

ENGINEERING STATEMENT
RE DTV BROADCAST ENGINEERING DATA
APPLICATION FOR MODIFICATION OF
CONSTRUCTION PERMIT (BPCDT-19991029AHH)
KQTV-DT, ST. JOSEPH, MISSOURI
CHANNEL 53 1000 KW ERP 247 METERS HAAT

MARCH 2004

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This engineering statement has been prepared on behalf of Nexstar Broadcasting, Inc., licensee of KQTV(TV), St. Joseph, Missouri. The purpose of this engineering statement is to modify its DTV construction permit, FCC File No. BPCDT-19991029AHH, for maximization of digital television (“DTV”) facilities.

KQTV(TV) is licensed to operate on NTSC television Channel 2 with a maximum visual effective radiated power (“ERP”) of 100 kW (horizontal polarization) and height above average terrain (“HAAT”) of 247 meters (810.4 feet). KQTV-DT has been allocated DTV Channel 53 with facilities of 1000 kW directional ERP and HAAT of 247 meters in the revised DTV Table of Allotments.¹ KQTV-DT currently has a construction permit (FCC File No. BPCDT-19991029AHH) for 10.0 kW ERP at 215.1 meters HAAT. KQTV-DT proposes to maximize its DTV operation by constructing Channel 53 DTV facilities of 1000 kW (horizontal polarization) at an HAAT of 247 meters.

The DTV antenna will be top-mounted on the same tower specified in FCC File No. BPCDT-19991029AHH. The tower has an overall structure height above ground of 228.6 meters (750 feet). Exhibit E-1 shows a vertical sketch and the arrangement of the antennas on the tower. The existing transmitter site is located at 40th and Faraon Street, St. Joseph, Missouri.

The geographic coordinates of the site are:

North Latitude: 39° 46' 12"

West Longitude: 94° 47' 53"

¹“In the Matter of Advanced Television Systems and Their Impact Upon the Existing Television Broadcast Service”, MM Docket No. 87-286, Memorandum Opinion and Order on Reconsideration of the Sixth Report and Order (FCC 98-24) February 12, 1998, DTV Table of Allotments (Appendix B).

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Tower Registration No. 1000389

Equipment Data

Antenna:	Dielectric	TFU-18GTH-R 04 or equivalent
	Beam Tilt	1.0° electrical
	Power Gain	15.5

Power Data

Transmitter output	76.35 kW	18.83 dBk
Total Transmission line efficiency loss	84.5%	0.73 dB
Dielectric, 8", 75 ohm or equivalent, length: 250 meters (820.2 feet)		
Input Power to the antenna	64.52 kW	18.10 dBk
Antenna power gain, Main Lobe	15.5	11.90 dBk
Effective Radiated Power, Max.	1000 kW	30.0 dBk

Elevation Data

Vertical dimension of Channel 53 top mounted antenna	11.0 meters 36.1 feet
Overall height above ground of existing antenna structure (including appurtenances)	228.6 meters 750 feet
Center of radiation of Channel 53 antenna above ground	213.1 meters 699.1 feet
Elevation of site above mean sea level	310.9 meters 1020 feet
Center of radiation of Channel 53 antenna above mean sea level	524 meters 1719.2 feet

Overall height above mean sea level of existing tower (including beacon)	539.5 meters 1770 feet
Antenna height above average terrain	247 meters

Coverage

The average elevation data for 3 to 16 km along the eight cardinal radials has been determined from the NGDC 3-second database. The F(50,90) DTV coverage contours have been computed from reference to the propagation data for Channel 53 as published by the FCC in Figure 10, Section 73.699 of the FCC Rules and Regulations. Utilizing the formula in Section 73.625(b)(2) of the rules for the effective heights, it is found that the depression angle, A_h , varies from 0.410 to 0.449 degrees. Since the relative vertical field is greater than 90% of the maximum at these depression angles, the maximum power was used in determining the distance to the DTV contour.

Exhibit E-3 shows the proposed KQTV-DT, 48 and 41 dBu F(50,90) coverage contours on a map and includes the legal boundaries of St. Joseph, Missouri.

