



SYSTEMS WITH RELIABILITY, LTD.
Broadcast Antenna and Transmission Systems

PATTERN CERTIFICATION

DIRECTIONAL FM ANTENNA

WQXB

April 2, 2003

Call Sign	:	WQXB
Location	:	Grenada, MS
Frequency	:	100.1 MHz
Channel	:	261
Antenna Model	:	FM10/6 DA
Maximum Antenna Gain	:	
Horizontal	:	5.651/ 7.521 dB
Vertical	:	5.651/ 7.521 dB

ANTENNA DESCRIPTION

A custom designed **FM10/6 DA** antenna was used to produce the required directional azimuth pattern. Each antenna bay consists of a circularly polarized dipole-radiating element with a vertical and horizontal parasitic system. The array is comprised of **six** bays, that are spaced a full wavelength apart, mounted to a tower pointing **330** degrees true north.

DESCRIPTION OF TEST PROCEDURE

The test antenna consists of a third-scale dipole antenna and parasitic system. This antenna was mounted to an 8-inch third-scale model tower with the use of mounting brackets supplied with the finalized antenna. The tower was 20 ft. on a platform. All feed cables are properly grounded during pattern testing. Horizontal and vertical parasitic elements were used to obtain the desired directional pattern.

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 300.3 MHz. The antenna under test was rotated in a clockwise direction. A gain reference was taken using a dipole tuned to 300.3 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 **88.74 %** of the **RMS** value of the pattern authorized in the related construction permit **BMPH-19940811IA**. The vertical component **RMS** value is **.734** and the horizontal component **RMS** value is **0.76**.

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

Measured horizontal polarized directivity	:	1.73 / 2.38 dB
Measured vertical polarized directivity	:	1.85 / 2.69 dB
Measured composite azimuth pattern directivity	:	1.8489 / 2.6693 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:

H-Pol. Gain = (1.73)(6.321)(0.516760) = 5.651 / 7.521 dB

V-Pol. Gain = (1.85)(6.321)(0.483240) = 5.651 / 7.521 dB

INSTALLATION AND MOUNTING

The antenna is to be mounted in accordance with the supplied drawings. The antenna center of radiation is to be **127 meters** above ground level. The antenna (parasitic system included) aperture is **49.129 feet**. 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 **330 degrees** true North.

The parasitic system is custom designed to shape and direct the antenna pattern as required. The systems orientation and the mounting details are described in the following drawings:

DRAWING NO.	TITLE
0606C00	ORIENTATION WITH PARASITICS
0606C01	ANTENNA ORIENTATION
0606C02	FRONT VIEW WITH PARASITICS
0606C03	PARASITIC PLACEMENT
2105A10	TEST RANGE SCHEMATIC

The array shall be mounted according to **DWG. 0606C00**. Each bay is mounted using the bracket assemblies in **DWG. 0434A03**. The parasitic assembly is shown in **DWG. 0606C01** and **DWG. 0606C02**. All lengths of the dipoles are shown in **DWG. 0606C03**. The antenna elements shall be aligned at the same heading as in **DWG. 0606C01**. This will ensure that the antenna is oriented properly at 59 degrees.

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

TEST EQUIPMENT

Network Analyzer	:	Hewlett Packard Model # 8753C Serial Number : 08753 – 69138 Calibrated 8/26/02, SWR, Inc.
Computer	:	White Mountain 366 Computer
Plotter	:	Hewlett-Packard 7550A
Positioner	:	Orbit Positioner Calibrated 1/06/03, SWR, Inc.

Prepared by:



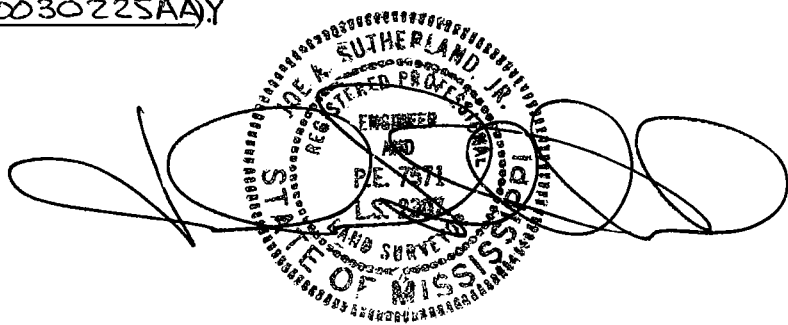
Jason P Duncan
SWR, Inc.

Surveyor's Declaration

I, Joe A. Sutherland, Jr. ^{P.E.-L.S.}, subject to the penalties of perjury, do declare the following:

- 1.) I am a licensed surveyor in the ^{STATE} ~~state(s)~~ of MISSISSIPPI,
_____ and _____.
- 2.) I have provided professional services to CHATTERBOX, INC. (permit tee name), permit tee of 100.1 -FM, GRONADA (city of license), MS (state), during the installation of the 10/6 DA -FM directional antenna.
- 3.) I certify that the 10/6 DA -FM directional antenna has been oriented at the proper azimuth as authorized in the construction permit (FCC File Number BMPH 20030225AAY

Dated: 07/11/03 mm/dd/yy



Engineer's Declaration

I, Michael B. Vanhooser, subject to the penalties of perjury, do declare the following:

- 1.) I am the holder of a valid General Radio Telephone Operators License, Number

PG-10-19832 (FCC License No.)

- 2.) I have been a member of the Society of Broadcast Engineer's since 19_____

- 3.) That I have been employed as a technical consultant with the firm of:

Nova Electronics (firm name), of

Dallas, Texas (city state)

- 4.) That Reynolds Technical (Firm's Name) was retained by

Chatterbox Inc. (Permittee's Name) for the

purpose of preparing its application for the construction permit of WQXB -FM

Grenada (City), Mississippi (State), from which

the underlying Construction Permit (FCC File Number BMPH-20030225 AAY)

was granted by the Commission.

- 5.) That I am familiar with the terms and conditions of the WQXB -FM

Construction Permit.

- 6.) I hereby certify that I have overseen the installation of the WQXB -FM

directional antenna and that the installation was complete to the manufacturer's instructions.

