



PATTERN CERTIFICATION

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MSO NO: 3044666

DATE: May 24, 2010

PATTERN NO: 16

FM AZIMUTH PATTERN APPROVAL

The azimuth pattern of the horizontal polarization and vertical polarization as supplied by Dielectric in the document labeled “ Pattern 16 ”, is acknowledged as acceptable. We understand that Dielectric does not guarantee or predict signal strength in any particular location.

(Customer’s name)

By: _____
(Name typed or printed)

Title: _____

(Signature)



PATTERN CERTIFICATION

Method of Measurement

The azimuth pattern for "WLRH", Dielectric Document Sketch #16, was measured in the following manner.

A single 4.4 to 1 scale model "DCRM8CRD" 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 #17. 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

Michael Spugnardi is a Senior Electrical Engineer here at Dielectric. He received a BS in Electrical Engineering from the Worcester Polytechnic Institute in 1999. He has over 12 years experience in RF antenna engineering and has been employed by Dielectric Communications since 1997.

Signed By: _____

Date: _____



Proposal Number **C-04137**
Date **May 24, 2010**
Call Letters **WLRH**
Location **Huntsville, AL**
Customer **Harris**
Antenna Type **DCRM8CRD**

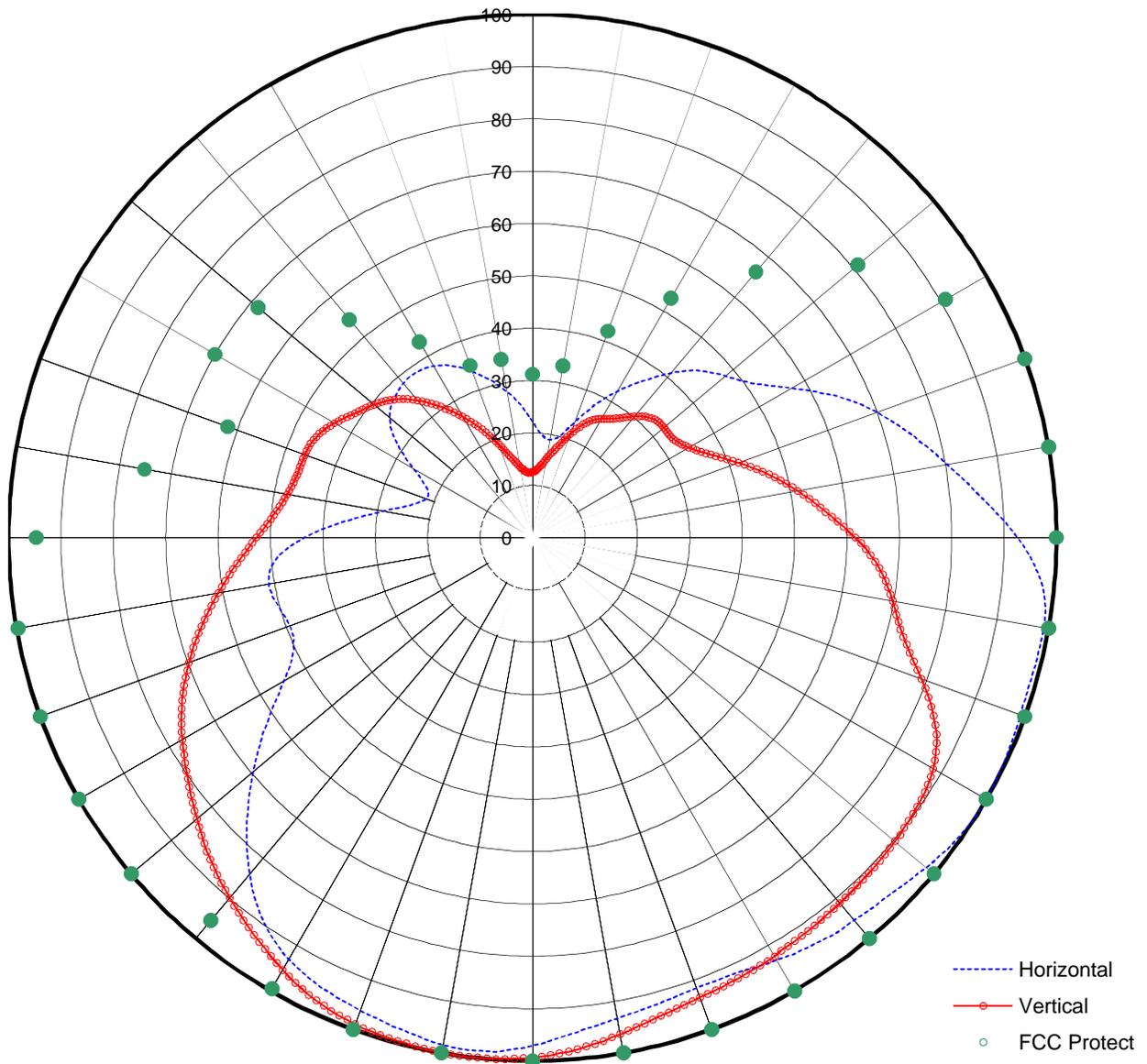
AZIMUTH PATTERN

85.12% Ccov - 51.11% Hrms - 48.89% Vrms

Gain **2.10 (3.22 dB) HPOL**
Gain **2.30 (3.62 dB) VPOL**
Calculated / Measured **Measured**

Frequency **89.30 MHz**
Drawing # **16**

90





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 Frequency **89.30 MHz**
 Drawing #: **16**

TABULATION OF HORIZONTAL AZIMUTH PATTERN

Angle	Field	dBk	ERP kW
0	0.221	6.888	4.884
10	0.190	5.575	3.610
