

ENGINEERING EXHIBIT  
APPLICATION FOR LICENSE  
MEL WHEELER, INC.  
FM BROADCAST STATION WXLK  
ROANOKE, VIRGINIA  
FACILITY ID 9692  
CH 222 93 KW (MAX-DA) 625 M

Engineering Statement

This Engineering Exhibit has been prepared on behalf of Mel Wheeler, Inc., licensee of FM broadcast station WXLK Roanoke, Virginia. Mel Wheeler, Inc., holds a construction permit, which authorizes a change in the directional antenna pattern for WXLK, File No. BPH-20031124AHH. In support of the application for license, the following items are attached:

1. Letter from Surveyors – Balzer and Associates, Inc.
2. Antenna Installation Letter – Sky Tower Service
3. Dielectric Pattern Certification

The transmitter output power has been determined employing the maximum antenna gain of 4.63, transmission line loss (including losses from a coax switch, five elbows and notch filter) of 0.369 dB. The transmitter output power needed to achieve an effective radiated power (ERP) of 93 kilowatts is 21.9 kilowatts.

The construction permit specifies an ERI five-section antenna, which has been replaced by a Dielectric five-section antenna, both of which have the same vertical radiation

characteristics. For this reason, there is no change in the showing of compliance with radiofrequency field exposure guidelines.

The construction permit specifies the vertically polarized antenna ERP at 88 kilowatts, which should be the same ERP as the horizontally polarized antenna ERP, 93 kilowatts. The vertical power was incorrectly specified in the WXLK application and was corrected by an amendment to the construction permit, File No. BMPH-20050607ACW. Simultaneous grant of the pending application is requested to permit WXLK to proceed with full power operation with the new facilities.

The WXLK construction, except where noted, complies with the special operating conditions or restrictions listed in the permit.

A handwritten signature in cursive script, reading "Louis R. du Treil, Sr.", written in dark ink.

Louis R. du Treil, Sr.  
du Treil, Lundin & Rackley, Inc.  
201 Fletcher Avenue  
Sarasota, Florida 34237-6019  
941 329 6000

August 30, 2005



K92  
Attn: J. J. Largen  
P.O. Box 92  
Roanoke, VA 24018

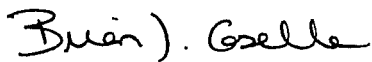
Dear Mr. Largen:

On August 3, 2005, Balzer and Associates, Inc. traveled to the K92 tower on Poor Mountain off of Honeysuckle Road in Roanoke County to establish a survey control network. On August 10, 2005, Balzer and Associates, Inc. returned to the tower and staked a bearing beginning at the center of the tower in the direction of true north for reference.

Balzer and Associates thanks you for your business and should you have any questions, please do not hesitate to contact me.

Respectfully submitted,

BALZER AND ASSOCIATES, INC.

