



Propagation Systems, Inc.

Quality Broadcast Antenna Systems

Directional FM Antenna

KMLY

Lazer Licenses, LLC

Gonzales, CA

A standard model PSIFMR antenna with parasitic elements was used in conjunction with the customer's 41" face triangular tower to create the necessary directional radiation pattern. The final antenna consists of four radiating elements each secured to the tower with a custom mounting bracket. The antenna bays are half-wave spaced and there are a total of two horizontal and two vertical parasitic elements per bay. The antenna array is center fed from an existing flexible transmission line. Each radiating element receives equal power and the correct 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 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 285.3 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 86.2% of the envelope RMS.

The antenna is to be mounted 53 meters (175 ft.) +2/-4 meters above ground level on a the southwest tower face and positioned 190° 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.

The measured principal minima at 20 and 320 degrees are .23 kW and .37 kW respectively, below the approved levels of .52 kW and .42 kW. An input power level of 2.20 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

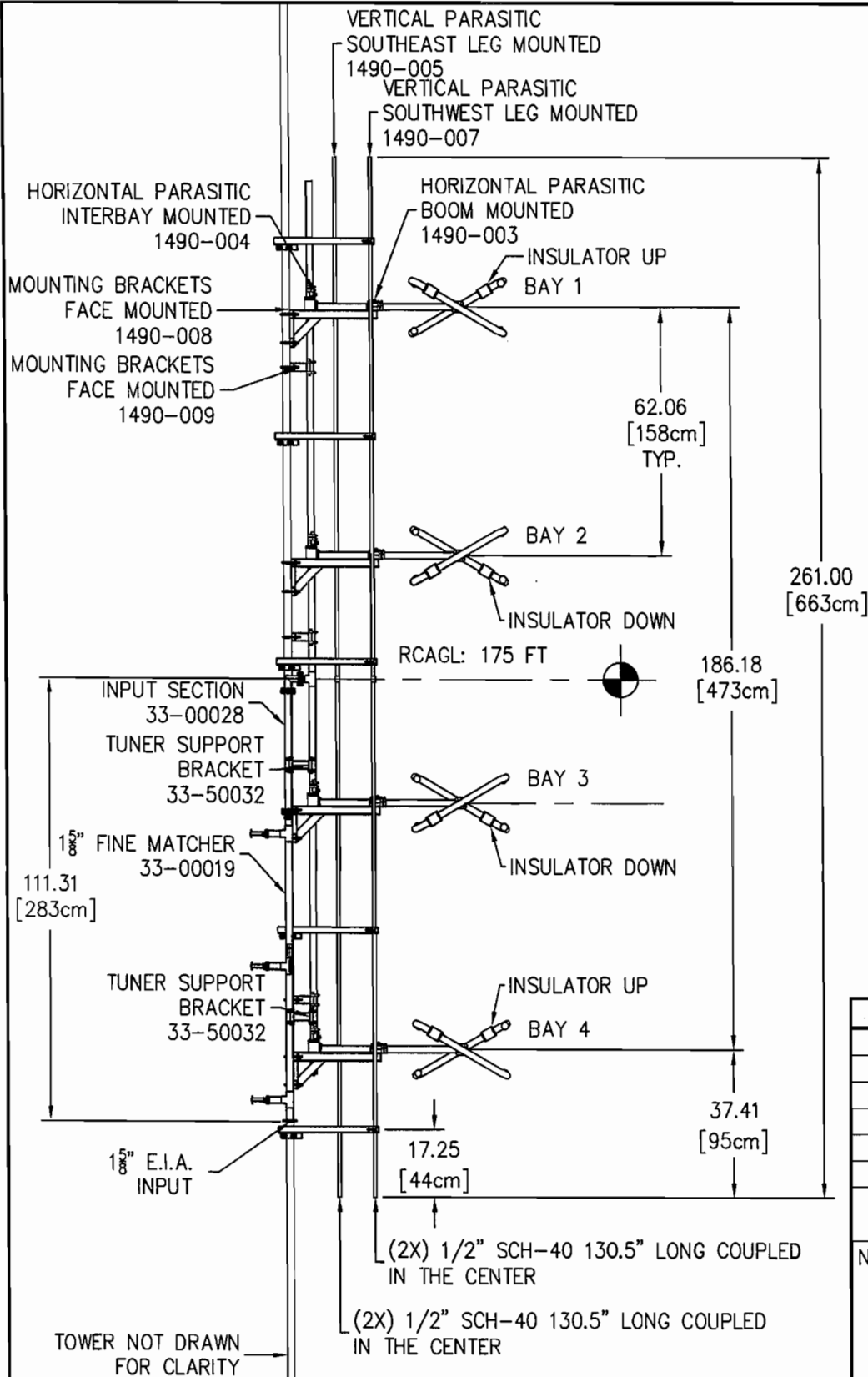
| | |
|---------------------|------------------------------|
| Antenna Model | PSIFMR-4C-50WS-DA |
| Type | 4-bay directional FM antenna |
| Bay Spacing | Half-wave spaced elements |
| Frequency | 95.1 MHz |
| Polarization | Circular |
| Envelope RMS | .777 |
| Composite RMS | .670 |
| Gain (h-pol) | 2.73 (4.36 dB) |
| Gain (v-pol) | 2.73 (4.36 dB) |
| ERP | 6.0 kW |
| Antenna input power | 2.20 kW |
| Input | 1-5/8" EIA center fed input |
| Power rating | 9 kW |
| Length | 21.75 ft. |
| Weight | 375 lbs. |
| Wind Area | 27.6 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.

