

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Cisco Systems, Inc.
BOXBOROUGH, MA
Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147
October 30, 2009

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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-receive earth station.

Company

FiberTower Network Services Corp.
Cellco Partnership - E-MA, NH, RI
Yankee Microwave, Inc.
Worcester Telephone Company
New Cingular Wireless PCS LLC - MA
Cellco Partnership - (W-NY)

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 09/24/2009.

Company

ALGONQUIN GAS TRANSMISSION CO
AT&T CORP
BAE Systems
Bank of America N.A.
Boston Catholic Television Inc.
Boston, City of
Cellco Partnership - (W-NY)
Cellco Partnership - CT, W-MA
Cellco Partnership - E-MA, NH, RI
Cellco Prtnrshp - Phil. Tri-State Rgn
City of Bristol Mayor's Office
City of New Haven Police Services
Clearwire Spectrum Holdings II, LLC
Community Wisp
Conterra Ultra Broadband, LLC
EAST HAMPTON TOWN POLICE DEPARTMENT
EMC CORPORATION
FiberTower Network Services Corp.
GREENWICH TOWN
Global Crossing Telecommunications, Inc.
Granite State Telephone, Inc.
Greater Boston Radio Inc.
Industrial Tower and Wireless, LLC
LACKAWANNA COUNTY
Local Communications Network, Inc.
MASSACHUSETTS BAY TRANSIT AUTHORITY
MASSACHUSETTS PORT AUTHORITY
MASSACHUSETTS STATE POLICE
MASSACHUSETTS WATER RESOURCES AUTHORITY
METROPOLITAN AREA NETWORKS, INC.
MVA.NET, LTD
Manchester-Nashua Cellular Telephone, LP
Massachusetts, Commonwealth Public Works
NEW HAMPSHIRE STATE POLICE
NEXTEL COMM. OF THE MID-ATLANTIC
NH #1 Rural Cellular, Inc.
NORTHEAST UTILITIES SERVICE COMPANY
NYNEX Mobile Limited Partnership 2
Nashua City New Hampshire
New Britain, City of

New Cingular Wireless PCS LLC - MA
New Cingular Wireless PCS LLC-Maine
New Cingular Wireless PCS, LLC - NY
New Cingular Wireless PCS, LLC - PA
New Hampshire RSA #2 Partnership
New York Communcations Co
Northeast Pennsylvania SMSA LTD Prtnrsh
Norton, Douglas R
Orange Poughkeepsie SMSA LTD Partnership
Pipeline Wireless, LLC
Portland Cellular Partnership - Maine
RCC ATLANTIC LICENSES LLC-NE EAST NTWK
RCC Atlantic Licenses, LLC
RCC Minnesota, Inc - E-MA,NH, RI, ME
STAMFORD, CITY OF
Southwestern NH District Fire Mutual Aid
State of New Hampshire Homeland Security
Towerstream, Inc
Town of Narragansett, Rhode Island
Verizon New England Inc.
Worcester Telephone Company
Yankee Microwave, Inc.
York County Maine

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: 10/30/2009
Job Number: 090924COMSGE01

Administrative Information

Status ENGINEER PROPOSAL
Call Sign
Licensee Code CISCOS
Licensee Name Cisco Systems, Inc.

Site Information

BOXBOROUGH, MA
Venue Name
Latitude (NAD 83) 42° 29' 0.6" N
Longitude (NAD 83) 71° 32' 26.4" W
Climate Zone A
Rain Zone 2
Ground Elevation (AMSL) 91.68 m / 300.8 ft

Link Information

Satellite Type Geostationary
Mode TR - Transmit-Receive
Modulation Digital
Satellite Arc 45° W to 142° West Longitude
Azimuth Range 143.5° to 256.5°
Corresponding Elevation Angles 34.1° / 5.6°
Antenna Centerline (AGL) 14.94 m / 49.0 ft

Antenna Information

		Receive - FCC32		Transmit - FCC32	
Manufacturer		Prodelin		Prodelin	
Model		1251		1251	
Gain / Diameter		47.6 dBi / 2.4 m		49.2 dBi / 2.4 m	
3-dB / 15-dB Beamwidth		0.70° / 1.40°		0.58° / 1.18°	
Max Available RF Power	(dBW/4 kHz) (dBW/MHz)			-14.0 10.0	
Maximum EIRP	(dBW/4 kHz) (dBW/MHz)			35.2 59.2	
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%

Frequency Information

	Receive 11.0 GHz	Transmit 14.0 GHz
Emission / Frequency Range (MHz)	1M60G7D - 6M50G7D / 10950.0 - 11200.0 1M60G7D - 6M50G7D / 11450.0 - 11700.0	1M60G7D - 6M50G7D / 14000.0 - 14500.0
Max Great Circle Coordination Distance	422.4 km / 262.4 mi	181.2 km / 112.6 mi
Precipitation Scatter Contour Radius	595.5 km / 370.0 mi	100.0 km / 62.1 mi

