

***Directional Antenna System  
for  
W286BK, Birmingham, Alabama***

June 6, 2011

Electronics Research Inc. is providing a custom fabricated antenna system that is specially designed to meet the FCC requirements and the general needs of radio station W286BK.

The antenna is the ERI model 100A-1M-DA configuration. The circular polarized system consists of one bay using one driven circular polarized radiating element, one horizontal parasitic element placed one-quarter wave above and below the bay. The power distribution and phase relationship will be fixed when antenna is manufactured. Proper maintenance of the elements should be all that is required to maintain the pattern in adjustment. W286BK will operate on a frequency of 105.1 megahertz, which is the center of the FM broadcast channel for the station.

The 100A-1M-DA array is to be mounted on the 45" face tower at a bearing of North 356 degrees East. Blue prints provided with the antenna will show the proper antenna orientation alignment. The antenna alignment procedure should be directed by a licensed surveyor as prescribed by the FCC.

Figure #1 represents the individual horizontal and vertical components, the composite maximum of either the horizontal or vertical component at any azimuth and the FCC filed envelope pattern. The horizontal plane relative field list for the composite pattern and the individual H & V components are shown as Figure #1 & 1A respectively. The power in the maximum will reach 0.099 kilowatts (-10.044 dBk).

The RMS of the vertically polarized horizontal plane component does not exceed the RMS of the horizontally polarized horizontal plane component.

Directional Antenna System  
Proposed For  
W286BK, Birmingham, Alabama

(Continued)

The clear vertical length of the structure required to support the antenna is 10 feet.

The directional antenna should not be mounted on the top of an antenna tower that includes a top-mounted platform larger than the cross-sectional area of the tower in the horizontal plane. No obstructions other than those that are specified by the blue prints supplied with the antenna are to be mounted within 75 ft. horizontally of the system. The vertical distance to the nearest obstruction should be a minimum of 10 ft. from the directional antenna. Metallic guy wires should be a minimum distance of forty feet horizontally from the antenna.

ELECTRONICS RESEARCH, INC.



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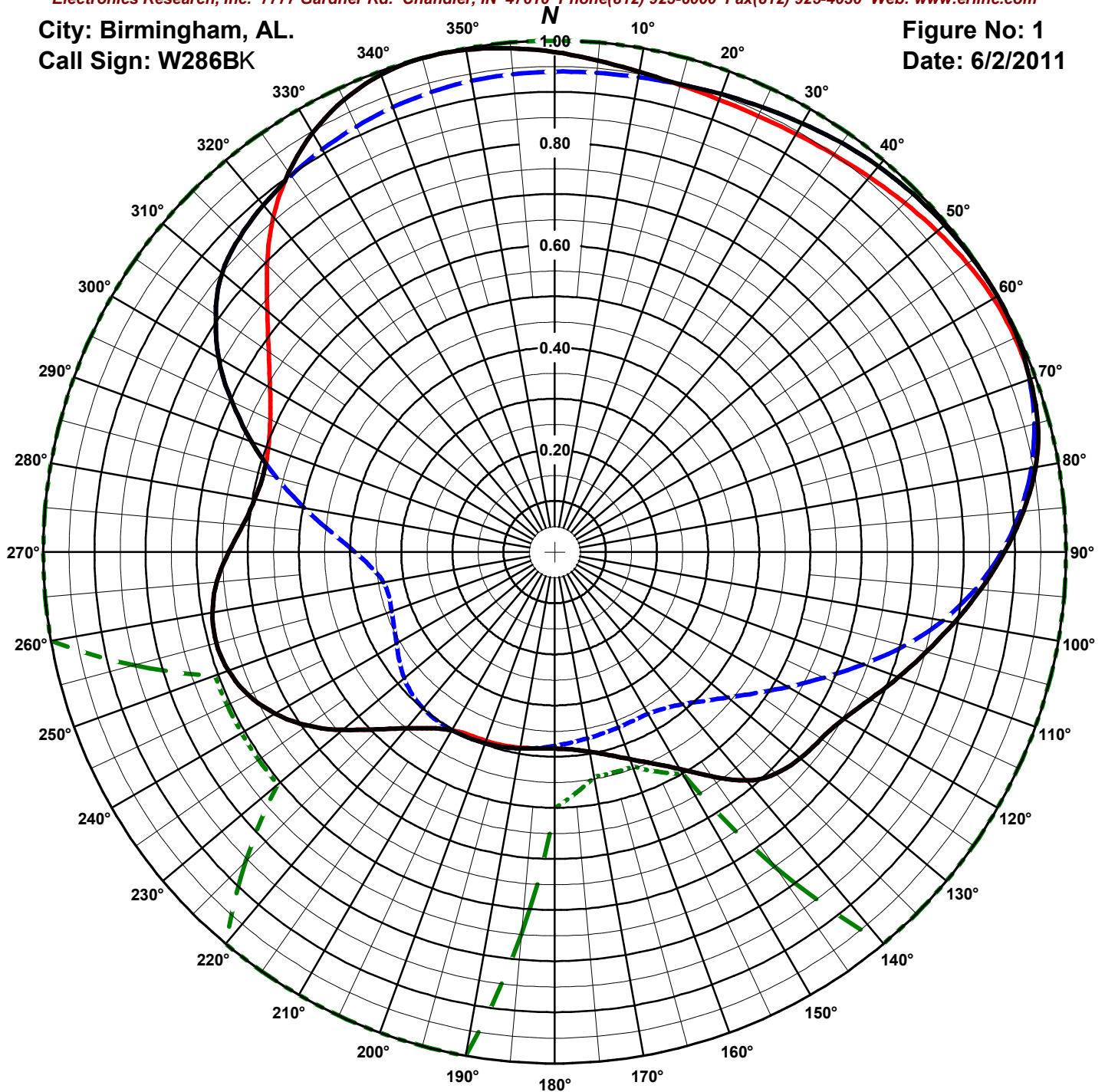
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# ERI® Horizontal Plane Relative Field Pattern