Interference Analysis

A study of predicted interference caused by the proposed KQTV-DT operation has been performed using a version of the Longley-Rice program as described in OET Bulletin No. 69 (July 2, 1997) and the Public Notice, "Additional Application Processing Guidelines for Digital Television (DTV)" (August 1998). The FCC's FORTRAN-77 code was modified only to the

extent necessary (primarily input/output handling) for the program to run on a Windows98/Intel platform. Comparison of service/interference areas and population indicates that this model closely matches the FCC's evaluation program. Best efforts have been made to use data and calculation identical to the FCC's program. The model employs the Longley-Rice propagation methodology and evaluates in grid cells of approximately 2 sq. km. Using 3-second terrain data sampled approximately every 0.1 km at one-degree azimuth intervals with 2000 census centroids, all studies are based upon data in the current CDBS data base update of the FCC's engineering database. A Longley-Rice study was performed with the proposed maximized KQTV-DT facilities and all relevant stations listed in the FCC data base as of December 31, 2003. The study results and the included stations are listed in Table II. No potentially affected station is predicted to receive more than the 2% de-minimis standard or approach a cumulative 10% interference.

Other Licensed and Broadcast Facilities

There is one AM station, KGNM, located within 3.22 km of the proposed site, however no interference is anticipated. KQTV(TV), channel 2, is the only other television broadcast station located within 2 km of the proposed site. There are no FM broadcast stations located within 2 km of the proposed site. No adverse technical effect is anticipated by the DTV operation to any other FCC licensed facility, however, if any problems occur, the permittee will take the necessary steps to resolve them.

Radio Frequency Field Level (“RFF” Level)

<u>Station</u>	<u>ERP</u> (kW)	<u>HAAT</u> (m)	<u>Frequency</u> (MHz)	<u>Ch</u>	<u>RCAGL</u> (m)	<u>F*</u>	<u>S (μW/cm²)</u>	<u>RFF</u> (%)
KQTV-DT Prop. Max	1000	247	707	53	211.1	0.1	7.50	1.59

*F = assumed value

** RCAGL - 2 meters

The addition of the KQTV-DT facilities will contribute approximately 7.5 μW/cm² or 1.59% of the limit for an uncontrolled environment to the total RFF levels from the existing operational facilities.

Section 1.1307

The proposed operation based upon the current OET Bulletin No.65, Edition 97-01 dated August 1997 and Supplement A meets the provisions of the FCC radio frequency field guidelines, and thus, complies with Section 1.1307 of the FCC Rules.

An environmental assessment (“EA”) is categorically excluded under Section 1.1306 of the FCC Rules and Regulations since the permittee indicates:

- (a)(1) The proposed facilities on an existing tower are not located in an officially designated wilderness area.
- (a)(2) The proposed facilities on an existing are not located in an officially designated wildlife preserve.
- (a)(3) The proposed facilities will not affect any listed threatened or endangered species or habitats.

- (a)(3)(ii) The proposed facilities will not jeopardize the continued existence of any proposed endangered or threatened species or likely to result in the destruction or adverse modification of proposed critical habitats.
- (a)(4) The proposed facilities will not affect any known districts, sites, buildings, structures, or objects significant in American history, architecture, archaeology, engineering, or culture.
- (a)(5) The proposed facilities located on an existing tower are not located near any known Indian religious sites.
- (a)(6) The proposed facilities located on an existing tower are not located in a flood plain.
- (a)(7) The placement of the DTV antenna on the existing tower at this site will not involve a significant change in surface features of the ground in the vicinity of the tower.
- (a)(8) It is not proposed to change the existing tower lighting.
- (b) Workers and the general public will not be subjected to RFF levels in excess of the current FCC guideline. Authorized personnel will be alerted to areas of the tower where potential radiation levels are in excess of the FCC guideline. A security fence with a locked gate deters unauthorized access to the tower site.

TABLE I
COMPUTED COVERAGE DATA
FOR THE PROPOSED DTV OPERATION OF
KQTV-DT, ST. JOSEPH, MISSOURI
CHANNEL 53 1000 KW ERP 247 METERS HAAT
MARCH 2004

<u>Radial Bearing</u> N ° E, T	<u>Depression Angle</u>	<u>ERP at Radio Horizon</u> kW	<u>Distance to Contour F(50,90)</u>	
			<u>48 dBu City Grade</u> km	<u>41 dBu Noise-Limited</u> km
0	0.410	1,000	75.0	86.0
45	0.438	1,000	77.4	90.0
90	0.437	1,000	77.3	89.9
135	0.435	1,000	77.1	89.6
180	0.418	1,000	75.6	87.1
225	0.449	1,000	78.6	91.8
270	0.447	1,000	78.4	91.5
315	0.436	1,000	77.1	89.6

*Based on data from FCC 3-second data base

DTV Channel 53 (704-710 MHz)
 Average Elevation 3.2 to 16.1 km 277 meters AMSL
 Center of Radiation 524 meters AMSL
 Antenna Height Above Average Terrain 247 meters
 Effective Radiated Power 1000 kW (30 dBk) Max.

North Latitude: 39° 46' 12"
 West Longitude: 94° 47' 53"

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TABLE II
POTENTIAL INTERFEREES
OF THE PROPOSED OPERATION OF
KQTV-DT, ST. JOSEPH, MISSOURI
CHANNEL 53 1000 KW 247 METERS
MARCH 2004

<u>Station</u>	<u>Ch</u>	<u>Status</u>	<u>City/State</u>	<u>Distance from KQTV-DT km</u>	<u>File No.</u>	<u>New Interference percent</u>
KMCI	38	Lic	Lawrence, KS	102.4	BLCT-19880225KE	0
KMCI	38	CP mod	Lawrence, KS	90.9	BMPCT-20020621AAQ	0
KTKA-TV	49	Lic	Topeka, KS	126.7	BLCT-19830627KF	0
KTKA-TV	49	CP	Topeka, KS	126.8	BPCT-20001101AAH	0
KPXE	50	Lic	Kansas City, MO	86.7	BLCT-19781204KG	0

ABOVE MEAN SEA LEVEL

ABOVE GROUND

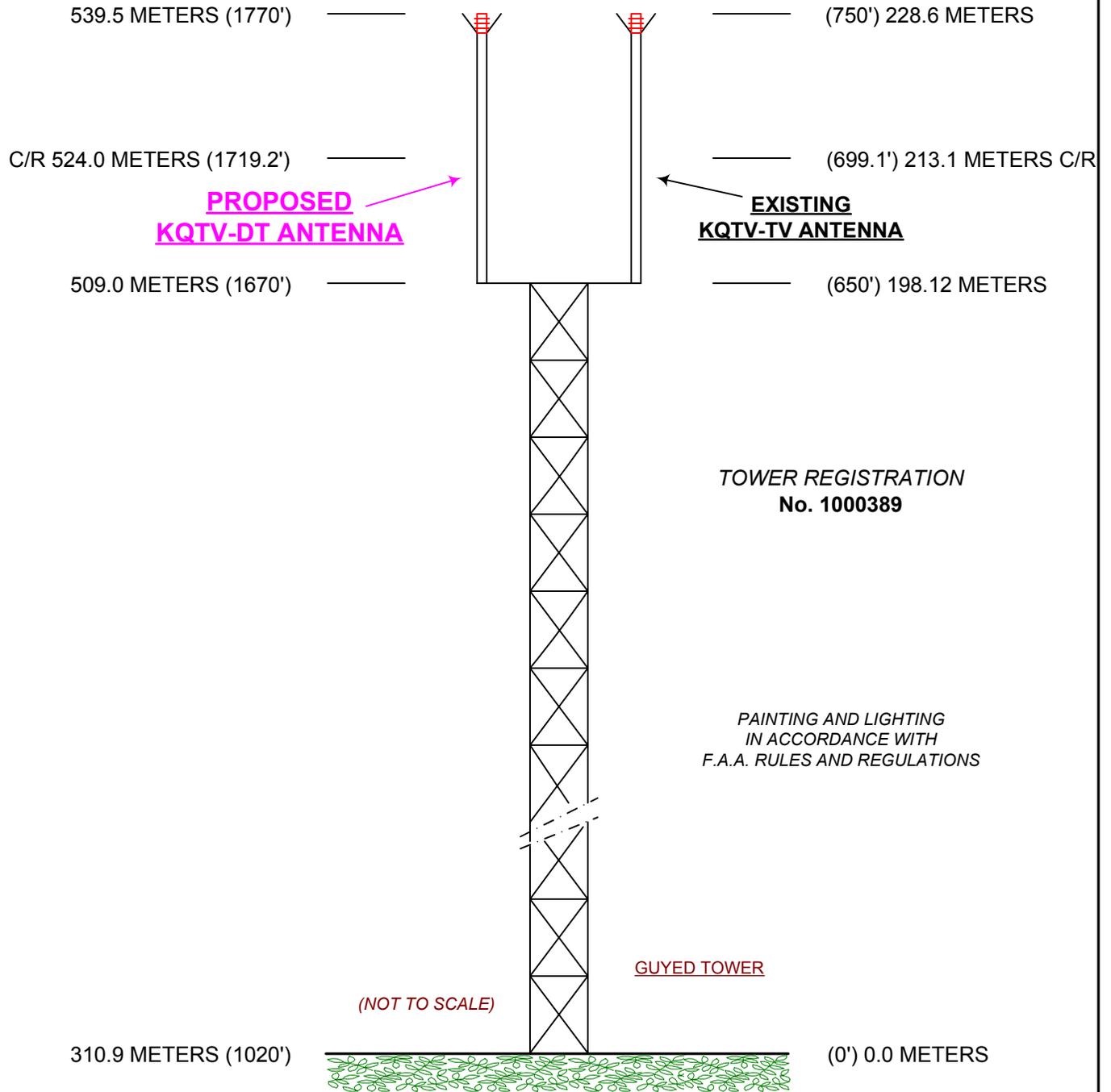


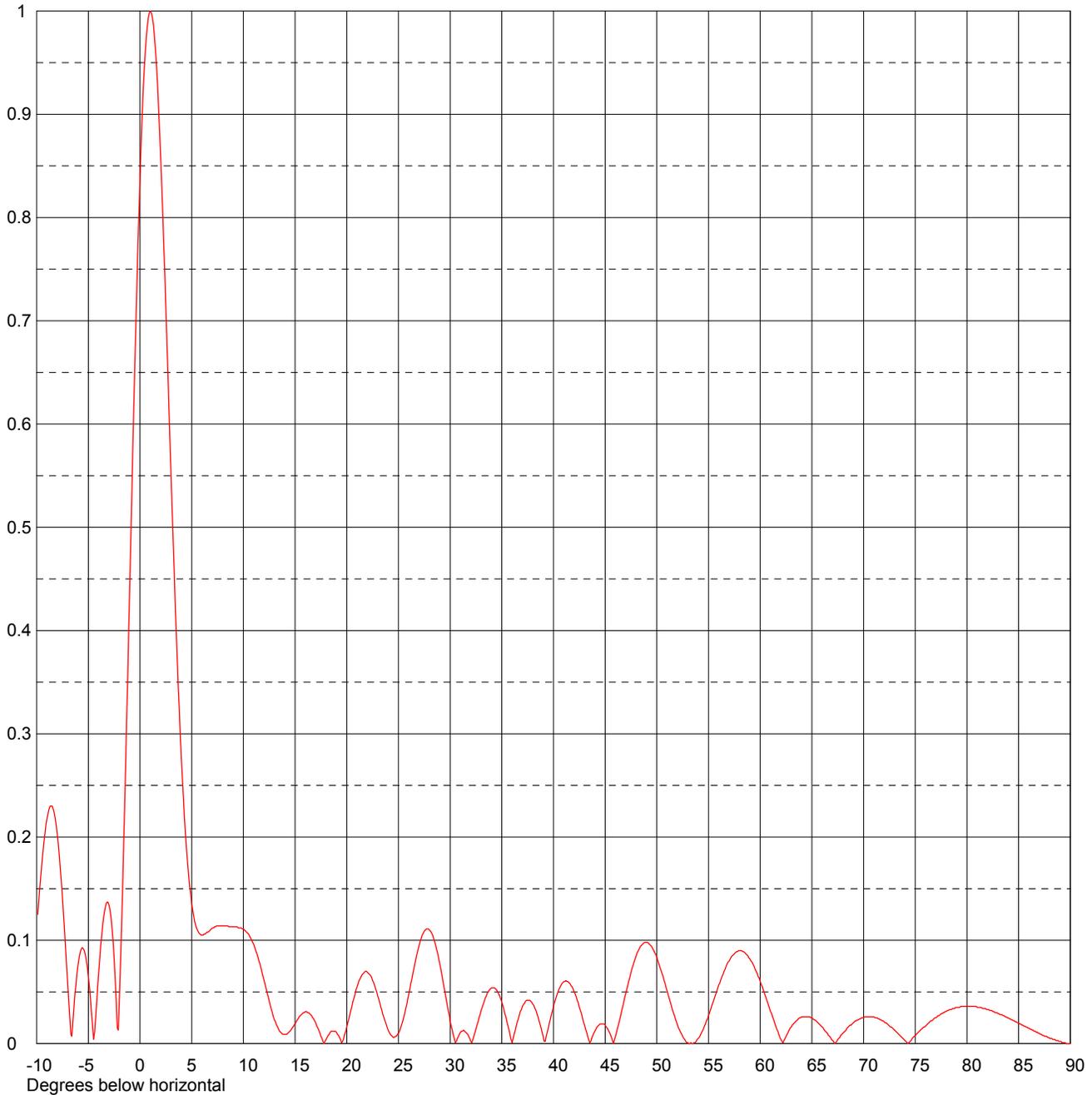
EXHIBIT E-1
VERTICAL SKETCH
KQTV-DT, ST. JOSEPH, MISSOURI
MARCH 2004



Date **02 Dec 2003**
Call Letters **KQTV-DT** Channel **53**
Location **St Joseph, MO**
Customer
Antenna Type **TFU-22GTH-R O6**

ELEVATION PATTERN

RMS Gain at Main Lobe	19.0 (12.79 dB)	Beam Tilt	1.00 Degrees
RMS Gain at Horizontal	13.4 (11.27 dB)	Frequency	707.00 MHz
Calculated / Measured	Calculated	Drawing #	22G190100-90



Remarks:



Date **02 Dec 2003**
 Call Letters **KQTV-DT** Channel **53**
 Location **St Joseph, MO**
 Customer
 Antenna Type **TFU-22GTH-R O6**

TABULATION OF ELEVATION PATTERN

Elevation Pattern Drawing # **22G190100-90**

Angle	Field										
-10.0	0.112	2.4	0.743	10.6	0.104	30.5	0.001	51.0	0.051	71.5	0.024
-9.5	0.174	2.6	0.680	10.8	0.100	31.0	0.011	51.5	0.033	72.0	0.021
-9.0	0.218	2.8	0.616	11.0	0.096	31.5	0.011	52.0	0.018	72.5	0.017
-8.5	0.230	3.0	0.551	11.5	0.080	32.0	0.002	52.5	0.007	73.0	0.013
-8.0	0.202	3.2	0.488	12.0	0.061	32.5	0.014	53.0	0.001	73.5	0.008
-7.5	0.140	3.4	0.428	12.5	0.041	33.0	0.032	53.5	0.000	74.0	0.003
-7.0	0.058	3.6	0.373	13.0	0.023	33.5	0.046	54.0	0.005	74.5	0.002
-6.5	0.021	3.8	0.322	13.5	0.012	34.0	0.054	54.5	0.014	75.0	0.008
-6.0	0.076	4.0	0.276	14.0	0.009	34.5	0.052	55.0	0.027	75.5	0.013
-5.5	0.092	4.2	0.237	14.5	0.012	35.0	0.040	55.5	0.042	76.0	0.017
-5.0	0.065	4.4	0.203	15.0	0.019	35.5	0.021	56.0	0.057	76.5	0.022
-4.5	0.004	4.6	0.175	15.5	0.027	36.0	0.001	56.5	0.070	77.0	0.025
-4.0	0.069	4.8	0.153	16.0	0.031	36.5	0.021	57.0	0.080	77.5	0.029
-3.5	0.124	5.0	0.136	16.5	0.028	37.0	0.036	57.5	0.087	78.0	0.031
-3.0	0.134	5.2	0.123	17.0	0.020	37.5	0.042	58.0	0.090	78.5	0.033
-2.8	0.121	5.4	0.114	17.5	0.007	38.0	0.038	58.5	0.088	79.0	0.035
-2.6	0.097	5.6	0.109	18.0	0.004	38.5	0.026	59.0	0.082	79.5	0.036
-2.4	0.061	5.8	0.106	18.5	0.012	39.0	0.007	59.5	0.072	80.0	0.036
-2.2	0.015	6.0	0.105	19.0	0.011	39.5	0.015	60.0	0.060	80.5	0.036
-2.0	0.043	6.2	0.106	19.5	0.001	40.0	0.036	60.5	0.046	81.0	0.035
-1.8	0.110	6.4	0.107	20.0	0.016	40.5	0.052	61.0	0.031	81.5	0.034
-1.6	0.185	6.6	0.108	20.5	0.036	41.0	0.060	61.5	0.017	82.0	0.033
-1.4	0.267	6.8	0.110	21.0	0.055	41.5	0.059	62.0	0.004	82.5	0.031
-1.2	0.353	7.0	0.112	21.5	0.067	42.0	0.050	62.5	0.007	83.0	0.029
-1.0	0.442	7.2	0.113	22.0	0.069	42.5	0.035	63.0	0.016	83.5	0.027
-0.8	0.530	7.4	0.114	22.5	0.061	43.0	0.018	63.5	0.022	84.0	0.025
-0.6	0.617	7.6	0.114	23.0	0.046	43.5	0.001	64.0	0.026	84.5	0.022
-0.4	0.698	7.8	0.114	23.5	0.028	44.0	0.012	64.5	0.026	85.0	0.020
-0.2	0.774	8.0	0.114	24.0	0.013	44.5	0.019	65.0	0.025	85.5	0.017
0.0	0.840	8.2	0.114	24.5	0.006	45.0	0.018	65.5	0.021	86.0	0.015
0.2	0.897	8.4	0.114	25.0	0.010	45.5	0.009	66.0	0.016	86.5	0.012
0.4	0.941	8.6	0.113	25.5	0.025	46.0	0.007	66.5	0.010	87.0	0.010
0.6	0.974	8.8	0.113	26.0	0.048	46.5	0.027	67.0	0.003	87.5	0.007
0.8	0.994	9.0	0.113	26.5	0.073	47.0	0.049	67.5	0.004	88.0	0.005
1.0	1.000	9.2	0.113	27.0	0.095	47.5	0.069	68.0	0.010	88.5	0.004
1.2	0.994	9.4	0.113	27.5	0.109	48.0	0.085	68.5	0.016	89.0	0.002
1.4	0.975	9.6	0.112	28.0	0.110	48.5	0.095	69.0	0.020	89.5	0.001
1.6	0.946	9.8	0.112	28.5	0.099	49.0	0.098	69.5	0.023	90.0	0.000
1.8	0.906	10.0	0.111	29.0	0.077	49.5	0.094	70.0	0.025		
2.0	0.858	10.2	0.109	29.5	0.050	50.0	0.083	70.5	0.026		
2.2	0.803	10.4	0.107	30.0	0.022	50.5	0.068	71.0	0.026		

Remarks:



SYSTEM SUMMARY

Antenna:

Type:	TFU-22GTH-R O6	ERP:	1000 kW	(30.00 dBk)
Channel:	53	RMS Gain*:	19.0	(12.79 dB)
Location:	St Joseph, MO	Input Power:	52.63 kW	(17.21 dBk)

H Pol

Transmission Line:

Type:	EIA Style Rigid TL	Attenuation:	0.93 dB
Size:	7" 75 ohm	Efficiency:	80.8%
Length	820 ft	250 m	

Transmitter:

Average Power Required: **65.14 kW** (18.14 dBk)

* Gain is with respect to half wave dipole.

