SYSTEMS WITH RELIABILITY, LTD.
Broadcast Antenna and Transmission Systems

PATTERN CERTIFICATION

DIRECTIONAL FM ANTENNA
KSCL
November 01, 2005

Call Sign	:	KSCL
Location	:	Shreveport, LA
Frequency	:	91.3 MHz
Channel	:	217
Antenna Model	:	FM3/3-DA
Maximum Antenna Gain		
Horizontal	:	3.490/ 5.428 dB
Vertical	:	3.490/ 5.428 dB

ANTENNA DESCRIPTION

A custom designed **FM3/3-DA** antenna was used to produce the required directional azimuth pattern. Each antenna bay consists of a circularly polarized cross V dipole radiating element with additional parasitic resonators, as required, to produce the pattern. The array is comprised of **three** bays, that are spaced a full wavelength apart, mounted to a tower pointing at **70** degrees from true north.

DESCRIPTION OF TEST PROCEDURE

The test antenna consists of a third-scale single bay antenna element and resonators. This antenna was mounted to a third-scale model tower with mounting brackets appropriately scaled to the ones supplied with the finalized antenna. The tower was placed on a 20 ft. wooden platform. All feed cables were properly grounded during pattern testing. Appropriate parasitic resonators were used to obtain desired directional pattern.

The receive antenna, a switchable (vertical/horizontal polarized) Cavity Back Resonator was mounted approximately 100 feet from the test antenna. The height and orientation was adjusted to provide a uniform field at the location of the single bay under test. The receive antenna was operated at a frequency of 273.9 MHz. The antenna under test was rotated in a clockwise direction in transmit mode. A gain reference was taken using a dipole tuned to 273.9 MHz. Nowhere does the received signal exceed a maximum to minimum ratio of 15 dB.

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
Computer	:	450 MHz Intel PIII
Plotter	:	Hewlett-Packard Laser Jet 6L
Positioner	:	Antenna Positioner Orbit AL-860-1 Position Controller Orbit AL-4901-3A.

The test equipment is calibrated in accordance to ANSI / NCSL Z540 -1-1994

Prepared by:

Jagannath G Shanbhag
Electrical Engineer
Department of Engineering
SWR Inc

TEST RESULTS

The attached calculations verify that the root mean square (RMS) of the measured composite antenna pattern is **95.38 %** of the RMS of the authorized composite directional antenna pattern of the related construction permit **File No.: BPED-20000511AAX**.
The following are the values of the measured antenna patterns

RMS value of circular polarized (Composite) pattern	**:**	**0.695**
Directivity of horizontal polarized pattern	**:**	**2.34857 / 3.71dB**
Directivity of vertical polarized pattern	**:**	**2.31854 / 3.65dB**
Directivity of circular polarized (Composite) pattern	**:**	**2.0654 / 3.1501dB**

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 = (2.34857)(2.991)(0.496783) = 3.490 / 5.428 dB
V-Pol. Gain = (2.31854)(2.991)(0.503217) = 3.490 / 5.428 dB

INSTALLATION AND MOUNTING

The antenna is to be mounted in accordance with the supplied drawings. The antenna center of radiation is to be **57.22** ***meters*** above ground level. The antenna (parasitic system included) aperture is **21.55** ***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 at **70** ***degrees*** from 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**
0596D01	ELEVATION ASSEMBLY
0596D02	ANTENNA ORIENTATION
0596D06	PARASITIC PLACEMENT
2105A10	TEST RANGE SCHEMATIC

The array shall be mounted according to **DWG. 0596D01**.The antenna elements shall be aligned at the same heading as in **DWG. 0596D02**.The parasitic assembly is shown in **DWG. 0596D06.** This will ensure that the antenna is oriented properly at **70** degrees from true north.

SYSTEMS WITH RELIABILITY, INC.

Broadcast Antennas and Transmission Systems

KSCL Antenna RMS Comparison

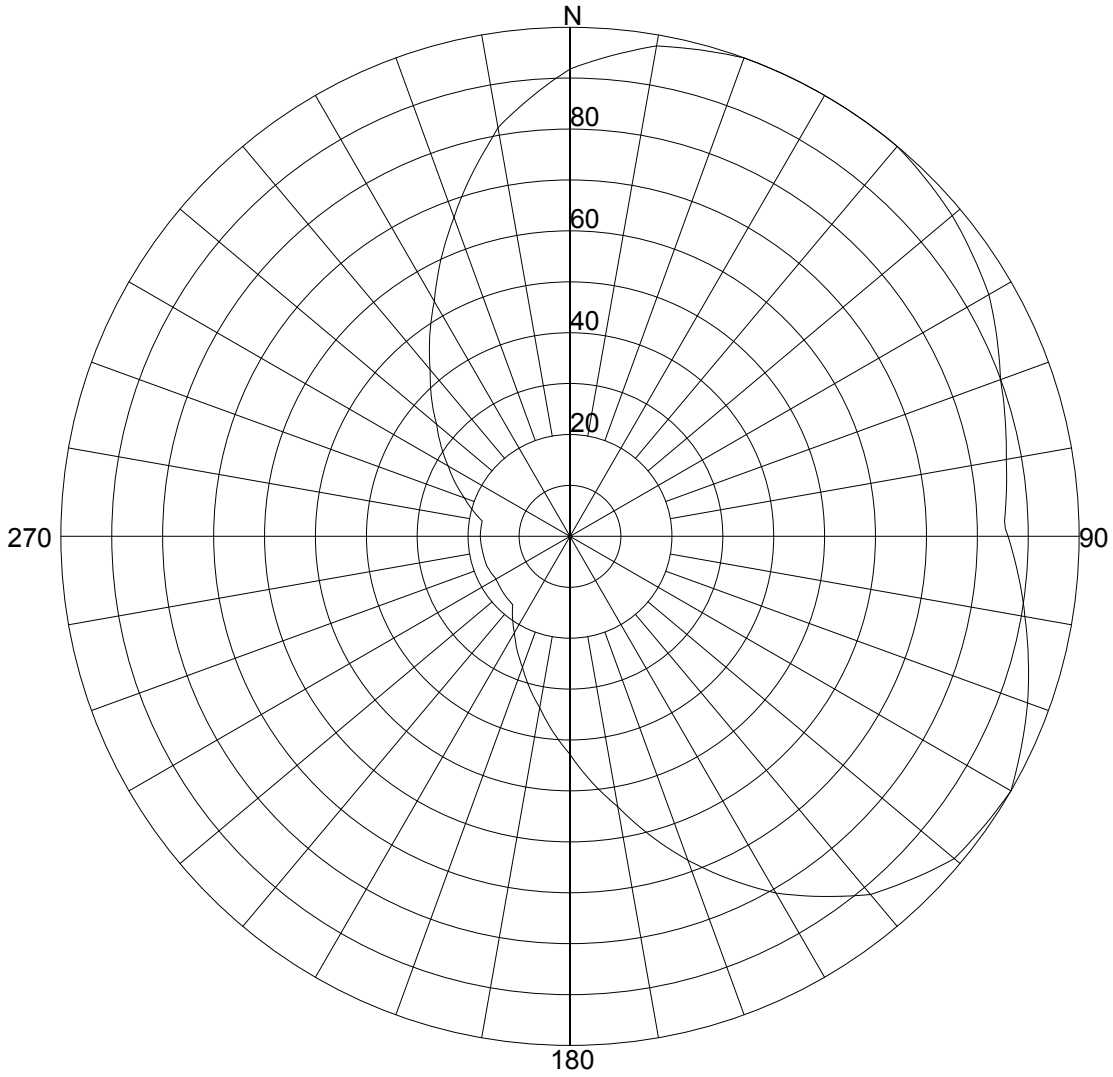
PROPOSED ANTENNA	
Azimuth Heading	Relative Field
0	1.0000
10	1.0000
20	1.0000
30	1.0000
40	1.0000
50	1.0000
60	1.0000
70	1.0000
80	1.0000
90	1.0000
100	1.0000
110	1.0000
120	1.0000
130	1.0000
140	1.0000
150	0.8560
160	0.6840
170	0.5460
180	0.4370
190	0.3490
200	0.2790
210	0.2230
220	0.1780
230	0.1780
240	0.1780
250	0.1780
260	0.1780

DESIGNED ANTENNA	
Azimuth Heading	Relative Field
0	0.9180
10	0.9780
20	1.0000
30	1.0000
40	1.0000
50	0.9800
60	0.9500
70	0.9000
80	0.8700
90	0.8604
100	0.9075
110	0.9565
120	1.0000
130	0.9850
140	0.9181
150	0.8090
160	0.6770
170	0.5390
180	0.4283
190	0.3420
200	0.2734
210	0.2185
220	0.1750
230	0.1715
240	0.1680
250	0.1733
260	0.1742

PROPOSED ANTENNA	
Azimuth Heading	**Relative Field**
270	0.1780
280	0.1780
290	0.2230
300	0.2790
310	0.3490
320	0.4370
330	0.5460
340	0.6840
350	0.8560
Sum of Relative Field Squared :	19.100
Sum Divided by 36 (Readings) :	0.531
Square Root :	0.728

DESIGNED ANTENNA	
Azimuth Heading	**Relative Field**
270	0.1762
280	0.1752
290	0.2208
300	0.2762
310	0.3420
320	0.4273
330	0.5331
340	0.6664
350	0.8150
Sum of Relative Field Squared :	17.375
Sum Divided by 36 (Readings) :	0.483
Square Root :	0.695

Percentage of Construction Permit Antenna Filled : 95.38%



Azimuth Pattern

Scale: Linear

Unit: Relative Field

Systems With Reliability

CLIENT: *Centenary College of Louisiana*

Date: 10/29/2005

ANTENNA TYPE: FM3/3 DA

FREQUENCY: 91.3

PATTERN POL.: Circular

CIRCULARITY(+/-dB):

AZ. DIRECTIVITY: 2.0654 / 3.1501dB

PATTERN RMS: *0.695*

Micro-Tek Eng. Ver. 2000

Relative Field Tabulation(Azimuth)

Azimuth Heading	Relative Field(dB)	Azimuth Heading	Relatve Field(dB)
0	.9180 (-0.73)	180	.4283 (-7.35)
5	.9480 (-0.45)	185	.3851 (-8.27)
10	.9780 (-0.18)	190	.3420 (-9.29)
15	.9890 (-0.09)	195	.3077 (-10.21)
20	1.0000 (0.01)	200	.2734 (-11.23)
25	1.0000 (0.01)	205	.2460 (-12.15)
30	1.0000 (0.01)	210	.2185 (-13.17)
35	1.0000 (0.01)	215	.1968 (-14.08)
40	1.0000 (0.01)	220	.1750 (-15.09)
45	.9900 (-0.08)	225	.1733 (-15.18)
50	.9800 (-0.17)	230	.1715 (-15.26)
55	.9650 (-0.3)	235	.1695 (-15.36)
60	.9500 (-0.44)	240	.1680 (-15.44)
65	.9250 (-0.67)	245	.1704 (-15.32)
70	.9000 (-0.91)	250	.1733 (-15.18)
75	.8850 (-1.05)	255	.1737 (-15.15)
80	.8700 (-1.2)	260	.1742 (-15.13)
85	.8600 (-1.3)	265	.1752 (-15.08)
90	.8604 (-1.3)	270	.1762 (-15.03)
95	.8840 (-1.06)	275	.1757 (-15.05)
100	.9075 (-0.83)	280	.1752 (-15.08)
105	.9320 (-0.6)	285	.1980 (-14.02)
110	.9565 (-0.38)	290	.2208 (-13.08)
115	.9782 (-0.18)	295	.2485 (-12.06)
120	1.0000 (0.01)	300	.2762 (-11.14)
125	.9925 (-0.06)	305	.3091 (-10.17)
130	.9850 (-0.12)	310	.3420 (-9.29)
135	.9516 (-0.42)	315	.3847 (-8.28)
140	.9181 (-0.73)	320	.4273 (-7.37)
145	.8636 (-1.26)	325	.4802 (-6.35)
150	.8090 (-1.83)	330	.5331 (-5.45)
155	.7430 (-2.57)	335	.5998 (-4.43)
160	.6770 (-3.38)	340	.6664 (-3.51)
165	.6080 (-4.31)	345	.7392 (-2.61)
170	.5390 (-5.35)	350	.8150 (-1.77)
175	.4836 (-6.29)	355	.8665 (-1.23)

Systems With Reliability

CLIENT: *Centenary College of Louisiana*

Date: 10/29/2005

ANTENNA TYPE: FM3/3 DA

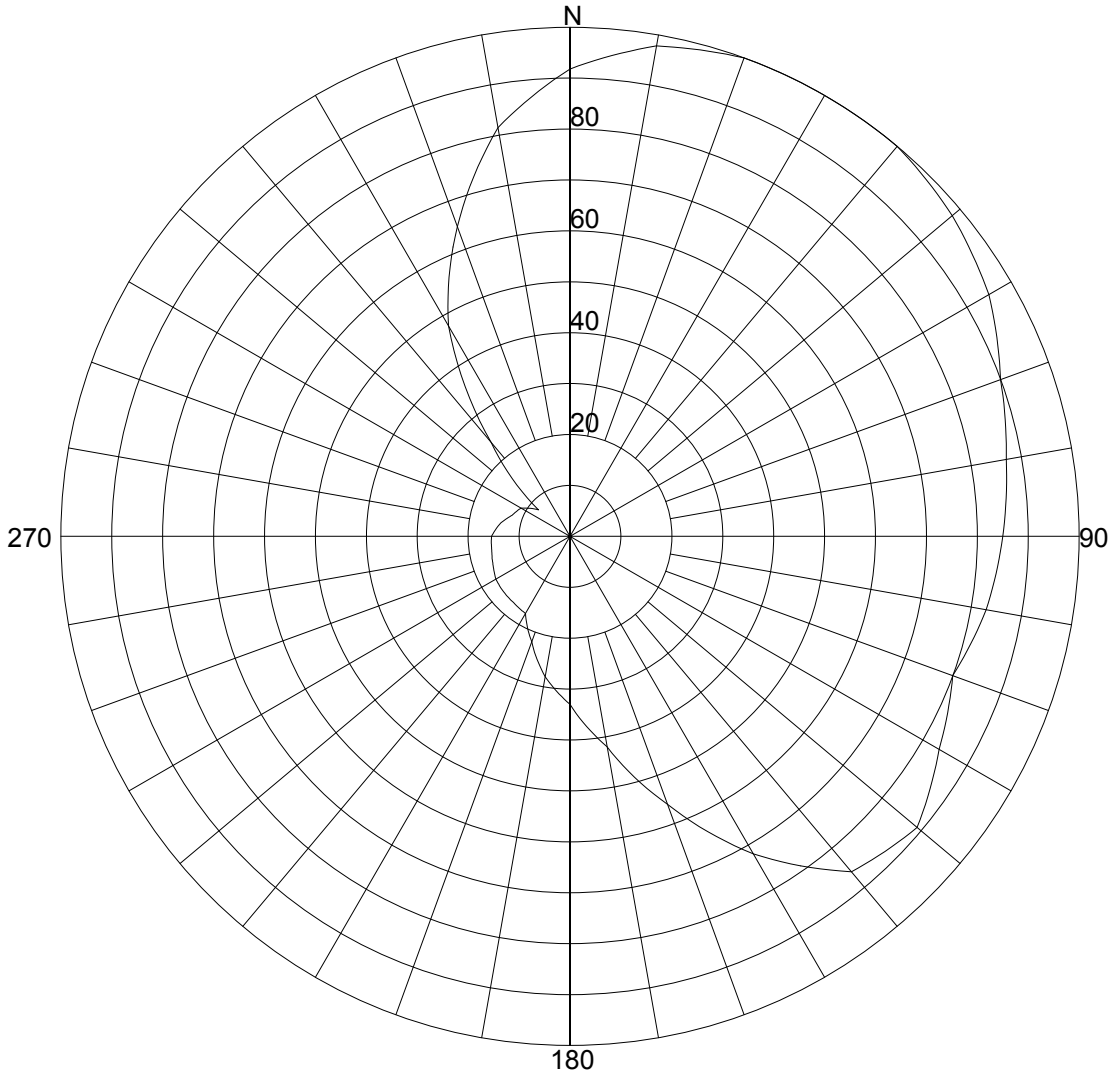
FREQUENCY: 91.3

PATTERN POL.: Circular

CIRCULARITY(+/-dB):

AZ. DIRECTIVITY: 2.0654 / 3.1501dB

PATTERN RMS: *0.695*



Azimuth Pattern

Scale: Linear

Unit: Relative Field

Systems With Reliability

CLIENT: *Centenary College of Louisiana*

Date: 10/29/2005

ANTENNA TYPE: FM3/3 DA

FREQUENCY: 91.3

PATTERN POL.: Horizontal

CIRCULARITY(+/-dB):

AZ. DIRECTIVITY: 2.34857 / 3.71dB

PATTERN RMS: *0.653*

Micro-Tek Eng. Ver. 2000

Relative Field Tabulation(Azimuth)

Azimuth Heading	Relative Field(dB)	Azimuth Heading	Relatve Field(dB)
0	.9180 (-0.73)	180	.3300 (-9.6)
5	.9480 (-0.45)	185	.3050 (-10.29)
10	.9780 (-0.18)	190	.2800 (-11.03)
15	.9890 (-0.09)	195	.2500 (-12.01)
20	1.0000 (0.01)	200	.2200 (-13.11)
25	1.0000 (0.01)	205	.1975 (-14.04)
30	1.0000 (0.01)	210	.1750 (-15.09)
35	1.0000 (0.01)	215	.1730 (-15.19)
40	1.0000 (0.01)	220	.1710 (-15.29)
45	.9900 (-0.08)	225	.1705 (-15.31)
50	.9800 (-0.17)	230	.1700 (-15.34)
55	.9650 (-0.3)	235	.1690 (-15.39)
60	.9500 (-0.44)	240	.1680 (-15.44)
65	.9250 (-0.67)	245	.1645 (-15.62)
70	.9000 (-0.91)	250	.1610 (-15.81)
75	.8850 (-1.05)	255	.1585 (-15.94)
80	.8700 (-1.2)	260	.1560 (-16.08)
85	.8600 (-1.3)	265	.1550 (-16.14)
90	.8500 (-1.4)	270	.1540 (-16.19)
95	.8400 (-1.5)	275	.1470 (-16.59)
100	.8300 (-1.61)	280	.1400 (-17.02)
105	.8150 (-1.77)	285	.1305 (-17.62)
110	.8000 (-1.93)	290	.1210 (-18.27)
115	.8185 (-1.73)	295	.1160 (-18.64)
120	.8370 (-1.54)	300	.1110 (-19.02)
125	.8635 (-1.26)	305	.0960 (-20.26)
130	.8900 (-1)	310	.0810 (-21.72)
135	.8750 (-1.15)	315	.1610 (-15.81)
140	.8600 (-1.3)	320	.2410 (-12.32)
145	.7900 (-2.04)	325	.3590 (-8.87)
150	.7200 (-2.84)	330	.4770 (-6.41)
155	.6400 (-3.86)	335	.5620 (-4.99)
160	.5600 (-5.02)	340	.6470 (-3.77)
165	.4900 (-6.18)	345	.7310 (-2.71)
170	.4200 (-7.51)	350	.8150 (-1.77)
175	.3750 (-8.5)	355	.8665 (-1.23)

Systems With Reliability

CLIENT: *Centenary College of Louisiana*

Date: 10/29/2005

ANTENNA TYPE: FM3/3 DA

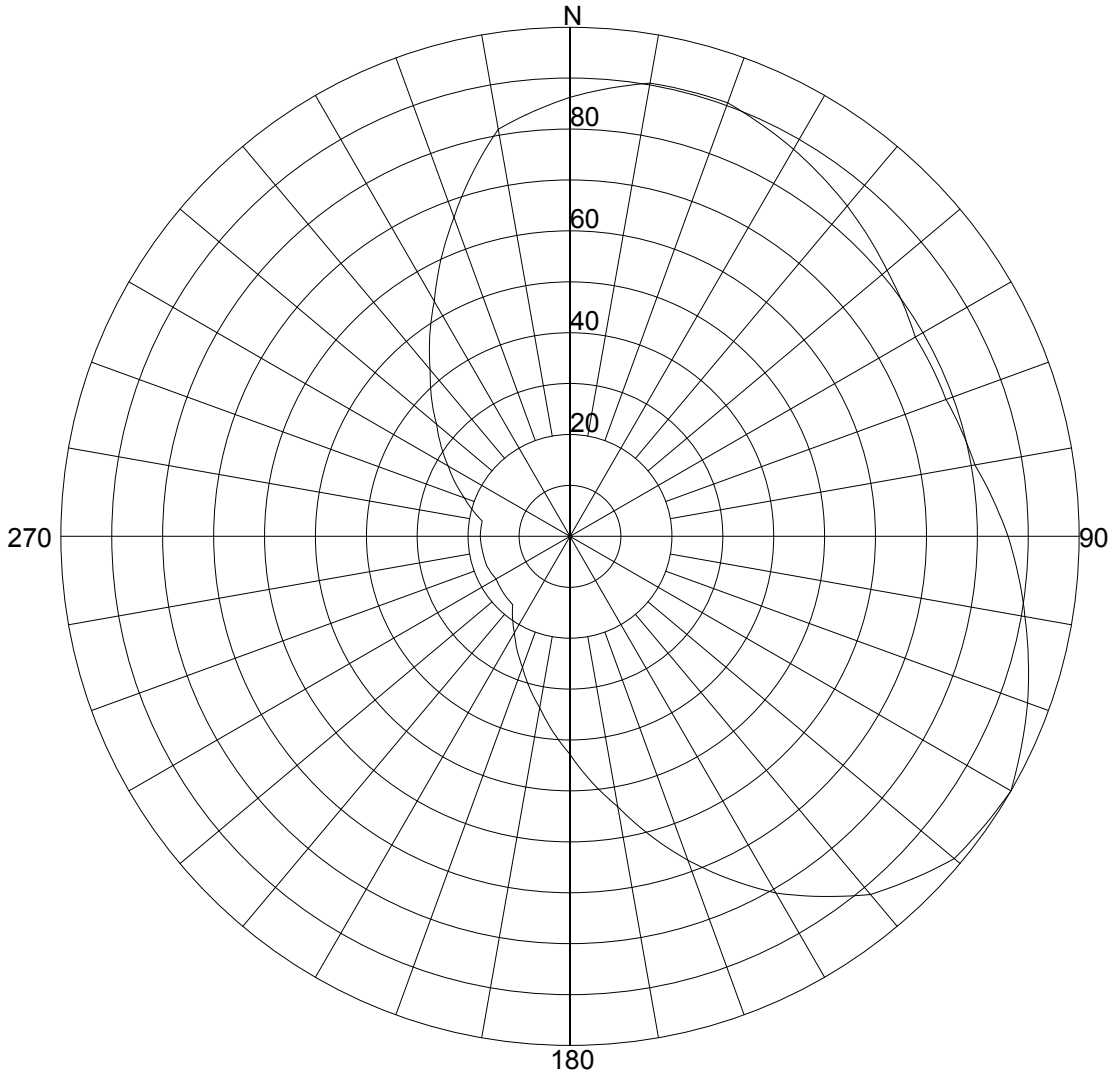
FREQUENCY: 91.3

PATTERN POL.: Horizontal

CIRCULARITY(+/-dB):

AZ. DIRECTIVITY: 2.34857 / 3.71dB

PATTERN RMS: *0.653*



Azimuth Pattern

Scale: Linear

Unit: Relative Field

Systems With Reliability

CLIENT: *Centenary College of Louisiana*

Date: 10/29/2005

ANTENNA TYPE: FM3/3 DA

FREQUENCY: 91.3

PATTERN POL.: Vertical

CIRCULARITY(+/-dB):

AZ. DIRECTIVITY: 2.31854 / 3.65dB

PATTERN RMS: *0.657*

Micro-Tek Eng. Ver. 2000

Relative Field Tabulation(Azimuth)

Azimuth Heading	Relative Field(dB)	Azimuth Heading	Relatve Field(dB)
0	.8624 (-1.28)	180	.4283 (-7.35)
5	.8832 (-1.07)	185	.3851 (-8.27)
10	.9040 (-0.87)	190	.3420 (-9.29)
15	.9050 (-0.86)	195	.3077 (-10.21)
20	.9060 (-0.85)	200	.2734 (-11.23)
25	.8920 (-0.98)	205	.2460 (-12.15)
30	.8780 (-1.12)	210	.2185 (-13.17)
35	.8625 (-1.27)	215	.1968 (-14.08)
40	.8470 (-1.43)	220	.1750 (-15.09)
45	.8300 (-1.61)	225	.1733 (-15.18)
50	.8130 (-1.79)	230	.1715 (-15.26)
55	.7980 (-1.95)	235	.1695 (-15.36)
60	.7830 (-2.11)	240	.1676 (-15.46)
65	.7845 (-2.1)	245	.1704 (-15.32)
70	.7860 (-2.08)	250	.1733 (-15.18)
75	.7968 (-1.96)	255	.1737 (-15.15)
80	.8075 (-1.85)	260	.1742 (-15.13)
85	.8340 (-1.57)	265	.1752 (-15.08)
90	.8604 (-1.3)	270	.1762 (-15.03)
95	.8840 (-1.06)	275	.1757 (-15.05)
100	.9075 (-0.83)	280	.1752 (-15.08)
105	.9320 (-0.6)	285	.1980 (-14.02)
110	.9565 (-0.38)	290	.2208 (-13.08)
115	.9782 (-0.18)	295	.2485 (-12.06)
120	1.0000 (0.01)	300	.2762 (-11.14)
125	.9925 (-0.06)	305	.3091 (-10.17)
130	.9850 (-0.12)	310	.3420 (-9.29)
135	.9516 (-0.42)	315	.3847 (-8.28)
140	.9181 (-0.73)	320	.4273 (-7.37)
145	.8636 (-1.26)	325	.4802 (-6.35)
150	.8090 (-1.83)	330	.5331 (-5.45)
155	.7430 (-2.57)	335	.5998 (-4.43)
160	.6770 (-3.38)	340	.6664 (-3.51)
165	.6080 (-4.31)	345	.7392 (-2.61)
170	.5390 (-5.35)	350	.8120 (-1.8)
175	.4836 (-6.29)	355	.8372 (-1.53)

Systems With Reliability

CLIENT: *Centenary College of Louisiana*

Date: 10/29/2005

ANTENNA TYPE: FM3/3 DA

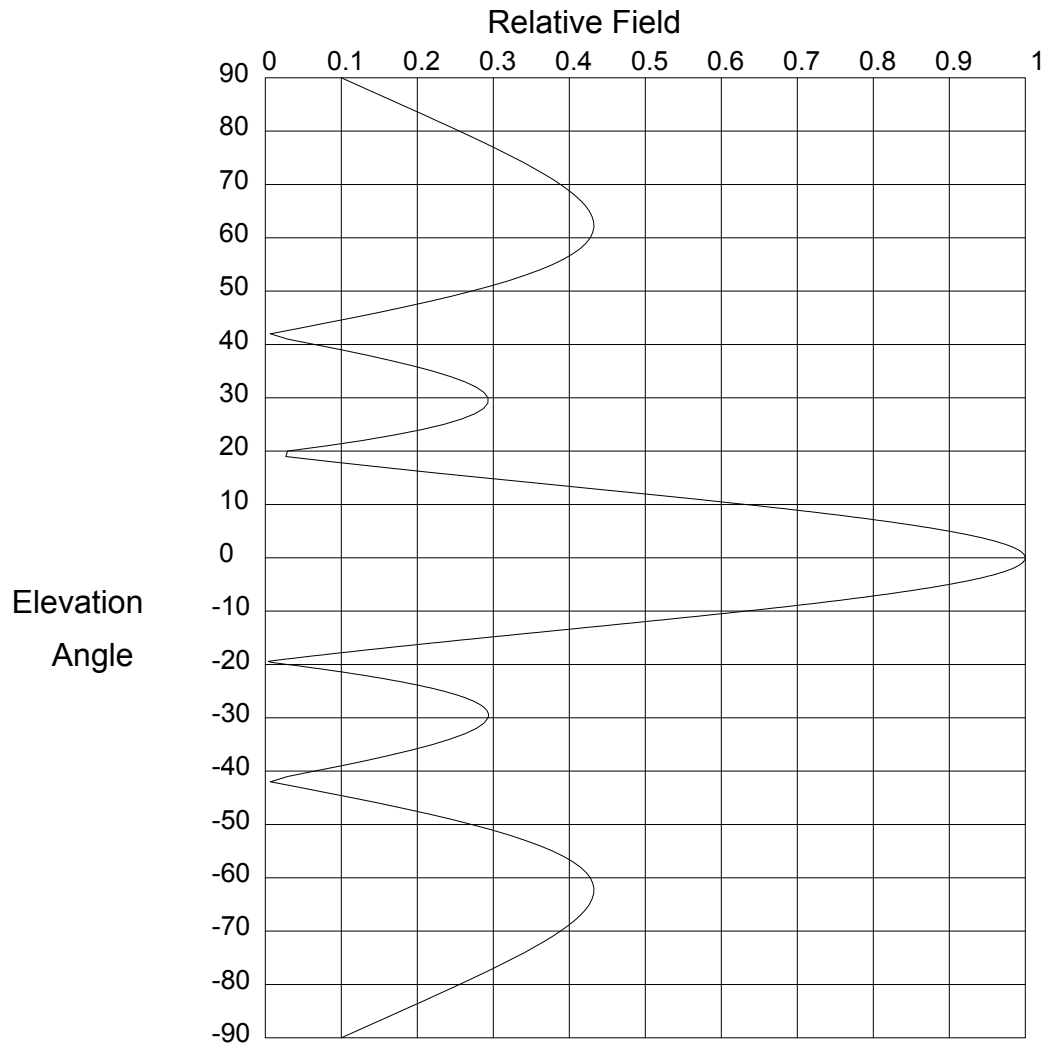
FREQUENCY: 91.3

PATTERN POL.: Vertical

CIRCULARITY(+/-dB):

AZ. DIRECTIVITY: 2.31854 / 3.65dB

PATTERN RMS: *0.657*



Elevation Pattern

Scale: Linear

Units: Field, Relative

Systems With Reliability

CLIENT: *Centenary College of Lousiana*

Date: 10/21/2005

ANTENNA TYPE: FM3/3 DA

FREQUENCY: 91.3

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*

Micro-Tek Eng. Ver. 2000

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

CLIENT: *Centenary College of Lousiana*
Date: 10/21/2005
ANTENNA TYPE: FM3/3 DA
FREQUENCY: 91.3
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

CLIENT: *Centenary College of Lousiana*
Date: 10/21/2005
ANTENNA TYPE: FM3/3 DA
FREQUENCY: 91.3
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

CLIENT: *Centenary College of Lousiana*
Date: 10/21/2005
ANTENNA TYPE: FM3/3 DA
FREQUENCY: 91.3
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*

(800) 762-7743 (814)472-5436 Fax: (814) 472-5552

SYSTEMS WITH RELIABILITY, Inc.

Broadcast Antenna & Transmission Systems

SYSTEM DATA SHEET

Customer	Centenary College of Louisiana
Contact	Benny Springer
Location	Shreveport,LA
Antenna Model	FM3/3 DA
Channel / Frequency	91.3 MHz
Shop Order No.	05520

ELECTRICAL SPECIFICATION

Polarization Type	Circular	
Polarization Ratio		
H-Pol. (PRH)	49.6783	**%**
V-Pol. (PRV)	50.3217	**%**
Elevation Directivity (ED)	2.991	
Azimuth Directivity (AD) H-Pol.	2.349	
Azimuth Directivity (AD) V-Pol.	2.319	
Antenna Gain (GH)		
H-Pol. (GH)	3.490	
V-Pol. (GV)	3.490	
dB Gain (AG)		
H-Pol (AGH)	5.428	
V-Pol (AGV)	5.428	
ERP		
H-Pol. (ERPH)	6.000	**kW**
V-Pol. (ERPV)	6.000	**kW**
Line Type	1 5/8" Air	**HJ7-50A**
Attenuation per 100 ft.	0.197	**dB/100ft**
Line Length (LL)	280.00	**ft.**
Total Line Attenuation	0.55	**dB**
Line Efficiency (LE)	88.07	**%**
Line Loss (LPL)	0.23	**kW**
Antenna Input Power (AIP)	1.72	**kW**
Req'd. Transmitter Output Power	1.95	**kW**

MECHANICAL SPECIFICATION

No. Of Bays	3			
Antenna Aperture	21.55	**ft.**	6.57	**m**
Center of Radiation (A.G.L)	187.73	**ft.**	57.22	**m**
Antenna Weight	155.00	**lbs.**	70.45	**kg**
Windload (50/33)	260.00	**lbs.**	118.18	**kg**

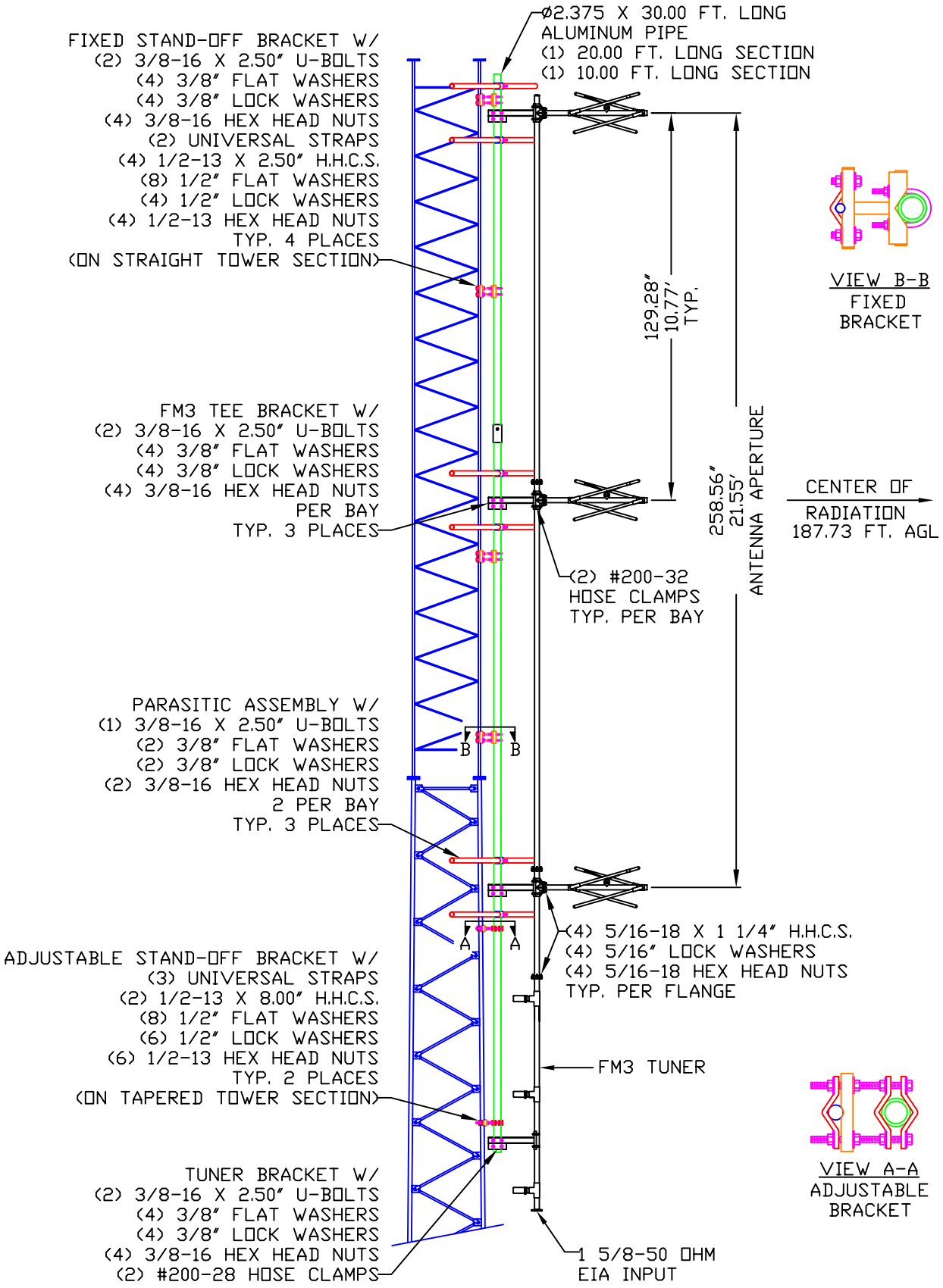
Prepared by:

Jagannath G Shanbhag
Electrical Engineer
Department of Engineering
SWR,Inc

DRAWING NUMBER: 0596D01

NOTES:

1. REFERENCE DWG. #0596D02 FOR ANTENNA ORIENTATION.
2. REFERENCE DWG. #0596D06 FOR PARASITIC PLACEMENT.

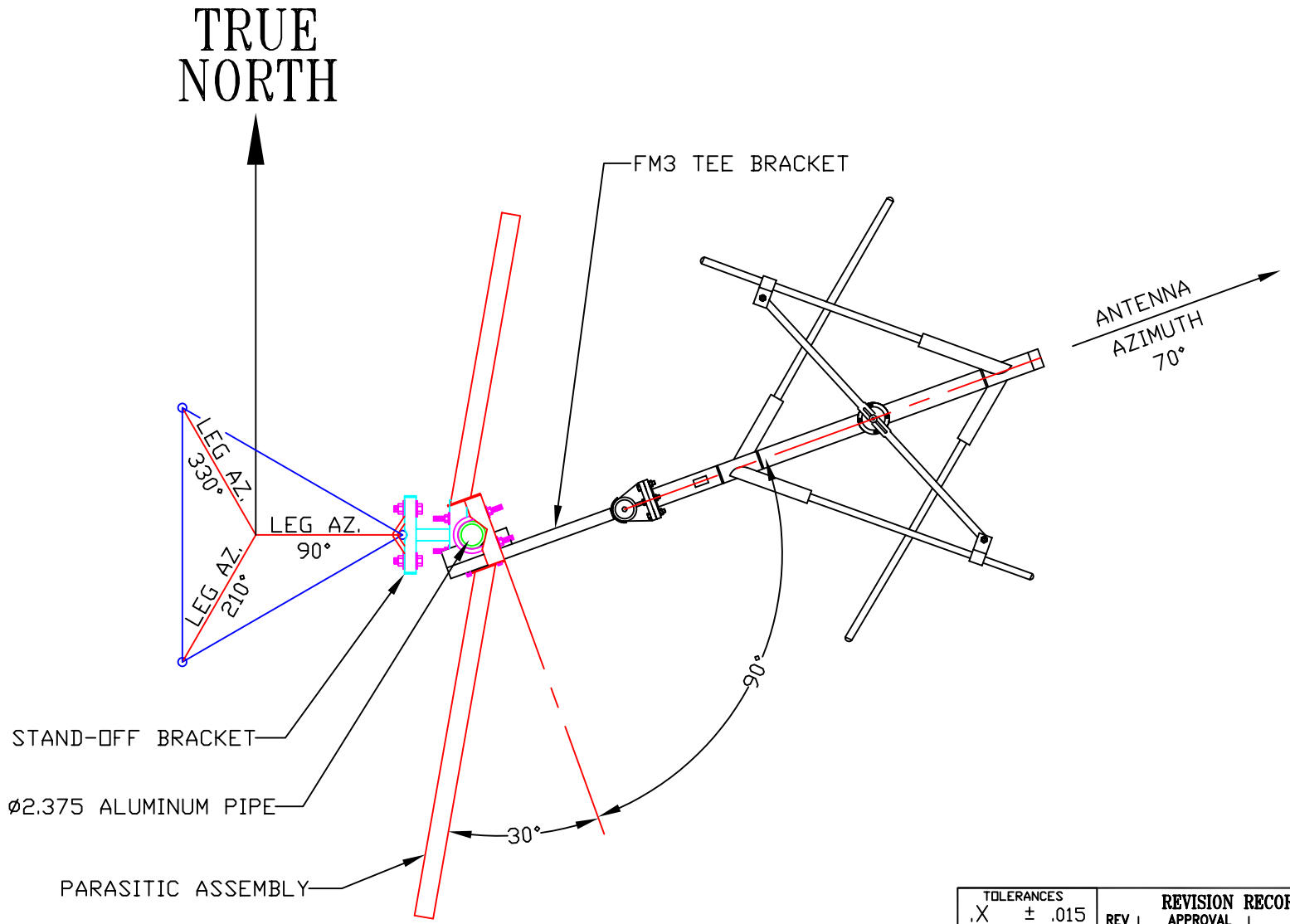


SYSTEMS WITH RELIABILITY, INC 619 INDUSTRIAL PARK ROAD EBENSBURG, PENNSYLVANIA 15931	TITLE: FM3/3-DA, FREQ. 91.3 KSCL, SHREVEPORT, AL MATERIAL:	SIZE C	REV	APPR.	DATE	ENGINEER:	DRAWING NUMBER: 0596D01	
			1			SCALE: NTS	NAME: RAC	DATE: 10/31/05 SHEET 1 OF 1
			2					
			3					

NOTE:

REFERENCE DWG. #0596D06
FOR PARASITIC PLACEMENT.

DRAWING NUMBER: 0596D02



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

UNLESS OTHERWISE SPECIFIED

REVISION RECORD

REV	APPROVAL	DATE

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

TITLE: FM3/3-DA, FREQ. 91.3
KSCL, SHREVEPORT, LA

MATERIAL: ANTENNA ORIENTATION
TOP VIEW

SIZE A

PARTS MADE BY THIS DRAWING

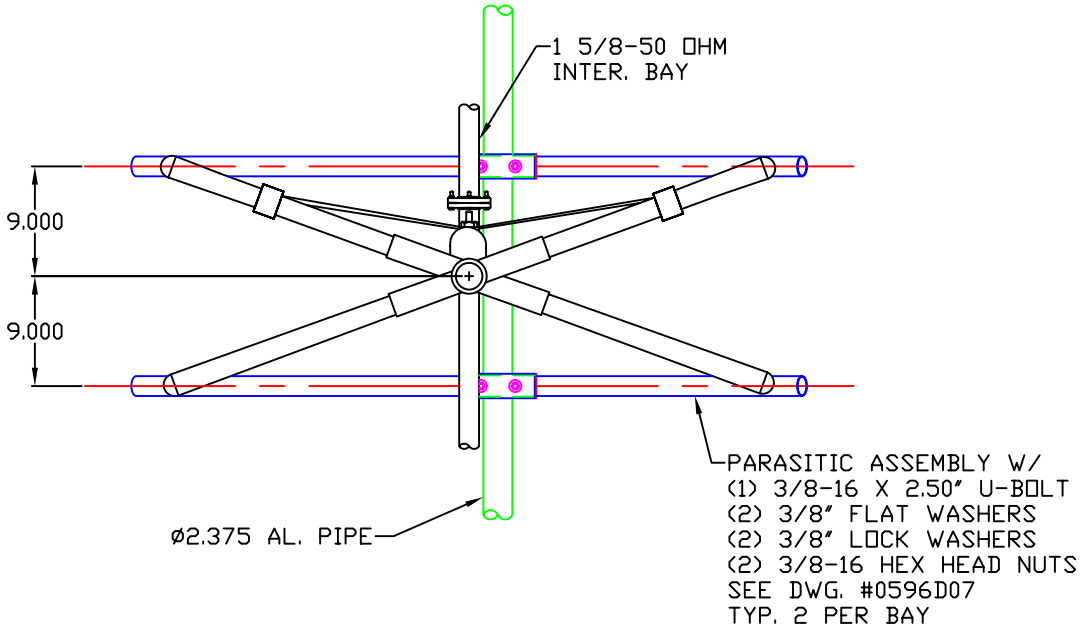
DRAWING NUMBER: 0596D02

SCALE: NTS | NAME: RAC | DATE: 10/31/05 | SHEET 1 OF 1

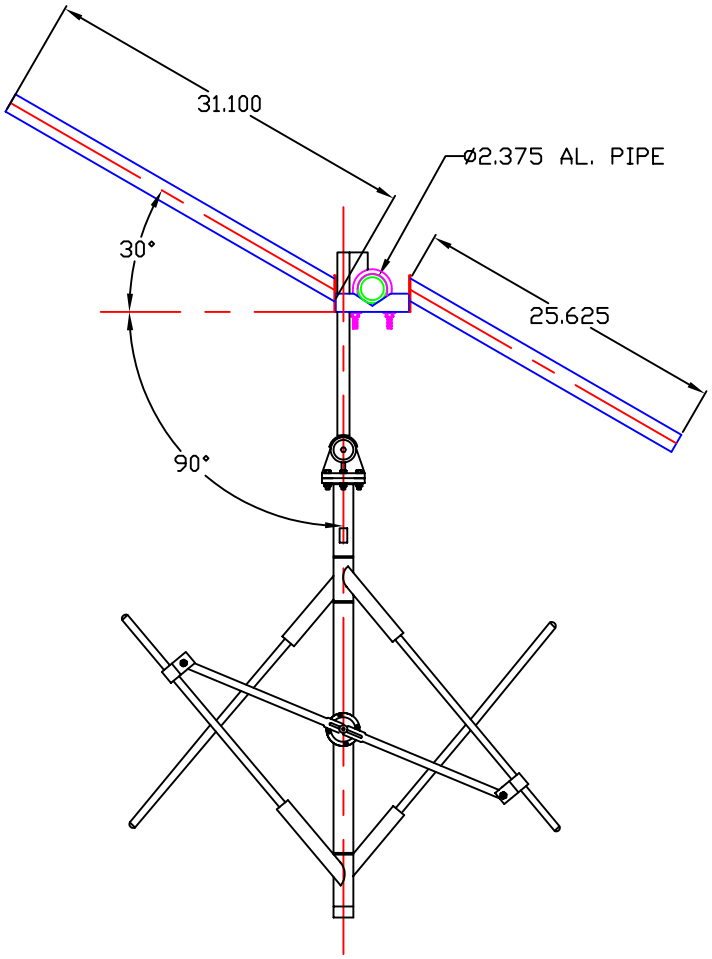
NOTE:

PARASITIC ASSEMBLIES TO BE MOUNTED
ON ø2.375 AL. PIPE AS SHOWN.

DRAWING NUMBER: 0596D06



FRONT VIEW



TOP VIEW

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

UNLESS OTHERWISE SPECIFIED

REVISION RECORD

REV	APPROVAL	DATE

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

TITLE: FM3/3-DA, FREQ. 91.3
KSCL, SHREVEPORT, LA

MATERIAL: PARASITIC PLACEMENT

SIZE A

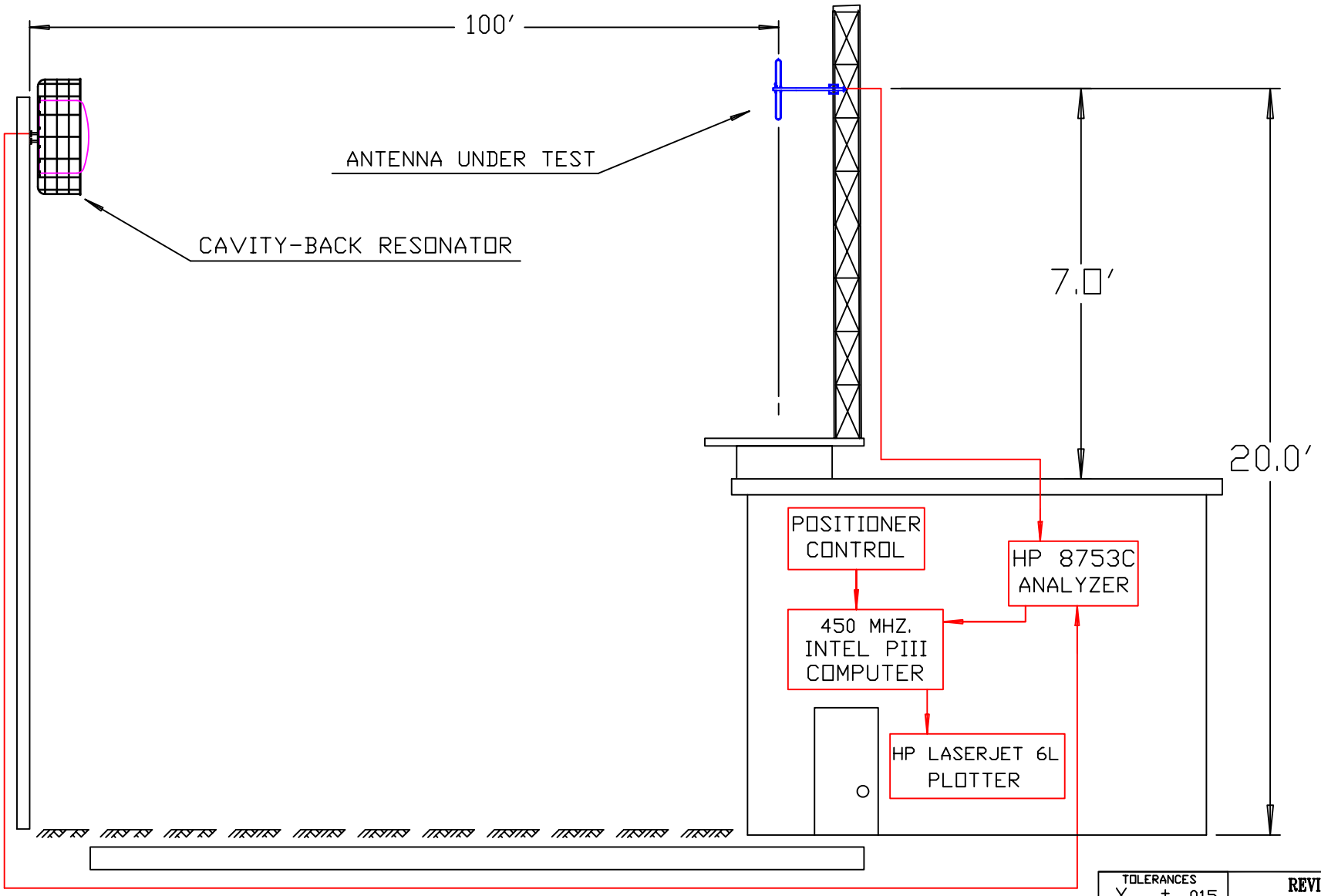
PARTS MADE BY THIS DRAWING

DRAWING NUMBER: 0596D06

SCALE: NTS | NAME: RAC | DATE: 10/28/05 | SHEET 1 OF 1

NOTE:

DRAWING NUMBER: 2105A10



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

UNLESS OTHERWISE SPECIFIED

REVISION RECORD

REV	APPROVAL	DATE
2		10/7/05
1		4/30/02

DRAWING NUMBER: 2105A10

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

TITLE: TEST RANGE SCHEMATIC

MATERIAL:

SIZE A

PARTS MADE BY THIS DRAWING

SCALE: NTS | NAME: JRM | DATE: 11/1/98 | SHEET 1 OF 1