

TECHNICAL EXHIBIT
APPLICATION FOR MODIFICATION OF
CONSTRUCTION PERMIT
TELEVISION STATION WTTV-DT
BLOOMINGTON, INDIANA

May 11, 2004

CHANNEL 48 870 KW (MAX-DA) 337 M

TECHNICAL EXHIBIT
APPLICATION FOR MODIFICATION OF CONSTRUCTION PERMIT
TELEVISION STATION WTTV-DT
BLOOMINGTON, INDIANA
CHANNEL 48 870 KW (MAX-DA) 337 M

Table of Contents

Technical Statement

Figure 1 Analysis of Permissible Effective Radiated Power

Figure 2 Predicted Coverage Contours

Appendix Transmitting Antenna Manufacturer's Pattern Data

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TELEVISION STATION WTTV-DT
BLOOMINGTON, INDIANA
CHANNEL 48 870 KW (MAX-DA) 337 M

Technical Statement

This Technical Exhibit was prepared on behalf of digital television broadcast station WTTV-DT, Bloomington, Indiana, in support of an application for modification of construction permit. WTTV-DT is paired with analog NTSC TV station WTTV(TV), Channel 4. Pursuant to the recent *Report and Order* in MM Docket No. 03-230^{*}, WTTV-DT was allotted Channel 48, with a maximum effective radiated power (ERP) of 840 kW and antenna height above average terrain (HAAT) of 357 m, as its transitional DTV allotment channel. The instant application proposes operation of the WTTV-DT facility using an existing antenna structure located at the WTTV-DT allotment reference point. The proposal complies with the DTV application “checklist” filing requirements.[†]

Proposed Facilities

The proposed transmitting antenna will employ a Dielectric, model TFU-24DSB-C260(C) antenna, which will be side-mounted on the existing WTTV(TV) tower structure. The transmitter site elevation is 265 m AMSL. The antenna center of radiation

^{*} See *Report and Order*, MM Docket No. 03-230, RM-10816, In the Matter of Amendment of Section 73.622(b), Table of Allotments, Digital Television Broadcast Stations (Bloomington, Indiana), Adopted: April 20, 2004, Released: April 26, 2004, DA 04-1057.

[†] 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.

will be located at 312 m above ground level and 577 m AMSL. The proposed WTTV-DT facility will operate on Channel 48 with a maximum directional average ERP of 29.4 dBk (870 kW) and antenna radiation center HAAT of 337 m. The proposed WTTV-DT facility meets the requirements of Section 73.622(f)(3) of the FCC Rules concerning the maximum permissible ERP adjustment for a proposed HAAT differing from the allotment facility. An analysis of the permissible effective radiated power for the proposed facility is included herein at Figure 1. As indicated therein, appropriate ERP adjustments were made in consideration of the decrease in antenna HAAT of 20 m and the use of a directional antenna pattern that differs slightly from the allotment pattern.

The proposed facility is located in the Canadian border area. The proposed transmitter site is located 376 km from the closest point on the U.S./Canadian border.[‡] The closest FCC Monitoring station is located at Allegan, Michigan, at distance of 356 km at a bearing of 3°True. The closest Radio Astronomy site conducting research on Channel 37 is located at North Liberty, Iowa, at distance of 528 km at a bearing of 302°True. There are no AM broadcast stations located within 3.2 km of the proposed transmitter site.

The proposed facility provides minimum 48 dBu, f(50,90), coverage of Bloomington in compliance with Section 73.625(a)(1) of the FCC Rules. Figure 3 herein is a map depicting the predicted coverage contours of the proposed facility.

Tower Registration

The existing antenna structure has been registered with the FCC. The FCC antenna structure registration number is 1026127. The overall antenna structure

[‡] Canadian concurrence of the proposal was obtained at the allotment stage. See *Report and Order* in MM Docket No. 03-230 referenced above.

height above ground is 345 m. This overall structure height will not change as a result of the proposal.

