

ENGINEERING STATEMENT RE
MODIFICATION OF OUTSTANDING CONSTRUCTION PERMIT
BPCDT-19991021AAW

ON BEHALF OF
GILMORE BROADCASTING CORPORATION
WEHT-DT, EVANSVILLE, INDIANA
CHANNEL 59 59.0 KW ERP 301.1 METERS

NOVEMBER 2001

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WASHINGTON, D.C.

This engineering statement has been prepared on behalf of Gilmore Broadcasting Corporation, licensee of WEHT(TV), Evansville, Indiana. The purpose of this engineering statement is to accompany its request for modification of the outstanding construction permit (BPCT-19991021AAW) for digital television (DTV). No other changes are requested.

WEHT(TV) operates on NTSC television Channel 25 with a maximum visual effective radiated power of 1200 kW (horizontal polarization) and a HAAT of 314 meters (1030 feet). WEHT(TV) has been allocated DTV Channel 59 with facilities of 56.5 kW and HAAT of 314 meters in the revised DTV Table of Allotments.¹ WEHT(TV) proposes to construct interim DTV facilities of 59.0 kW non-directional (horizontal polarization) and at a slightly reduced height above average terrain of 301.1 meters in accordance with the effective radiated power authorized for WEHT(TV) by the Sixth Report and the outstanding construction permit.

This will be the equivalent facilities based on the formula listed in 47 C.F.R. Section 73.622(f)(3)(ii).

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), 2/12/98, DTV Table of Allotments, p. B-21.

Equivalent facilities calculation per Section 73.622(f)(3)(ii):

ERP adjustment in dB = $20\log(H_1/H_2)$ H_1 = Reference antenna HAAT

H_2 = Actual antenna HAAT

Maximum adjustment 25 meters

ERP adjustment in dB = $20\log(314/301.1)$ **ERP adjustment = 0.364 dB**

ERP actual = ERP allotted + ERP adjustment

ERP actual = 17.52 dBk + 0.364 dB ERP actual = 17.88 dBk

ERP actual = 61.4 kW

Assigned Directional Pattern

WEHT-DT has been assigned a directional pattern in the Sixth Report and Order which has a minimum relative field of 0.9800. The corresponding ERP for this relative field value is:

ERP minimum = (Minimum Relative Field)² x ERP actual

ERP minimum = $(0.980)^2 \times 61.4 \text{ kW}$ **ERP minimum = 59.0 kW**

Therefore, the maximum ERP in this proposal will be 59.0 kW in order to ensure that the DTV facilities will radiate no more than the equivalent effective radiated power in every direction as the effective radiated power authorized for the WEHT-DT facilities in the Sixth Report and Order and the outstanding construction permit.

There are no AM stations located within one km of the existing WEHT(TV) tower site. Other than WEHT(TV) NTSC Channel 25, there are no FM or no other full-service TV stations

transmitting from the WEHT(TV) existing tower. No other FM or TV stations are located within 200 meters.

The TV antenna will be side-mounted on the existing tower having a total overall structure height above ground of 301.1 meters (988 feet). The existing transmitter site is located at 800 Marywood Drive, Henderson, Kentucky. Since there is no change in overall height FAA airspace approval is not required. The tower registration number is 1042028.

The geographic coordinates of the site remain unchanged and as follows.

North Latitude: 37° 51' 57"

West Longitude: 87° 34' 04"

NAD-27

Equipment Data

Antenna: Dielectric, Type TFU-16DSB-A(C) or equivalent non-directional antenna with 1° electrical beam tilt. The vertical plane pattern and other exhibits required by Section 73.625(c) are included in Appendix A. Except in the main lobe, this proposed antenna will radiate equal to or less than the field authorized in the granted construction permit (BPCDT19991021AAW).