 11/2/2015

Douglas A. Ross
President
Propagation Systems Inc.



| SPECIFICATIONS | |
|----------------|----------------------|
| SPACING: | .5 λ |
| LENGTH: | 21.75 FT [6.63m] |
| APERTURE: | 15.52 FT [4.73m] |
| RATING: | 9 kW |
| GAIN: | 2.73 (4.36 dB) |
| WEIGHT: | 375 LB [170.1 Kg] |
| WINDAREA: | 27.6 FT ² |
| TIA-222-F | (NO ICE) |
| NOTE: | |

PROPAGATION SYSTEMS, INC.

Ebensburg, Pennsylvania USA 814-472-5540

ANTENNA ELEVATION AND SPECIFICATIONS

| | | | | | |
|--------------------|-------------------|--------------|---------------|-------|---------|
| MODEL: | PSIFMR-4C-50WS-DA | DRAWN BY: | B.K.SCHILLING | DATE: | 10/8/15 |
| CHANNEL/FREQUENCY: | 95.1 MHz | APPROVED BY: | | DATE: | |
| SCALE: | 1:40 | DRAWING NO.: | 1490-001 | REV. | |

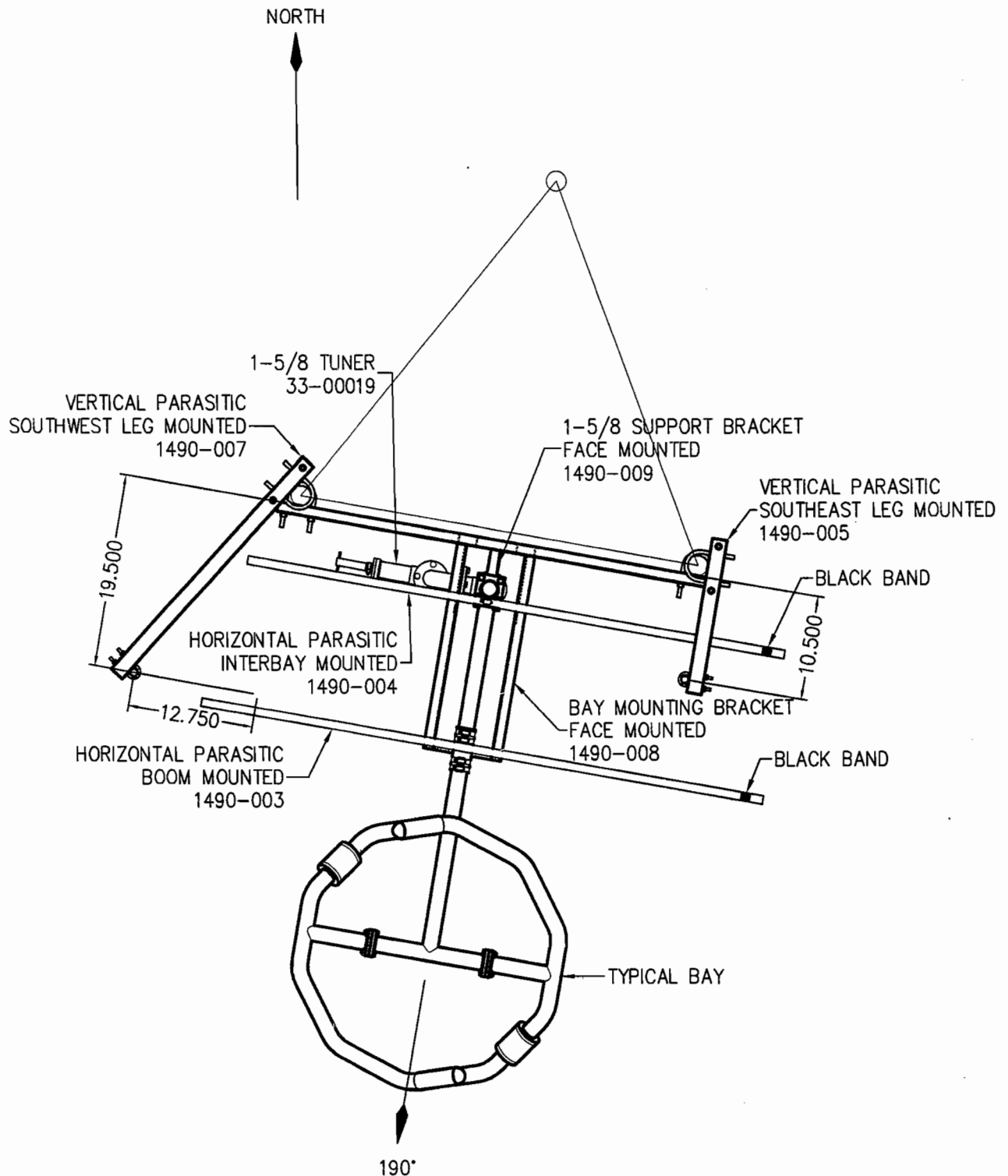
REV. MADE BY CHECKED BY DATE CHANGE

