

TECHNICAL EXHIBIT  
APPLICATION FOR MODIFICATION OF  
CONSTRUCTION PERMIT  
TELEVISION STATION KRMJ-DT  
GRAND JUNCTION, COLORADO

February 16, 2004

CHANNEL 17 65 KW (MAX-DA) 409 M

TECHNICAL EXHIBIT  
APPLICATION FOR MODIFICATION OF CONSTRUCTION PERMIT  
TELEVISION STATION KRMJ-DT  
GRAND JUNCTION, COLORADO  
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Technical Statement

This Technical Exhibit was prepared on behalf of Rocky Mountain Public Broadcasting (“RMPB”) in support of an application for modification of construction permit for KRMJ-DT, Grand Junction, Colorado (See FCC File No BPEDT-20000501AGR). KRMJ-DT is paired with analog NTSC TV station KRMJ(TV), Channel 18. The instant application proposes to relocate the proposed KRMJ-DT facility to an existing tower on Black Mountain near Grand Junction. The proposed antenna and transmission system will be shared with the KRMJ(TV) analog facility.\* It is proposed that the KRMJ-DT facility operate with a maximum directional average effective radiated power (ERP) of 18.1 dBk (65 kW) and an antenna radiation center height above average terrain (HAAT) of 409 m.

As described in detail herein, the proposed Channel 17 operation meets the *de minimis* interference protection requirements as outlined FCC’s DTV Processing Guidelines,<sup>†</sup> the FCC’s *Second Memorandum Opinion and Order*,<sup>‡</sup> and the *DTV Report and Order and Further Notice of Proposed Rule Making*.<sup>§</sup> Technical specifications for the proposed operation are included herein as Figure 1.

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\* A separate application is being filed to relocate KRMJ(TV) to this site.

<sup>†</sup> See FCC *Public Notice*, “Additional Application Processing Guidelines for Digital Television (DTV)”, Released: August 10, 1998.

<sup>‡</sup> See *Second Memorandum Opinion and Order on Reconsideration of the Fifth and Sixth Report and Orders*, FCC-98-315, Released: December 18, 1998.

<sup>§</sup> See *Report and Order and Further Notice of Proposed Rule Making* in MM Docket No. 00-39, FCC 01-24, released January 19, 2001.

### Proposed Facilities

The proposed transmitting antenna will be side-mounted on an existing tower located on Black Mountain 17 km west of Grand Junction. The geographic coordinates of the proposed transmitter site are: 39°03'58" North Latitude, 108°44'43" West Longitude based on NAD27 datum. The transmitter site elevation is 2,158 m AMSL and the antenna structure has an overall height of 49 m above ground level. The antenna center of radiation will be located at 46 m above ground level (2,204 m AMSL).

The proposed facility provides minimum 48 dBu, f(50,90), coverage of Grand Junction in compliance with Section 73.625(a)(1) of the FCC Rules, as adopted by the FCC in MM Docket No. 00-39. Figure 2 herein is a map depicting the predicted coverage contours of the proposed facility.

The proposed facility meets the maximum permissible ERP requirements for UHF DTV stations as outlined in Section 73.623(f)(8)(i) of the FCC Rules. According to this section of the Rules, considering a proposed antenna height above average terrain for the proposed KRMJ-DT facility of 409 m, the maximum permissible ERP is 830 kW.

The proposed transmitter is located well beyond the international border coordination distances with Canada and Mexico. The closest FCC Monitoring station is located at Douglas, Arizona at a distance of 845 km at a bearing of 186°True. The facility is located more than 321 km from the Table Mountain Radio Quiet Zone. The proposal is located more than 3.2 km from the closest AM broadcast facility.

No adverse electromagnetic impact is expected as a result of the proposed operation. However, the applicant recognizes its responsibility to correct objectionable electromagnetic interference problems that result from its proposed operation.

#### Tower Registration

The antenna is to be mounted on an existing structure for which antenna structure registration is not required.

