



Propagation Systems, Inc.

Quality Broadcast Antenna Systems

**Directional FM Antenna
New FM
Hispanic Target Media Inc.
Refugio, TX**

A standard model PSIFM antenna with parasitic elements was used in conjunction with the customer's 38" face triangular tower to create the necessary directional radiation pattern. The final antenna consists of two radiating elements each secured to the tower with a custom mounting bracket. The antenna bays are full wave spaced, there is one horizontal parasitic and one vertical parasitic element per bay. The antenna array is end fed from an existing flexible transmission line. Each radiating element receives equal power and phase.

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 tower under test were 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 318.3 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 86.8% of the envelope RMS.

The antenna is to be mounted 51 meters (167.3 ft.) +2/-4 meters above ground level on a the southwest tower face and positioned 264° True. No other antenna can be installed within 10 ft of any radiating element. Any guy wire that passes within 20 ft. of a radiating element must be changed to the appropriate 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 3.57 kW will be required at the antenna input in order to reach the approved 6.0 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

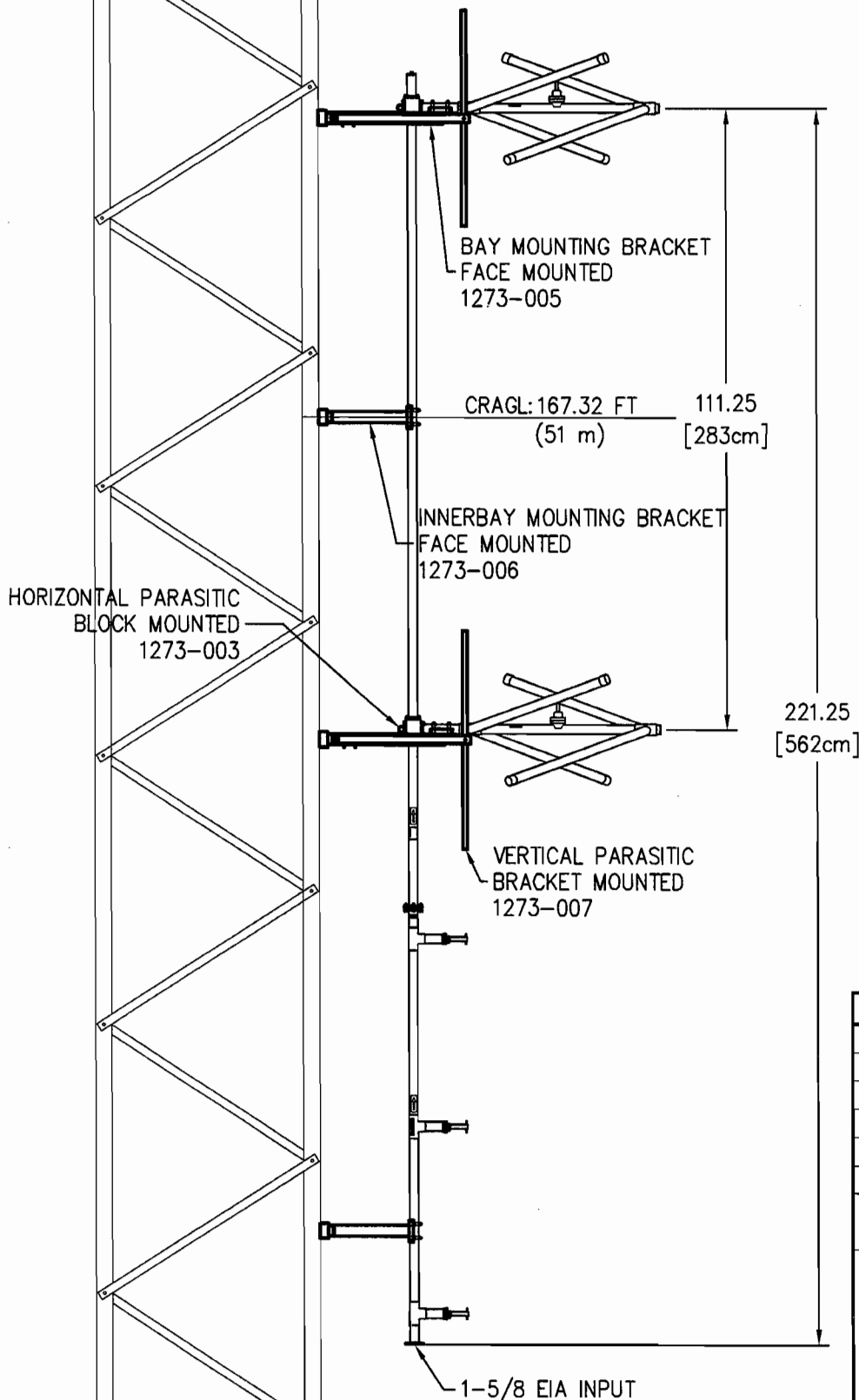
Antenna Model	PSIFM-2-DA
Type	2-bay directional FM antenna
Bay Spacing	Full wave spaced elements
Frequency	106.1 MHz
Polarization	Circular
Envelope RMS	.942
Composite RMS	.818
Gain (h-pol)	1.68 (2.25 dB)
Gain (v-pol)	1.67 (2.24 dB)
ERP	6.0 kW
Antenna input power	3.57 kW
Input	1-5/8" EIA end fed input
Power rating	6 kW
Length	18.44 ft.
Weight	195.7 lbs.
Wind Area	15.24 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	
SPACING:	1.0λ
LENGTH:	18.44 FT [5.62m]
APERTURE:	9.27 FT [2.83m]
RATING:	6 kW
GAIN:	1.68 (2.25 dB)
WEIGHT:	195.68 LB [88.76 Kg]
WINDAREA:	15.24 FT ²
	TIA-222-F (NO ICE)
NOTE:	