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SIZE

A

TOWER NOT DRAWN FOR CLARITY



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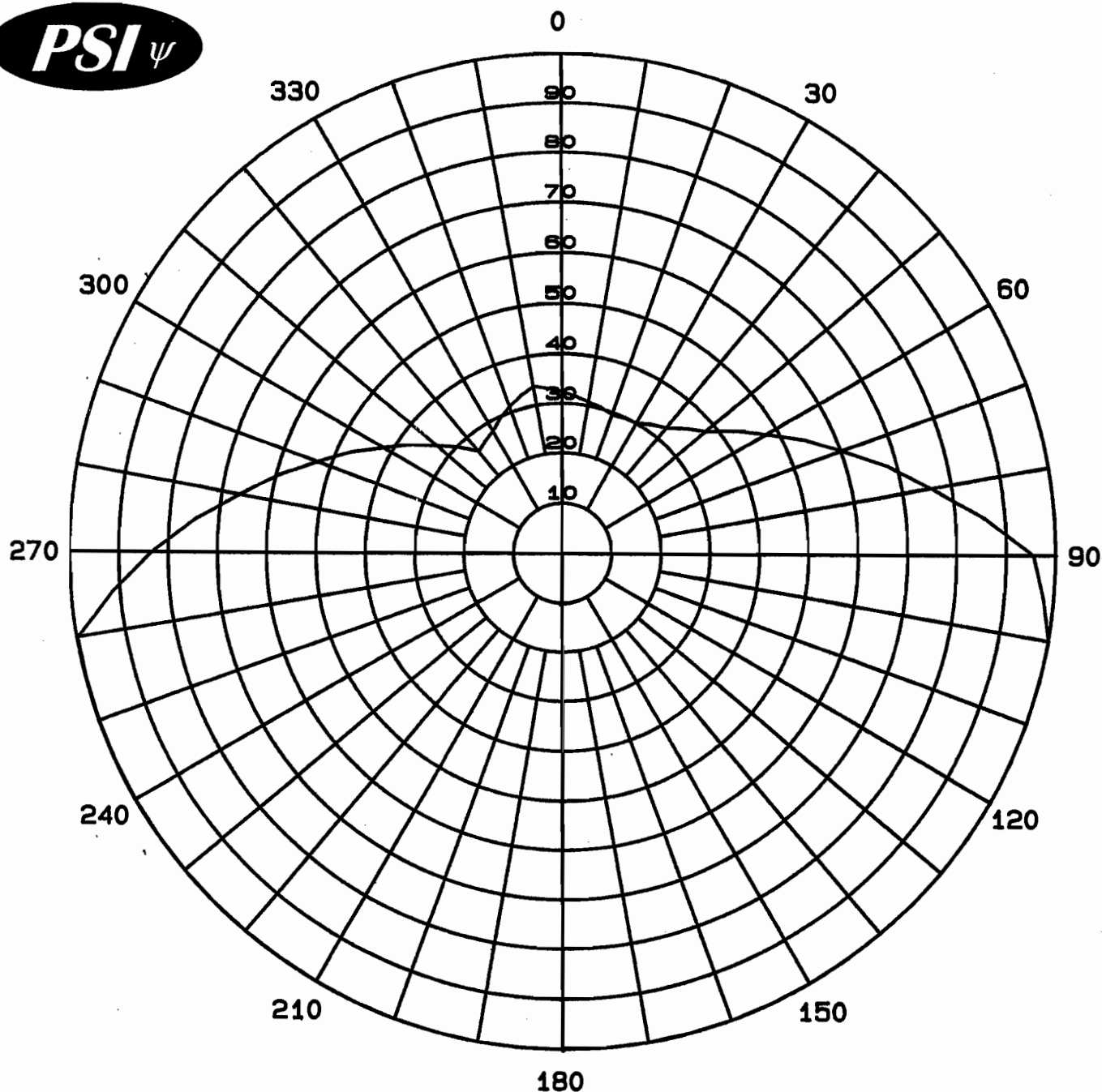
ANTENNA ORIENTATION

| | | |
|------------------------------------|----------------------------|------------------|
| MODEL: PSIFMR-4C-50WS-DA | DRAWN BY: B.K.SCHILLING | DATE: 10/8/15 |
| CHANNEL/ FREQUENCY: 95.1 MHz | APPROVED BY: | DATE: |
| SCALE: 1:10 | DRAWING NO.: 1490-002 | REV. |

| REV. | MADE BY | CHECKED BY | DATE | CHANGE |
|------|---------|------------|------|--------|
| | | | | |

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SIZE
A



Maximum Envelope
Azimuth Plane Pattern
Antenna: PSIFMR-4C-50WS-DA
Type: 4-Bay Directional FM Antenna
ERP: 6.0 kW (7.78 dBk)
RMS Envelope: .777
Frequency: 95.1 MHz
KMLY Gonzales, CA