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Coordination Values

BOXBOROUGH, MA

Licensee Name Cisco Systems, Inc.
Latitude (NAD 83) 42° 29' 0.6" N
Longitude (NAD 83) 71° 32' 26.4" W
Ground Elevation (AMSL) 91.68 m / 300.8 ft
Antenna Centerline (AGL) 14.94 m / 49.0 ft
Antenna Model Prodelin 2.4 Meter
Antenna Mode Receive 11.0 GHz Transmit 14.0 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 -14.0 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 11.0 GHz		Transmit 14.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.49	103.43	-10.00	205.23	-10.00	100.00
5	0.25	108.40	-10.00	226.48	-10.00	111.88
10	0.41	113.38	-10.00	211.99	-10.00	100.00
15	0.00	118.33	-10.00	231.37	-10.00	115.80
20	0.57	117.41	-10.00	203.40	-10.00	100.00
25	1.12	113.61	-10.00	177.80	-10.00	100.00
30	1.13	109.56	-10.00	177.30	-10.00	100.00
35	0.88	105.41	-10.00	187.77	-10.00	100.00
40	0.85	101.28	-10.00	189.44	-10.00	100.00
45	0.98	97.13	-10.00	182.91	-10.00	100.00
50	1.24	92.96	-10.00	173.74	-10.00	100.00
55	0.94	88.76	-10.00	184.53	-10.00	100.00
60	0.89	84.58	-10.00	187.64	-10.00	100.00
65	0.42	80.46	-10.00	211.14	-10.00	100.00
70	0.00	76.41	-10.00	231.37	-10.00	115.80
75	0.00	72.34	-10.00	231.37	-10.00	115.80
80	0.00	68.33	-10.00	231.37	-10.00	115.80
85	0.33	64.27	-10.00	218.98	-10.00	105.70
90	0.00	60.50	-10.00	231.37	-10.00	115.80
95	0.00	56.73	-10.00	231.37	-10.00	115.80
100	0.48	52.84	-10.00	205.70	-10.00	100.00
105	0.58	49.28	-10.00	202.76	-10.00	100.00
110	0.30	46.14	-9.60	223.78	-9.60	109.26
115	0.00	43.31	-8.91	236.18	-8.91	118.51
120	0.33	40.33	-8.14	226.66	-8.14	110.02
125	0.00	38.25	-7.57	242.35	-7.57	121.91
130	0.00	36.37	-7.02	245.05	-7.02	123.30
135	0.00	35.01	-6.60	247.01	-6.60	124.35
140	0.00	34.25	-6.37	248.15	-6.37	124.96
145	0.00	34.11	-6.32	248.35	-6.32	125.07
150	0.00	34.62	-6.48	247.58	-6.48	124.65
155	0.00	35.75	-6.83	245.93	-6.83	123.77
160	0.21	37.21	-7.27	242.93	-7.27	122.03
165	0.00	38.92	-7.75	241.47	-7.75	121.43
170	0.28	39.77	-7.99	232.65	-7.99	114.71
175	0.32	40.41	-8.16	228.02	-8.16	111.17
180	0.00	40.96	-8.31	238.92	-8.31	120.03
185	0.00	40.73	-8.25	239.20	-8.25	120.19

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Coordination Values

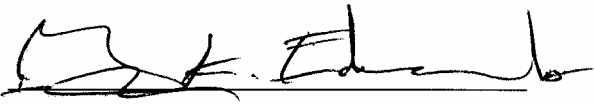
BOXBOROUGH, MA

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Latitude (NAD 83)	42° 29' 0.6" N		
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Antenna Mode	Receive 11.0 GHz		Transmit 14.0 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	-14.0 (dBW/4 kHz)		

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 11.0 GHz		Transmit 14.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	40.04	-8.06	240.05	-8.06	120.65
195	0.58	38.37	-7.60	209.91	-7.60	100.00
200	1.10	36.39	-7.02	192.05	-7.02	100.00
205	1.47	34.22	-6.36	184.13	-6.36	100.00
210	1.47	32.06	-5.65	187.59	-5.65	100.00
215	1.35	29.71	-4.82	194.67	-4.82	100.00
220	0.54	27.67	-4.05	227.63	-4.05	105.77
225	0.40	24.88	-2.90	245.23	-2.90	118.33
230	0.46	21.75	-1.44	246.99	-1.44	117.70
235	0.64	18.39	0.38	243.92	0.38	112.71
240	0.65	15.06	2.56	255.13	2.56	118.28
245	0.82	11.51	5.47	262.05	5.47	119.20
250	0.64	8.13	9.25	295.00	9.25	136.76
255	0.87	4.99	14.54	422.35	14.54	181.22
260	0.98	5.80	12.91	296.37	12.91	133.47
265	1.09	9.61	7.43	260.34	7.43	114.76
270	1.12	14.20	3.19	235.63	3.19	101.89
275	1.20	18.99	0.04	217.90	0.04	100.00
280	1.32	23.85	-2.44	203.65	-2.44	100.00
285	1.53	28.75	-4.47	191.41	-4.47	100.00
290	1.63	33.69	-6.19	180.04	-6.19	100.00
295	1.34	38.68	-7.69	181.59	-7.69	100.00
300	1.35	43.65	-9.00	174.89	-9.00	100.00
305	1.40	48.62	-10.00	168.19	-10.00	100.00
310	1.43	53.60	-10.00	167.33	-10.00	100.00
315	1.43	58.58	-10.00	167.15	-10.00	100.00
320	1.30	63.56	-10.00	171.77	-10.00	100.00
325	1.47	68.54	-10.00	163.11	-10.00	100.00
330	1.51	73.53	-10.00	161.87	-10.00	100.00
335	1.37	78.51	-10.00	169.23	-10.00	100.00
340	1.24	83.50	-10.00	173.64	-10.00	100.00
345	1.19	88.49	-10.00	175.38	-10.00	100.00
350	1.22	93.47	-10.00	174.33	-10.00	100.00
355	0.89	98.45	-10.00	187.50	-10.00	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: October 30, 2009