

# FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for  
**Liberty Broadcasting Network, Inc**  
**LYNCHBURG, VA**  
**Satellite Earth Station**

Prepared By:  
COMSEARCH  
19700 Janelia Farm Boulevard  
Ashburn, VA 20147  
October 13, 2010

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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

Alltel Communications of Virginia #1 LLC  
Cellco Partnership - Southern Virginia  
USCOC of Virginia RSA #3, Inc.

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.

Company

AT&T COMMUNICATIONS OF VIRGINIA INC  
Alltel Communications of Virginia #1 LLC  
Alltel Communications of Virginia, Inc.  
Bellsouth Telecommunications, Inc.  
Carolina Power & Light Company  
Cellco Partnership - Southern Virginia  
Cellco Partnership-Newark-Dallas Verizon  
County of Franklin, VA  
METROPOLITAN AREA NETWORKS, INC.  
Mecklenburg Electric Cooperative  
NTELOS Telephone, Inc.  
National Radio Astronomy Observatory  
Norfolk Southern Railway  
Peach Acquisitions LLC  
ROANOKE COUNTY  
Roanoke, City of  
South & Central Wireless, LLC - SOVA  
USCOC of Virginia RSA #2, Inc.  
USCOC of Virginia RSA #3, Inc.  
Virginia Cellular LLC  
Virginia Department of State Police  
Virginia Electric & Power Company  
Virginia PCS Alliance, L.C.  
Virginia RSA #7, 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: 10/13/2010

### Administrative Information

Call Sign E881163  
Licensee Name Liberty Broadcasting Network, Inc

### Site Information LYNCHBURG, VA

Latitude (NAD 83) 37° 21' 17.5" N  
Longitude (NAD 83) 79° 10' 49.1" W  
Climate Zone A  
Rain Zone 2  
Ground Elevation (AMSL) 240.79 m / 790.0 ft

### Link Information

Satellite Type Geostationary  
Mode TR - Transmit-Receive  
Modulation Digital  
Satellite Arc 65° W to 143° West Longitude  
Azimuth Range 157.4° to 253.4°  
Corresponding Elevation Angles 44.2° / 12.0°  
Antenna Centerline (AGL) 6.1 m / 20.0 ft

### Antenna Information

#### Receive - A40911

Manufacturer ANDREW CORPORATION  
Model ESA91-46  
Gain / Diameter 50.7 dBi / 9.1 m  
3-dB / 15-dB Beamwidth 0.50° / 1.00°

#### Transmit - A6091E

Manufacturer ANDREW CORPORATION  
Model ESA91-46  
Gain / Diameter 53.9 dBi / 9.1 m  
3-dB / 15-dB Beamwidth 0.32° / 0.62°

		<u>51K2G7W - 36M0G7W</u>			
Max Available RF Power	(dBW/4 kHz)			-13.01	-13.01
	(dBW/MHz)			-1.94	10.99
Maximum EIRP	(dBW/4 kHz)			40.89	40.89
	(dBW/MHz)			51.96	64.89
	(dBW)			51.96	80.43
Interference Objectives:	Long Term	-150.0 dBW/MHz	20%	-154.0 dBW/4 kHz	20%
	Short Term	-130.0 dBW/MHz	0.01%	-131.0 dBW/4 kHz	0.0025%

### Frequency Information

#### Receive 4.0 GHz

Emission / Frequency Range (MHz) 51K2G7W - 36M0G7W / 3700.0 - 4200.0

#### Transmit 6.1 GHz

Emission / Frequency Range (MHz) 51K2G7W - 36M0G7W / 5925.0 - 6425.0

Max Great Circle Coordination Distance 189.1 km / 117.5 mi 121.1 km / 75.3 mi  
Precipitation Scatter Contour Radius 399.2 km / 248.0 mi 100.0 km / 62.1 mi

