

Exhibit A

# DIRECTIONAL ANTENNA

## PROOF OF PERFORMANCE



## **Propagation Systems, Inc.**

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Quality Broadcast Antenna Systems

**Directional FM Antenna  
WQYZ  
Genesis Broadcasting  
Ocean Springs, Mississippi**

A standard model PSIFM antenna with parasitic elements was used in conjunction with the customers' 48 inch face triangular tower to create the necessary directional radiation pattern. The final antenna consists of three radiating elements each secured to the tower with a standard mounting bracket. There are two parasitic elements per bay. A single vertical parasitic is mounted in front of the radiating element and a single horizontal parasitic is mounted behind the element. The antenna bays are full wavelength spaced. The antenna array is end fed and utilizes rigid 1-5/8" inter-bay transmission lines to distribute equal power to each radiating element. A transformer section has been added at the antenna input.

Pattern testing was performed using a 1/3 scale model element and tower. The azimuth plane measurements were taken on a ground reflection test range. This type of test range utilizes the reflected signal and direct signal from the source antenna to form an interference pattern on the antenna under test. The antenna and mounting structure under test was mounted to a turntable that allowed the structure to be rotated 360° in the azimuth plane. The source antenna was located approximately 75 ft. from the antenna under test. The source height above ground was adjusted to peak the first lobe of the interference pattern at the antenna under test.

The test antenna was mounted in the center of rotation of the turntable. The antenna and mounting structure were rotated clockwise while data was recorded in a counter clockwise direction. All feed cables to the antenna were secured and grounded during pattern measurements. A Hewlett Packard 8753A-network analyzer operating at 277.5 MHz was used as both the source and receiver. The level of the received signal was compared with a standard dipole to establish the directivity of the final pattern. The final pattern measured does not exceed the envelope pattern, does not deviate more than 2 dB per ten degrees of azimuth and does not exceed the 15 dB maximum to minimum ratio required by the FCC.

The antenna is to be mounted on the south leg of the tower. The antenna center of radiation approved in the construction permit is 91 meters above ground. The original tower structure was 91 meters with a guy point at 87.8 meters above ground. According to a statement by WQYZ, additional tower structure of the same configuration was added that enabled the antenna to be repositioned vertically on the tower so that the center of radiation corresponds to the tolerance allowed in the construction permit. The antenna center of radiation with the additional tower is 88.7 meters above ground. No other antenna can be installed within 10 ft of any radiating element. The antenna is to be positioned at 180° True. It is recommended that a broadcast engineer is present to supervise the installation of the antenna and that he or she certifies the antenna has been installed according to the enclosed instructions.

An input power level of 2.449 kW will be required at the antenna in order to reach the licensed 6 kW ERP. The supplied 290-ft. of 1-5/8" flexible air dielectric coaxial cable has an efficiency of 87.5%. The necessary transmitter output will be 2.80 kW if the full 290-ft. of transmission line is utilized.



Douglas A. Ross

President

Revised 11/7/2000

### Antenna Specifications

Antenna Model	PSIFM-3-DA
Type	3-bay full wave spaced directional FM antenna
Frequency	92.5 MHz
Gain (h-pol)	2.45 (3.88 dB)
Gain (v-pol)	2.45 (3.88 dB)
Input	1-5/8" EIA end fed input
Power rating	9 kW
Length	35 ft. - 9 in.
Weight	175 lbs.
Windload (50/33 PSF)	350 lbs.

### Uncrating

When uncrating the antenna system, open each crate carefully so that the crates may be used to return any merchandise that may have been damaged in shipping. Separate all parts and confirm that all items on the packing list have been received. If any parts are missing, notify PSI or it's agent prior to assembling the antenna. If any parts are damaged through shipment or are missing, **promptly** notify the shipping carrier.

## General Notes

1. Review antenna elevation and plan the installation. The antenna brackets have been designed for tower leg mount.
2. All bays are to be aligned to the same azimuth angle.
3. Use only the supplied hardware and O-ring at all 1-5/8" flange connections.
4. Exercise care when assembling the inner conductors of the coaxial line. The bullet should fit firmly in the inner conductor in order to assure a proper connection.
5. The feed points are in the up position.
6. Install one bay/inter-bay assembly at a time.
7. Keep all transmission lines free from dirt and moisture. All Teflon insulators must be clean and dry.
8. The antenna must be pressurized with dry air or nitrogen.
9. The antenna has been tuned at the factory and should not require field adjustment.
10. The antenna system should be tested before the erector leaves the premises to insure that the complete antenna system is functioning properly.

## Installation Instructions

### Step One

Review the enclosed drawings and read all steps for a general overview of the antenna installation. Starting with radiating element one, attach the vertical parasitic to the tee at the end of the element boom. The insulators will hold the parasitic in place. Refer to drawing J79FM-122-009. Next attach the horizontal parasitic to the inter-bay block using the supplied 1/4-20 x 3/4" bolts, flat and lock washers. Align the red band on the parasitic to the west as shown in drawing J79FM-122-003. Next attach bay one to inter-bay one block. Use only the supplied 5/16-18 x 7/8" bolts, locks and O-ring. The vertical parasitic must be parallel to the inter-bay line. Next attach the end cap extension to inter-bay one block with the supplied 5/16-18 x 7/8" bolts, locks and O-ring. Attach a FM bay bracket to the boom of bay one using the supplied #28 hose clamps, then attach an inter-bay bracket approximately 24" below the bay. See drawing J79FM-122-003 for an over view.

### Step Two

Follow the same procedure for bay two. Install the vertical parasitic, attach the horizontal parasitic, and attach the element and brackets.

### Step Three

Follow the same procedure for bay three. Install the vertical parasitic, attach the horizontal parasitic, and attach the element and brackets. Inter-bay three has been pre-assembled to the tuner. Attach a second inter-bay bracket between probes two and three.

#### Step Four

Each section of the antenna is now ready to be hoisted to the proper elevation on the tower. **Use caution when erecting the bay/inter-bay assembly. The inter-bay inner conductor is not captivated. Take the necessary precautions to secure the inner conductor.** The antenna is to mount to the south tower leg and positioned 180° True. The top radiating element is to be mounted approximately 9 ft. down from the tower top. It may be necessary to start with bay two due to its close proximity to the top guy wire and then install bay one. The actual procedure is at the discretion of the on site engineer. Hoist the first bay/inter-bay assembly and attach to the tower with the supplied ½-13 x 4.0" bolts, nuts and lock washers.

#### Step Five

Connect inter-bay one to inter-bay block two. Use only the 5/16-18 x 7/8" bolts, locks and O-ring supplied. Attach the mounting brackets to the tower leg. Be sure to align the elements to the proper azimuth angle with the feed points in the up position. The vertical parasitic should be plumb and parallel to the inter-bay line. Adjust the horizontal parasitic for level.

#### Step Six

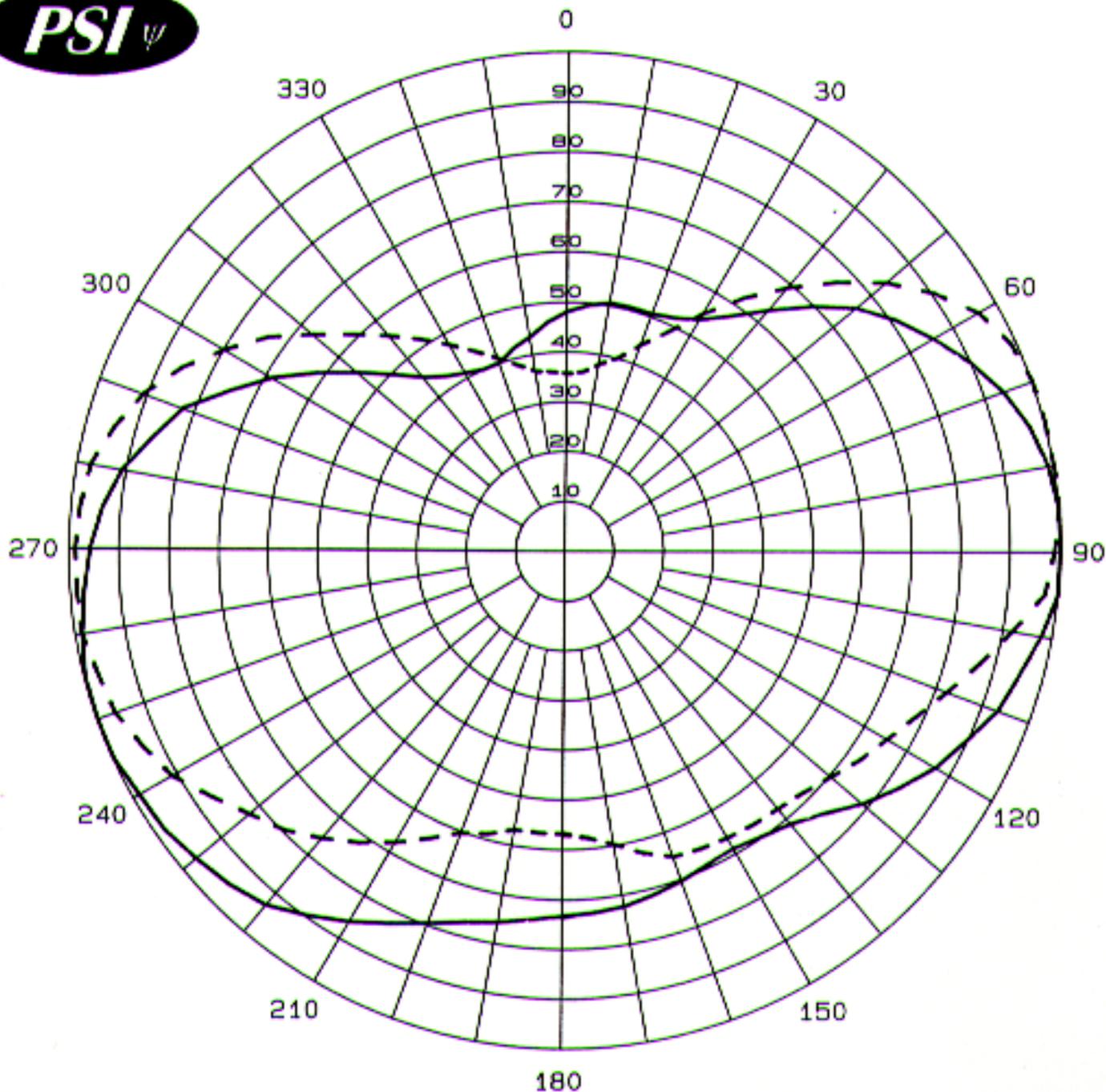
Install bay three/inter-bay three with tuner. Connect inter-bay two to inter-bay block three. Use only the 5/16-18 x 7/8" bolts, locks and O-ring supplied. Be sure to align the elements to the proper azimuth angle with the feed points in the up position. The vertical parasitic should be plumb and parallel to the inter-bay line. Adjust the horizontal parasitic for level.

#### Step Seven

**Check all bolted connections for tightness.** Connect the main transmission line to the antenna input located at the base of the tuner. **Do not allow the weight of the feed line to be supported by the antenna.** Pressurize the antenna system to a maximum of 5 lbs. with dry air or nitrogen. The antenna system should be tested before the erector leaves the premises to insure that the complete antenna system is functioning properly. The antenna has been tested and tuned at the factory. If the antenna has a high VSWR, consult the factory immediately.

### **Drawing Index**

<u>Drawing Number</u>	<u>Description</u>
J79FM-122-001A	Antenna Elevation and Orientation
J79FM-122-003	Bay One Side and Top View
J79FM-122-002	Bay Two and Three Side and Top View
J79FM-122-009	Vertical Parasitic Attachment
J79FM-122-006	Horizontal Parasitic Attachment
33-00006	Tuner Outline
33-00029	Bay Bracket Outline
33-00030	Inter-Bay Bracket Outline



Measured Relative Field  
Azimuth Plane Pattern  
Antenna: PSIFM-3-DA  
H-pol Gain (solid): 2.45 (3.88 dB)  
V-pol Gain (dash): 2.45 (3.88 dB)  
Station Call: WQYZ  
Frequency: 92.5 MHz  
Location: Ocean Springs, MS

**Propagation Systems Inc.**  
**PO Box 113**  
**Ebensburg, PA 15931**

## Measured Relative Field Tabulation

Antenna: PSIFM-3-DA  
 Genesis Broadcasting  
 Station: WQYZ  
 Frequency: 92.5 MHz  
 Location: Ocean Springs, Mississippi

### Horizontal Polarization

Angle	Relative Field	Power Gain	Gain (dB)
0	0.479	0.561	-2.51
10	0.504	0.621	-2.07
20	0.504	0.621	-2.07
30	0.534	0.697	-1.57
40	0.629	0.967	-0.14
50	0.758	1.405	1.48
60	0.853	1.779	2.50
70	0.938	2.151	3.33
80	0.988	2.387	3.78
90	1.000	2.445	3.88
100	0.978	2.339	3.69
110	0.933	2.128	3.28
120	0.868	1.842	2.65
130	0.788	1.518	1.81
140	0.714	1.246	0.96
150	0.689	1.161	0.65
160	0.704	1.212	0.83
170	0.724	1.282	1.08
180	0.734	1.317	1.20
190	0.758	1.405	1.48
200	0.798	1.557	1.92
210	0.863	1.821	2.60
220	0.933	2.128	3.28
230	0.968	2.291	3.60
240	0.988	2.387	3.78
250	1.000	2.445	3.88
260	0.988	2.387	3.78
270	0.958	2.244	3.51
280	0.908	2.016	3.04
290	0.823	1.656	2.19
300	0.684	1.144	0.58
310	0.549	0.737	-1.33
320	0.449	0.493	-3.07
330	0.409	0.409	-3.88
340	0.399	0.389	-4.10
350	0.434	0.461	-3.37

Maximum Value

Field 1.00  
 Gain 2.45 (3.88 dB)  
 Azimuth Bearing 85-95 degrees  
 Pattern RMS 0.783

Minimum Field

Field 0.399  
 Gain .389 (-4.10 dB)  
 Azimuth Bearing 335-340 degrees

### Vertical Polarization

Angle	Relative Field	Power Gain	Gain (dB)
0	0.354	0.306	-5.14
10	0.379	0.351	-4.54
20	0.439	0.471	-3.27
30	0.549	0.737	-1.33
40	0.689	1.161	0.65
50	0.838	1.717	2.35
60	0.958	2.244	3.51
70	1.000	2.445	3.88
80	1.000	2.445	3.88
90	0.988	2.387	3.78
100	0.918	2.060	3.14
110	0.823	1.656	2.19
120	0.753	1.386	1.42
130	0.704	1.212	0.83
140	0.674	1.111	0.46
150	0.664	1.078	0.33
160	0.654	1.046	0.19
170	0.599	0.877	-0.57
180	0.569	0.792	-1.01
190	0.569	0.792	-1.01
200	0.604	0.892	-0.50
210	0.679	1.127	0.52
220	0.758	1.405	1.48
230	0.828	1.676	2.24
240	0.913	2.038	3.09
250	0.963	2.267	3.56
260	0.988	2.387	3.78
270	0.988	2.387	3.78
280	0.973	2.315	3.65
290	0.908	2.016	3.04
300	0.798	1.557	1.92
310	0.669	1.094	0.39
320	0.559	0.764	-1.17
330	0.474	0.549	-2.60
340	0.409	0.409	-3.88
350	0.364	0.324	-4.90

Maximum Value

Field 1.00  
 Gain 2.45 (3.88 dB)  
 Azimuth Bearing 70-85 degrees  
 Pattern RMS 0.783

Minimum Field

Field 0.354  
 Gain .306 (-5.09 dB)  
 Azimuth Bearing 0 degrees

### ERP Tabulation

Antenna: PSIFM-3-DA  
Genesis Broadcasting  
Station: WQYZ  
Frequency: 92.5 MHz  
Location: Ocean Springs, Mississippi  
Maximum ERP: 6.0 kW (7.78 dBk)

#### Horizontal Polarization

Angle	Relative Field	ERP (kW)	ERP (dBk)
0	0.479	1.38	1.39
10	0.504	1.52	1.83
20	0.504	1.52	1.83
30	0.534	1.71	2.33
40	0.629	2.37	3.75
50	0.758	3.45	5.37
60	0.853	4.37	6.40
70	0.938	5.28	7.23
80	0.988	5.86	7.68
90	1.000	6.00	7.78
100	0.978	5.74	7.59
110	0.933	5.22	7.18
120	0.868	4.52	6.55
130	0.788	3.73	5.71
140	0.714	3.06	4.86
150	0.689	2.85	4.55
160	0.704	2.97	4.73
170	0.724	3.15	4.98
180	0.734	3.23	5.10
190	0.758	3.45	5.37
200	0.798	3.82	5.82
210	0.863	4.47	6.50
220	0.933	5.22	7.18
230	0.968	5.62	7.50
240	0.988	5.86	7.68
250	1.000	6.00	7.78
260	0.988	5.86	7.68
270	0.958	5.51	7.41
280	0.908	4.95	6.94
290	0.823	4.06	6.09
300	0.684	2.81	4.48
310	0.549	1.81	2.57
320	0.449	1.21	0.83
330	0.409	1.00	0.02
340	0.399	0.96	-0.20
350	0.434	1.13	0.53

#### Maximum Value (H-pol)

Field 1.00  
ERP 6.0 kW (7.78 dBk)  
Azimuth Bearing 85-95 degrees

#### Minimum Field (H-pol)

Field 0.399  
ERP .955 kW (-.20 dBk)  
Azimuth Bearing 335-340 degrees

#### Vertical Polarization

Angle	Relative Field	ERP (kW)	ERP (dBk)
0	0.354	0.75	-1.24
10	0.379	0.86	-0.65
20	0.439	1.16	0.63
30	0.549	1.81	2.57
40	0.689	2.85	4.55
50	0.838	4.21	6.25
60	0.958	5.51	7.41
70	1.000	6.00	7.78
80	1.000	6.00	7.78
90	0.988	5.86	7.68
100	0.918	5.06	7.04
110	0.823	4.06	6.09
120	0.753	3.40	5.32
130	0.704	2.97	4.73
140	0.674	2.73	4.35
150	0.664	2.65	4.22
160	0.654	2.57	4.09
170	0.599	2.15	3.33
180	0.569	1.94	2.88
190	0.569	1.94	2.88
200	0.604	2.19	3.40
210	0.679	2.77	4.42
220	0.758	3.45	5.37
230	0.828	4.11	6.14
240	0.913	5.00	6.99
250	0.963	5.56	7.45
260	0.988	5.86	7.68
270	0.988	5.86	7.68
280	0.973	5.68	7.54
290	0.908	4.95	6.94
300	0.798	3.82	5.82
310	0.669	2.69	4.29
320	0.559	1.87	2.73
330	0.474	1.35	1.30
340	0.409	1.00	0.02
350	0.364	0.79	-1.00

#### Maximum Value (V-pol)

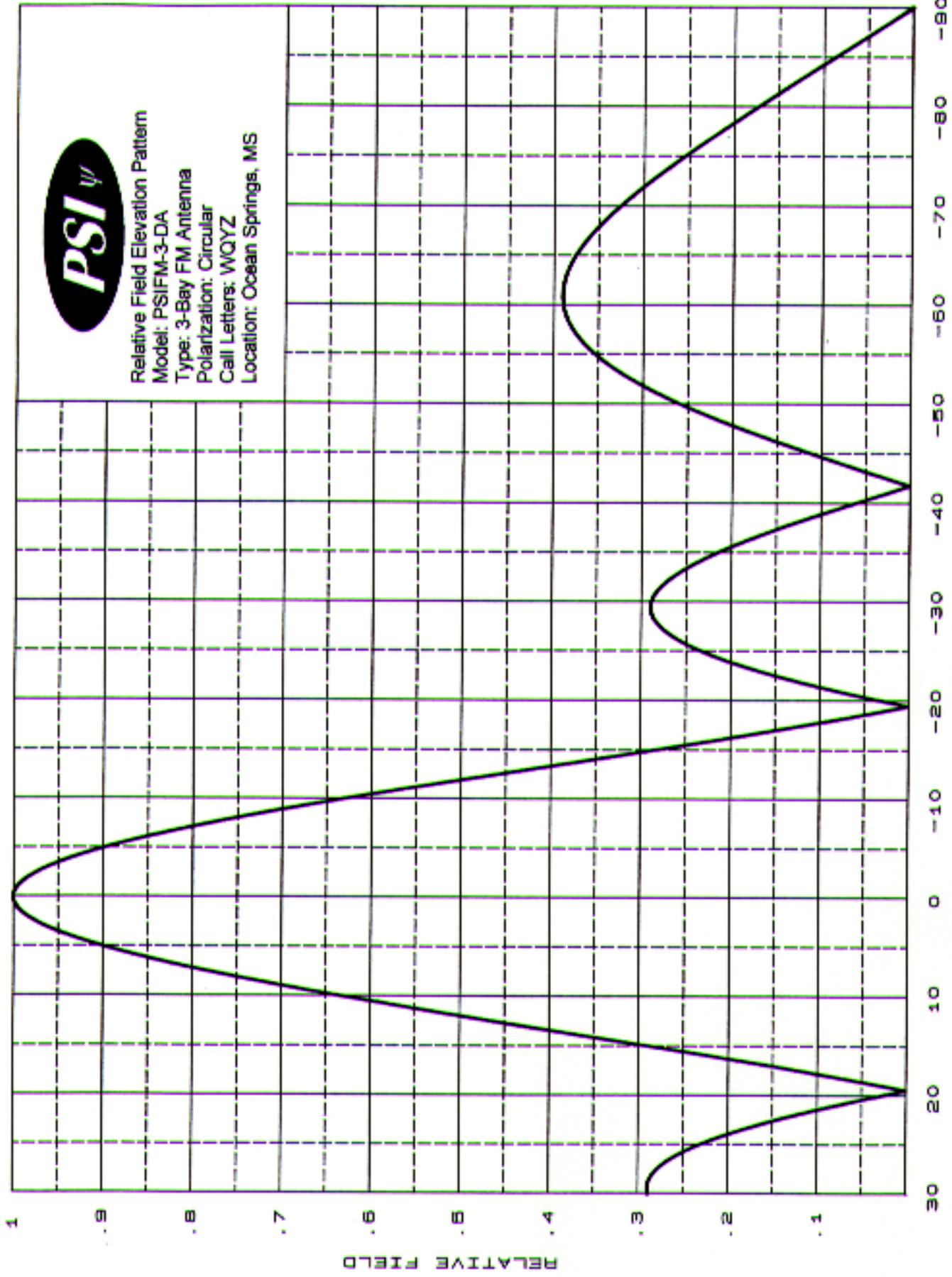
Field 1.00  
ERP 6.0 kW (7.78 dBk)  
Azimuth Bearing 70-85 degrees

#### Minimum Field (V-pol)

Field 0.354  
ERP .752 kW (-1.24 dBk)  
Azimuth Bearing 0 degrees



Relative Field Elevation Pattern  
Model: PSIFM-3-DA  
Type: 3-Bay FM Antenna  
Polarization: Circular  
Call Letters: WQYZ  
Location: Ocean Springs, MS



DEGREES BELOW HORIZONTAL

Final

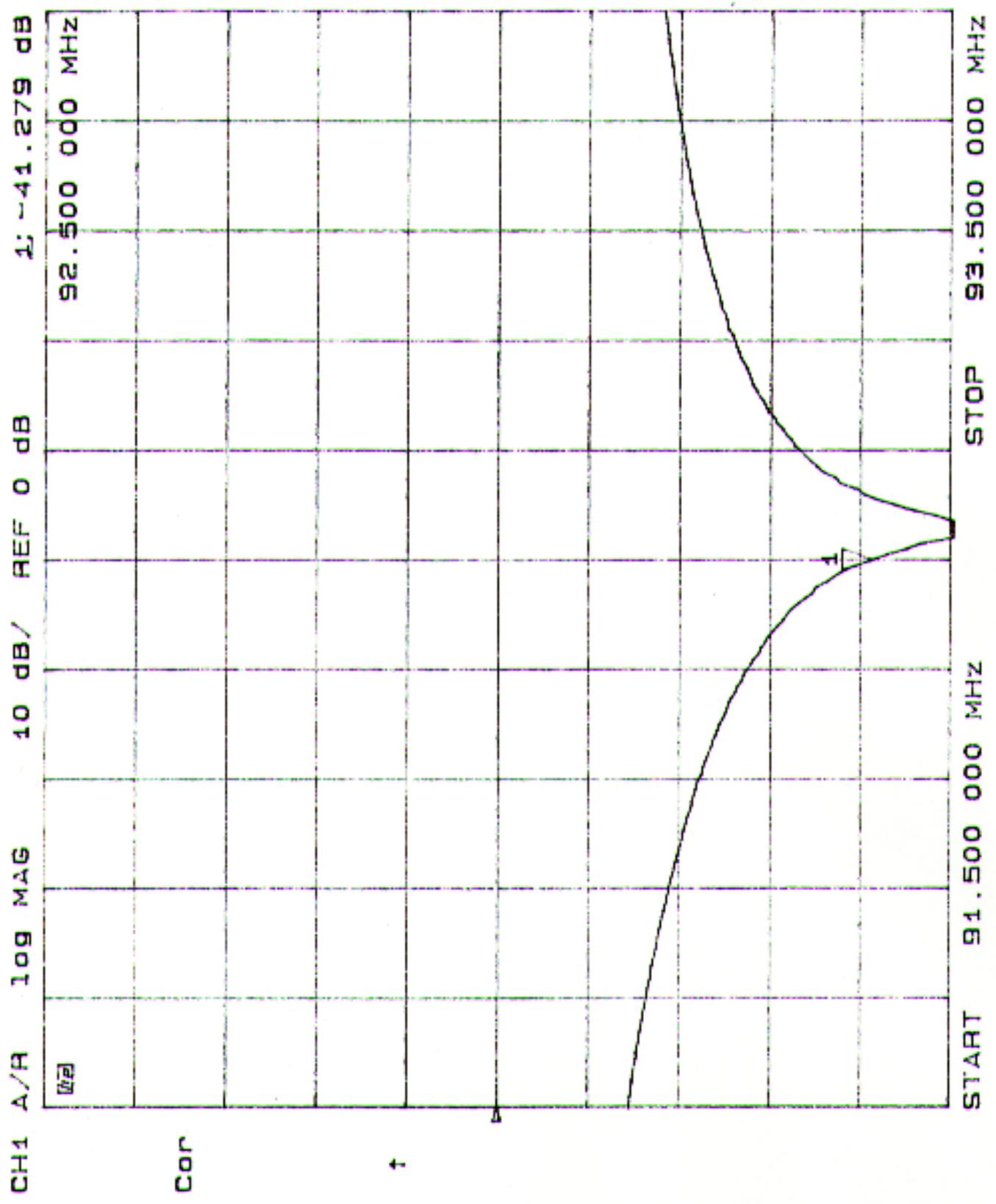


Exhibit B

# SURVEYOR AFFIDAVIT



Exhibit C

# ENGINEER AFFIDAVIT

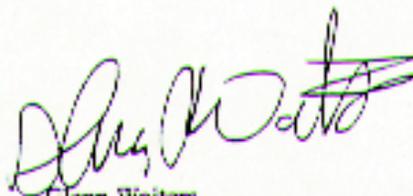
## Engineer's Affidavit

I hereby certify that the antenna was installed in accordance with the manufacturer's instructions, either by myself or under my direct supervision. Additionally, the antenna was oriented properly, according to the manufacturer's instructions.



## Engineer's Statement of Qualification

I have been involved in Broadcasting, either as a Chief Engineer, or as a contract engineer for over 20 years. In this time, I have been involved in all aspects of design, installation and repair of radio broadcast systems. Additionally, my qualifications are a matter of record with the FCC.



Glenn Walters  
1-334-649-6901