Electronics Research, Inc. 7777 Gardner Rd. Chandler, IN 47610 Phone(812) 925-6000 Fax(812) 925-4030 Web: www.eriinc.com

City: Birmingham, AL.  
Call Sign: W286BK

Figure No: 1  
Date: 6/2/2011



Antenna Orientation: 356° True

Frequency: 105.1 MHz  
Antenna Type: 100A-1M-DA

Antenna Mounting: Custom  
Tower Type: 45" Pirod Tower

## HORIZONTAL

RMS: .748

Maximum: 1 @ 346°

Minimum: .384 @ 181°

## VERTICAL

RMS: .706

Maximum: 1 @ 60°

Minimum: .335 @ 255°

## COMPOSITE

RMS: .759

Maximum: 1 @ 60°

Minimum: .384 @ 181°

## FCC ENVELOPE

RMS: .932

Maximum: 1 @ 0°

Minimum: .446 @ 160°

Patterns of the horizontal and vertical components.

# ERI<sup>®</sup> Horizontal Plane Relative Field Pattern

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Figure# 1

Date: 6/2/2011

Station: W286BK

Antenna: 100A-1M-DA

Location: Birmingham, AL.

Antenna Orientation: 356° True

Frequency: 105.1 MHz

Number of Bays: 1

| Azimuth | Envelope |       |         | Polarization<br>Maximum | Azimuth | Envelope |       |         | Polarization<br>Maximum |
|---------|----------|-------|---------|-------------------------|---------|----------|-------|---------|-------------------------|
|         | Field    | kW    | dBk     |                         |         | Field    | kW    | dBk     |                         |
| 0°      | 0.978    | 0.095 | -10.238 | Horizontal              | 180°    | 0.384    | 0.015 | -18.354 | Horizontal              |
| 5°      | 0.965    | 0.092 | -10.354 | Horizontal              | 185°    | 0.385    | 0.015 | -18.334 | Horizontal              |
| 10°     | 0.954    | 0.090 | -10.457 | Horizontal              | 190°    | 0.390    | 0.015 | -18.226 | Vertical                |
| 15°     | 0.947    | 0.089 | -10.515 | Vertical                | 195°    | 0.394    | 0.015 | -18.128 | Vertical                |
| 20°     | 0.953    | 0.090 | -10.464 | Vertical                | 200°    | 0.398    | 0.016 | -18.052 | Vertical                |
| 25°     | 0.960    | 0.091 | -10.399 | Vertical                | 205°    | 0.400    | 0.016 | -17.997 | Vertical                |
| 30°     | 0.968    | 0.093 | -10.323 | Vertical                | 210°    | 0.402    | 0.016 | -17.952 | Horizontal              |
| 35°     | 0.977    | 0.095 | -10.245 | Vertical                | 215°    | 0.420    | 0.017 | -17.570 | Horizontal              |
| 40°     | 0.985    | 0.096 | -10.177 | Vertical                | 220°    | 0.450    | 0.020 | -16.986 | Horizontal              |
| 45°     | 0.991    | 0.097 | -10.123 | Vertical                | 225°    | 0.490    | 0.024 | -16.237 | Horizontal              |
| 50°     | 0.996    | 0.098 | -10.083 | Vertical                | 230°    | 0.541    | 0.029 | -15.380 | Horizontal              |
| 55°     | 0.999    | 0.099 | -10.056 | Vertical                | 235°    | 0.591    | 0.035 | -14.610 | Horizontal              |
| 60°     | 1.000    | 0.099 | -10.044 | Vertical                | 240°    | 0.631    | 0.039 | -14.037 | Horizontal              |
