Information

Status ENGINEER PROPOSAL  
Call Sign  
Licensee Code WFDDFM  
Licensee Name Wake Forest University

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### Site Information

**WINSTON-SALEM, NC**  
Venue Name WFDD  
Latitude (NAD 83) 36° 8' 6.4" N  
Longitude (NAD 83) 80° 16' 27.0" W  
Climate Zone A  
Rain Zone 1  
Ground Elevation (AMSL) 286.9 m / 941.3 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 147.9° to 253.1°  
Corresponding Elevation Angles 42.9° / 13.3°  
Antenna Centerline (AGL) 2.74 m / 9.0 ft

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### Antenna Information

**Receive - FCC32**  
Manufacturer Prodelin  
Model 1374  
Gain / Diameter 41.7 dBi / 3.7 m  
3-dB / 15-dB Beamwidth 1.40° / 2.40°

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) 30K0F1D - 10M3G7W / 3700.0 - 4200.0

Max Great Circle Coordination Distance 386.7 km / 240.3 mi  
Precipitation Scatter Contour Radius 607.5 km / 377.5 mi

# COMSEARCH

## Earth Station Data Sheet

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### Coordination Values

### WINSTON-SALE, NC

Licensee Name Wake Forest University  
Latitude (NAD 83) 36° 8' 6.4" N  
Longitude (NAD 83) 80° 16' 27.0" W  
Ground Elevation (AMSL) 286.9 m / 941.3 ft  
Antenna Centerline (AGL) 2.74 m / 9.0 ft  
Antenna Model Prodelin 3.7 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	0.91	106.51	-10.00	225.23
5	0.90	111.38	-10.00	225.66
10	1.00	116.25	-10.00	220.46
15	1.09	120.52	-10.00	217.62
20	1.30	117.38	-10.00	211.19
25	1.36	114.02	-10.00	209.51
30	1.18	110.47	-10.00	214.66
35	1.05	106.88	-10.00	218.76
40	1.00	103.25	-10.00	220.29
45	0.81	99.57	-10.00	230.68
50	0.70	95.87	-10.00	237.48
55	0.58	92.17	-10.00	244.47
60	0.59	88.48	-10.00	244.14
65	0.68	84.78	-10.00	238.14
70	0.79	81.08	-10.00	231.90
75	0.79	77.43	-10.00	232.02
80	0.63	73.86	-10.00	241.49
85	0.45	70.38	-10.00	255.42
90	0.36	66.97	-10.00	265.39
95	0.29	63.66	-10.00	273.44
100	0.30	60.45	-10.00	272.90
105	0.28	57.40	-10.00	275.69
110	0.24	54.54	-10.00	279.99
115	0.24	51.88	-10.00	279.87
120	0.25	49.47	-10.00	278.72
125	0.25	47.35	-9.88	279.35
130	0.28	45.56	-9.46	278.74
135	0.32	44.13	-9.12	275.84
140	0.00	43.48	-8.96	292.00
145	0.00	42.97	-8.83	292.83
150	0.00	42.93	-8.82	292.90
155	0.25	43.12	-8.87	286.68
160	0.00	44.24	-9.14	290.78
165	0.00	45.54	-9.46	288.74
170	0.00	46.92	-9.78	286.66
175	0.00	47.78	-9.98	285.41
180	0.00	48.07	-10.00	285.28
185	0.00	47.78	-9.98	285.40



# COMSEARCH

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### Coordination Values

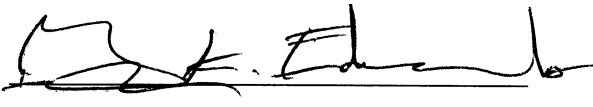
### WINSTON-SALE, NC

Licensee Name Wake Forest University  
Latitude (NAD 83) 36° 8' 6.4" N  
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Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 4.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	46.92	-9.78	286.66
195	0.00	45.53	-9.46	288.75
200	0.00	43.67	-9.00	291.69
205	0.00	41.40	-8.42	295.50
210	0.00	38.78	-7.71	300.23
215	0.00	35.86	-6.87	305.99
220	0.00	32.71	-5.87	313.56
225	0.00	29.36	-4.69	321.86
230	0.00	25.85	-3.31	331.83
235	0.00	22.21	-1.67	344.00
240	0.00	18.55	0.29	358.86
245	0.00	15.49	2.25	374.10
250	0.00	13.60	3.66	385.36
255	0.00	13.39	3.83	386.74
260	0.00	14.92	2.65	377.32
265	0.00	17.75	0.77	362.53
270	0.00	21.37	-1.24	347.16
275	0.00	25.44	-3.14	333.11
280	0.22	29.69	-4.82	318.00
285	0.37	34.16	-6.34	287.36
290	0.56	38.74	-7.70	259.75
295	0.43	43.48	-8.96	264.10
300	0.46	48.23	-10.00	253.83
305	0.56	53.00	-10.00	245.95
310	0.74	57.80	-10.00	234.88
315	0.66	62.65	-10.00	239.81
320	0.78	67.49	-10.00	232.66
325	0.67	72.36	-10.00	238.81
330	0.80	77.23	-10.00	231.61
335	0.96	82.10	-10.00	222.68
340	0.98	86.98	-10.00	221.16
345	1.08	91.87	-10.00	217.90
350	1.13	96.76	-10.00	216.19
355	0.72	101.62	-10.00	235.99

## 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 06, 2016