Dated: 7-10-03 mm/dd/yy



SYSTEMS WITH RELIABILITY, INC.
Broadcast Antennas and Transmission Systems

WQXB Antenna RMS Comparison

PROPOSED ANTENNA

Azimuth Heading	Relative Field
0	1.000
10	1.000
20	1.000
30	1.000
40	1.000
50	1.000
60	0.950
70	0.780
80	0.620
90	0.620
100	0.620
110	0.780
120	0.950
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

DESIGNED ANTENNA

Azimuth Heading	Relative Field
0	0.870
10	0.920
20	0.970
30	1.000
40	0.990
50	0.950
60	0.860
70	0.740
80	0.620
90	0.560
100	0.620
110	0.780
120	0.850
130	0.880
140	0.860
150	0.800
160	0.740
170	0.700
180	0.680
190	0.720
200	0.810
210	0.940
220	1.000
230	0.970
240	0.880
250	0.880
260	0.870

PROPOSED ANTENNA

Azimuth Heading	Relative Field
270	1.000
280	1.000
290	1.000
300	1.000
310	1.000
320	1.000
330	1.000
340	1.000
350	1.000

Sum of Relative Field Squared : 33.175

Sum Divided by 36 (Readings) : 0.922

Square Root : 0.960

Percentage of Construction Permit Antenna Filled :

DESIGNED ANTENNA

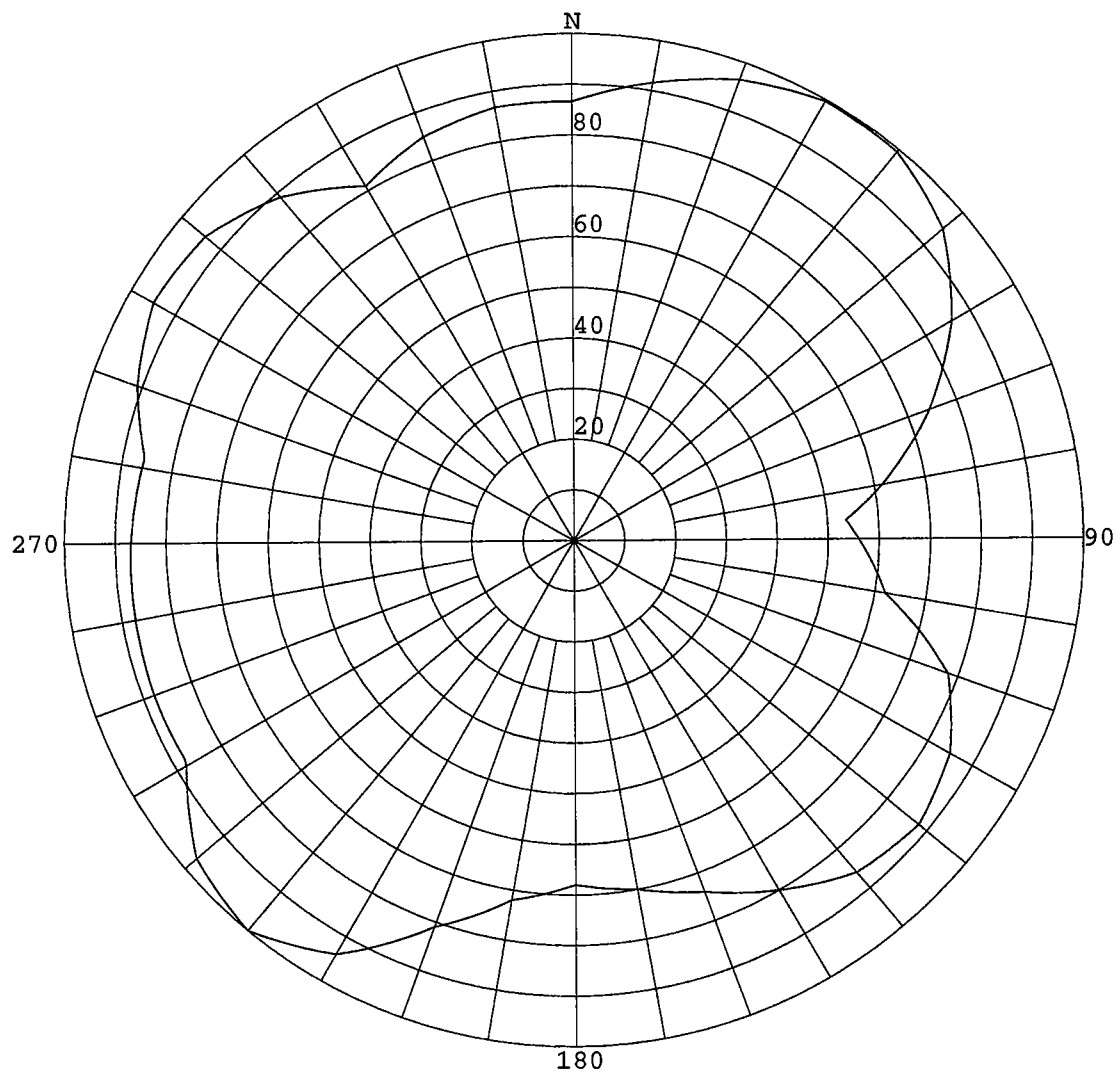
Azimuth Heading	Relative Field
270	0.870
280	0.860
290	0.910
300	0.950
310	0.940
320	0.890
330	0.810
340	0.850
350	0.870

Sum of Relative Field Squared : 26.124

Sum Divided by 36 (Readings) : 0.726

Square Root : 0.852

88.74%



Azimuth Pattern

Scale: Linear
Unit: Relative Field

Systems With Reliability Inc.

CLIENT: WQXB Exhibit 1

Date: 3/26/03

ANTENNA TYPE: FM10/6 DA

FREQUENCY: 100.1

PATTERN POL.: Circular

CIRCULARITY(+/-dB):

AZ. DIRECTIVITY: 1.8489 / 2.6693dB

PATTERN RMS: 0.735

Relative Field Tabulation(Azimuth)

Azimuth Heading	Relative Field(dB)		Azimuth Heading
0	.87 (-1.24)	180	.68 (-3.34)
5	.89 (-0.99)	185	.70 (-3.09)
10	.92 (-0.75)	190	.72 (-2.84)
15	.94 (-0.52)	195	.77 (-2.32)
20	.97 (-0.3)	200	.81 (-1.82)
25	.98 (-0.16)	205	.88 (-1.15)
30	1.00 (-0.02)	210	.94 (-0.53)
35	1.00 (-0.03)	215	.97 (-0.26)
40	.99 (-0.04)	220	1.00 (0.01)
45	.97 (-0.24)	225	.99 (-0.12)
50	.95 (-0.44)	230	.97 (-0.26)
55	.90 (-0.86)	235	.93 (-0.67)
60	.86 (-1.31)	240	.88 (-1.1)
65	.80 (-1.91)	245	.88 (-1.13)
70	.74 (-2.56)	250	.88 (-1.12)
75	.68 (-3.34)	255	.88 (-1.14)
80	.62 (-4.21)	260	.87 (-1.16)
85	.55 (-5.18)	265	.87 (-1.18)
90	.56 (-5.02)	270	.87 (-1.21)
95	.59 (-4.57)	275	.86 (-1.25)
100	.62 (-4.14)	280	.86 (-1.3)
105	.70 (-3.09)	285	.88 (-1.1)
110	.78 (-2.15)	290	.91 (-0.81)
115	.82 (-1.77)	295	.93 (-0.62)
120	.85 (-1.4)	300	.95 (-0.44)
125	.87 (-1.25)	305	.95 (-0.48)
130	.88 (-1.1)	310	.94 (-0.53)
135	.87 (-1.2)	315	.92 (-0.76)
140	.86 (-1.3)	320	.89 (-1)
145	.83 (-1.61)	325	.85 (-1.4)
150	.80 (-1.93)	330	.81 (-1.82)
155	.77 (-2.26)	335	.83 (-1.61)
160	.74 (-2.6)	340	.85 (-1.4)
165	.72 (-2.84)	345	.86 (-1.31)
170	.70 (-3.09)	350	.87 (-1.22)
175	.69 (-3.21)	355	.87 (-1.23)

