



SYSTEMS WITH RELIABILITY, LLP
BROADCAST ANTENNAS AND TRANSMISSION LINE

PATTERN CERTIFICATION

DIRECTIONAL FM ANTENNA WSLZ

July 29, 2010

Station	: WSLZ
Location	: Cape Vincent, NY
Frequency	: 88.1 MHz
Channel	: 201A
Antenna Model	: FMECD/3 DA
Maximum Antenna Gain	
Vertical	: 3.118 / 4.939 dB
Horizontal	: 3.118 / 4.939 dB

ANTENNA DESCRIPTION

A custom designed **FMECD/3 DA** antenna was used to produce the required directional azimuth pattern. Each antenna bay consists of a circularly polarized dipole-radiating element with a deicer system. The array is comprised of three bays, that are spaced a full wavelength apart, mounted to pole that is mounted to a tower pointing **180°** true north.

DESCRIPTION OF TEST PROCEDURE

The test antenna consists of a third-scale model antenna. This antenna was mounted to a pole mounted to an exact replicated third-scale 24-inch wide face model tower. Third scale mounting brackets like the ones supplied with the finalized antenna were used for this configuration. The tower and antenna were placed 20 ft. on a platform. Several parsitics were tried and all were detrimental to the proposed pattern. Several tests were then made varying the distance from the antenna to the tower until the tower shielded enough signal in the back to obtain the submitted directional azimuth pattern. All feed cables were properly grounded during pattern testing.

The source antenna, a vertical/horizontal dipole Cavity Back Resonator antenna configuration was mounted approximately 100 feet from the test antenna. The source's height was adjusted to provide a uniform field at the test antenna location. The CBR antenna was operated in the transmit mode at a frequency of 264.3 MHz. The antenna under test was rotated in a clockwise direction. A gain reference was taken using a dipole tuned to 264.3 MHz. Nowhere, does the received signal exceed a maximum to minimum ratio of 15 dB.

TEST RESULTS

The attached calculations verify that the **RMS** value of this antenna is **92.24 %** of the **RMS** value of the pattern authorized in the related construction permit **BMPED-20100127ABL**. The vertical polarized component **RMS** value is **0.730**. The horizontal polarized component **RMS** value is **0.653**. The circular polarized component **RMS** value is **0.780**.

Azimuth and elevation plots and associated tabulations of this antenna are included with this package.

Measured vertical polarized directivity:	1.877 / 2.734 dB
Measured horizontal polarized directivity:	2.345 / 3.702 dB
Measured circular polarized pattern directivity:	1.645 / 2.161 dB

Gain in each polarization was calculated using the following relation:

GAIN = Azimuth Directivity x Elevation Directivity x Power Ratio Between Polarizations

Using this relationship along with ratio measured at our testing facilities:

V-Pol. Gain =	(1.877)(.555)(2.991)	= 3.118 / 4.939 dB
H-Pol. Gain =	(2.345)(.445)(2.991)	= 3.118 / 4.939 dB

INSTALLATION AND MOUNTING

The antenna is to be mounted in accordance with the supplied drawings. The antenna center of radiation is to be **73 meters** (239.513 ft.) above ground level. The antenna aperture is **22.33feet**. No other antennas are to be mounted within **10 feet** of the antenna. No other obstructions other than those specified by original drawings supplied are to be mounted at the same level as the antenna. The antenna is to be oriented **180°** true north.

The tower shapes and directs the antenna pattern as required. The systems orientation and the mounting details are described in the following drawings:

DRAWING NO.	TITLE
1472D00	ELEVATION AND MOUNTING DETAIL
1472D01	ANTENNA ORENTATION AND MOUNTING DETAIL
2105A10	TEST RANGE SCHEMATIC

The array shall be mounted and spaced according to **DWG. 1472D00** and **DWG. 1472D01**. The antenna elements shall be aligned at the same heading as in **DWG. 1472D01**. This will ensure that the antenna is oriented properly at **180°** true north.

DOCUMENT EXHIBITS

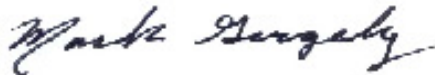
The following exhibits are included as part of this Certificate of Compliance:

Exhibit 1	Circular Polarized Azimuth Pattern Field Strength Tabulations (Composite)
Exhibit 2	Measured Horizontal Polarized Azimuth Pattern Measured Field Strength Tabulations (Horizontal)
Exhibit 3	Measured Vertical Polarized Azimuth Pattern Measured Field Strength Tabulations (Vertical)
Exhibit 4	Elevation Pattern Elevation Tabulations
Exhibit 5	Antenna Data Sheet
Exhibit 6	RMS Calculations
Exhibit 7	Drawings