Propagation Systems Inc.
PO Box 113
Ebensburg, PA 15931

Maximum Envelope Tabulation

Antenna: PSIFMR-4C-50WS-DA

Lazer Licenses, LLC

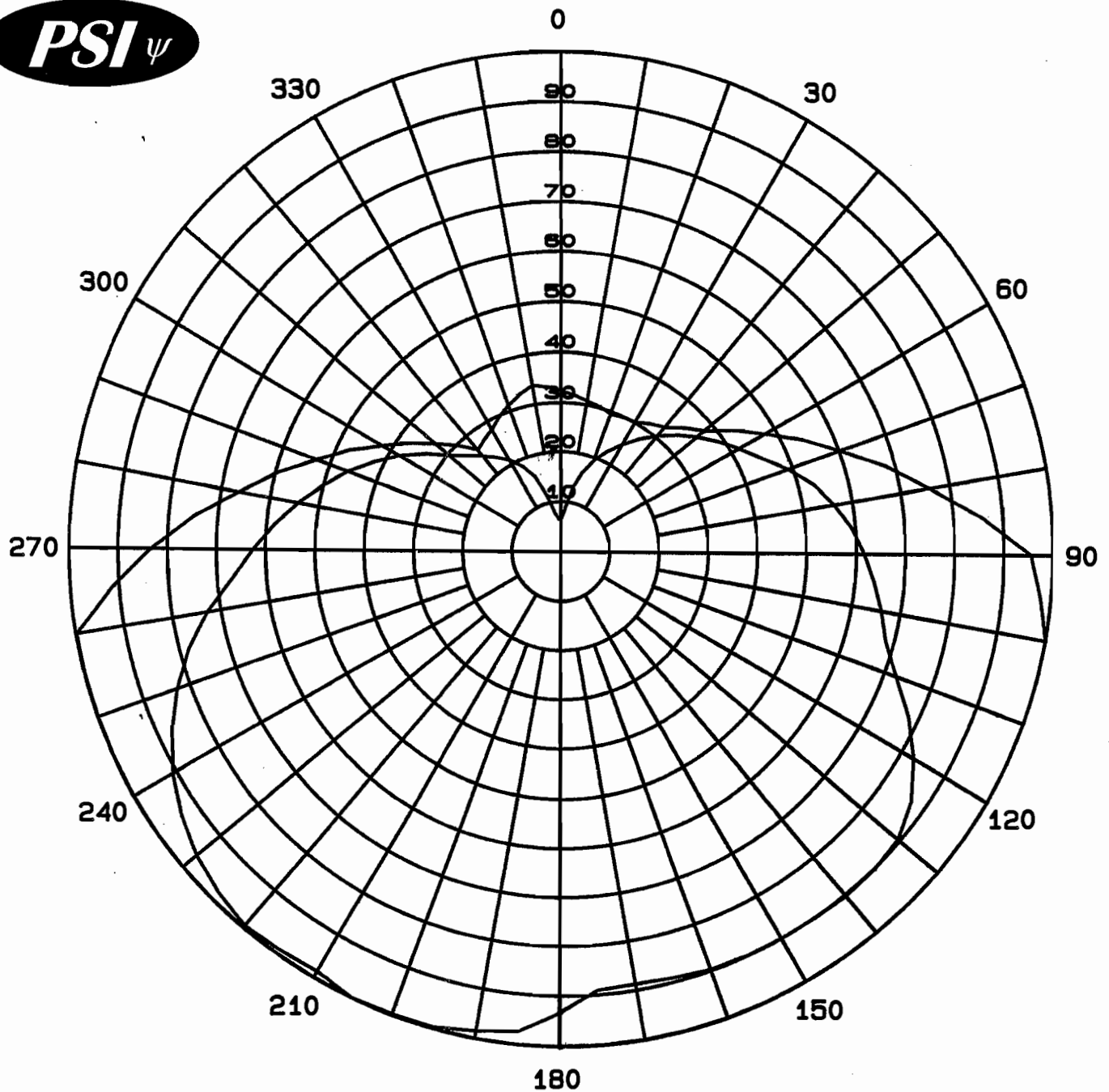
Station: KMLY

Frequency: 95.1 MHz

Location: Gonzales, CA

Maximum ERP: 6.0 kW (7.78 dBk)