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CLIENT: WQXB Exhibit 1

Date: 3/26/03

ANTENNA TYPE: FM10/6 DA

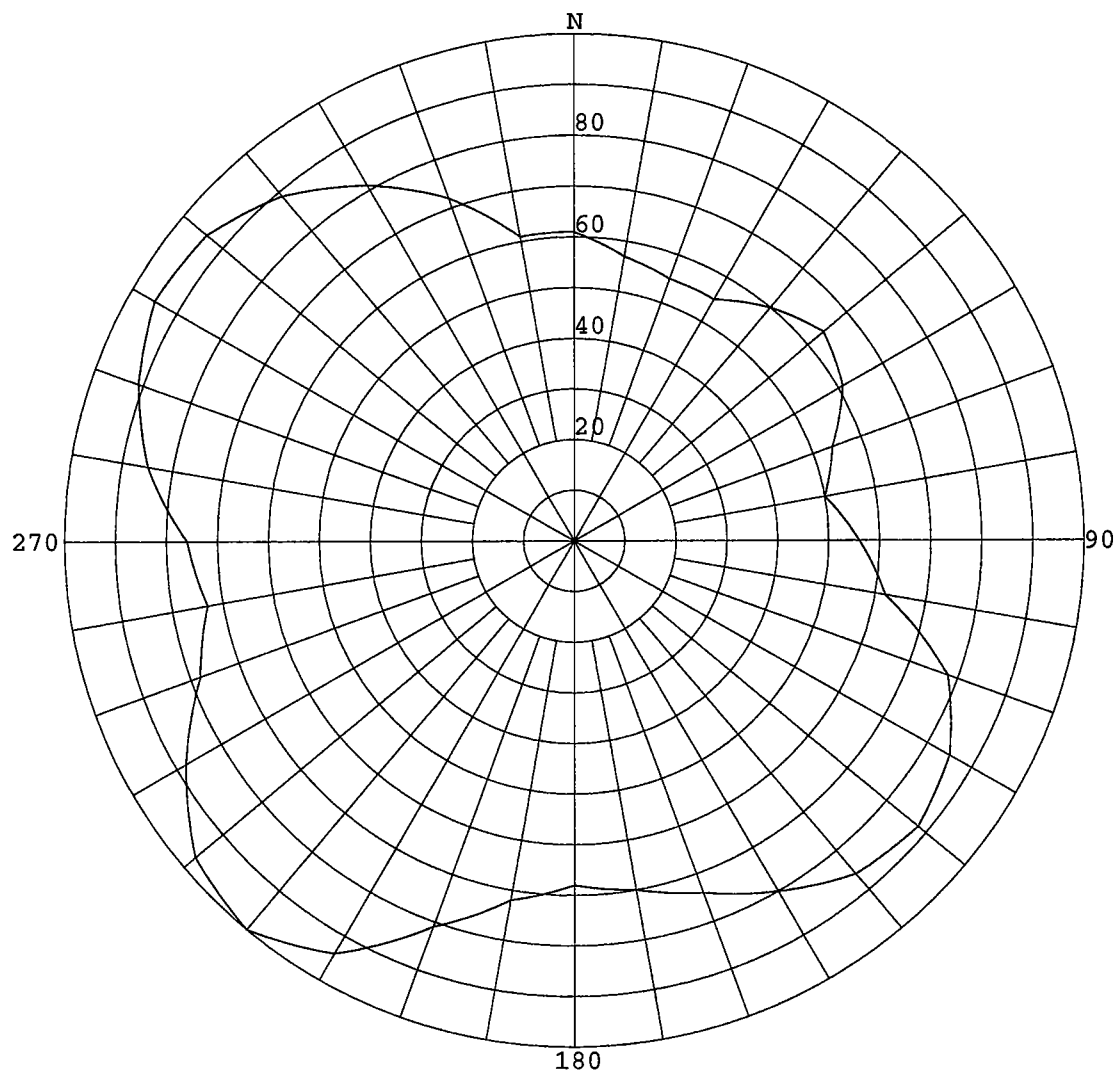
FREQUENCY: 100.1

PATTERN POL.: Circular

CIRCULARITY(+/-dB):

AZ. DIRECTIVITY: 1.8489 / 2.6693dB

PATTERN RMS: 0.735



Azimuth Pattern

Scale: Linear

Systems With Reliability Inc.

Unit: Relative Field

CLIENT: WQXB Exhibit 2

Date: 3/26/03

ANTENNA TYPE: FM10/6 DA

FREQUENCY: 100.1

PATTERN POL.: Horizontal

CIRCULARITY(+/-dB):

AZ. DIRECTIVITY: 1.73 / 2.38dB

PATTERN RMS: 0.760

Relative Field Tabulation(Azimuth)

Azimuth Heading	Relative Field(dB)	Azimuth Heading	Relative Field(dB)
0	.61 (-4.28)	180	.68 (-3.34)
5	.59 (-4.57)	185	.70 (-3.09)
10	.57 (-4.87)	190	.72 (-2.84)
15	.56 (-5.02)	195	.77 (-2.32)
20	.55 (-5.18)	200	.81 (-1.82)
25	.55 (-5.18)	205	.88 (-1.15)
30	.55 (-5.18)	210	.94 (-0.53)
35	.58 (-4.79)	215	.97 (-0.26)
40	.60 (-4.42)	220	1.00 (0.01)
45	.62 (-4.14)	225	.99 (-0.12)
50	.64 (-3.86)	230	.97 (-0.26)
55	.63 (-4.07)	235	.93 (-0.67)
60	.61 (-4.28)	240	.88 (-1.1)
65	.58 (-4.79)	245	.83 (-1.61)
70	.54 (-5.34)	250	.78 (-2.15)
75	.52 (-5.66)	255	.76 (-2.43)
80	.50 (-6)	260	.73 (-2.72)
85	.53 (-5.5)	265	.75 (-2.55)
90	.56 (-5.02)	270	.76 (-2.37)
95	.59 (-4.57)	275	.81 (-1.87)
100	.62 (-4.14)	280	.85 (-1.4)
105	.70 (-3.09)	285	.88 (-1.1)
110	.78 (-2.15)	290	.91 (-0.81)
115	.82 (-1.77)	295	.93 (-0.62)
120	.85 (-1.4)	300	.95 (-0.44)
125	.87 (-1.25)	305	.95 (-0.48)
130	.88 (-1.1)	310	.94 (-0.53)
135	.87 (-1.2)	315	.92 (-0.76)
140	.86 (-1.3)	320	.89 (-1)
145	.83 (-1.61)	325	.85 (-1.4)
150	.80 (-1.93)	330	.81 (-1.82)
155	.77 (-2.26)	335	.77 (-2.32)
160	.74 (-2.6)	340	.72 (-2.84)
165	.72 (-2.84)	345	.67 (-3.53)
170	.70 (-3.09)	350	.61 (-4.28)
175	.69 (-3.21)	355	.61 (-4.28)