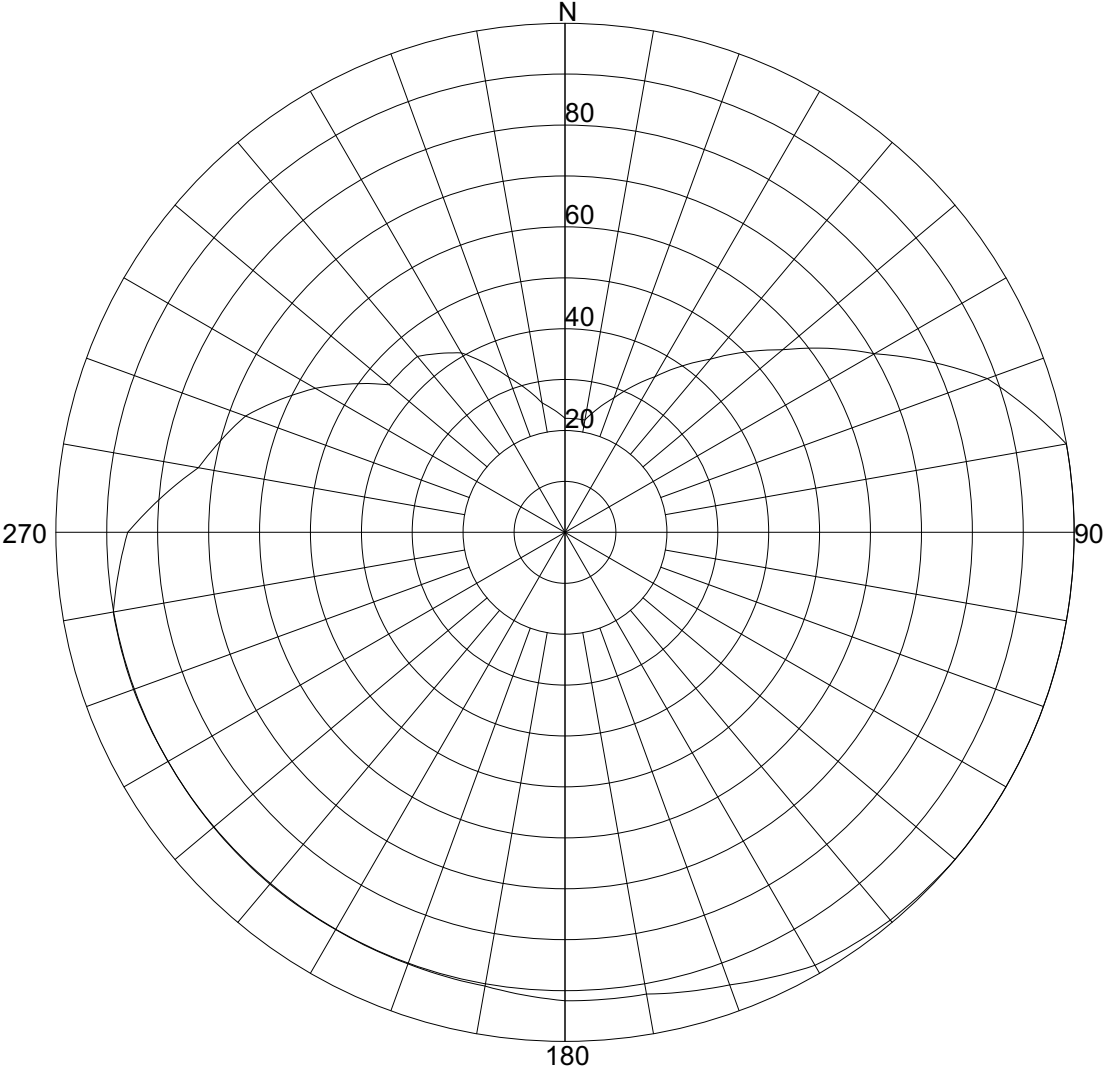
TEST EQUIPMENT

Network Analyzer	:	Hewlett Packard Model # 8753C Serial Number: 08753 – 69138 Calibrated 4/28/10, SWR, Inc.
Computer	:	Pentium 3, 450 MHz, Range Program
Printer	:	Hewlett-Packard Laser Jet 6L
Positioner	:	Orbit Positioner Calibrated 1/12/10, SWR, Inc.

Prepared by:



Mark A. Gergely
Electrical Engineer
Systems With Reliability LLP



Azimuth Pattern

Systems With Reliability

Scale: Linear
Unit: Relative Field

CLIENT: WSLZ / Bob Sauter	Date: 7/14/2010
ANTENNA TYPE: FMECD/3 DA	
FREQUENCY: 88.1 MHz	
PATTERN POL.: Circular	CIRCULARITY(+/-dB):
AZ. DIRECTIVITY: 1.64469 / 2.16dB	PATTERN RMS: 0.780

Relative Field Tabulation(Azimuth)

Azimuth Heading	Relative Field(dB)	Azimuth Heading	Relative Field(dB)
0	.2240 (-12.96)	180	.9200 (-0.71)
5	.2240 (-12.96)	185	.9125 (-0.79)
10	.2240 (-12.96)	190	.9050 (-0.86)
15	.2525 (-11.92)	195	.9035 (-0.87)
20	.2810 (-11)	200	.9020 (-0.89)
25	.3170 (-9.95)	205	.9015 (-0.89)
30	.3530 (-9.02)	210	.9010 (-0.9)
35	.3985 (-7.97)	215	.9015 (-0.89)
40	.4440 (-7.03)	220	.9020 (-0.89)
45	.5010 (-5.99)	225	.9015 (-0.89)
50	.5580 (-5.05)	230	.9010 (-0.9)
55	.6300 (-4)	235	.9005 (-0.9)
60	.7020 (-3.06)	240	.9000 (-0.91)
65	.7925 (-2.01)	245	.9010 (-0.9)
70	.8830 (-1.07)	250	.9020 (-0.89)
75	.9415 (-0.51)	255	.9015 (-0.89)
80	1.0000 (0.01)	260	.9010 (-0.9)
85	1.0000 (0.01)	265	.8800 (-1.1)
90	1.0000 (0.01)	270	.8590 (-1.31)
95	1.0000 (0.01)	275	.7950 (-1.98)
100	1.0000 (0.01)	280	.7310 (-2.71)
105	1.0000 (0.01)	285	.6995 (-3.09)
110	1.0000 (0.01)	290	.6680 (-3.49)
115	1.0000 (0.01)	295	.6170 (-4.18)
120	1.0000 (0.01)	300	.5660 (-4.93)
125	1.0000 (0.01)	305	.5085 (-5.86)
130	1.0000 (0.01)	310	.4510 (-6.9)
135	.9970 (-0.02)	315	.4510 (-6.9)
140	.9940 (-0.04)	320	.4510 (-6.9)
145	.9880 (-0.1)	325	.4290 (-7.33)
150	.9820 (-0.15)	330	.4070 (-7.79)
155	.9640 (-0.31)	335	.3655 (-8.72)
160	.9460 (-0.47)	340	.3240 (-9.76)
165	.9335 (-0.59)	345	.2910 (-10.69)
170	.9210 (-0.71)	350	.2580 (-11.73)
175	.9205 (-0.71)	355	.2410 (-12.32)