#### Domestic Allocation Considerations

The proposed KRMJ-DT Channel 17 facility meets the requirements of Section 73.623 of the FCC Rules concerning predicted interference to other existing U.S. NTSC facilities and U.S. DTV allotments and assignments. Longley-Rice interference analyses were conducted pursuant to the requirements of the FCC Rules; OET Bulletin No. 69; and published FCC guidelines for preparation of such interference analyses. The Longley-Rice interference analyses were conducted using the software maintained by du Treil, Lundin & Rackley, Inc. based on the FCC published software routines.\*\* Stations selected for analysis were determined pursuant to the distance requirements outlined in the FCC DTV Processing Guidelines Public Notice. Accordingly, co-channel DTV and NTSC stations within 429 km and 407 km, respectively, were examined for potential interference; and first-adjacent DTV and NTSC stations within 229 km and 207 km, respectively, were examined for potential interference. Analog taboo-related NTSC stations within 142 km were examined for potential interference. The results of the interference analyses for the proposed KRMJ-DT facility are summarized herein at Figure 3. As indicated therein, the proposed facility will meet the 2%/10% criterion

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\*\* The duTreil, Lundin & Rackley, Inc. DTV interference analysis program is a precise implementation of the procedures outlined by the FCC in the Sixth Report and Order; subsequent Memorandum Opinion and Order; and FCC OET Bulletin No. 69. A nominal grid size resolution of 2 km was employed.

outlined in the FCC Rules and published guidelines with respect to all considered stations.

With respect to Class A TV station protection, the proposal has been evaluated according to the requirements of Section 73.623(c)(5) of the FCC Rules. The analysis reveals no potentially affected Class A TV stations.

#### Environmental Considerations

An evaluation was conducted for the proposed facility concerning compliance with Section 1.1307(b) of the FCC Rules regarding human exposure to radio frequency (RF) energy.<sup>††</sup>

There are other broadcast facilities to be located on the tower or within close proximity of the tower site. Preliminary calculations indicate that the proposed facility may exceed the 5% MPE exclusion level for certain points on the ground in the vicinity of the proposed transmitter site. Therefore, the applicant shall conduct RF power density measurements throughout the transmitter site area to confirm compliance with the FCC specified guidelines for human exposure to RF energy.

The transmitter site is to be restricted from access. In the event that personnel are required to enter the restricted area or climb the tower structure, the

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<sup>††</sup> See FCC Office of Engineering and Technology Bulletin No. 56 for background information on non-ionizing RF energy of the type discussed here. Internet web reference:  
[http://www.fcc.gov/Bureaus/Engineering\\_Technology/Documents/bulletins/oet56/oet56e4.pdf](http://www.fcc.gov/Bureaus/Engineering_Technology/Documents/bulletins/oet56/oet56e4.pdf)

proposed KRMJ-DT transmissions shall be reduced or terminated as necessary to prevent RF exposure above the FCC recommended limits.

Louis Robert du Treil, Jr.

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February 16, 2004

Figure 1

TECHNICAL EXHIBIT  
 APPLICATION FOR MODIFICATION OF CONSTRUCTION PERMIT  
 TELEVISION STATION KRMJ-DT  
 GRAND JUNCTION, COLORADO  
 CHANNEL 17 65 KW (MAX-DA) 409 M

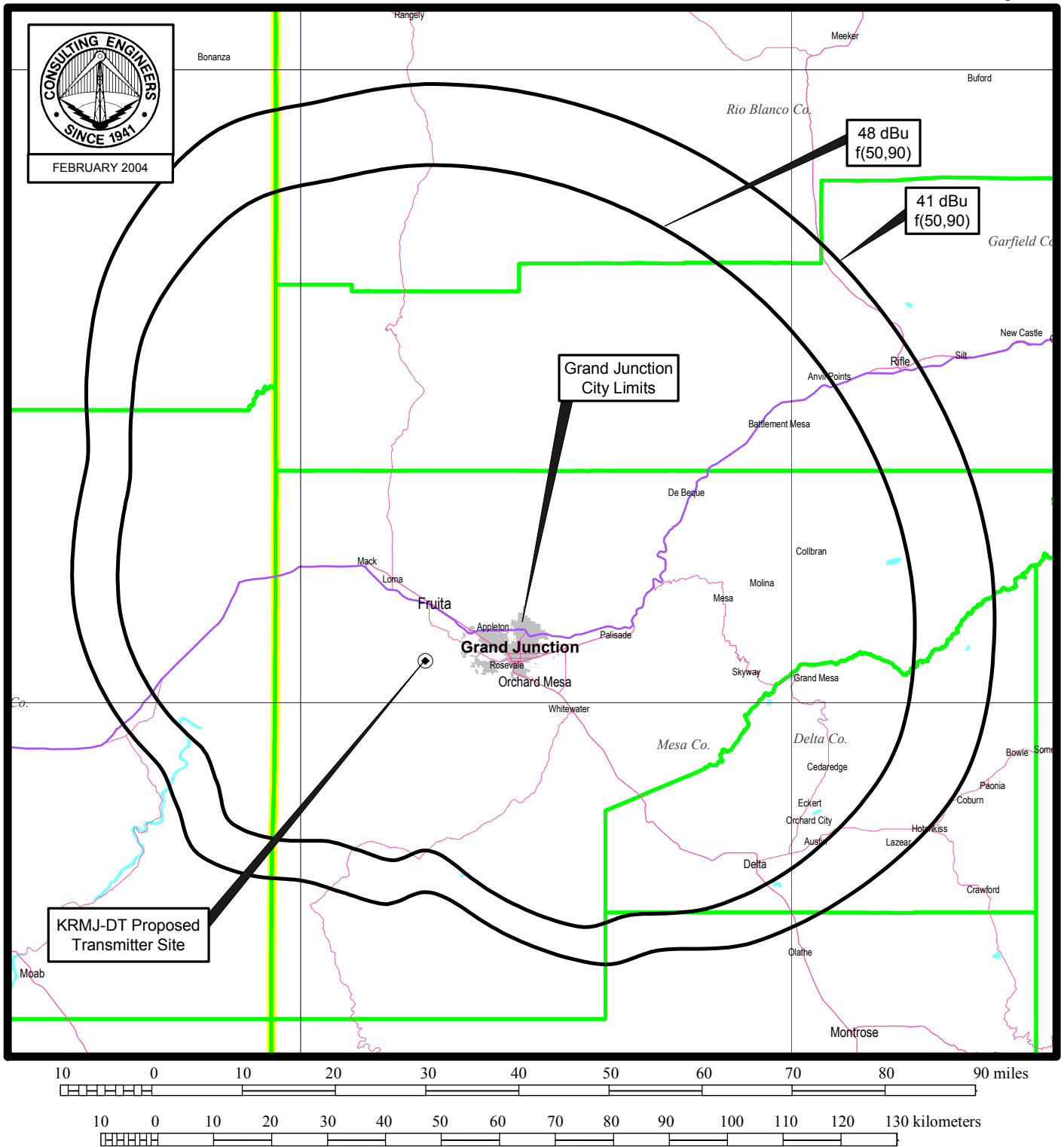
Technical Specifications

Channel / Frequency Band	17 / 488-494 MHz
Site Coordinates (NAD 27)	39°03'58" North Latitude 108°44'43" West Longitude
Site elevation	2158 m AMSL
Average elevation of standard eight radials, 3 to 16 km	1,795 m AMSL
Overall height of existing structure	49 m AGL / 2,207 m AMSL
Height of antenna radiation center	46 m AGL / 2,204 m AMSL
Antenna radiation center HAAT	409 m
ASRN	not required

Proposed Operation	
Parameter	DTV
Transmitter power output	7.40 dBk (5.5 kW)
Combiner loss (Dielectric, 2003-147-24A)	0.40 dB
Transmission line loss (Andrew, model HJ11-50 4-inch 50-ohm flexible coaxial, line, 76 meter, 250-ft)	0.70 dB
Antenna input power	6.30 dBk
Antenna gain (Dielectric, model TFU-8DSB-M DC)	11.82 dB
Effective radiated power (ERP)	18.1 dBk (65 kW)



Figure 2



## PREDICTED COVERAGE CONTOURS

TELEVISION STATION KRMJ-DT  
GRAND JUNCTION, COLORADO  
CHANNEL 17 65 KW (MAX-DA) 409 M

du Treil, Lundin & Rackley, Inc. Sarasota, Florida

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Summary of Allocation Analysis

Stations Potentially Affected by Proposed Station							
Facility Number	Channel	Call	City State	Distance (km)	Status	Application Prefix	Application Reference Number
1	17	960710KR	PAGE AZ	343.7	APP	BPET	19960710KR
2	17	KMGH-TV	DENVER CO	310.7	CP MOD	BMPCDT	20000421AAV
3	17	KMGH-DT	DENVER CO	310.2	PLN	DTVPLN	DTVP0252
4	17	KOBF-DT	FARMINGTON NM	267.5	PLN	DTVPLN	DTVP0272
5	17	KZAR-DT	PROVO UT	284.4	PLN	DTVPLN	DTVP0284
6	17	960705KJ	VERNAL UT	166.3	APP	BPET	19960705KJ
7	18	KRMJ	GRAND JUNCTION	42.5	LIC	BLET	19970807KL

Summary of Interference Analysis for Worst-Case Scenarios							
Facility Number	Interference Population Before Analysis	Interference Population After Analysis	Baseline Population	Net Change in Interference	Percent of Baseline	Permissible Percent of Baseline	Result
1	--	--	--	--	0.000 <sup>*</sup>	--	pass
2	--	--	--	--	0.000 <sup>*</sup>	--	pass
3	--	--	--	--	0.000 <sup>*</sup>	--	pass
4	--	--	--	--	0.000 <sup>*</sup>	--	pass
5	--	--	--	--	0.000 <sup>*</sup>	--	pass
6	617	59	19418	-558	-2.874	2.0	pass
7	--	--	--	--	0.000 <sup>*</sup>	--	pass

<sup>\*</sup> Proposal causes no interference.

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Transmitting Antenna Manufacturer's  
Azimuthal Plane and Vertical Plane Pattern Data

(four pages follow)



Exhibit No.

Date

16 Feb 2004

Call Letters

Channel 17

Location

Grand Junction, CO

Customer

Antenna Type

TFU-8DSB-M

### AZIMUTH PATTERN

Gain

1.90 (2.79 dB)

Frequency

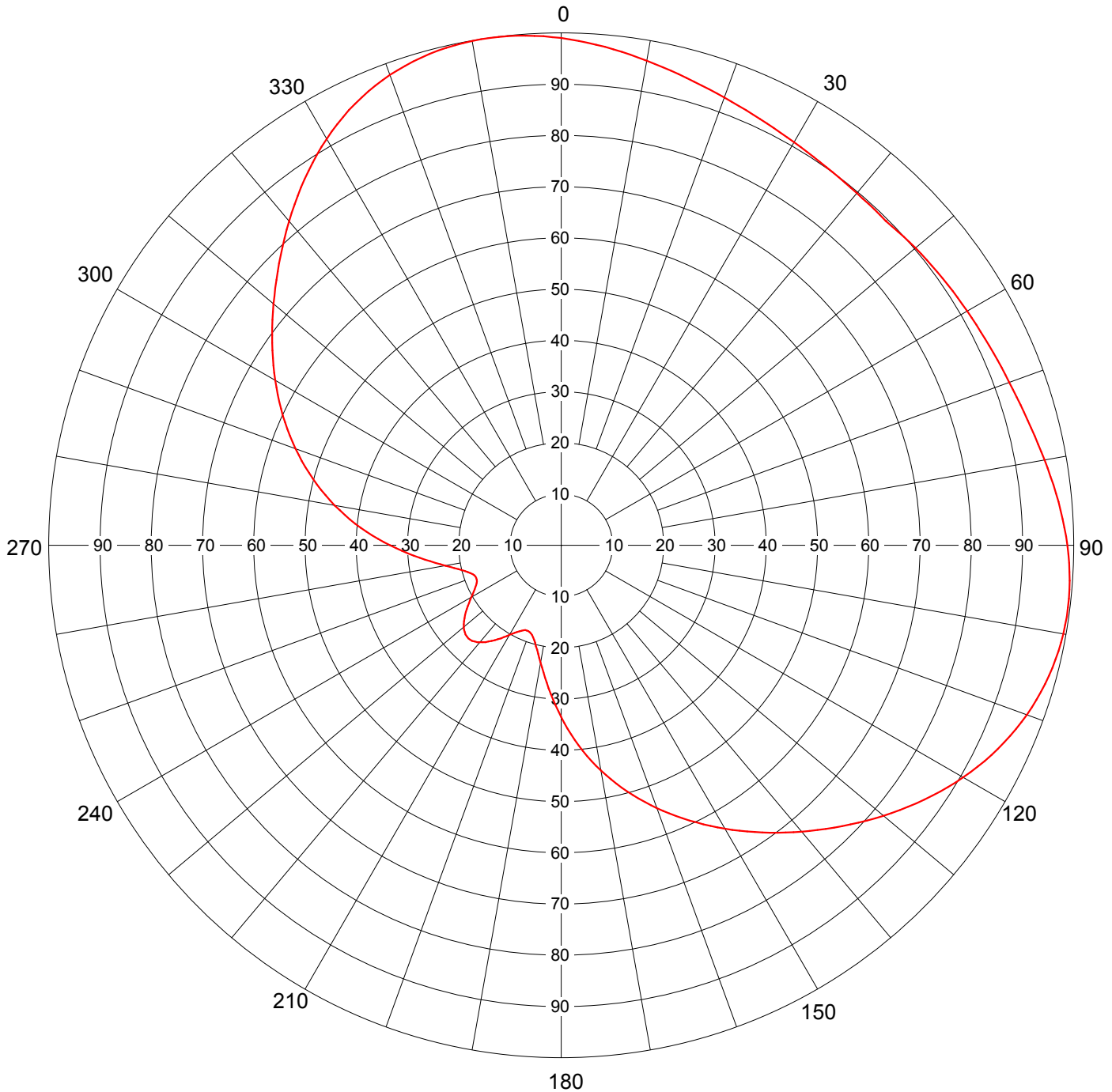
491 MHz

Calculated / Measured

Calculated

Drawing #

DSB-M



Remarks:



Date **16 Feb 2004**  
Call Letters  
Location **Grand Junction, CO**  
Customer  
Antenna Type **TFU-8DSB-M**

Channel **17**

**TABULATION OF AZIMUTH PATTERN**Azimuth Pattern Drawing # **DSB-M**

Angle	Field	ERP (kW)	ERP (dBk)
0	0.990	63.7	18.04
10	0.960	59.9	17.77
20	0.930	56.2	17.50
30	0.908	53.6	17.29
40	0.897	52.3	17.18
50	0.902	52.9	17.23
60	0.914	54.3	17.35
70	0.930	56.2	17.50
80	0.958	59.7	17.76
90	0.988	63.4	18.02
100	0.995	64.4	18.09
110	0.967	60.8	17.84
120	0.906	53.4	17.27
130	0.821	43.8	16.42
140	0.730	34.6	15.40
150	0.639	26.5	14.24
160	0.546	19.4	12.87
170	0.446	12.9	11.12
180	0.335	7.3	8.63
190	0.232	3.5	5.44
200	0.180	2.1	3.23
210	0.202	2.7	4.24
220	0.247	4.0	5.98
230	0.248	4.0	6.02
240	0.202	2.7	4.24
250	0.178	2.1	3.14
260	0.229	3.4	5.33
270	0.334	7.3	8.60
280	0.449	13.1	11.17
290	0.552	19.8	12.97
300	0.644	27.0	14.31
310	0.733	34.9	15.43
320	0.826	44.3	16.47
330	0.916	54.5	17.37
340	0.977	62.0	17.93
350	1.000	65.0	18.13

**Maxima**

Angle	Field	ERP (kW)	ERP (dBk)
0	0.990	63.7	18.04
97	0.996	64.5	18.09
225	0.257	4.3	6.33
352	1.000	65.0	18.13

**Minima**

Angle	Field	ERP (kW)	ERP (dBk)
45	0.895	52.1	17.17
201	0.179	2.1	3.19
249	0.178	2.1	3.14

Remarks:

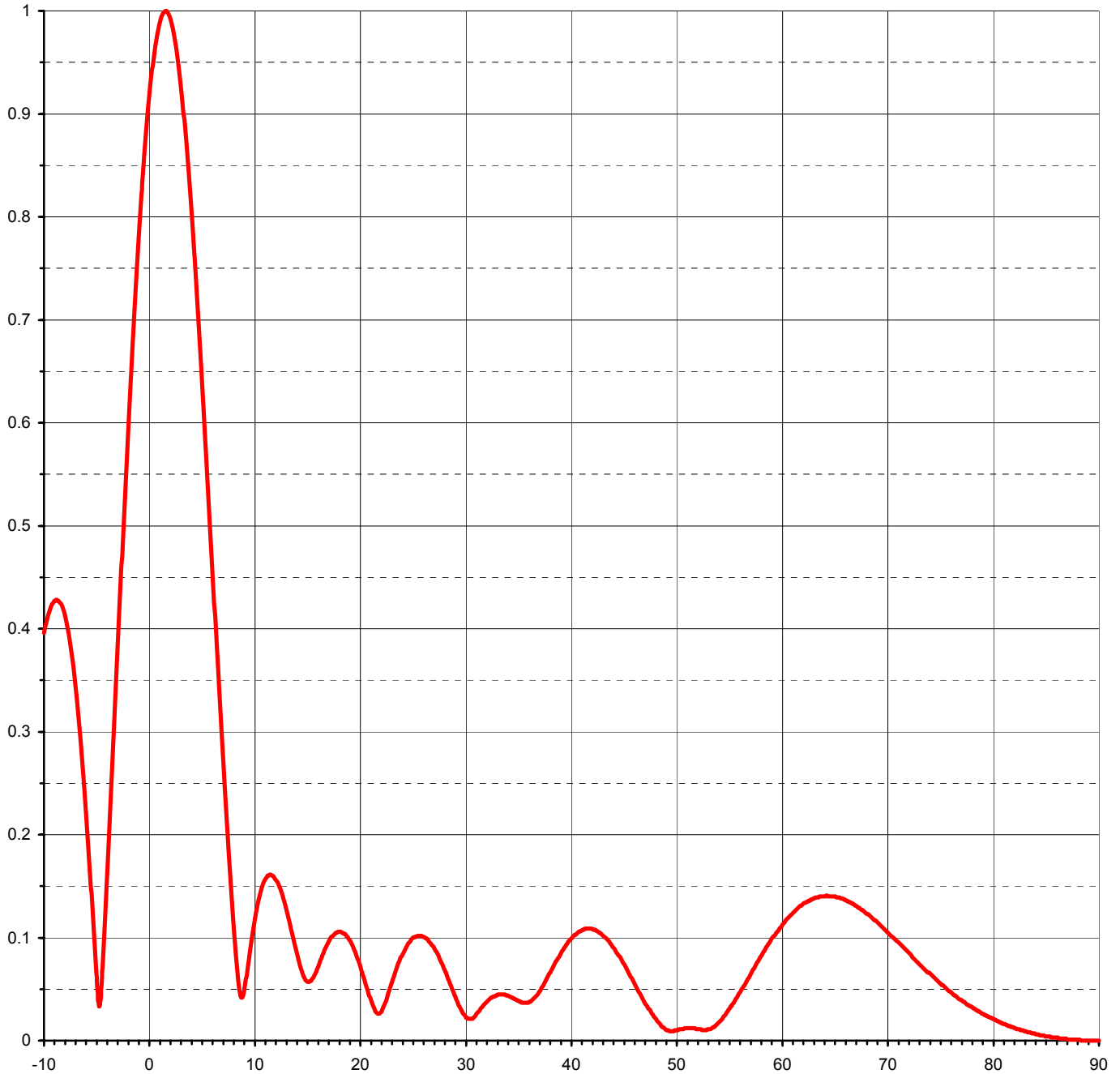


Proposal Number	1046:6:153701		
Date	9-May-03		
Call Letters	KRMJ-DT	Channel	17
Location	Grand Junction , CO		
Customer			
Antenna Type	TFU-8DSB-M DC		

## ELEVATION PATTERN

RMS Gain at Main Lobe	8.00	( 9.03 dB )
RMS Gain at Horizontal	6.70	( 8.26 dB )
Calculated / Measured	Calculated	

Beam Tilt	1.50 deg
Frequency	491.00 MHz
Drawing #	08B080150-90



Degrees Below Horizontal



Proposal Number **1046:6:153701**

Date **9-May-03**

Call Letters **KRMJ-DT** Channel **17**

Location **Grand Junction , CO**

Customer

Antenna Type **TFU-8DSB-M DC**

## TABULATION OF ELEVATION PATTERN

Elevation Pattern Drawing #: **08B080150-90**

Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.396	2.4	0.973	10.6	0.143	30.5	0.021	51.0	0.012	71.5	0.090
-9.5	0.416	2.6	0.960	10.8	0.150	31.0	0.024	51.5	0.012	72.0	0.085
-9.0	0.427	2.8	0.944	11.0	0.155	31.5	0.031	52.0	0.011	72.5	0.079
-8.5	0.425	3.0	0.926	11.5	0.161	32.0	0.037	52.5	0.010	73.0	0.074
-8.0	0.412	3.2	0.905	12.0	0.157	32.5	0.042	53.0	0.011	73.5	0.069
-7.5	0.384	3.4	0.882	12.5	0.147	33.0	0.044	53.5	0.013	74.0	0.065
-7.0	0.343	3.6	0.857	13.0	0.130	33.5	0.045	54.0	0.017	74.5	0.060
-6.5	0.289	3.8	0.830	13.5	0.109	34.0	0.044	54.5	0.023	75.0	0.055
-6.0	0.221	4.0	0.802	14.0	0.088	34.5	0.042	55.0	0.030	75.5	0.051
-5.5	0.142	4.2	0.771	14.5	0.069	35.0	0.039	55.5	0.037	76.0	0.047
-5.0	0.057	4.4	0.740	15.0	0.058	35.5	0.037	56.0	0.046	76.5	0.043
-4.5	0.062	4.6	0.706	15.5	0.060	36.0	0.037	56.5	0.054	77.0	0.039
-4.0	0.163	4.8	0.672	16.0	0.070	36.5	0.041	57.0	0.063	77.5	0.035
-3.5	0.272	5.0	0.637	16.5	0.083	37.0	0.047	57.5	0.072	78.0	0.032
-3.0	0.383	5.2	0.601	17.0	0.094	37.5	0.055	58.0	0.081	78.5	0.029
-2.8	0.427	5.4	0.564	17.5	0.102	38.0	0.065	58.5	0.089	79.0	0.026
-2.6	0.471	5.6	0.527	18.0	0.106	38.5	0.074	59.0	0.097	79.5	0.023
-2.4	0.514	5.8	0.489	18.5	0.104	39.0	0.083	59.5	0.105	80.0	0.021
-2.2	0.556	6.0	0.452	19.0	0.098	39.5	0.091	60.0	0.111	80.5	0.018
-2.0	0.598	6.2	0.414	19.5	0.088	40.0	0.098	60.5	0.118	81.0	0.016
-1.8	0.638	6.4	0.377	20.0	0.075	40.5	0.103	61.0	0.123	81.5	0.014
-1.6	0.677	6.6	0.340	20.5	0.059	41.0	0.107	61.5	0.128	82.0	0.012
-1.4	0.714	6.8	0.304	21.0	0.042	41.5	0.109	62.0	0.132	82.5	0.011
-1.2	0.749	7.0	0.269	21.5	0.028	42.0	0.109	62.5	0.135	83.0	0.009
-1.0	0.783	7.2	0.234	22.0	0.027	42.5	0.107	63.0	0.138	83.5	0.008
-0.8	0.814	7.4	0.201	22.5	0.038	43.0	0.103	63.5	0.139	84.0	0.006
-0.6	0.844	7.6	0.169	23.0	0.054	43.5	0.098	64.0	0.140	84.5	0.005
-0.4	0.871	7.8	0.138	23.5	0.069	44.0	0.091	64.5	0.140	85.0	0.004
-0.2	0.896	8.0	0.109	24.0	0.082	44.5	0.084	65.0	0.140	85.5	0.003
0.0	0.918	8.2	0.083	24.5	0.092	45.0	0.075	65.5	0.138	86.0	0.003
0.2	0.938	8.4	0.061	25.0	0.099	45.5	0.066	66.0	0.136	86.5	0.002
0.4	0.955	8.6	0.046	25.5	0.102	46.0	0.057	66.5	0.134	87.0	0.001
0.6	0.970	8.8	0.042	26.0	0.101	46.5	0.047	67.0	0.131	87.5	0.001
0.8	0.981	9.0	0.049	26.5	0.098	47.0	0.038	67.5	0.127	88.0	0.001
1.0	0.990	9.2	0.063	27.0	0.091	47.5	0.030	68.0	0.123	88.5	0.000
1.2	0.996	9.4	0.078	27.5	0.082	48.0	0.022	68.5	0.119	89.0	0.000
1.4	0.999	9.6	0.093	28.0	0.070	48.5	0.016	69.0	0.115	89.5	0.000
1.6	1.000	9.8	0.100	28.5	0.058	49.0	0.011	69.5	0.110	90.0	0.000
1.8	0.997	10.0	0.113	29.0	0.045	49.5	0.009	70.0	0.105		
2.0	0.992	10.2	0.125	29.5	0.033	50.0	0.010	70.5	0.100		
2.2	0.984	10.4	0.135	30.0	0.024	50.5	0.011	71.0	0.095		