20	0.234	7.384	5.476
30	0.322	10.157	10.368
40	0.410	12.256	16.810
50	0.480	13.625	23.040
60	0.571	15.133	32.604
70	0.700	16.902	49.000
80	0.804	18.105	64.642
90	0.926	19.332	85.748
100	0.991	19.921	98.208
110	0.991	19.921	98.208
120	1.000	20.000	100.000
130	0.981	19.833	96.236
140	0.955	19.600	91.203
150	0.932	19.388	86.862
160	0.916	19.238	83.906
170	0.933	19.398	87.049
180	0.971	19.744	94.284
190	0.984	19.860	96.826
200	0.962	19.664	92.544
210	0.930	19.370	86.490
220	0.840	18.486	70.560
230	0.696	16.852	48.442
240	0.548	14.776	30.030
250	0.493	13.857	24.305
260	0.511	14.168	26.112
270	0.435	12.770	18.923
280	0.290	9.248	8.410
290	0.217	6.729	4.709
300	0.262	8.366	6.864
310	0.356	11.029	12.674
320	0.384	11.687	14.746
330	0.379	11.573	14.364
340	0.338	10.578	11.424
350	0.283	9.036	8.009



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TABULATION OF VERTICAL AZIMUTH PATTERN

Angle	Field	dBk	ERP kW
0	0.125	1.938	1.563
10	0.153	3.694	2.341
20	0.210	6.444	4.410
30	0.262	8.366	6.864
40	0.302	9.600	9.120
50	0.327	10.291	10.693
60	0.344	10.731	11.834
70	0.418	12.424	17.472
80	0.514	14.219	26.420
90	0.616	15.792	37.946
100	0.698	16.877	48.720
110	0.790	17.953	62.410
120	0.883	18.919	77.969
130	0.903	19.114	81.541
140	0.912	19.200	83.174
150	0.924	19.313	85.378
160	0.935	19.416	87.423
170	0.964	19.682	92.930
180	0.994	19.948	98.804
190	0.999	19.991	99.800
200	0.990	19.913	98.010
210	0.954	19.591	91.012
220	0.899	19.075	80.820
230	0.836	18.444	69.890
240	0.772	17.752	59.598
250	0.698	16.877	48.720
260	0.609	15.692	37.088
270	0.527	14.436	27.773
280	0.475	13.534	22.563
290	0.462	13.293	21.344
300	0.437	12.810	19.097
310	0.395	11.932	15.603
320	0.342	10.681	11.696
330	0.267	8.530	7.129
340	0.190	5.575	3.610
350	0.137	2.734	1.877



