

# FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for  
**KANSAS STATE UNIV. RADIO NETWORK**  
**MANHATTAN, KS**  
**Satellite Earth Station**

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June 19, 2003

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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

Mid Kansas Inc.  
Montgomery Communications 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 with a letter dated 04/30/2003.

Company

AT&T CORP

CORBAN COMMUNICATIONS INC.

DOBSON CELLULAR OF KANSAS/MISSOURI, INC.

DOBSON CELLULAR SYSTEMS, INC.

GREAT PLAINS ENERGY, INC

KANSAS CITY SMSA LIMITED PARTNERSHIP

MCI NETWORK SERVICES INC

MID KANSAS INC

MONTGOMERY COMMUNICATIONS INC

PATHNET, INC. - DEBTOR IN POSSESSION

ST. JOSEPH SMSA LIMITED PARTNERSHIP

THE BURLINGTON NORTHERN AND SANTA FE

WICHITA SMSA LIMITED PARTNERSHIP

WWC LICENSE L.L.C.

## **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.

SATELLITE EARTH STATION  
 FREQUENCY COORDINATION DATA  
 04/30/2003

Company	KANSAS STATE UNIV. RADIO NETWORK		
Owner code	KSURAD		
Earth Station Name, State	MANHATTAN, KS		
Latitude (DMS) (NAD83)	39 11 13.0 N		
Longitude (DMS) (NAD83)	96 34 45.0 W		
Ground Elevation AMSL (Ft/m)	1060.05 /	323.09	
Antenna Centerline AGL (Ft/m)	9.00 /	2.74	
Receive Antenna Type:	P40381	PRODELIN	
4.0 GHz Gain (dBi) / Diameter (m)	42.1 /	3.8	
3 dB / 15 dB Half Beamwidth	0.70 /	1.40	
Transmit Antenna Type:	P60381	PRODELIN	
6.0 GHz Gain (dBi) / Diameter (m)	46.0 /	3.8	
3 dB / 15 dB Half Beamwidth	0.50 /	1.00	
Operating Mode	TRANSMIT AND RECEIVE		
Modulation	DIGITAL		
Emission / Receive Band (MHz)	154KG7D - 200KG7D /	3700.0000 - 4200.0000	
Emission / Transmit Band (MHz)	154KG7D - 200KG7D /	5925.0000 - 6425.0000	
Max. Available RF Power (dBW)/4 kHz	-2.80		
(dBW)/MHz	21.20		
Max. EIRP (dBW)/4 kHz	43.20		
(dBW)/MHz	67.20		
Max permissible Interference Power			
4.0 GHz, 20% (dBW/1 MHz)	-156.0		
4.0 GHz, 0.0100% (dBW/1 MHz)	-146.0		
6.0 GHz, 20% (dBW/4 kHz)	-154.0		
6.0 GHz, 0.0025% (dBW/4 kHz)	-131.0		
Range of Satellite Arc (Geostationary)			
Degrees Longitude	60.0 W /	143.0 W	
Azimuth Range (Min/Max)	130.4 /	239.0	
Corresponding Elevation Angles	31.0 /	24.4	
Radio Climate	A		
Rain Zone	2		
Max Great Circle Coordination Distance (Mi/Km)			
4.0 GHz	188.6 /	303.6	
6.0 GHz	112.3 /	180.7	
Precipitation Scatter Contour Radius (Mi/Km)			
4.0 GHz	308.4 /	496.4	
6.0 GHz	62.1 /	100.0	

Table of Earth Station Coordination Values  
04/30/2003

Earth Station Name        MANHATTAN KS  
 Owner                    KANSAS STATE UNIV. RADIO NETWORK  
 Latitude (DMS) (NAD83) 39 11 13.0 N  
 Longitude (DMS) (NAD83) 96 34 45.0 W  
 Ground Elevation (Ft/m)    1060.05 /    323.09 AMSL  
 Antenna Centerline (Ft/m)    9.00 /    2.74 AGL  
 Antenna Model                PRODELIN 3.8 Meter  
 Objectives: Receive        -156.0 (dBW /1 MHz)  
                               Transmit        -154.0 (dBW /4 kHz)    TX Power        -2.8 (dBW/4 kHz)

