

WMAH-DT CHANNEL 16 MINOR
MODIFICATION TO CONSTRUCTION
PERMIT APPLICATION TO CHANGE
ANTENNA SYSTEMS.
(MISSISSIPPI AUTHORITY FOR EDUCATIONAL TELEVISION)

KESSLER & GEHMAN ASSOCIATES, INC.
TELECOMMUNICATIONS CONSULTING ENGINEERS

20021119

Prepared by William T. Godfrey

KG&A

507 N.W. 60th Street, Suite C
Gainesville, Florida 32607

ENGINEERING TECHNICAL STATEMENT PREPARED BY WILLIAM T. GODFREY OF THE FIRM KESSLER AND GEHMAN ASSOCIATES, INC., TELECOMMUNICATIONS CONSULTING ENGINEERS IN CONNECTION WITH THE WMAH-DT MINOR MODIFICATION OF CONSTRUCTION PERMIT APPLICATION TO CHANGE ANTENNA SYSTEMS.

The firm Kessler and Gehman Associates, Inc., (KGA) has been retained by the Mississippi Authority for Educational Television (MAET), Jackson, Mississippi in order to prepare engineering studies and the engineering portion of a minor modification of construction permit application to change antenna systems.

Discussion

The MAET proposes to modify the existing WMAH-DT Channel 16 construction permit (BPEDT20000110AAC) by replacing the authorized Dielectric TFU-26GTH 04 top-mount, non-directional DTV antenna with a Dielectric 881-32 top-mount, directional (Cardioid) DTV antenna. The change in antenna systems will not change the antenna height radiation center.

The MAET is licensed to operate WMAH-TV on UHF, NTSC Channel 19 with an ERP of 1,620 kW at an antenna height R/C of 496.0 meters above average terrain (AAT) in the vicinity of Biloxi, Mississippi with 0.75 degrees electrical beam tilt and 0.25 degrees of mechanical beam tilt at 135 degrees true north.

The proposed minor modification of construction permit is based on a change in antennas from a non-directional to a directional with the main lobe oriented toward 270 degrees with the same electrical and mechanical beam tilt, 0.75 degrees electrical and 0.25 degrees mechanical at 135 degrees true north, as the licensed NTSC antenna. All other parameters are proposed to remain in accordance with the existing construction permit.

Transmitter Location

It is proposed to top-mount a Dielectric model 881-32 horizontally polarized, directional (Cardioid with main lobe oriented at N270°E), UHF, DTV antenna on the existing WMAH-TV support structure owned by the MAET. The tower is registered with the FCC and has a registration number of 1041052. The support structure is located on the north side of tower road, 1.1 km east of Cable Bridge Road, McHenry, MS. The proposed antenna height radiation center is 460.7 meters above ground level (AGL). The antenna's highest point will extend to 468.6 meters AGL and the overall height of the structure will extend to 470.0 meters AGL as depicted in Exhibit 3's elevation view of the support structure.

Interference Studies

The proposed parameters would produce a F(50,90) 38.9 dBuV/m noise limited contour (directional) that would be fully encompassed by the authorized F(50,90) 38.9 dBuV/m noise limited contour (nondirectional). Therefore, interference studies are not required.

Exhibits

Exhibits 1 and 2 represent WMAH-DT's administration data, antenna and antenna structure specifications as per §VII item 10 in the DTV Engineering Technical Specifications portion of the application regarding directional antennas and beam tilt.

Exhibit 3 depicts the profile view of the proposed antenna on the antenna structure with all the appropriate elevations as per §VII item 10 in the DTV Engineering Technical Specifications portion of the application regarding supporting structures and elevations.

Exhibits 4 and 5 display the elevation pattern.

Exhibit 6 displays the elevation pattern tabulation.

Exhibits 7 and 8 display the azimuth pattern and the azimuth pattern tabulation respectively.

Exhibit 9 depicts the location of the proposed WMAH-DT site on a 7.5-Minute (Series) Topographic Map as per §VII item 10 in the DTV Engineering Technical Specifications portion of the application regarding topographic maps.

Exhibit 10 is a noise limited contour (NLC) comparison map between the WMAH-DT construction permit (CP) facility and the proposed WMAH-DT facility. This comparison map pictorially verifies that the proposed NLC is subsumed by the CP NLC.

Exhibit 11 depicts the proposed WMAH-DT coverage contour, boundaries of the principal community to be served, and the proposed transmitting location with radials every 45° as per §VII item 10 in the DTV Engineering Technical Specifications portion of the application regarding Sectional Aeronautical Charts.

Exhibit 12 is a distance to contour tabulation of the WMAH-DT CP. This exhibit depicts the distance, in kilometers, from the transmitter to the CP NLC on all 360 radials.

Exhibit 13 is a distance to contour tabulation of the WMAH-DT APP. This exhibit depicts the distance, in kilometers, from the transmitter to the APP NLC on all 360 radials. Comparing Exhibit 13 with Exhibit 12 also proves that the proposed NLC will be completely encompassed by the authorized NLC.

Exhibit 14 is a mechanical beam tilt exhibit as per §VII item 10(c) in the DTV Engineering Technical Specifications portion of the application regarding mechanical beam tilt. This exhibit shows that the mechanical beam tilt does not extend the pattern in any azimuthal direction.

Environmental Impact

Assuming that the maximum lobe of radiation is oriented at the base of the tower, it will produce a power density six feet above the ground of 0.0238 mW/cm^2 . This is only 1.47% of the maximum permissible exposure (“MPE”) authorized by the American National Standards Institute (“ANSI”). Since the proposed operation of WMAH-DT Channel 16 will not exceed 5.0% of the MPE limit for population/uncontrolled at any point on the ground, WMAH-DT is not considered to be a “significant contributor” to the RF exposure environment pursuant to OET Bulletin 65, Edition 97-01. Therefore, contributions of exposure from other sources were not accounted for in this analysis. It is safe to conclude that the emissions will be insignificant and well within the maximum allowable requirements.

If other antennas are placed on the tower in the future, the applicant will cooperate with those users by reducing or completely terminating the power to the antenna when maintenance workers are in danger from the electromagnetic radiation emanating from the antenna.

The applicant accepts full responsibility for the elimination of any objectionable interference including that caused by intermodulation to facilities in existence or authorized prior to the grant of this application.

Certification

This technical statement was prepared by William T. Godfrey, Telecommunications Technical Consultant with Kessler and Gehman Associates, Inc. having offices in Gainesville, Florida and has been working in the field of radio and television broadcast consulting since 1998. He graduated from the University of North Florida with a Bachelor of Arts degree in Criminal Justice and a minor in Mathematics in 1993. As a Professional in the field of Telecommunications, he states under penalty of perjury that the information contained in this report is true and correct to the best of his knowledge and belief.



KESSLER AND GEHMAN ASSOCIATES, INC.

A handwritten signature in blue ink that reads 'William T. Godfrey'. The signature is written in a cursive, flowing style with a large, prominent 'W' and 'G'.

WILLIAM T. GODFREY
Telecommunications Technical Consultant

November 26, 2002

**WMAH-DT
BILOXI, MS**

ENGINEERING SPECIFICATIONS

A. Transmitter Site:

Geographic coordinates determined by licensed surveyor:

North Latitude	30° 45' 18"
West Longitude	88° 56' 44"

Transmitter Site Address: **North side of Tower Road, 1.1 kilometers East of
Cable Bridge Road, McHenry, Mississippi.**

**B. Main Studio Site Address: **3825 Ridgewood Road, Jackson,
(Hinds County) Mississippi 39211-6463.****

C. Proposed Facility:

DTV Channel	Number	16
	Frequency	482-488 MHz

D. Antenna Height:

Height of Site Above Mean Sea Level (AMSL)	53.0 M
Overall Height of Structure Above Ground	470.0 M
(including all appurtenances)	
Overall Height of Structure Above Mean Sea Level	523.0 M
(including all appurtenances)	
Height of Site Above Average Terrain	7.9 M
Antenna Height Radiation Center (R/C) Above Ground	460.7 M
Antenna Height R/C Above Mean Sea Level	513.7 M
Average of All Non-Odd Radials	37.4 M
Antenna Height R/C Above Average Terrain	476.3 M

E. System Parameters – Horizontal Polarization:

Transmitter Power Required	5.65 kW
Maximum Power Input to Antenna	3.62 kW
Transmission Line Loss	1.73 dB
Transmission Line Efficiency	67.1%
Maximum Antenna Gain in Beam Maximum	16.17 dB
Maximum Antenna Gain in Horizontal Plane	15.19 dB
Maximum Effective Radiated Power	21.76 dBk
In Beam Maximum	150.0 kW
Maximum Effective Radiated Power	20.78 dBk
In Horizontal Plane	119.7 kW

