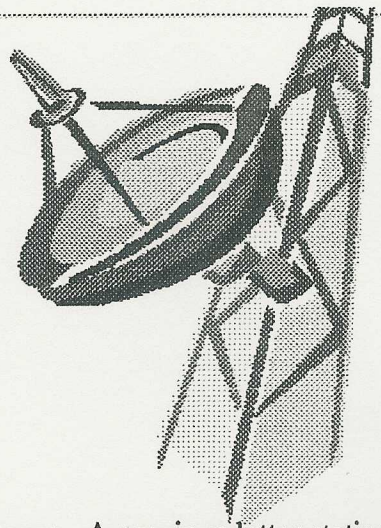
B&H TOWER SERVICE, LLC
HC 61 BOX 736
ARGILLITE, KY 41121



15 July 2004

Don Locke
American Family Radio
PO Drawer 3206
Tupelo, MS 38803

To whom it may concern,

B&H Tower Service, LLC installed one Shively 6810 6DA-bay antenna. A previous letter stating the C.O.R. was set at 626 feet was in error. Mark went to the site on July 15, 2004 and verified that the C.O.R. was at 612 feet. This is a Central X series 4200 guyed tower located at 14320 Lily Orchard Road, Moss Point Mississippi. The antenna was directed at an azimuth of 108 degrees and installed per directions accompanying the antenna from Shively. Azimuth was verified by a surveyor before the B&H Tower Service crew left the job site.

B&H Tower Service was started in 1994 and has completed hundreds of jobs across the United States for various companies (reference sheet enclosed). We have experience in numerous types of antenna installations including directional and omni-directional FM antennas, pcs, cellular, microwave, television, and two way radio antennas.

The crew leader on the job @ Moss Point, Ms was myself, Mark Black, President of B&H Tower Service, LLC

Sincerely,

Mark Black

Shively Labs
a division of Howell Laboratories,Inc.
- An Employee-Owned Company -

P. O. Box 389 Harrison Rd.,
Bridgton, Maine 04009 USA
(207) 647-3327
888-SHIVELY
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E-mail: sales@shively.com
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S.O. 22948

Report of Test 6810-6-DA

for

AMERICAN FAMILY ASSOCIATION

WPAS 89.1 MHZ PASCAGOULA, MS

OBJECTIVE:

The objective of this test was to demonstrate the directional characteristics of a 6810-6-DA to meet the needs of WPAS and to comply with the requirements of the FCC construction permit, file number BMPED-20030515AAJ.

RESULTS:

The measured azimuth pattern for the 6810-6-DA is shown in Figure 1. Figure 1A shows the Tabulation of the Horizontal Polarization. Figure 1B shows the Tabulation of the Vertical Polarization. The calculated elevation pattern of the antenna is shown in Figure 3. Construction permit file number BMPED-20030515AAJ indicates that the Horizontal radiation component shall not exceed 60 kW at any azimuth and is restricted to the following values at the azimuths specified:

70 Degrees T: 33.75 kW
240 Degrees T: 15 kW
330 Degrees T: 21.6 kW

From Figure 1, the maximum radiation of the Horizontal component occurs at 165 Degrees T to 189 Degrees T. At the restricted azimuth of 70 Degrees T the Horizontal component is 2.793 dB down from the maximum of 60 kW, or 31.54 kW. At the restricted azimuth of 240 Degrees T the Horizontal component is 6.375 dB down from the maximum of 60 kW, or 13.82 kW. At the restricted azimuth of 330 Degrees T the Horizontal component is 4.73 dB down from the maximum of 60 kW, or 20.2 kW.

The R.M.S. of the Horizontal component is 0.780. The total Horizontal power gain is 5.756. The R.M.S. of the Vertical component is 0.740. The total Vertical power gain is 5.644. See Figure 4 for calculations. The R.M.S. of the FCC composite pattern is 0.850. Therefore this Pattern complies with the FCC requirement of 73.316(c)(2)(ix)(A).

METHOD OF DIRECTIONALIZATION:

One bay of the 6810-6-DA was mounted on a tower of exact scale to a Central-24. The spacing of the antenna to the tower was varied and vertical parasitic elements were attached to the interbay feedline to achieve the vertical pattern shown in Figure 1. A horizontal parasitic element was placed directly under the bay. The position of this horizontal parasitic element was changed until the horizontal pattern shown in Figure 1 was achieved. See Figure 2 for mechanical details.

METHOD OF MEASUREMENT:

As allowed by the construction permit, file number BMPED-20030515AAJ, a single level of the 6810-6-DA was set up on the Howell Laboratories scale model antenna pattern measuring range. A scale of 4.5:1 was used.

SUPERVISION:

Mr. Surette was graduated from Lowell Technological Institute, Lowell, Massachusetts in 1973 with the degree of Bachelor of Science in Electrical Engineering. He has been directly involved with design and development of broadcast antennas, filter systems and RF transmission components since 1974, as an RF Engineer for six years with the original Shively Labs in Raymond, ME and for a short period of time with Dielectric Communications. He is currently an Associate Member of the AFCCE and a Senior Member of IEEE. He has authored a chapter on filters and combining systems for the latest edition of the CRC Electronics Handbook and for the 9th Edition of the NAB Handbook.

EQUIPMENT:

The scale model pattern range consists of a wooden rotating pedestal equipped with a position indicator. The scale model bay is placed on the top of this pedestal and is used in the transmission mode at approximately 20 feet above ground level. The receiving corner reflector is spaced 50 feet away from the rotating pedestal at the same level above ground as the transmitting model. The transmitting and receiving signals are carried to a control building by means of RG-9/U double shielded coax cable.

The control building is equipped with:

Hewlett Packard Model 8753 Network Analyzer

PC Based Controller

Hewlett Packard 7550A Graphics Plotter

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

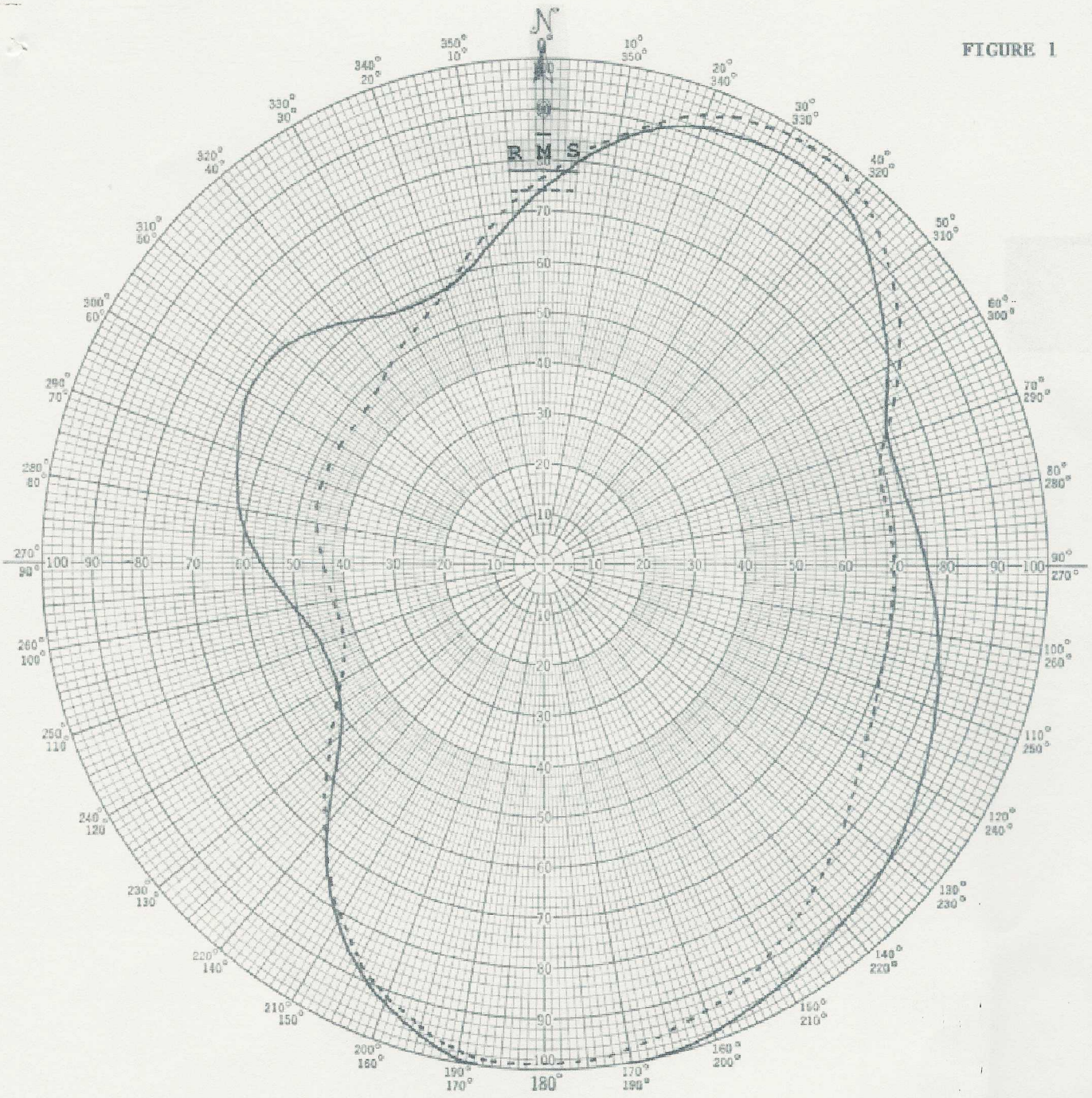
TEST PROCEDURES:

The corner reflector is mounted so that the horizontal and vertical azimuth patterns are measured independently by rotating the corner reflector by 90 degrees. The network analyzer was set to 400.95 MHz. Calibrated pads are used to check the linearity of the measuring system. For example, 6 dB padding yields a scale reading of 50 from an unpadded reading of 100 in voltage. From the recorded patterns, the R.M.S. values are calculated and recorded as shown in Figure 1.

Respectfully submitted by:

Robert A. Surette
Manager of RF Engineering
S/O 22948
April 30, 2004

FIGURE 1



Shively Labs

PROJECT NAME WPAS PASCAGOULA, MS

PROJECT NUMBER 22948 DATE 4/29/04

MODEL (X) FULL SCALE ( ) FREQUENCY 400.95/89.1 MHz

POLARIZATION HORIZ (——); VERT (----)

CURVE PLOTTED IN: VOLTAGE (X) POWER( ) DB( )

OBSERVER RAS

ANTENNA TYPE 6810-6-DA

PATTERN TYPE DIRECTIONAL AZIMUTH

REMARKS: SEE FIGURE 2 FOR MECHANICAL DETAILS

Figure 1A

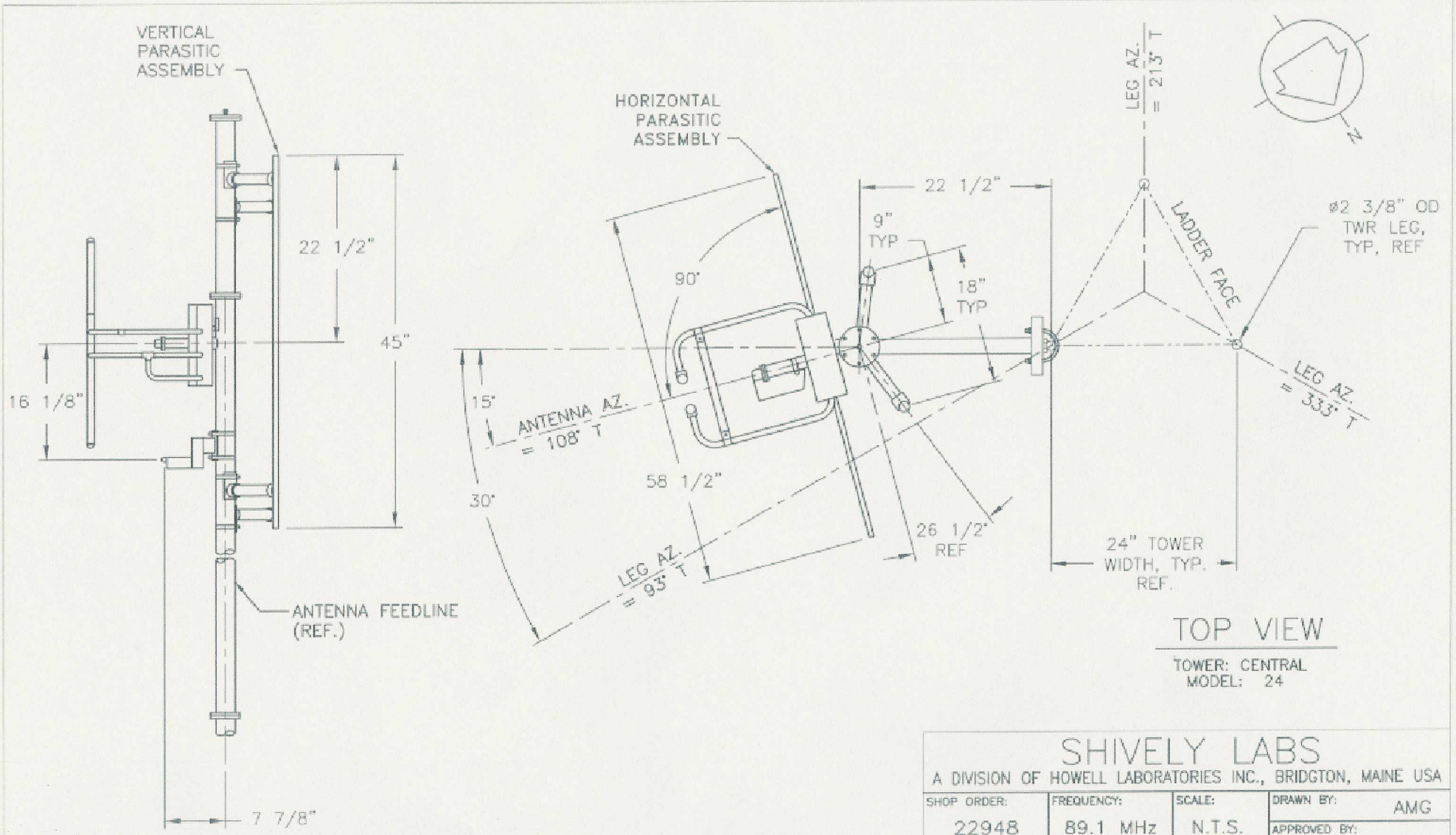
S/O 22948
TABULATION OF HORIZONTAL POLARIZATION
WPAS PASCAGOULA, MS

DEGREE	RELATIVE FIELD	DEGREE	RELATIVE FIELD
0	0.740	180	1.000
10	0.850	190	0.995
20	0.920	200	0.925
30	0.940	210	0.820
40	0.935	220	0.670
45	0.900	225	0.590
50	0.860	230	0.530
60	0.790	240	0.480
70	0.725	250	0.470
80	0.730	260	0.505
90	0.760	270	0.565
100	0.795	280	0.615
110	0.825	290	0.645
120	0.860	300	0.680
130	0.895	310	0.670
135	0.910	315	0.650
140	0.920	320	0.620
150	0.950	330	0.580
160	0.985	340	0.580
170	1.000	350	0.640

Figure 1B

S/O 22948
TABULATION OF VERTICAL POLARIZATION
WPAS PASCAGOULA, MS

DEGREE	RELATIVE FIELD	DEGREE	RELATIVE FIELD
0	0.765	180	0.990
10	0.860	190	0.980
20	0.945	200	0.910
30	0.980	210	0.810
40	0.970	220	0.580
45	0.940	225	0.620
50	0.900	230	0.560
60	0.820	240	0.470
70	0.720	250	0.425
80	0.690	260	0.425
90	0.695	270	0.440
100	0.700	280	0.460
110	0.705	290	0.470
120	0.730	300	0.470
130	0.780	310	0.470
135	0.810	315	0.475
140	0.835	320	0.490
150	0.890	330	0.525
160	0.940	340	0.570
170	0.970	350	0.660



SHIVELY LABS

A DIVISION OF HOWELL LABORATORIES INC., BRIDGTON, MAINE USA

SHOP ORDER:	FREQUENCY:	SCALE:	DRAWN BY: AMG
22948	89.1 MHz	N.T.S.	APPROVED BY:

MODEL: MODEL-6810-6-DIRECTIONAL ANTENNA

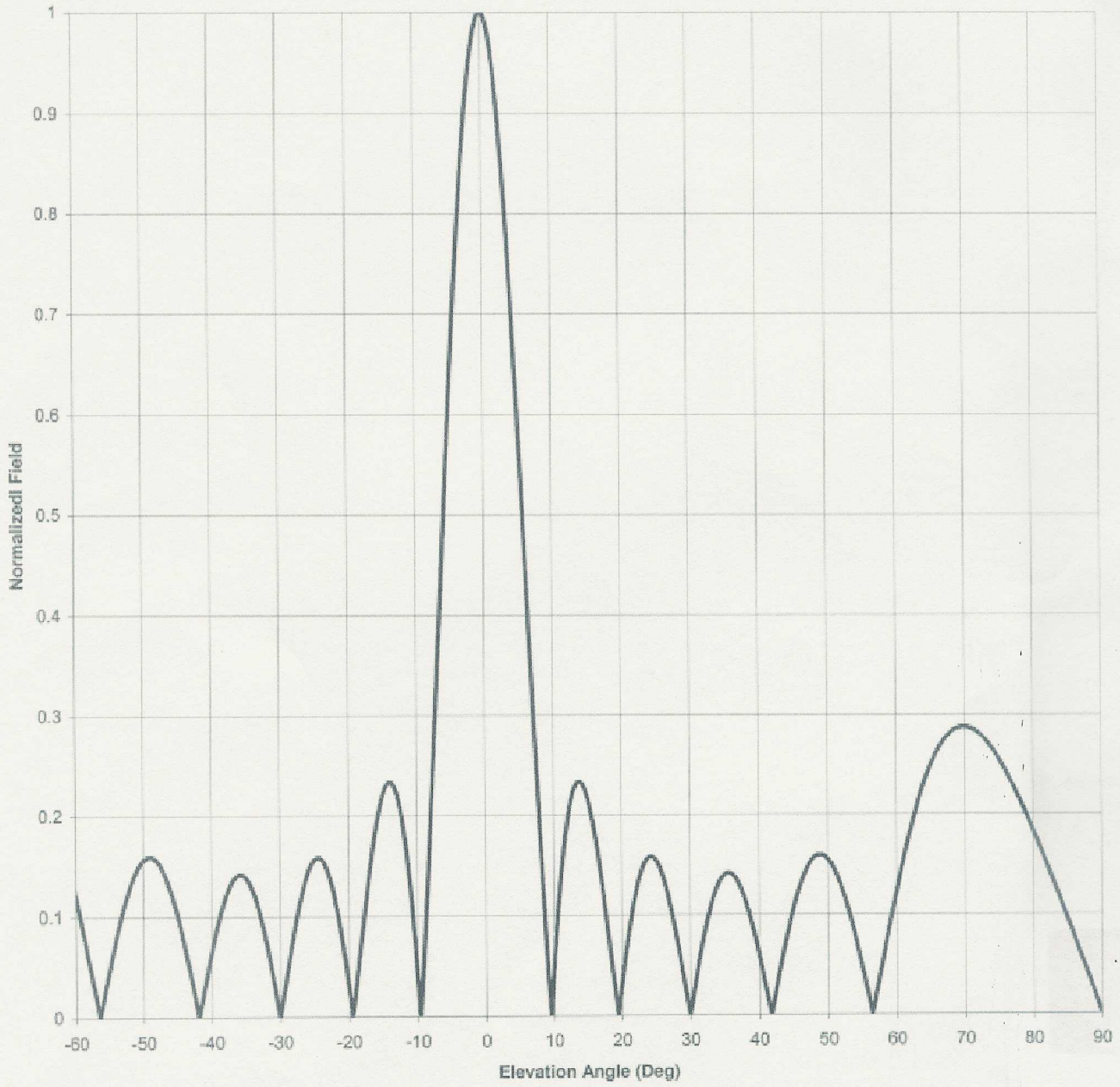
DATE: 4/29/04

FIGURE 2

Antenna Mfg.: Shively Labs
Antenna Type: 6810-6-DA
Station: WPAS
Frequency: 89.1
Channel #: 206
Figure: 3

Date: 4/28/2004

Beam Tilt	0	
Gain (Max)	5.756	7.601 dB
Gain (Horizon)	5.756	7.601 dB



Antenna Mfg.: Shively Labs
Antenna Type: 6810-6-DA
Station: WPAS
Frequency: 89.1
Channel #: 206
Figure: 3

Date: 4/28/2004

Beam Tilt	0	
Gain (Max)	5.756	7.601 dB
Gain (Horizon)	5.756	7.601 dB

Angle of Depression (Deg)	Relative Field
-90	0.000
-89	0.021
-88	0.040
-87	0.059
-86	0.078
-85	0.096
-84	0.114
-83	0.132
-82	0.150
-81	0.167
-80	0.184
-79	0.200
-78	0.215
-77	0.230
-76	0.243
-75	0.256
-74	0.266
-73	0.275
-72	0.281
-71	0.286
-70	0.287
-69	0.286
-68	0.281
-67	0.274
-66	0.262
-65	0.247
-64	0.229
-63	0.207
-62	0.181
-61	0.153
-60	0.122
-59	0.089
-58	0.055
-57	0.020
-56	0.014
-55	0.047
-54	0.078
-53	0.105
-52	0.127
-51	0.144
-50	0.155
-49	0.159
-48	0.156
-47	0.145
-46	0.128
-45	0.104

Angle of Depression (Deg)	Relative Field
-44	0.075
-43	0.042
-42	0.007
-41	0.028
-40	0.062
-39	0.092
-38	0.116
-37	0.133
-36	0.141
-35	0.139
-34	0.127
-33	0.106
-32	0.077
-31	0.041
-30	0.000
-29	0.041
-28	0.081
-27	0.115
-26	0.141
-25	0.155
-24	0.157
-23	0.144
-22	0.118
-21	0.079
-20	0.029
-19	0.027
-18	0.085
-17	0.140
-16	0.186
-15	0.219
-14	0.232
-13	0.223
-12	0.188
-11	0.128
-10	0.042
-9	0.067
-8	0.193
-7	0.331
-6	0.473
-5	0.612
-4	0.740
-3	0.848
-2	0.931
-1	0.982
0	1.000

Angle of Depression (Deg)	Relative Field
0	1.000
1	0.982
2	0.931
3	0.848
4	0.740
5	0.612
6	0.473
7	0.331
8	0.193
9	0.067
10	0.042
11	0.128
12	0.188
13	0.223
14	0.232
15	0.219
16	0.186
17	0.140
18	0.085
19	0.027
20	0.029
21	0.079
22	0.118
23	0.144
24	0.157
25	0.155
26	0.141
27	0.115
28	0.081
29	0.041
30	0.000
31	0.041
32	0.077
33	0.106
34	0.127
35	0.139
36	0.141
37	0.133
38	0.116
39	0.092
40	0.062
41	0.028
42	0.007
43	0.042
44	0.075
45	0.104

Angle of Depression (Deg)	Relative Field
46	0.128
47	0.145
48	0.156
49	0.159
50	0.155
51	0.144
52	0.127
53	0.105
54	0.078
55	0.047
56	0.014
57	0.020
58	0.055
59	0.089
60	0.122
61	0.153
62	0.181
63	0.207
64	0.229
65	0.247
66	0.262
67	0.274
68	0.281
69	0.286
70	0.287
71	0.286
72	0.281
73	0.275
74	0.266
75	0.256
76	0.243
77	0.230
78	0.215
79	0.200
80	0.184
81	0.167
82	0.150
83	0.132
84	0.114
85	0.096
86	0.078
87	0.059
88	0.040
89	0.021
90	0.000

FIGURE 4

S.O. 22948

VALIDATION OF GAIN CALCULATION

WPAS PASCAGOULA, MS

MODEL 6810-6-DA

Elevation Gain of 6810-6-DA equals 3.322

The RMS values are calculated utilizing the data of a planimeter.

Horizontal RMS divided by Vertical RMS equals
$0.780 \div 0.740 = 1.054$

Elevation Gain of Horizontal Component equals
$3.322 \times 1.054 = 3.501$

Elevation Gain of Vertical Component equals
$3.322 \times 0.949 = 3.153$

Horizontal Azimuth Gain equals $1/(\text{RMS})^2$
$1/(0.780)^2 = 1.644$

Vertical Azimuth Gain equals $1/(\text{RMS} \div \text{Max Vert})^2$
$1/(0.740 \div 0.990)^2 = 1.790$

* **Total Horizontal Gain is Elevation Gain times Azimuth Gain**
  $3.501 \times 1.644 = 5.756$

* **Total Vertical Gain is Elevation Gain times Azimuth Gain**
  $3.153 \times 1.790 = 5.644$

ERP divided by Horizontal Gain equals Antenna Input Power
$60 \text{ kW} \div 5.756 = 10.424 \text{ kW}$

Antenna Input Power times Vertical Gain equals Vertical ERP
$10.424 \times 5.644 = 58.83 \text{ kW}$

Maximum Value of the Vertical Component squared times the Maximum ERP equals the Vertical ERP
$(0.990)^2 \times 60 \text{ kW} = 58.81 \text{ kW}$

NOTE: Calculating the ERP of the Vertical Component by two methods validates the total antenna gain calculations

Moody
& Associates, Inc.

MAY 5, 2004

TO WHOM IT MAY CONCERN:

I, GERALD MOODY, A REGISTERED PROFESSIONAL LAND SURVEYOR IN THE STATE OF MISSISSIPPI, LICENSE NO. 1723, DO HEREBY CERTIFY THAT I CHECKED THE POSITION OF THE RADIO TOWER AT THE SITE ON THE ATTACHED SKETCH ON MAY 5, 2004, AND THAT IT WAS LOCATED AT AN AZIMUTH OF 108 DEGREES FROM TRUE NORTH.

GERALD MOODY Registered Land Surveyor LS-1723 STATE OF MISSISSIPPI

GERALD MOODY, P.L.S.

GM/kld

P. O. Box 1543 • 281 Ratliff Street • Lucedale, Mississippi 39452 • Tele / Fax (601) 947-4499