Power Data

Transmitter output	5.52 kW	7.42 dBk
Dielectric 4-1/16" 50 ohm line or equivalent--length 289.6 meters (950 feet)	66.9%	1.75 dB
Input power to the antenna	3.69 kW	5.67 dBk

Non-Directional antenna power gain Main Lobe (1° electrical tilt)	16	12.04 dB
Non-Directional antenna power gain Antenna power gain (horizontal)	11.8	10.72 dB
Effective Radiated Power, Maximum	59.0 kW	17.7 dBk

Elevation Data

[(Existing Tower; No Change in Overall Height)]

Vertical dimension of Channel 59 side-mounted antenna	7.5 meters 24.7 feet
Overall height above ground of the existing NTSC antenna and structure (including beacon)	301.1 meters 988 feet
Center of radiation of Channel 59 antenna above ground	278.9 meters 915 feet
Elevation of site above mean sea level	140.5 meters 461 feet
Center of radiation of Channel 59 antenna above mean sea level	419.4 meters 1376 feet
Overall height above mean sea level of existing tower (including beacon)	441.7 meters 1449 feet
Antenna height above average terrain	301.1 meters

Note: Slight height differences result due to conversion to metric.

Allocation

An allocation study from the proposed site has not been performed since the proposed DTV facilities radiate less effective radiated power in every direction than that effective radiated power authorized for the WEHT(TV) facilities in the Sixth Report and in the outstanding construction permit.

Coverage (unchanged)

The average elevation data for 3 to 16 km along each radial has been determined from the data file for the existing WEHT(TV) site abstracted from the FCC files (BLCT-2510).

The F(50,90) DTV coverage contour remains unchanged from that submitted in the engineering statement (see Exhibit E-3) for the outstanding construction permit.

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 0.473 to 0.487 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.

Population and Area Data (unchanged)

The population within the predicted DTV coverage contour is unchanged from that submitted in the engineering report for the outstanding construction permit.

Other Licensed and Broadcast Facilities

No adverse technical effect is anticipated by the proposed DTV operation to any other FCC licensed facility. If required, the applicant will install filters or take other measures as necessary to resolve the problem.

FCC Rule, Section 1.1307

The proposed 59 kW operation will utilize a Dielectric, Type TFU-16DSB-A(C) antenna (or the equivalent) with a center of radiation above ground of 278.9 meters. The proposed side-mounted antenna will be side-mounted on an existing single guyed, uniform, cross-section, steel lattice tower including top antenna with an existing overall height of 301.1 meters AGL.

As previously indicated, there are no AM stations located within one km of the existing WEHT(TV) tower site. According to the FCC data base with the exception of NTSC Channel 25, there are no other stations located within 200 meters. The property on which the WEHT(TV) tower is located is at 800 Marywood Drive, Henderson, Kentucky. Access to the tower is prevented by a chain link fence with a locked gate.

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 ("RFF") guidelines, and thus, complies with Section 1.1307 of the FCC Rules. Provisions will be made to reduce power or to terminate the transmitter emissions, as appropriate, when it is necessary for authorized personnel to be on the tower.

For NTSC, WEHT(TV) employs a RCA, Type TFU-30J with 0.75° electrical beamtilt. The antenna manufacturer representative indicates that the elevation pattern for this antenna shows a maximum relative field of less than 0.1 towards the ground in the vicinity of the tower. Using this relative field factor and the procedures prescribed in OST Bulletin No. 65, the maximum RFF resulting from the present operation at two meters above the base of the tower is calculated to be less

than 2.4 microwatts/cm². This is less than 1% of the 447 microwatts/cm² maximum uncontrolled exposure to RFF recommended by the current FCC guidelines for the general population.

For the DTV operation WEHT(TV) proposes to use a Dielectric, Type TFU-16DSB-A(C) or equivalent antenna. The elevation pattern for this antenna shows a maximum relative field of less than 0.1 towards the ground in the vicinity of the tower. Using this relative field factor and the procedures prescribed in OST Bulletin 65, the maximum RFF resulting from the proposed operation is less than 1 µW/cm². This is less than 1% of the 617 µW/cm² maximum human exposure to RFF recommended by the current FCC guidelines for the general population.

The total contribution by the existing NTSC facility and the proposed DTV operation at 2 meters above ground level is less than 2% of the current FCC guidelines for general population exposure.

Authorized personnel and rigging contractors will be alerted to the potential zone of high radiation on the tower, and if necessary, the station will operate with reduced power or terminate the operation of the transmitter as appropriate when it is necessary for authorized personnel or contractors to perform work on the tower. Workers and the general public, therefore, will not be subjected to RFF levels in excess of the current FCC guidelines.

An environmental assessment (EA) is categorically excluded under Section 1.1307 of the FCC Rules and Regulations since the licensee 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 tower are not located in an officially designated wildlife preserve.

- (a)(3) The proposed facilities on an existing tower will not affect any listed threatened or endangered species or habitats.
- (a)(3)(ii) The proposed facilities on an existing tower 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 are not located near any known Indian religious sites.
- (a)(6) The proposed facilities are not located in a flood plain.
- (a)(7) The installation of the DTV facilities on an existing guyed tower 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 equip the tower with high intensity white lights unless required by the FAA.
- (b) Workers and the general public will not be subjected to RFF levels in excess of the current FCC guidelines based on OET Bulletin No. 65, Edition 97-01 dated August 1997 and Supplement A. Authorized personnel will be alerted to areas of the antennas where potential radiation levels are in excess of the FCC guidelines. A security fence with a locked gate precludes access to the tower site.

APPENDIX

A



Proposal Number		Revision	
Date	13 Nov 2001		
Call Letters	WEHT-DT	Channel	59
Location	Evansville, IN		
Customer			
Antenna Type	TFU-16DSB-A (C)		

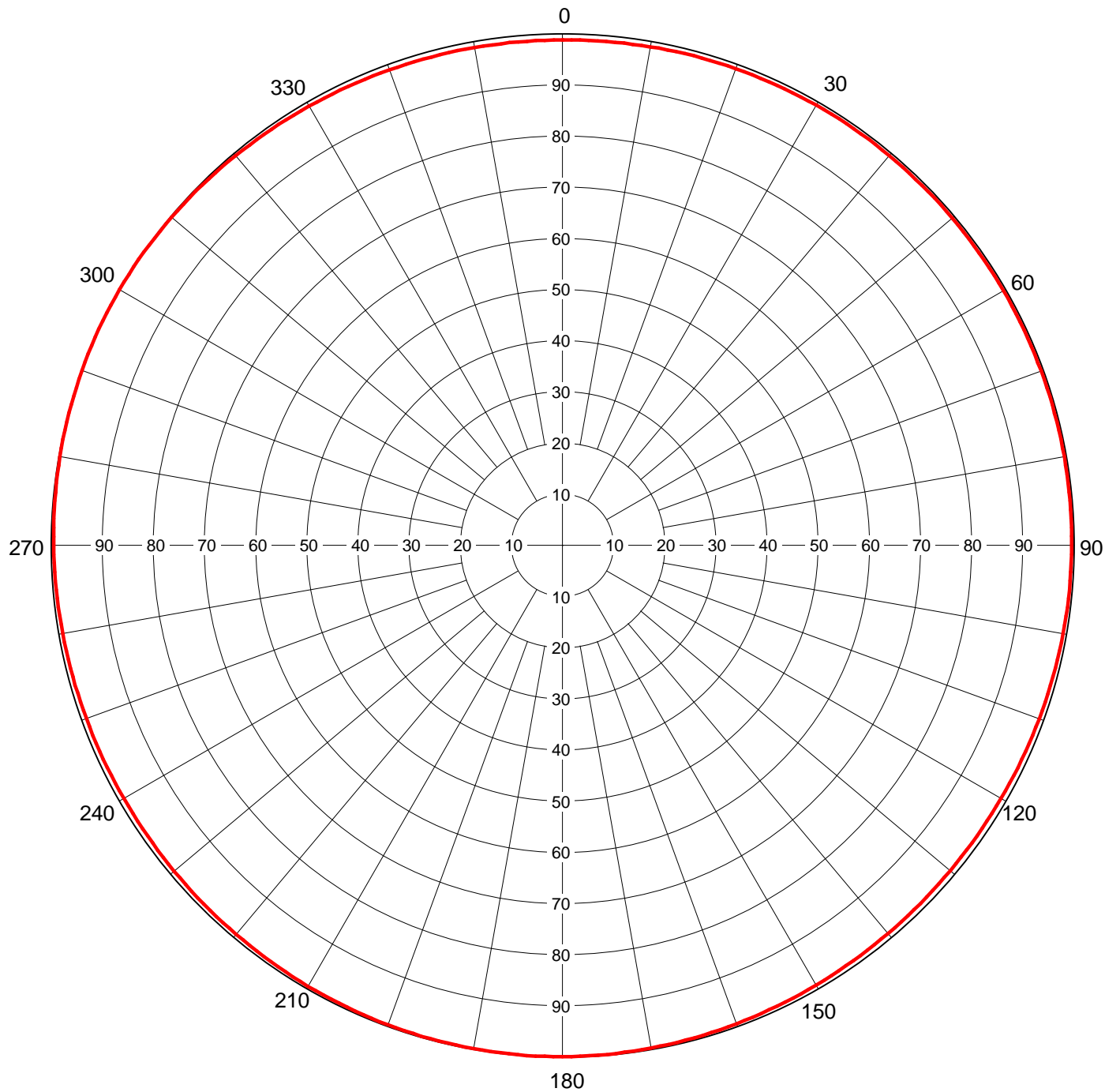
AZIMUTH PATTERN

RMS Gain at Main Lobe
Calculated / Measured

1.00 (0.00 dB)
Calculated

Frequency
Drawing #

743 MHz
DSB-A



Remarks:



Proposal Number
 Date **13 Nov 2001**
 Call Letters **WEHT-DT** Channel **59**
 Location **Evansville, IN**
 Customer
 Antenna Type **TFU-16DSB-A (C)**

TABULATION OF AZIMUTH PATTERN

Azimuth Pattern Drawing # **DSB-A**

Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
0	0.987	45	0.995	90	0.996	135	0.990	180	0.999	225	0.992	270	0.995	315	0.996
1	0.988	46	0.995	91	0.996	136	0.990	181	0.999	226	0.991	271	0.995	316	0.996
2	0.988	47	0.995	92	0.995	137	0.990	182	1.000	227	0.991	272	0.995	317	0.995
3	0.988	48	0.995	93	0.995	138	0.990	183	1.000	228	0.991	273	0.996	318	0.995
4	0.988	49	0.995	94	0.995	139	0.990	184	1.000	229	0.991	274	0.996	319	0.995
5	0.988	50	0.995	95	0.995	140	0.990	185	1.000	230	0.991	275	0.996	320	0.994
6	0.989	51	0.995	96	0.995	141	0.990	186	0.999	231	0.991	276	0.996	321	0.994
7	0.989	52	0.995	97	0.995	142	0.991	187	0.999	232	0.991	277	0.997	322	0.993
8	0.989	53	0.995	98	0.994	143	0.991	188	0.999	233	0.990	278	0.997	323	0.993
9	0.989	54	0.995	99	0.994	144	0.991	189	0.999	234	0.990	279	0.997	324	0.993
10	0.989	55	0.995	100	0.994	145	0.991	190	0.999	235	0.990	280	0.998	325	0.992
11	0.990	56	0.995	101	0.994	146	0.991	191	0.999	236	0.990	281	0.998	326	0.992
12	0.990	57	0.995	102	0.994	147	0.992	192	0.999	237	0.990	282	0.998	327	0.992
13	0.990	58	0.995	103	0.993	148	0.992	193	0.999	238	0.990	283	0.998	328	0.992
14	0.990	59	0.996	104	0.993	149	0.992	194	0.999	239	0.990	284	0.999	329	0.991
15	0.990	60	0.996	105	0.993	150	0.992	195	0.998	240	0.990	285	0.999	330	0.991
16	0.990	61	0.996	106	0.993	151	0.993	196	0.998	241	0.990	286	0.999	331	0.991
17	0.991	62	0.996	107	0.993	152	0.993	197	0.998	242	0.990	287	0.999	332	0.990
18	0.991	63	0.996	108	0.992	153	0.993	198	0.998	243	0.990	288	0.999	333	0.990
19	0.991	64	0.996	109	0.992	154	0.993	199	0.998	244	0.990	289	0.999	334	0.990
20	0.991	65	0.996	110	0.992	155	0.994	200	0.997	245	0.990	290	1.000	335	0.990
21	0.991	66	0.996	111	0.992	156	0.994	201	0.997	246	0.990	291	1.000	336	0.990
22	0.992	67	0.996	112	0.991	157	0.994	202	0.997	247	0.990	292	1.000	337	0.989
23	0.992	68	0.996	113	0.991	158	0.995	203	0.997	248	0.990	293	1.000	338	0.989
24	0.992	69	0.996	114	0.991	159	0.995	204	0.996	249	0.990	294	1.000	339	0.989
25	0.992	70	0.996	115	0.991	160	0.995	205	0.996	250	0.990	295	1.000	340	0.989
26	0.992	71	0.996	116	0.991	161	0.995	206	0.996	251	0.991	296	1.000	341	0.989
27	0.992	72	0.996	117	0.991	162	0.996	207	0.996	252	0.991	297	1.000	342	0.989
28	0.993	73	0.996	118	0.990	163	0.996	208	0.996	253	0.991	298	1.000	343	0.988
29	0.993	74	0.996	119	0.990	164	0.996	209	0.995	254	0.991	299	1.000	344	0.988
30	0.993	75	0.996	120	0.990	165	0.997	210	0.995	255	0.991	300	1.000	345	0.988
31	0.993	76	0.996	121	0.990	166	0.997	211	0.995	256	0.991	301	1.000	346	0.988
32	0.993	77	0.996	122	0.990	167	0.997	212	0.995	257	0.992	302	1.000	347	0.988
33	0.993	78	0.996	123	0.990	168	0.997	213	0.994	258	0.992	303	0.999	348	0.988
34	0.993	79	0.996	124	0.990	169	0.998	214	0.994	259	0.992	304	0.999	349	0.988
35	0.994	80	0.996	125	0.990	170	0.998	215	0.994	260	0.992	305	0.999	350	0.988
36	0.994	81	0.996	126	0.989	171	0.998	216	0.994	261	0.992	306	0.999	351	0.988
37	0.994	82	0.996	127	0.989	172	0.998	217	0.993	262	0.993	307	0.998	352	0.988
38	0.994	83	0.996	128	0.989	173	0.998	218	0.993	263	0.993	308	0.998	353	0.988
39	0.994	84	0.996	129	0.989	174	0.999	219	0.993	264	0.993	309	0.998	354	0.988
40	0.994	85	0.996	130	0.989	175	0.999	220	0.993	265	0.993	310	0.998	355	0.988
41	0.994	86	0.996	131	0.989	176	0.999	221	0.992	266	0.994	311	0.997	356	0.988
42	0.994	87	0.996	132	0.989	177	0.999	222	0.992	267	0.994	312	0.997	357	0.988
43	0.994	88	0.996	133	0.990	178	0.999	223	0.992	268	0.994	313	0.997	358	0.988
44	0.994	89	0.996	134	0.990	179	0.999	224	0.992	269	0.995	314	0.996	359	0.988

Remarks:



Proposal Number

Revision

Date

13 Nov 2001

Call Letters

WEHT-DT

Channel

59

Location

Evansville, IN

Customer

Antenna Type

TFU-16DSB-A (C)

ELEVATION PATTERN

RMS Gain at Main Lobe

16.0 (12.04 dB)

Beam Tilt

1.00 Degrees

RMS Gain at Horizontal

11.8 (10.72 dB)

Frequency

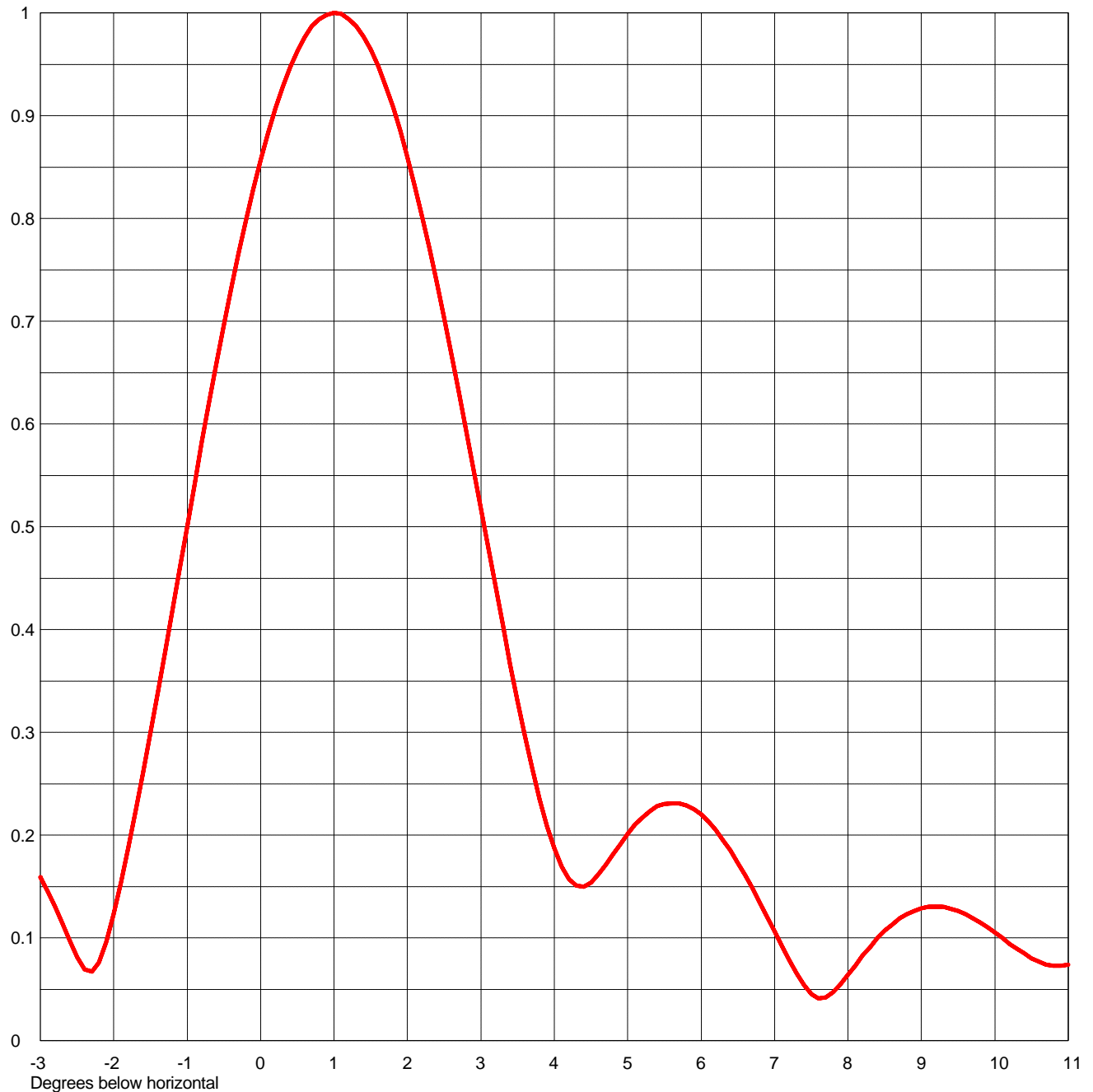
743.00 MHz

Calculated / Measured

Calculated

Drawing #

16B160100



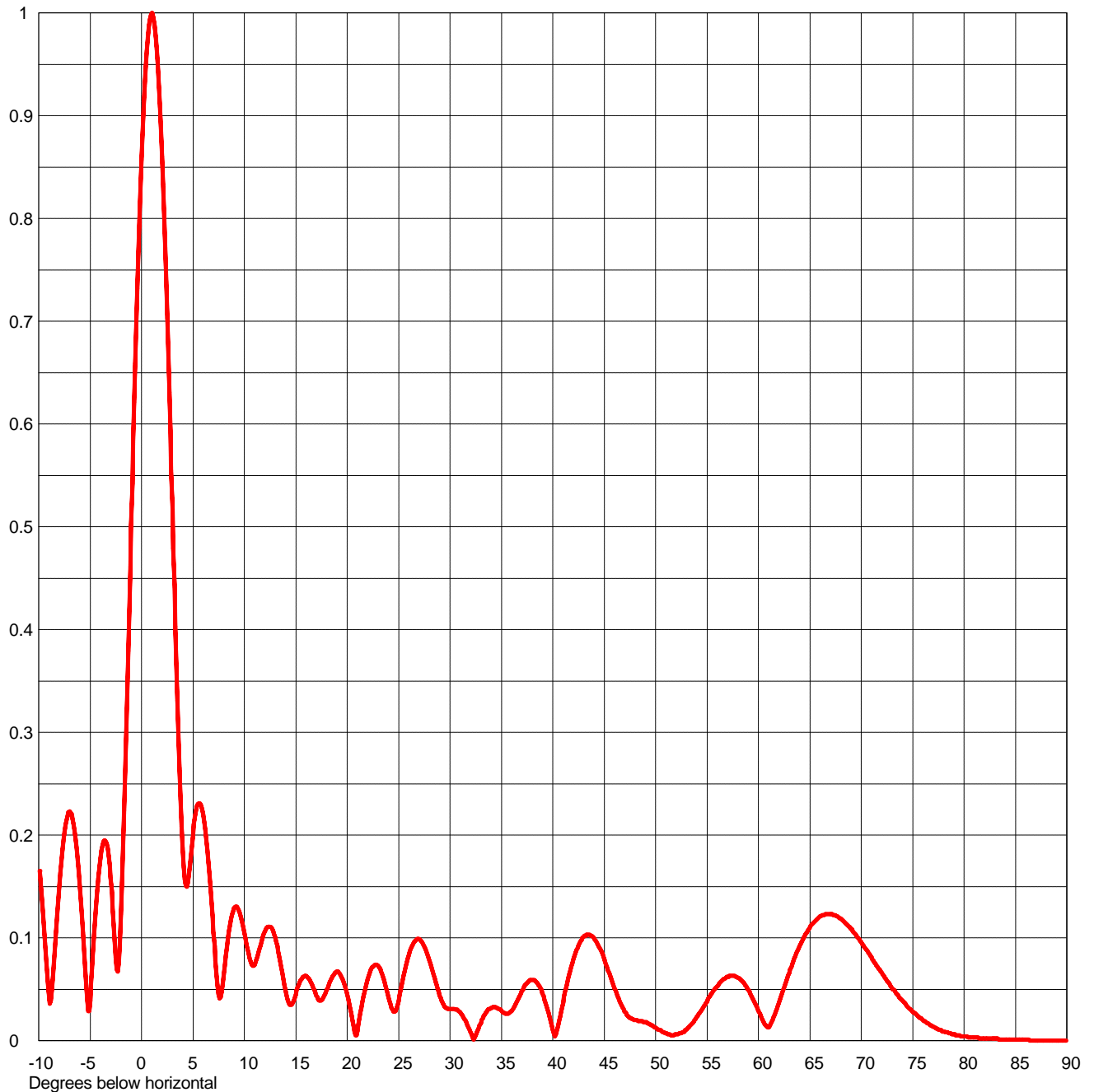
Remarks:



Proposal Number	Revision	
Date	13 Nov 2001	
Call Letters	WEHT-DT	Channel 59
Location	Evansville, IN	
Customer		
Antenna Type	TFU-16DSB-A (C)	

ELEVATION PATTERN

RMS Gain at Main Lobe	16.0 (12.04 dB)	Beam Tilt	1.00 Degrees
RMS Gain at Horizontal	11.8 (10.72 dB)	Frequency	743.00 MHz
Calculated / Measured	Calculated	Drawing #	16B160100-90



Remarks:



Proposal Number
 Date **13 Nov 2001**
 Call Letters **WEHT-DT** Channel **59**
 Location **Evansville, IN**
 Customer
 Antenna Type **TFU-16DSB-A (C)**

TABULATION OF ELEVATION PATTERN

Elevation Pattern Drawing # **16B160100-90**

Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.177	2.4	0.738	10.6	0.077	30.5	0.030	51.0	0.007	71.5	0.073
-9.5	0.110	2.6	0.667	10.8	0.073	31.0	0.027	51.5	0.005	72.0	0.066
-9.0	0.041	2.8	0.593	11.0	0.074	31.5	0.020	52.0	0.006	72.5	0.058
-8.5	0.077	3.0	0.517	11.5	0.090	32.0	0.008	52.5	0.007	73.0	0.051
-8.0	0.150	3.2	0.441	12.0	0.106	32.5	0.005	53.0	0.011	73.5	0.045
-7.5	0.203	3.4	0.366	12.5	0.111	33.0	0.017	53.5	0.016	74.0	0.039
-7.0	0.223	3.6	0.297	13.0	0.100	33.5	0.027	54.0	0.023	74.5	0.033
-6.5	0.204	3.8	0.235	13.5	0.077	34.0	0.032	54.5	0.030	75.0	0.028
-6.0	0.150	4.0	0.187	14.0	0.049	34.5	0.032	55.0	0.038	75.5	0.024
-5.5	0.071	4.2	0.157	14.5	0.035	35.0	0.029	55.5	0.046	76.0	0.020
-5.0	0.039	4.4	0.150	15.0	0.045	35.5	0.026	56.0	0.053	76.5	0.017
-4.5	0.118	4.6	0.162	15.5	0.059	36.0	0.029	56.5	0.059	77.0	0.014
-4.0	0.177	4.8	0.181	16.0	0.063	36.5	0.038	57.0	0.062	77.5	0.011
-3.5	0.194	5.0	0.201	16.5	0.056	37.0	0.048	57.5	0.063	78.0	0.009
-3.0	0.159	5.2	0.217	17.0	0.044	37.5	0.056	58.0	0.061	78.5	0.007
-2.8	0.130	5.4	0.228	17.5	0.039	38.0	0.059	58.5	0.057	79.0	0.006
-2.6	0.097	5.6	0.231	18.0	0.049	38.5	0.056	59.0	0.050	79.5	0.005
-2.4	0.069	5.8	0.229	18.5	0.061	39.0	0.046	59.5	0.040	80.0	0.004
-2.2	0.076	6.0	0.220	19.0	0.067	39.5	0.030	60.0	0.029	80.5	0.003
-2.0	0.123	6.2	0.205	19.5	0.061	40.0	0.010	60.5	0.018	81.0	0.003
-1.8	0.188	6.4	0.185	20.0	0.045	40.5	0.014	61.0	0.013	81.5	0.002
