Dielectric

A Unit of SPX Corporation

PATTERN CERTIFICATION

Method of Measurement

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

A single 4.4 to1 scale model "DCRM" 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 #16 final. 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 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 to 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

Paul S. Jones Jr. is a Senior Electrical Engineer here at Dielectric. He received a BS in Electrical Engineering from the University of New Hampshire in 1990. He has over 12 years of experience in RF antenna engineering and has been employed by Dielectric Communications since 1995.

Signed By: *Paul S Jones Jr*

Date: 3/11/03

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EXHIBIT #B
APPL FOR STATION LICENSE
CUMULUS LICENSING LLC
WTWR-FM RADIO STATION
CH 252A - 3.4 KW (DA)
LUNA PIER, MICHIGAN
February 2007
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![Dielectric logo]

Proposal Number	**73783**
Date	**Mar 12, 2003**
Call Letters	**WTWR**
Location	**Luna Pier, Mi**
Customer	**Cumulus**
Antenna Type	**DCRM2E5D**

AZIMUTH PATTERN
50.0%Hrms 50.0%Vrms

Gain	**H 2.25(3.52db) V 2.05(3.12db)**	Frequency	**98.3**
Calculated / Measured	**Measured**	Drawing #	**16-final**

Horizontal ● (blue)
Vertical ● (red)

TABULATION OF HORIZONTAL AZIMUTH PATTERN

Angle	Field
0	0.980
10	0.975
20	0.932
30	0.845
40	0.744
50	0.637
60	0.553
70	0.495
80	0.476
90	0.498
100	0.551
110	0.611
120	0.668
130	0.728
140	0.766
150	0.768
160	0.740
170	0.671
180	0.562
190	0.437
200	0.338
210	0.287
220	0.273
230	0.260
240	0.261
250	0.287
260	0.327
270	0.374
280	0.450
290	0.553
300	0.691
310	0.827
320	0.936
330	0.993
340	0.995
350	0.974

TABULATION OF VERTICAL AZIMUTH PATTERN

Angle	Field
0	0.763
10	0.784
20	0.791
30	0.788
40	0.780
50	0.777
60	0.778
70	0.779
80	0.772
90	0.776
100	0.797
110	0.846
120	0.897
130	0.944
140	0.953
150	0.920
160	0.841
170	0.729
180	0.604
190	0.478
200	0.371
210	0.274
220	0.199
230	0.162
240	0.146
250	0.131
260	0.141
270	0.205
280	0.309
290	0.423
300	0.526
310	0.599
320	0.668
330	0.708
340	0.722
350	0.727

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MEASURED ELEVATION PATTERN

RMS Gain at Main Lobe **0.68** **-(1.67 dB)** Beam Tilt **0.00 deg**
PER POLARIZATION Frequency **98.30 MHz**
Plane **Typical**