Allocation Considerations

The proposed WTTV-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.[§]

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 based on the following conservative assumptions, with the following results:

Call Sign	Channel	Average ERP (kW)	Radiation Center Height Above Ground (m)	Relative Field Factor**	FCC Limit^{††} (mW/cm²)	Percentage of Limit
WTTV-DT	48	870	312	0.20	0.451	2.7%

As indicated above, the exposure to RF radiation at 2-m above ground level will not exceed 2.7% of the FCC limit for general population / uncontrolled exposure. Therefore,

[§] This is presumed to include consideration of electromagnetic interference with respect to Class A television stations.

^{**} This is a conservative estimate of the relative field factor in the downward direction.

^{††} for general population/uncontrolled environments

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 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 34237-6019

May 11, 2004

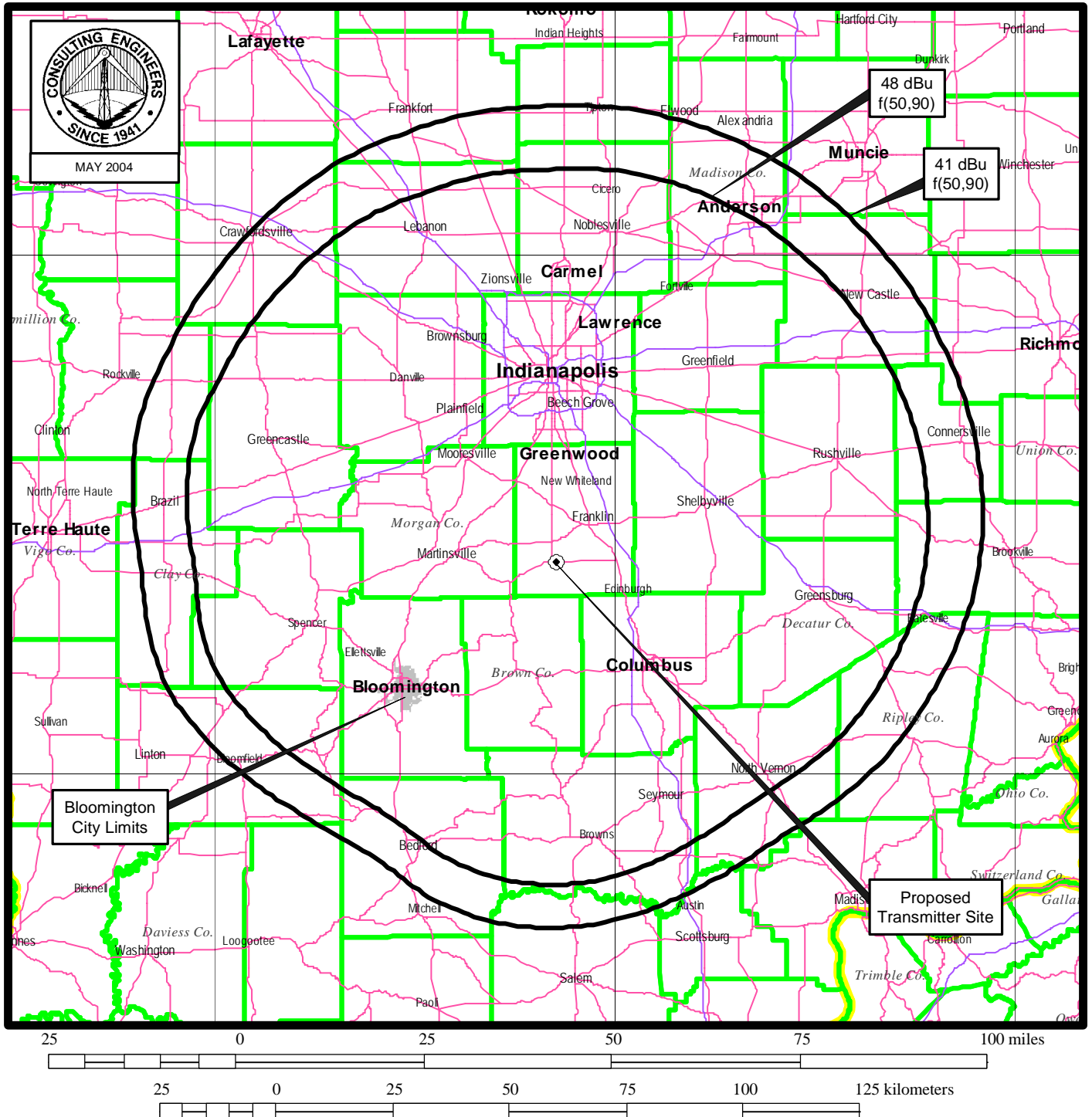
TECHNICAL EXHIBIT
APPLICATION FOR MODIFICATION OF CONSTRUCTION PERMIT
TELEVISION STATION WTTV-DT
BLOOMINGTON, INDIANA
CHANNEL 48 870 KW (MAX-DA) 337 M