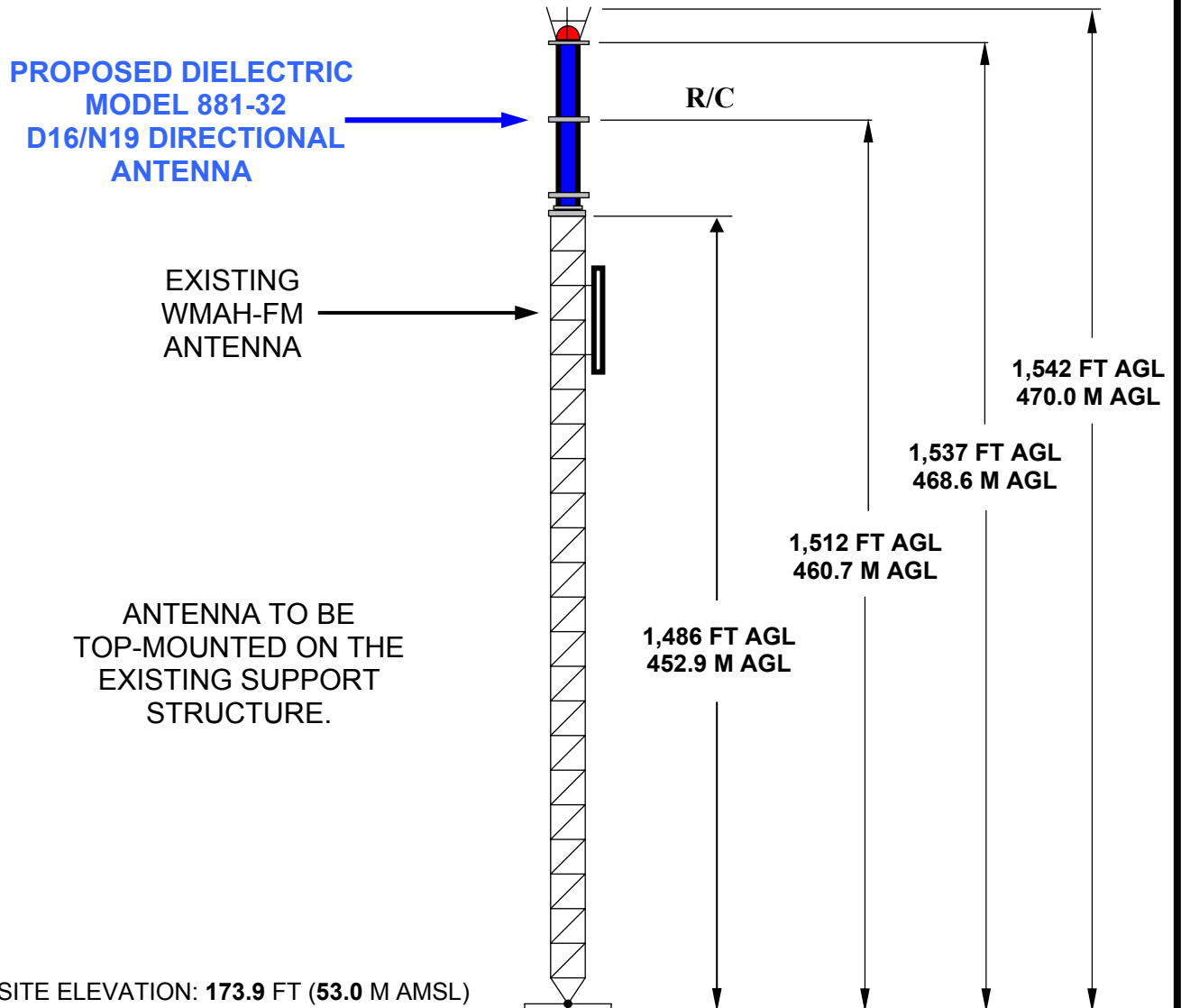
**WMAH-DT
BILOXI, MS**

**DATA FOR PROPOSED DTV
DIRECTIONAL TRANSMITTING ANTENNA**

- A. **Antenna:** Top-mounted, Dielectric Model 881-32, Horizontally Polarized, Directional Antenna.
- B. **Electrical Beam Tilt:** 0.75°
- C. **Mechanical Beam Tilt:** 0.25° M @ 135° T
- D.

<u>Maximum Power Gain</u>	<u>Horizontal Polarization</u>
Maximum:	41.4 (16.17 dB)
Horizontal:	33.0 (15.19 dB)
- E. **Average Power Required:** 5.65 kW
- F. **Null Fill:** 12.0%
- G. **Transmission Line:** 6-1/8" 75-ohm Digit Line.
- H. **Transmission Line Loss:** 0.1066 dB/100-feet
- I. **Total Transmission Line:** 1,625 feet
- J. **Transmission Line Attenuation:** 1.73 dB
- K. **Combiner/Decombiner Loss:** 0.20 dB
- L. **Total System Attenuation:** 1.93 dB

ANTENNA STRUCTURE ELEVATION VIEW



OVERALL HEIGHT AGL: 470.0 M
OVERALL HEIGHT AMSL: 523.0 M
RADIATION CENTER AGL: 460.7 M
RADIATION CENTER AMSL: 513.7 M
AVERAGE OF NON-ODD RADIALS: 37.4 M
RADIATION CENTER HAAT: 476.3 M

COORDINATES: (NAD 27)

N. LATITUDE 30° 45' 18"

W. LONGITUDE 88° 56' 44"

Antenna Structure Registration Number:
1041052

NOTE: NOT TO SCALE

KESSLER & GEHMAN
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WMAH-DT CHANNEL 16