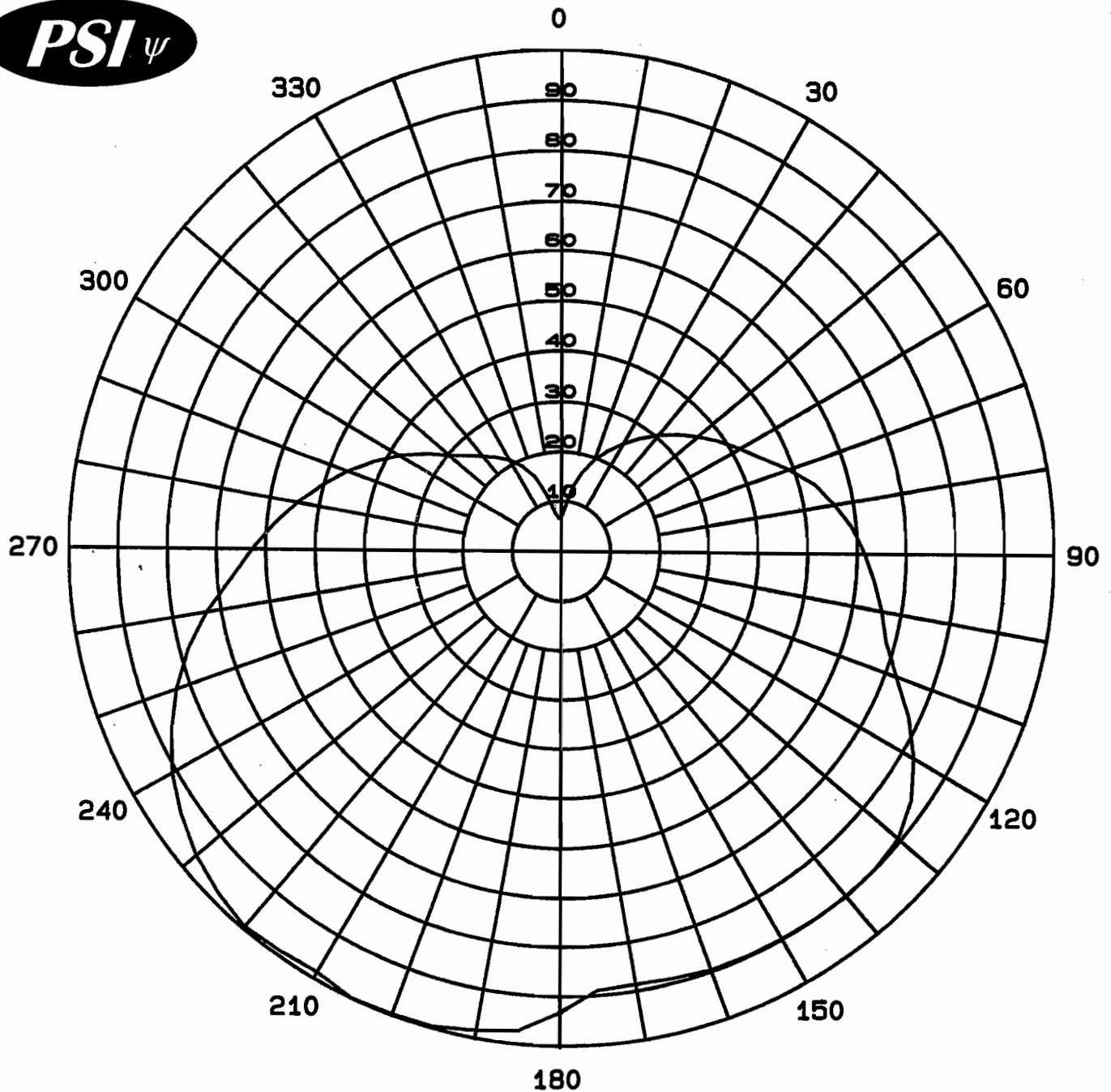
| Angle | Relative Field | ERP (kW) | ERP (dBk) |
|-------|----------------|----------|-----------|
| 0 | 0.324 | 0.63 | -2.01 |
| 10 | 0.308 | 0.57 | -2.45 |
| 20 | 0.295 | 0.52 | -2.82 |
| 30 | 0.301 | 0.54 | -2.65 |
| 40 | 0.328 | 0.65 | -1.90 |
| 50 | 0.380 | 0.87 | -0.62 |
| 60 | 0.478 | 1.37 | 1.37 |
| 70 | 0.602 | 2.17 | 3.37 |
| 80 | 0.758 | 3.45 | 5.37 |
| 90 | 0.954 | 5.46 | 7.37 |
| 100 | 1.000 | 6.00 | 7.78 |
| 110 | 1.000 | 6.00 | 7.78 |
| 120 | 1.000 | 6.00 | 7.78 |
| 130 | 1.000 | 6.00 | 7.78 |
| 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 | 0.834 | 4.17 | 6.20 |
| 280 | 0.663 | 2.64 | 4.21 |
| 290 | 0.527 | 1.67 | 2.22 |
| 300 | 0.418 | 1.05 | 0.21 |
| 310 | 0.332 | 0.66 | -1.80 |
| 320 | 0.264 | 0.42 | -3.79 |
| 330 | 0.282 | 0.48 | -3.21 |
| 340 | 0.313 | 0.59 | -2.31 |
| 350 | 0.340 | 0.69 | -1.59 |



Maximum Envelope and
Composite Pattern
Antenna: PSIFMR-4C-50WS-DA
Type: 4-Bay Directional FM Antenna
ERP: 6.0 kW (7.78 dBk)
RMS Envelope: .777
RMS Composite: .670
Frequency: 95.1 MHz

Propagation Systems Inc.
PO Box 113
Ebensburg, PA 15931

KMLY Gonzales, CA



Measured Composite
Azimuth Plane Pattern
Antenna: PSIFMR-4C-50WS-DA
Type: 4-Bay Directional FM Antenna
ERP: 6.0 kW (7.78 dBk)
RMS Composite: .670
Frequency: 95.1 MHz
KMLY Gonzales, CA

Propagation Systems Inc.
PO Box 113
Ebensburg, PA 15931

Composite Pattern Tabulation

Antenna: PSIFMR-4C-50WS-DA

Lazer Licenses, LLC

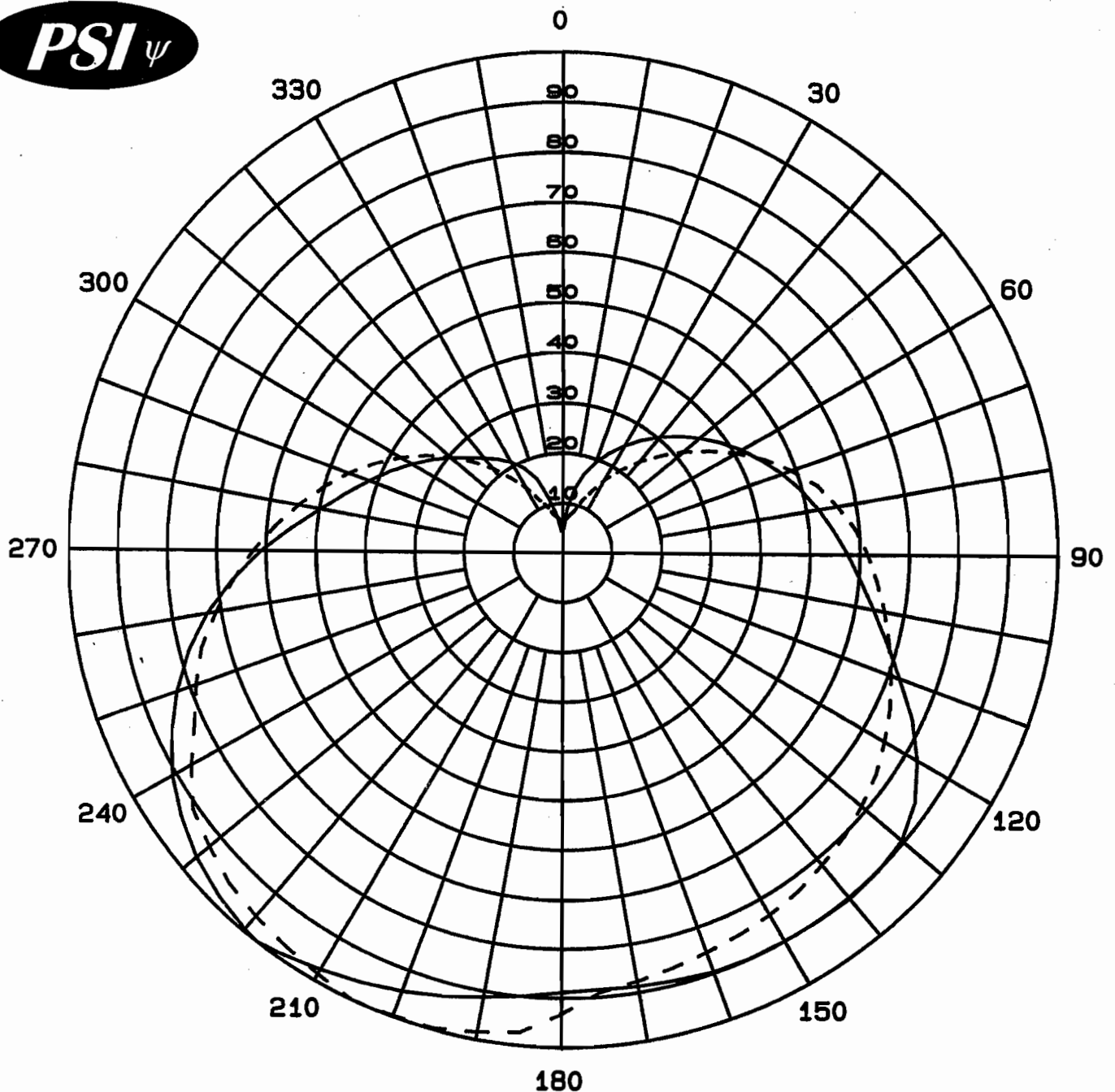
Station: KMLY

Frequency: 95.1 MHz

Location: Gonzales, CA

Maximum ERP: 6.0 kW (7.78 dBk)

| Angle | Relative Field | ERP (kW) | ERP (dBk) |
|-------|----------------|----------|-----------|
| 0 | 0.066 | 0.03 | -15.83 |
| 10 | 0.129 | 0.10 | -10.01 |
| 20 | 0.195 | 0.23 | -6.42 |
| 30 | 0.249 | 0.37 | -4.29 |
| 40 | 0.305 | 0.56 | -2.53 |
| 50 | 0.361 | 0.78 | -1.07 |
| 60 | 0.417 | 1.04 | 0.18 |
| 70 | 0.490 | 1.44 | 1.59 |
| 80 | 0.561 | 1.89 | 2.76 |
| 90 | 0.614 | 2.26 | 3.54 |
| 100 | 0.659 | 2.61 | 4.16 |
| 110 | 0.723 | 3.14 | 4.96 |
| 120 | 0.827 | 4.10 | 6.13 |
| 130 | 0.895 | 4.81 | 6.82 |
| 140 | 0.903 | 4.89 | 6.90 |
| 150 | 0.900 | 4.86 | 6.87 |
| 160 | 0.898 | 4.84 | 6.85 |
| 170 | 0.888 | 4.73 | 6.75 |
| 180 | 0.933 | 5.22 | 7.18 |
| 190 | 0.985 | 5.82 | 7.65 |
| 200 | 0.998 | 5.98 | 7.76 |
| 210 | 0.986 | 5.83 | 7.66 |
| 220 | 0.995 | 5.94 | 7.74 |
| 230 | 0.963 | 5.56 | 7.45 |
| 240 | 0.910 | 4.97 | 6.96 |
| 250 | 0.830 | 4.13 | 6.16 |
| 260 | 0.730 | 3.20 | 5.05 |
| 270 | 0.626 | 2.35 | 3.71 |
| 280 | 0.542 | 1.76 | 2.46 |
| 290 | 0.460 | 1.27 | 1.04 |
| 300 | 0.379 | 0.86 | -0.65 |
| 310 | 0.297 | 0.53 | -2.76 |
| 320 | 0.247 | 0.37 | -4.36 |
| 330 | 0.210 | 0.26 | -5.77 |
| 340 | 0.158 | 0.15 | -8.25 |
| 350 | 0.077 | 0.04 | -14.49 |



Measured Relative Field
Azimuth Plane Pattern
Antenna: PSIFMR-4C-50WS-DA
Type: 4-Bay Directional FM Antenna
Gain H-pol (solid): 2.73 (4.36 dB)
Gain V-pol (dash): 2.73 (4.36 dB)
Frequency: 95.1 MHz
KMLY Gonzales, CA

Propagation Systems Inc.
PO Box 113
Ebensburg, PA 15931

Measured Relative Field Tabulation

Antenna: PSIFMR-4C-50WS-DA

Lazer Licenses, LLC

Station: KMLY

Frequency: 95.1 MHz

Location: Gonzales, CA

Horizontal Polarization

| Angle | Relative Field | Power Gain | Gain (dB) |
|-------|----------------|------------|-----------|
| 0 | 0.042 | 0.005 | -23.17 |
| 10 | 0.129 | 0.045 | -13.43 |
| 20 | 0.195 | 0.104 | -9.84 |
| 30 | 0.249 | 0.169 | -7.71 |
| 40 | 0.305 | 0.254 | -5.95 |
| 50 | 0.361 | 0.356 | -4.49 |
| 60 | 0.417 | 0.475 | -3.24 |
| 70 | 0.471 | 0.606 | -2.18 |
| 80 | 0.524 | 0.750 | -1.25 |
| 90 | 0.574 | 0.899 | -0.46 |
| 100 | 0.636 | 1.104 | 0.43 |
| 110 | 0.723 | 1.427 | 1.54 |
| 120 | 0.827 | 1.867 | 2.71 |
| 130 | 0.895 | 2.187 | 3.40 |
| 140 | 0.903 | 2.226 | 3.48 |
| 150 | 0.900 | 2.211 | 3.45 |
| 160 | 0.898 | 2.201 | 3.43 |
| 170 | 0.888 | 2.153 | 3.33 |
| 180 | 0.888 | 2.153 | 3.33 |
| 190 | 0.912 | 2.271 | 3.56 |
| 200 | 0.944 | 2.433 | 3.86 |
| 210 | 0.975 | 2.595 | 4.14 |
| 220 | 0.995 | 2.703 | 4.32 |
| 230 | 0.963 | 2.532 | 4.03 |
| 240 | 0.910 | 2.261 | 3.54 |
| 250 | 0.830 | 1.881 | 2.74 |
| 260 | 0.730 | 1.455 | 1.63 |
| 270 | 0.610 | 1.016 | 0.07 |
| 280 | 0.497 | 0.674 | -1.71 |
| 290 | 0.416 | 0.472 | -3.26 |
| 300 | 0.353 | 0.340 | -4.68 |
| 310 | 0.296 | 0.239 | -6.21 |
| 320 | 0.247 | 0.167 | -7.78 |
| 330 | 0.210 | 0.120 | -9.19 |
| 340 | 0.158 | 0.068 | -11.67 |
| 350 | 0.077 | 0.016 | -17.91 |

Maximum Value

Field 1.00
Gain 2.73 (4.36 dB)
Azimuth Bearing 218 degrees

Minimum Field

Field 0.042
Gain .005 (-23.17 dB)
Azimuth Bearing 0 degrees

Vertical Polarization

| Angle | Relative Field | Power Gain | Gain (dB) |
|-------|----------------|------------|-----------|
| 0 | 0.066 | 0.012 | -19.25 |
| 10 | 0.078 | 0.017 | -17.80 |
| 20 | 0.113 | 0.035 | -14.58 |
| 30 | 0.170 | 0.079 | -11.03 |
| 40 | 0.240 | 0.157 | -8.03 |
| 50 | 0.318 | 0.276 | -5.59 |
| 60 | 0.404 | 0.446 | -3.51 |
| 70 | 0.490 | 0.655 | -1.83 |
| 80 | 0.561 | 0.859 | -0.66 |
| 90 | 0.614 | 1.029 | 0.12 |
| 100 | 0.659 | 1.186 | 0.74 |
| 110 | 0.705 | 1.357 | 1.33 |
| 120 | 0.750 | 1.536 | 1.86 |
| 130 | 0.788 | 1.695 | 2.29 |
| 140 | 0.816 | 1.818 | 2.60 |
| 150 | 0.838 | 1.917 | 2.83 |
| 160 | 0.856 | 2.000 | 3.01 |
| 170 | 0.878 | 2.105 | 3.23 |
| 180 | 0.933 | 2.376 | 3.76 |
| 190 | 0.985 | 2.649 | 4.23 |
| 200 | 0.998 | 2.719 | 4.34 |
| 210 | 0.986 | 2.654 | 4.24 |
| 220 | 0.961 | 2.521 | 4.02 |
| 230 | 0.930 | 2.361 | 3.73 |
| 240 | 0.866 | 2.047 | 3.11 |
| 250 | 0.788 | 1.695 | 2.29 |
| 260 | 0.712 | 1.384 | 1.41 |
| 270 | 0.626 | 1.070 | 0.29 |
| 280 | 0.542 | 0.802 | -0.96 |
| 290 | 0.460 | 0.578 | -2.38 |
| 300 | 0.379 | 0.392 | -4.07 |
| 310 | 0.297 | 0.241 | -6.18 |
| 320 | 0.219 | 0.131 | -8.83 |
| 330 | 0.150 | 0.061 | -12.12 |
| 340 | 0.101 | 0.028 | -15.55 |
| 350 | 0.073 | 0.015 | -18.37 |

Maximum Value

Field 1.00
Gain 2.73 (4.36 dB)
Azimuth Bearing 205 degrees

Minimum Field

Field 0.065
Gain .012 (-19.38 dB)
Azimuth Bearing 355 degrees

ERP Tabulation

Antenna: PSIFMR-4C-50WS-DA

Lazer Licenses, LLC

Station: KMLY

Frequency: 95.1 MHz

Location: Gonzales, CA

Maximum ERP: 6.0 kW (7.78 dBk)

Horizontal Polarization

| Angle | Relative Field | ERP (kW) | ERP (dBk) |
|-------|----------------|----------|-----------|
| 0 | 0.042 | 0.01 | -19.75 |
| 10 | 0.129 | 0.10 | -10.01 |
| 20 | 0.195 | 0.23 | -6.42 |
| 30 | 0.249 | 0.37 | -4.29 |
| 40 | 0.305 | 0.56 | -2.53 |
| 50 | 0.361 | 0.78 | -1.07 |
| 60 | 0.417 | 1.04 | 0.18 |
| 70 | 0.471 | 1.33 | 1.24 |
| 80 | 0.524 | 1.65 | 2.17 |
| 90 | 0.574 | 1.98 | 2.96 |
| 100 | 0.636 | 2.43 | 3.85 |
| 110 | 0.723 | 3.14 | 4.96 |
| 120 | 0.827 | 4.10 | 6.13 |
| 130 | 0.895 | 4.81 | 6.82 |
| 140 | 0.903 | 4.89 | 6.90 |
| 150 | 0.900 | 4.86 | 6.87 |
| 160 | 0.898 | 4.84 | 6.85 |
| 170 | 0.888 | 4.73 | 6.75 |
| 180 | 0.888 | 4.73 | 6.75 |
| 190 | 0.912 | 4.99 | 6.98 |
| 200 | 0.944 | 5.35 | 7.28 |
| 210 | 0.975 | 5.70 | 7.56 |
| 220 | 0.995 | 5.94 | 7.74 |
| 230 | 0.963 | 5.56 | 7.45 |
| 240 | 0.910 | 4.97 | 6.96 |
| 250 | 0.830 | 4.13 | 6.16 |
| 260 | 0.730 | 3.20 | 5.05 |
| 270 | 0.610 | 2.23 | 3.49 |
| 280 | 0.497 | 1.48 | 1.71 |
| 290 | 0.416 | 1.04 | 0.16 |
| 300 | 0.353 | 0.75 | -1.26 |
| 310 | 0.296 | 0.53 | -2.79 |
| 320 | 0.247 | 0.37 | -4.36 |
| 330 | 0.210 | 0.26 | -5.77 |
| 340 | 0.158 | 0.15 | -8.25 |
| 350 | 0.077 | 0.04 | -14.49 |

Maximum Value (H-pol)

Field 1.00
ERP 6.0 kW (7.78 dBk)
Azimuth Bearing 218 degrees

Minimum Field (H-pol)

Field 0.042
ERP .01 kW (-19.75 dBk)
Azimuth Bearing 0 degrees

Vertical Polarization

| Angle | Relative Field | ERP (kW) | ERP (dBk) |
|-------|----------------|----------|-----------|
| 0 | 0.066 | 0.03 | -15.83 |
| 10 | 0.078 | 0.04 | -14.38 |
| 20 | 0.113 | 0.08 | -11.16 |
| 30 | 0.170 | 0.17 | -7.61 |
| 40 | 0.240 | 0.35 | -4.61 |
| 50 | 0.318 | 0.61 | -2.17 |
| 60 | 0.404 | 0.98 | -0.09 |
| 70 | 0.490 | 1.44 | 1.59 |
| 80 | 0.561 | 1.89 | 2.76 |
| 90 | 0.614 | 2.26 | 3.54 |
| 100 | 0.659 | 2.61 | 4.16 |
| 110 | 0.705 | 2.98 | 4.75 |
| 120 | 0.750 | 3.38 | 5.28 |
| 130 | 0.788 | 3.73 | 5.71 |
| 140 | 0.816 | 4.00 | 6.02 |
| 150 | 0.838 | 4.21 | 6.25 |
| 160 | 0.856 | 4.40 | 6.43 |
| 170 | 0.878 | 4.63 | 6.65 |
| 180 | 0.933 | 5.22 | 7.18 |
| 190 | 0.985 | 5.82 | 7.65 |
| 200 | 0.998 | 5.98 | 7.76 |
| 210 | 0.986 | 5.83 | 7.66 |
| 220 | 0.961 | 5.54 | 7.44 |
| 230 | 0.930 | 5.19 | 7.15 |
| 240 | 0.866 | 4.50 | 6.53 |
| 250 | 0.788 | 3.73 | 5.71 |
| 260 | 0.712 | 3.04 | 4.83 |
| 270 | 0.626 | 2.35 | 3.71 |
| 280 | 0.542 | 1.76 | 2.46 |
| 290 | 0.460 | 1.27 | 1.04 |
| 300 | 0.379 | 0.86 | -0.65 |
| 310 | 0.297 | 0.53 | -2.76 |
| 320 | 0.219 | 0.29 | -5.41 |
| 330 | 0.150 | 0.14 | -8.70 |
| 340 | 0.101 | 0.06 | -12.13 |
| 350 | 0.073 | 0.03 | -14.95 |

Maximum Value (V-pol)

Field 1.00
ERP 6.0 kW (7.78 dBk)
Azimuth Bearing 205 degrees

Minimum Field (V-pol)

Field 0.065
ERP .025 kW (-15.96 dBk)
Azimuth Bearing 355 degrees



Relative Field Elevation Pattern
Model: PSIFMR-4C-50WS-DA
Type: Directional FM
Polarization: Circular
Bays: Four, Half-wave spaced
Gain: 2.73 (4.36 dB)
KMLY Gonzales, CA