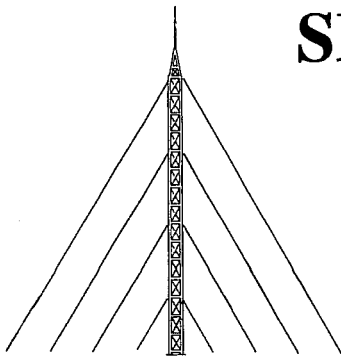
  
Brian J. Casella, P.E.  
Department Head

BJC/mc

PLANNERS • ARCHITECTS • ENGINEERS • SURVEYORS

ROANOKE • RICHMOND • NEW RIVER VALLEY • SHENANDOAH VALLEY

1208 Corporate Circle • Roanoke, Virginia 24018 • (540) 772-9580 FAX (540) 772-8050



# SKY TOWER SERVICE

P.O. Box 11493 • Lynchburg, Virginia 24506

•Answering Service (434) 845-9479•

•Mobile (434) 941-9479•

•Fax (434) 283-1411•

August 16, 2005

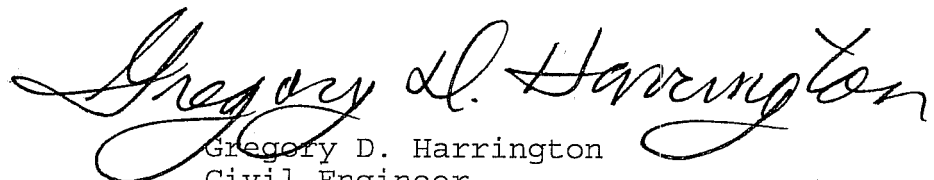
Mr. J.J. Largen  
Chief Engineer  
WXLK Radio Station  
P.O. Box 92  
Roanoke, VA 24022

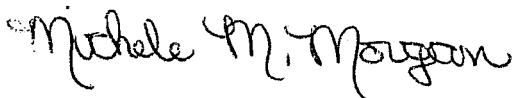
Dear J. J.,

This letter is to confirm that we, Sky Tower Service, installed the new Dielectric 5-bay DCR-M5 broadcast antenna on the WXLK 245' guyed tower on Poor Mountain, and aligned the booms of the radiating elements at true North.

Sincerely,

SKY TOWER SERVICE

  
Gregory D. Harrington  
Civil Engineer

  
MICHELE M. MORGAN

Executed this 16<sup>th</sup> day of August, 2005, in  
the County of Roanoke, State of Virginia.  
My commission expires 12/31/2007.



## **PATTERN CERTIFICATION**

### **TABLE OF CONTENTS**

**Narrative Pattern Certification**

**FM Azimuth Pattern Approval**

**Azimuth Patterns of Horizontal and Vertically Polarized Planes**

**Tabulation of Measured Horizontal and Vertically Polarized Planes**

**Composite Pattern of Horizontal and Vertically Polarized Planes**

**Tabulation of Composite Pattern**

**Gain Summary**

**Rectangular Plot of Vertical Plane Pattern**

**Sketch of Scale Model Test**



## PATTERN CERTIFICATION

### Method of Measurement

The azimuth pattern for "WXLK", Dielectric Document Sketch #4, was measured in the following manner.

A single 4.4 to 1 scale model "DCRM5EFE80HD" bay radiator was mounted on a similarly scaled model of the tower according to information provided to Dielectric by the customer; refer to Dielectric Document Sketch #4. The antenna under test, all parasitics, all known tower appurtenances, and the tower section were rotated through 360 degrees while receiving a signal at the appropriate frequency from a linear cavity-backed source antenna. Both the horizontal and vertical polarization azimuth patterns were measured in an anechoic test range.

The transmit and scale model antennas are mounted at identical elevations and at opposite ends of the chamber. A Hewlett Packard model 8752C network analyzer was used to supply the RF signal to the source antenna at 4.4 times the fundamental FM frequency and to receive the signal intercepted by the antenna under test. The received signal was converted to a relative level, referenced to the source. This level was stored on a computer acting as the master controller. The computer controls the measurement system via IEEE-488 control bus through a GPIB card.

### Statement of Qualifications

Keith L. Pelletier is a Senior Electrical Engineer here at Dielectric. He received a BS in Electrical Engineering Technology from the University of Maine in 1998. He has over 6 years experience in RF antenna engineering and has been employed by Dielectric Communications since 1997.

Signed By: \_\_\_\_\_

Handwritten signature of Keith L. Pelletier in black ink.

Date: \_\_\_\_\_

Handwritten date "5/2/05" in black ink.



MSO NO: 81322

DATE: May 2, 2005

PATTERN NO: 4

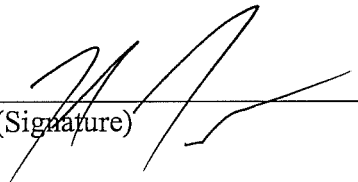
**FM AZIMUTH PATTERN APPROVAL**

The azimuth pattern of the horizontal polarization and vertical polarization as supplied by Dielectric in the document labeled " Pattern 4 ", is acknowledged as acceptable. We understand that Dielectric does not guarantee or predict signal strength in any particular location.