BILOXI, MISSISSIPI

20021118

EXHIBIT 3

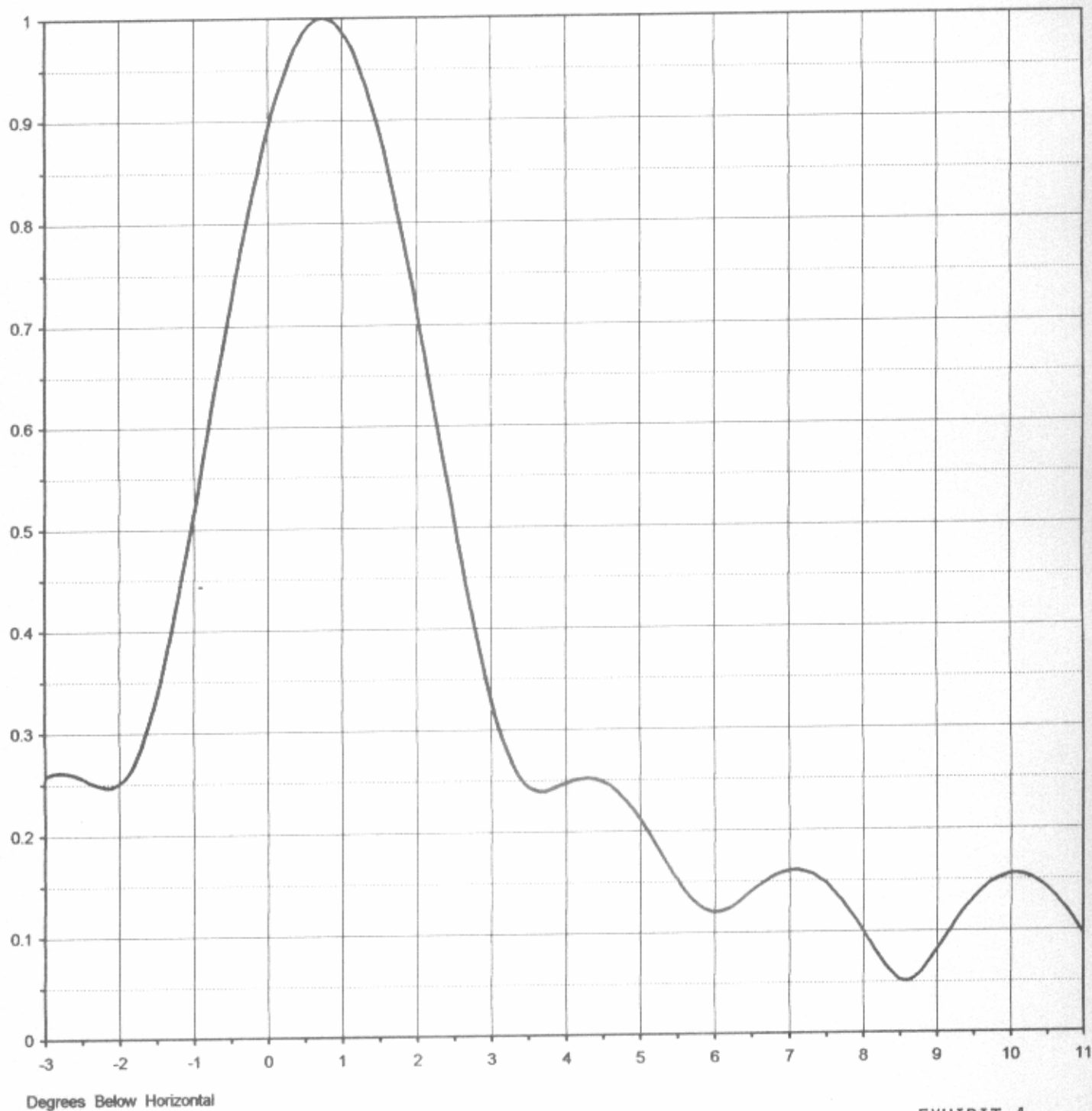


Proposal Number	DCA-9877	
Date	22-Mar-02	
Call Letters	WMAH-DT	Channel 16
Location	Biloxi, MS	
Customer	MAET	
Antenna Type	881-32	

ELEVATION PATTERN

RMS Gain at Main Lobe	19.70 (12.94 dB)
RMS Gain at Horizontal	15.70 (11.96 dB)
Calculated / Measured	Calculated

Beam Tilt	0.25° M @ 135° TN
Frequency	0.75 deg
Drawing #	485.00 MHz
	321197075





Proposal Number **DCA-9877**
Date **22-Mar-02**
Call Letters **WMAH-DT**
Location **Biloxi, MS**
Customer **MAET**
Antenna Type **881-32**

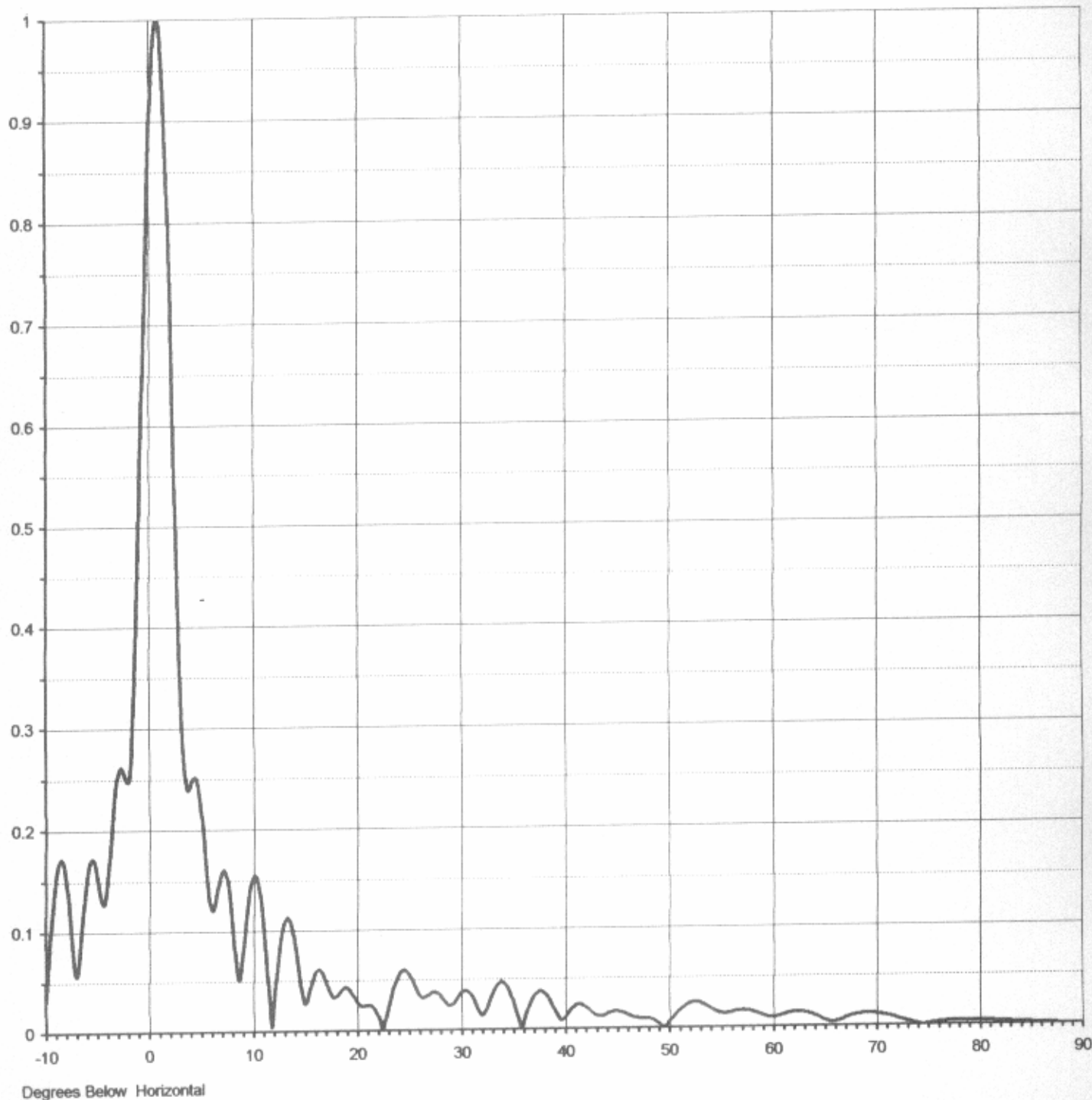
Channel **16**

ELEVATION PATTERN

RMS Gain at Main Lobe **19.70 (12.94 dB)**
RMS Gain at Horizontal **15.70 (11.96 dB)**
Calculated / Measured **Calculated**

Beam Tilt **0.75 deg**
Frequency **485.00 MHz**
Drawing # **321197075-90**

0.25° M @ 135° TN





Proposal Number **DCA-9877**
 Date **22-Mar-02**
 Call Letters **WMAH-DT**
 Location **Biloxi, MS**
 Customer **MAET**
 Antenna Type **881-32**