Systems With Reliability

CLIENT: WSLZ / Bob Sauter

Date: 7/14/2010

ANTENNA TYPE: FMECD/3 DA

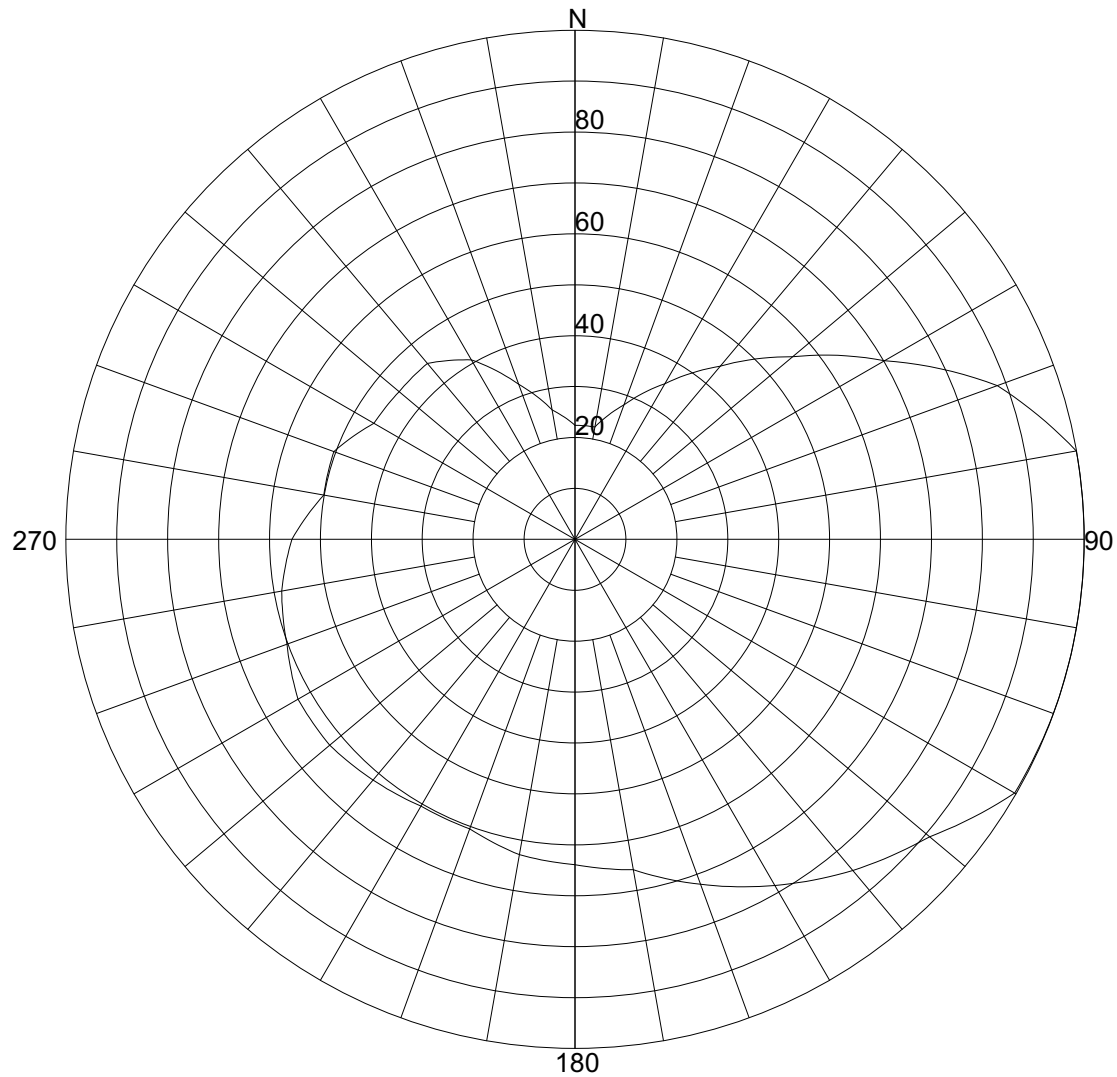
FREQUENCY: 88.1 MHz

PATTERN POL.: Circular

CIRCULARITY(+/-dB):

AZ. DIRECTIVITY: 1.64469 / 2.16dB

PATTERN RMS: 0.780



Azimuth Pattern

Scale: Linear

Unit: Relative Field

Systems With Reliability

CLIENT: WSLZ / Bob Sauter

Date: 7/14/2010

ANTENNA TYPE: FMECD/3 DA

FREQUENCY: 88.1 MHz

PATTERN POL.: Horizontal

CIRCULARITY(+/-dB):

AZ. DIRECTIVITY: 2.34525 / 3.7dB

PATTERN RMS: 0.653

Relative Field Tabulation(Azimuth)

Azimuth Heading	Relative Field(dB)	Azimuth Heading	Relative Field(dB)
0	.2240 (-12.96)	180	.6390 (-3.88)
5	.2240 (-12.96)	185	.6340 (-3.94)
10	.2240 (-12.96)	190	.6290 (-4.01)
15	.2525 (-11.92)	195	.6170 (-4.18)
20	.2810 (-11)	200	.6050 (-4.35)
25	.3170 (-9.95)	205	.6050 (-4.35)
30	.3530 (-9.02)	210	.6050 (-4.35)
35	.3985 (-7.97)	215	.6110 (-4.26)
40	.4440 (-7.03)	220	.6170 (-4.18)
45	.5010 (-5.99)	225	.6230 (-4.1)
50	.5580 (-5.05)	230	.6290 (-4.01)
55	.6300 (-4)	235	.6285 (-4.02)
60	.7020 (-3.06)	240	.6280 (-4.03)
65	.7925 (-2.01)	245	.6150 (-4.21)
70	.8830 (-1.07)	250	.6020 (-4.39)
75	.9415 (-0.51)	255	.5935 (-4.52)
80	1.0000 (0.01)	260	.5850 (-4.64)
85	1.0000 (0.01)	265	.5705 (-4.86)
90	1.0000 (0.01)	270	.5560 (-5.08)
95	1.0000 (0.01)	275	.5285 (-5.52)
100	1.0000 (0.01)	280	.5010 (-5.99)
105	1.0000 (0.01)	285	.5025 (-5.96)
110	1.0000 (0.01)	290	.5040 (-5.93)
115	.9985 (0)	295	.4800 (-6.36)
120	.9970 (-0.02)	300	.4560 (-6.8)
125	.9530 (-0.41)	305	.4535 (-6.85)
130	.9090 (-0.82)	310	.4510 (-6.9)
135	.8790 (-1.11)	315	.4510 (-6.9)
140	.8490 (-1.41)	320	.4510 (-6.9)
145	.8170 (-1.74)	325	.4290 (-7.33)
150	.7850 (-2.09)	330	.4070 (-7.79)
155	.7530 (-2.45)	335	.3655 (-8.72)
160	.7210 (-2.83)	340	.3240 (-9.76)
165	.6900 (-3.21)	345	.2910 (-10.69)
170	.6590 (-3.61)	350	.2580 (-11.73)
175	.6490 (-3.74)	355	.2410 (-12.32)

Systems With Reliability

CLIENT: WSLZ / Bob Sauter

Date: 7/14/2010

ANTENNA TYPE: FMECD/3 DA

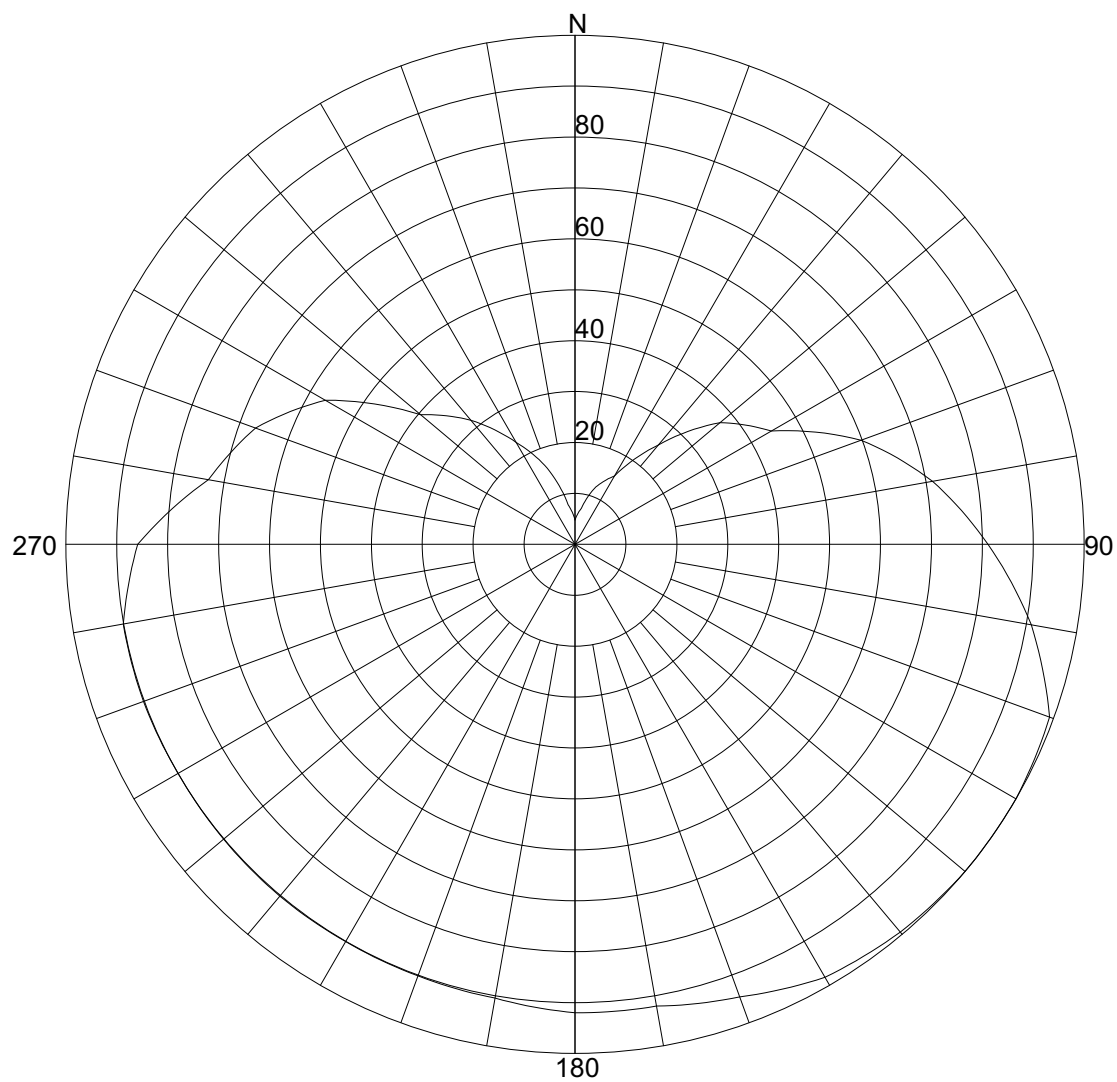
FREQUENCY: 88.1 MHz

PATTERN POL.: Horizontal

CIRCULARITY(+/-dB):