WXLK MEL WHEELER INC  
(Customer's name)

By: JJ LARSEN  
(Name typed or printed)

Title: CE

  
(Signature)

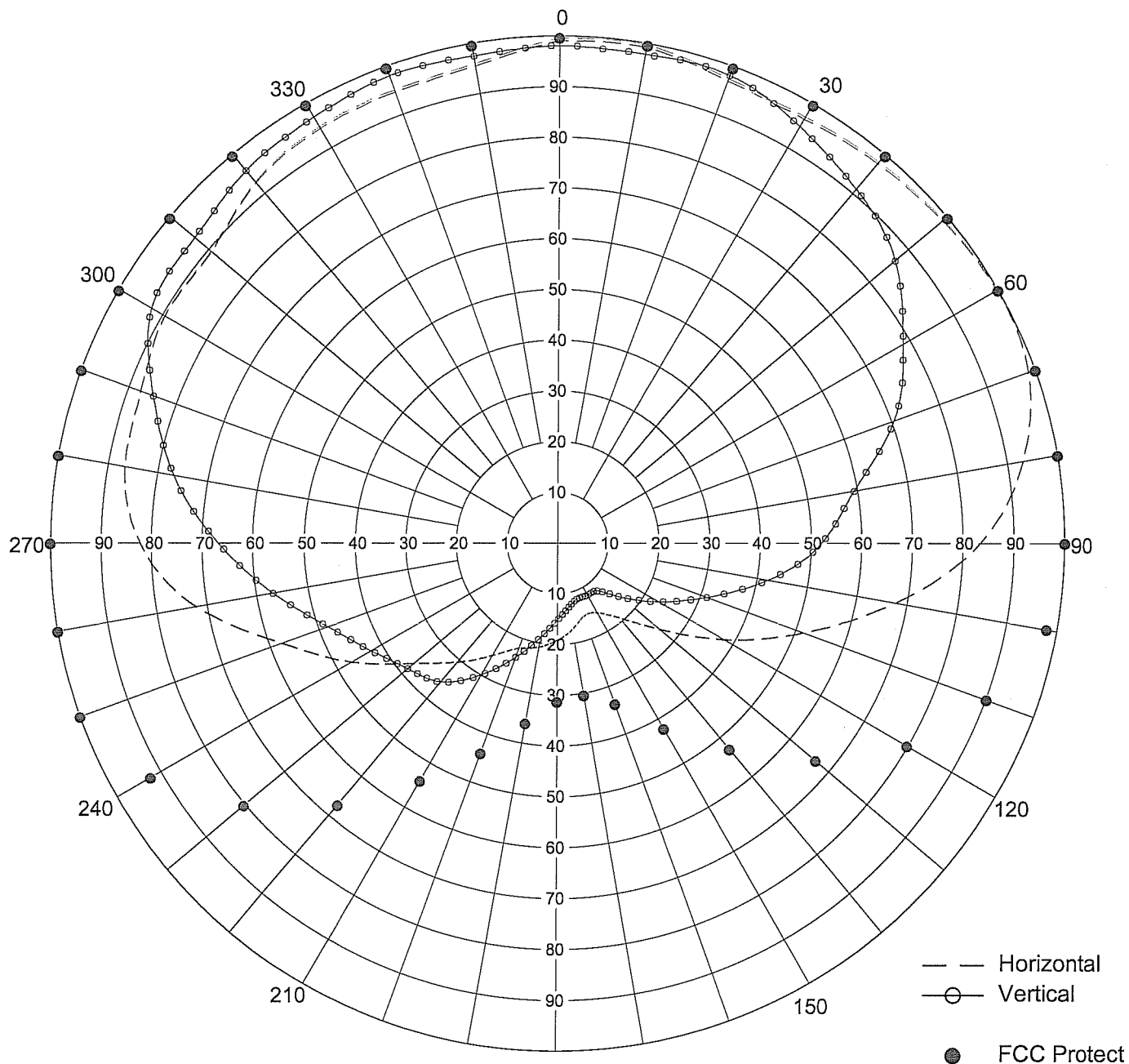


Proposal Number **81322** Revision  
Date **Mar 23, 2005**  
Call Letters **WXLK** Channel  
Location **ROANOKE, VA**  
Customer **MEL WHEEL**  
Antenna Type **DCRM5EFE80HD**