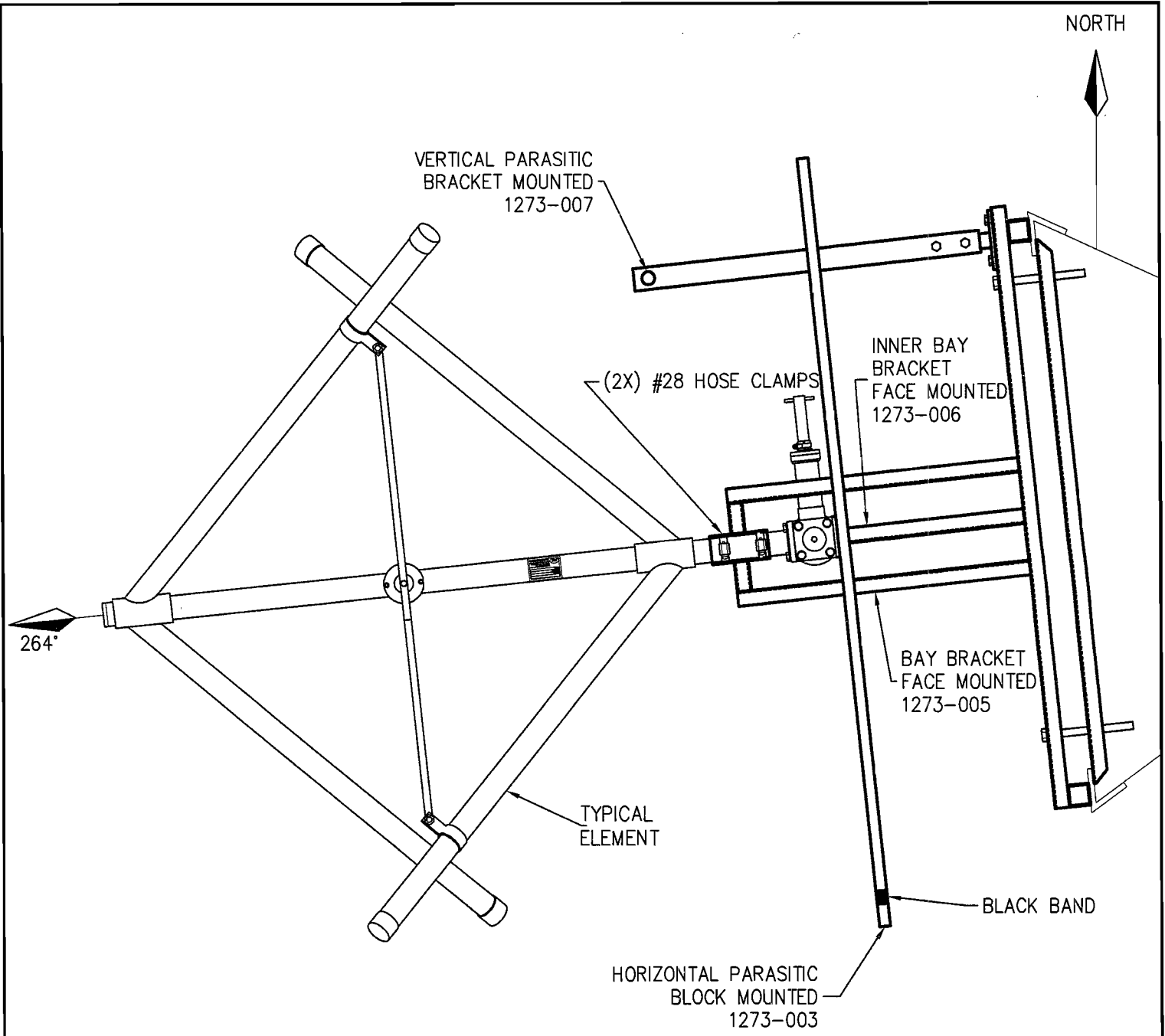
REV.	MADE BY CHECKED BY	DATE	CHANGE
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PROPAGATION SYSTEMS, INC.

Ebensburg, Pennsylvania USA 814-472-5540

ELEVATIONS AND SPECIFICATIONS

MODEL:	PSIFM-2-DA	DRAWN BY:	B.K.SCHILLING	DATE:	3/31/14
CHANNEL/ FREQUENCY:	106.1 MHz	APPROVED BY:		DATE:	
SCALE:		DRAWING NO.:	1273-001	REV.	



REV.	MADE BY CHECKED BY	DATE	CHANGE

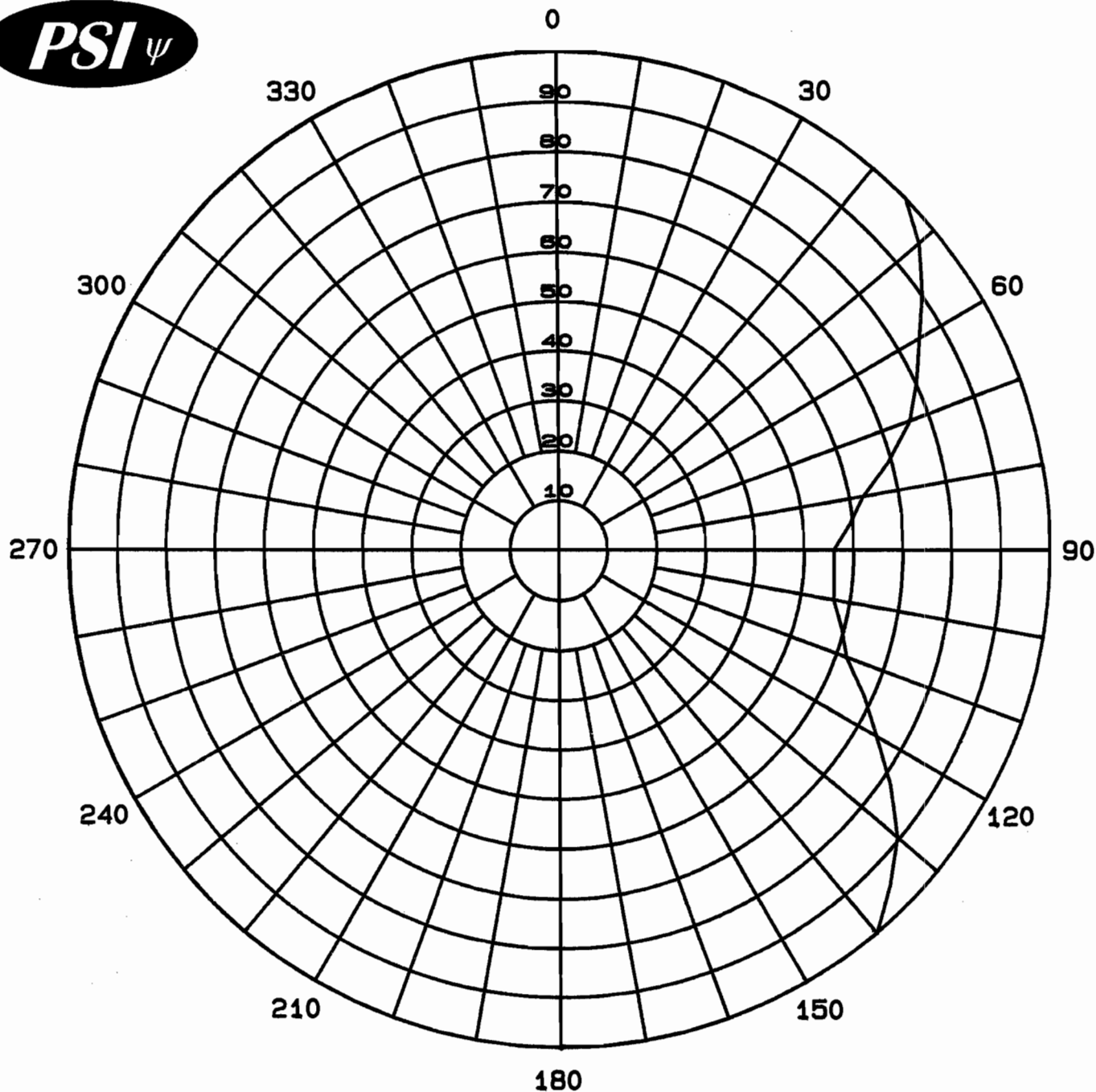
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Ebensburg, Pennsylvania USA 814-472-5540

ANTENNA PLAN VIEW AND ORIENTATION

MODEL: PSIFM-2-DA	DRAWN BY: B.K.SCHILLING	DATE: 3/31/14
CHANNEL/ FREQUENCY: 106.1 MHz	APPROVED BY:	DATE:
SCALE: 1:10	DRAWING NO.: 1273-002	REV. A



Maximum Envelope
Azimuth Plane Pattern
Antenna: PSIFM-2-DA
Type: 2-Bay Directional FM Antenna
ERP: 6.0 kW (7.78 dBk)
RMS Envelope: .942
Frequency: 106.1 MHz
New FM Refugio, TX

Propagation Systems Inc.
PO Box 113
Ebensburg, PA 15931

Maximum Envelope Tabulation

Antenna: PSIFM-2-DA

Hispanic Target Media, Inc

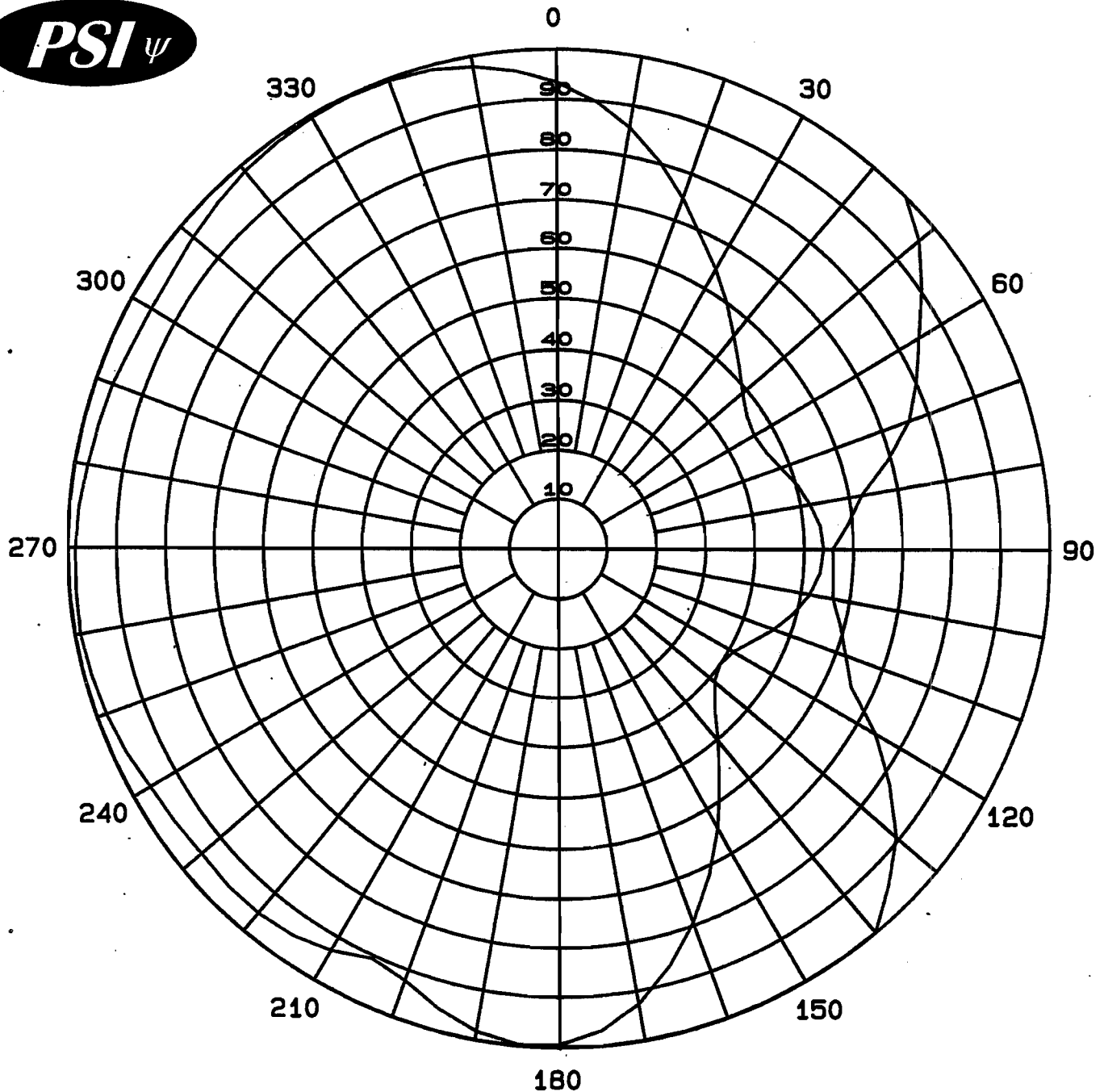
Station: New

Frequency: 106.1 MHz

Location: Refugio, TX

Maximum ERP: 6.0 kW (7.78 dBk)

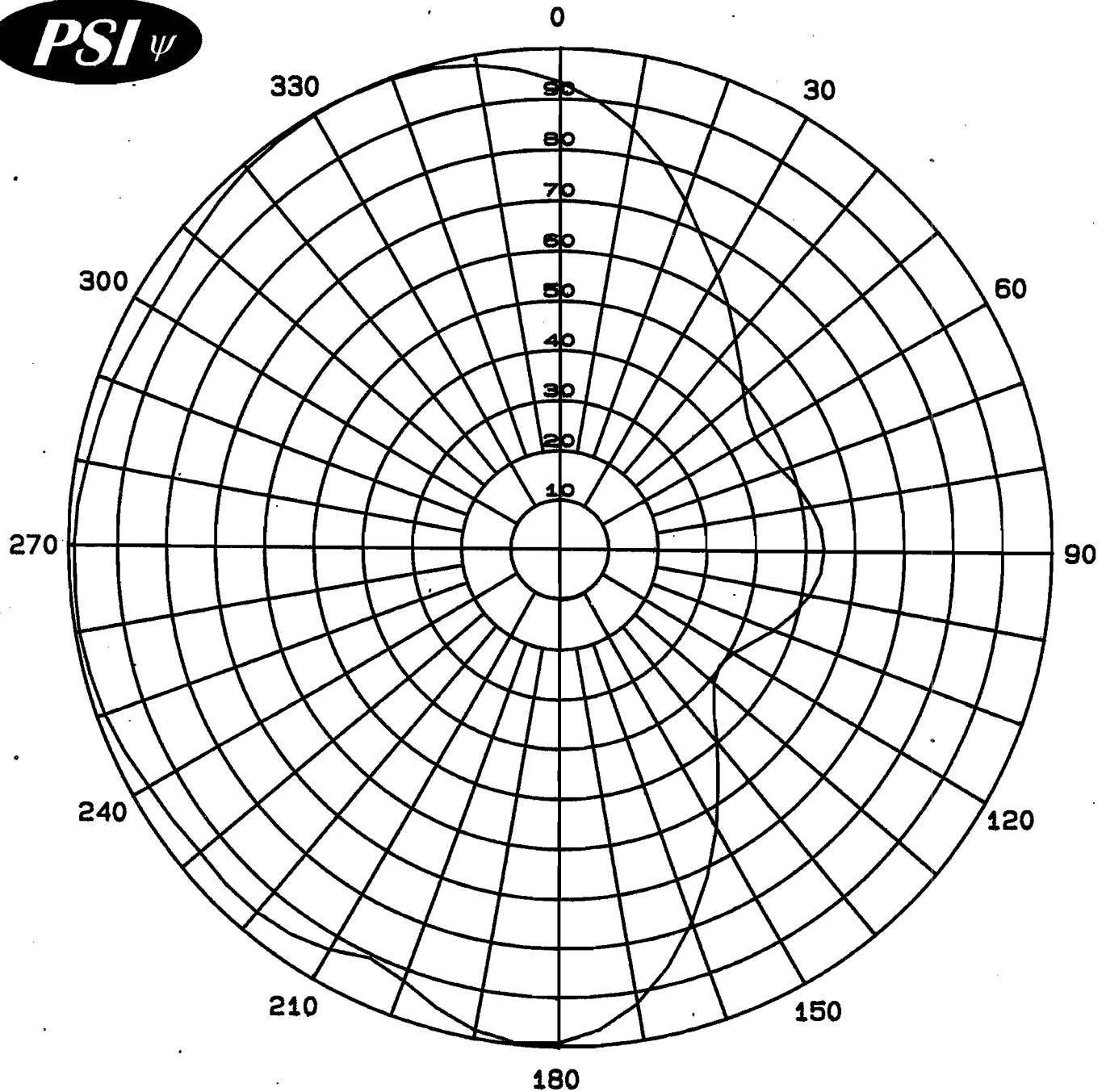
Angle	Relative Field	ERP (kW)	ERP (dBk)
0	1.000	6.00	7.78
10	1.000	6.00	7.78
20	1.000	6.00	7.78
30	1.000	6.00	7.78
40	1.000	6.00	7.78
50	0.959	5.52	7.42
60	0.848	4.31	6.35
70	0.760	3.47	5.40
80	0.627	2.36	3.73
90	0.557	1.86	2.70
100	0.565	1.92	2.82
110	0.619	2.30	3.62
120	0.741	3.29	5.18
130	0.894	4.80	6.81
140	1.000	6.00	7.78
150	1.000	6.00	7.78
160	1.000	6.00	7.78
170	1.000	6.00	7.78
180	1.000	6.00	7.78
190	1.000	6.00	7.78
200	1.000	6.00	7.78
210	1.000	6.00	7.78
220	1.000	6.00	7.78
230	1.000	6.00	7.78
240	1.000	6.00	7.78
250	1.000	6.00	7.78
260	1.000	6.00	7.78
270	1.000	6.00	7.78
280	1.000	6.00	7.78
290	1.000	6.00	7.78
300	1.000	6.00	7.78
310	1.000	6.00	7.78
320	1.000	6.00	7.78
330	1.000	6.00	7.78
340	1.000	6.00	7.78
350	1.000	6.00	7.78



Maximum Envelope and
Composite Pattern
Antenna: PSIFM-2-DA
Type: 2-Bay Directional FM Antenna
ERP: 6.0 kW (7.78 dBk)
RMS Envelope: .942
RMS Composite: .818
Frequency: 106.1 MHz

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Ebensburg, PA 15931

New FM Refugio, TX



Measured Composite
Azimuth Plane Pattern
Antenna: PSIFM-2-DA
Type: 2-Bay Directional FM Antenna
ERP: 6.0 kW (7.78 dBk)
RMS Composite: .818
Frequency: 106.1 MHz
New FM Refugio, TX

Propagation Systems Inc.
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Ebensburg, PA 15931

Composite Pattern Tabulation

Antenna: PSIFM-2-DA

Hispanic Target Media, Inc

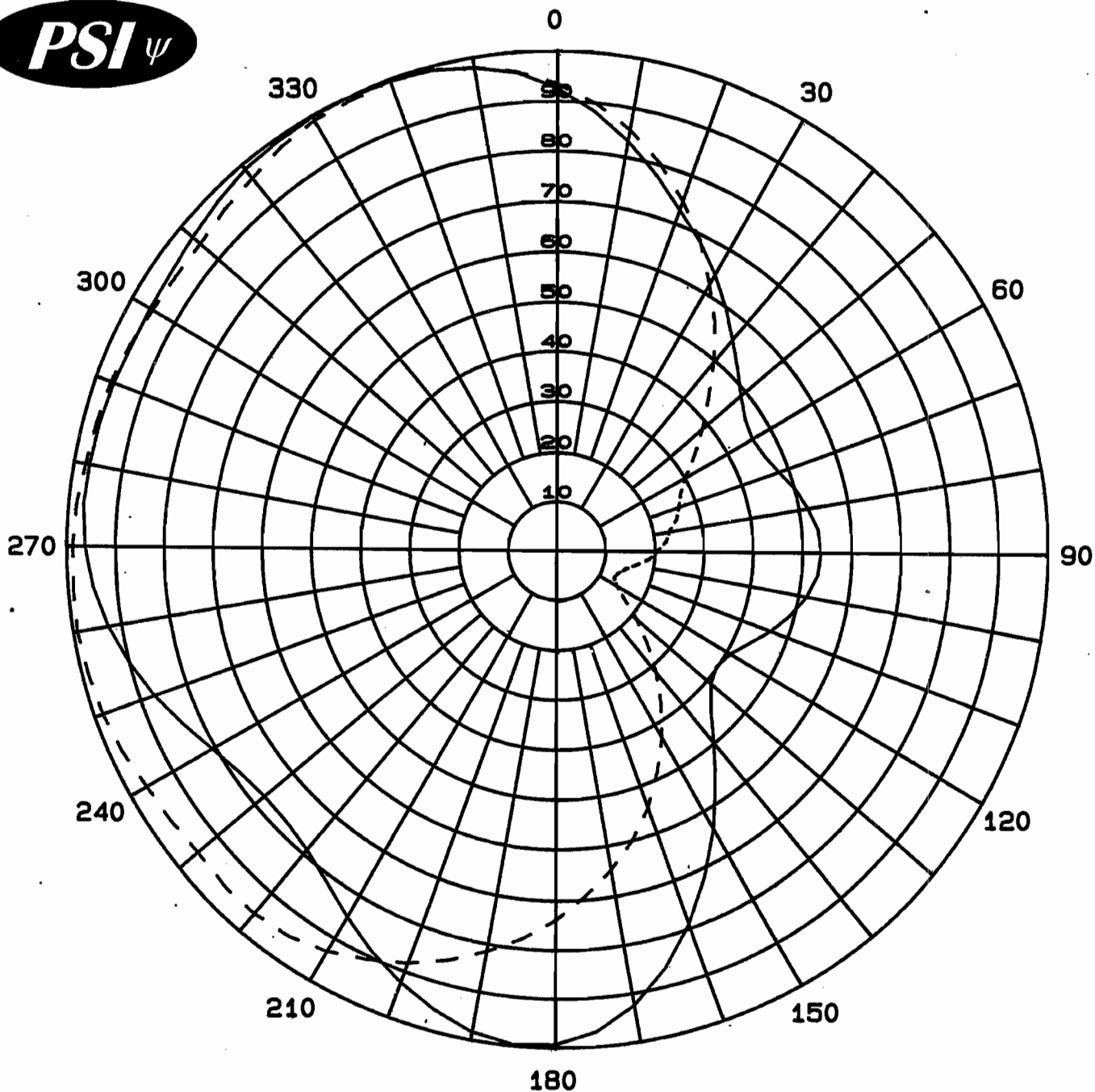
Station: New

Frequency: 106.1 MHz

Location: Refugio, TX

Maximum ERP: 6.0 kW (7.78 dBk)

Angle	Relative Field	ERP (kW)	ERP (dBk)
0	0.934	5.23	7.19
10	0.855	4.39	6.42
20	0.746	3.34	5.24
30	0.642	2.47	3.93
40	0.555	1.85	2.67
50	0.488	1.43	1.55
60	0.459	1.26	1.02
70	0.480	1.38	1.41
80	0.518	1.61	2.07
90	0.538	1.74	2.40
100	0.517	1.60	2.05
110	0.464	1.29	1.11
120	0.409	1.00	0.02
130	0.411	1.01	0.06
140	0.500	1.50	1.76
150	0.642	2.47	3.93
160	0.793	3.77	5.77
170	0.926	5.14	7.11
180	0.994	5.93	7.73
190	0.983	5.80	7.63
200	0.923	5.11	7.09
210	0.931	5.20	7.16
220	0.954	5.46	7.37
230	0.951	5.43	7.35
240	0.962	5.55	7.45
250	0.982	5.79	7.62
260	0.991	5.89	7.70
270	0.987	5.85	7.67
280	0.975	5.70	7.56
290	0.967	5.61	7.49
300	0.957	5.50	7.40
310	0.968	5.62	7.50
320	0.988	5.86	7.68
330	0.997	5.96	7.76
340	0.997	5.96	7.76
350	0.980	5.76	7.61



Measured Relative Field
Azimuth Plane Pattern
Antenna: PSIFM-2-DA
Type: 2-Bay Directional FM Antenna
Gain H-pol (solid): 1.68 (2.25 dB)
Gain V-pol (dash): 1.67 (2.24 dB)
Frequency: 106.1 MHz
New FM Refugio, TX

Propagation Systems Inc.
PO Box 113
Ebensburg, PA 15931

Measured Relative Field Tabulation

Antenna: PSIFM-2-DA
Hispanic Target Media, Inc
Station: New
Frequency: 106.1 MHz
Location: Refugio, TX

Horizontal Polarization

Angle	Relative Field	Power Gain	Gain (dB)
0	0.926	1.441	1.59
10	0.832	1.163	0.66
20	0.728	0.890	-0.50
30	0.642	0.692	-1.60
40	0.555	0.517	-2.86
50	0.488	0.400	-3.98
60	0.459	0.354	-4.51
70	0.480	0.387	-4.12
80	0.518	0.451	-3.46
90	0.538	0.486	-3.13
100	0.517	0.449	-3.48
110	0.464	0.362	-4.42
120	0.409	0.281	-5.51
130	0.411	0.284	-5.47
140	0.500	0.420	-3.77
150	0.642	0.692	-1.60
160	0.793	1.056	0.24
170	0.926	1.441	1.59
180	0.994	1.660	2.20
190	0.983	1.623	2.10
200	0.923	1.431	1.56
210	0.848	1.208	0.82
220	0.788	1.043	0.18
230	0.774	1.006	0.03
240	0.807	1.094	0.39
250	0.870	1.272	1.04
260	0.926	1.441	1.59
270	0.961	1.552	1.91
280	0.967	1.571	1.96
290	0.961	1.552	1.91
300	0.957	1.539	1.87
310	0.968	1.574	1.97
320	0.988	1.640	2.15
330	0.997	1.670	2.23
340	0.996	1.667	2.22
350	0.979	1.610	2.07

Maximum Value

Field 1.000
Gain 1.68 (2.25 dB)
Azimuth Bearing 334 degrees

Minimum Field

Field 0.398
Gain .266 (-5.75 dB)
Azimuth Bearing 124 degrees

Vertical Polarization

Angle	Relative Field	Power Gain	Gain (dB)
0	0.934	1.466	1.66
10	0.855	1.228	0.89
20	0.746	0.935	-0.29
30	0.620	0.646	-1.90
40	0.498	0.417	-3.80
50	0.388	0.253	-5.97
60	0.302	0.153	-8.15
70	0.265	0.118	-9.28
80	0.233	0.091	-10.40
90	0.206	0.071	-11.47
100	0.164	0.045	-13.45
110	0.133	0.030	-15.27
120	0.140	0.033	-14.82
130	0.210	0.074	-11.30
140	0.315	0.167	-7.78
150	0.431	0.312	-5.06
160	0.548	0.505	-2.97
170	0.650	0.710	-1.49
180	0.739	0.917	-0.37
190	0.816	1.119	0.49
200	0.882	1.307	1.16
210	0.931	1.456	1.63
220	0.954	1.529	1.84
230	0.951	1.519	1.82
240	0.962	1.555	1.92
250	0.982	1.620	2.10
260	0.991	1.650	2.17
270	0.987	1.637	2.14
280	0.975	1.597	2.03
290	0.967	1.571	1.96
300	0.951	1.519	1.82
310	0.947	1.507	1.78
320	0.965	1.564	1.94
330	0.989	1.643	2.16
340	0.997	1.670	2.23
350	0.980	1.613	2.08

Maximum Value

Field 0.998
Gain 1.67 (2.24 dB)
Azimuth Bearing 339 degrees

Minimum Field

Field 0.127
Gain .027 (-15.67 dB)
Azimuth Bearing 114 degrees

ERP Tabulation

Antenna: PSIFM-2-DA

Hispanic Target Media, Inc

Station: New

Frequency: 106.1 MHz

Location: Refugio, TX

Maximum ERP: 6.0 kW (7.78 dBk)

Horizontal Polarization

Angle	Relative Field	ERP (kW)	ERP (dBk)
0	0.926	5.14	7.11
10	0.832	4.15	6.18
20	0.728	3.18	5.02
30	0.642	2.47	3.93
40	0.555	1.85	2.67
50	0.488	1.43	1.55
60	0.459	1.26	1.02
70	0.480	1.38	1.41
80	0.518	1.61	2.07
90	0.538	1.74	2.40
100	0.517	1.60	2.05
110	0.464	1.29	1.11
120	0.409	1.00	0.02
130	0.411	1.01	0.06
140	0.500	1.50	1.76
150	0.642	2.47	3.93
160	0.793	3.77	5.77
170	0.926	5.14	7.11
180	0.994	5.93	7.73
190	0.983	5.80	7.63
200	0.923	5.11	7.09
210	0.848	4.31	6.35
220	0.788	3.73	5.71
230	0.774	3.59	5.56
240	0.807	3.91	5.92
250	0.870	4.54	6.57
260	0.926	5.14	7.11
270	0.961	5.54	7.44
280	0.967	5.61	7.49
290	0.961	5.54	7.44
300	0.957	5.50	7.40
310	0.968	5.62	7.50
320	0.988	5.86	7.68
330	0.997	5.96	7.76
340	0.996	5.95	7.75
350	0.979	5.75	7.60

Maximum Value (H-pol)

Field 1.000
ERP 6.0 kW (7.78 dBk)

Azimuth Bearing 334 degrees

Minimum Field (H-pol)

Field 0.398
ERP .95 kW (-22 dBk)

Azimuth Bearing 124 degrees

Vertical Polarization

Angle	Relative Field	ERP (kW)	ERP (dBk)
0	0.934	5.23	7.19
10	0.855	4.39	6.42
20	0.746	3.34	5.24
30	0.620	2.31	3.63
40	0.498	1.49	1.73
50	0.388	0.90	-0.44
60	0.302	0.55	-2.62
70	0.265	0.42	-3.75
80	0.233	0.33	-4.87
90	0.206	0.25	-5.94
100	0.164	0.16	-7.92
110	0.133	0.11	-9.74
120	0.140	0.12	-9.30
130	0.210	0.26	-5.77
140	0.315	0.60	-2.25
150	0.431	1.11	0.47
160	0.548	1.80	2.56
170	0.650	2.54	4.04
180	0.739	3.28	5.15
190	0.816	4.00	6.02
200	0.882	4.67	6.69
210	0.931	5.20	7.16
220	0.954	5.46	7.37
230	0.951	5.43	7.35
240	0.962	5.55	7.45
250	0.982	5.79	7.62
260	0.991	5.89	7.70
270	0.987	5.85	7.67
280	0.975	5.70	7.56
290	0.967	5.61	7.49
300	0.951	5.43	7.35
310	0.947	5.38	7.31
320	0.965	5.59	7.47
330	0.989	5.87	7.69
340	0.997	5.96	7.76
350	0.980	5.76	7.61

Maximum Value (V-pol)

Field 0.998
ERP 5.98 kW (7.76 dBk)

Azimuth Bearing 339 degrees

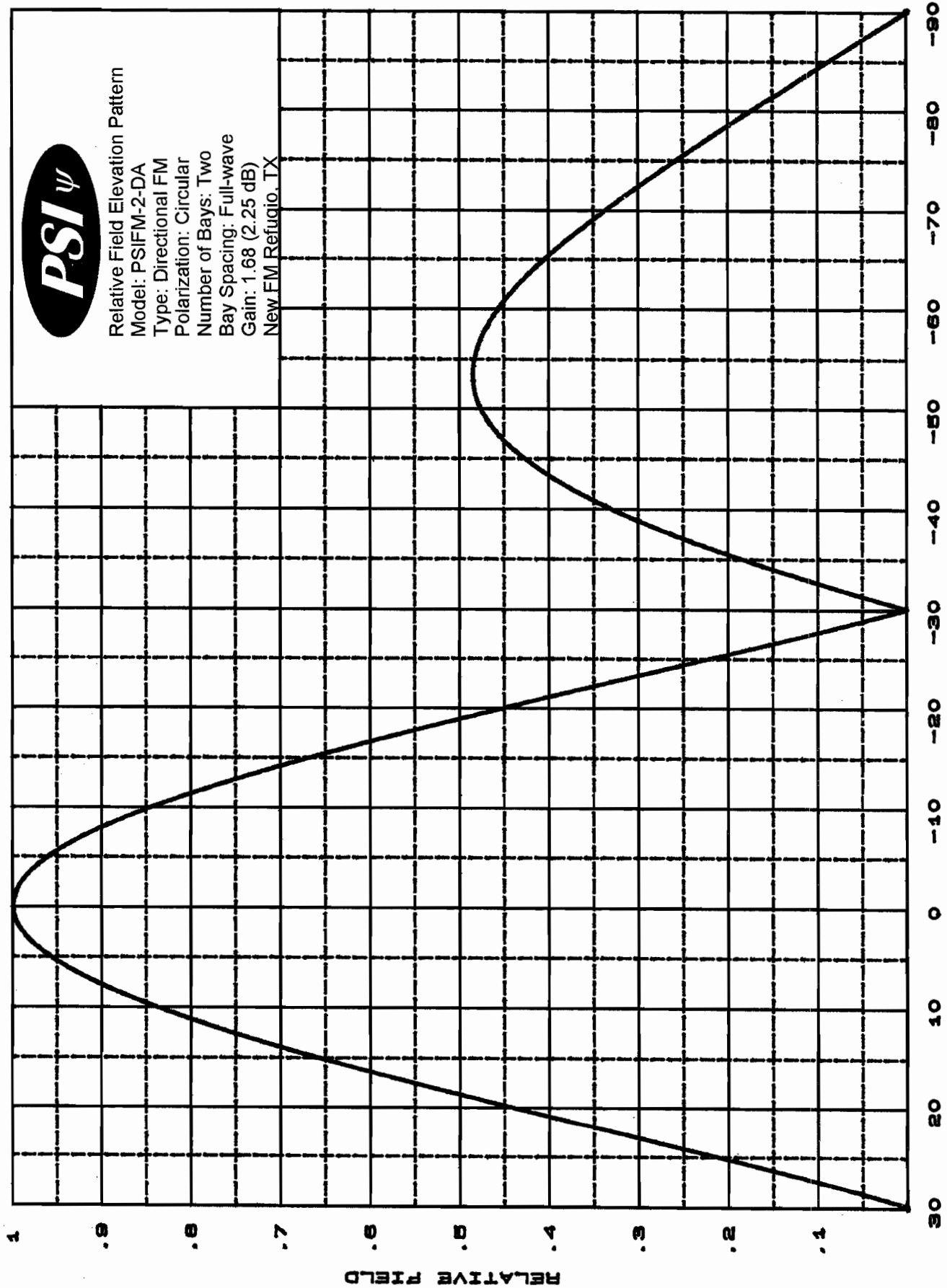
Minimum Field (V-pol)

Field 0.127
ERP .10 kW (-10.14 dBk)

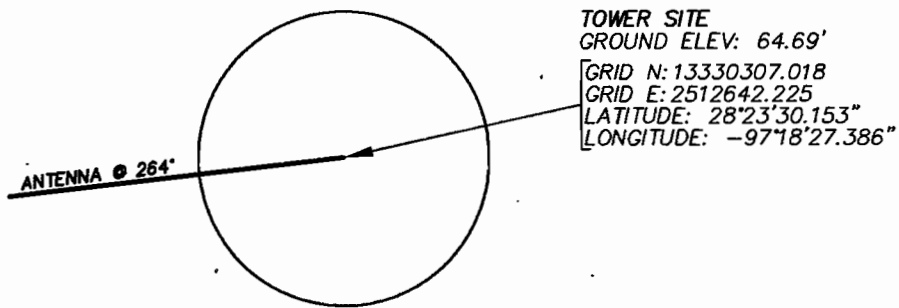
Azimuth Bearing 114 degrees



Relative Field Elevation Pattern
Model: PSIFM-2-DA
Type: Directional FM
Polarization: Circular
Number of Bays: Two
Bay Spacing: Full-wave
Gain: 1.68 (2.25 dB)
New FM Refugio, TX



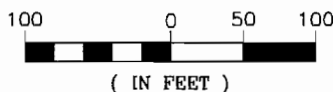
DEGREES BELOW HORIZONTAL



Tower antenna is oriented at an azimuth of 264°; situated approximately 6.3 miles northwest of the town of Refugio, TX.

Bearings, distances and coordinates are based on the Texas State Plane Coordinate System, North American Datum of 1983, South Central Zone. Geographic coordinates are based on the North American Datum of 1983.

PLAT SHOWING RADIO TOWER
HISPANIC TARGET MEDIA
T. SCOTT SURVEY, A-65
REFUGIO COUNTY, TEXAS



This plat meets the requirements for filing a well location plat with the Texas Railroad Commission and is intended solely for that purpose. This plat is not intended to represent a boundary survey and does not meet the requirements for boundary surveys in the State of Texas, prepared this the 19th day of March, 2014.



FIRM REG. NO. 10193705
600 Second Street
P.O. Box 1284
Woodsboro, TX 78393
Phone 361-543-8161
Fax 361-288-8438



Nathan Eby
Registered Prof. Land Surveyor
Registration No. 6198