AZ. DIRECTIVITY: 2.34525 / 3.7dB

PATTERN RMS: 0.653



Azimuth Pattern

Scale: Linear

Unit: Relative Field

Systems With Reliability

CLIENT: WSLZ / Bob Sauter

Date: 7/14/2010

ANTENNA TYPE: FMECD/3 DA

FREQUENCY: 88.1 MHz

PATTERN POL.: Vertical

CIRCULARITY(+/-dB):

AZ. DIRECTIVITY: 1.87682 / 2.73dB

PATTERN RMS: 0.730

Relative Field Tabulation(Azimuth)

Azimuth Heading	Relative Field(dB)	Azimuth Heading	Relative Field(dB)
0	.0480 (-26.2)	180	.9200 (-0.71)
5	.0600 (-24.29)	185	.9125 (-0.79)
10	.0720 (-22.73)	190	.9050 (-0.86)
15	.0960 (-20.26)	195	.9035 (-0.87)
20	.1200 (-18.34)	200	.9020 (-0.89)
25	.1375 (-17.17)	205	.9015 (-0.89)
30	.1550 (-16.14)	210	.9010 (-0.9)
35	.2050 (-13.72)	215	.9015 (-0.89)
40	.2550 (-11.84)	220	.9020 (-0.89)
45	.3135 (-10.05)	225	.9015 (-0.89)
50	.3720 (-8.57)	230	.9010 (-0.9)
55	.4085 (-7.75)	235	.9005 (-0.9)
60	.4450 (-7.01)	240	.9000 (-0.91)
65	.5215 (-5.64)	245	.9010 (-0.9)
70	.5980 (-4.45)	250	.9020 (-0.89)
75	.6555 (-3.66)	255	.9015 (-0.89)
80	.7130 (-2.93)	260	.9010 (-0.9)
85	.7620 (-2.35)	265	.8800 (-1.1)
90	.8110 (-1.81)	270	.8590 (-1.31)
95	.8605 (-1.29)	275	.7950 (-1.98)
100	.9100 (-0.81)	280	.7310 (-2.71)
105	.9510 (-0.43)	285	.6995 (-3.09)
110	.9920 (-0.06)	290	.6680 (-3.49)
115	.9960 (-0.03)	295	.6170 (-4.18)
120	1.0000 (0.01)	300	.5660 (-4.93)
125	1.0000 (0.01)	305	.4810 (-6.34)
130	1.0000 (0.01)	310	.3960 (-8.02)
135	.9970 (-0.02)	315	.3570 (-8.92)
140	.9940 (-0.04)	320	.3180 (-9.92)
145	.9880 (-0.1)	325	.2745 (-11.2)
150	.9820 (-0.15)	330	.2310 (-12.69)
155	.9640 (-0.31)	335	.1950 (-14.15)
160	.9460 (-0.47)	340	.1590 (-15.92)
165	.9335 (-0.59)	345	.1190 (-18.42)
170	.9210 (-0.71)	350	.0790 (-21.94)
175	.9205 (-0.71)	355	.0635 (-23.81)

Systems With Reliability

CLIENT: WSLZ / Bob Sauter

Date: 7/14/2010

ANTENNA TYPE: FMECD/3 DA

FREQUENCY: 88.1 MHz

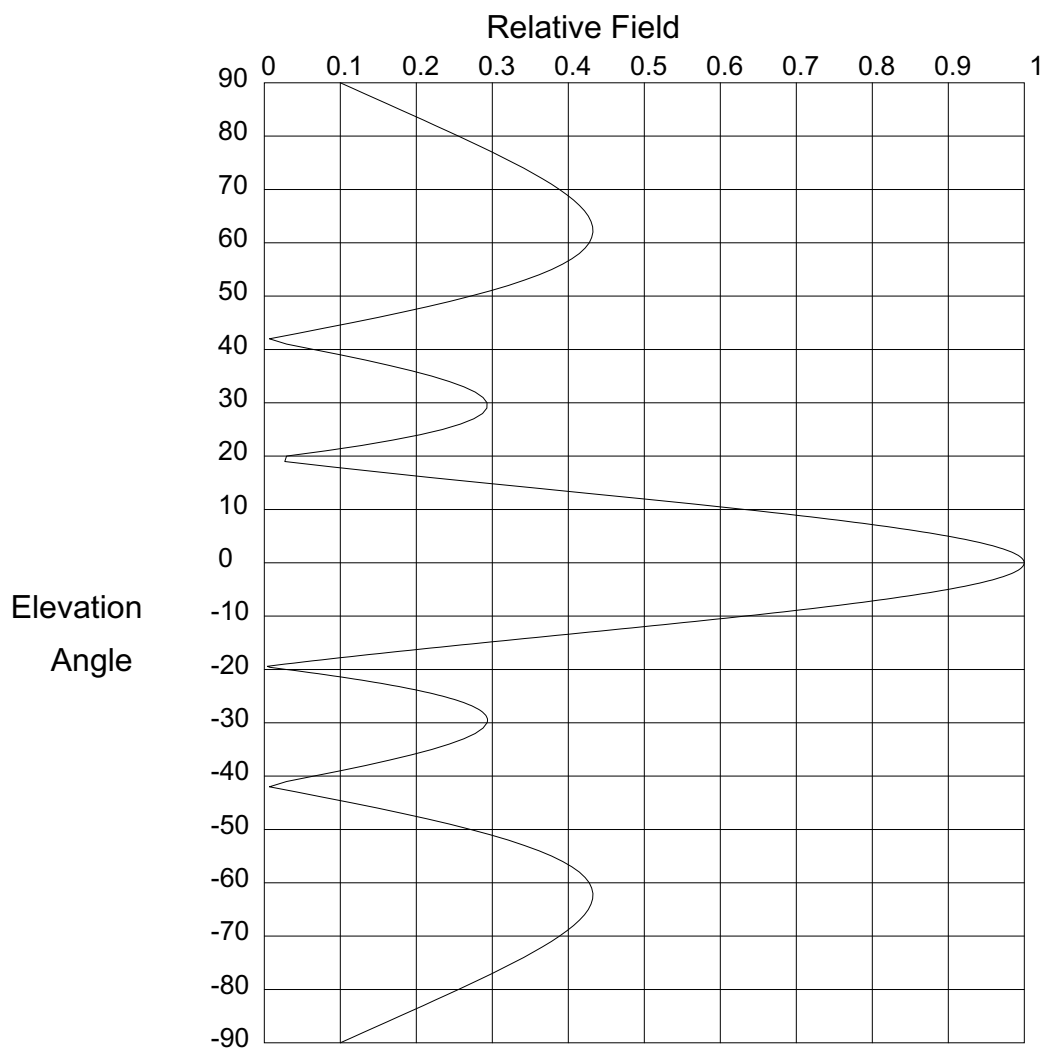
PATTERN POL.: Vertical

CIRCULARITY(+/-dB):