## AZIMUTH PATTERN

85.0Ccov-52.3 %Hrms-47.7%Vrms

Gain **1.87 (2.72) HPOL 2.18 (3.38) VPOL** Frequency **92.3 MHz**  
Calculated / Measured **Measured** Drawing # **4**



Remarks: 2 HORIZONTAL PARASITICS



Proposal Number **81322**  
 Date **2-May-05**  
 Call Letters **WXLK**  
 Location **ROANOKE, VA**  
 Customer **MEL WHEELER**  
 Antenna Type **DCRM5EFE80HD**  
 Frequency **92.30 MHz**  
 Drawing #: **4**

## TABULATION OF HORIZONTAL AZIMUTH PATTERN

Angle	Field	dBk	ERP kW
0	0.995	19.641	92.072
10	0.996	19.650	92.257
20	0.974	19.456	88.227
30	0.969	19.411	87.323
40	0.981	19.518	89.500
50	0.991	19.606	91.334
60	1.000	19.685	93.000
70	0.986	19.562	90.414
80	0.931	19.064	80.609
90	0.834	18.108	64.687
100	0.677	16.297	42.625
110	0.516	13.938	24.762
120	0.379	11.258	13.359
130	0.262	8.051	6.384
140	0.191	5.305	3.393
150	0.157	3.603	2.292
160	0.153	3.379	2.177
170	0.172	4.395	2.751
180	0.191	5.305	3.393
190	0.207	6.004	3.985
200	0.220	6.533	4.501
210	0.255	7.816	6.047
220	0.305	9.371	8.651
230	0.368	11.002	12.594
240	0.468	13.090	20.369
250	0.576	14.893	30.855
260	0.720	16.831	48.211
270	0.821	17.972	62.686
280	0.866	18.435	69.746
290	0.875	18.525	71.203
300	0.895	18.721	74.495
310	0.894	18.712	74.329
320	0.929	19.045	80.263
330	0.947	19.212	83.403
340	0.951	19.248	84.109
350	0.959	19.321	85.530

Proposal Number **81322**  
 Date **2-May-05**  
 Call Letters **WXLK**  
 Location **ROANOKE, VA**  
 Customer **MEL WHEELER**  
 Antenna Type **DCRM5EFE80HD**  
 Frequency **92.30 MHz**  
 Drawing #: **4**

## TABULATION OF VERTICAL AZIMUTH PATTERN

Angle	Field	dBk	ERP kW
0	0.981	19.278	84.688
10	0.978	19.252	84.171
20	0.981	19.278	84.688
30	0.948	18.981	79.086
40	0.911	18.635	73.033
50	0.866	18.195	65.996
60	0.785	17.342	54.228
70	0.705	16.409	43.738
80	0.593	14.906	30.945
90	0.521	13.782	23.887
100	0.422	11.951	15.671
110	0.313	9.356	8.621
120	0.231	6.717	4.696
130	0.166	3.847	2.425
140	0.123	1.243	1.331
150	0.118	0.882	1.225
160	0.116	0.734	1.184
170	0.129	1.657	1.464
180	0.152	3.082	2.033
190	0.189	4.974	3.143
200	0.240	7.049	5.069
210	0.300	8.987	7.920
220	0.357	10.498	11.216
230	0.385	11.154	13.044
240	0.425	12.013	15.895
250	0.482	13.106	20.445
260	0.568	14.532	28.391
270	0.668	15.940	39.268
280	0.767	17.141	51.769
290	0.848	18.013	63.281
300	0.926	18.777	75.458
310	0.936	18.870	77.096
320	0.958	19.072	80.763
330	0.969	19.171	82.629
340	0.981	19.278	84.688
350	0.975	19.225	83.655

Proposal Number	<b>81322</b>	Revision:
Date	<b>May 02, 2005</b>	
Call Letters	<b>WXLK</b>	
Location	<b>ROANOKE, VA</b>	
Customer	<b>MEL WHEELER</b>	
Antenna Type	<b>DCRM5EFE80HD</b>	

## COMPOSITE AZIMUTH PATTERN

Calculated / Measured

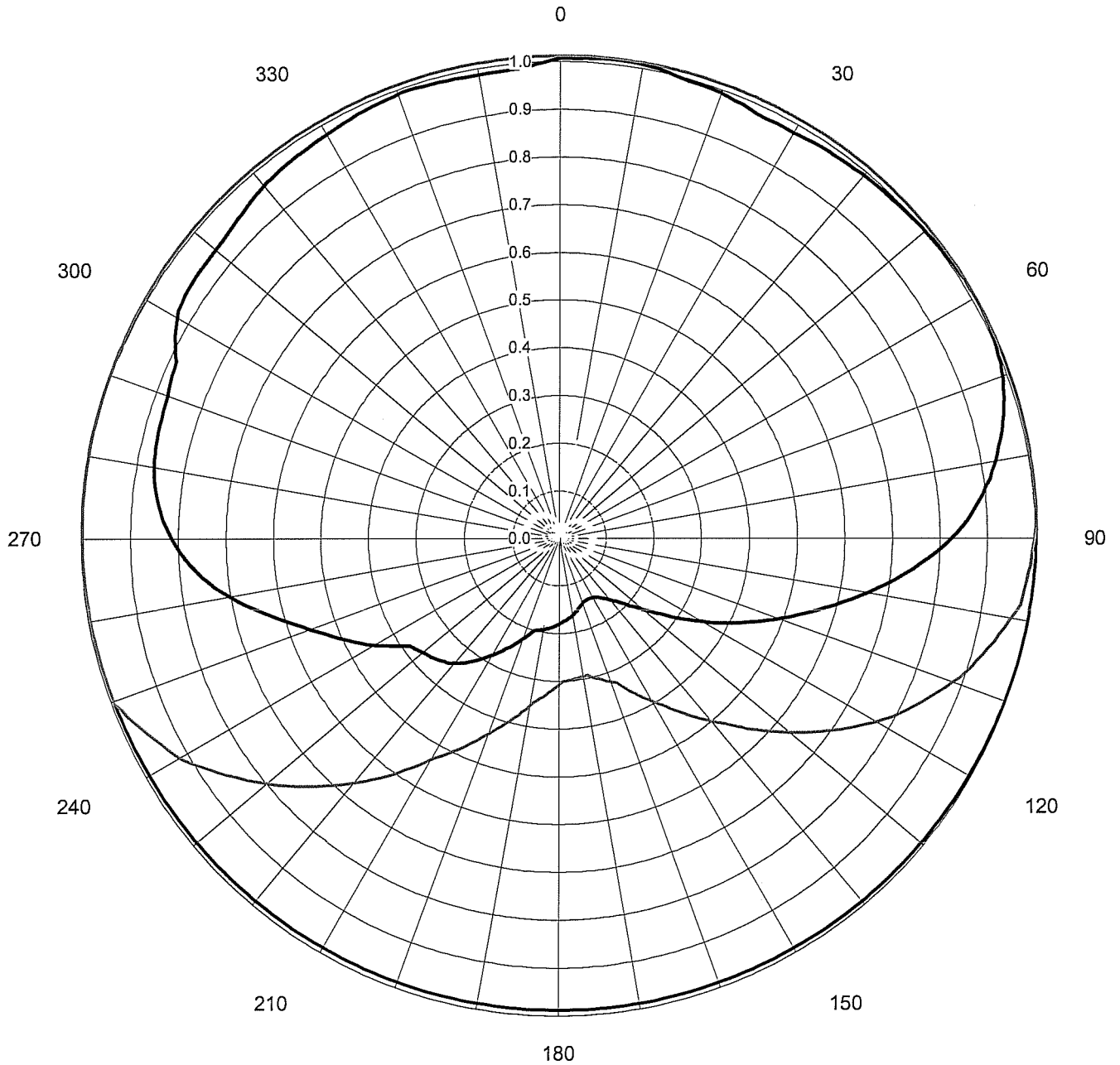
**Measured**

Frequency

**92.30 MHz**

Drawing #

**4**



Proposal Number	81322
Date	2-May-05
Call Letters	WXLK
Location	ROANOKE, VA
Customer	MEL WHEELER
Antenna Type	DCRM5EFE80HD
Frequency	92.30 MHz
Drawing #:	4

## TABULATION OF COMPOSITE AZIMUTH PATTERN

**WARNING, HPOL AND VPOL POWER DIFFERENT!**

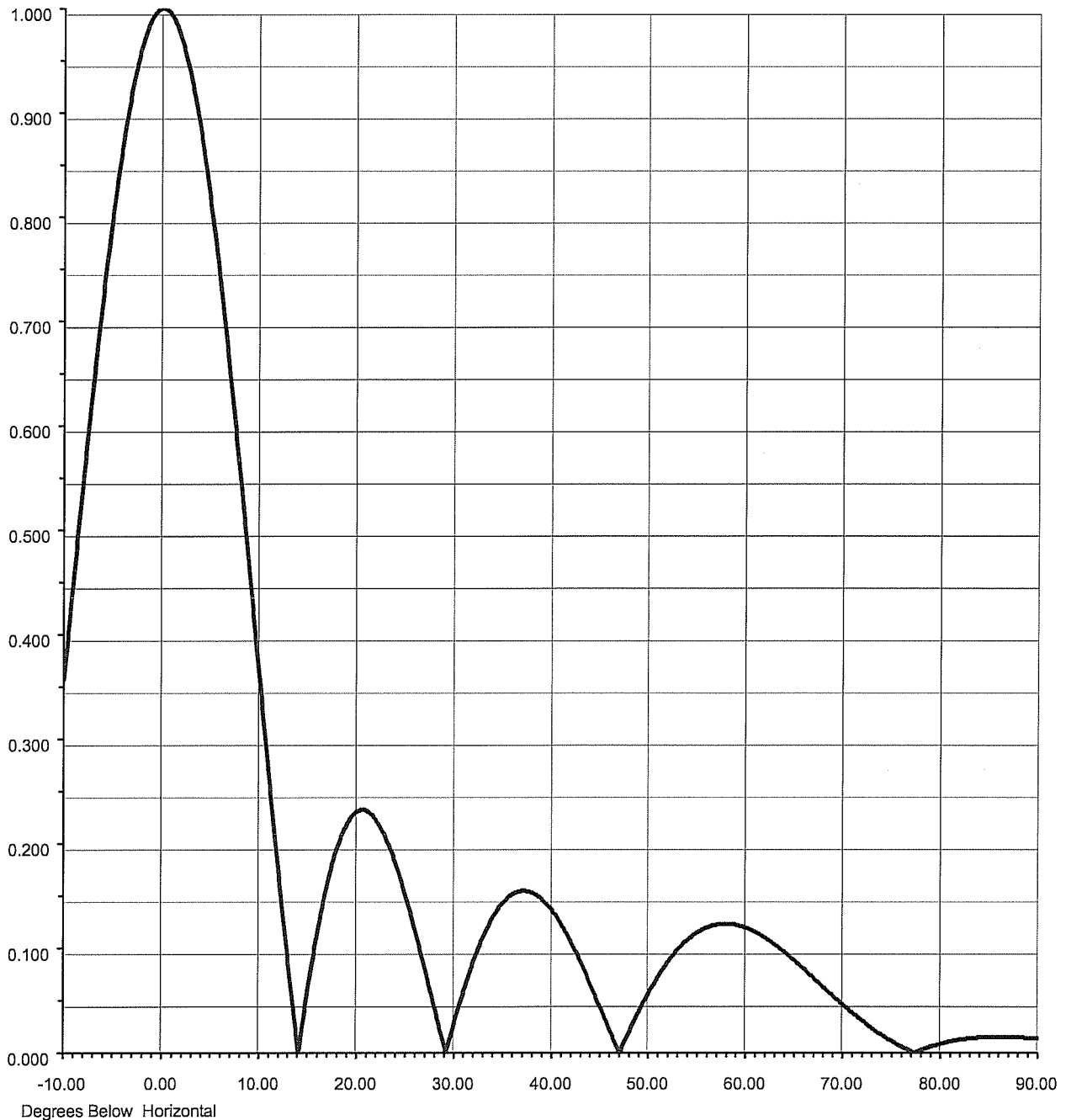
Angle	Field	dBk	Power kW	Input Power
0	0.995	19.641	92.072	93.000
10	0.996	19.650	92.257	93.000
20	0.981	19.278	84.688	88.000
30	0.969	19.411	87.323	93.000
40	0.981	19.518	89.500	93.000
50	0.991	19.606	91.334	93.000
60	1.000	19.685	93.000	93.000