| 65°     | 0.997    | 0.098 | -10.066 | Vertical                | 245°    | 0.661    | 0.043 | -13.643 | Horizontal              |
| 70°     | 0.989    | 0.097 | -10.138 | Horizontal              | 250°    | 0.679    | 0.046 | -13.410 | Horizontal              |
| 75°     | 0.978    | 0.095 | -10.240 | Horizontal              | 255°    | 0.685    | 0.046 | -13.329 | Horizontal              |
| 80°     | 0.955    | 0.090 | -10.445 | Horizontal              | 260°    | 0.679    | 0.046 | -13.402 | Horizontal              |
| 85°     | 0.921    | 0.084 | -10.763 | Horizontal              | 265°    | 0.663    | 0.044 | -13.615 | Horizontal              |
| 90°     | 0.879    | 0.077 | -11.159 | Horizontal              | 270°    | 0.637    | 0.040 | -13.961 | Horizontal              |
| 95°     | 0.836    | 0.069 | -11.597 | Horizontal              | 275°    | 0.612    | 0.037 | -14.313 | Horizontal              |
| 100°    | 0.793    | 0.062 | -12.055 | Horizontal              | 280°    | 0.595    | 0.035 | -14.549 | Horizontal              |
| 105°    | 0.753    | 0.056 | -12.511 | Horizontal              | 285°    | 0.590    | 0.034 | -14.633 | Horizontal              |
| 110°    | 0.715    | 0.051 | -12.955 | Horizontal              | 290°    | 0.631    | 0.039 | -14.048 | Vertical                |
| 115°    | 0.681    | 0.046 | -13.383 | Horizontal              | 295°    | 0.696    | 0.048 | -13.186 | Vertical                |
| 120°    | 0.653    | 0.042 | -13.748 | Horizontal              | 300°    | 0.758    | 0.057 | -12.447 | Vertical                |
| 125°    | 0.636    | 0.040 | -13.971 | Horizontal              | 305°    | 0.809    | 0.065 | -11.887 | Vertical                |
| 130°    | 0.627    | 0.039 | -14.096 | Horizontal              | 310°    | 0.849    | 0.071 | -11.467 | Vertical                |
| 135°    | 0.612    | 0.037 | -14.310 | Horizontal              | 315°    | 0.871    | 0.075 | -11.244 | Vertical                |
| 140°    | 0.583    | 0.034 | -14.728 | Horizontal              | 320°    | 0.886    | 0.078 | -11.097 | Vertical                |
| 145°    | 0.535    | 0.028 | -15.469 | Horizontal              | 325°    | 0.907    | 0.081 | -10.895 | Horizontal              |
| 150°    | 0.490    | 0.024 | -16.243 | Horizontal              | 330°    | 0.947    | 0.089 | -10.520 | Horizontal              |
| 155°    | 0.457    | 0.021 | -16.851 | Horizontal              | 335°    | 0.975    | 0.094 | -10.259 | Horizontal              |
| 160°    | 0.431    | 0.018 | -17.355 | Horizontal              | 340°    | 0.993    | 0.098 | -10.102 | Horizontal              |
| 165°    | 0.411    | 0.017 | -17.767 | Horizontal              | 345°    | 1.000    | 0.099 | -10.044 | Horizontal              |
| 170°    | 0.397    | 0.016 | -18.078 | Horizontal              | 350°    | 0.997    | 0.098 | -10.068 | Horizontal              |
| 175°    | 0.388    | 0.015 | -18.275 | Horizontal              | 355°    | 0.989    | 0.097 | -10.140 | Horizontal              |

Horizontal Polarization:

Maximum: 0.793 (-1.005 dB)

Horizontal Plane: 0.793 (-1.005 dB)

Maximum ERP: 0.099 kW

Vertical Polarization:

Maximum: 0.793 (-1.005 dB)

Horizontal Plane: 0.793 (-1.005 dB)

Maximum ERP: 0.099 kW

Total Input Power: 0.123 kW

Reference: W2861M.FIG

This list shows the the maximum azimuth values of either the horizontal or vertical components.

# ERI<sup>®</sup> Horizontal Plane Relative Field Pattern

Electronics Research, Inc. 7777 Gardner Rd. Chandler, IN 47610 Phone(812) 925-6000 Fax(812) 925-4030 Web: www.eriinc.com

Figure# 1A

Date: 6/2/2011

Station: W286BK

Antenna: 100A-1M-DA

Location: Birmingham, AL.

Antenna Orientation: 356° True

Frequency: 105.1 MHz

Number of Bays: 1

| Azimuth | Horizontal |       |         | Vertical |       |         | Azimuth | Horizontal |       |         | Vertical |       |         |
|---------|------------|-------|---------|----------|-------|---------|---------|------------|-------|---------|----------|-------|---------|
|         | Field      | kW    | dBk     | Field    | kW    | dBk     |         | Field      | kW    | dBk     | Field    | kW    | dBk     |
| 0°      | 0.978      | 0.095 | -10.238 | 0.939    | 0.087 | -10.586 | 180°    | 0.384      | 0.015 | -18.354 | 0.379    | 0.014 | -18.473 |
| 5°      | 0.965      | 0.092 | -10.354 | 0.941    | 0.088 | -10.574 | 185°    | 0.385      | 0.015 | -18.334 | 0.385    | 0.015 | -18.345 |
| 10°     | 0.954      | 0.090 | -10.457 | 0.943    | 0.088 | -10.551 | 190°    | 0.388      | 0.015 | -18.259 | 0.390    | 0.015 | -18.226 |
| 15°     | 0.946      | 0.089 | -10.529 | 0.947    | 0.089 | -10.515 | 195°    | 0.391      | 0.015 | -18.192 | 0.394    | 0.015 | -18.128 |
| 20°     | 0.942      | 0.088 | -10.567 | 0.953    | 0.090 | -10.464 | 200°    | 0.393      | 0.015 | -18.157 | 0.398    | 0.016 | -18.052 |
| 25°     | 0.941      | 0.088 | -10.569 | 0.960    | 0.091 | -10.399 | 205°    | 0.395      | 0.015 | -18.118 | 0.400    | 0.016 | -17.997 |
| 30°     | 0.944      | 0.088 | -10.543 | 0.968    | 0.093 | -10.323 | 210°    | 0.402      | 0.016 | -17.952 | 0.402    | 0.016 | -17.964 |
| 35°     | 0.950      | 0.089 | -10.492 | 0.977    | 0.095 | -10.245 | 215°    | 0.420      | 0.017 | -17.570 | 0.402    | 0.016 | -17.958 |
| 40°     | 0.957      | 0.091 | -10.422 | 0.985    | 0.096 | -10.177 | 220°    | 0.450      | 0.020 | -16.986 | 0.400    | 0.016 | -18.011 |
| 45°     | 0.967      | 0.092 | -10.339 | 0.991    | 0.097 | -10.123 | 225°    | 0.490      | 0.024 | -16.237 | 0.394    | 0.015 | -18.142 |
| 50°     | 0.976      | 0.094 | -10.255 | 0.996    | 0.098 | -10.083 | 230°    | 0.541      | 0.029 | -15.380 | 0.384    | 0.015 | -18.358 |
| 55°     | 0.985      | 0.096 | -10.178 | 0.999    | 0.099 | -10.056 | 235°    | 0.591      | 0.035 | -14.610 | 0.371    | 0.014 | -18.660 |
| 60°     | 0.991      | 0.097 | -10.124 | 1.000    | 0.099 | -10.044 | 240°    | 0.631      | 0.039 | -14.037 | 0.357    | 0.013 | -18.986 |
| 65°     | 0.993      | 0.098 | -10.106 | 0.997    | 0.098 | -10.066 | 245°    | 0.661      | 0.043 | -13.643 | 0.346    | 0.012 | -19.257 |