AZ. DIRECTIVITY: 1.87682 / 2.73dB

PATTERN RMS: 0.730

Exhibit 4: Elevation Pattern



Elevation Pattern

Scale: Linear

Units: Field, Relative

Systems With Reliability

CLIENT: WSLZ / Bob Sauter
ANTENNA TYPE: FMECD/3 DA
FREQUENCY: 88.1 MHz
PATTERN POL.: Circular
DIRECTIVITY(Peak): 2.991/4.758 dBd
DIRECTIVITY(Horiz): 2.991/4.758 dBd

Date: 7/16/2010

Beam Tilt (Deg.) : 0
Null Fill(s)(%) : 0, 0, 0

Relative Field Tabulation

Elev. Angle	Rel. Fld(dB)	Elev. Angle	Rel. Fld(dB)	Elev. Angle	Rel. Fld(dB)
90.0	.10 (-20)	52.0	.321 (-9.865)	14.0	.357 (-8.938)
89.0	.116 (-18.733)	51.0	.298 (-10.529)	13.0	.428 (-7.377)
88.0	.131 (-17.628)	50.0	.272 (-11.318)	12.0	.498 (-6.062)
87.0	.147 (-16.648)	49.0	.244 (-12.26)	11.0	.566 (-4.942)
86.0	.163 (-15.769)	48.0	.214 (-13.395)	10.0	.632 (-3.982)
85.0	.178 (-14.972)	47.0	.182 (-14.784)	9.8	.645 (-3.807)
84.0	.194 (-14.244)	46.0	.149 (-16.526)	9.6	.658 (-3.637)
83.0	.21 (-13.575)	45.0	.115 (-18.805)	9.4	.671 (-3.472)
82.0	.225 (-12.957)	44.0	.079 (-22.01)	9.2	.683 (-3.312)
81.0	.24 (-12.385)	43.0	.043 (-27.275)	9.0	.695 (-3.157)
80.0	.256 (-11.852)	42.0	.007 (-43.22)	8.8	.707 (-3.006)
79.0	.271 (-11.356)	41.0	.029 (-30.637)	8.6	.719 (-2.86)
78.0	.285 (-10.893)	40.0	.065 (-23.719)	8.4	.731 (-2.719)
77.0	.30 (-10.462)	39.0	.10 (-19.999)	8.2	.743 (-2.582)
76.0	.314 (-10.06)	38.0	.133 (-17.494)	8.0	.754 (-2.449)
75.0	.328 (-9.686)	37.0	.165 (-15.651)	7.8	.766 (-2.321)
74.0	.341 (-9.339)	36.0	.194 (-14.237)	7.6	.777 (-2.196)
73.0	.354 (-9.018)	35.0	.22 (-13.132)	7.4	.787 (-2.076)
72.0	.366 (-8.724)	34.0	.243 (-12.271)	7.2	.798 (-1.959)
71.0	.378 (-8.455)	33.0	.263 (-11.612)	7.0	.808 (-1.847)
70.0	.389 (-8.211)	32.0	.278 (-11.131)	6.8	.819 (-1.738)
69.0	.398 (-7.995)	31.0	.288 (-10.815)	6.6	.829 (-1.633)
68.0	.407 (-7.804)	30.0	.293 (-10.658)	6.4	.838 (-1.532)
67.0	.415 (-7.642)	29.0	.293 (-10.662)	6.2	.848 (-1.434)
66.0	.421 (-7.507)	28.0	.287 (-10.834)	6.0	.857 (-1.34)
65.0	.426 (-7.403)	27.0	.276 (-11.192)	5.8	.866 (-1.249)
64.0	.43 (-7.329)	26.0	.258 (-11.764)	5.6	.875 (-1.162)
63.0	.432 (-7.287)	25.0	.234 (-12.598)	5.4	.883 (-1.078)
62.0	.432 (-7.281)	24.0	.205 (-13.772)	5.2	.891 (-0.998)
61.0	.431 (-7.31)	23.0	.169 (-15.43)	5.0	.899 (-0.921)
60.0	.428 (-7.38)	22.0	.128 (-17.86)	4.8	.907 (-0.847)
59.0	.422 (-7.491)	21.0	.081 (-21.813)	4.6	.914 (-0.777)
58.0	.415 (-7.648)	20.0	.029 (-30.657)	4.4	.922 (-0.709)
57.0	.405 (-7.856)	19.0	.027 (-31.323)	4.2	.928 (-0.645)
56.0	.393 (-8.119)	18.0	.088 (-21.139)	4.0	.935 (-0.584)
55.0	.378 (-8.442)	17.0	.152 (-16.379)	3.8	.941 (-0.527)
54.0	.362 (-8.835)	16.0	.219 (-13.21)	3.6	.947 (-0.472)
53.0	.343 (-9.305)	15.0	.287 (-10.833)	3.4	.953 (-0.421)