Azimuth (Deg)	Horizon Elevation Angle (Deg)	Antenna Disc. Angle (Deg)	4.0 GHz		6.0 GHz	
			Antenna Gain (dBi)	Coordination Distance (Km)	Antenna Gain (dBi)	Coordination Distance (Km)
0	0.00	117.99	-9.90	285.9	-10.00	170.2
5	1.51	120.28	-9.90	205.7	-10.00	104.1
10	1.53	116.14	-9.90	205.3	-10.00	103.7
15	1.70	111.97	-9.90	203.0	-10.00	100.0
20	1.64	107.69	-9.90	204.6	-10.00	100.8
25	1.58	103.38	-9.90	206.3	-10.00	102.4
30	1.85	99.08	-9.90	198.9	-10.00	100.0
35	1.72	94.72	-9.90	202.4	-10.00	100.0
40	1.75	90.36	-9.90	201.6	-10.00	100.0
45	2.04	85.99	-9.90	194.1	-10.00	100.0
50	2.09	81.62	-9.90	192.8	-10.00	100.0
55	1.30	77.37	-9.90	211.7	-10.00	109.5
60	1.20	73.10	-9.90	214.7	-10.00	112.2
65	1.40	68.80	-9.90	208.8	-10.00	106.9
70	0.00	64.98	-9.90	285.9	-10.00	170.2
75	0.00	60.90	-9.90	285.9	-10.00	170.2
80	0.00	56.91	-9.90	285.9	-10.00	170.2
85	0.00	53.03	-9.90	285.9	-10.00	170.2
90	0.00	49.29	-9.76	286.8	-9.86	170.8
95	0.00	45.72	-9.04	291.4	-9.14	173.6
100	0.00	42.37	-8.37	295.8	-8.47	176.2
105	0.00	39.30	-7.76	299.9	-7.86	178.5
110	0.00	36.59	-7.22	303.5	-7.32	180.6
115	0.47	33.90	-6.46	274.5	-6.56	153.3
120	0.80	31.83	-5.63	256.8	-5.73	138.0
125	0.81	30.67	-5.17	258.9	-5.27	139.0
130	0.83	30.22	-4.99	259.1	-5.09	139.0
135	0.76	30.60	-5.14	262.7	-5.24	141.9
140	0.81	31.59	-5.53	256.9	-5.63	138.0
145	0.91	33.18	-6.17	246.5	-6.27	132.5
150	0.84	35.49	-7.00	245.8	-7.10	133.1
155	0.79	37.92	-7.48	246.2	-7.58	134.1
160	0.56	40.17	-7.93	258.1	-8.03	142.3
165	0.41	41.97	-8.29	269.8	-8.39	152.2
170	0.00	43.61	-8.62	294.2	-8.72	175.2
175	0.38	44.00	-8.70	271.5	-8.80	154.3
180	0.00	44.64	-8.83	292.8	-8.93	174.4



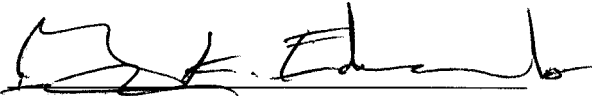
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Azimuth (Deg)	Horizon Elevation Angle (Deg)	Antenna Disc. Angle (Deg)	4.0 GHz		6.0 GHz	
			Antenna Gain (dBi)	Coordination Distance (Km)	Antenna Gain (dBi)	Coordination Distance (Km)
185	0.24	44.14	-8.73	288.4	-8.83	170.4
190	0.00	43.61	-8.62	294.2	-8.72	175.2
195	0.00	42.36	-8.37	295.8	-8.47	176.2
200	0.00	40.66	-8.03	298.1	-8.13	177.5
205	0.31	38.32	-7.56	286.8	-7.66	165.5
210	1.04	35.33	-6.97	235.3	-7.07	125.2
215	0.69	32.93	-6.07	260.9	-6.17	141.8
220	0.92	29.83	-4.83	254.1	-4.93	135.1
225	0.94	27.09	-3.73	259.8	-3.83	137.9
230	1.35	24.63	-2.75	250.0	-2.85	131.1
235	1.49	23.22	-2.19	248.5	-2.29	129.5
240	1.32	23.08	-2.13	255.0	-2.23	133.9
245	1.30	23.81	-2.42	253.8	-2.52	133.4
250	1.19	25.54	-3.12	253.3	-3.22	133.8
255	1.19	27.93	-4.07	247.1	-4.17	130.5
260	1.13	30.95	-5.28	241.9	-5.38	128.0
265	1.08	34.38	-6.65	235.7	-6.75	125.1
270	0.99	38.14	-7.53	234.2	-7.63	125.1
275	1.13	42.00	-8.30	224.9	-8.40	118.7
280	1.03	46.16	-9.13	223.7	-9.23	118.7
285	1.01	50.40	-9.90	220.5	-10.00	117.1
290	1.45	54.60	-9.90	207.4	-10.00	105.6
295	1.96	58.89	-9.90	196.1	-10.00	100.0
300	2.22	63.34	-9.90	189.9	-10.00	100.0
305	2.27	67.88	-9.90	188.7	-10.00	100.0
310	2.31	72.46	-9.90	187.9	-10.00	100.0
315	2.33	77.06	-9.90	187.3	-10.00	100.0
320	2.30	81.68	-9.90	188.2	-10.00	100.0
325	2.24	86.31	-9.90	189.5	-10.00	100.0
330	2.14	90.94	-9.90	191.8	-10.00	100.0
335	2.09	95.57	-9.90	192.8	-10.00	100.0
340	2.06	100.18	-9.90	193.6	-10.00	100.0
345	1.92	104.78	-9.90	197.0	-10.00	100.0
350	1.65	109.32	-9.90	204.5	-10.00	100.7
355	1.36	113.81	-9.90	210.1	-10.00	108.0

## 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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COMSEARCH  
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DATED: June 19, 2003