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 20-m Decrease in HAAT (dB)	Adjusted Permissible ERP (dBk)	Proposed Antenna Pattern (relative field)	Proposed ERP (dBk)
0	1.000	840.0	29.24	0.50	29.74	1.000	29.40
10	0.988	820.0	29.14	0.50	29.64	0.989	29.30
20	0.954	764.5	28.83	0.50	29.33	0.957	29.02
30	0.907	691.0	28.39	0.50	28.90	0.911	28.59
40	0.848	604.0	27.81	0.50	28.31	0.854	28.03
50	0.784	516.3	27.13	0.50	27.63	0.793	27.39
60	0.723	439.1	26.43	0.50	26.93	0.731	26.68
70	0.667	373.7	25.73	0.50	26.23	0.670	25.92
80	0.612	314.6	24.98	0.50	25.48	0.608	25.08
90	0.553	256.9	24.10	0.50	24.60	0.544	24.11
100	0.488	200.0	23.01	0.50	23.51	0.475	22.93
110	0.414	144.0	21.58	0.50	22.08	0.400	21.44
120	0.327	89.8	19.53	0.50	20.03	0.321	19.53
130	0.246	50.8	17.06	0.50	17.56	0.250	17.36

Azimuth (deg. True)	FCC Allotment Pattern (relative field)	FCC Allotment Permissible ERP (kW)	FCC Allotment Permissible ERP (dBk)	Permissible ERP Adjustment for 20-m Decrease in HAAT (dB)	Adjusted Permissible ERP (dBk)	Proposed Antenna Pattern (relative field)	Proposed ERP (dBk)
140	0.203	34.6	15.39	0.50	15.89	0.209	15.80
150	0.215	38.8	15.89	0.50	16.39	0.220	16.25
160	0.261	57.2	17.58	0.50	18.08	0.262	17.77
170	0.305	78.1	18.93	0.50	19.43	0.301	18.97
180	0.322	87.1	19.40	0.50	19.90	0.317	19.42
190	0.305	78.1	18.93	0.50	19.43	0.301	18.97
200	0.261	57.2	17.58	0.50	18.08	0.262	17.77
210	0.215	38.8	15.89	0.50	16.39	0.220	16.25
220	0.203	34.6	15.39	0.50	15.89	0.209	15.80
230	0.246	50.8	17.06	0.50	17.56	0.250	17.36
240	0.327	89.8	19.53	0.50	20.03	0.321	19.53
250	0.414	144.0	21.58	0.50	22.08	0.400	21.44
260	0.488	200.0	23.01	0.50	23.51	0.475	22.93
270	0.533	238.6	23.78	0.50	24.28	0.544	24.11
280	0.612	314.6	24.98	0.50	25.48	0.608	25.08
290	0.667	373.7	25.73	0.50	26.23	0.670	25.92
300	0.723	439.1	26.43	0.50	26.93	0.731	26.68
310	0.784	516.3	27.13	0.50	27.63	0.793	27.39
320	0.848	604.0	27.81	0.50	28.31	0.854	28.03
330	0.907	691.0	28.39	0.50	28.90	0.910	28.58
340	0.954	764.5	28.83	0.50	29.33	0.957	29.02
350	0.988	820.0	29.14	0.50	29.64	0.989	29.30