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CLIENT: WQXB Exhibit 2

Date: 3/26/03

ANTENNA TYPE: FM10/6 DA

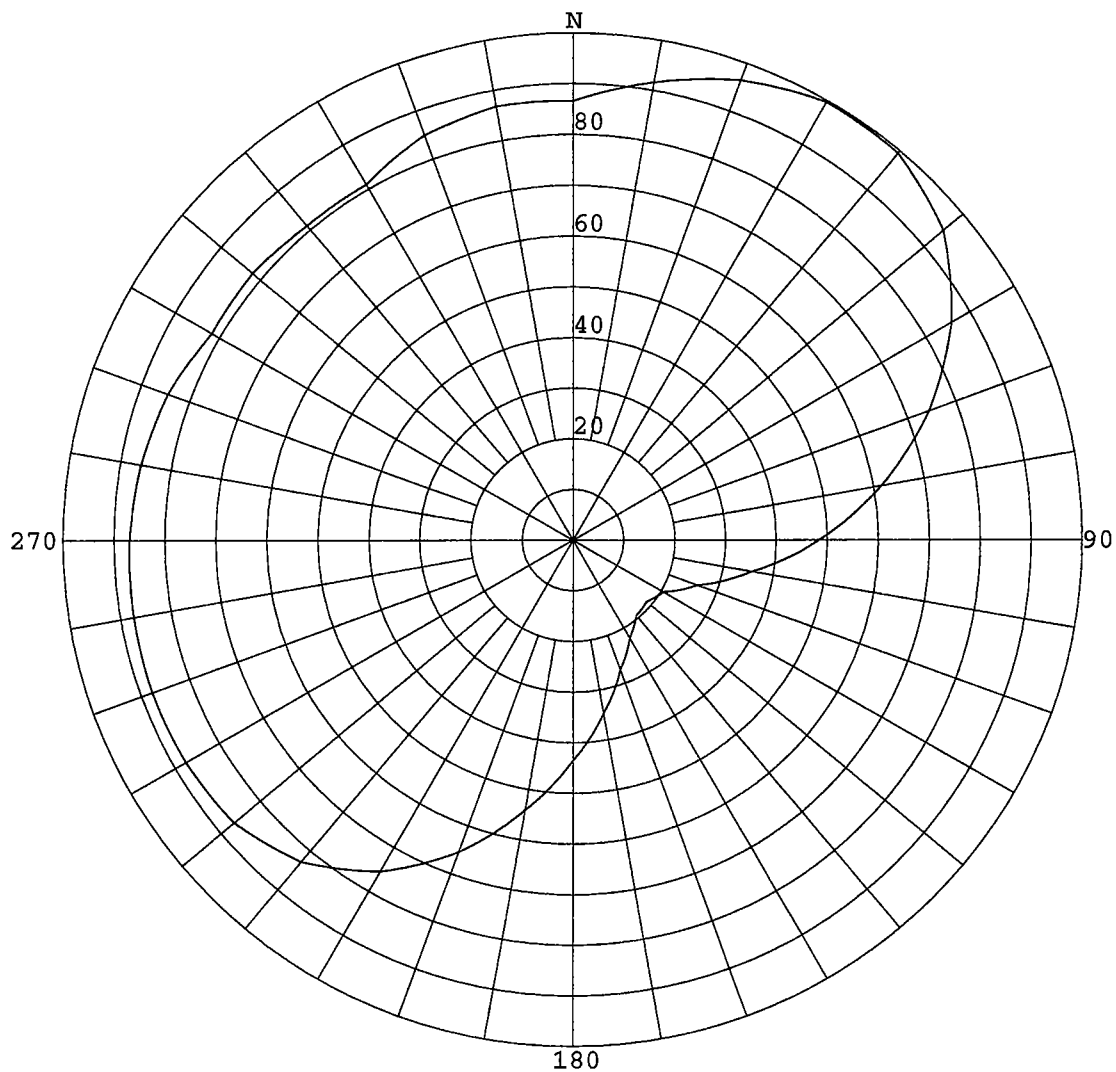
FREQUENCY: 100.1

PATTERN POL.: Horizontal

CIRCULARITY(+/-dB):

AZ. DIRECTIVITY:1.73 / 2.38dB

PATTERN RMS: 0.760



Azimuth Pattern

Scale: Linear

Systems With Reliability Inc.

Unit: Relative Field

CLIENT: WQXB Exhibit 3

Date: 3/26/03

ANTENNA TYPE: FM10/6 DA

FREQUENCY: 100.1

PATTERN POL.: Vertical

CIRCULARITY (+/-dB):

AZ. DIRECTIVITY: 1.856 / 2.69dB

PATTERN RMS: 0.734

Relative Field Tabulation(Azimuth)

Azimuth Heading	Relative Field(dB)	Azimuth Heading	Relative Field(dB)
0	.87 (-1.24)	180	.44 (-7.21)
5	.89 (-0.99)	185	.49 (-6.21)
10	.92 (-0.75)	190	.54 (-5.32)
15	.94 (-0.52)	195	.60 (-4.45)
20	.97 (-0.3)	200	.66 (-3.66)
25	.98 (-0.16)	205	.71 (-3.02)
30	1.00 (-0.02)	210	.76 (-2.43)
35	1.00 (-0.03)	215	.79 (-2.02)
40	.99 (-0.04)	220	.83 (-1.63)
45	.97 (-0.24)	225	.85 (-1.43)
50	.95 (-0.44)	230	.87 (-1.23)
55	.90 (-0.86)	235	.87 (-1.18)
60	.86 (-1.31)	240	.88 (-1.14)
65	.80 (-1.91)	245	.88 (-1.13)
70	.74 (-2.56)	250	.88 (-1.12)
75	.68 (-3.34)	255	.88 (-1.14)
80	.62 (-4.21)	260	.87 (-1.16)
85	.55 (-5.18)	265	.87 (-1.18)
90	.48 (-6.29)	270	.87 (-1.21)
95	.42 (-7.5)	275	.86 (-1.25)
100	.36 (-8.92)	280	.86 (-1.3)
105	.31 (-10.19)	285	.85 (-1.38)
110	.26 (-11.67)	290	.85 (-1.45)
115	.23 (-12.63)	295	.83 (-1.6)
120	.21 (-13.72)	300	.82 (-1.74)
125	.20 (-14.07)	305	.82 (-1.73)
130	.19 (-14.42)	310	.82 (-1.71)
135	.19 (-14.31)	315	.82 (-1.77)
140	.19 (-14.2)	320	.81 (-1.82)
145	.21 (-13.58)	325	.81 (-1.82)
150	.22 (-13)	330	.81 (-1.82)
155	.25 (-12.09)	335	.83 (-1.61)
160	.27 (-11.28)	340	.85 (-1.4)
165	.31 (-10.16)	345	.86 (-1.31)
170	.35 (-9.17)	350	.87 (-1.22)
175	.39 (-8.13)	355	.87 (-1.23)

Systems With Reliability Inc.