Degrees Below Horizontal

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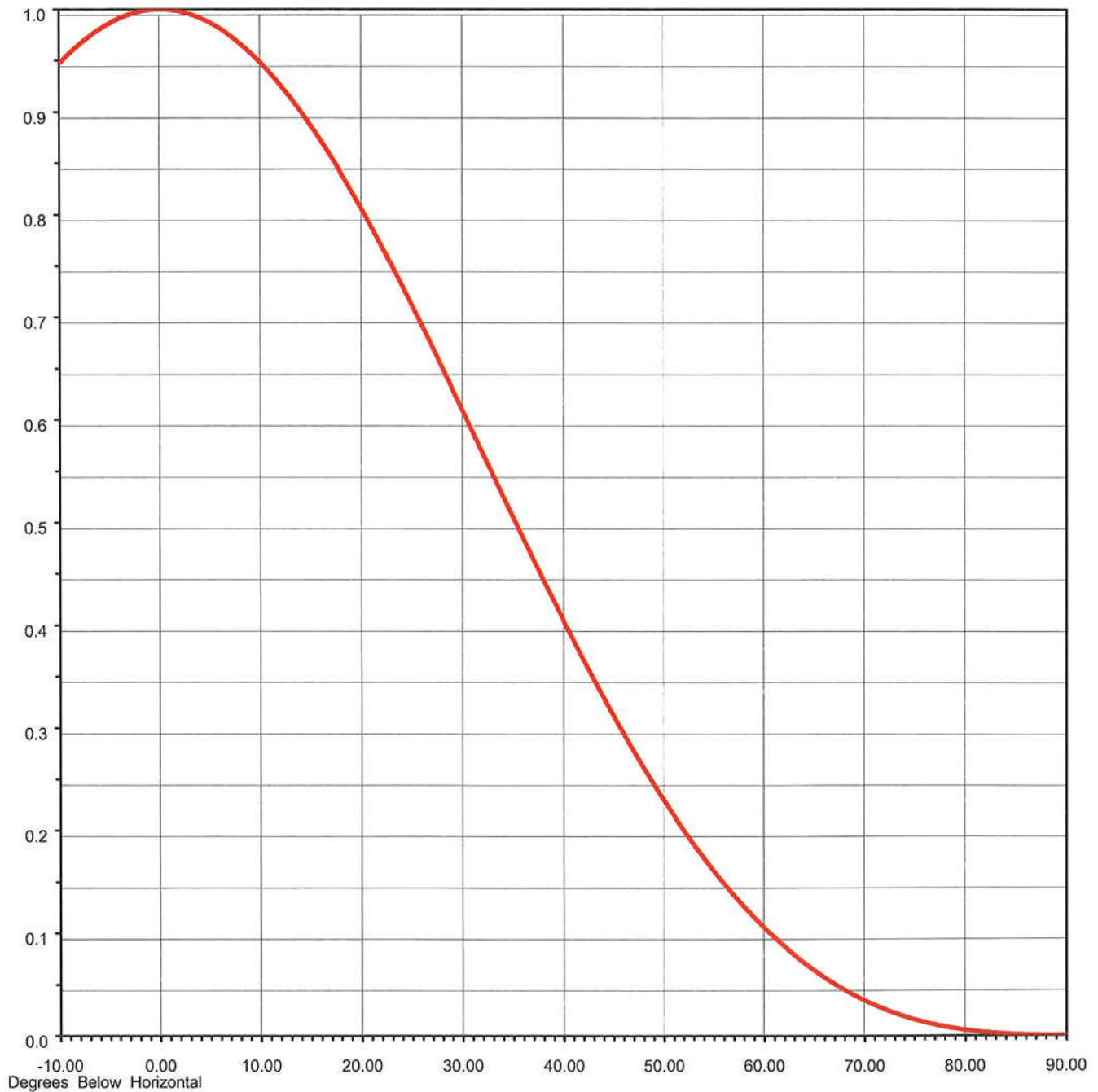
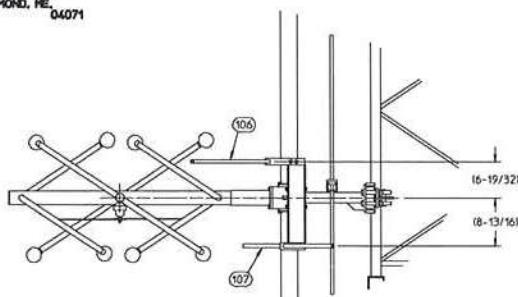|	
Proposal Number	**73783**
Date	**Mar 13, 2003**
Call Letters	**WTWR**
Location	**Luna Pier, Mi**
Customer	**Cumulus**
Antenna Type	**DCR M2E5D**
Frequency	**98.30 MHz**
Drawing #	**16 final**

CUSTOMER GAIN SUMMARY

Azimuth Pattern Gain of Horizontal Polarization	2.24
Elevation Pattern Gain Per Polarization	0.68
Peak Gain at Horizontal Polarization	1.52

DETAIL C
4X SCALE

90° T.N.
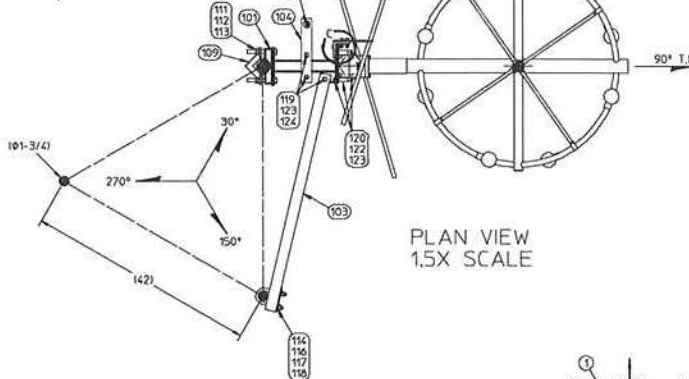
PLAN VIEW
1.5X SCALE

30°
270°
150°
(Ø1-3/4)
(42)
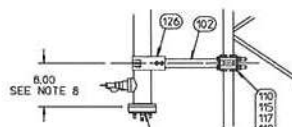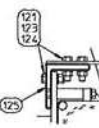
NOTES:

1- TO ACHIEVE ANY GIVEN PATTERN STUDY
PERFORMED BY DIELECTRIC, THE PROVIDED
ANTENNA MUST BE INSTALLED AND ORIENTED
AS DEPICTED IN THIS DRAWING.
IF ANY SUCH PATTERN WAS NOT PROVIDED,
THE ANTENNA ORIENTATION AND POSITION IS
AT THE DISCRETION OF THE BUYER TO WHICH
THE ANTENNA WAS SOLD.
IF ANY QUESTIONS ARISE DURING THE
INSTALLATION PROCESS, CONTACT DIELECTRIC
COMMUNICATIONS AT 800-341-9678, TO ASSIST
IN THIS PROCESS, BE PREPARED TO PROVIDE
THE PART NUMBER SHOWN BELOW.

2- COMPONENTS ARE MATCH MARKED FOR EASE
IN ASSEMBLY.

3- ITEM NUMBERS DEPICTED ON THIS DRAWING
CORRESPOND TO ITEM NUMBERS LISTED ON
ENCLOSED BILL OF MATERIAL.

4- APPLY THIN LAYER OF DC4 DOW CORNING
COMPOUND TO ALL "O"-RING SEALS PRIOR
TO ASSEMBLY.

5- THE TOP BAY MUST NOT BE LOCATED ANY
CLOSER THAN 5 ft. BELOW THE TOWER TOP.

6- BAY TAP POINT DIRECTION INDICATED BY
ARROWS @ BAY IN ELEVATION VIEW.

7- MATCHING TRANSFORMER ITEM 6) IS SHIPPED
WITH ALL PROBES FULLY INSERTED.
AT INSTALLATION, BE CERTAIN TO LOOSEN
LOCKNUTS AND PULL ALL PROBES TO FULL
OUTWARD POSITION.
ALL PROBES MUST BE IN FULL OUTWARD
POSITION BEFORE POWERING UP ANTENNA.
REFER TO INSTRUCTION MANUAL FOR TUNING
INSTRUCTIONS.

8- SUGGESTED LOCATION FOR TERMINATION MOUNT.
LOCATION MAY VARY PER TOWER DESIGN.

9- FOR HEATED ANTENNAS ONLY: HEATER HARNESS
TO BE DRESSED & SECURED TO TOWER PER
INSTALLERS DISCRETION.
LOOSE OR DANGLING WIRE IN RF FIELD WILL SHORT
& RESULT IN ANTENNA FAILURE.

10- REFER TO DRAWING A88212 FOR ALL HARDWARE
TORQUE SPECIFICATIONS.

11- IT IS IMPORTANT TO MAINTAIN DOCUMENT FOR
HISTORICAL PURPOSES.
THE MOST CRITICAL PORTION OF INFORMATION TO
BE MAINTAINED IS THE PART NUMBER AS SPECIFIED.

12- AFTER ANTENNA HAS BEEN INSTALLED & TUNED
ON THE TOWER IT IS REQUESTED THAT A COPY
OF THE TEST DATA BE FORWARDED TO:
DIELECTRIC COMMUNICATIONS
C/O FM ENGINEERING MANAGER
22 TOWER RD.
RAYMOND, ME.
04071

BAY 2

BAY 1

(60)
30
(125)

445' + 3' RAD CEN
ABV GRND LVL

A

B

DETAIL A
1.5X SCALE

(6-19/32)
(8-13/16)

8.00
SEE NOTE 8

DETAIL B
1.5X SCALE

REVISIONS
ZONE REV DESCRIPTION DATE APPROVED
CAD MAINTAINED CHANGES SHALL BE INCORPORATED BY THE DESIGN ACTIVITY