Systems With Reliability

Page 1 of 3

CLIENT: WSLZ / Bob Sauter

Date: 7/16/2010

ANTENNA TYPE: FMECD/3 DA

FREQUENCY: 88.1 MHz

PATTERN POL.: Circular

DIRECTIVITY(Peak): 2.991/4.758 dBd

Beam Tilt (Deg.) : 0

DIRECTIVITY(Horiz): 2.991/4.758 dBd

Null Fill(s)(%) : 0, 0, 0

Relative Field Tabulation

Elev. Angle	Rel. Fld(dB)	Elev. Angle	Rel. Fld(dB)	Elev. Angle	Rel. Fld(dB)
3.2	.958 (-0.372)	-4.4	.922 (-0.709)	-12.0	.498 (-6.062)
3.0	.963 (-0.327)	-4.6	.914 (-0.777)	-12.2	.484 (-6.308)
2.8	.968 (-0.284)	-4.8	.907 (-0.847)	-12.4	.47 (-6.562)
2.6	.972 (-0.245)	-5.0	.899 (-0.921)	-12.6	.456 (-6.825)
2.4	.976 (-0.208)	-5.2	.891 (-0.998)	-12.8	.442 (-7.096)
2.2	.98 (-0.175)	-5.4	.883 (-1.078)	-13.0	.428 (-7.377)
2.0	.983 (-0.145)	-5.6	.875 (-1.162)	-13.2	.414 (-7.667)
1.8	.987 (-0.117)	-5.8	.866 (-1.249)	-13.4	.40 (-7.968)
1.6	.989 (-0.092)	-6.0	.857 (-1.34)	-13.6	.385 (-8.28)
1.4	.992 (-0.071)	-6.2	.848 (-1.434)	-13.8	.371 (-8.603)
1.2	.994 (-0.052)	-6.4	.838 (-1.532)	-14.0	.357 (-8.938)
1.0	.996 (-0.036)	-6.6	.829 (-1.633)	-14.2	.343 (-9.287)
.8	.997 (-0.023)	-6.8	.819 (-1.738)	-14.4	.329 (-9.65)
.6	.999 (-0.013)	-7.0	.808 (-1.847)	-14.6	.315 (-10.027)
.4	.999 (-0.006)	-7.2	.798 (-1.959)	-14.8	.301 (-10.421)
.2	1.00 (-0.001)	-7.4	.787 (-2.076)	-15.0	.287 (-10.833)
.0	1.00 (0)	-7.6	.777 (-2.196)	-15.2	.273 (-11.263)
-.2	1.00 (-0.001)	-7.8	.766 (-2.321)	-15.4	.26 (-11.714)
-.4	.999 (-0.006)	-8.0	.754 (-2.449)	-15.6	.246 (-12.187)
-.6	.999 (-0.013)	-8.2	.743 (-2.582)	-15.8	.232 (-12.685)
-.8	.997 (-0.023)	-8.4	.731 (-2.719)	-16.0	.219 (-13.21)
-1.0	.996 (-0.036)	-8.6	.719 (-2.86)	-16.2	.205 (-13.766)
-1.2	.994 (-0.052)	-8.8	.707 (-3.006)	-16.4	.192 (-14.356)
-1.4	.992 (-0.071)	-9.0	.695 (-3.157)	-16.6	.178 (-14.984)
-1.6	.989 (-0.092)	-9.2	.683 (-3.312)	-16.8	.165 (-15.656)
-1.8	.987 (-0.117)	-9.4	.671 (-3.472)	-17.0	.152 (-16.379)
-2.0	.983 (-0.145)	-9.6	.658 (-3.637)	-17.2	.139 (-17.16)
-2.2	.98 (-0.175)	-9.8	.645 (-3.807)	-17.4	.126 (-18.01)
-2.4	.976 (-0.208)	-10.0	.632 (-3.982)	-17.6	.113 (-18.943)
-2.6	.972 (-0.245)	-10.2	.619 (-4.163)	-17.8	.10 (-19.978)
-2.8	.968 (-0.284)	-10.4	.606 (-4.349)	-18.0	.088 (-21.139)
-3.0	.963 (-0.327)	-10.6	.593 (-4.541)	-18.2	.075 (-22.464)
-3.2	.958 (-0.372)	-10.8	.58 (-4.739)	-18.4	.063 (-24.008)
-3.4	.953 (-0.421)	-11.0	.566 (-4.942)	-18.6	.051 (-25.862)
-3.6	.947 (-0.472)	-11.2	.553 (-5.153)	-18.8	.039 (-28.188)
-3.8	.941 (-0.527)	-11.4	.539 (-5.37)	-19.0	.027 (-31.323)
-4.0	.935 (-0.584)	-11.6	.525 (-5.593)	-19.2	.016 (-36.185)
-4.2	.928 (-0.645)	-11.8	.511 (-5.824)	-19.4	.004 (-47.865)

Systems With Reliability

Page 2 of 3

CLIENT: WSLZ / Bob Sauter

Date: 7/16/2010

ANTENNA TYPE: FMECD/3 DA

FREQUENCY: 88.1 MHz

PATTERN POL.: Circular

DIRECTIVITY(Peak): 2.991/4.758 dBd

Beam Tilt (Deg.) : 0

DIRECTIVITY(Horiz): 2.991/4.758 dBd

Null Fill(s)(%) : 0, 0, 0

Relative Field Tabulation

Elev. Angle	Rel. Fld(dB)	Elev. Angle	Rel. Fld(dB)	Elev. Angle	Rel. Fld(dB)
-19.6	.007 (-42.787)	-27.2	.278 (-11.104)	-54.0	.362 (-8.835)
-19.8	.018 (-34.715)	-27.4	.281 (-11.025)	-55.0	.378 (-8.442)
-20.0	.029 (-30.657)	-27.6	.283 (-10.953)	-56.0	.393 (-8.119)
-20.2	.04 (-27.943)	-27.8	.285 (-10.89)	-57.0	.405 (-7.856)
-20.4	.051 (-25.91)	-28.0	.287 (-10.834)	-58.0	.415 (-7.648)
-20.6	.061 (-24.292)	-28.2	.289 (-10.785)	-59.0	.422 (-7.491)
-20.8	.071 (-22.952)	-28.4	.29 (-10.744)	-60.0	.428 (-7.38)
-21.0	.081 (-21.813)	-28.6	.291 (-10.71)	-61.0	.431 (-7.31)
-21.2	.091 (-20.825)	-28.8	.292 (-10.682)	-62.0	.432 (-7.281)
-21.4	.101 (-19.956)	-29.0	.293 (-10.662)	-63.0	.432 (-7.287)
-21.6	.11 (-19.183)	-29.2	.293 (-10.648)	-64.0	.43 (-7.329)
-21.8	.119 (-18.489)	-29.4	.294 (-10.641)	-65.0	.426 (-7.403)
-22.0	.128 (-17.86)	-29.6	.294 (-10.64)	-66.0	.421 (-7.507)
-22.2	.137 (-17.288)	-29.8	.294 (-10.646)	-67.0	.415 (-7.642)
-22.4	.145 (-16.765)	-30.0	.293 (-10.658)	-68.0	.407 (-7.804)
-22.6	.153 (-16.284)	-31.0	.288 (-10.815)	-69.0	.398 (-7.995)
-22.8	.161 (-15.84)	-32.0	.278 (-11.131)	-70.0	.389 (-8.211)
-23.0	.169 (-15.43)	-33.0	.263 (-11.612)	-71.0	.378 (-8.455)
-23.2	.177 (-15.049)	-34.0	.243 (-12.271)	-72.0	.366 (-8.724)
-23.4	.184 (-14.695)	-35.0	.22 (-13.132)	-73.0	.354 (-9.018)
-23.6	.191 (-14.366)	-36.0	.194 (-14.237)	-74.0	.341 (-9.339)
-23.8	.198 (-14.059)	-37.0	.165 (-15.651)	-75.0	.328 (-9.686)
-24.0	.205 (-13.772)	-38.0	.133 (-17.494)	-76.0	.314 (-10.06)
-24.2	.211 (-13.505)	-39.0	.10 (-19.999)	-77.0	.30 (-10.462)
-24.4	.217 (-13.254)	-40.0	.065 (-23.719)	-78.0	.285 (-10.893)
-24.6	.223 (-13.021)	-41.0	.029 (-30.637)	-79.0	.271 (-11.356)
-24.8	.229 (-12.802)	-42.0	.007 (-43.22)	-80.0	.256 (-11.852)
-25.0	.234 (-12.598)	-43.0	.043 (-27.275)	-81.0	.24 (-12.385)
-25.2	.24 (-12.407)	-44.0	.079 (-22.01)	-82.0	.225 (-12.957)
-25.4	.245 (-12.229)	-45.0	.115 (-18.805)	-83.0	.21 (-13.575)
-25.6	.249 (-12.063)	-46.0	.149 (-16.526)	-84.0	.194 (-14.244)
-25.8	.254 (-11.908)	-47.0	.182 (-14.784)	-85.0	.178 (-14.972)
-26.0	.258 (-11.764)	-48.0	.214 (-13.395)	-86.0	.163 (-15.769)
-26.2	.262 (-11.63)	-49.0	.244 (-12.26)	-87.0	.147 (-16.648)
-26.4	.266 (-11.507)	-50.0	.272 (-11.318)	-88.0	.131 (-17.628)
-26.6	.269 (-11.393)	-51.0	.298 (-10.529)	-89.0	.116 (-18.733)
-26.8	.273 (-11.288)	-52.0	.321 (-9.865)	-90.0	.10 (-20)
-27.0	.276 (-11.192)	-53.0	.343 (-9.305)	90.0	.00 (-50)