| 70°     | 0.989      | 0.097 | -10.138 | 0.988    | 0.097 | -10.148 | 250°    | 0.679      | 0.046 | -13.410 | 0.339    | 0.011 | -19.445 |
| 75°     | 0.978      | 0.095 | -10.240 | 0.971    | 0.093 | -10.299 | 255°    | 0.685      | 0.046 | -13.329 | 0.335    | 0.011 | -19.534 |
| 80°     | 0.955      | 0.090 | -10.445 | 0.946    | 0.089 | -10.522 | 260°    | 0.679      | 0.046 | -13.402 | 0.340    | 0.011 | -19.411 |
| 85°     | 0.921      | 0.084 | -10.763 | 0.914    | 0.083 | -10.824 | 265°    | 0.663      | 0.044 | -13.615 | 0.358    | 0.013 | -18.964 |
| 90°     | 0.879      | 0.077 | -11.159 | 0.874    | 0.076 | -11.213 | 270°    | 0.637      | 0.040 | -13.961 | 0.391    | 0.015 | -18.209 |
| 95°     | 0.836      | 0.069 | -11.597 | 0.826    | 0.068 | -11.701 | 275°    | 0.612      | 0.037 | -14.313 | 0.438    | 0.019 | -17.217 |
| 100°    | 0.793      | 0.062 | -12.055 | 0.771    | 0.059 | -12.304 | 280°    | 0.595      | 0.035 | -14.549 | 0.497    | 0.024 | -16.115 |
| 105°    | 0.753      | 0.056 | -12.511 | 0.708    | 0.050 | -13.044 | 285°    | 0.590      | 0.034 | -14.633 | 0.562    | 0.031 | -15.041 |
| 110°    | 0.715      | 0.051 | -12.955 | 0.642    | 0.041 | -13.891 | 290°    | 0.596      | 0.035 | -14.540 | 0.631    | 0.039 | -14.048 |
| 115°    | 0.681      | 0.046 | -13.383 | 0.581    | 0.033 | -14.759 | 295°    | 0.614      | 0.037 | -14.285 | 0.696    | 0.048 | -13.186 |
| 120°    | 0.653      | 0.042 | -13.748 | 0.527    | 0.028 | -15.604 | 300°    | 0.643      | 0.041 | -13.885 | 0.758    | 0.057 | -12.447 |
| 125°    | 0.636      | 0.040 | -13.971 | 0.481    | 0.023 | -16.401 | 305°    | 0.683      | 0.046 | -13.361 | 0.809    | 0.065 | -11.887 |
| 130°    | 0.627      | 0.039 | -14.096 | 0.442    | 0.019 | -17.125 | 310°    | 0.734      | 0.053 | -12.734 | 0.849    | 0.071 | -11.467 |
| 135°    | 0.612      | 0.037 | -14.310 | 0.412    | 0.017 | -17.752 | 315°    | 0.795      | 0.063 | -12.036 | 0.871    | 0.075 | -11.244 |
| 140°    | 0.583      | 0.034 | -14.728 | 0.389    | 0.015 | -18.254 | 320°    | 0.856      | 0.072 | -11.398 | 0.886    | 0.078 | -11.097 |
| 145°    | 0.535      | 0.028 | -15.469 | 0.373    | 0.014 | -18.605 | 325°    | 0.907      | 0.081 | -10.895 | 0.898    | 0.080 | -10.976 |
| 150°    | 0.490      | 0.024 | -16.243 | 0.365    | 0.013 | -18.787 | 330°    | 0.947      | 0.089 | -10.520 | 0.909    | 0.082 | -10.872 |
| 155°    | 0.457      | 0.021 | -16.851 | 0.364    | 0.013 | -18.828 | 335°    | 0.975      | 0.094 | -10.259 | 0.918    | 0.083 | -10.786 |
| 160°    | 0.431      | 0.018 | -17.355 | 0.365    | 0.013 | -18.806 | 340°    | 0.993      | 0.098 | -10.102 | 0.926    | 0.085 | -10.716 |
| 165°    | 0.411      | 0.017 | -17.767 | 0.367    | 0.013 | -18.757 | 345°    | 1.000      | 0.099 | -10.044 | 0.931    | 0.086 | -10.661 |
| 170°    | 0.397      | 0.016 | -18.078 | 0.370    | 0.014 | -18.684 | 350°    | 0.997      | 0.098 | -10.068 | 0.936    | 0.087 | -10.622 |
| 175°    | 0.388      | 0.015 | -18.275 | 0.374    | 0.014 | -18.589 | 355°    | 0.989      | 0.097 | -10.140 | 0.938    | 0.087 | -10.597 |