CLIENT: WQXB Exhibit 3

Date: 3/26/03

ANTENNA TYPE: FM10/6 DA

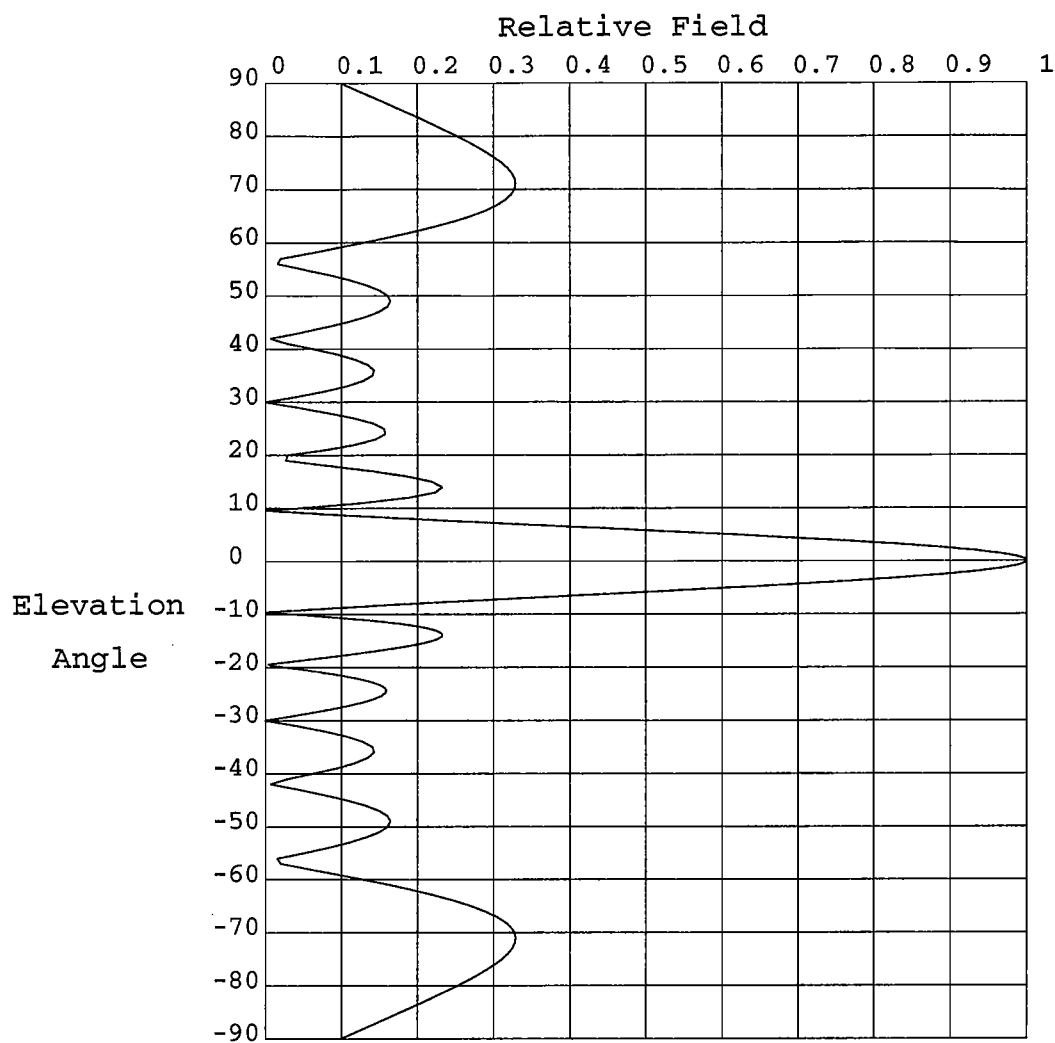
FREQUENCY: 100.1

PATTERN POL.: Vertical

CIRCULARITY(+/-dB):

AZ. DIRECTIVITY:1.856 / 2.69dB

PATTERN RMS: 0.734



Elevation Pattern

Scale: Linear

Systems With Reliability Inc.

Units: Field, Relative

CLIENT: WQXB Exhibit 4

Date: 2/19/03

ANTENNA TYPE: FM10/6

FREQUENCY: 100.1

PATTERN POL.: Circular

DIRECTIVITY(Peak) 6.321/8.008 dBd

Beam Tilt (Deg.) : 0

DIRECTIVITY(Horiz) 5.321/8.008 dBd

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

Relative Field Tabulation

Elev. Angle	Rel. Fld(dB)		Elev. Angle	Rel. Fld(dB)		Elev. Angl
3.2	.829 (-1.634)	-4.4	.691 (-3.211)	-12.0	.189 (-14.489)	
3.0	.848 (-1.429)	-4.6	.665 (-3.538)	-12.2	.198 (-14.083)	
2.8	.867 (-1.239)	-4.8	.639 (-3.886)	-12.4	.206 (-13.739)	
2.6	.885 (-1.064)	-5.0	.613 (-4.256)	-12.6	.213 (-13.451)	
2.4	.901 (-0.903)	-5.2	.586 (-4.649)	-12.8	.218 (-13.213)	
2.2	.917 (-0.756)	-5.4	.558 (-5.067)	-13.0	.223 (-13.022)	
2.0	.931 (-0.623)	-5.6	.53 (-5.512)	-13.2	.227 (-12.873)	
1.8	.944 (-0.503)	-5.8	.502 (-5.985)	-13.4	.23 (-12.765)	
1.6	.955 (-0.397)	-6.0	.474 (-6.489)	-13.6	.232 (-12.695)	
1.4	.966 (-0.303)	-6.2	.445 (-7.028)	-13.8	.233 (-12.661)	
1.2	.975 (-0.222)	-6.4	.417 (-7.603)	-14.0	.233 (-12.663)	
1.0	.982 (-0.154)	-6.6	.388 (-8.22)	-14.2	.232 (-12.699)	
.8	.989 (-0.098)	-6.8	.36 (-8.882)	-14.4	.23 (-12.769)	
.6	.994 (-0.055)	-7.0	.331 (-9.596)	-14.6	.227 (-12.872)	
.4	.997 (-0.025)	-7.2	.303 (-10.369)	-14.8	.224 (-13.008)	
.2	.999 (-0.006)	-7.4	.275 (-11.21)	-15.0	.219 (-13.178)	
.0	1.00 (0)	-7.6	.247 (-12.13)	-15.2	.214 (-13.382)	
-.2	.999 (-0.006)	-7.8	.22 (-13.145)	-15.4	.208 (-13.621)	
-.4	.997 (-0.025)	-8.0	.193 (-14.277)	-15.6	.202 (-13.897)	
-.6	.994 (-0.055)	-8.2	.167 (-15.553)	-15.8	.195 (-14.21)	
-.8	.989 (-0.098)	-8.4	.141 (-17.018)	-16.0	.187 (-14.563)	
-1.0	.982 (-0.154)	-8.6	.116 (-18.737)	-16.2	.179 (-14.959)	
-1.2	.975 (-0.222)	-8.8	.091 (-20.823)	-16.4	.17 (-15.4)	
-1.4	.966 (-0.303)	-9.0	.067 (-23.485)	-16.6	.16 (-15.891)	
-1.6	.955 (-0.397)	-9.2	.044 (-27.201)	-16.8	.151 (-16.437)	
-1.8	.944 (-0.503)	-9.4	.021 (-33.511)	-17.0	.141 (-17.043)	
-2.0	.931 (-0.623)	-9.6	.001 (-63.973)	-17.2	.13 (-17.718)	
-2.2	.917 (-0.756)	-9.8	.022 (-33.336)	-17.4	.119 (-18.472)	
-2.4	.901 (-0.903)	-10.0	.042 (-27.624)	-17.6	.108 (-19.319)	
-2.6	.885 (-1.064)	-10.2	.061 (-24.335)	-17.8	.097 (-20.276)	
-2.8	.867 (-1.239)	-10.4	.079 (-22.058)	-18.0	.085 (-21.369)	
-3.0	.848 (-1.429)	-10.6	.096 (-20.341)	-18.2	.074 (-22.635)	
-3.2	.829 (-1.634)	-10.8	.112 (-18.983)	-18.4	.062 (-24.13)	
-3.4	.808 (-1.855)	-11.0	.128 (-17.877)	-18.6	.05 (-25.942)	
-3.6	.786 (-2.091)	-11.2	.142 (-16.957)	-18.8	.039 (-28.236)	
-3.8	.763 (-2.344)	-11.4	.155 (-16.183)	-19.0	.027 (-31.347)	
-4.0	.74 (-2.615)	-11.6	.167 (-15.527)	-19.2	.016 (-36.193)	
-4.2	.716 (-2.903)	-11.8	.179 (-14.967)	-19.4	.004 (-47.865)	

Systems With Reliability Inc.

Page 1 of 2

CLIENT: WQXB Exhibit 4

Date: 2/19/03

ANTENNA TYPE: FM10/6

FREQUENCY: 100.1

PATTERN POL.: Circular

DIRECTIVITY(Peak) 6.321/8.008 dBd

Beam Tilt (Deg.) : 0

DIRECTIVITY(Horiz) 6.321/8.008 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 (-42.789)	-27.2	.11 (-19.207)	-54.0	.082 (-21.708)
-19.8	.018 (-34.726)	-27.4	.103 (-19.746)	-55.0	.05 (-25.949)
-20.0	.029 (-30.687)	-27.6	.096 (-20.348)	-56.0	.016 (-35.975)
-20.2	.04 (-27.998)	-27.8	.089 (-21.02)	-57.0	.02 (-33.828)
-20.4	.05 (-26)	-28.0	.082 (-21.775)	-58.0	.057 (-24.836)
-20.6	.06 (-24.424)	-28.2	.074 (-22.626)	-59.0	.094 (-20.535)
-20.8	.07 (-23.136)	-28.4	.066 (-23.596)	-60.0	.13 (-17.743)
-21.0	.079 (-22.057)	-28.6	.058 (-24.712)	-61.0	.164 (-15.729)
-21.2	.088 (-21.138)	-28.8	.05 (-26.016)	-62.0	.195 (-14.202)
-21.4	.096 (-20.346)	-29.0	.042 (-27.575)	-63.0	.223 (-13.015)
-21.6	.104 (-19.659)	-29.2	.034 (-29.497)	-64.0	.249 (-12.082)
-21.8	.111 (-19.059)	-29.4	.025 (-31.989)	-65.0	.271 (-11.35)
-22.0	.118 (-18.535)	-29.6	.017 (-35.513)	-66.0	.289 (-10.781)
-22.2	.125 (-18.076)	-29.8	.008 (-41.544)	-67.0	.304 (-10.349)
-22.4	.131 (-17.675)	-30.0	.00 (-50)	-68.0	.315 (-10.034)
-22.6	.136 (-17.327)	-31.0	.041 (-27.815)	-69.0	.323 (-9.821)
-22.8	.141 (-17.026)	-32.0	.077 (-22.242)	-70.0	.327 (-9.697)
-23.0	.145 (-16.768)	-33.0	.107 (-19.39)	-71.0	.329 (-9.654)
-23.2	.149 (-16.551)	-34.0	.129 (-17.795)	-72.0	.328 (-9.682)
-23.4	.152 (-16.371)	-35.0	.141 (-17.02)	-73.0	.324 (-9.777)
-23.6	.154 (-16.228)	-36.0	.143 (-16.897)	-74.0	.319 (-9.931)
-23.8	.156 (-16.118)	-37.0	.135 (-17.386)	-75.0	.311 (-10.142)
-24.0	.158 (-16.041)	-38.0	.118 (-18.539)	-76.0	.302 (-10.405)
-24.2	.159 (-15.997)	-39.0	.094 (-20.549)	-77.0	.291 (-10.718)
-24.4	.159 (-15.983)	-40.0	.064 (-23.941)	-78.0	.279 (-11.079)
-24.6	.158 (-16)	-41.0	.029 (-30.681)	-79.0	.266 (-11.487)
-24.8	.158 (-16.047)	-42.0	.007 (-43.222)	-80.0	.253 (-11.941)
-25.0	.156 (-16.124)	-43.0	.043 (-27.366)	-81.0	.239 (-12.443)
-25.2	.154 (-16.231)	-44.0	.077 (-22.315)	-82.0	.224 (-12.994)
-25.4	.152 (-16.37)	-45.0	.107 (-19.452)	-83.0	.209 (-13.597)
-25.6	.149 (-16.539)	-46.0	.131 (-17.644)	-84.0	.194 (-14.256)
-25.8	.146 (-16.741)	-47.0	.149 (-16.509)	-85.0	.178 (-14.977)
-26.0	.142 (-16.977)	-48.0	.161 (-15.879)	-86.0	.163 (-15.771)
-26.2	.137 (-17.247)	-49.0	.165 (-15.674)	-87.0	.147 (-16.649)
-26.4	.133 (-17.555)	-50.0	.161 (-15.864)	-88.0	.131 (-17.628)
-26.6	.127 (-17.901)	-51.0	.15 (-16.461)	-89.0	.116 (-18.733)
-26.8	.122 (-18.289)	-52.0	.133 (-17.519)	-90.0	.10 (-20)
-27.0	.116 (-18.723)	-53.0	.11 (-19.169)	90.0	.00 (-50)

Systems With Reliability Inc.

Page 2 of 2

CLIENT: WQXB Exhibit 4

Date: 2/19/03

ANTENNA TYPE: FM10/6

FREQUENCY: 100.1

PATTERN POL.: Circular

DIRECTIVITY(Peak) 6.321/8.008 dBd

Beam Tilt (Deg.) : 0

DIRECTIVITY(Horiz) 3.321/8.008 dBd

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

**SYSTEMS WITH RELIABILITY, Inc.****Broadcast Antenna & Transmission Systems****SYSTEM DATA SHEET**

Call Letters WQXB
Contact Bob Evans
Location Grenada, MS
Antenna Model FM10/6-DA
Channel / Frequency 100.1 MHz