Systems With Reliability

Page 3 of 3

CLIENT: WSLZ / Bob Sauter

Date: 7/16/2010

ANTENNA TYPE: FMECD/3 DA

FREQUENCY: 88.1 MHz

PATTERN POL.: Circular

DIRECTIVITY(Peak): 2.991/4.758 dBd

Beam Tilt (Deg.) : 0

DIRECTIVITY(Horiz): 2.991/4.758 dBd

Null Fill(s)(%) : 0, 0, 0

Exhibit 5: Antenna Data Sheet



SYSTEMS WITH RELIABILITY, LLP

BROADCAST ANTENNAS AND TRANSMISSION LINE

SYSTEM DATA SHEET

Customer	WSLZ
Contact	Bob Sauter
Location	Cape Vincent, NY
Antenna Model	FMECD/3 DA
Channel / Frequency	201A / 88.1 MHz

ELECTRICAL SPECIFICATIONS

Antenna Specifications:

	H-POL			V. Pol.	
		dB			dB
License ERP (KW)	2.000	3.010 dB		2.000	3.010 dB
FCC Limit Pattern Directivity	1.400	1.462 dB		1.400	1.462 dB
Elevation Directivity	2.991	4.758 dB		2.991	4.758 dB
Azimuth Directivity	2.345	3.702 dB		1.877	2.734 dB
Composite Pattern	1.645	2.161 dB		1.645	2.161 dB
Polarization Ratio	0.445	-3.521 dB		0.555	-2.553 dB
RMS Comp./RMS Limit	92.26 %				
Antenna Efficiency %	100	0		100	0
Power Ratio (Pol. Ratio X Efficiency)	0.4445	0		0.5555	0
Antenna Gain	3.118	4.939 dB		3.118	4.939 dB

Antenna Input Power (KW)	0.641 kW	-1.929 (dBK)
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Feed Line Specifications:

Line Type	7/8" Foam	50 Ω
Attenuation Per 100 ft (dB)	0.34	dB
Line Length (ft) AGL + 45'	284.00	ft.
Total Line Attenuation (dB)	0.9656	dB
Line Efficiency	80.06	%
Power Input to the Line (KW)	0.801 kW	-0.963 (dBK)

MECHANICAL SPECIFICATIONS

No. Of Bays	3		
Antenna Aperture	22.33	ft.	6.81 meter
Center of Radiation AGL	239.51	ft.	73.02 meter
Antenna Weight with Pole	115.00	lbs.	52.27 kg
Windload (50/33)	205.00	lbs.	Windload CaAc 5.90 ft^2

Prepared by:

David K. Edmiston Jr.

David K. Edmiston Jr.
SWR, LLP

Exhibit 6: RMS Calculations



SYSTEMS WITH RELIABILITY, INC.
Broadcast Antennas and Transmission Systems

WSLZ Antenna RMS Comparison

PROPOSED ANTENNA

Azimuth Heading	Relative Field
0	0.224
10	0.224
20	0.281
30	0.353
40	0.444
50	0.558
60	0.702
70	0.883
80	1.000
90	1.000
100	1.000
110	1.000
120	1.000
130	1.000
140	1.000
150	1.000
160	1.000
170	1.000
180	1.000
190	1.000
200	1.000
210	1.000
220	1.000
230	1.000
240	1.000
250	1.000
260	1.000
270	1.000
280	1.000
290	1.000
300	0.810
310	0.644
320	0.512
330	0.407
340	0.324
350	0.258

DESIGNED ANTENNA

Azimuth Heading	Relative Field
0	0.224
10	0.224
20	0.281
30	0.353
40	0.444
50	0.558
60	0.702
70	0.883
80	1.000
90	1.000
100	1.000
110	1.000
120	1.000
130	1.000
140	0.994
150	0.982
160	0.946
170	0.921
180	0.920
190	0.905
200	0.902
210	0.901
220	0.902
230	0.901
240	0.900
250	0.902
260	0.901
270	0.859
280	0.731
290	0.668
300	0.566
310	0.451
320	0.451
330	0.407
340	0.324
350	0.258

Sum of Relative Field Squared : 25.755
Sum Divided by 36 (Readings) : 0.715
Square Root : 0.846

Sum of Relative Field Squared : 21.915
Sum Divided by 36 (Readings) : 0.609
Square Root : 0.780

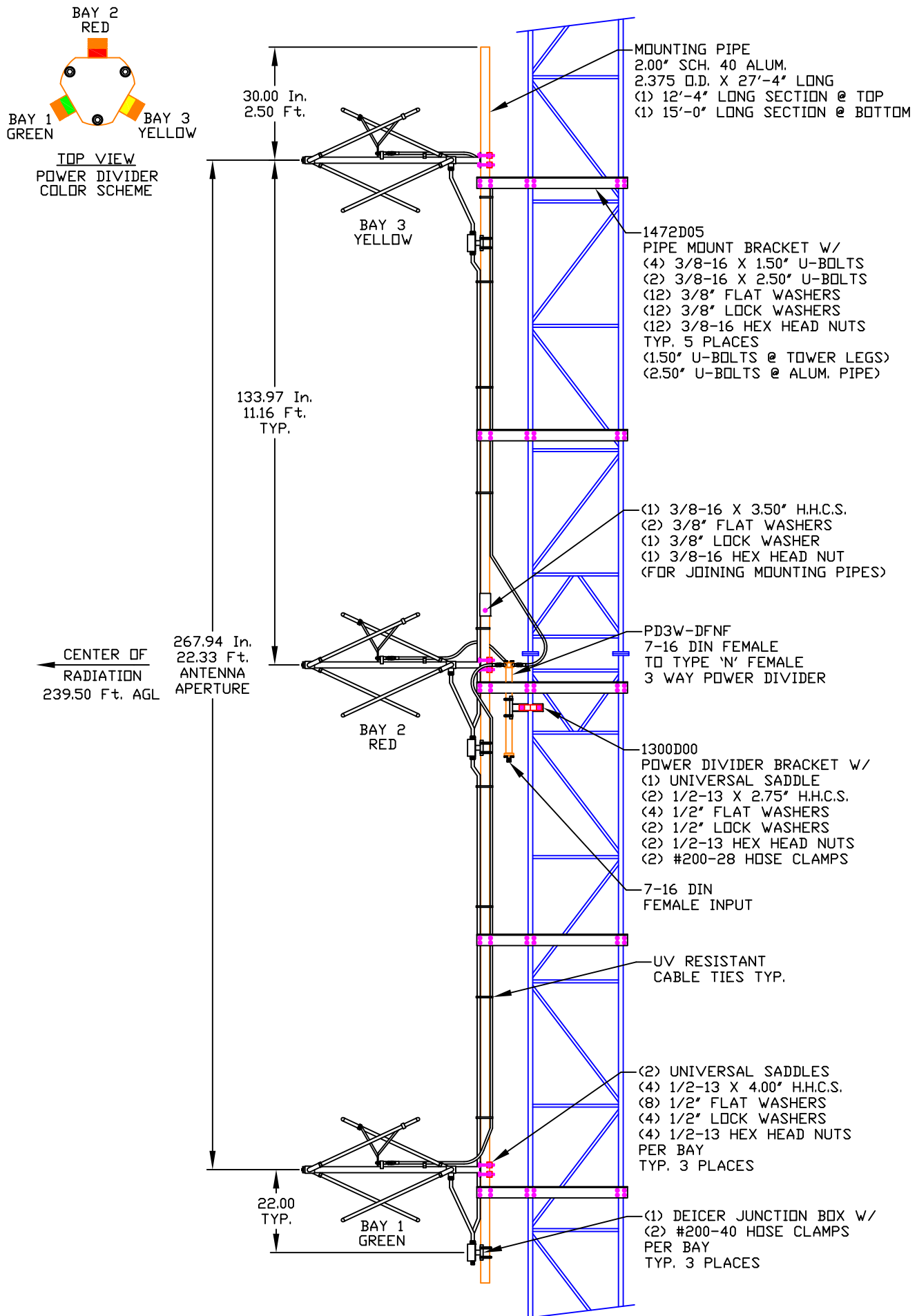
Percentage of Construction Permit Antenna Filled : 92.24%