70	0.986	19.562	90.414	93.000
80	0.931	19.064	80.609	93.000
90	0.834	18.108	64.687	93.000
100	0.677	16.297	42.625	93.000
110	0.516	13.938	24.762	93.000
120	0.379	11.258	13.359	93.000
130	0.262	8.051	6.384	93.000
140	0.191	5.305	3.393	93.000
150	0.157	3.603	2.292	93.000
160	0.153	3.379	2.177	93.000
170	0.172	4.395	2.751	93.000
180	0.191	5.305	3.393	93.000
190	0.207	6.004	3.985	93.000
200	0.240	7.049	5.069	88.000
210	0.300	8.987	7.920	88.000
220	0.357	10.498	11.216	88.000
230	0.385	11.154	13.044	88.000
240	0.468	13.090	20.369	93.000
250	0.576	14.893	30.855	93.000
260	0.720	16.831	48.211	93.000
270	0.821	17.972	62.686	93.000
280	0.866	18.435	69.746	93.000
290	0.875	18.525	71.203	93.000
300	0.926	18.777	75.458	88.000
310	0.936	18.870	77.096	88.000
320	0.958	19.072	80.763	88.000
330	0.969	19.171	82.629	88.000
340	0.981	19.278	84.688	88.000
350	0.975	19.225	83.655	88.000

Proposal Number	81322
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Call Letters	WXLK
Location	ROANOKE, VA
Customer	MEL WHEELER
Antenna Type	DCRM5EFE80HD
Drawing #	

## ELEVATION PATTERN

RMS Gain at Main Lobe    **2.49    ( 3.96 dB )**  
Per Polarization  
Calculated / Measured    **Calculated**

Beam Tilt    **0.00 deg**  
Frequency    **92.30 MHz**



Proposal Number	<b>81322</b>
Date	<b>May 02, 2005</b>
Call Letters	<b>WXLK</b>
Location	<b>ROANOKE, VA</b>
Customer	<b>MEL WHEELER</b>
Antenna Type	<b>DCRM5EFE80HD</b>
Frequency	<b>92.30 MHz</b>
Drawing #	<b>4</b>

## **CUSTOMER GAIN SUMMARY**

<b>Azimuth Pattern Gain of Horizontal Polarization</b>	<b>1.86</b>	<b>(2.70 dB)</b>
<b>Elevation Pattern Gain Per Polarization</b>	<b>2.49</b>	<b>(3.96 dB)</b>
<b>Peak Gain at Horizontal Polarization</b>	<b>4.63</b>	<b>(6.66 dB)</b>