Horizontal Polarization:

Maximum: 0.793 (-1.005 dB)

Horizontal Plane: 0.793 (-1.005 dB)

Maximum ERP: 0.099 kW

Vertical Polarization:

Maximum: 0.793 (-1.005 dB)

Horizontal Plane: 0.793 (-1.005 dB)

Maximum ERP: 0.099 kW

Total Input Power: 0.123 kW

Reference: W2861M.FIG

This list shows the azimuth values for the horizontal and vertical components.

# ERI<sup>®</sup> Vertical Plane Relative Field Pattern

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Figure No: 3

Call Sign: W286BK

Location: Birmingham, AL.

Frequency: 105.1 MHz

1 bay 100A-1M-DA antenna

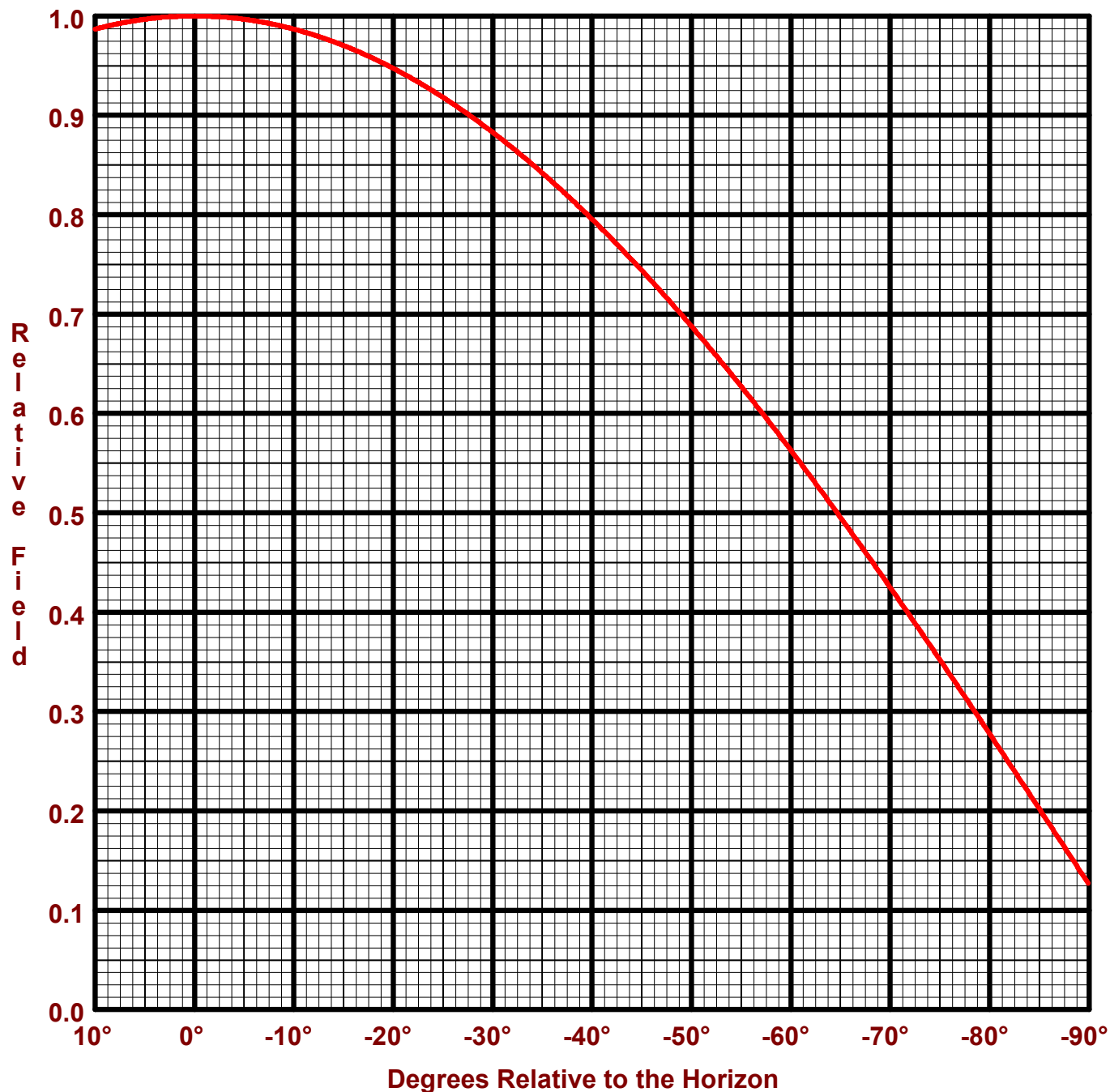
Date: 6/2/2011

H/V Power Ratio: 1

1 Wave-length Spacing

0° Beam Tilt

0% First Null Fill



Horizontal Polarization:

Maximum: 0.793 (-1.005 dB)

Horizontal Plane: 0.793 (-1.005 dB)

Maximum ERP: 0.099 kW

Vertical Polarization:

Maximum: 0.793 (-1.005 dB)

Horizontal Plane: 0.793 (-1.005 dB)

Maximum ERP: 0.099 kW

Directional Antenna System  
for  
W286BK, Birmingham, Alabama

(Continued)

ANTENNA SPECIFICATIONS

|                 |            |
|-----------------|------------|
| Antenna Type:   | 100A-1M-DA |
| Frequency:      | 105.1 MHz  |
| Number of Bays: | One        |

MECHANICAL SPECIFICATIONS

|                           |           |
|---------------------------|-----------|
| Mounting:                 | Standard  |
| System length:            | 4 ft 8 in |
| Aperture length required: | 10ft      |
| Orientation:              | 356° true |

Input flange to the antenna 7-16 DIN female.

ELECTRICAL SPECIFICATIONS  
(For directional use)

|                                |                        |
|--------------------------------|------------------------|
| Maximum horizontal ERP:        | 0.099 kW (-10.044 dBk) |
| Horizontal maximum power gain: | 0.793 (-1.005 dB)      |
| Maximum vertical ERP:          | 0.099 kW (-10.044 dBk) |
| Vertical maximum power gain:   | 0.793 (-1.005 dB)      |
| Total input power:             | 0.123 kW (-9.101 dBk)  |