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COMPOSITE AZIMUTH PATTERN

Calculated / Measured

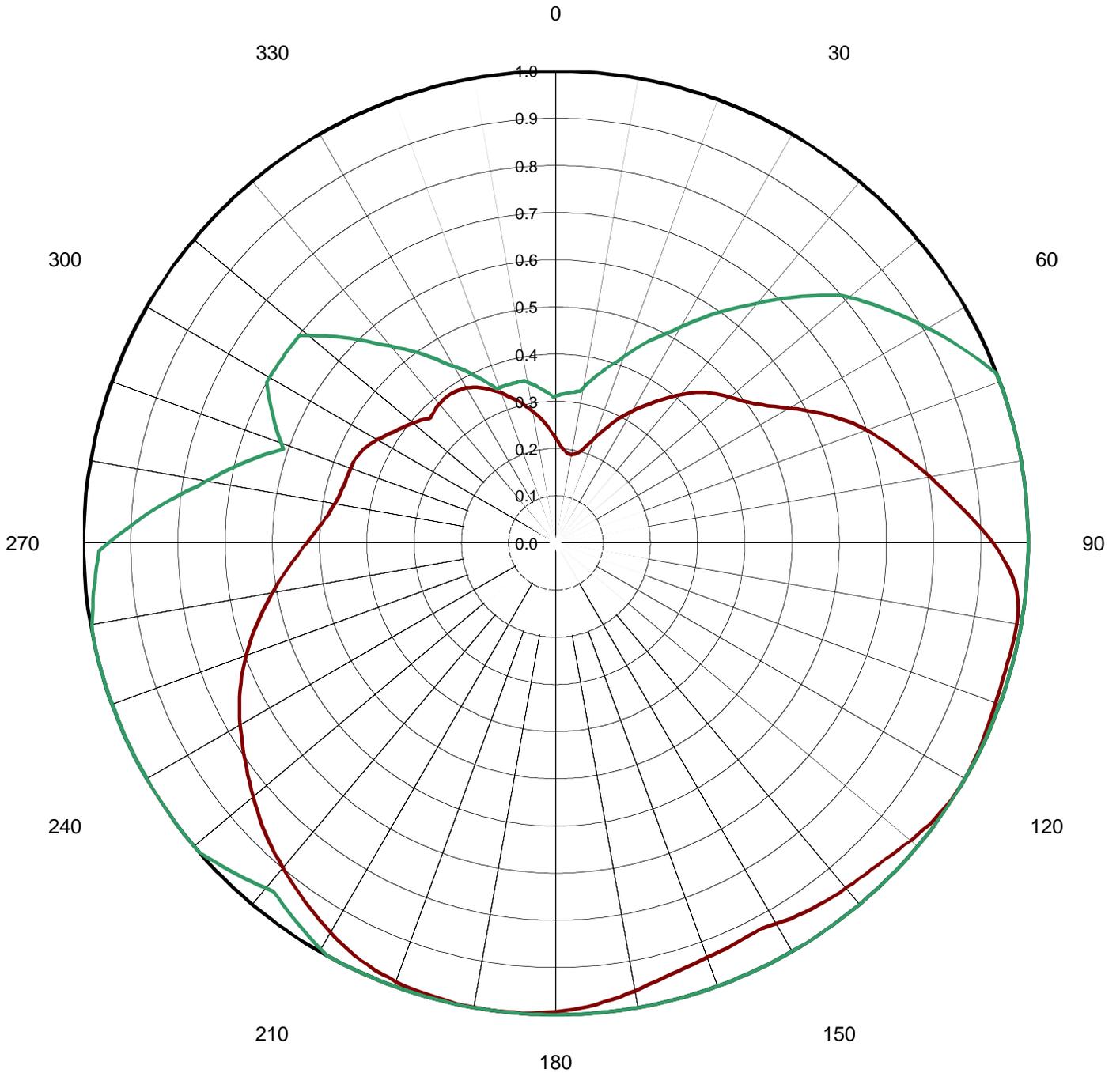
Measured

Frequency

89.30 MHz

Drawing #

16





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TABULATION OF COMPOSITE AZIMUTH PATTERN

Angle	Field	dBk	Power kW	Input Power
0	0.221	6.888	4.884	100.000
10	0.190	5.575	3.610	100.000
20	0.234	7.384	5.476	100.000
30	0.322	10.157	10.368	100.000
40	0.410	12.256	16.810	100.000
50	0.480	13.625	23.040	100.000
60	0.571	15.133	32.604	100.000
70	0.700	16.902	49.000	100.000
80	0.804	18.105	64.642	100.000
90	0.926	19.332	85.748	100.000
100	0.991	19.921	98.208	100.000
110	0.991	19.921	98.208	100.000
120	1.000	20.000	100.000	100.000
130	0.981	19.833	96.236	100.000
140	0.955	19.600	91.203	100.000
150	0.932	19.388	86.862	100.000
160	0.935	19.416	87.423	100.000
170	0.964	19.682	92.930	100.000
180	0.994	19.948	98.804	100.000
190	0.999	19.991	99.800	100.000
200	0.990	19.913	98.010	100.000
210	0.954	19.591	91.012	100.000
220	0.899	19.075	80.820	100.000
230	0.836	18.444	69.890	100.000
240	0.772	17.752	59.598	100.000
250	0.698	16.877	48.720	100.000
260	0.609	15.692	37.088	100.000
270	0.527	14.436	27.773	100.000
280	0.475	13.534	22.563	100.000
290	0.462	13.293	21.344	100.000
300	0.437	12.810	19.097	100.000
310	0.395	11.932	15.603	100.000
320	0.384	11.687	14.746	100.000
330	0.379	11.573	14.364	100.000
340	0.338	10.578	11.424	100.000
350	0.283	9.036	8.009	100.000



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CUSTOMER GAIN SUMMARY

Azimuth Pattern Gain of Horizontal Polarization	2.10	(3.22 dB)
Elevation Pattern Gain Per Polarization	4.30	(6.33 dB)
Peak Gain at Horizontal Polarization	9.03	(9.56 dB)