NOTE:

1. REFERENCE DWG. 1472D01 FOR ANTENNA ORIENTATION.

Exhibit 7: Drawings

DRAWING NUMBER: 1472D00



SYSTEMS WITH RELIABILITY, INC.
619 INDUSTRIAL PARK ROAD
EBENSBURG, PENNSYLVANIA 15931

TITLE: FMECD/3-DA, FREQ. 88.1
WSLZ, CAPE VINCENT, NY

MATERIAL:

SIZE REV APPR. DATE
C 1
2
3

ENGINEER:

SCALE: NTS

NAME: RAC

DATE: 7/29/10

SHEET 1 OF 1

DRAWING NUMBER: 1472D00

DRAWING
NUMBER:
1472D01

TRUE
NORTH

Technical drawing of the antenna structure showing dimensions and components:

- 1472D05 PIPE MOUNT ANGLE**: Points to the mounting angle.
- 31°36'**: Angle of the climbing face.
- LEG A**, **LEG B**, **LEG C**: Labels for the climbing legs.
- 271°36'**: Angle between LEG B and LEG C.
- 151°36'**: Angle between LEG A and LEG B.
- CLIMBING FACE**: Label for the climbing surface.
- 24.00 TYP.**: Typical distance between climbing feet.
- 12.00**: Distance from the mounting pipe to the antenna structure.
- MOUNTING PIPE 2.00" SCH. 40 ALUM.**: Label for the mounting pipe.
- ANTENNA AZIMUTH 180°**: Label for the antenna azimuth.
- FMEC ANTENNA**: Label for the FMEC antenna.

TOP VIEW

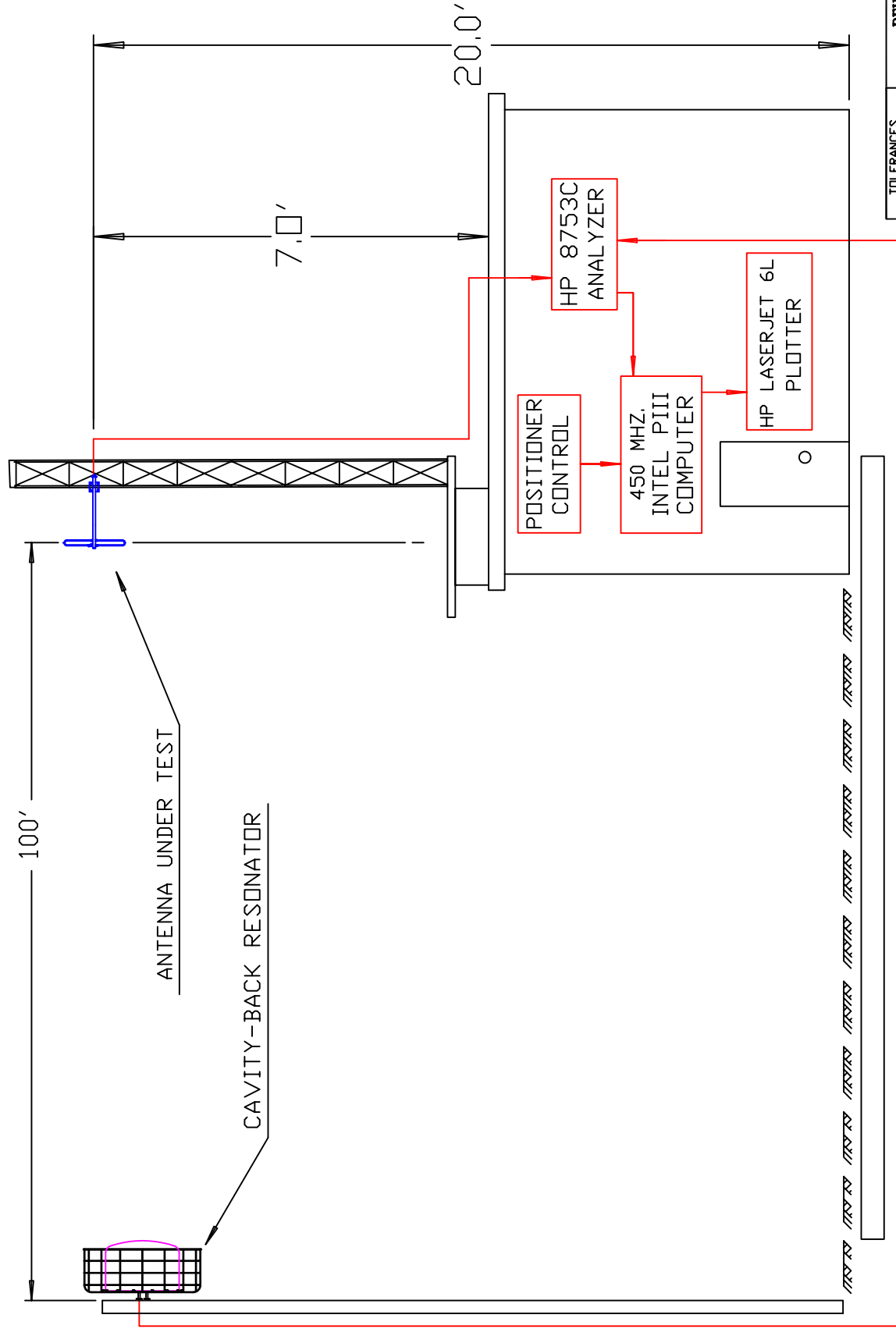
TITLE:	FMECD/3-DA, FREQ. 88.1 WSLZ, CAPE VINCENT, NY
MATERIAL:	ANTENNA ORIENTATION FROM TRUE NORTH


A

TOLERANCES		REVISION RECORD		DATE	
.X	± .015	REV	APPROVAL		
.XX	± .005				
.XXX	± .002				
X/X	± 1/32				
DEC.	± 1/2				
UNLESS OTHERWISE SPECIFIED					
DRAWING NUMBER:		1472D01			
Y THIS DRAWING		DATE: 7/29/10			
NAME: RAC		SHEET 1 OF 1			

Exhibit 7 (cont'd): Drawings

DRAWING
NUMBER:
2105A10



 <p>SYSTEMS WITH RELIABILITY, INC 619 INDUSTRIAL PARK ROAD EBENSBURG, PENNSYLVANIA 15931</p>	TITLE: TEST RANGE SCHEMATIC		SIZE: A		SCALE: NTS NAME: JRM DATE: 11/1/98		SHEET 1 OF 1
	MATERIAL:						