# COMSEARCH

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### Coordination Values

### LYNCHBURG, VA

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Latitude (NAD 83) 37° 21' 17.5" N  
Longitude (NAD 83) 79° 10' 49.1" W  
Ground Elevation (AMSL) 240.79 m / 790.0 ft  
Antenna Centerline (AGL) 6.1 m / 20.0 ft  
Antenna Model ANDREW CORPORATION ESA91-46  
Antenna Mode Receive 4.0 GHz Transmit 6.1 GHz  
Interference Objectives: Long Term -150.0 dBW/MHz 20% -154.0 dBW/4 kHz 20%  
Short Term -130.0 dBW/MHz 0.01% -131.0 dBW/4 kHz 0.0025%  
Max Available RF Power -13.0 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 4.0 GHz		Transmit 6.1 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.60	106.27	-10.30	170.61	-10.10	106.33
5	1.55	111.23	-10.79	131.97	-12.57	100.00
10	1.55	116.13	-12.98	124.33	-20.10	100.00
15	2.96	121.17	-15.30	100.00	-20.10	100.00
20	2.96	123.61	-15.30	100.00	-20.10	100.00
25	2.96	120.47	-15.30	100.00	-20.10	100.00
30	2.96	117.18	-13.61	100.00	-20.10	100.00
35	3.97	114.15	-11.96	100.00	-18.40	100.00
40	3.97	110.57	-10.53	100.00	-11.24	100.00
45	3.91	106.90	-10.30	100.00	-10.10	100.00
50	5.02	103.40	-10.30	100.00	-10.10	100.00
55	5.02	99.58	-10.30	100.00	-10.10	100.00
60	4.60	95.69	-10.30	100.00	-10.10	100.00
65	5.22	91.86	-10.30	100.00	-10.10	100.00
70	5.22	87.97	-10.30	100.00	-10.10	100.00
75	4.94	84.12	-10.30	100.00	-10.10	100.00
80	5.48	80.19	-10.30	100.00	-10.10	100.00
85	5.59	76.33	-10.30	100.00	-10.10	100.00
90	5.60	72.51	-10.30	100.00	-10.10	100.00
95	5.92	68.66	-10.30	100.00	-10.10	100.00
100	6.95	64.60	-10.30	100.00	-10.10	100.00
105	6.95	60.93	-10.30	100.00	-10.10	100.00
110	8.07	56.85	-10.30	100.00	-10.10	100.00
115	8.07	53.38	-10.30	100.00	-10.10	100.00
120	7.87	50.20	-10.30	100.00	-10.10	100.00
125	8.42	46.75	-9.65	100.00	-10.10	100.00
130	8.42	43.91	-9.08	100.00	-10.10	100.00
135	7.47	42.17	-8.73	100.00	-10.10	100.00
140	7.91	39.71	-8.24	100.00	-10.10	100.00
145	7.91	38.07	-7.91	100.00	-10.10	100.00
150	6.83	37.98	-7.90	100.00	-10.10	100.00
155	7.13	37.12	-7.72	100.00	-10.10	100.00
160	6.27	38.00	-7.90	100.00	-10.10	100.00
165	6.27	38.56	-8.01	100.00	-10.10	100.00
170	6.07	39.74	-8.25	100.00	-10.10	100.00
175	6.07	40.41	-8.38	100.00	-10.10	100.00
180	5.22	41.47	-8.59	100.00	-10.10	100.00
185	5.22	41.24	-8.55	100.00	-10.10	100.00



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Interference Objectives: Long Term -150.0 dBW/MHz 20% -154.0 dBW/4 kHz 20%  
Short Term -130.0 dBW/MHz 0.01% -131.0 dBW/4 kHz 0.0025%  
Max Available RF Power -13.0 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 4.0 GHz		Transmit 6.1 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	4.26	41.50	-8.60	100.00	-10.10	100.00
195	4.34	40.26	-8.35	100.00	-10.10	100.00
200	3.29	39.60	-8.22	105.86	-10.10	100.00
205	3.29	37.55	-7.81	107.43	-10.10	100.00
210	3.29	35.14	-7.33	109.28	-10.10	100.00
215	2.44	33.07	-6.91	126.70	-10.10	100.00
220	2.44	30.07	-6.31	128.97	-10.10	100.00
225	1.06	27.83	-5.87	164.78	-10.10	100.00
230	1.06	24.43	-5.19	169.83	-10.10	100.00
235	1.09	20.86	-4.47	172.03	-10.10	100.00
240	1.26	17.10	-3.72	170.28	-7.78	100.00
245	1.32	13.57	-0.87	181.54	-4.67	100.00
250	2.07	10.51	4.19	184.27	-3.10	100.00
255	1.99	10.17	4.53	187.93	-3.10	100.00
260	2.16	11.86	1.98	171.06	-3.96	100.00
265	2.16	15.19	-3.34	144.55	-6.25	100.00
270	1.85	19.41	-4.18	148.73	-9.62	100.00
275	2.35	23.58	-5.02	134.32	-10.10	100.00
280	2.78	28.06	-5.91	124.14	-10.10	100.00
285	2.41	32.90	-6.88	127.29	-10.10	100.00
290	2.53	37.65	-7.83	121.40	-10.10	100.00
295	2.78	42.44	-8.79	113.20	-10.10	100.00
300	2.35	47.38	-9.78	117.68	-10.10	100.00
305	1.97	52.31	-10.30	123.49	-10.10	100.00
310	2.17	57.17	-10.30	119.34	-10.10	100.00
315	2.03	62.08	-10.30	122.15	-10.10	100.00
320	1.81	67.00	-10.30	127.15	-10.10	100.00
325	1.88	71.91	-10.30	125.69	-10.10	100.00
330	1.40	76.85	-10.30	136.12	-10.10	100.00
335	1.00	81.77	-10.30	147.03	-10.10	100.00
340	0.37	86.68	-10.30	189.13	-10.10	121.14
345	0.66	91.58	-10.30	165.61	-10.10	103.83
350	0.60	96.48	-10.30	170.89	-10.10	106.54
355	0.67	101.38	-10.30	165.08	-10.10	103.42

## 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.



Timothy O. Crutcher  
Frequency Planner  
COMSEARCH  
19700 Janelia Farm Boulevard  
Ashburn, VA 20147

DATED: October 13, 2010