Figure 2



PREDICTED COVERAGE CONTOURS

TELEVISION STATION WTTV-DT
BLOOMINGTON, INDIANA
CHANNEL 48 870 KW (MAX-DA) 337 M

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

TECHNICAL EXHIBIT
APPLICATION FOR MODIFICATION OF CONSTRUCTION PERMIT
TELEVISION STATION WTTV-DT
BLOOMINGTON, INDIANA
CHANNEL 48 870 KW (MAX-DA) 337 M

Transmitting Antenna Manufacturer's Pattern Data

(four pages follow)



Proposal Number

Revision

Date

10 May 2004

Call Letters

WTTV

Channel

48

Location

Bloomington, IN

Customer

Antenna Type

TFU-24DSB C260 (C)

AZIMUTH PATTERN

Gain

2.60 (4.15 dB)

Frequency

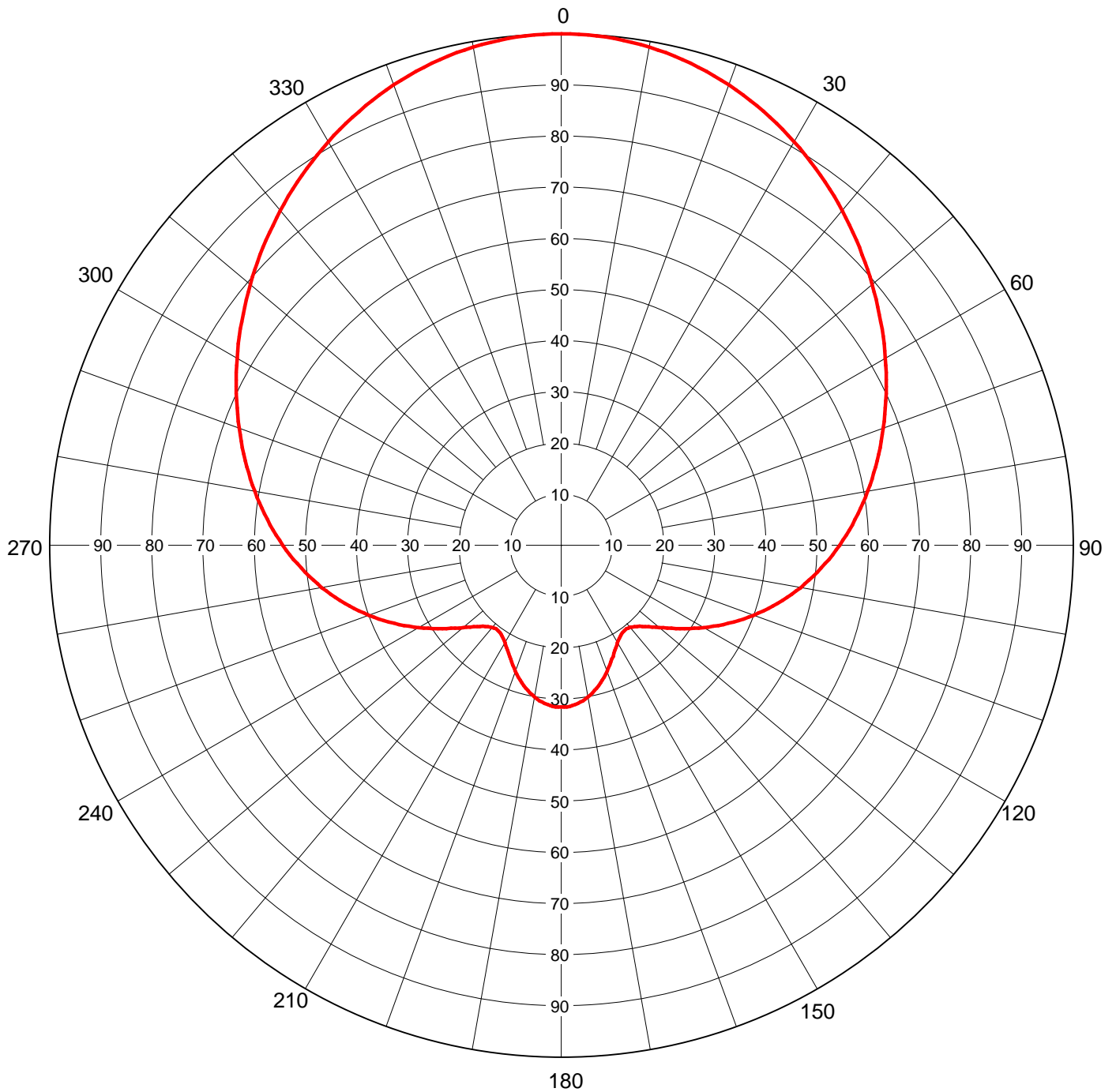
677 MHz

Calculated / Measured

Calculated

Drawing #

TFU-C260-48



Remarks:



Proposal Number
 Date **10 May 2004**
 Call Letters **WTTV** Channel **48**
 Location **Bloomington, IN**
 Customer
 Antenna Type **TFU-24DSB C260 (C)**

TABULATION OF AZIMUTH PATTERN

Azimuth Pattern Drawing # **TFU-C260-48**

Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
0	1.000	45	0.824	90	0.544	135	0.224	180	0.317	225	0.224	270	0.544	315	0.824
1	1.000	46	0.818	91	0.537	136	0.220	181	0.316	226	0.228	271	0.550	316	0.830
2	1.000	47	0.811	92	0.531	137	0.217	182	0.316	227	0.234	272	0.557	317	0.836
3	0.999	48	0.805	93	0.524	138	0.214	183	0.315	228	0.239	273	0.564	318	0.842
4	0.998	49	0.799	94	0.517	139	0.212	184	0.314	229	0.244	274	0.570	319	0.848
5	0.997	50	0.793	95	0.510	140	0.209	185	0.312	230	0.250	275	0.576	320	0.854