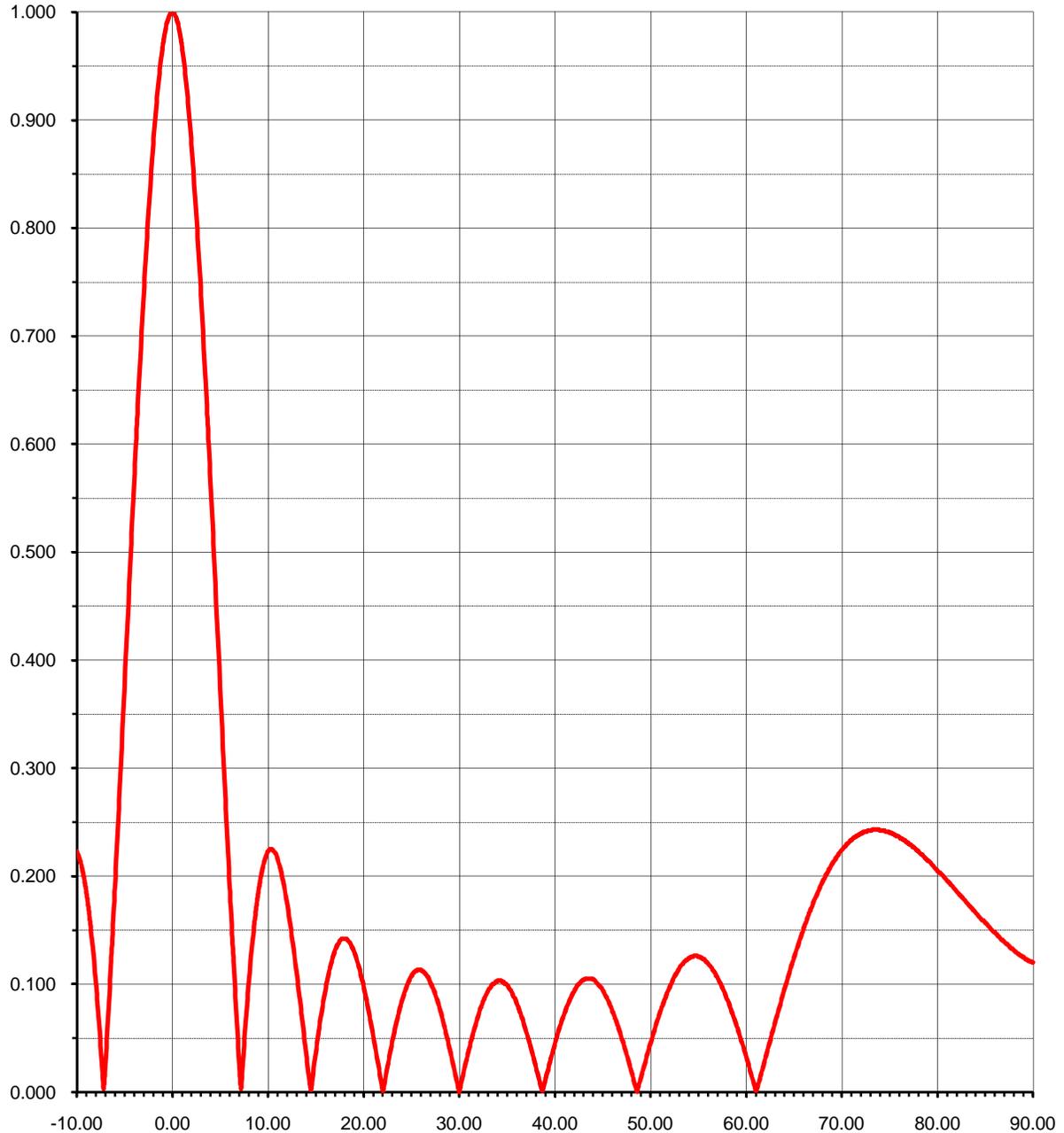


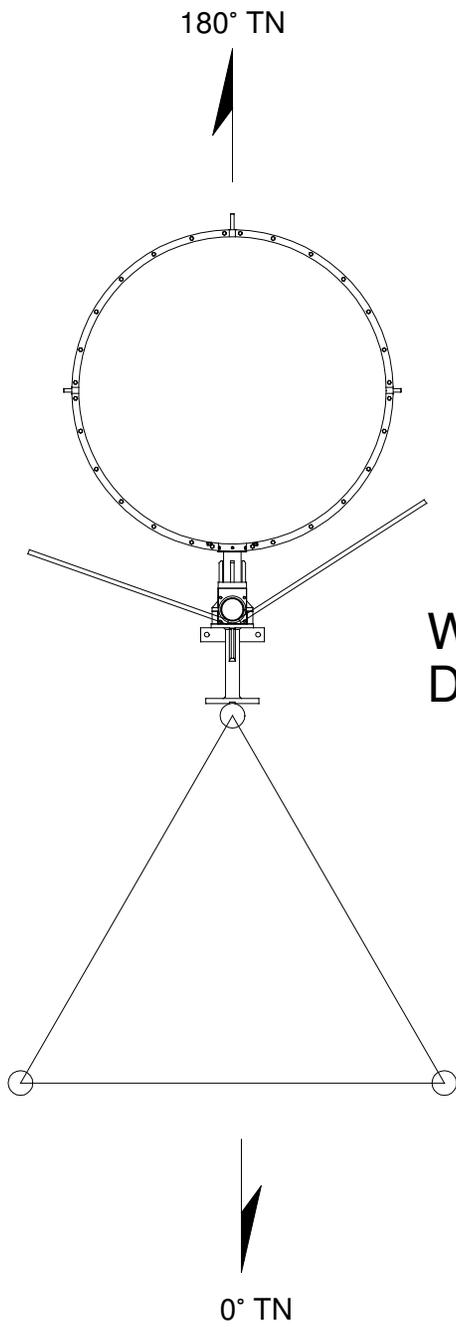
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ELEVATION PATTERN

RMS Gain at Main Lobe **4.30 (6.33 dB)**
Per Polarization
Calculated / Measured **Calculated**

Beam Tilt **0.00 deg**
Frequency **89.30 MHz**





WLRH-FM 89.3 MHz
DCR-M8CRD