ELECTRICAL SPECIFICATION

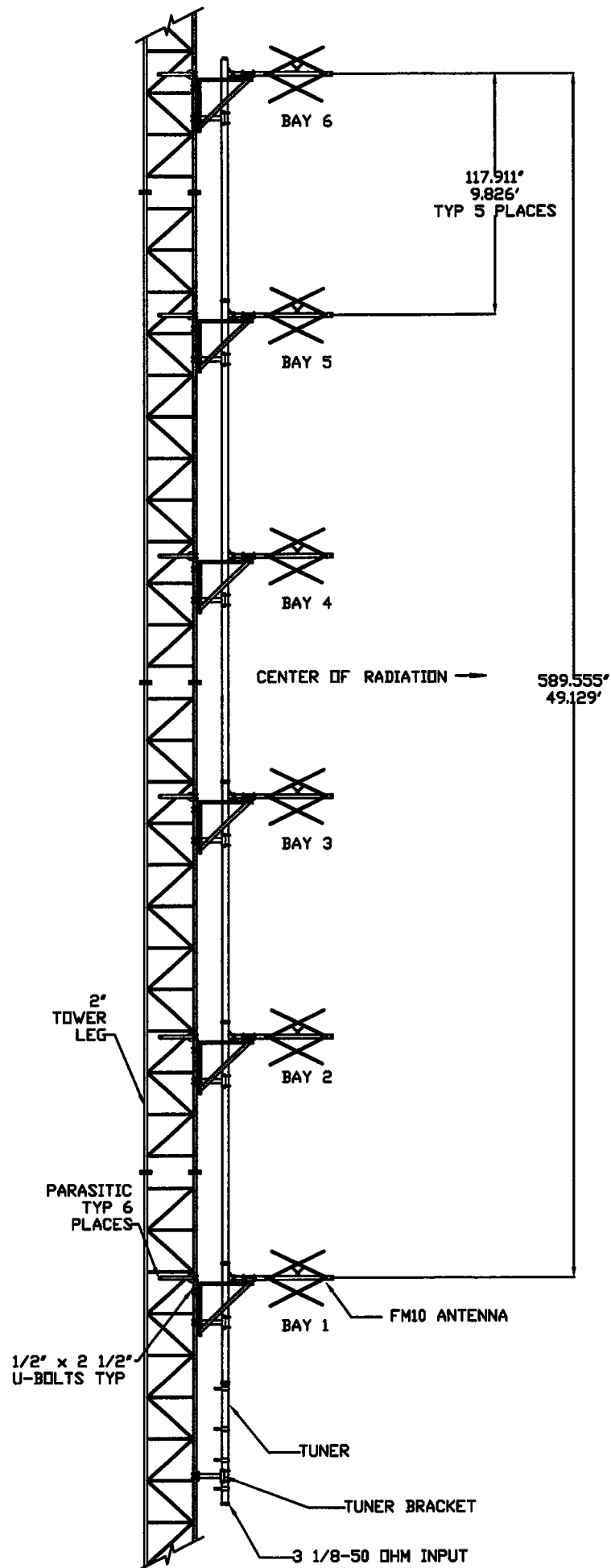
Polarization Type	Circular		
Polarization Ratio			
	H-Pol. (PRH)	51.6760	%
	V-Pol. (PRV)	48.3240	%
Elevation Directivity (ED)		6.321	
Azimuth Directivity (AD) H-Pol.		1.730	
Azimuth Directivity (AD) V-Pol.		1.850	
Antenna Gain (GH)			
	H-Pol. (GH)	5.651	
	V-Pol. (GV)	5.651	
dB Gain (AG)			
	H-Pol. (AGH)	7.521	
	V-Pol. (AGV)	7.521	
ERP			
	H-Pol. (ERPH)	50.000	kW
	V-Pol. (ERPV)	50.000	kW
Line Type	2 1/4 air 50 Ohm		
Attenuation per 100 ft.	0.183	dB/100ft	
Line Length (LL)	450.00	ft.	
Total Line Attenuation	0.82	dB	
Line Efficiency (LE)	82.73	%	
Line Loss (LPL)	1.85	kW	
Antenna Input Power (AIP)	8.85	kW	
Req'd. Transmitter Output Power	10.70	kW	

MECHANICAL SPECIFICATION

No. Of Bays	6			
Antenna Aperture	49.13	ft.	14.98	m
Center of Radiation AGL	416.56	ft.	127.00	m
Antenna Weight	425.00	lbs.	193.18	kg
Windload (50/33)	730.00	lbs.	331.82	kg

Prepared by:

Jason P Duncan



SYSTEMS WITH RELIABILITY, INC.
619 INDUSTRIAL PARK ROAD
FREMONT, NE 68025

TITLE: FM10/6-DA
FREQ. 100.1, WQXB, BESCO
DATE: 1/24/03

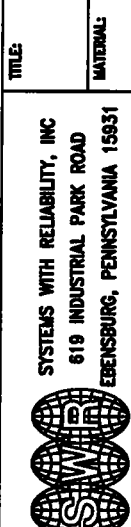
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REV: 1
DATE: 1/24/03

ENGINEER:

DRAWING NUMBER: 0606C00

SHEET 1 OF 1

DRAWING NUMBER: 0-76C01



FM10/6-DA, ORIENTATION
FREQ. 100.1, WQXB, BESCO

SIZE	A
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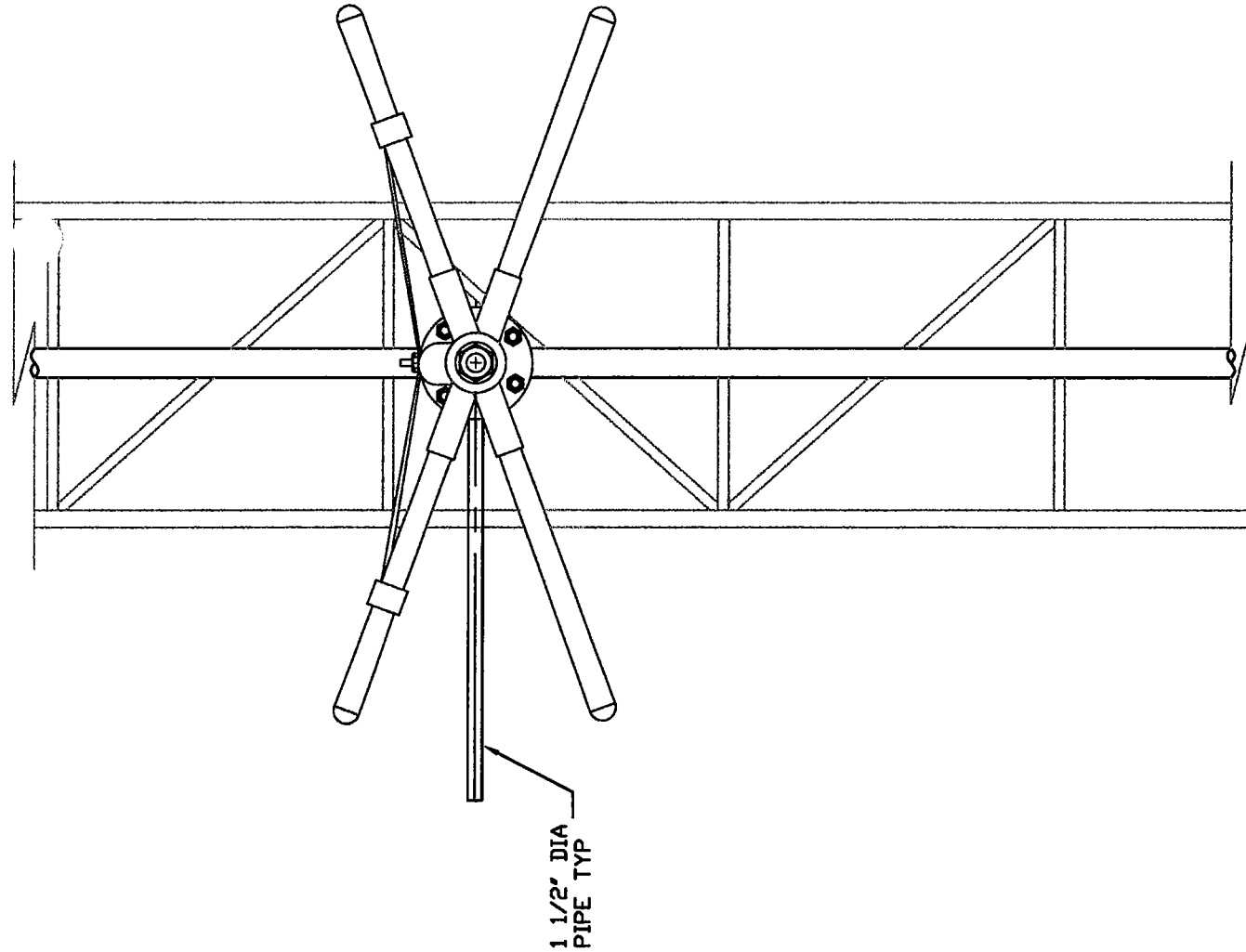
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TOLERANCES		REVISION RECORD			
		REV	APPROVAL	DATE	
.X	± .015				
.XX	± .005				
.XXX	± .002				
X/X	± 1/32				
DEG.	± 1/2				
UNLESS OTHERWISE SPECIFIED					

