

# FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for  
**EchoStar Corporation**  
**MANTENO, IL**  
**Satellite Earth Station**

Prepared By:  
COMSEARCH  
19700 Janelia Farm Boulevard  
Ashburn, VA 20147  
November 07, 2011

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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 transmit-only earth station.

### Company

Clearwire Spectrum Holdings III, LLC  
Kankakee County Emergency Telephone Syst

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 10/10/2011.

Company

AT&T CORP  
AWB American Wireless Broadband LLC  
Alcatel-Lucent USA, Inc.  
Alda Wireless Holdings, Inc  
BP America, Inc.  
Bison Gear and Engineering Corporation  
Blackwater Telecom  
Blast Communications Inc  
Broadband Heaven Inc.  
Business Only Broadband, LLC  
CATERPILLAR OF DELAWARE INC  
CBS Broadcasting Inc  
CJE SeniorLife  
Chicago FCC License Sub, LLC  
China Cat Productions  
City of Aurora  
City of Bloomington  
Clearwire Spectrum Holdings III, LLC  
DLS COMPUTER SERVICES, INC.  
DONTRON INC  
DUPAGE COUNTY  
District 230  
EAST PORTER COUNTY SCHOOL CORPORATION  
ELK GROVE VILLAGE  
ELMHURST MEMORIAL HEALTHCARE  
Eye Surgical Associates  
FAIRNET LLC  
FiberTower Network Services Corp.  
Fourway Computer Products, Inc.  
Fox Valley Internet, Inc.  
GRUNDY COUNTY E.T.S.B.  
Governors State University  
HiPoint Technology Services Inc  
High Voltage Communications LLC  
ILLINOIS INSTITUTE OF TECHNOLOGY  
INDIAN PRAIRIE SCHOOL DISTRICT #204  
INTEGRATED TECHNOLOGY PROVIDERS  
Illinois Bell Telephone Company  
Illinois International Port District  
Indiana Department of Transportation

Indiana Wireless LLC  
Jefferson Microwave, LLC  
John G. Shedd Aquarium  
Joliet Public Schools District # 86  
Kaneland Community School District 302  
Kankakee County Emergency Telephone Syst  
Kankakee Valley Schools  
Kirby School District #140  
LA PORTE COUNTY GOVERNMENT  
LUCENT TECHNOLOGIES INC  
LYONS TOWNSHIP HIGH SCHOOL DISTRICT 204  
LaGrange School District 102  
M-Wave Networks LLC  
MIDWEST TELECOM OF AMERICA INC  
MLS ENGINEERING  
MPX, Inc.  
Microtek Computer Labs  
Monosol LLC  
MorganFranklin Corporation  
NBC TELEMUNDO LICENSE CO.  
New Trier High School District 203  
Nextlink Wireless, Inc  
Nextweb Inc  
Nokia Siemens Networks  
ORLAND FIRE PROTECTION DISTRICT  
Oak Park Elementary School District #97  
Olivet Nazarene University  
Open Range Communications  
PLAINFIELD SCHOOL DISTRICT #202  
PYXIS BROADBAND  
Porter County Government  
Ports of Indiana  
SILVER CROSS HOSPITAL  
STATE OF ILLINOIS, DEPT OF TRANSPORT  
SW Networks  
Sprint Spectrum, LP  
Sprintcom, Inc  
TELEFUTURA CHICAGO LLC  
THORNTON FRACTIONAL TOWNSHIP HS DIST 215  
Tate & Lyle  
The Chicago Switch, LLC  
Towerstream Corp  
UNIVERSITY OF CHICAGO  
Urbancom.net Wireless LLC  
Village of Franklin Park  
Village of Hoffman Estates  
Village of Niles  
Village of Orland Park Police Department  
Village of Tinley Park  
WAUBONSEE COMMUNITY COLLEGE  
WEIGEL BROADCASTING COMPANY  
WGBO License Partnership, G. P.  
WGN CONTINENTAL BROADCASTING CO  
WLS Television, Inc.  
Weblin Holdings LLC  
Will County 9-1-1

Wireless Backhaul Infrastructure, LLC  
db3 Broadband, LLC  
iSignal

## **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: 11/07/2011  
Job Number: 111010COMSGE01

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### Administrative Information