-1.6	0.261	6.6	0.161	20.5	0.020	41.0	0.037	61.5	0.023	82.0	0.002
-1.4	0.339	6.8	0.134	21.0	0.010	41.5	0.060	62.0	0.037	82.5	0.002
-1.2	0.420	7.0	0.106	21.5	0.038	42.0	0.079	62.5	0.052	83.0	0.002
-1.0	0.501	7.2	0.078	22.0	0.060	42.5	0.093	63.0	0.066	83.5	0.001
-0.8	0.582	7.4	0.054	22.5	0.072	43.0	0.101	63.5	0.080	84.0	0.001
-0.6	0.659	7.6	0.041	23.0	0.073	43.5	0.103	64.0	0.092	84.5	0.001
-0.4	0.732	7.8	0.047	23.5	0.062	44.0	0.100	64.5	0.102	85.0	0.001
-0.2	0.798	8.0	0.064	24.0	0.043	44.5	0.091	65.0	0.110	85.5	0.001
0.0	0.857	8.2	0.083	24.5	0.028	45.0	0.079	65.5	0.116	86.0	0.001
0.2	0.907	8.4	0.100	25.0	0.039	45.5	0.066	66.0	0.121	86.5	0.000
0.4	0.947	8.6	0.113	25.5	0.063	46.0	0.051	66.5	0.123	87.0	0.000
0.6	0.976	8.8	0.123	26.0	0.083	46.5	0.038	67.0	0.123	87.5	0.000
0.8	0.994	9.0	0.129	26.5	0.096	47.0	0.028	67.5	0.122	88.0	0.000
1.0	1.000	9.2	0.130	27.0	0.099	47.5	0.022	68.0	0.119	88.5	0.000
1.2	0.994	9.4	0.128	27.5	0.092	48.0	0.020	68.5	0.114	89.0	0.000
1.4	0.977	9.6	0.123	28.0	0.078	48.5	0.019	69.0	0.109	89.5	0.000
1.6	0.948	9.8	0.115	28.5	0.061	49.0	0.018	69.5	0.103	90.0	0.000
1.8	0.909	10.0	0.105	29.0	0.044	49.5	0.016	70.0	0.096		
2.0	0.860	10.2	0.094	29.5	0.033	50.0	0.013	70.5	0.088		
2.2	0.802	10.4	0.085	30.0	0.031	50.5	0.010	71.0	0.081		

Remarks:



SYSTEM SUMMARY

Antenna:

Type:	TFU-16DSB-A (C)	ERP:	59 kW	H Pol (17.71 dBk)
Channel:	59	RMS Gain*:	16.0	(12.04 dB)
Location:	Evansville, IN	Input Power:	3.69 kW	(5.67 dBk)

Transmission Line:

Type:	EIA Style Rigid TL	Attenuation:	1.75 dB
Size:	4" 50 ohm	Efficiency:	66.9%
Length	950 ft	290 m	

Transmitter:

Average Power Required: **5.51 kW** (7.41 dBk)

* Gain is with respect to half wave dipole.



MECHANICAL SPECIFICATIONS

Antenna:

Type: **TFU-16DSB-A (C)**
Channel: **59**
Location: **Evansville, IN**

Antenna Length (H2): **24.7 ft**

Center of Radiation (H3): **12.3 ft**

Weight: **390 lbs**

RS-222C Specification per RS-222-C

EIA-222F Specification per EIA 222-F

Area of Flats: **19.6 ft²**

Force Coef x Projected Area:

35.3 ft²