6	0.996	51	0.787	96	0.503	141	0.208	186	0.311	231	0.257	276	0.583	321	0.860
7	0.994	52	0.781	97	0.496	142	0.207	187	0.309	232	0.263	277	0.589	322	0.866
8	0.993	53	0.774	98	0.489	143	0.207	188	0.307	233	0.270	278	0.595	323	0.872
9	0.991	54	0.768	99	0.482	144	0.207	189	0.304	234	0.277	279	0.602	324	0.877
10	0.989	55	0.762	100	0.475	145	0.209	190	0.301	235	0.284	280	0.608	325	0.883
11	0.987	56	0.756	101	0.468	146	0.210	191	0.298	236	0.291	281	0.614	326	0.889
12	0.984	57	0.750	102	0.460	147	0.212	192	0.295	237	0.299	282	0.621	327	0.894
13	0.981	58	0.744	103	0.453	148	0.214	193	0.291	238	0.306	283	0.627	328	0.900
14	0.979	59	0.737	104	0.446	149	0.217	194	0.288	239	0.314	284	0.633	329	0.905
15	0.975	60	0.731	105	0.438	150	0.220	195	0.284	240	0.321	285	0.639	330	0.910
16	0.972	61	0.725	106	0.431	151	0.223	196	0.280	241	0.329	286	0.645	331	0.916
17	0.969	62	0.719	107	0.423	152	0.227	197	0.275	242	0.337	287	0.651	332	0.921
18	0.965	63	0.713	108	0.415	153	0.231	198	0.271	243	0.345	288	0.658	333	0.926
19	0.961	64	0.707	109	0.408	154	0.235	199	0.267	244	0.353	289	0.664	334	0.931
20	0.957	65	0.700	110	0.400	155	0.239	200	0.262	245	0.361	290	0.670	335	0.936
21	0.953	66	0.694	111	0.392	156	0.244	201	0.257	246	0.369	291	0.676	336	0.940
22	0.949	67	0.688	112	0.384	157	0.248	202	0.253	247	0.376	292	0.682	337	0.945
23	0.945	68	0.682	113	0.376	158	0.253	203	0.248	248	0.384	293	0.688	338	0.949
24	0.940	69	0.676	114	0.369	159	0.257	204	0.244	249	0.392	294	0.694	339	0.953
25	0.936	70	0.670	115	0.361	160	0.262	205	0.239	250	0.400	295	0.700	340	0.957