DRAWING NUMBER: 0606C01

NOTE:

DRAWING
NUMBER: 0-76C02





SYSTEMS WITH RELIABILITY, INC

618 INDUSTRIAL PARK ROAD

EBENSBURG, PENNSYLVANIA 15931

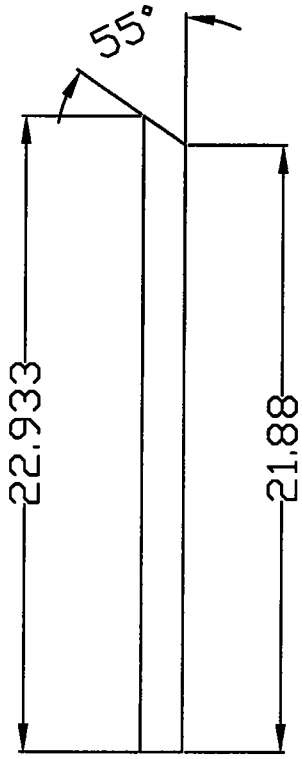
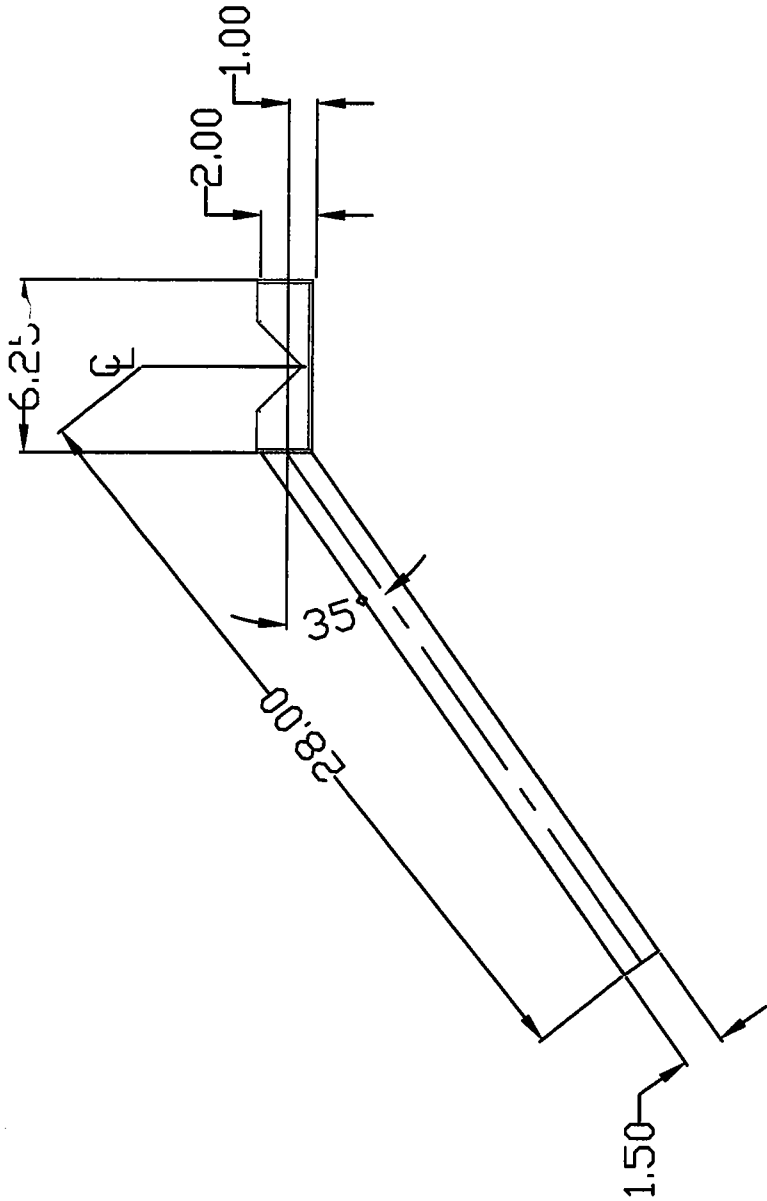
TITLE:	FM10/6-DA, FRONT VIEW WITH PARASITICS WQXB, FREQ. 100.1, BESCO.
MATERIAL:	

SIZE	A
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TOLERANCES		REVISION RECORD	
.X	± .015	REV	APPROVAL
.XX	± .005		DATE
.XXX	± .002		
X/X	± 1/32		
DEG.	± 1/2		
UNLESS OTHERWISE SPECIFIED			
		2	03/19/03
		1	03/19/03
PARTS MADE BY THIS DRAWING		DRAWING NUMBER	0606C02
SCALE: NTS	NAME: NI A	DATE: 03/19/03	SHEET 1 OF 1

NOTE:

DRAWING
NUMBER: 076C03



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

TITLE:

FM10/6-DA PARASITIC PLACEMENT
WQXB, FREQ 100.1, BESCO

MATERIAL:

SIZE

A

PARTS MADE BY THIS DRAWING

DRAWING
NUMBER:

0606C03

SCALE: NTS

NAME: OIA

DATE: 03/20/03

SHEET 1

OF 1

TOLERANCES	
.X	± .015
.XX	± .005
.XXX	± .002
X/X	± 1/32
DEG.	± 1/2
UNLESS OTHERWISE SPECIFIED	

REVISION RECORD	
REV	APPROVAL