Status ENGINEER PROPOSAL  
Call Sign  
Licensee Code ZECHOS  
Licensee Name EchoStar Corporation

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### Site Information

**MANTENO, IL**  
Venue Name  
Latitude (NAD 83) 41° 12' 36.8" N  
Longitude (NAD 83) 87° 51' 14.4" W  
Climate Zone A  
Rain Zone 2  
Ground Elevation (AMSL) 206.3 m / 676.8 ft

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### Link Information

Satellite Type Geostationary  
Mode TR - Transmit-Receive  
Modulation Digital  
Satellite Arc 61° W to 148° West Longitude  
Azimuth Range 142.5° to 249.3°  
Corresponding Elevation Angles 35.0° / 13.5°  
Antenna Centerline (AGL) 7.92 m / 26.0 ft

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### Antenna Information

		<b>Receive - FCC32</b>		<b>Transmit - FCC32</b>	
Manufacturer		Vertex		Vertex	
Model		13.2 Meter		13.2 Meter	
Gain / Diameter		62.0 dBi / 13.2 m		65.0 dBi / 13.2 m	
3-dB / 15-dB Beamwidth		0.10° / 0.20°		0.10° / 0.30°	
Max Available RF Power	(dBW/4 kHz) (dBW/MHz)			-10.1 13.9	
Maximum EIRP	(dBW/4 kHz) (dBW/MHz)			54.9 78.9	
Interference Objectives:	Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz	20%
	Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz	0.0025%

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### Frequency Information

	<b>Receive 12.0 GHz</b>	<b>Transmit 17.3 GHz</b>
Emission / Frequency Range (MHz)	800KG2D - 24M0G7W / 12200.0 - 12700.0	800KG2D - 24M0G7W / 17300.0 - 17800.0
Max Great Circle Coordination Distance	294.4 km / 182.9 mi	169.5 km / 105.3 mi
Precipitation Scatter Contour Radius	512.6 km / 318.5 mi	100.0 km / 62.1 mi

# COMSEARCH

## Earth Station Data Sheet

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### Coordination Values

### MANTENO, IL

Licensee Name EchoStar Corporation  
Latitude (NAD 83) 41° 12' 36.8" N  
Longitude (NAD 83) 87° 51' 14.4" W  
Ground Elevation (AMSL) 206.3 m / 676.8 ft  
Antenna Centerline (AGL) 7.92 m / 26.0 ft  
Antenna Model Vertex 13.2 Meter  
Antenna Mode Receive 12.0 GHz Transmit 17.3 GHz  
Interference Objectives: Long Term -156.0 dBW/MHz 20% -151.0 dBW/4 kHz 20%  
Short Term -146.0 dBW/MHz 0.01% -128.0 dBW/4 kHz 0.0025%  
Max Available RF Power -10.1 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 12.0 GHz		Transmit 17.3 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.00	110.12	-10.00	227.19	-10.00	125.64
5	0.00	114.95	-10.00	227.19	-10.00	125.64
10	0.00	119.77	-10.00	227.19	-10.00	125.64
15	0.00	119.86	-10.00	227.19	-10.00	125.64
20	0.00	116.07	-10.00	227.19	-10.00	125.64
25	0.00	112.18	-10.00	227.19	-10.00	125.64
30	0.00	108.23	-10.00	227.19	-10.00	125.64
35	0.00	104.22	-10.00	227.19	-10.00	125.64
40	0.00	100.17	-10.00	227.19	-10.00	125.64
45	0.00	96.10	-10.00	227.19	-10.00	125.64
50	0.00	92.01	-10.00	227.19	-10.00	125.64
55	0.00	87.92	-10.00	227.19	-10.00	125.64
60	0.00	83.83	-10.00	227.19	-10.00	125.64
65	0.00	79.76	-10.00	227.19	-10.00	125.64
70	0.00	75.72	-10.00	227.19	-10.00	125.64
75	0.00	71.71	-10.00	227.19	-10.00	125.64
80	0.00	67.76	-10.00	227.19	-10.00	125.64
85	0.00	63.87	-10.00	227.19	-10.00	125.64
90	0.00	60.08	-10.00	227.19	-10.00	125.64
95	0.00	56.39	-10.00	227.19	-10.00	125.64
100	0.00	52.84	-10.00	227.19	-10.00	125.64
105	0.00	49.47	-10.00	227.19	-10.00	125.64
110	0.00	46.31	-9.64	228.75	-9.64	126.56
115	0.00	43.41	-8.94	231.86	-8.94	128.36
120	0.00	40.84	-8.28	234.86	-8.28	130.08
125	0.00	38.65	-7.68	237.61	-7.68	130.39
130	0.00	36.93	-7.18	239.93	-7.18	131.71
135	0.00	35.73	-6.83	241.61	-6.83	132.69
140	0.00	35.12	-6.64	242.51	-6.64	133.20
145	0.00	35.13	-6.64	242.50	-6.64	133.20
150	0.00	35.75	-6.83	241.59	-6.83	132.67
155	0.00	36.95	-7.19	239.89	-7.19	131.69
160	0.00	38.66	-7.68	237.60	-7.68	130.38
165	0.00	40.25	-8.12	235.58	-8.12	130.49
170	0.00	41.42	-8.43	234.16	-8.43	129.68
175	0.00	42.13	-8.62	233.32	-8.62	129.20
180	0.00	42.38	-8.68	233.04	-8.68	129.04
185	0.00	42.14	-8.62	233.32	-8.62	129.20

# COMSEARCH

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

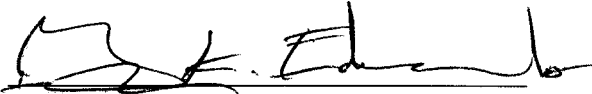
### MANTENO, IL

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Interference Objectives: Long Term -156.0 dBW/MHz 20% -151.0 dBW/4 kHz 20%  
Short Term -146.0 dBW/MHz 0.01% -128.0 dBW/4 kHz 0.0025%  
Max Available RF Power -10.1 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 12.0 GHz		Transmit 17.3 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	41.42	-8.43	234.16	-8.43	129.68
195	0.00	40.25	-8.12	235.58	-8.12	130.49
200	0.00	38.66	-7.68	237.60	-7.68	130.38
205	0.00	36.70	-7.12	240.24	-7.12	131.89
210	0.00	34.42	-6.42	244.06	-6.42	133.81
215	0.00	31.85	-5.58	248.13	-5.58	136.20
220	0.00	29.05	-4.58	253.06	-4.58	139.16
225	0.00	26.04	-3.39	259.02	-3.39	142.82
230	0.00	22.87	-1.98	266.27	-1.98	147.39
235	0.00	19.55	-0.28	275.24	-0.28	153.21
240	0.00	16.37	1.65	285.76	1.65	160.25
245	0.00	14.19	3.20	294.44	3.20	167.64
250	0.00	13.56	3.70	294.38	3.70	169.52
255	0.00	14.67	2.84	292.37	2.84	166.25
260	0.00	17.20	1.11	282.78	1.11	158.23
265	0.00	20.63	-0.86	272.14	-0.86	151.18
270	0.00	24.58	-2.77	262.21	-2.77	144.81
275	0.00	28.85	-4.50	253.43	-4.50	139.39
280	0.00	33.30	-6.06	245.79	-6.06	134.82
285	0.00	37.87	-7.46	238.64	-7.46	130.98
290	0.00	42.53	-8.72	232.86	-8.72	128.94
295	0.00	47.25	-9.86	227.80	-9.86	126.00
300	0.00	52.01	-10.00	227.19	-10.00	125.64
305	0.00	56.79	-10.00	227.19	-10.00	125.64
310	0.00	61.60	-10.00	227.19	-10.00	125.64
315	0.00	66.43	-10.00	227.19	-10.00	125.64
320	0.00	71.27	-10.00	227.19	-10.00	125.64
325	0.00	76.12	-10.00	227.19	-10.00	125.64
330	0.00	80.98	-10.00	227.19	-10.00	125.64
335	0.00	85.84	-10.00	227.19	-10.00	125.64
340	0.00	90.70	-10.00	227.19	-10.00	125.64
345	0.00	95.56	-10.00	227.19	-10.00	125.64
350	0.00	100.41	-10.00	227.19	-10.00	125.64
355	0.00	105.27	-10.00	227.19	-10.00	125.64

## 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: November 07, 2011