26	0.931	71	0.664	116	0.353	161	0.267	206	0.235	251	0.408	296	0.707	341	0.961
27	0.926	72	0.658	117	0.345	162	0.271	207	0.231	252	0.415	297	0.713	342	0.965
28	0.921	73	0.651	118	0.337	163	0.275	208	0.227	253	0.423	298	0.719	343	0.969
29	0.916	74	0.645	119	0.329	164	0.280	209	0.223	254	0.431	299	0.725	344	0.972
30	0.911	75	0.639	120	0.321	165	0.284	210	0.220	255	0.438	300	0.731	345	0.975
31	0.905	76	0.633	121	0.314	166	0.288	211	0.217	256	0.446	301	0.737	346	0.979
32	0.900	77	0.627	122	0.306	167	0.291	212	0.214	257	0.453	302	0.744	347	0.981
33	0.894	78	0.621	123	0.299	168	0.295	213	0.212	258	0.460	303	0.750	348	0.984
34	0.889	79	0.614	124	0.291	169	0.298	214	0.210	259	0.468	304	0.756	349	0.987
35	0.883	80	0.608	125	0.284	170	0.301	215	0.209	260	0.475	305	0.762	350	0.989
36	0.877	81	0.602	126	0.277	171	0.304	216	0.207	261	0.482	306	0.768	351	0.991
37	0.872	82	0.595	127	0.270	172	0.307	217	0.207	262	0.489	307	0.774	352	0.993
38	0.866	83	0.589	128	0.263	173	0.309	218	0.207	263	0.496	308	0.781	353	0.994
39	0.860	84	0.583	129	0.257	174	0.311	219	0.208	264	0.503	309	0.787	354	0.996
40	0.854	85	0.576	130	0.250	175	0.312	220	0.209	265	0.510	310	0.793	355	0.997
41	0.848	86	0.570	131	0.244	176	0.314	221	0.212	266	0.517	311	0.799	356	0.998
42	0.842	87	0.564	132	0.239	177	0.315	222	0.214	267	0.524	312	0.805	357	0.999
43	0.836	88	0.557	133	0.234	178	0.316	223	0.217	268	0.531	313	0.811	358	1.000
44	0.830	89	0.550	134	0.228	179	0.316	224	0.220	269	0.537	314	0.818	359	1.000