Channel **16**

TABULATION OF ELEVATION PATTERN

Elevation Pattern Drawing #: **321197075-90**

Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.031	2.4	0.548	10.6	0.141	30.5	0.039	51.0	0.017	71.5	0.008
-9.5	0.104	2.6	0.467	10.8	0.126	31.0	0.035	51.5	0.021	72.0	0.007
-9.0	0.156	2.8	0.392	11.0	0.106	31.5	0.024	52.0	0.024	72.5	0.005
-8.5	0.172	3.0	0.328	11.5	0.045	32.0	0.014	52.5	0.025	73.0	0.004
-8.0	0.147	3.2	0.280	12.0	0.021	32.5	0.021	53.0	0.024	73.5	0.002
-7.5	0.092	3.4	0.251	12.5	0.076	33.0	0.035	53.5	0.022	74.0	0.001
-7.0	0.057	3.6	0.240	13.0	0.107	33.5	0.044	54.0	0.019	74.5	0.000
-6.5	0.107	3.8	0.241	13.5	0.111	34.0	0.047	54.5	0.016	75.0	0.001
-6.0	0.158	4.0	0.247	14.0	0.089	34.5	0.041	55.0	0.014	75.5	0.002
-5.5	0.172	4.2	0.251	14.5	0.054	35.0	0.029	55.5	0.013	76.0	0.003
-5.0	0.150	4.4	0.251	15.0	0.027	35.5	0.012	56.0	0.014	76.5	0.003
-4.5	0.127	4.6	0.244	15.5	0.041	36.0	0.006	56.5	0.016	77.0	0.004
-4.0	0.159	4.8	0.230	16.0	0.058	36.5	0.022	57.0	0.016	77.5	0.004
-3.5	0.220	5.0	0.211	16.5	0.060	37.0	0.033	57.5	0.016	78.0	0.004
-3.0	0.258	5.2	0.188	17.0	0.050	37.5	0.038	58.0	0.015	78.5	0.004
-2.8	0.262	5.4	0.163	17.5	0.037	38.0	0.036	58.5	0.013	79.0	0.004
-2.6	0.259	5.6	0.141	18.0	0.034	38.5	0.029	59.0	0.011	79.5	0.004
-2.4	0.252	5.8	0.126	18.5	0.040	39.0	0.019	59.5	0.009	80.0	0.004
-2.2	0.247	6.0	0.120	19.0	0.043	39.5	0.009	60.0	0.009	80.5	0.004
-2.0	0.251	6.2	0.124	19.5	0.038	40.0	0.011	60.5	0.010	81.0	0.004
-1.8	0.270	6.4	0.135	20.0	0.029	40.5	0.018	61.0	0.011	81.5	0.003
-1.6	0.309	6.6	0.146	20.5	0.024	41.0	0.023	61.5	0.013	82.0	0.003
-1.4	0.366	6.8	0.155	21.0	0.025	41.5	0.024	62.0	0.014	82.5	0.003
-1.2	0.437	7.0	0.160	21.5	0.024	42.0	0.021	62.5	0.014	83.0	0.003
-1.0	0.516	7.2	0.159	22.0	0.015	42.5	0.017	63.0	0.014	83.5	0.002
-0.8	0.599	7.4	0.152	22.5	0.001	43.0	0.013	63.5	0.012	84.0	0.002
-0.6	0.682	7.6	0.139	23.0	0.021	43.5	0.012	64.0	0.010	84.5	0.002
-0.4	0.761	7.8	0.121	23.5	0.041	44.0	0.014	64.5	0.008	85.0	0.001
-0.2	0.832	8.0	0.100	24.0	0.055	44.5	0.016	65.0	0.006	85.5	0.001
0.0	0.893	8.2	0.077	24.5	0.060	45.0	0.017	65.5	0.004	86.0	0.001
0.2	0.942	8.4	0.058	25.0	0.056	45.5	0.016	66.0	0.005	86.5	0.001
0.4	0.977	8.6	0.051	25.5	0.045	46.0	0.013	66.5	0.006	87.0	0.001
0.6	0.996	8.8	0.062	26.0	0.035	46.5	0.011	67.0	0.008	87.5	0.000
0.8	0.999	9.0	0.082	26.5	0.033	47.0	0.010	67.5	0.010	88.0	0.000
1.0	0.986	9.2	0.104	27.0	0.036	47.5	0.009	68.0	0.011	88.5	0.000
1.2	0.957	9.4	0.124	27.5	0.038	48.0	0.009	68.5	0.012	89.0	0.000
1.4	0.913	9.6	0.140	28.0	0.035	48.5	0.008	69.0	0.012	89.5	0.000
1.6	0.857	9.8	0.146	28.5	0.028	49.0	0.005	69.5	0.012	90.0	0.000
1.8	0.789	10.0	0.153	29.0	0.024	49.5	0.000	70.0	0.011		
2.0	0.713	10.2	0.155	29.5	0.029	50.0	0.006	70.5	0.010		
2.2	0.632	10.4	0.151	30.0	0.037	50.5	0.011	71.0	0.009		



Proposal Number

DCA-9877

Date

22-Mar-02

Call Letters

WMAH-DT

Channel

16

Location

Biloxi, MS

Customer

MAET

Antenna Type

881-32

AZIMUTH PATTERN

Gain

2.10

(3.22 dB)

Frequency

485.00 MHz

Calculated / Measured

Calculated

Drawing #

881-D16

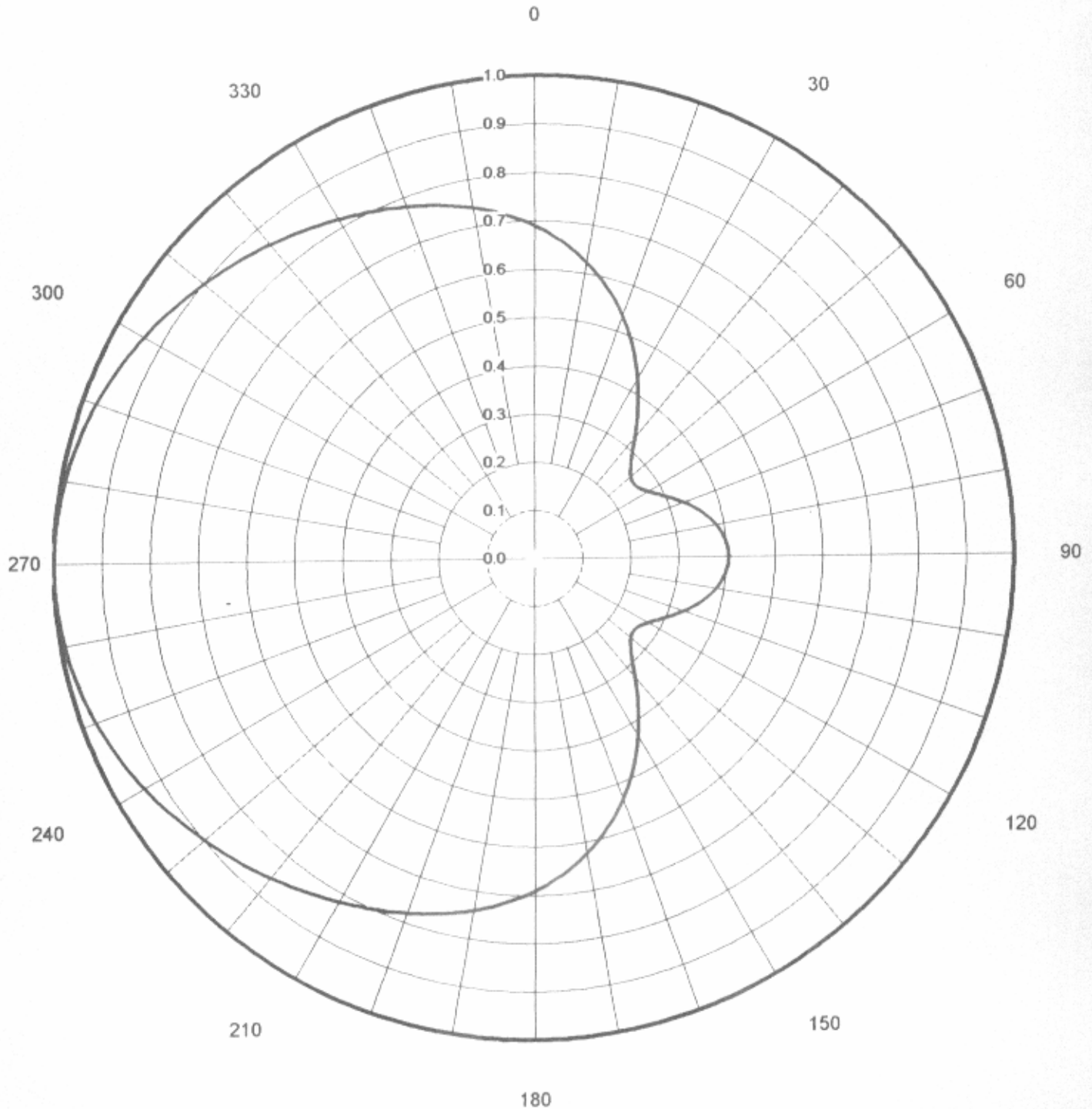


EXHIBIT 7



Proposal Number **DCA-9877**
 Date **22-Mar-02**
 Call Letters **WMAH-DT**
 Location **Biloxi, MS**
 Customer **MAET**
 Antenna Type **881-32**

Channel **16**

TABULATION OF AZIMUTH PATTERN

Azimuth Pattern Drawing #: **881-D16**

Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
0	0.690	45	0.284	90	0.403	135	0.284	180	0.690	225	0.878	270	1.000	315	0.878
1	0.684	46	0.278	91	0.403	136	0.291	181	0.695	226	0.882	271	1.000	316	0.874
2	0.678	47	0.272	92	0.402	137	0.299	182	0.701	227	0.887	272	1.000	317	0.870
3	0.672	48	0.268	93	0.401	138	0.306	183	0.706	228	0.891	273	0.999	318	0.865
4	0.665	49	0.264	94	0.400	139	0.315	184	0.711	229	0.895	274	0.999	319	0.861
5	0.659	50	0.260	95	0.398	140	0.324	185	0.716	230	0.899	275	0.998	320	0.857
6	0.652	51	0.258	96	0.396	141	0.333	186	0.721	231	0.903	276	0.997	321	0.853
7	0.645	52	0.257	97	0.393	142	0.343	187	0.726	232	0.907	277	0.996	322	0.849
8	0.637	53	0.256	98	0.390	143	0.353	188	0.731	233	0.911	278	0.995	323	0.845
9	0.630	54	0.256	99	0.387	144	0.363	189	0.735	234	0.915	279	0.994	324	0.841
10	0.622	55	0.257	100	0.383	145	0.374	190	0.740	235	0.919	280	0.993	325	0.837
11	0.614	56	0.259	101	0.379	146	0.384	191	0.744	236	0.923	281	0.991	326	0.833
12	0.606	57	0.261	102	0.375	147	0.395	192	0.748	237	0.927	282	0.989	327	0.829
13	0.598	58	0.264	103	0.370	148	0.406	193	0.752	238	0.931	283	0.988	328	0.825
14	0.589	59	0.268	104	0.365	149	0.417	194	0.756	239	0.935	284	0.986	329	0.821
15	0.580	60	0.272	105	0.360	150	0.428	195	0.760	240	0.939	285	0.984	330	0.817
16	0.571	61	0.277	106	0.354	151	0.439	196	0.764	241	0.942	286	0.981	331	0.813
17	0.562	62	0.282	107	0.349	152	0.450	197	0.768	242	0.946	287	0.979	332	0.810
18	0.553	63	0.288	108	0.343	153	0.461	198	0.772	243	0.949	288	0.976	333	0.806
19	0.543	64	0.293	109	0.337	154	0.471	199	0.776	244	0.953	289	0.974	334	0.802
20	0.533	65	0.299	110	0.330	155	0.482	200	0.780	245	0.956	290	0.971	335	0.798
21	0.523	66	0.305	111	0.324	156	0.493	201	0.783	246	0.959	291	0.968	336	0.794
22	0.513	67	0.312	112	0.318	157	0.503	202	0.787	247	0.962	292	0.965	337	0.791
23	0.503	68	0.318	113	0.312	158	0.513	203	0.791	248	0.965	293	0.962	338	0.787
24	0.493	69	0.324	114	0.305	159	0.523	204	0.794	249	0.968	294	0.959	339	0.783
25	0.482	70	0.330	115	0.299	160	0.533	205	0.798	250	0.971	295	0.956	340	0.780
26	0.471	71	0.337	116	0.293	161	0.543	206	0.802	251	0.974	296	0.953	341	0.776
27	0.461	72	0.343	117	0.288	162	0.553	207	0.806	252	0.976	297	0.949	342	0.772
28	0.450	73	0.349	118	0.282	163	0.562	208	0.810	253	0.979	298	0.946	343	0.768
29	0.439	74	0.354	119	0.277	164	0.571	209	0.813	254	0.981	299	0.942	344	0.764
30	0.428	75	0.360	120	0.272	165	0.580	210	0.817	255	0.984	300	0.939	345	0.760
31	0.417	76	0.365	121	0.268	166	0.589	211	0.821	256	0.986	301	0.935	346	0.756
32	0.406	77	0.370	122	0.264	167	0.598	212	0.825	257	0.988	302	0.931	347	0.752
33	0.395	78	0.375	123	0.261	168	0.606	213	0.829	258	0.989	303	0.927	348	0.748
34	0.384	79	0.379	124	0.259	169	0.614	214	0.833	259	0.991	304	0.923	349	0.744
35	0.374	80	0.383	125	0.257	170	0.622	215	0.837	260	0.993	305	0.919	350	0.740
36	0.363	81	0.387	126	0.256	171	0.630	216	0.841	261	0.994	306	0.915	351	0.735
37	0.353	82	0.390	127	0.256	172	0.637	217	0.845	262	0.995	307	0.911	352	0.731
38	0.343	83	0.393	128	0.257	173	0.645	218	0.849	263	0.996	308	0.907	353	0.726
39	0.333	84	0.396	129	0.258	174	0.652	219	0.853	264	0.997	309	0.903	354	0.721
40	0.324	85	0.398	130	0.260	175	0.659	220	0.857	265	0.998	310	0.899	355	0.716
41	0.315	86	0.400	131	0.264	176	0.665	221	0.861	266	0.999	311	0.895	356	0.711
42	0.306	87	0.401	132	0.268	177	0.672	222	0.865	267	0.999	312	0.891	357	0.706
43	0.299	88	0.402	133	0.272	178	0.678	223	0.870	268	1.000	313	0.887	358	0.701
44	0.291	89	0.403	134	0.278	179	0.684	224	0.874	269	1.000	314	0.882	359	0.695

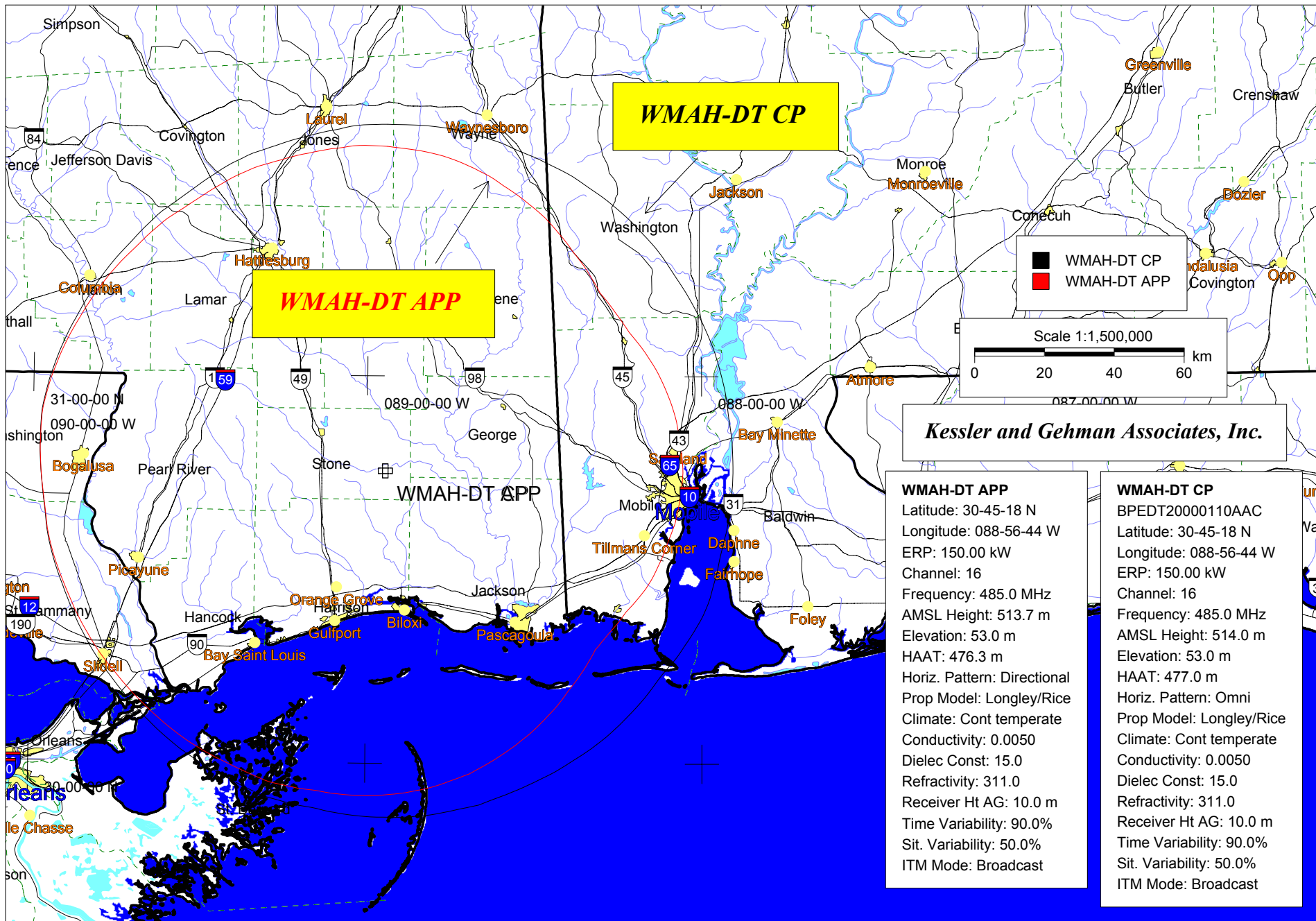


Exhibit 10

WMAH-DT CP Distance to Contour Tabulation

Curve Table: WMAH-DT CP

Transmitter Information:

Call Letters: WMAH-DT CP
File Number: BPEDT20000110AAC
Latitude: 30-45-18 N
Longitude: 088-56-44 W
ERP: 150.00 kW
Channel: 16
Frequency: 485.0 MHz
AMSL Height: 514.0 m
Elevation: 53.0 m
HAAT: 477.0 m
Horiz. Antenna Pattern: Omni
Vert. Elevation Pattern: Yes
Electrical Beam Tilt: 0.75

Type of curve: FCC
Location Variability: 50.0 %
Time Variability: 90.0 %
Field Strength: 38.94 dBuV/m

Primary Terrain: V-Soft US 3 Arc-Second Database

Bearing (deg)	Distance (km)	HAAT (m)
-----	-----	-----
0.0	99.2	479.2
1.0	99.1	478.8
2.0	99.2	479.1
3.0	99.2	479.8
4.0	99.3	480.4
5.0	99.3	481.4
6.0	99.4	482.6
7.0	99.5	483.2
8.0	99.5	483.5
9.0	99.6	484.3
10.0	99.6	484.8
11.0	99.6	485.0
12.0	99.6	485.1
13.0	99.6	485.0
14.0	99.6	484.4
15.0	99.6	484.1
16.0	99.6	484.1
17.0	99.5	483.2
18.0	99.5	483.2
19.0	99.5	483.1
20.0	99.4	482.0
21.0	99.3	480.4
22.0	99.2	479.1
23.0	99.2	479.8
24.0	99.2	480.2
25.0	99.3	481.3
26.0	99.4	481.8

WMAH-DT CP Distance to Contour Tabulation

27.0	99.4	481.8
28.0	99.4	482.5
29.0	99.5	483.5
30.0	99.6	484.7
31.0	99.7	486.0
32.0	99.8	487.1
33.0	99.8	486.7
34.0	99.8	486.5
35.0	99.7	486.3
36.0	99.8	486.8
37.0	99.9	487.9
38.0	99.9	488.8
39.0	100.0	489.6
40.0	100.0	489.8
41.0	100.0	490.0
42.0	100.1	490.3
43.0	100.1	490.7
44.0	100.1	491.2
45.0	100.1	490.8
46.0	100.1	490.4
47.0	100.1	490.5
48.0	100.1	491.1
49.0	100.2	491.5
50.0	100.2	491.8
51.0	100.2	491.8
52.0	100.1	491.1
53.0	100.1	490.3
54.0	100.0	489.3
55.0	99.9	488.4
56.0	99.9	488.1
57.0	99.9	488.4
58.0	99.9	488.7
59.0	100.0	489.0
60.0	100.0	489.2
61.0	100.0	489.3
62.0	100.0	489.4
63.0	100.0	489.7
64.0	100.1	490.6
65.0	100.1	490.9
66.0	100.1	490.7
67.0	100.1	490.8
68.0	100.1	490.9
69.0	100.1	491.2
70.0	100.2	491.3
71.0	100.1	490.3
72.0	100.1	490.0
73.0	100.0	489.2
74.0	99.9	488.6
75.0	99.9	488.2
76.0	99.9	487.9
77.0	99.8	487.2
78.0	99.7	486.0
79.0	99.6	484.8
80.0	99.5	483.4
81.0	99.5	482.8
82.0	99.5	483.1
83.0	99.5	483.4

WMAH-DT CP Distance to Contour Tabulation

84.0	99.6	484.2
85.0	99.6	484.4
86.0	99.5	483.9
87.0	99.5	483.5
88.0	99.5	483.5
89.0	99.5	483.5
90.0	99.5	483.3
91.0	99.5	483.1
92.0	99.5	482.9
93.0	99.4	482.0
94.0	99.3	481.5
95.0	99.3	481.5
96.0	99.3	481.2
97.0	99.3	480.7
98.0	99.3	480.3
99.0	99.2	479.9
100.0	99.2	479.3
101.0	99.1	478.1
102.0	99.0	477.5
103.0	99.0	477.0
104.0	99.0	476.9
105.0	99.1	478.1
106.0	99.2	480.0
107.0	99.4	481.8
108.0	99.4	482.6
109.0	99.5	483.6
110.0	99.7	485.5
111.0	99.9	487.7
112.0	100.0	488.8
113.0	100.0	488.9
114.0	100.0	489.2
115.0	99.9	488.3
116.0	99.8	486.8
117.0	99.7	485.4
118.0	99.5	483.8
119.0	99.4	482.1
120.0	99.3	480.7
121.0	99.2	479.7
122.0	99.1	478.5
123.0	99.0	476.7
124.0	98.7	474.0
125.0	98.5	471.5
126.0	98.4	469.8
127.0	98.4	469.9
128.0	98.5	470.6
129.0	98.6	471.8
130.0	98.6	472.7
131.0	98.7	473.4
132.0	98.7	473.8
133.0	98.7	474.0
134.0	98.8	474.4
135.0	98.8	474.9
136.0	98.9	475.5
137.0	98.9	476.1
138.0	99.0	476.6
139.0	99.0	477.0
140.0	99.0	477.4

WMAH-DT CP Distance to Contour Tabulation

141.0	99.0	477.3
142.0	99.0	477.3
143.0	99.0	477.0
144.0	99.0	476.8
145.0	98.9	476.1
146.0	98.8	475.2
147.0	98.8	475.1
148.0	98.9	475.5
149.0	98.9	475.8
150.0	98.9	476.0
151.0	98.9	475.9
152.0	98.8	475.1
153.0	98.8	474.8
154.0	98.8	475.0
155.0	98.8	475.0
156.0	98.8	475.1
157.0	98.9	475.4
158.0	98.9	475.4
159.0	98.9	475.7
160.0	98.9	475.9
161.0	99.0	476.7
162.0	99.0	477.6
163.0	99.2	479.1
164.0	99.3	480.9
165.0	99.2	479.8
166.0	99.2	479.1
167.0	99.1	478.4
168.0	99.1	478.6
169.0	99.2	479.1
170.0	99.2	479.4
171.0	99.3	480.4
172.0	99.3	480.7
173.0	99.3	480.8
174.0	99.2	479.7
175.0	99.2	480.1
176.0	99.3	480.4
177.0	99.2	479.9
178.0	99.2	479.5
179.0	99.1	478.7
180.0	99.1	478.4
181.0	99.1	478.9
182.0	99.1	478.8
183.0	99.1	478.4
184.0	99.0	477.7
185.0	99.0	477.2
186.0	99.0	476.6
187.0	98.9	476.1
188.0	98.8	475.2
189.0	98.8	474.8
190.0	98.7	473.7
191.0	98.6	472.4
192.0	98.6	472.2
193.0	98.7	473.5
194.0	98.8	475.3
195.0	99.0	476.8
196.0	99.0	476.8
197.0	99.0	477.4

WMAH-DT CP Distance to Contour Tabulation

198.0	99.1	478.4
199.0	99.2	479.9
200.0	99.4	481.6
201.0	99.3	480.6
202.0	99.1	478.7
203.0	99.0	477.7
204.0	99.0	476.8
205.0	98.9	475.5
206.0	98.8	474.7
207.0	98.8	474.3
208.0	98.7	473.8
209.0	98.7	474.0
210.0	98.8	474.3
211.0	98.8	474.4
212.0	98.8	474.5
213.0	98.8	474.5
214.0	98.8	474.4
215.0	98.8	474.6
216.0	98.8	474.6
217.0	98.8	474.2
218.0	98.7	473.4
219.0	98.6	472.7
220.0	98.6	472.3
221.0	98.6	471.7
222.0	98.5	471.0
223.0	98.4	470.1
224.0	98.4	469.4
225.0	98.3	468.6
226.0	98.3	468.3
227.0	98.3	468.1
228.0	98.3	467.9
229.0	98.2	467.2
230.0	98.2	466.9
231.0	98.2	466.6
232.0	98.1	466.0
233.0	98.1	465.7
234.0	98.1	466.4
235.0	98.1	466.6
236.0	98.2	466.8
237.0	98.2	467.1
238.0	98.2	467.2
239.0	98.2	466.9
240.0	98.1	466.2
241.0	98.1	465.7
242.0	98.1	465.7
243.0	98.1	465.7
244.0	98.0	465.1
245.0	98.0	465.0
246.0	98.0	464.7
247.0	97.9	464.0
248.0	97.9	463.7
249.0	97.9	464.0
250.0	97.9	463.9
251.0	98.0	464.4
252.0	98.0	465.1
253.0	98.1	465.7
254.0	98.1	466.5

WMAH-DT CP Distance to Contour Tabulation

255.0	98.2	467.2
256.0	98.2	467.4
257.0	98.2	467.7
258.0	98.3	468.0
259.0	98.3	467.9
260.0	98.2	467.6
261.0	98.2	466.6
262.0	98.1	465.5
263.0	98.0	465.0
264.0	98.0	465.2
265.0	98.1	465.9
266.0	98.2	466.7
267.0	98.2	467.8
268.0	98.3	469.1
269.0	98.5	470.5
270.0	98.6	472.0
271.0	98.7	473.4
272.0	98.8	475.1
273.0	99.0	477.2
274.0	99.1	478.4
275.0	99.2	479.5
276.0	99.3	481.0
277.0	99.5	482.8
278.0	99.6	484.0
279.0	99.7	486.0
280.0	99.8	486.9
281.0	99.8	486.6
282.0	99.7	486.1
283.0	99.7	485.6
284.0	99.7	485.4
285.0	99.7	485.2
286.0	99.6	484.2
287.0	99.5	483.0
288.0	99.4	482.3
289.0	99.4	481.5
290.0	99.3	480.8
291.0	99.2	480.0
292.0	99.1	479.0
293.0	99.1	477.9
294.0	99.0	477.1
295.0	98.9	476.0
296.0	98.8	474.6
297.0	98.7	474.0
298.0	98.7	473.6
299.0	98.6	472.7
300.0	98.6	472.1
301.0	98.6	472.0
302.0	98.5	471.4
303.0	98.5	470.8
304.0	98.5	470.4
305.0	98.4	470.1
306.0	98.4	469.5
307.0	98.3	468.5
308.0	98.3	467.9
309.0	98.2	466.8
310.0	98.1	465.4
311.0	98.0	464.4

WMAH-DT CP Distance to Contour Tabulation

312.0	97.9	463.9
313.0	98.0	464.3
314.0	98.0	464.8
315.0	98.0	464.7
316.0	98.0	464.6
317.0	98.0	464.6
318.0	98.1	465.3
319.0	98.0	464.9
320.0	97.9	462.9
321.0	97.7	461.2
322.0	97.7	460.4
323.0	97.6	460.2
324.0	97.6	460.0
325.0	97.6	460.2
326.0	97.7	460.9
327.0	97.8	462.0
328.0	97.9	463.2
329.0	97.9	463.8
330.0	98.0	465.0
331.0	98.2	466.8
332.0	98.3	468.3
333.0	98.3	469.0
334.0	98.4	469.3
335.0	98.4	469.5
336.0	98.5	470.5
337.0	98.5	470.7
338.0	98.4	469.2
339.0	98.3	468.1
340.0	98.2	467.7
341.0	98.2	467.3
342.0	98.2	467.8
343.0	98.3	468.0
344.0	98.3	468.5
345.0	98.3	468.5
346.0	98.3	468.4
347.0	98.4	469.2
348.0	98.4	470.1
349.0	98.5	471.1
350.0	98.6	472.0
351.0	98.6	472.1
352.0	98.7	473.3
353.0	98.9	476.1
354.0	99.1	478.1
355.0	99.2	479.1
356.0	99.2	479.3
357.0	99.1	479.0
358.0	99.1	478.7
359.0	99.1	479.0

WMAH-DT APP Distance to Contour Tabulation

Curve Table: WMAH-DT APP

Transmitter Information:

Call Letters: WMAH-DT APP
Latitude: 30-45-18 N
Longitude: 088-56-44 W
ERP: 150.00 kW
Channel: 16
Frequency: 485.0 MHz
AMSL Height: 513.7 m
Elevation: 53.0 m
HAAT: 476.3 m
Horiz. Antenna Pattern: Directional
Vert. Elevation Pattern: Yes
Electrical Beam Tilt: 0.75

Type of curve: FCC
Location Variability: 50.0 %
Time Variability: 90.0 %
Field Strength: 38.94 dBuV/m

Primary Terrain: V-Soft US 3 Arc-Second Database

Bearing (deg)	Distance (km)	HAAT (m)
-----	-----	-----
0.0	92.8	478.9
1.0	92.6	478.5
2.0	92.5	478.8
3.0	92.4	479.5
4.0	92.3	480.1
5.0	92.2	481.1
6.0	92.1	482.3
7.0	92.0	482.9
8.0	91.8	483.2
9.0	91.7	484.0
10.0	91.6	484.5
11.0	91.4	484.7
12.0	91.2	484.8
13.0	90.9	484.7
14.0	90.7	484.1
15.0	90.4	483.8
16.0	90.2	483.8
17.0	89.9	482.9
18.0	89.7	482.9
19.0	89.4	482.8
20.0	89.1	481.7
21.0	88.7	480.1
22.0	88.3	478.8
23.0	88.1	479.5
24.0	87.8	479.9
25.0	87.5	481.0
26.0	87.3	481.5
27.0	86.9	481.5

WMAH-DT APP Distance to Contour Tabulation

28.0	86.7	482.2
29.0	86.4	483.2
30.0	86.1	484.4
31.0	85.8	485.7
32.0	85.6	486.8
33.0	85.2	486.4
34.0	84.8	486.2
35.0	84.4	486.0
36.0	84.1	486.5
37.0	83.7	487.6
38.0	83.4	488.5
39.0	83.0	489.3
40.0	82.6	489.5
41.0	82.3	489.7
42.0	82.1	490.0
43.0	81.8	490.4
44.0	81.6	490.9
45.0	81.3	490.5
46.0	80.9	490.1
47.0	80.6	490.2
48.0	80.4	490.8
49.0	80.1	491.2
50.0	79.8	491.5
51.0	79.8	491.5
52.0	79.9	490.8
53.0	79.9	490.0
54.0	79.9	489.0
55.0	79.9	488.1
56.0	80.0	487.8
57.0	80.0	488.1
58.0	80.1	488.4
59.0	80.2	488.7
60.0	80.2	488.9
61.0	80.5	489.0
62.0	80.8	489.1
63.0	81.1	489.4
64.0	81.4	490.3
65.0	81.7	490.6
66.0	81.9	490.4
67.0	82.2	490.5
68.0	82.4	490.6
69.0	82.7	490.9
70.0	82.9	491.0
71.0	83.1	490.0
72.0	83.3	489.7
73.0	83.4	488.9
74.0	83.6	488.3
75.0	83.8	487.9
76.0	84.0	487.6
77.0	84.1	486.9
78.0	84.3	485.7
79.0	84.4	484.5
80.0	84.5	483.1
81.0	84.6	482.5
82.0	84.6	482.8
83.0	84.7	483.1
84.0	84.8	483.9

WMAH-DT APP Distance to Contour Tabulation

85.0	84.9	484.1
86.0	85.0	483.6
87.0	85.0	483.2
88.0	85.1	483.2
89.0	85.1	483.2
90.0	85.2	483.0
91.0	85.1	482.8
92.0	85.0	482.6
93.0	84.9	481.7
94.0	84.8	481.2
95.0	84.8	481.2
96.0	84.7	480.9
97.0	84.6	480.4
98.0	84.5	480.0
99.0	84.4	479.6
100.0	84.3	479.0
101.0	84.0	477.8
102.0	83.8	477.2
103.0	83.6	476.7
104.0	83.4	476.6
105.0	83.3	477.8
106.0	83.2	479.7
107.0	83.1	481.5
108.0	82.9	482.3
109.0	82.7	483.3
110.0	82.6	485.2
111.0	82.5	487.4
112.0	82.3	488.5
113.0	82.1	488.6
114.0	81.8	488.9
115.0	81.5	488.0
116.0	81.2	486.5
117.0	80.9	485.1
118.0	80.6	483.5
119.0	80.2	481.8
120.0	79.9	480.4
121.0	79.8	479.4
122.0	79.7	478.2
123.0	79.5	476.4
124.0	79.4	473.7
125.0	79.2	471.2
126.0	79.1	469.5
127.0	79.0	469.6
128.0	79.0	470.3
129.0	79.0	471.5
130.0	79.0	472.4
131.0	79.3	473.1
132.0	79.6	473.5
133.0	79.9	473.7
134.0	80.2	474.1
135.0	80.5	474.6
136.0	80.8	475.2
137.0	81.1	475.8
138.0	81.4	476.3
139.0	81.7	476.7
140.0	82.0	477.1
141.0	82.4	477.0

WMAH-DT APP Distance to Contour Tabulation

142.0	82.8	477.0
143.0	83.2	476.7
144.0	83.5	476.5
145.0	83.9	475.8
146.0	84.2	474.9
147.0	84.5	474.8
148.0	84.9	475.2
149.0	85.3	475.5
150.0	85.6	475.7
151.0	85.9	475.6
152.0	86.2	474.8
153.0	86.5	474.5
154.0	86.9	474.7
155.0	87.2	474.7
156.0	87.5	474.8
157.0	87.8	475.1
158.0	88.1	475.1
159.0	88.4	475.4
160.0	88.7	475.6
161.0	89.0	476.4
162.0	89.3	477.3
163.0	89.6	478.8
164.0	90.0	480.6
165.0	90.1	479.5
166.0	90.3	478.8
167.0	90.5	478.1
168.0	90.7	478.3
169.0	91.0	478.8
170.0	91.2	479.1
171.0	91.5	480.1
172.0	91.6	480.4
173.0	91.8	480.5
174.0	91.9	479.4
175.0	92.1	479.8
176.0	92.3	480.1
177.0	92.4	479.6
178.0	92.5	479.2
179.0	92.6	478.4
180.0	92.8	478.1
181.0	92.9	478.6
182.0	93.0	478.5
183.0	93.1	478.1
184.0	93.2	477.4
185.0	93.2	476.9
186.0	93.3	476.3
187.0	93.4	475.8
188.0	93.4	474.9
189.0	93.5	474.5
190.0	93.5	473.4
191.0	93.5	472.1
192.0	93.6	471.9
193.0	93.8	473.2
194.0	94.0	475.0
195.0	94.2	476.5
196.0	94.3	476.5
197.0	94.4	477.1
198.0	94.6	478.1

WMAH-DT APP Distance to Contour Tabulation

199.0	94.8	479.6
200.0	95.0	481.3
201.0	95.0	480.3
202.0	94.9	478.4
203.0	94.9	477.4
204.0	94.9	476.5
205.0	94.9	475.2
206.0	94.9	474.4
207.0	95.0	474.0
208.0	95.0	473.5
209.0	95.1	473.7
210.0	95.2	474.0
211.0	95.3	474.1
212.0	95.4	474.2
213.0	95.5	474.2
214.0	95.6	474.1
215.0	95.6	474.3
216.0	95.7	474.3
217.0	95.8	473.9
218.0	95.8	473.1
219.0	95.8	472.4
220.0	95.9	472.0
221.0	95.9	471.4
222.0	95.9	470.7
223.0	96.0	469.8
224.0	96.0	469.1
225.0	96.0	468.3
226.0	96.1	468.0
227.0	96.1	467.8
228.0	96.2	467.6
229.0	96.2	466.9
230.0	96.3	466.6
231.0	96.3	466.3
232.0	96.4	465.7
233.0	96.4	465.4
234.0	96.5	466.1
235.0	96.6	466.3
236.0	96.7	466.5
237.0	96.8	466.8
238.0	96.9	466.9
239.0	97.0	466.6
240.0	97.0	465.9
241.0	97.0	465.4
242.0	97.1	465.4
243.0	97.1	465.4
244.0	97.1	464.8
245.0	97.2	464.7
246.0	97.2	464.4
247.0	97.2	463.7
248.0	97.3	463.4
249.0	97.3	463.7
250.0	97.4	463.6
251.0	97.5	464.1
252.0	97.6	464.8
253.0	97.7	465.4
254.0	97.8	466.2
255.0	97.9	466.9

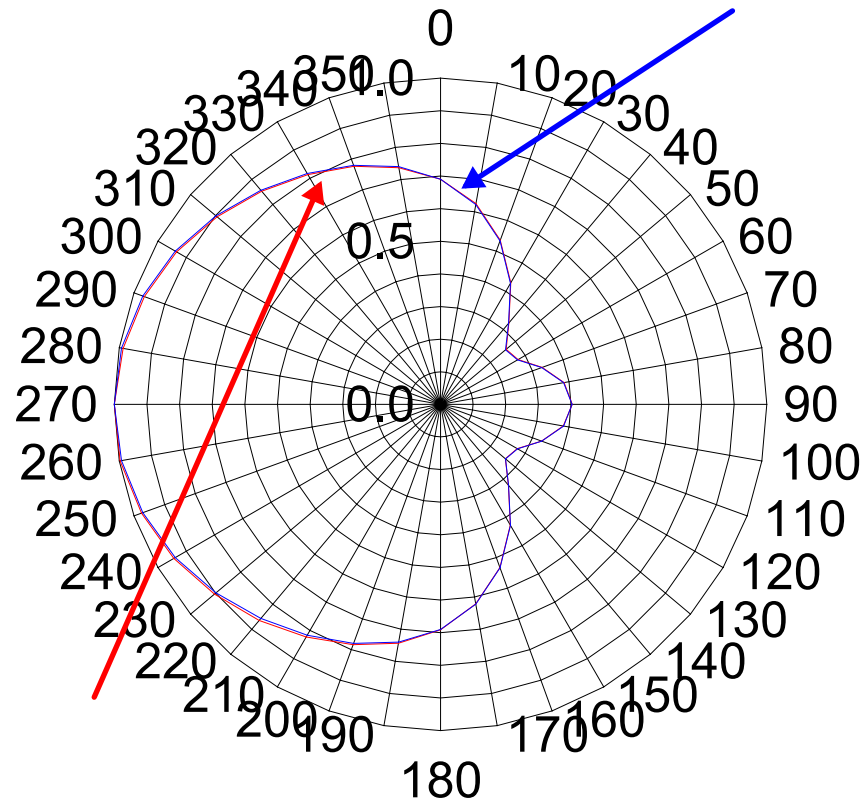
WMAH-DT APP Distance to Contour Tabulation

256.0	97.9	467.1
257.0	98.0	467.4
258.0	98.0	467.7
259.0	98.1	467.6
260.0	98.1	467.3
261.0	98.0	466.3
262.0	97.9	465.2
263.0	97.9	464.7
264.0	97.9	464.9
265.0	98.0	465.6
266.0	98.1	466.4
267.0	98.2	467.5
268.0	98.3	468.8
269.0	98.4	470.2
270.0	98.6	471.7
271.0	98.7	473.1
272.0	98.8	474.8
273.0	98.9	476.9
274.0	99.0	478.1
275.0	99.1	479.2
276.0	99.2	480.7
277.0	99.3	482.5
278.0	99.4	483.7
279.0	99.6	485.7
280.0	99.6	486.6
281.0	99.6	486.3
282.0	99.5	485.8
283.0	99.4	485.3
284.0	99.4	485.1
285.0	99.3	484.9
286.0	99.2	483.9
287.0	99.0	482.7
288.0	98.9	482.0
289.0	98.8	481.2
290.0	98.7	480.5
291.0	98.6	479.7
292.0	98.5	478.7
293.0	98.3	477.6
294.0	98.2	476.8
295.0	98.1	475.7
296.0	97.9	474.3
297.0	97.8	473.7
298.0	97.7	473.3
299.0	97.6	472.4
300.0	97.4	471.8
301.0	97.4	471.7
302.0	97.2	471.1
303.0	97.1	470.5
304.0	97.0	470.1
305.0	96.9	469.8
306.0	96.8	469.2
307.0	96.6	468.2
308.0	96.5	467.6
309.0	96.3	466.5
310.0	96.2	465.1
311.0	96.0	464.1
312.0	95.9	463.6

WMAH-DT APP Distance to Contour Tabulation

313.0	95.8	464.0
314.0	95.8	464.5
315.0	95.7	464.4
316.0	95.6	464.3
317.0	95.5	464.3
318.0	95.5	465.0
319.0	95.4	464.6
320.0	95.2	462.6
321.0	95.0	460.9
322.0	94.8	460.1
323.0	94.7	459.9
324.0	94.6	459.7
325.0	94.6	459.9
326.0	94.6	460.6
327.0	94.5	461.7
328.0	94.6	462.9
329.0	94.5	463.5
330.0	94.5	464.7
331.0	94.6	466.5
332.0	94.6	468.0
333.0	94.6	468.7
334.0	94.5	469.0
335.0	94.5	469.2
336.0	94.5	470.2
337.0	94.4	470.4
338.0	94.2	468.9
339.0	94.1	467.8
340.0	94.0	467.4
341.0	93.9	467.0
342.0	93.8	467.5
343.0	93.7	467.7
344.0	93.7	468.2
345.0	93.6	468.2
346.0	93.5	468.1
347.0	93.5	468.9
348.0	93.5	469.8
349.0	93.4	470.8
350.0	93.4	471.7
351.0	93.3	471.8
352.0	93.3	473.0
353.0	93.4	475.8
354.0	93.4	477.8
355.0	93.4	478.8
356.0	93.3	479.0
357.0	93.2	478.7
358.0	93.0	478.4
359.0	92.9	478.7

WMAH-DT Mechanical Beam Tilt Exhibit



- New Azimuth Pattern (With Mechanical Beam Tilt)
- Licensed Azimuth Pattern Relative Field (Without Mechanical Beam Tilt)