

**DELAWDER COMMUNICATIONS, INC.**

5568 General Washington Drive, Suite A-218

Alexandria, Virginia 22312

(703) 658-5390

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**ENGINEERING REPORT**

Blue Earth-Nicollet-Faribault Cooperative Electric Assoc.  
K16GL, Jackson, MN (Channel 16+ Minor Modification)

**EXHIBIT 6**

**LPTV MINOR MODIFICATION – INTERFERENCE STUDIES**

**I. Introduction**

1. Blue Earth-Nicollet-Faribault Cooperative Electric Assoc. (“BENCO”) owns a construction permit for K16GL, Jackson, MN, channel 16(+). By this application, BENCO is requesting a minor modification to K16GL to install a different omnidirectional transmit antenna (a Scala SL-8-2), and to move the antenna from the side to the top of the support tower. The antenna radiation centerline is being increased by 26.8 meters by this modification. No other changes are proposed. No new mutual exclusivity results from this modification.

2. All terrain studies use USGS/DMA three arc-second data.

3. Attached as Table 1 is a Dataworld TV Spacing Study for Channel 16(+). The Dataworld Study was conducted from a reference site at the unchanged transmitter location (N 43° 36' 12"; W 94° 59' 33"; NAD 27). Protection to the following stations has caused design constraints to the proposed Channel 16(+) transmit facility:

- a. K16CG, St. James, MN, Licensed LPTV Channel 16z;
- b. KXNE-DT, Norfolk, NE, Licensed DTV Channel 16d;
- c. KTCI-DT, St. Paul, MN, Licensed DTV Channel 16d;
- d. KD SM-DT, Des Moines, IA, CP DTV Channel 16d;
- e. KSMN-DT, Worthington, MN, CP DTV Channel 15d;
- f. K23FO, Jackson, MN, App LPTV Channel 17z.

4. A discussion and/or a detailed interference study is included for each station, listed above. All other stations listed on Table 1 are either too far away to require a detailed study (and are obviously protected), or do not require protection pursuant to

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the FCC Rules. Tables 2A and 2B, attached, include the proposed service and interference contour distances for the proposed facility.

5. The use of frequency offset is required, and is made in order to add protection to any nearby analog co-channel station. The applicant will maintain the requested offset per 47 C.F.R. Section 74.761 by use of a precision oscillator supplied by the transmitter manufacturer.

**II. Interference Studies**

Regarding K16CG, St. James, MN, LPTV Channel 16z

6. In accordance with 47 C.F.R. Section 74.707(d)(1), a co-channel UHF LPTV station is protected to a C/I ratio that is no less than 28 dB for offset carrier frequency operation. As demonstrated by Figure 1A, attached, the 46 dBu (F50,10) interference contour for the proposed facility will not overlap with the 74 dBu (F50,50) service contour of K16CG. Since offset is proposed between the two co-channel stations, adequate protection to K16CG will exist. (Figure 1B is a tabulation of the K16CG service contour.)

Regarding KXNE-DT, Norfolk, NE, Channel 16d

7. In accordance with 47 C.F.R. Section 74.706(d)(1), a co-channel DTV UHF station is protected to a C/I ratio of 21 dB. As demonstrated by Figure 2A, attached, the 20 dBu (F50,10) interference contour for the proposed facility will not overlap with the 41 dBu (F50,90) noise-limited service contour of KXNE-DT. Adequate protection to KXNE-DT will exist. (Figure 2B is a tabulation of the KXNE-DT service contour.)

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Regarding KTCI-DT, St. Paul, MN, Channel 16d

8. In accordance with 47 C.F.R. Section 74.706(d)(1), a co-channel DTV UHF station is protected to a C/I ratio of 21 dB. As demonstrated by Figure 3A, attached, the 20 dBu (F50,10) interference contour for the proposed facility will overlap with the 41 dBu (F50,90) noise-limited service contour of KTCI-DT. (Figure 3B is a tabulation of the KTCI-DT service contour.)

9. Using the service and interference contours, interference is predicted to result; however, the FCC allows for the use of the Longley-Rice point-to-point radio propagation model, version 1.2.2 (hereafter "Longley-Rice") in order to demonstrate that interference will not be caused to a DTV station. (A description of the allowed use of Longley-Rice {as stated by the FCC}, and a description of the Longley-Rice studies included with this application, are made in Section III, below.) Using Longley-Rice, as demonstrated by Figure 3C, co-channel interference to KTCI-DT is not predicted to result from the proposed facility.

Regarding KDSM-DT, Des Moines, IA, Channel 16d

10. In accordance with 47 C.F.R. Section 74.706(d)(1), a co-channel DTV UHF station is protected to a C/I ratio of 21 dB. As demonstrated by Figure 4A, attached, the 20 dBu (F50,10) interference contour for the proposed facility will overlap with the 41 dBu (F50,90) noise-limited service contour of KDSM-DT. (Figure 4B is a tabulation of the KDSM-DT service contour.)

11. Using the service and interference contours, interference is predicted to result; however, by using Longley-Rice, as demonstrated by Figure 4C, co-channel interference to KDSM-DT is not predicted to result from the proposed facility. (See paragraph 10, above, and Section III, below, for a discussion of Longley-Rice.)

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Regarding KSMN-DT, Worthington, MN, Channel 15d

12. In accordance with 47 C.F.R. Section 74.706(d)(2), an adjacent-channel DTV UHF station is protected to a C/I ratio of -48 dB. As demonstrated by Figure 5A, attached, the 89 dBu (F50,50) interference contour for the proposed facility will overlap with the 41 dBu (F50,90) noise-limited service contour of KSMN-DT. (Figure 5B is a tabulation of the KSMN-DT service contour.)

13. Using the service and interference contours, interference is predicted to result; however, by using Longley-Rice, as demonstrated by Figure 5C, adjacent-channel interference to KSMN-DT is not predicted to result from the proposed facility. (See paragraph 10, above, and Section III, below, for a discussion of Longley-Rice.)

Regarding K23FO, Jackson, MN, LPTV Channel 17z

14. In accordance with 47 C.F.R. Section 74.707(d)(4), an adjacent-channel UHF LPTV station is protected to a C/I ratio that is no less than -15 dB. The proposed facility is collocated with the proposed channel 17z facility, and will not transmit with more than 6 dB ERP of channel 17 in any direction. The channel 17 facility will be adequately protected by this proposal.

**III. DESCRIPTION OF LONGLEY-RICE STUDIES**

15. With the support of a waiver request, 47 C.F.R. Sections 74.705(e) and 74.707(e) allow for the use of Longley-Rice in order to demonstrate protection to TV broadcast analog stations and LPTV stations, respectively. Furthermore, Paragraph 145 of the FCC's *In the Matter of Advanced Television Systems and Their Impact upon the Existing Television Broadcast Service - Sixth Report and Order (FCC 97-115, released April 21, 1997)* (hereafter "DTV 6th R & O.") also allows for the use of Longley-Rice in order to demonstrate protection to DTV stations. This paragraph states, in part, that "{The FCC} will allow low power TV and TV translator applicants to

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make use of terrain shielding and the Longley-Rice terrain dependent propagation methods, and other established engineering techniques, such as receiving antenna modeling, to show that interference will not be caused to DTV stations". Furthermore, 47 C.F.R. Section 73.622(e) states that "within {the noise-limited} contour {of a DTV station}, service is considered available at locations where the station's signal strength, as predicted using the terrain dependent Longley-Rice point-to-point propagation model, exceeds the levels above {41 dBu for UHF}".

16. While the use of Longley-Rice for analog TV and LPTV protection specifically indicates that such use must include a waiver request, the need for a waiver request when applying Longley-Rice in order to show protection to a DTV station is not similarly mentioned in the FCC Rules or policies. If deemed necessary by the FCC, a waiver request will be submitted.

17. EDX Engineering, Inc.'s computer software program MSITE™ includes the Longley-Rice version 1.2.2 model; and the MSITE™ program is used to conduct the Longley-Rice studies which are included with this application. With the exception of not being able to identify and use population centroids, the procedures and parameters specified by the FCC's OET Bulletin No. 69, *Longley-Rice Methodology for Evaluating TV Coverage and Interference* (dated July 2, 1997) are used by the MSITE™ program. In order to compensate for the programs inability to choose population centroids, the grid size for each study has been reduced from two kilometer spacing (the spacing used by the FCC), to one kilometer or less spacing. With the reduced grid spacing, the applicant can confidently conclude that a study using population centroids will also demonstrate protection from interference.

18. The software is limited to a study distance of 300 kilometers; therefore, in some instances, the study is truncated at 300 kilometers from the proposed transmitter site. Interference is not predicted to result beyond 300 kilometers from the proposed LPTV transmitter site. Furthermore, any contour overlap area is located completely within 300 kilometers; and, therefore, the contour overlap area is completely studied.

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19. For each Longley-Rice study, the dipole factor adjustment specified by OET Bulletin No. 69 is applied to both the point-to-point evaluation and the contour distances. Also, USGS three arc-second terrain data is used. The product of each study is a map which identifies those examined points of the study-grid (within the protected station's applicable Grade B or noise-limited contour) which are above or below the C/I protection requirement. (For the included studies, all C/I results are above the required protection standards.)

20. As allowed by OET Bulletin No. 69, only those grid points which are predicted to receive a field strength from the desired station that is above the threshold for reception are considered. Conservatively, a desired station's threshold of reception has been reduced by at least two decibels for the Longley-Rice studies which support this application. The MSITE™ output exhibits of this application show the threshold of reception as the corresponding minimum allowed receive power.

21. As with most complicated computer propagation models, much of the underlying data of each study cannot be easily generated or reported in text form. To the extent possible, if requested by the FCC, additional data regarding the Longley-Rice studies will be provided.

**Delawder Communications, Inc.  
Alexandria, VA**

TABLE 1, Page 1 of 1  
Thursday, Dec 9, 2004

Dataworld LPTV/TV Translator Interference Study

**Title: Jackson, MN**

Channel: 16 Offset: Plus (482-488 MHz) Analog  
Database: FCC 5/18/2004 11:20:00 PM (No change thru 12/9/2004)

ERP: 3 kW  
HAAT: 100.0 m

Latitude: N 43° 36' 12.0"  
Longitude: W 94° 59' 33.0"  
Safety Zone: 0.0 km

Call	Auth	Licensee name	Chan	HAAT(m)	ERP	Latitude	Br-to	Dist	Req
City of License		St	FCC File Number	Zone	HAMSL(m)	Longitude	-from	(km)	(km)
K15EB	LIC	INDEPENDENT COMMUNICATIONS, INC.	15 o		16.2	N 43° 37' 02.0"	271.8	56.24	
WORTHINGTON		MN BLTT-19940721JF		635.0		W 95° 41' 20.0"	91.3		

**Calculated HAAT: 136 m**

**DeLawder Note: Too Far; No interference study is required.**

KSMN	CP	WEST CENTRAL MINNESOTA EDUCATION	15	290.1	200	N 43° 53' 52.0"	293.4	83.57	
WORTHINGTON		MN BPEDT-20000501AII	II	809.3		W 95° 56' 50.0"	112.8		

Digital channelDA: DIE TFU-24DSC S180 @ 0.0°

**DeLawder Note: Attached study shows adequate protection; See Engineering Statement.**

K16CG	LIC	COOPERATIVE TV ASSN. OF SOUTHERN	16 o		0.992	N 44° 06' 28.0"	29.2	64.38	
ST. JAMES		MN BLTTL-19970507JJ		497.0		W 94° 35' 55.0"	209.5		

**Calculated HAAT: 184 m**

**DeLawder Note: Attached study shows adequate protection; See Engineering Statement.**

JD0415YZ	APP	HARLAN L. JACOBSON	16 -		18.8	N 42° 45' 04.0"	207.3	106.4	
CHEROKEE		IA BPTTL-JD0415YZ		412.0		W 95° 35' 23.0"	26.9		

**Calculated HAAT: 2 m**

**DeLawder Note: Too Far; No interference study is required.**

K16CP	LIC	MINNESOTA VALLEY TV IMPROVEMENT	16 +		1.67	N 44° 48' 17.0"	340.9	141.5	
GRANITE FALLS		MN BLTTL-19910227JZ		404.0		W 95° 34' 49.0"	160.5		

**Calculated HAAT: 91 m**

**DeLawder Note: Too Far; No interference study is required.**

KTCI-TV	LIC	TWIN CITIES PUBLIC TELEVISION, I	*16	394.0	50	N 45° 03' 29.0"	41.9	219.9	
ST. PAUL		MN BLEDT-19990920AAW	II	677.0		W 93° 07' 27.0"	223.2		

Digital channelDA: AND ATW30H4-DSC3-17S, EII @ 0.0°

**DeLawder Note: Attached study shows adequate protection; See Engineering Statement.**

KDSM-TV	CP	KDSM LICENSEE, LLC	16	612.0	500	N 41° 49' 47.0"	149.8	227.0	
DES MOINES		IA BPCDT-19991028ACE	II	902.5		W 93° 36' 56.0"	330.8		

Digital channelDA: DIE TFU-28GTH-R 06SP DC @ 0.0°

**DeLawder Note: Attached study shows adequate protection; See Engineering Statement.**

KXNE-TV	LIC	NEBRASKA EDUCATIONAL TELECOMMUNI	*16	253.2	200	N 42° 14' 15.0"	231.6	240.5	
NORFOLK		NE BLEDT-20031016ACA	II	770.0		W 97° 16' 41.0"	50.0		

Digital channelDA: AND ALP32M3-HSOC-16 @ 0.0°

**DeLawder Note: Attached study shows adequate protection; See Engineering Statement.**

K23FO	APP	FEDERATED RURAL ELECTRIC ASSOCIA	17 o		0.8	N 43° 36' 12.0"	0.0	0.000	
JACKSON		MN BMJPTTL-20000821AHH		525.1		W 94° 59' 33.0"	0.0		

**Calculated HAAT: 90 m**

**DeLawder Note: Attached study shows adequate protection; See Engineering Statement.**

>> End of channel 16 study <<

TABLE 2A - JACKSON, MN F50,50 CONTOURS

DATE: December 9, 2004

DISTANCES TO CONTOURS (Kilometers):

Antenna COR elevation (AMSL): 537 mtrs Average HAAT: 103 mtrs

Frequency: 485.0000 MHz

Coordinates: N 43 36 12.00 W 94 59 33.00

F(50,50) Curves Number of Contours: 5

AZ (degs)	HAAT (m)	ERPd (kW)	CONTOUR LEVELS (dBu):				
			89.0	80.0	79.0	74.0	70.0
0.0	101	3.0000	4.6	7.7	8.1	10.7	13.4
15.0	105	3.0000	4.7	7.8	8.3	11.0	13.7
30.0	110	3.0000	4.8	8.0	8.5	11.2	14.0
45.0	113	3.0000	4.8	8.1	8.6	11.3	14.2
60.0	115	3.0000	4.8	8.2	8.7	11.4	14.3
75.0	115	3.0000	4.9	8.2	8.7	11.5	14.4
90.0	118	3.0000	4.9	8.3	8.8	11.6	14.5
105.0	115	3.0000	4.8	8.2	8.7	11.4	14.3
120.0	113	3.0000	4.8	8.1	8.6	11.4	14.2
135.0	116	3.0000	4.9	8.2	8.7	11.5	14.4
150.0	132	3.0000	5.2	8.7	9.3	12.2	15.5
165.0	110	3.0000	4.8	8.0	8.5	11.2	14.0
180.0	100	3.0000	4.5	7.6	8.1	10.7	13.4
195.0	107	3.0000	4.7	7.9	8.4	11.1	13.8
210.0	104	3.0000	4.6	7.8	8.3	10.9	13.6
225.0	99	3.0000	4.5	7.6	8.0	10.7	13.3
240.0	94	3.0000	4.4	7.4	7.8	10.4	12.9
255.0	92	3.0000	4.4	7.3	7.8	10.3	12.8
270.0	88	3.0000	4.3	7.2	7.6	10.1	12.5
285.0	82	3.0000	4.1	6.9	7.3	9.7	12.1
300.0	75	3.0000	3.9	6.6	7.0	9.3	11.6
315.0	76	3.0000	4.0	6.7	7.1	9.4	11.7
330.0	99	3.0000	4.5	7.6	8.0	10.7	13.3
345.0	104	3.0000	4.6	7.8	8.2	10.9	13.6

TABLE 2B - JACKSON, MN F50,10 CONTOURS

DATE: December 9, 2004

DISTANCES TO CONTOURS (Kilometers):

Antenna COR elevation (AMSL): 537 mtrs Average HAAT: 103 mtrs

Frequency: 485.0000 MHz

Coordinates: N 43 36 12.00 W 94 59 33.00

F(50,10) Curves Number of Contours: 5

AZ (degs)	HAAT (m)	ERPd (kW)	CONTOUR LEVELS (dBu):				
			89.0	80.0	79.0	74.0	70.0
0.0	101	3.0000	48.7	74.8	110.4	159.2	164.9
15.0	105	3.0000	49.4	75.6	111.3	160.1	165.8
30.0	110	3.0000	50.1	76.4	112.1	161.0	166.6
45.0	113	3.0000	50.4	76.8	112.6	161.4	167.1
60.0	115	3.0000	50.7	77.2	112.9	161.8	167.4
75.0	115	3.0000	50.8	77.3	113.0	161.9	167.5
90.0	118	3.0000	51.1	77.7	113.4	162.3	167.9
105.0	115	3.0000	50.7	77.2	112.9	161.8	167.4
120.0	113	3.0000	50.5	76.9	112.6	161.5	167.1
135.0	116	3.0000	50.8	77.4	113.1	162.0	167.6
150.0	132	3.0000	52.7	80.0	115.4	164.4	169.8
165.0	110	3.0000	50.0	76.3	112.0	160.9	166.6
180.0	100	3.0000	48.6	74.7	110.3	159.1	164.8
195.0	107	3.0000	49.7	75.9	111.6	160.4	166.1
210.0	104	3.0000	49.2	75.4	111.0	159.9	165.5
225.0	99	3.0000	48.4	74.5	110.0	158.9	164.6
240.0	94	3.0000	47.6	73.7	109.0	157.8	163.5
255.0	92	3.0000	47.4	73.5	108.7	157.6	163.2
270.0	88	3.0000	46.6	72.7	107.8	156.7	162.3
285.0	82	3.0000	45.5	71.6	106.4	155.4	160.9
300.0	75	3.0000	44.3	70.5	105.0	154.1	159.4
315.0	76	3.0000	44.6	70.7	105.3	154.4	159.7
330.0	99	3.0000	48.5	74.6	110.1	158.9	164.6
345.0	104	3.0000	49.2	75.4	111.0	159.9	165.5

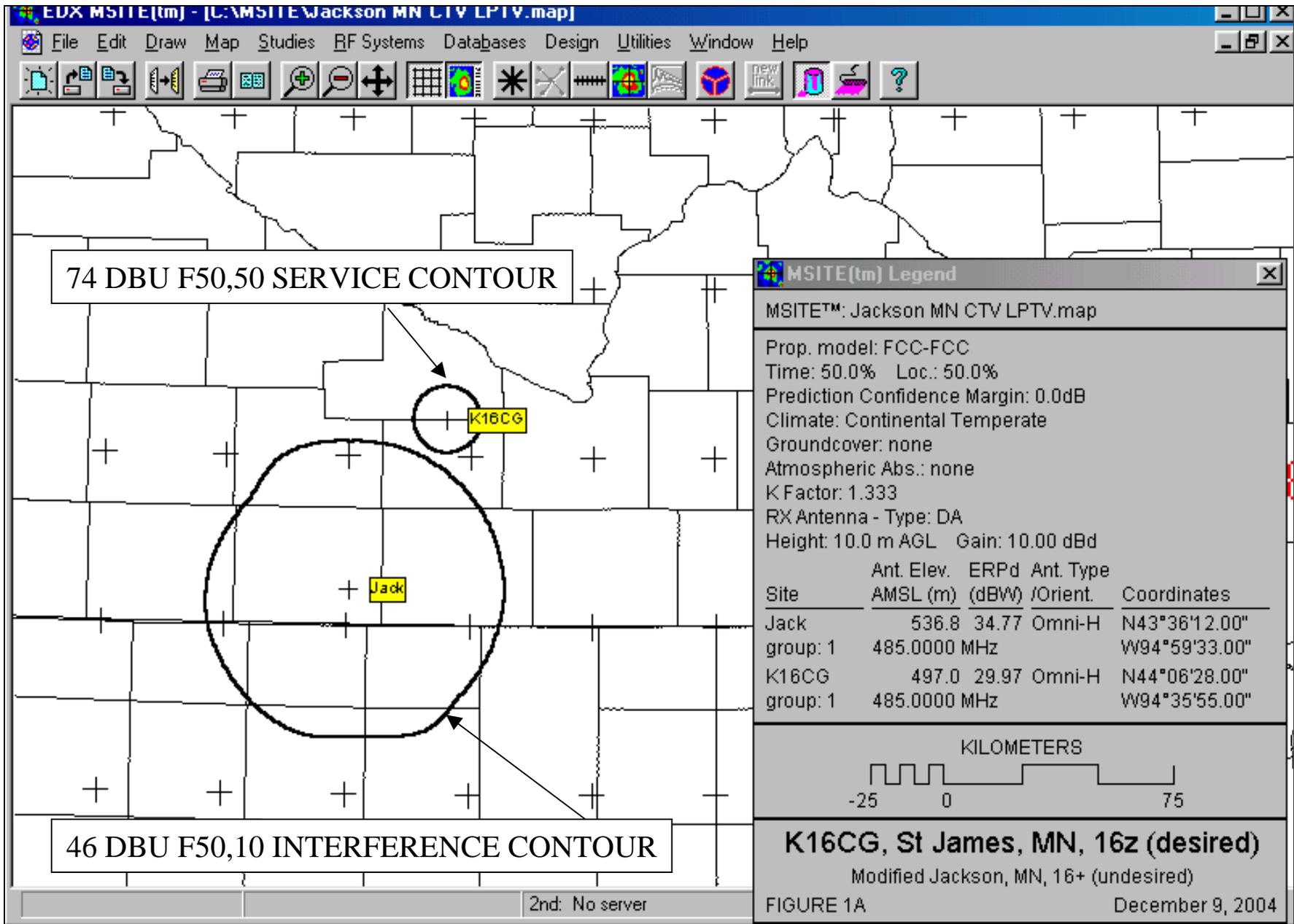


FIGURE 1B - K16CG, ST. JAMES, MN F50,50 CONTOUR

DATE: May 20, 2004

DISTANCES TO CONTOURS (Kilometers):

Antenna COR elevation (AMSL): 497 mtrs Average HAAT: 184 mtrs

Frequency: 485.0000 MHz

Coordinates: N 44 6 28.00 W 94 35 55.00

F(50,50) Curves Number of Contours: 1

AZ (degs)	HAAT (m)	ERPd (kW)	CONTOUR LEVELS (dBu): 74.0
0.0	191	0.9920	11.1
15.0	190	0.9920	11.1
30.0	190	0.9920	11.1
45.0	192	0.9920	11.2
60.0	191	0.9920	11.1
75.0	189	0.9920	11.1
90.0	185	0.9920	11.0
105.0	185	0.9920	11.0
120.0	194	0.9920	11.2
135.0	182	0.9920	10.9
150.0	178	0.9920	10.8
165.0	175	0.9920	10.7
180.0	178	0.9920	10.8
195.0	177	0.9920	10.8
210.0	175	0.9920	10.7
225.0	175	0.9920	10.7
240.0	171	0.9920	10.6
255.0	173	0.9920	10.7
270.0	181	0.9920	10.9
285.0	183	0.9920	10.9
300.0	188	0.9920	11.0
315.0	190	0.9920	11.1
330.0	190	0.9920	11.1
345.0	190	0.9920	11.1

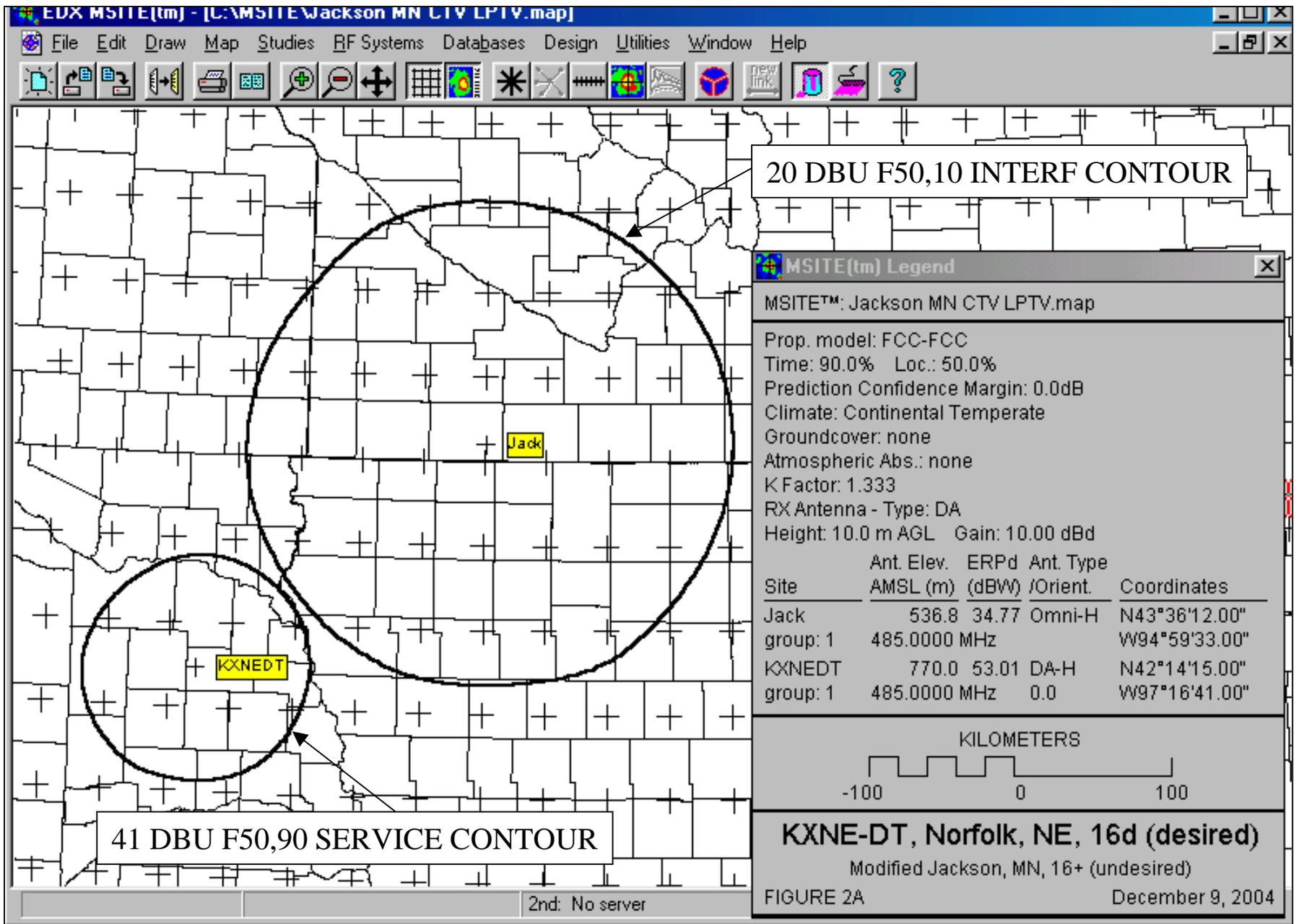


FIGURE 2B - KXNE-DT, NORFOLK, NE F50,90 CONTOUR

DATE: May 20, 2004

DISTANCES TO CONTOURS (Kilometers):

Antenna COR elevation (AMSL): 770 mtrs Average HAAT: 251 mtrs

Frequency: 485.0000 MHz

Coordinates: N 42 14 15.00 W 97 16 41.00

F(50,90) Curves Number of Contours: 1

AZ (degs)	HAAT (m)	ERPd (kW)	CONTOUR LEVELS (dBu): 41.0
0.0	253	82.4271	72.9
15.0	261	88.4388	73.9
30.0	263	91.3889	74.1
45.0	270	88.4388	74.6
60.0	280	82.4271	75.1
75.0	284	75.8859	75.0
90.0	285	72.4758	74.9
105.0	274	76.8747	74.1
120.0	270	89.2386	74.7
135.0	267	109.8085	75.5
150.0	262	134.4706	76.2
165.0	246	159.4787	75.8
180.0	231	180.8676	75.3
195.0	228	194.4256	75.5
210.0	243	200.0000	76.8
225.0	235	194.4256	76.0
240.0	236	180.8676	75.7
255.0	237	159.4787	75.1
270.0	242	134.4706	74.6
285.0	233	109.8085	72.8
300.0	226	89.2386	71.3
315.0	224	76.8747	70.5
330.0	230	72.4758	70.6
345.0	248	75.8859	72.0

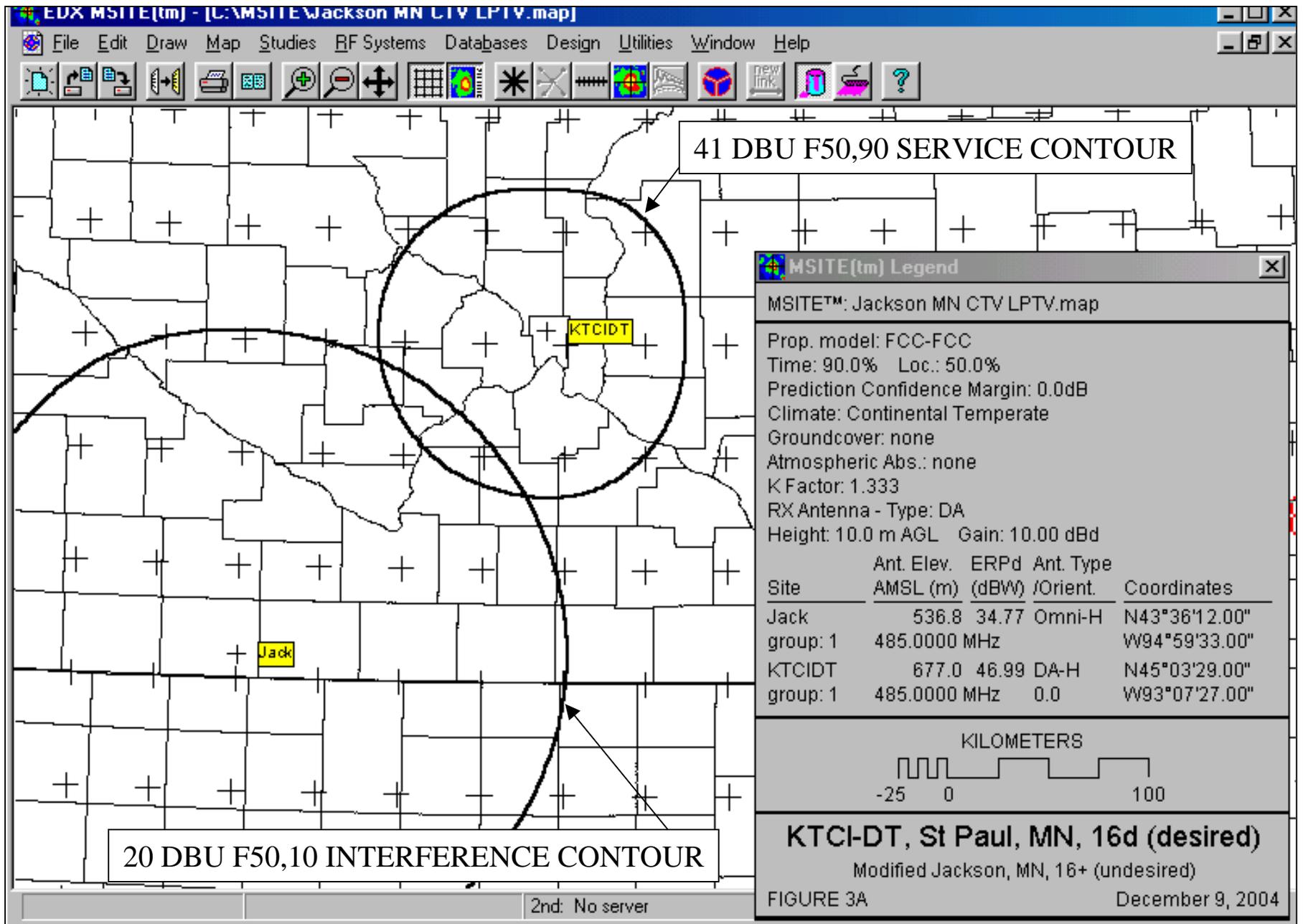


FIGURE 3A

December 9, 2004

FIGURE 3B - KTCI-DT, ST. PAUL, MN F50,90 CONTOUR

DATE: May 20, 2004

DISTANCES TO CONTOURS (Kilometers):

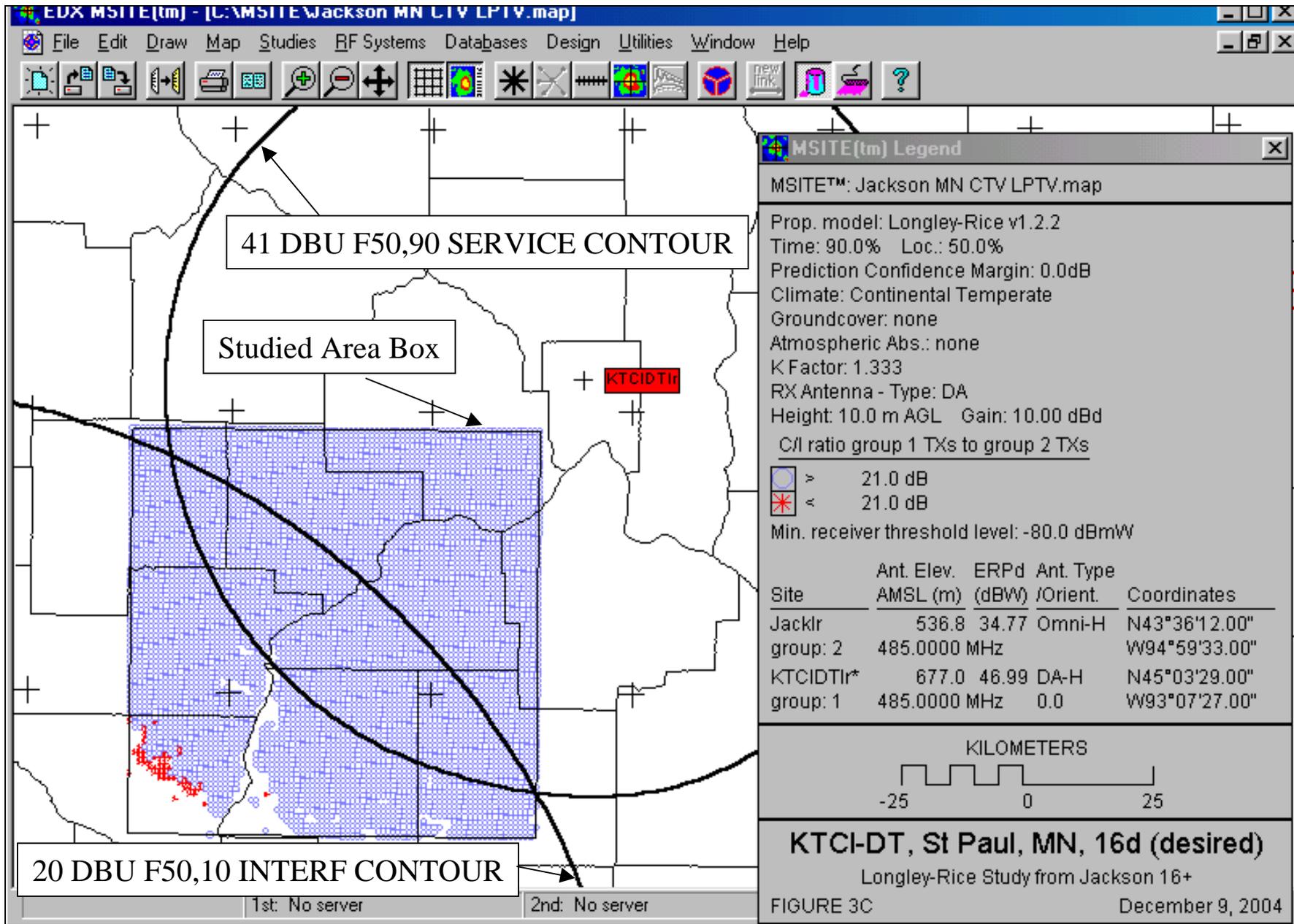
Antenna COR elevation (AMSL): 677 mtrs Average HAAT: 398 mtrs

Frequency: 485.0000 MHz

Coordinates: N 45 3 29.00 W 93 7 27.00

F(50,90) Curves Number of Contours: 1

AZ (degs)	HAAT (m)	ERPd (kW)	CONTOUR LEVELS (dBu): 41.0
0.0	398	6.8455	69.3
15.0	402	8.4056	70.8
30.0	399	12.5009	73.3
45.0	390	12.5009	72.7
60.0	386	11.0458	71.6
75.0	389	8.4056	69.9
90.0	382	6.8455	68.3
105.0	384	9.2456	70.3
120.0	384	15.1261	73.5
135.0	391	23.4629	77.0
150.0	405	32.0022	80.0
165.0	422	38.7227	82.1
180.0	410	43.2480	82.2
195.0	394	47.0483	81.8
210.0	400	49.0084	82.4
225.0	402	50.0000	82.7
240.0	401	49.0084	82.5
255.0	399	47.0483	82.2
270.0	405	43.2480	81.9
285.0	408	38.7227	81.4
300.0	404	32.0022	79.9
315.0	397	23.4629	77.4
330.0	399	15.1261	74.6
345.0	401	9.2456	71.4



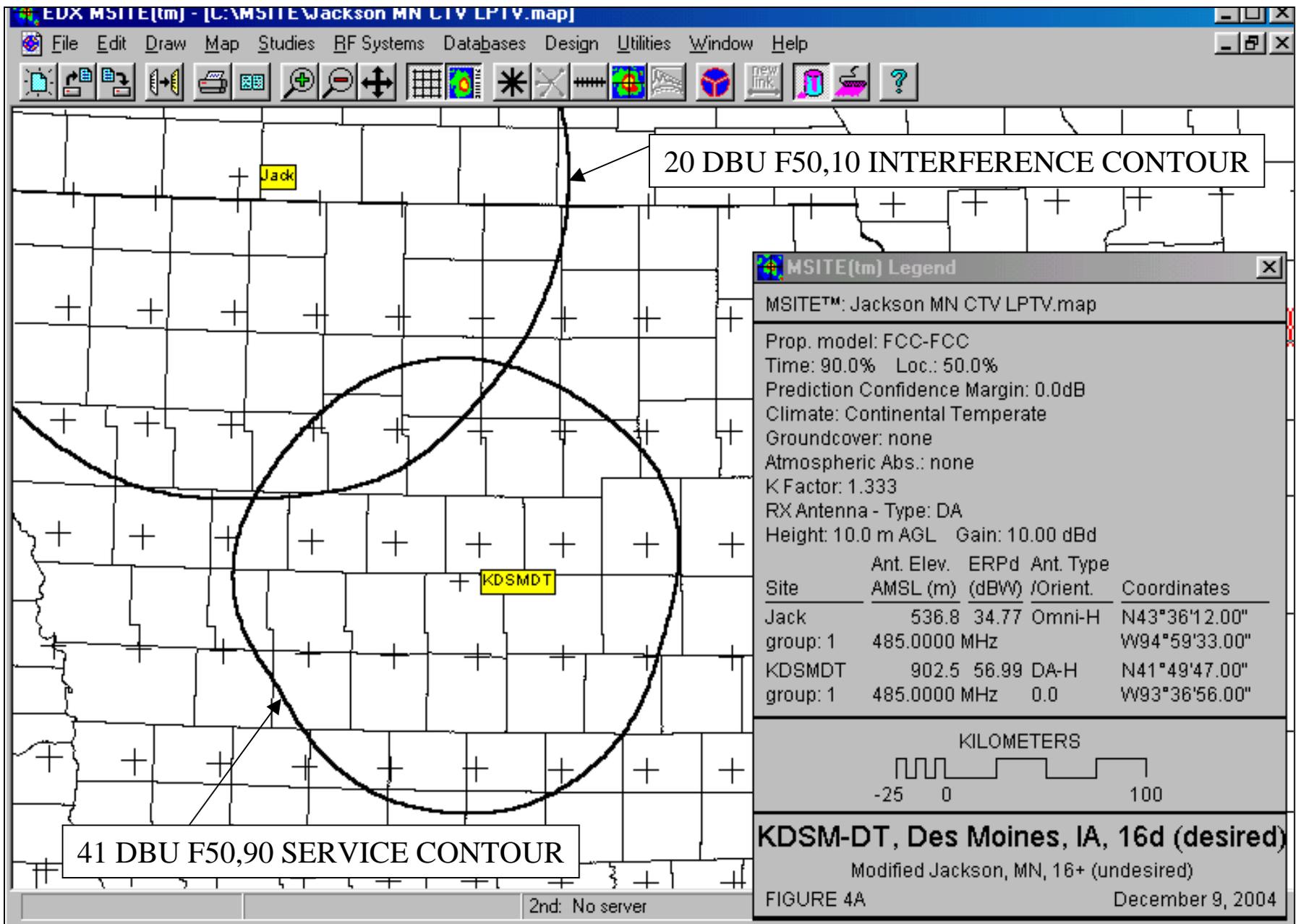


FIGURE 4B - KDSM-DT, DES MOINES, IA F50,90 CONTOUR

DATE: May 20, 2004

DISTANCES TO CONTOURS (Kilometers):

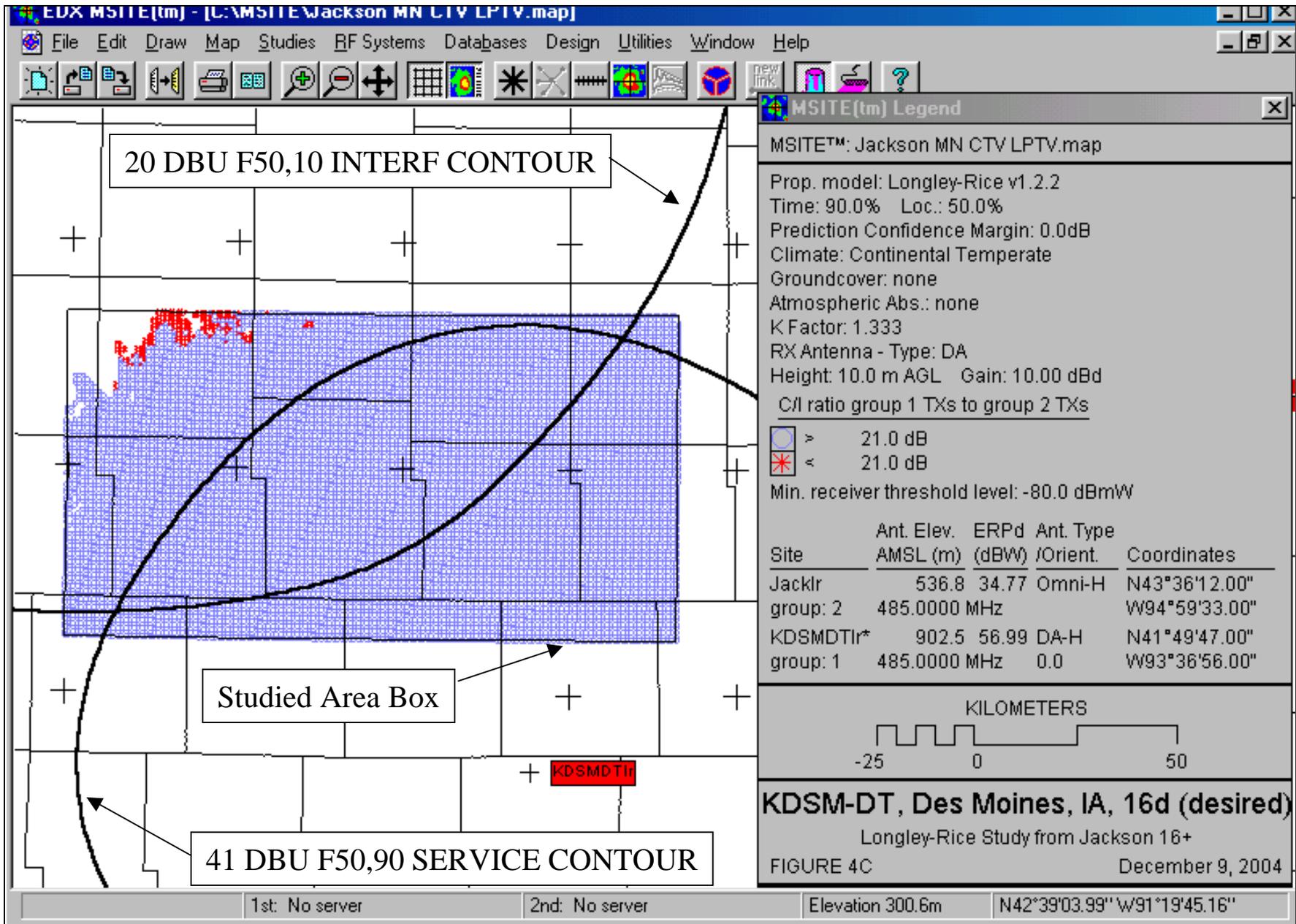
Antenna COR elevation (AMSL): 903 mtrs Average HAAT: 610 mtrs

Frequency: 485.0000 MHz

Coordinates: N 41 49 47.00 W 93 36 56.00

F(50,90) Curves Number of Contours: 1

AZ (degs)	HAAT (m)	ERPd (kW)	CONTOUR LEVELS (dBu): 41.0
0.0	597	324.0350	110.0
15.0	611	269.3968	108.9
30.0	618	232.5781	107.9
45.0	615	276.0437	109.3
60.0	620	351.1465	111.7
75.0	623	313.6537	110.8
90.0	632	189.7412	106.8
105.0	627	141.5219	104.0
120.0	608	215.8395	106.8
135.0	604	345.3045	110.8
150.0	607	448.4357	113.4
165.0	623	493.0586	115.1
180.0	611	487.1181	114.4
195.0	613	417.7272	113.0
210.0	617	305.0016	110.3
225.0	622	180.0126	105.9
240.0	619	135.7299	103.3
255.0	617	233.2608	107.9
270.0	606	348.6368	111.0
285.0	598	326.4547	110.1
300.0	593	251.3579	107.5
315.0	588	241.5292	106.9
330.0	587	288.8201	108.4
345.0	590	331.3212	109.8



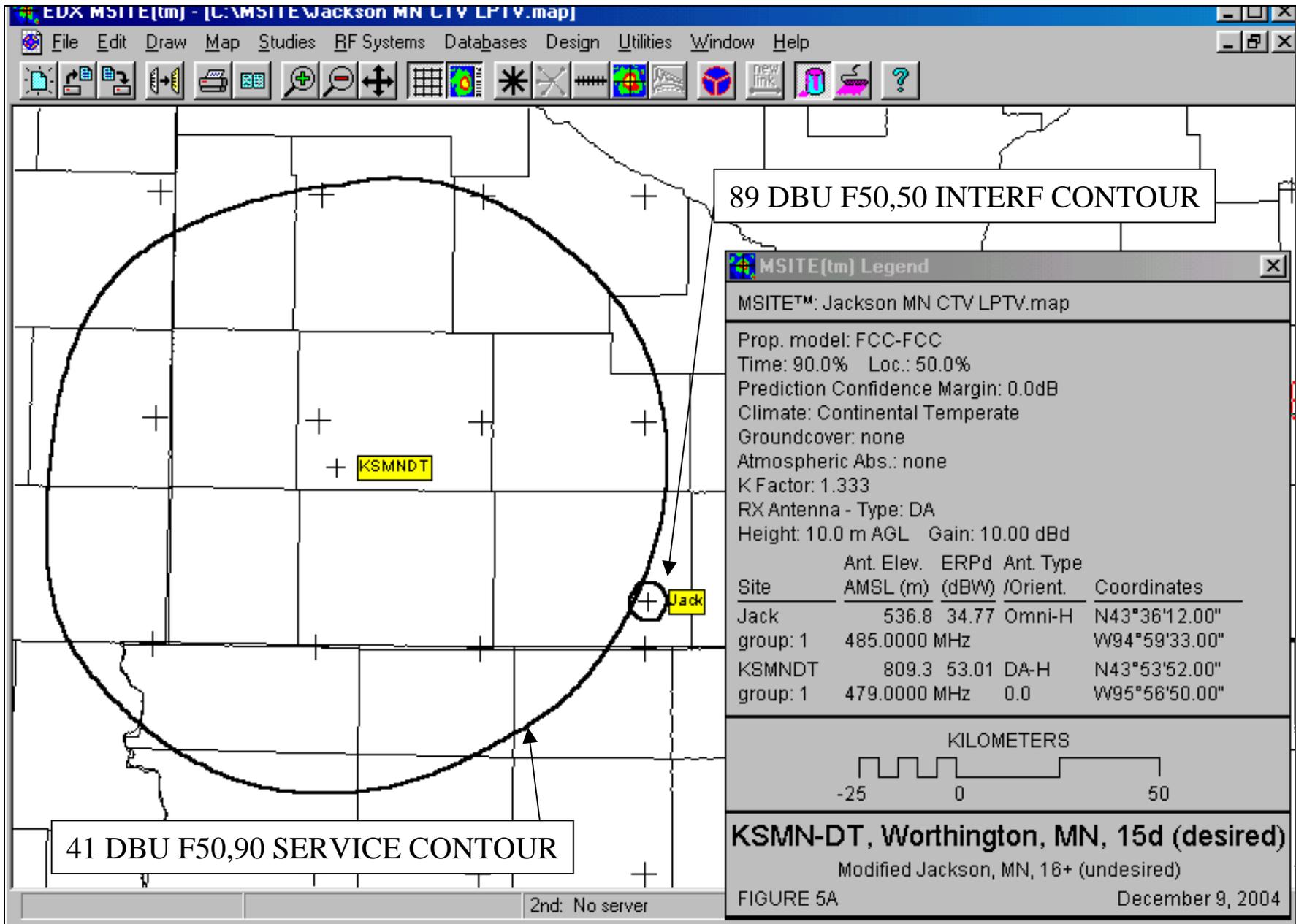


FIGURE 5B - KSMN-DT, WORTHINGTON, MN F50,90 CONTOUR

DATE: May 20, 2004

DISTANCES TO CONTOURS (Kilometers):

Antenna COR elevation (AMSL): 809 mtrs Average HAAT: 287 mtrs

Frequency: 479.0000 MHz

Coordinates: N 43 53 52.00 W 95 56 50.00

F(50,90) Curves Number of Contours: 1

AZ (degs)	HAAT (m)	ERPd (kW)	CONTOUR LEVELS (dBu): 41.0
0.0	292	22.4434	69.1
15.0	298	45.1218	73.3
30.0	288	83.7160	76.0
45.0	284	120.4268	77.8
60.0	297	147.9097	80.5
75.0	299	163.7937	81.5
90.0	294	176.3320	81.4
105.0	286	187.3918	80.8
120.0	279	196.4026	80.4
135.0	276	200.0000	80.2
150.0	265	196.4026	78.8
165.0	275	187.3918	79.6
180.0	287	176.3320	80.5
195.0	294	163.7937	80.9
210.0	292	147.9097	79.9
225.0	295	120.4268	78.9
240.0	303	83.7160	77.5
255.0	295	45.1218	73.1
270.0	304	22.4434	69.9
285.0	298	24.2191	69.9
300.0	283	37.3222	71.1
315.0	272	44.1769	71.1
330.0	255	37.3222	69.1
345.0	275	24.2191	68.3