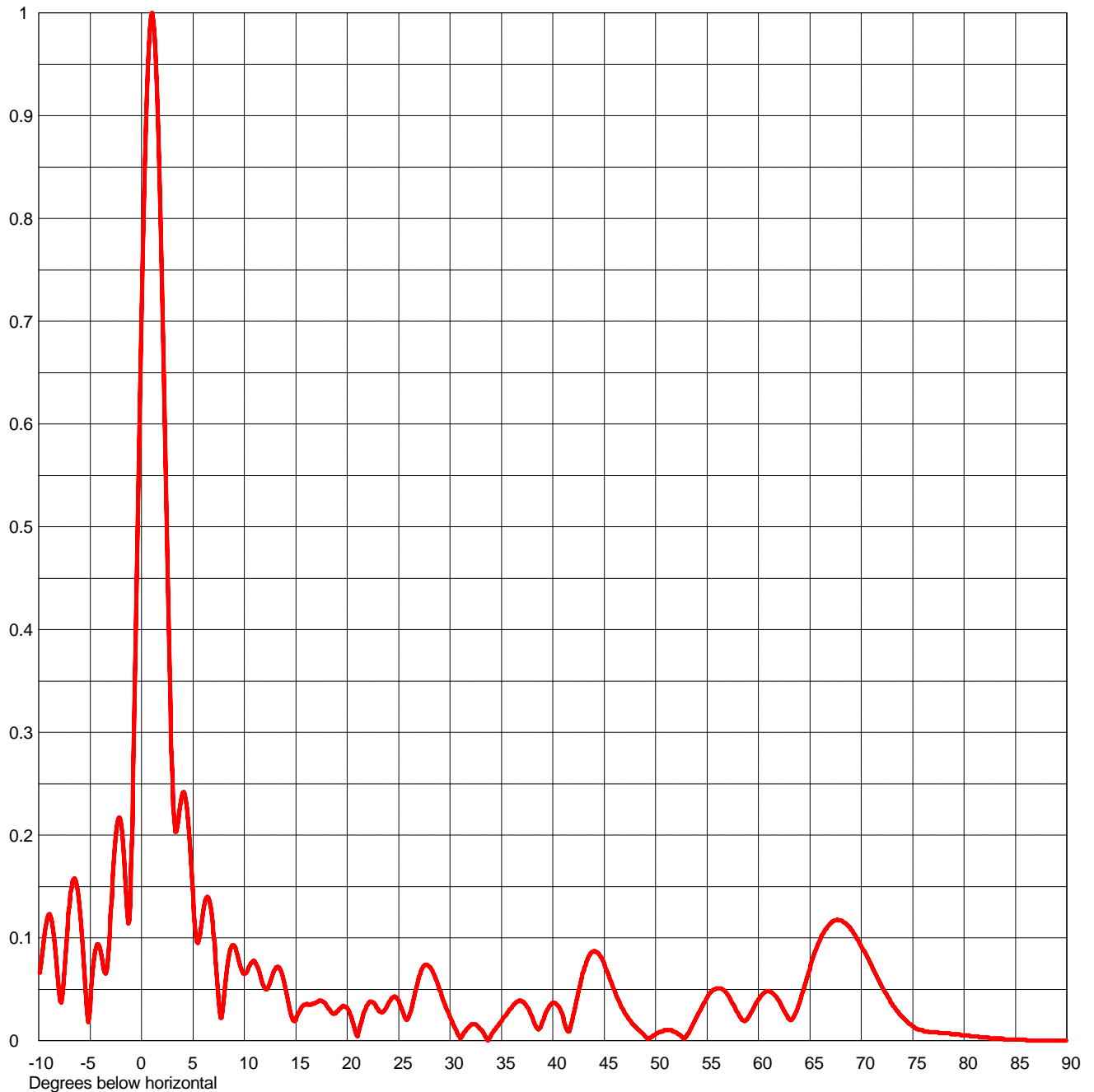
Remarks:



Proposal Number		Revision	
Date	10 May 2004		
Call Letters	WTTV	Channel	48
Location	Bloomington, IN		
Customer			
Antenna Type	TFU-24DSB-C260 (C)		

ELEVATION PATTERN

RMS Gain at Main Lobe	24.0 (13.80 dB)	Beam Tilt	1.00 Degrees
RMS Gain at Horizontal	11.9 (10.76 dB)	Frequency	677.00 MHz
Calculated / Measured	Calculated	Drawing #	24B240100-90



Remarks:



Proposal Number
 Date **10 May 2004**
 Call Letters **WTTV** Channel **48**
 Location **Bloomington, IN**
 Customer
 Antenna Type **TFU-24DSB-C260 (C)**

TABULATION OF ELEVATION PATTERN

Elevation Pattern Drawing # **24B240100-90**

Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.063	2.4	0.524	10.6	0.075	30.5	0.012	51.0	0.010	71.5	0.063
-9.5	0.099	2.6	0.420	10.8	0.077	31.0	0.002	51.5	0.010	72.0	0.053
-9.0	0.123	2.8	0.327	11.0	0.077	31.5	0.009	52.0	0.008	72.5	0.044
-8.5	0.101	3.0	0.254	11.5	0.066	32.0	0.015	52.5	0.004	73.0	0.036
-8.0	0.045	3.2	0.211	12.0	0.051	32.5	0.016	53.0	0.004	73.5	0.029
-7.5	0.069	3.4	0.203	12.5	0.057	33.0	0.011	53.5	0.013	74.0	0.023
-7.0	0.134	3.6	0.215	13.0	0.070	33.5	0.003	54.0	0.023	74.5	0.018
-6.5	0.158	3.8	0.231	13.5	0.069	34.0	0.005	54.5	0.033	75.0	0.014
-6.0	0.127	4.0	0.241	14.0	0.051	34.5	0.013	55.0	0.042	75.5	0.011
-5.5	0.056	4.2	0.240	14.5	0.026	35.0	0.019	55.5	0.048	76.0	0.010
-5.0	0.035	4.4	0.227	15.0	0.020	35.5	0.025	56.0	0.051	76.5	0.009
-4.5	0.087	4.6	0.203	15.5	0.031	36.0	0.032	56.5	0.050	77.0	0.008
-4.0	0.088	4.8	0.173	16.0	0.035	36.5	0.038	57.0	0.045	77.5	0.008
-3.5	0.065	5.0	0.141	16.5	0.035	37.0	0.038	57.5	0.036	78.0	0.007
-3.0	0.122	5.2	0.112	17.0	0.037	37.5	0.033	58.0	0.027	78.5	0.007
-2.8	0.156	5.4	0.096	17.5	0.039	38.0	0.023	58.5	0.020	79.0	0.006
-2.6	0.186	5.6	0.098	18.0	0.034	38.5	0.012	59.0	0.022	79.5	0.006
-2.4	0.208	5.8	0.111	18.5	0.027	39.0	0.018	59.5	0.031	80.0	0.005
-2.2	0.217	6.0	0.126	19.0	0.028	39.5	0.030	60.0	0.040	80.5	0.005
-2.0	0.212	6.2	0.137	19.5	0.033	40.0	0.037	60.5	0.046	81.0	0.004
-1.8	0.192	6.4	0.140	20.0	0.032	40.5	0.034	61.0	0.048	81.5	0.003
-1.6	0.159	6.6	0.136	20.5	0.019	41.0	0.023	61.5	0.045	82.0	0.003
-1.4	0.124	6.8	0.124	21.0	0.004	41.5	0.009	62.0	0.039	82.5	0.002
-1.2	0.117	7.0	0.105	21.5	0.022	42.0	0.025	62.5	0.029	83.0	0.002
-1.0	0.169	7.2	0.081	22.0	0.035	42.5	0.048	63.0	0.021	83.5	0.002
-0.8	0.259	7.4	0.055	22.5	0.037	43.0	0.068	63.5	0.024	84.0	0.001
-0.6	0.366	7.6	0.030	23.0	0.031	43.5	0.082	64.0	0.037	84.5	0.001
-0.4	0.481	7.8	0.022	23.5	0.028	44.0	0.087	64.5	0.054	85.0	0.001
-0.2	0.595	8.0	0.040	24.0	0.036	44.5	0.084	65.0	0.070	85.5	0.001
0.0	0.704	8.2	0.060	24.5	0.042	45.0	0.075	65.5	0.086	86.0	0.001
0.2	0.802	8.4	0.077	25.0	0.039	45.5	0.062	66.0	0.098	86.5	0.000
0.4	0.884	8.6	0.088	25.5	0.026	46.0	0.049	66.5	0.108	87.0	0.000
0.6	0.946	8.8	0.093	26.0	0.023	46.5	0.037	67.0	0.114	87.5	0.000
0.8	0.985	9.0	0.093	26.5	0.042	47.0	0.027	67.5	0.117	88.0	0.000
1.0	1.000	9.2	0.088	27.0	0.062	47.5	0.020	68.0	0.117	88.5	0.000
1.2	0.990	9.4	0.081	27.5	0.073	48.0	0.014	68.5	0.114	89.0	0.000
1.4	0.956	9.6	0.073	28.0	0.072	48.5	0.009	69.0	0.108	89.5	0.000
1.6	0.899	9.8	0.067	28.5	0.063	49.0	0.004	69.5	0.101	90.0	0.000
1.8	0.823	10.0	0.065	29.0	0.049	49.5	0.003	70.0	0.092		
2.0	0.731	10.2	0.066	29.5	0.036	50.0	0.006	70.5	0.083		
2.2	0.630	10.4	0.071	30.0	0.023	50.5	0.009	71.0	0.073		

Remarks: