



PATTERN CERTIFICATION

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Narrative Pattern Certification

FM Azimuth Pattern Approval

Azimuth Pattern of Horizontal and Vertically Polarized Planes

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EXHIBIT #C
MODIFY BLH-20021101ABP
CUMULUS LICENSING LLC
WSEA RADIO STATION
CH 262C3 - 12.0 KW (DA)
ATLANTIC BEACH, SC
September 2011



A Unit of SPX Corporation

PATTERN CERTIFICATION

Method of Measurement

The azimuth pattern for "WSEA", Dielectric Document Sketch # 58, was measured in the following manner.

A single 4.4 to 1 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 # 58. 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 8711A 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 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

John Schadler is the Director of Antenna Design and Development here at Dielectric. He has been working for Dielectric since 1986. He received a BS in Electrical Engineering from Penn State University, and a Masters in Electrical Engineering from Drexel University. He has multiple patents in the areas of circular polarization, centerfed antennas, broadband and multi-channel antennas, common aperture antennas, and DTV antennas.

Signed by: _____

Date: _____

Post Office Box 949, 22 Tower Road, Raymond, Maine 04071

Voice: 207.655.4555 1.800.341.9678 Fax: 207.655.7120 Email: drsales@dielectric.com



Proposal Number 71217
Date May 14, 2002
Call Letters WSEA
Location Atlantic Beach, SC
Customer Gary Kline
Antenna Type DCRM4C5

AZIMUTH PATTERN

80.4% Ccov-51.8% Hrms- 48.2% Vrms

Calculated / Measured

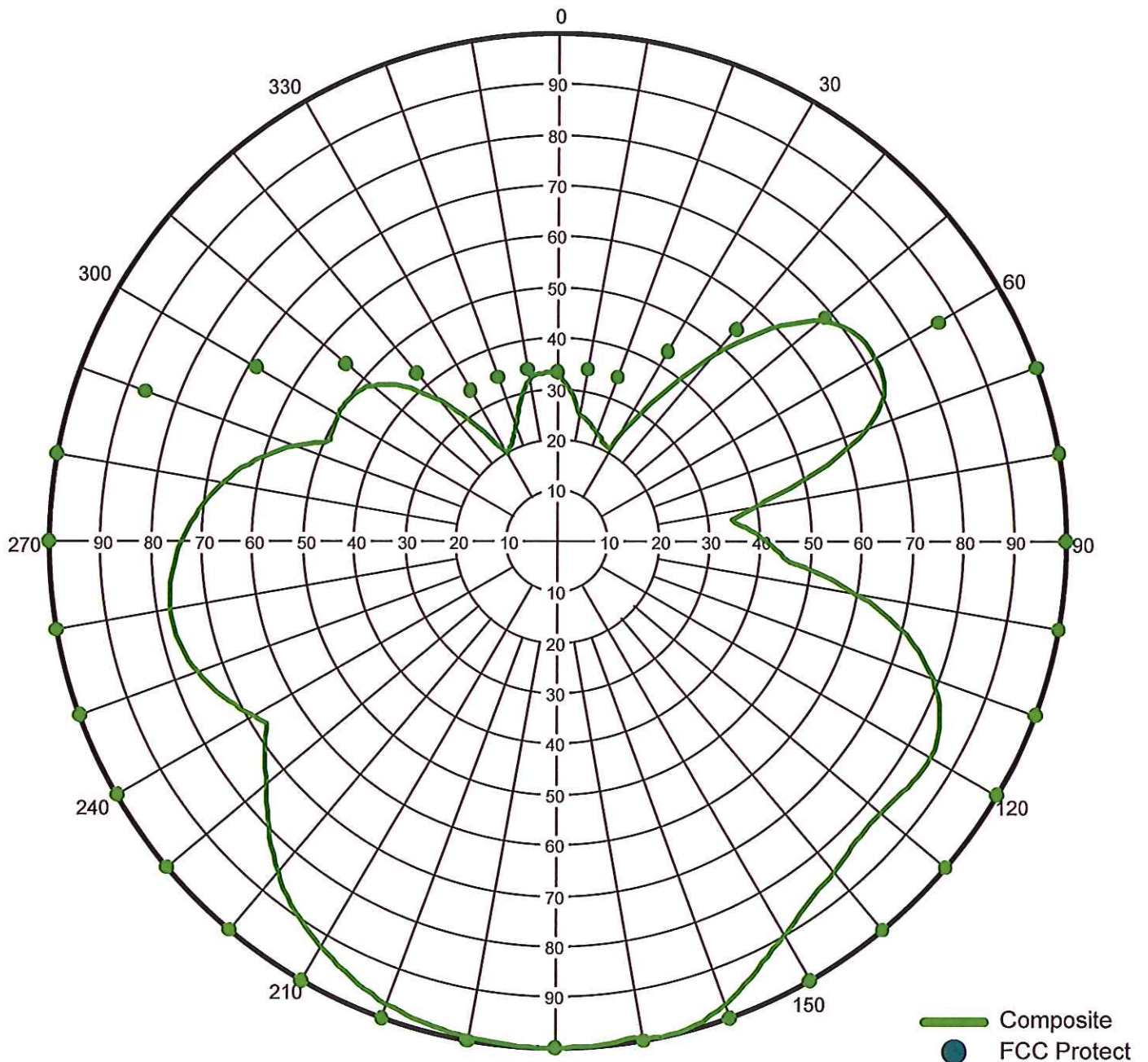
Measured

Frequency

441.32 MHz

Drawing #

58.





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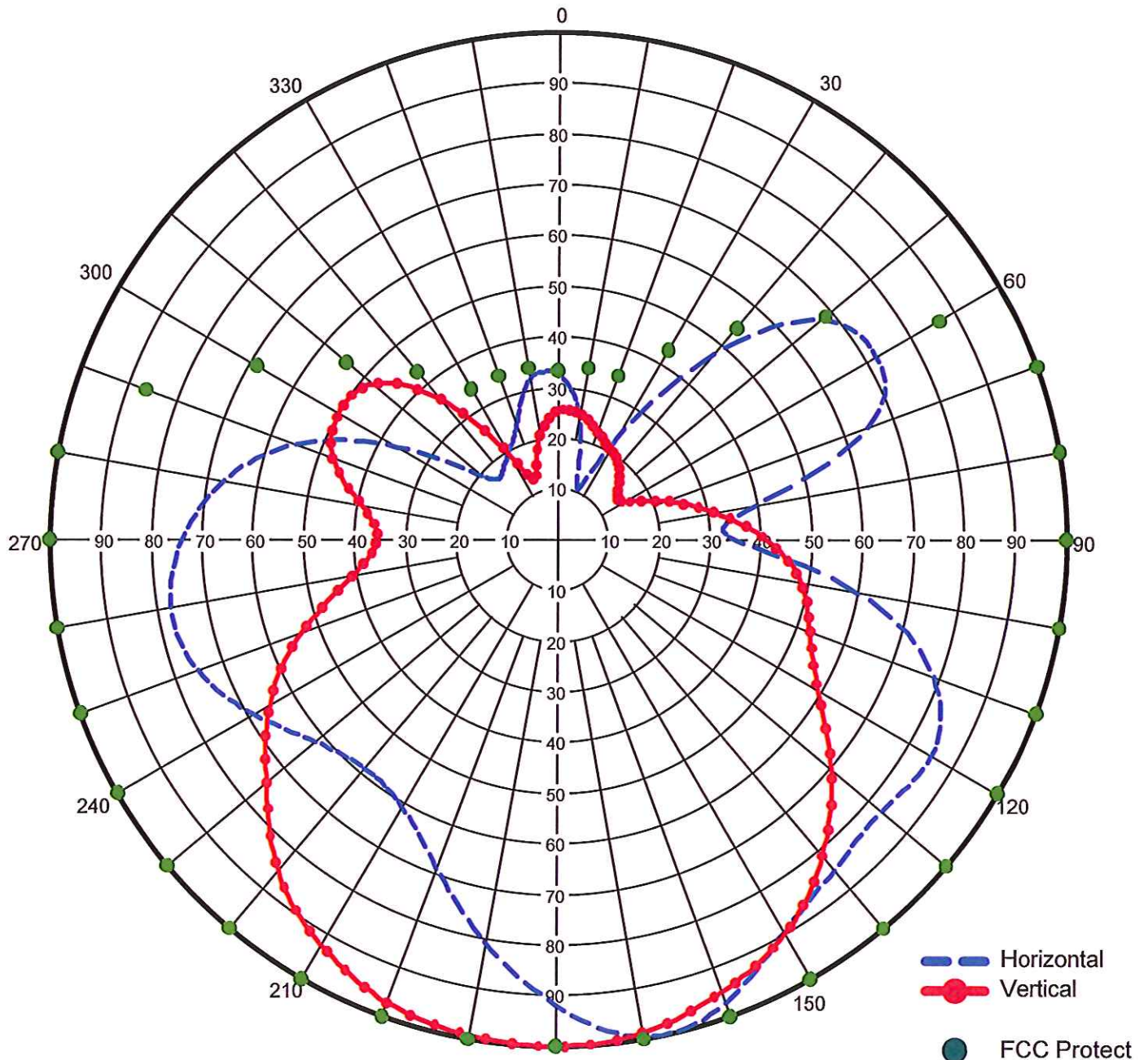
AZIMUTH PATTERN

Calculated / Measured

Measured

Frequency
Drawing #

441.32 MHz
58.





Proposal Number **71217**
 Date **14-May-02**
 Call Letters **WSEA**
 Location **Atlantic Beach, SC**
 Customer **Gary Kline**
 Antenna Type **DCRM4C5**
 Frequency **100.30 MHz**
 Drawing #: **58**

TABULATION OF HORIZONTAL AZIMUTH PATTERN

Angle	Field	dBk	Power kW
0	0.334	1.267	1.339
10	0.231	-1.936	0.640
20	0.105	-8.784	0.132
30	0.254	-1.112	0.774
40	0.502	4.806	3.024
50	0.686	7.518	5.647
60	0.722	7.963	6.255
70	0.627	6.737	4.718
80	0.375	2.272	1.688
90	0.366	2.061	1.607
100	0.626	6.723	4.703
110	0.799	8.843	7.661
120	0.851	9.390	8.690
130	0.833	9.205	8.327
140	0.853	9.411	8.731
150	0.902	9.896	9.763
160	0.980	10.616	11.525
170	0.992	10.722	11.809
180	0.908	9.954	9.894
190	0.795	8.799	7.584
200	0.679	7.429	5.532
210	0.604	6.413	4.378
220	0.589	6.194	4.163
230	0.626	6.723	4.703
240	0.696	7.644	5.813
250	0.757	8.374	6.877
260	0.771	8.533	7.133
270	0.734	8.106	6.465
280	0.658	7.156	5.196
290	0.533	5.326	3.409
300	0.345	1.548	1.428
310	0.187	-3.771	0.420
320	0.174	-4.397	0.363
330	0.200	-3.188	0.480
340	0.249	-1.284	0.744
350	0.326	1.056	1.275



Proposal Number 71217
Date 14-May-02
Call Letters WSEA
Location Atlantic Beach, SC
Customer Gary Kline
Antenna Type DCRM4C5
Frequency 100.30 MHz
Drawing #: 58

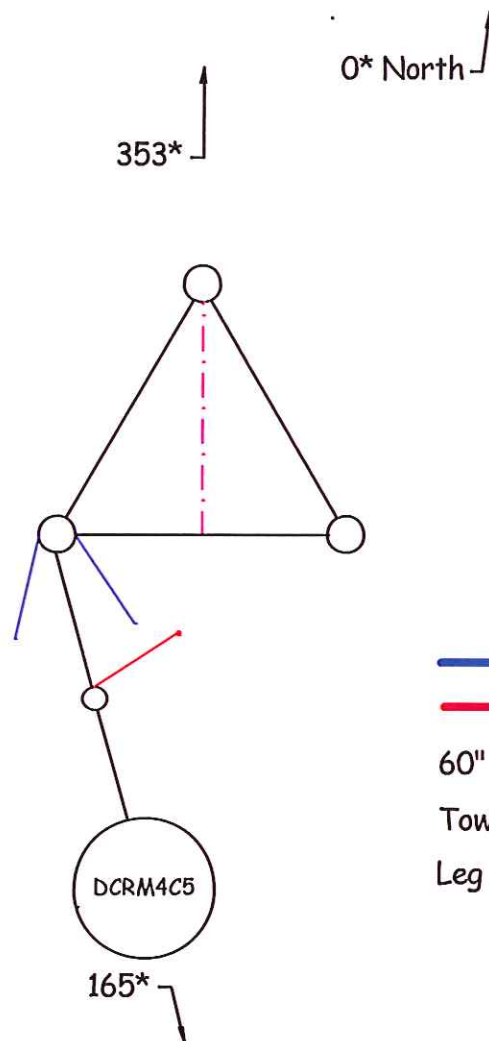
TABULATION OF VERTICAL AZIMUTH PATTERN

Angle	Field	dBk	Power kW
0	0.258	-0.976	0.799
10	0.252	-1.180	0.762
20	0.224	-2.203	0.602
30	0.205	-2.973	0.504
40	0.186	-3.818	0.415
50	0.152	-5.571	0.277
60	0.154	-5.458	0.285
70	0.233	-1.861	0.651
80	0.321	0.922	1.236
90	0.421	3.277	2.127
100	0.492	4.631	2.905
110	0.533	5.326	3.409
120	0.602	6.384	4.349
130	0.716	7.890	6.152
140	0.823	9.100	8.128
150	0.905	9.925	9.828
160	0.955	10.392	10.944
170	0.991	10.713	11.785
180	1.000	10.792	12.000
190	0.992	10.722	11.809
200	0.968	10.509	11.244
210	0.918	10.049	10.113
220	0.841	9.288	8.487
230	0.736	8.129	6.500
240	0.643	6.956	4.961
250	0.521	5.129	3.257
260	0.400	2.833	1.920
270	0.355	1.796	1.512
280	0.399	2.811	1.910
290	0.477	4.362	2.730
300	0.499	4.754	2.988
310	0.469	4.215	2.640
320	0.345	1.548	1.428
330	0.183	-3.959	0.402
340	0.134	-6.666	0.215
350	0.217	-2.479	0.565

Dielectric

WSEA - 100.3

Document Sketch #58



— Horizontal Parasitic
— Vertical Parasitic

60" Tower Face -

Tower legs - 3.5" dia.

Leg Azimuths @ 113°, 233°, 353°



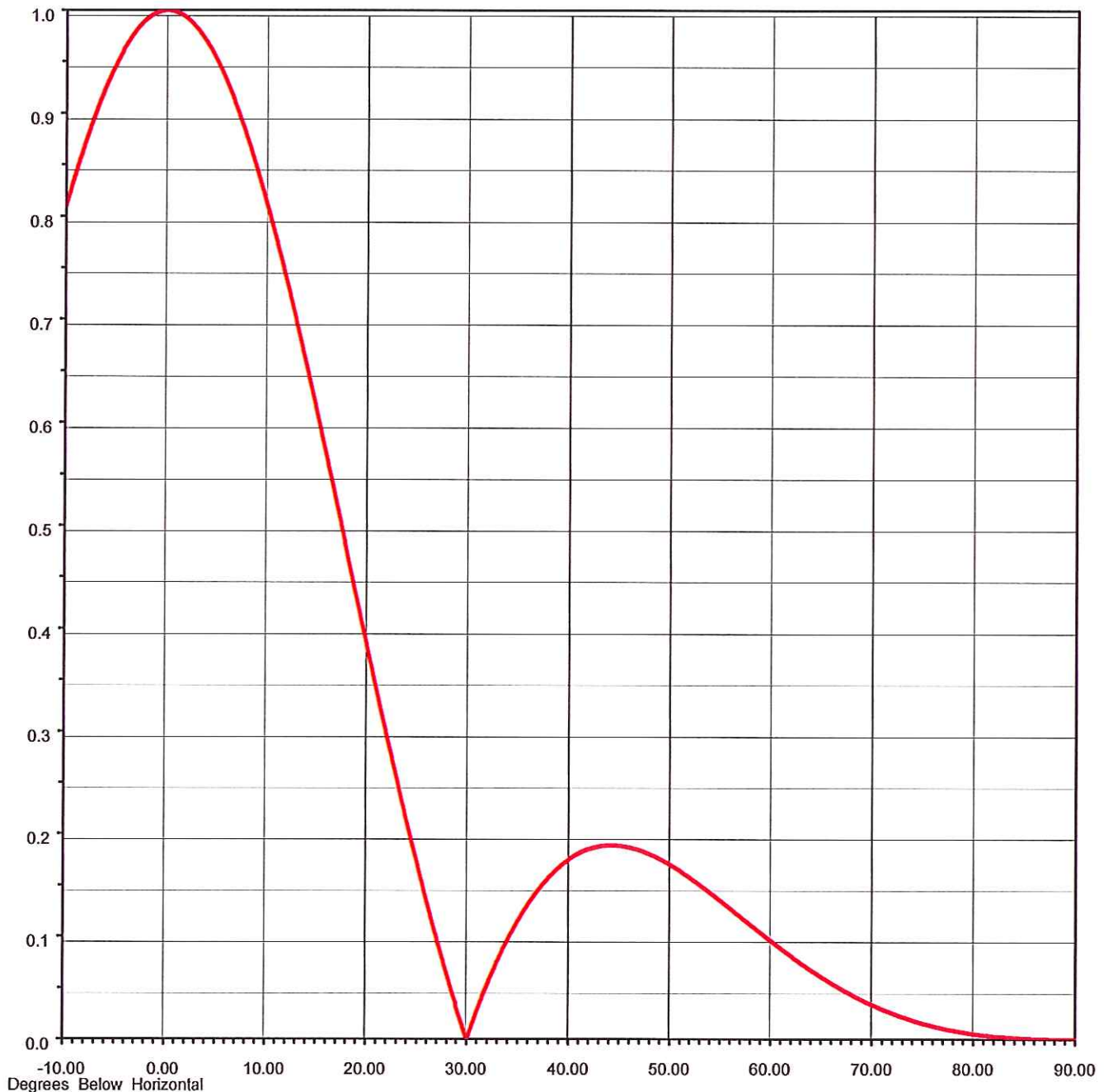
Date
Call Letters
Location
Customer
Antenna Type

14-May-02
WSEA
Atlantic Beach, SC
Gary Kline
DCRM4C5

MEASURED ELEVATION PATTERN

RMS Gain at Main Lobe **1.30 (1.14 dB)**
Per Polarization

Beam Tilt **0.00 deg**
Frequency **100.30 MHz**
Plane **Typical**

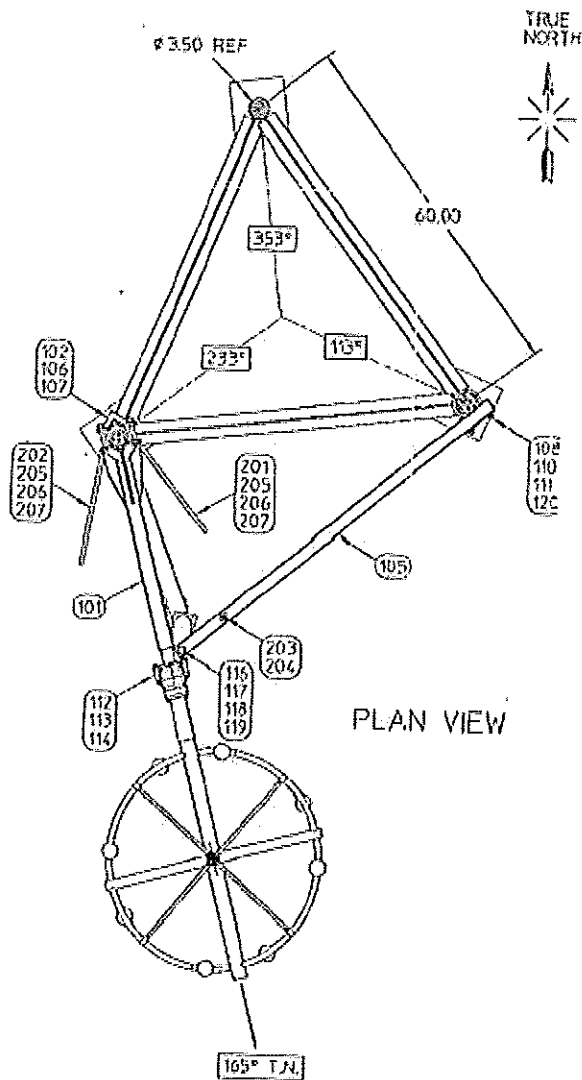




Date	May 14, 2002
Call Letters	WSEA
Location	Atlantic Beach, S
Customer	Gary Kline
Antenna Type	DCRM4C5
Frequency	100.30 MHz
Drawing #	58

CUSTOMER GAIN SUMMARY

Azimuth Pattern Gain of Horizontal Polarization	2.49
Elevation Pattern Gain Per Polarization	1.30
Peak Gain at Horizontal Polarization	3.24



PLAN VIEW

RELEASED
JUL 27 2002
D.C. ENG. DEPT

P/N 84524 ANTENNA ASSEMBLY BILL OF MATERIAL
P/N 84524 MOUNTING KIT BILL OF MATERIAL
P/N 84524 PARASITIC NET BILL OF MATERIAL
MSO NO. 7127

STATE: CONCEPTUAL		Dielectric A Unit of SOK Corporation TITLE: INSTALLATION WSEA 100.3 FH DCRH4C50			
29-JUL-2002 15:49:26					
DIMENSIONAL TOLERANCES UNLESS OTHERWISE NOTED: - DECIMAL DIMENSIONS 3 PLACE DIMENSIONS ±.001 2 PLACE DIMENSIONS ±.002 - FRACTIONAL DIMENSIONS 0" - 1" ±1/32" 1" - 6" ±1/16" 6" - 12" ±1/8" 12" - 24" ±1/4" 24" - 48" ±1/2" 48" - 96" ±1" - ANGLES DIMENSIONS ±1/2° - DIMENSIONS DIMENSIONS ARE NOT FOR MANUFACTURING OR ASSEMBLY		CODE IDENT NO	DRAWING NO	REV	VER
DESIGNED BY	DATE	08441	D98142	-	1
ENG. 1 APPROV	DATE				
ENG. 2 APPROV	DATE				
MANUFACT.	DATE				
				SHEET: 1 OF 1	

**WSEA, Atlantic Beach, South Carolina
Application for License**

**Comparison of the Construction Permit Pattern, the New Modified Composite
Antenna Pattern, and the Constructed Antenna Composite Pattern**

86.07 % of the New Modified Composite Envelope is Filled by the Constructed Composite Envelope

AZ	Construction Permit	New Modified Pattern			Construction Pattern		
	Field	Field	dBk	kW	Field	dBk	kW
0	0.334	0.334	1.267	1.339	0.334	1.267	1.339
10	0.344	0.310	0.619	1.153	0.252	-1.180	0.762
20	0.344	0.350	1.673	1.470	0.224	-2.203	0.602
30	0.433	0.433	3.522	2.250	0.254	-1.112	0.774
40	0.545	0.545	5.520	3.564	0.502	4.806	3.024
50	0.686	0.686	7.518	5.647	0.686	7.518	5.647
60	0.864	0.864	9.522	8.958	0.722	7.963	6.255
70	1.000	0.880	9.681	9.293	0.627	6.737	4.718
80	1.000	0.900	9.877	9.720	0.375	2.272	1.688
90	1.000	0.920	10.068	10.157	0.421	3.277	2.127
100	1.000	0.940	10.254	10.603	0.626	6.723	4.703
110	1.000	0.950	10.346	10.830	0.799	8.843	7.661
120	1.000	0.960	10.437	11.059	0.851	9.390	8.690
130	1.000	0.970	10.527	11.291	0.833	9.205	8.327
140	1.000	0.980	10.616	11.525	0.853	9.411	8.731
150	1.000	0.990	10.705	11.761	0.905	9.925	9.828
160	1.000	0.990	10.705	11.761	0.980	10.616	11.525
170	1.000	1.000	10.792	12.000	0.992	10.722	11.809
180	1.000	1.000	10.792	12.000	1.000	10.792	12.000
190	1.000	1.000	10.792	12.000	0.992	10.722	11.809
200	1.000	0.970	10.527	11.291	0.968	10.509	11.244
210	1.000	0.940	10.254	10.603	0.918	10.049	10.113
220	1.000	0.850	9.380	8.670	0.841	9.288	8.487
230	1.000	0.800	8.854	7.680	0.736	8.129	6.500
240	1.000	0.800	8.854	7.680	0.696	7.644	5.813
250	1.000	0.800	8.854	7.680	0.757	8.374	6.877
260	1.000	0.790	8.744	7.489	0.771	8.533	7.133
270	1.000	0.750	8.293	6.750	0.734	8.106	6.465
280	1.000	0.690	7.569	5.713	0.658	7.156	5.196
290	0.864	0.550	5.599	3.630	0.533	5.326	3.409
300	0.686	0.520	5.112	3.245	0.499	4.754	2.988
310	0.545	0.470	4.234	2.651	0.469	4.215	2.640
320	0.433	0.430	3.461	2.219	0.345	1.548	1.428
330	0.344	0.390	2.613	1.825	0.200	-3.188	0.480
340	0.344	0.330	1.162	1.307	0.249	-1.284	0.744
350	0.344	0.330	1.162	1.307	0.326	1.056	1.275

**WSEA, Atlantic Beach, South Carolina
Application for License**

**Polar Graph
Comparison of the Construction Permit Pattern, the New Modified Composite
Antenna Pattern, and the Constructed Antenna Composite Pattern**

86.07 % of the New Modified Composite Envelope is Filled by the Constructed Composite Envelope

