

TECHNICAL EXHIBIT  
APPLICATION FOR CONSTRUCTION PERMIT  
TELEVISION STATION WOAI-DT  
SAN ANTONIO, TEXAS

April 29, 2004

CHANNEL 58 776 KW 457 M

TECHNICAL EXHIBIT  
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Technical Statement

This Technical Exhibit was prepared on behalf of digital television broadcast station WOAI-DT, San Antonio, Texas, in support of an application for construction permit. WOAI-DT is paired with analog NTSC TV station WOAI-TV, Channel 4. Pursuant to the FCC *Sixth Report and Order* concerning digital television, WOAI-DT was allotted Channel 58, with a maximum effective radiated power (ERP) of 1000 kW and antenna height above average terrain (HAAT) of 451 m, as its transitional DTV allotment channel.<sup>\*</sup> WOAI-DT is licensed for operation on Channel 58 with a non-directional ERP of 480 kW with an HAAT of 457 m.<sup>†</sup> The instant application proposes operation of the WOAI-DT facility using its existing transmission system, but with an increase in ERP to 776 kW. No other changes are proposed. The proposal complies with the DTV application “checklist” filing requirements<sup>‡</sup> and the requirements of the FCC *Public Notice* concerning the freeze on the filing of DTV “maximization” applications.<sup>§</sup>

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<sup>\*</sup> See DTV Table of Allotments, *Second Memorandum Opinion and Order on Reconsideration of the Fifth and Sixth Report and Orders*, 14 FCC Rcd 1348, at Appendix B

<sup>†</sup> See FCC File No. BLCDDT-20020405AAW.

<sup>‡</sup> See FCC *Public Notice*, “Commission Details Application Filing Procedures Digital Television (DTV)”, Released: October 16, 1997; and, FCC *Public Notice*, “Additional Application Processing Guidelines for Digital Television (DTV)”, Released: August 10, 1998.

<sup>§</sup> See *Public Notice*, “Freeze on Filing of TV and DTV “Maximization” Applications in Channels 52-59,” Released: June 18, 2002, DA 02-1440.

Proposed Facilities

The proposed facility will employ the existing transmitting antenna now used by WOAI-DT, a Dielectric model TFU-28GTH-RO4. The antenna is mounted with a center of radiation at 459 m above ground level and 617 m above mean sea level. The antenna radiation center HAAT is calculated to be 457 m based on the U.S.G.S. 3-second computer database. Technical specifications for the proposed operation are included herein as Figure 1.

The proposed facility provides minimum 48 dBu, f(50,90), coverage of San Antonio 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 WOAI-DT facility meets the requirements of Section 73.622(f)(3) of the FCC Rules concerning the maximum permissible ERP for DTV stations with a small increase in HAAT relative to the DTV Allotment facility in Appendix B. \*\* An analysis of the permissible effective radiated power for the proposed facility is included herein at Figure 3. As indicated therein, appropriate ERP adjustments were made in consideration of the increase in antenna HAAT of 6 m and the use of a non-directional antenna pattern that differs slightly from the allotment directional pattern.

As illustrated on the coverage map at Figure 2, the proposed 41 dBu, f(50,90) contour of the proposed WOAI-DT facility will not extend beyond that of the WOAI-DT allotment facility. Therefore, the proposal complies with the FCC freeze order concerning maximization applications for Channels 52-59, which prohibits any

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\*\* See DTV Table of Allotments, *Second Memorandum Opinion and Order on Reconsideration of the Fifth and Sixth Report and Orders*, 14 FCC Rcd 1348, at Appendix B

extension of the DTV service area beyond that defined in the FCC DTV Table of Allotments.

The proposed transmitter is located within the coordination zone with Mexico. The closest FCC Monitoring station is located at Kingsville, Texas at a distance of 207 km at a bearing of 169°True. The facility is located more than 1000 km from the National Radio Quiet Zones in West Virginia and Colorado. 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 proposed antenna structure has been registered with the FCC. The FCC antenna structure registration number is 1226610. There will be no change in the overall height of the antenna structure as a result of the instant proposal.

#### Allocation Considerations

The proposed WOAI-DT facility meets the criteria of Section 73.622(f)(2) of the FCC Rules. Therefore, pursuant to that section, the application shall not be subject to further consideration of electromagnetic interference to other DTV or analog TV broadcast stations.

With respect to Mexican coordination, the proposal is acceptable pursuant to Section 2 of the U.S./Mexico *Memorandum of Understanding* (“MOU”)

Concerning Digital Television.<sup>††</sup> The proposal is for an allotment that is listed in Appendix 4 of the *MOU* and it is not listed as a “specially negotiated mutually accepted short space” allotment. Therefore, only notification of Mexico is required under Section 2 of the *MOU*.

#### Environmental Considerations

With respect to the potential for human exposure to radio frequency (RF) radiation, calculations prepared in accordance with FCC Bulletin OET-65 (Edition 97-01) indicate that the proposal will not result in human exposure to RF radiation at ground level in excess of FCC standards. Power density calculations were conducted at 2-m above ground<sup>‡‡</sup> based on the following conservative assumptions, with the following results:

<b>Call Sign</b>	<b>Channel</b>	<b>Average ERP (kW)</b>	<b>Relative Field Factor<sup>§§</sup></b>	<b>FCC Limit<sup>***</sup> (mW/cm<sup>2</sup>)</b>	<b>Percentage of Limit</b>
WOAI-DT	58	776	0.20	0.491	1.0%

As indicated above, the exposure to RF radiation at 2-m above ground level will not exceed 1.0% of the FCC limit for general population / uncontrolled exposure. Therefore, the proposal complies with the FCC limits for human exposure to RF radiation and it is categorically excluded from environmental processing. The applicant, in coordination with any other users of the transmission facility, shall reduce power or cease operation

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<sup>††</sup> See *Memorandum of Understanding Between the Federal Communications Commission of the United States of America and the Secretaria de Comunicaciones y Transportes of the United Mexican States Related to the use of the 54-72 MHz, 76-88 MHz, 174-216 MHz and 470-806 MHz Bands for the Digital Television Broadcasting Service Along the Common Border* (July 22, 1998)

<sup>‡‡</sup> The radiation center height above ground is 459 m.

<sup>§§</sup> This is a conservative estimate of the relative field factor in the downward direction. See Appendix.

<sup>\*\*\*</sup> for general population/uncontrolled environments

as necessary to protect persons having access to the tower or antenna from radio frequency radiation in excess of the FCC guidelines.

Louis Robert du Treil, Jr.

du Treil, Lundin & Rackley, Inc.  
201 Fletcher Ave.  
Sarasota, FL 34237

April 29, 2004

Figure 1

TECHNICAL EXHIBIT  
APPLICATION FOR CONSTRUCTION PERMIT  
TELEVISION STATION WOAI-DT  
SAN ANTONIO, TEXAS  
CHANNEL 58 776 KW 457 M

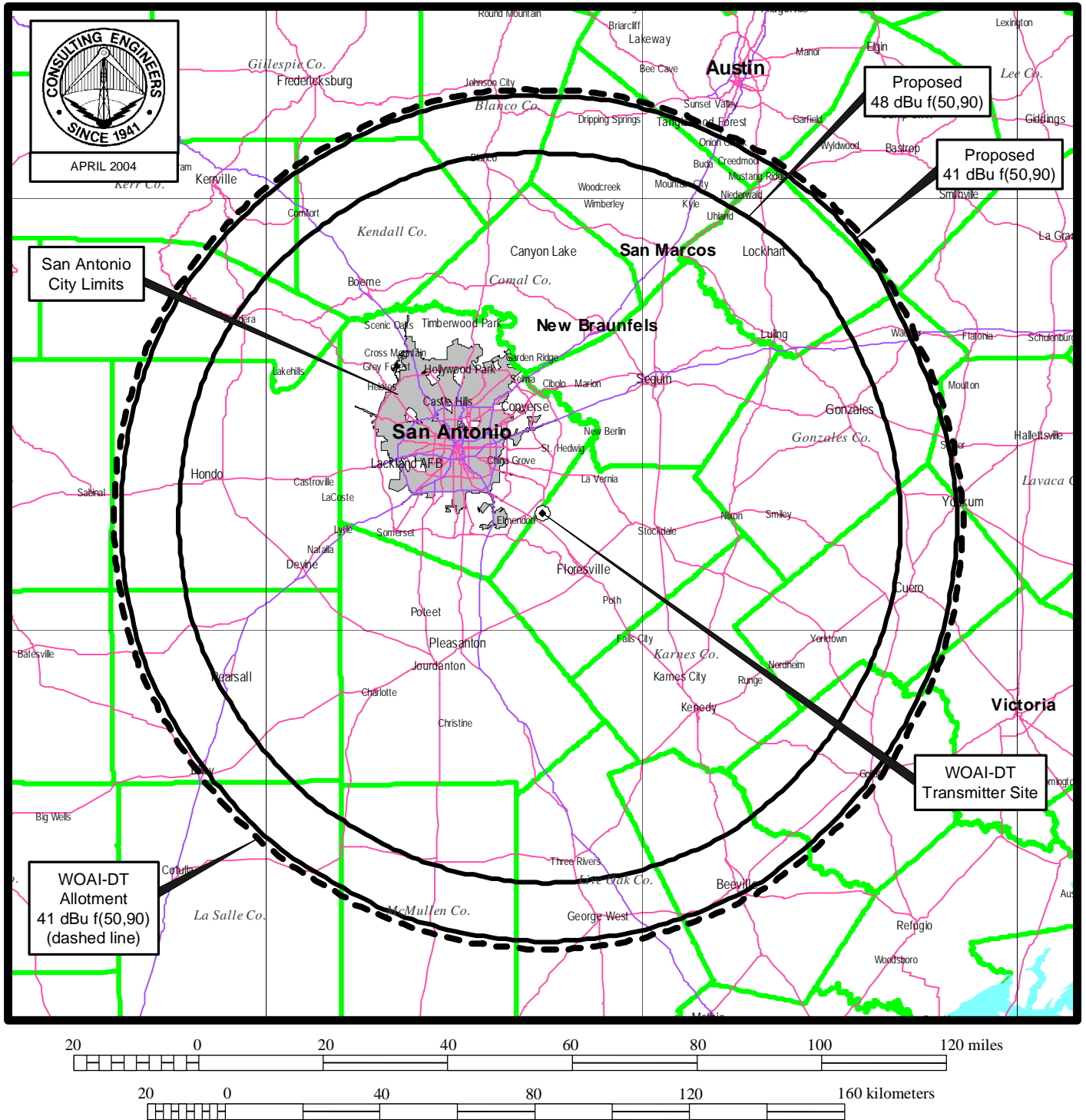
Technical Specifications

Channel / Frequency Band	58 / 734-740 MHz
Site Coordinates (NAD 27)	29°16'11" North Latitude 98°15'55" West Longitude
Site elevation	158.2 m AMSL
Average elevation of standard eight radials, 3 to 16 km	160 m AMSL
Overall height of existing structure	466.3 m AGL / 624.5 m AMSL
Height of antenna radiation center	459 m AGL / 617 m AMSL
Antenna radiation center HAAT	457 m
Antenna structure ASRN	1226610

Proposed Operation	
Parameter	DTV
Transmitter power output (output of mask filter)	16.98 dBk (50 kW)
Transmission line loss (519-m, DCA, 7-inch, EIA style, rigid)	1.97 dB
Antenna input power	15.01 dBk
Antenna RMS gain (DCA, model TFU-28GTH-RO4)	13.89 dBd
Maximum effective radiated power	28.9 dBk (776 kW)



Figure 2



## PREDICTED COVERAGE CONTOURS

TELEVISION STATION WOAI-DT  
SAN ANTONIO, TEXAS  
CHANNEL 58 776 KW 457 M

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

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Analysis of Permissible Effective Radiated Power

Azimuth (deg. True)	FCC Allotment Pattern (relative field)	FCC Allotment Permissible ERP (kW)	FCC Allotment Permissible ERP (dBk)	Permissible ERP Adjustment for 6-m Increase in HAAT (dB)	Adjusted Permissible ERP (dBk)	Proposed Antenna Pattern (relative field)	Proposed ERP (dBk)
0	0.975	950.6	29.78	-0.11	29.67	1.000	28.9
10	0.974	948.7	29.77	-0.11	29.66	1.000	28.9
20	0.974	948.7	29.77	-0.11	29.66	1.000	28.9
30	0.974	948.7	29.77	-0.11	29.66	1.000	28.9
40	0.974	948.7	29.77	-0.11	29.66	1.000	28.9
50	0.974	948.7	29.77	-0.11	29.66	1.000	28.9
60	0.973	946.7	29.76	-0.11	29.65	1.000	28.9
70	0.973	946.7	29.76	-0.11	29.65	1.000	28.9
80	0.973	946.7	29.76	-0.11	29.65	1.000	28.9
90	0.972	944.8	29.75	-0.11	29.64	1.000	28.9
100	0.975	950.6	29.78	-0.11	29.67	1.000	28.9
110	0.978	956.5	29.81	-0.11	29.69	1.000	28.9
120	0.982	964.3	29.84	-0.11	29.73	1.000	28.9
130	0.986	972.2	29.88	-0.11	29.76	1.000	28.9

Azimuth (deg. True)	FCC Allotment Pattern (relative field)	FCC Allotment Permissible ERP (kW)	FCC Allotment Permissible ERP (dBk)	Permissible ERP Adjustment for 6-m Increase in HAAT (dB)	Adjusted Permissible ERP (dBk)	Proposed Antenna Pattern (relative field)	Proposed ERP (dBk)
140	0.989	978.1	29.90	-0.11	29.79	1.000	28.9
150	0.992	984.1	29.93	-0.11	29.82	1.000	28.9
160	0.994	988.0	29.95	-0.11	29.83	1.000	28.9
170	0.997	994.0	29.97	-0.11	29.86	1.000	28.9
180	1.000	1000.0	30.00	-0.11	29.89	1.000	28.9
190	0.997	994.0	29.97	-0.11	29.86	1.000	28.9
200	0.994	988.0	29.95	-0.11	29.83	1.000	28.9
210	0.991	982.1	29.92	-0.11	29.81	1.000	28.9
220	0.988	976.1	29.90	-0.11	29.78	1.000	28.9
230	0.986	972.2	29.88	-0.11	29.76	1.000	28.9
240	0.985	970.2	29.87	-0.11	29.75	1.000	28.9
250	0.984	968.3	29.86	-0.11	29.75	1.000	28.9
260	0.983	966.3	29.85	-0.11	29.74	1.000	28.9
270	0.982	964.3	29.84	-0.11	29.73	1.000	28.9
280	0.982	964.3	29.84	-0.11	29.73	1.000	28.9
290	0.981	962.4	29.83	-0.11	29.72	1.000	28.9
300	0.981	962.4	29.83	-0.11	29.72	1.000	28.9
310	0.980	960.4	29.82	-0.11	29.71	1.000	28.9
320	0.980	960.4	29.82	-0.11	29.71	1.000	28.9
330	0.978	956.5	29.81	-0.11	29.69	1.000	28.9
340	0.977	954.5	29.80	-0.11	29.68	1.000	28.9
350	0.976	952.6	29.79	-0.11	29.67	1.000	28.9

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Transmitting Antenna Manufacturer's Pattern Data

*(three pages follow)*



Date

29 Apr 2004

Call Letters

Channel 58

Location

SAN ANTONIO, TX

Customer

Antenna Type

TFU-28GTH-R O4

**ELEVATION PATTERN**

RMS Gain at Main Lobe

**24.5 (13.89 dB)**

Beam Tilt

**0.75 Degrees**

RMS Gain at Horizontal

**18.0 (12.55 dB)**

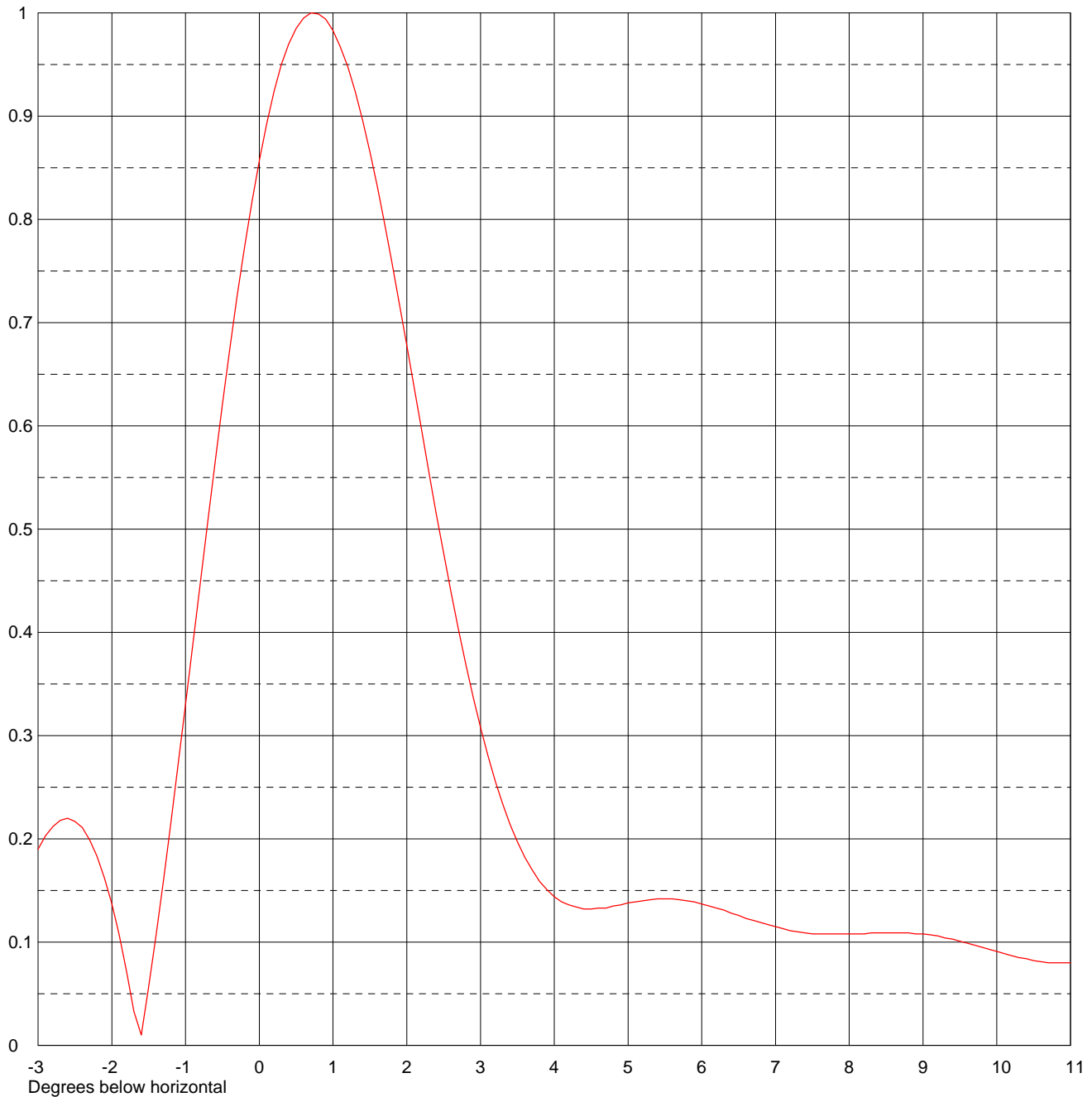
Frequency

**737.00 MHz**

Calculated / Measured

**Calculated**

Drawing #

**28G245075**

Remarks:



Date

29 Apr 2004

Call Letters

Channel 58

Location

SAN ANTONIO, TX

Customer

Antenna Type

TFU-28GTH-R O4

**ELEVATION PATTERN**

RMS Gain at Main Lobe

**24.5 (13.89 dB)**

Beam Tilt

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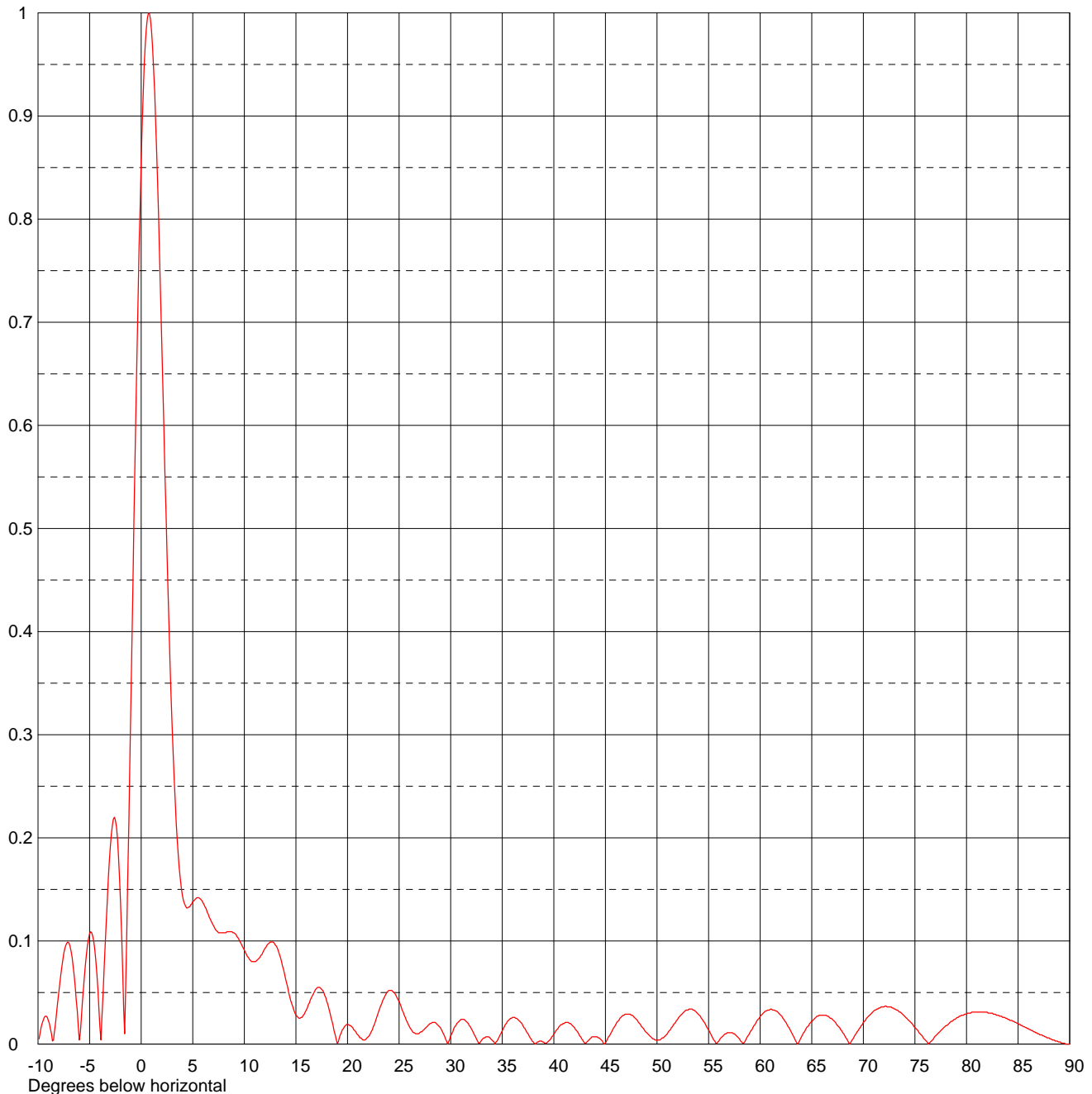
Frequency

**737.00 MHz**

Calculated / Measured

**Calculated**

Drawing #

**28G245075-90**

Remarks:



Date **29 Apr 2004**  
 Call Letters **Channel 58**  
 Location **SAN ANTONIO, TX**  
 Customer  
 Antenna Type **TFU-28GTH-R 04**

## TABULATION OF ELEVATION PATTERN

Elevation Pattern Drawing # **28G245075-90**

Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.001	2.4	0.515	10.6	0.081	30.5	0.018	51.0	0.010	71.5	0.035
-9.5	0.023	2.6	0.439	10.8	0.080	31.0	0.024	51.5	0.017	72.0	0.036
-9.0	0.023	2.8	0.369	11.0	0.080	31.5	0.022	52.0	0.024	72.5	0.036
-8.5	0.004	3.0	0.308	11.5	0.084	32.0	0.015	52.5	0.030	73.0	0.034
-8.0	0.049	3.2	0.256	12.0	0.093	32.5	0.005	53.0	0.033	73.5	0.031
-7.5	0.088	3.4	0.214	12.5	0.099	33.0	0.004	53.5	0.033	74.0	0.027
-7.0	0.098	3.6	0.182	13.0	0.096	33.5	0.007	54.0	0.029	74.5	0.022
-6.5	0.067	3.8	0.159	13.5	0.084	34.0	0.004	54.5	0.022	75.0	0.016
-6.0	0.004	4.0	0.144	14.0	0.063	34.5	0.003	55.0	0.014	75.5	0.010
-5.5	0.066	4.2	0.136	14.5	0.042	35.0	0.013	55.5	0.004	76.0	0.004
-5.0	0.107	4.4	0.132	15.0	0.028	35.5	0.022	56.0	0.003	76.5	0.002
-4.5	0.092	4.6	0.133	15.5	0.026	36.0	0.026	56.5	0.009	77.0	0.008
-4.0	0.016	4.8	0.135	16.0	0.033	36.5	0.024	57.0	0.011	77.5	0.013
-3.5	0.094	5.0	0.138	16.5	0.045	37.0	0.018	57.5	0.010	78.0	0.018
-3.0	0.190	5.2	0.140	17.0	0.054	37.5	0.010	58.0	0.005	78.5	0.022
-2.8	0.212	5.4	0.142	17.5	0.053	38.0	0.002	58.5	0.002	79.0	0.025
-2.6	0.220	5.6	0.142	18.0	0.041	38.5	0.002	59.0	0.011	79.5	0.028
-2.4	0.211	5.8	0.140	18.5	0.022	39.0	0.002	59.5	0.019	80.0	0.029
-2.2	0.183	6.0	0.137	19.0	0.001	39.5	0.003	60.0	0.027	80.5	0.031
-2.0	0.137	6.2	0.133	19.5	0.014	40.0	0.010	60.5	0.032	81.0	0.031
-1.8	0.072	6.4	0.128	20.0	0.019	40.5	0.017	61.0	0.034	81.5	0.031
-1.6	0.010	6.6	0.123	20.5	0.016	41.0	0.020	61.5	0.032	82.0	0.031
-1.4	0.107	6.8	0.119	21.0	0.009	41.5	0.020	62.0	0.028	82.5	0.030
-1.2	0.215	7.0	0.115	21.5	0.004	42.0	0.016	62.5	0.021	83.0	0.028
-1.0	0.330	7.2	0.111	22.0	0.007	42.5	0.008	63.0	0.012	83.5	0.026
-0.8	0.448	7.4	0.109	22.5	0.017	43.0	0.001	63.5	0.002	84.0	0.024
-0.6	0.565	7.6	0.108	23.0	0.031	43.5	0.005	64.0	0.007	84.5	0.022
-0.4	0.674	7.8	0.108	23.5	0.044	44.0	0.007	64.5	0.016	85.0	0.020
-0.2	0.773	8.0	0.108	24.0	0.052	44.5	0.005	65.0	0.022	85.5	0.017
0.0	0.857	8.2	0.108	24.5	0.050	45.0	0.001	65.5	0.027	86.0	0.015
0.2	0.924	8.4	0.109	25.0	0.041	45.5	0.010	66.0	0.028	86.5	0.012
0.4	0.970	8.6	0.109	25.5	0.028	46.0	0.019	66.5	0.027	87.0	0.010
0.6	0.995	8.8	0.109	26.0	0.017	46.5	0.026	67.0	0.024	87.5	0.008
0.8	0.999	9.0	0.108	26.5	0.011	47.0	0.029	67.5	0.018	88.0	0.006
1.0	0.983	9.2	0.106	27.0	0.011	47.5	0.028	68.0	0.011	88.5	0.004
1.2	0.948	9.4	0.103	27.5	0.015	48.0	0.024	68.5	0.003	89.0	0.002
1.4	0.896	9.6	0.099	28.0	0.020	48.5	0.017	69.0	0.005	89.5	0.001
1.6	0.832	9.8	0.095	28.5	0.021	49.0	0.011	69.5	0.013	90.0	0.000
1.8	0.758	10.0	0.091	29.0	0.016	49.5	0.006	70.0	0.021		
2.0	0.678	10.2	0.087	29.5	0.005	50.0	0.004	70.5	0.027		
2.2	0.596	10.4	0.084	30.0	0.008	50.5	0.006	71.0	0.032		

Remarks: