



Propagation Systems, Inc.

Quality Broadcast Antenna Systems

**Directional FM Antenna
WCOZ
Telikoja Educational Broadcasting Inc.
Laceyville, PA**

A standard model PSIFML antenna with parasitic elements was used in conjunction with the customer's Rohn tower create the necessary directional radiation pattern. The final antenna consists of one radiating element secured to the southeast tower leg with two horizontal parasitic elements.

Pattern testing was performed using a 1/3 scale model element and mast. 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 tower 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 8753E-network analyzer operating at 271.5 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 and is 89.1% of the envelope RMS.

The antenna is to be mounted 20 meters (66 ft.) above ground level on the southeast tower leg and positioned 135° True. At this elevation the antenna will be within the allowed +2m/-4m tolerance. No other antenna can be installed within 3 meters from the radiating element. Any guy wires that pass within 10 ft. of any radiating element must be replaced with a non-metallic substitute. It is recommended that a broadcast engineer be present to supervise the installation of the antenna and that he or she certifies that the antenna has been installed according to the enclosed instructions.

An input power level of .345 kW will be necessary at the antenna input in order to reach the required .320 kW ERP. The transmitter output power requirements are dependent upon the transmission line size and length used to feed the antenna. The final length of transmission line must be determined after installation.

Antenna Specifications

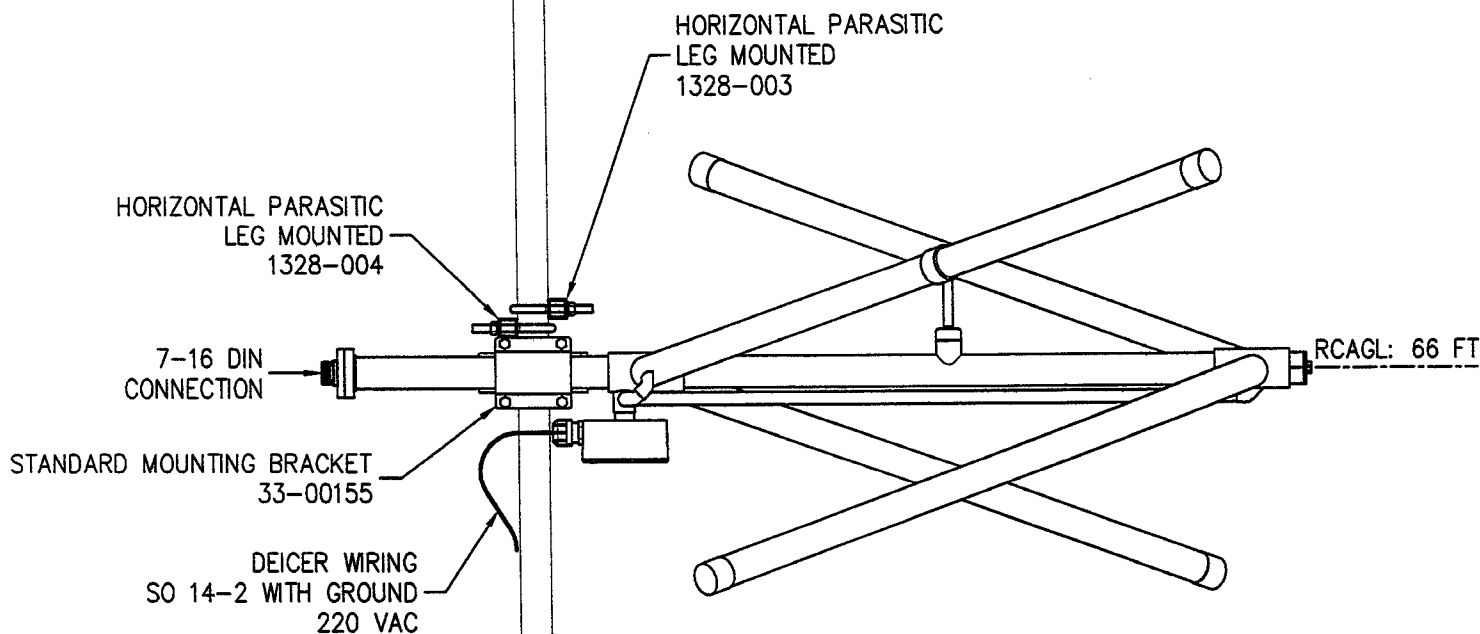
Antenna Model	PSIFML-1C-H-DA
Type	1-bay directional FM antenna
Frequency	90.5 MHz
Polarization	Circular
Envelope RMS	.789
Composite RMS	.703
Gain (h-pol)	.927 (-.33 dB)
Gain (v-pol)	.807 (-.932dB)
ERP	.320 kW
Antenna input power	.345 kW
Input	Type 7-16 DIN female
Power rating	1.0 kW
Length	2.4 ft.
Weight	56 lbs.
Wind Area	4.62 sq. ft.

Statement of Certification

This is to certify the antenna has been designed, fabricated and tested under my supervision and it meets the required envelope pattern limitations set forth in the stations construction permit.



Douglas A. Ross
President
Propagation Systems Inc.



SPECIFICATIONS	
RATING:	1 KW
GAIN:	.927 (-0.33 dB)
WEIGHT:	56 Lb [25.4 Kg]
WINDAREA:	4.62 FT ²
TIA-222-F	(NO ICE)

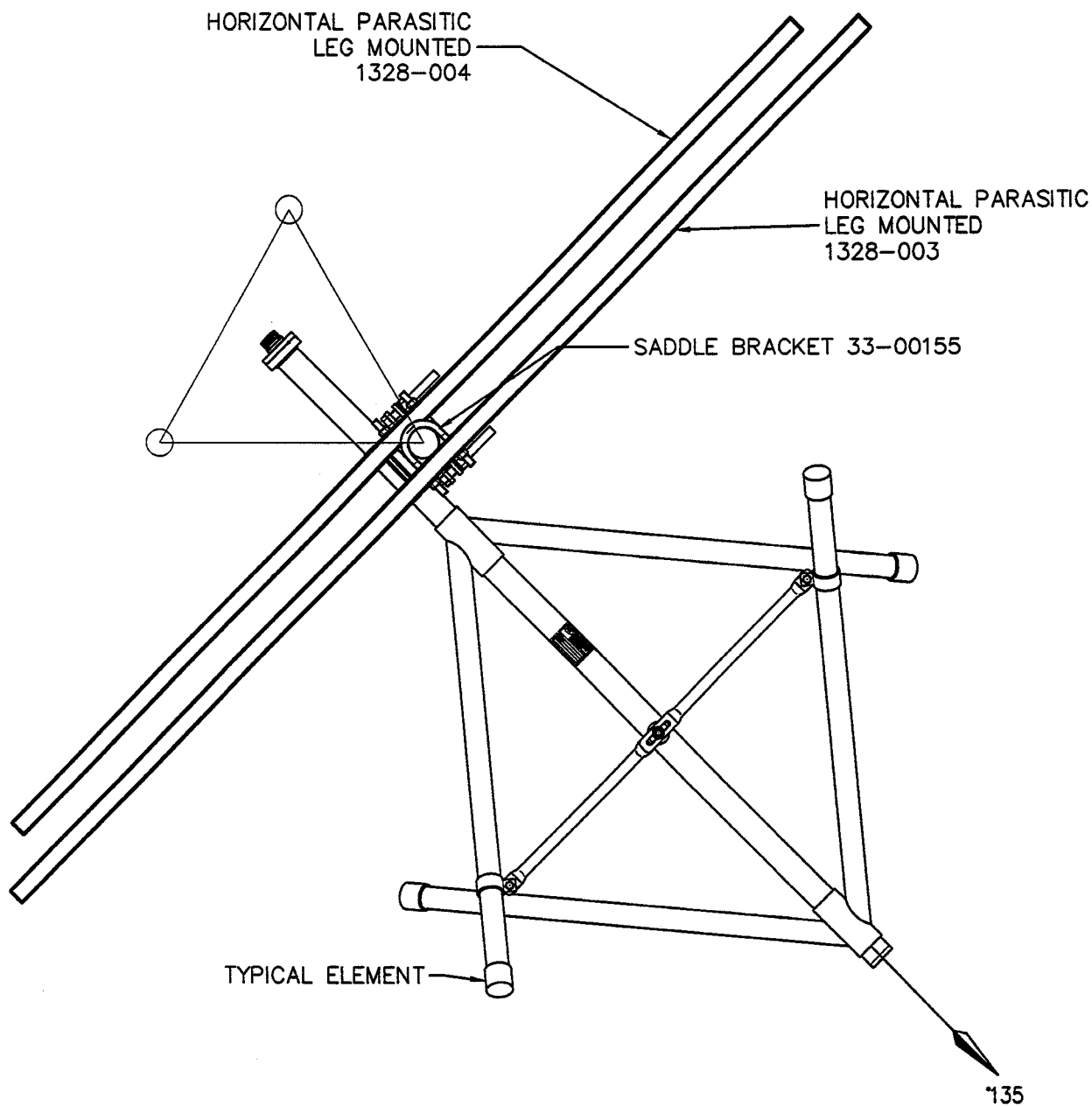
REV.	MADE BY	CHECKED BY	DATE	CHANGE	SIZE
					A
<p>This drawing is loaned subject to the express understanding and agreement that the drawing and information therein contained are, and shall remain the property of PSI, and will not be otherwise utilized or disposed of, directly or indirectly, and will not be used in whole or in part or assist in making or finish any information for the making of drawings, prints or other reproductions hereof, or for the design or making of any item, parts, object, apparatus or parts thereof, except upon the written permissions of PSI first obtained. The acceptance of this drawing will be construed as an acceptance of the forgoing agreement.</p>					

PROPAGATION SYSTEMS, INC.

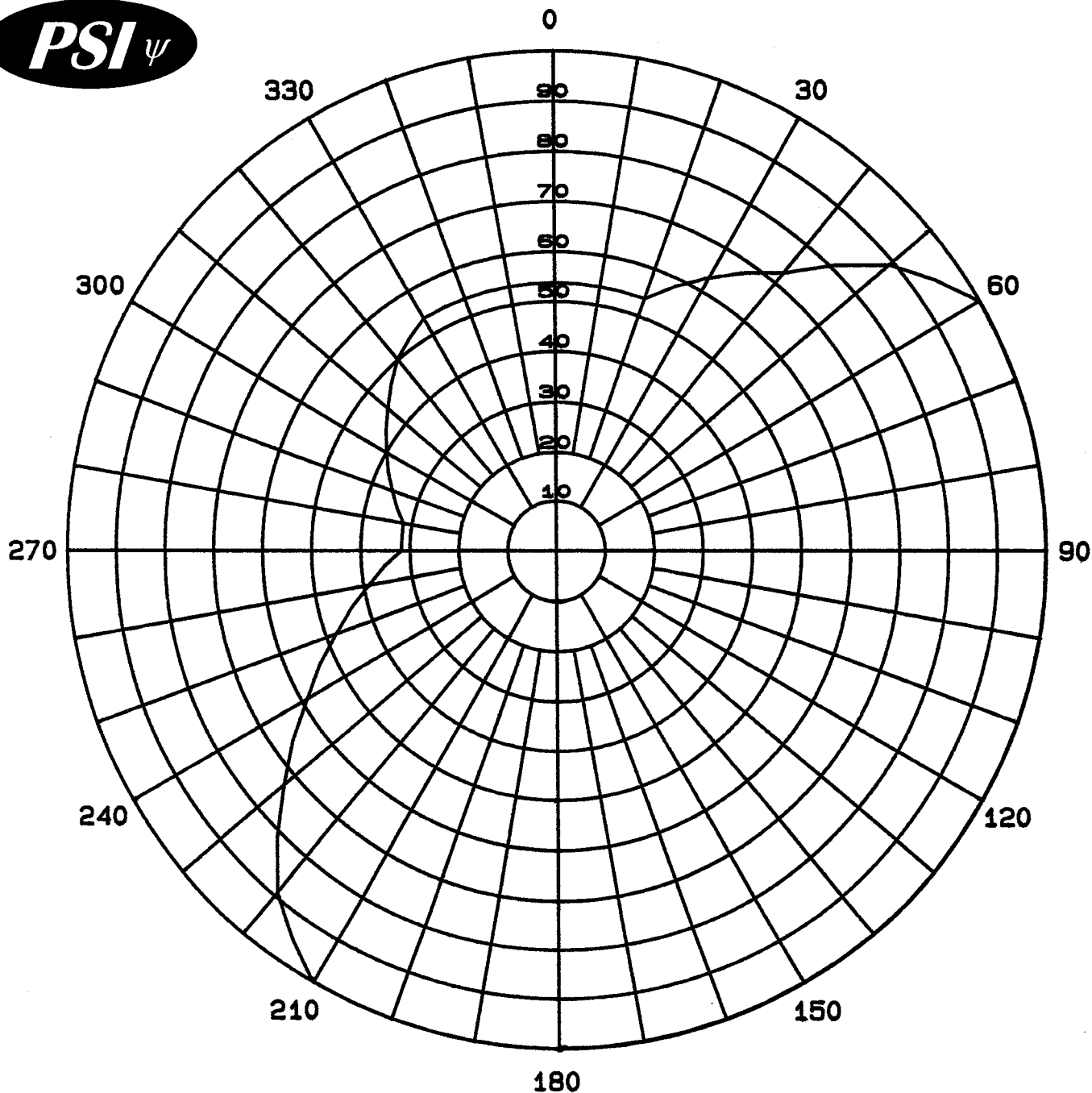
Ebensburg, Pennsylvania USA 814-472-5540

ANTENNA ELEVATIONS AND SPECIFICATIONS

MODEL:	PSIFML-1C-H-DA	DRAWN BY:	B.K.SCHILLING	DATE:	10/15/14
CHANNEL/ FREQUENCY:	90.5 MHz	APPROVED BY:		DATE:	
SCALE:	1:10	DRAWING NO.:	1328-001	REV.	



PROPAGATION SYSTEMS, INC.			
Ebensburg, Pennsylvania USA 814-472-5540			
ANTENNA PLAN VIEW AND ORIENTATION			
REV.	MADE BY CHECKED BY	DATE	CHANGE
This drawing is loaned subject to the express understanding and agreement that the drawing and information therein contained are, and shall remain the property of PSI, and will not be otherwise utilized or disposed of, directly or indirectly, and will not be used in whole or in part or assist in making or finish any information for the making of drawings, prints or other reproductions hereof, or for the design or making of any item, parts, object, apparatus or parts thereof, except upon the written permissions of PSI first obtained. The acceptance of this drawing will be construed as an acceptance of the forgoing agreement.			SIZE A
MODEL: PSIFML-1C-H-DA		DRAWN BY: B.K.SCHILLING	DATE: 10/15/14
CHANNEL/ FREQUENCY: 90.5 MHz		APPROVED BY:	DATE:
SCALE: 1:10		DRAWING NO.: 1328-002	REV.



Maximum Envelope
Azimuth Plane Pattern
Antenna: PSIFML-1C-H-DA
Type: 1-Bay Directional FM Antenna
ERP: .32 kW (-4.95 dBk)
RMS Envelope: .789
Frequency: 90.5 MHz
WCOZ Laceyville, PA

Propagation Systems Inc.
PO Box 113
Ebensburg, PA 15931

Maximum Envelope Tabulation

Antenna: PSIFML-1C-H-DA

Telikoj Educational Broadcasting Inc.

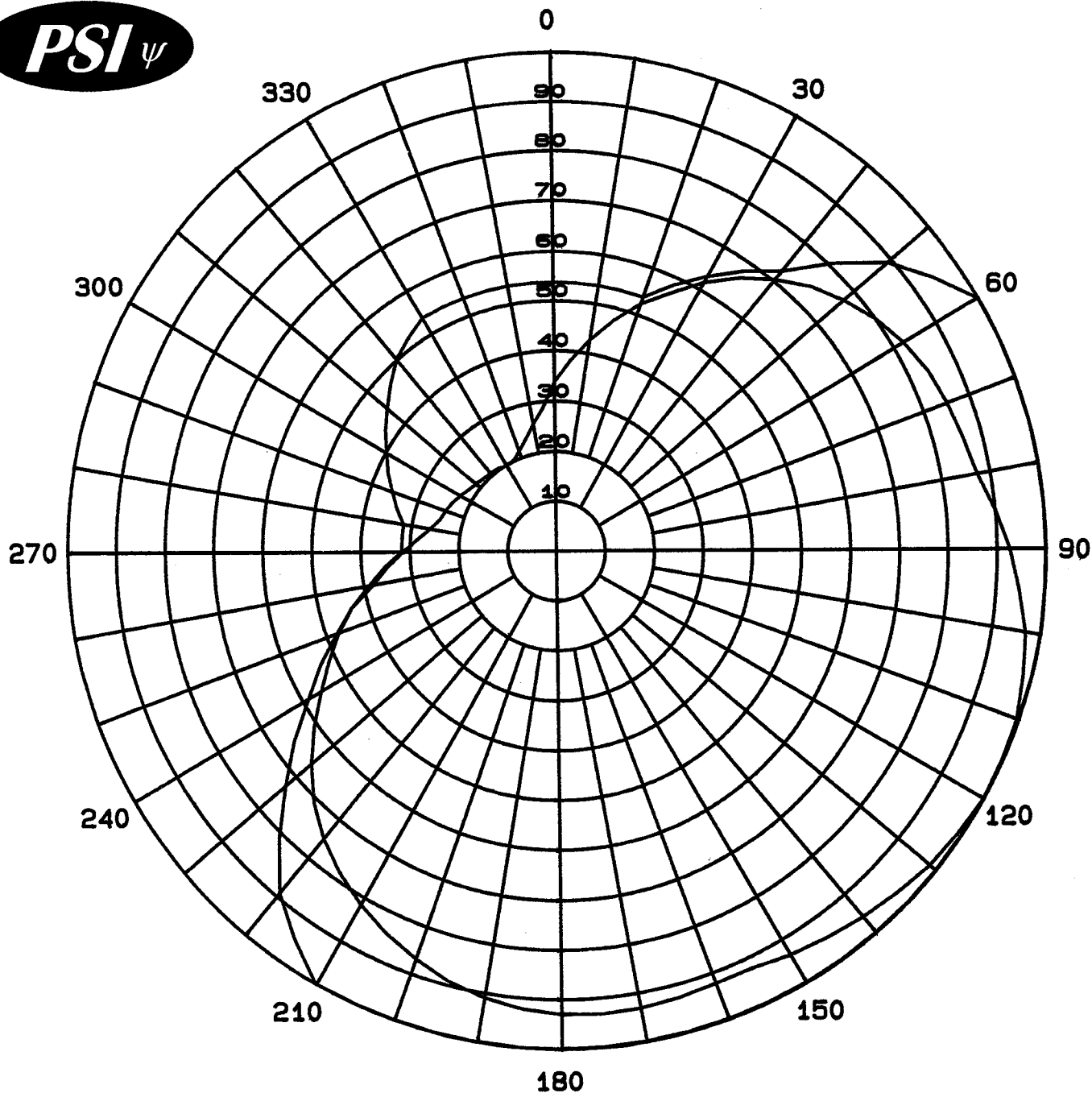
Station: WCOZ

Frequency: 90.5 MHz

Location: Laceyville, PA

Maximum ERP: .32 kW (-4.95 dBk)

Angle	Relative Field	ERP (kW)	ERP (dBk)
0	0.537	0.092	-10.35
10	0.537	0.092	-10.35
20	0.537	0.092	-10.35
30	0.631	0.127	-8.95
40	0.726	0.169	-7.73
50	0.891	0.254	-5.95
60	1.000	0.320	-4.95
70	1.000	0.320	-4.95
80	1.000	0.320	-4.95
90	1.000	0.320	-4.95
100	1.000	0.320	-4.95
110	1.000	0.320	-4.95
120	1.000	0.320	-4.95
130	1.000	0.320	-4.95
140	1.000	0.320	-4.95
150	1.000	0.320	-4.95
160	1.000	0.320	-4.95
170	1.000	0.320	-4.95
180	1.000	0.320	-4.95
190	1.000	0.320	-4.95
200	1.000	0.320	-4.95
210	1.000	0.320	-4.95
220	0.891	0.254	-5.95
230	0.729	0.170	-7.69
240	0.589	0.111	-9.55
250	0.479	0.073	-11.34
260	0.389	0.048	-13.15
270	0.316	0.032	-14.95
280	0.316	0.032	-14.95
290	0.355	0.040	-13.94
300	0.398	0.051	-12.95
310	0.447	0.064	-11.94
320	0.501	0.080	-10.95
330	0.537	0.092	-10.35
340	0.537	0.092	-10.35
350	0.537	0.092	-10.35



Maximum Envelope and
Composite Pattern
Antenna: PSIFML-1C-H-DA
Type: 1-Bay Directional FM Antenna
ERP: .32 kW (-4.95 dBk)
RMS Envelope: .789
RMS Composite: .703
Frequency: 90.5 MHz

Propagation Systems Inc.
PO Box 113
Ebensburg, PA 15931

WCOZ Laceyville, PA

