ERI® Electronics Research, Inc.
Electronics Research, Inc. 7777 Gardner Rd. Chandler, In 47610 Phone (812) 925-6000 Fax (812) 925-4030 http://www.eriinc.com/

Directional Antenna System for WKXS, Leland, North Carolina

November 4, 2005

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 WKXS.

The antenna is the ERI model LP-2E-DA-HW configuration. The circular polarized system consists of two half-wavelength spaced bays using one driven circular polarized radiating element per bay, one horizontal parasitic element per bay and one vertical parasitic element interleaved between the bays. The antenna was mounted on the 24" face with bracketry to provide an antenna orientation of North 168° 13' 30" East. The antenna was tested on a 24" face tower, which is the structure the station plans to use to support the array. All tests were performed on a frequency of 94.5 megahertz, which is the center of the FM broadcast channel assigned to WKXS.

Pattern measurements were made on a sixty-acre antenna pattern range that is owned and operated by Electronics Research, Inc. The tests were performed under the direction of Thomas B. Silliman, president of Electronics Research, Inc. Mr. Silliman has the Bachelor of Electrical Engineering and the Master of Electrical Engineering degrees from Cornell University and is a registered professional engineer in the states of Indiana, Maryland and Minnesota.

EXHIBIT B

Directional Antenna System
For
WKXS, Leland, North Carolina

(Continued)

DESCRIPTION OF THE TEST PROCEDURE

The test antenna consisted of a full-scale model of the complete circular polarized system with the associated horizontal and vertical parasitic elements. The elements and brackets that were used in this test are electrically equivalent to those that will be supplied with the antenna. A section of 1 5/8 inch o.d. rigid coaxial line was used to feed the test antenna, and a section of 1 5/8 inch o.d. rigid outer conductor only was attached above the test antenna. The lines were properly grounded during all tests.

The power distribution and phase relationship to the antenna elements was adjusted in order to achieve the directional radiation patterns for both horizontal and vertical polarization components.

The proof-of-performance was accomplished using a 24" face tower with identical dimension and configuration including all braces, ladders, conduits, coaxial lines and other appurtenances that are included in the actual aperture at which the antenna will be installed. The structure was erected vertically on a turntable mounted on a non-metallic building with the antenna centered vertically on the structure, making the center of radiation of the test approximately 30 feet above ground. The turntable is equipped with a motor drive and azimuth indicating mechanism, resolution of this azimuth measuring device is one-tenth of a degree.

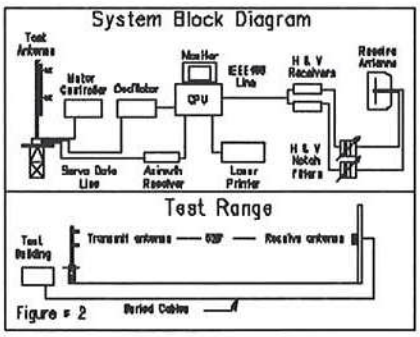


Figure # 2

The antenna under test was operated in the transmitting mode and fed from a Wavetek Model 3000 signal generator. The frequency of the signal source was set at 94.5 MHz and was constantly monitored by an Anritsu Model ML521B measuring receiver.

A broad-band horizontal and vertical dipole system, located approximately 628 feet from the test antenna, was used to receive the emitted test signals. The dipole system was mounted at the same height above terrain as the center of the antenna under test. The signals received by the dipole system were fed to the test building by way of two buried Heliax cables to an Anritsu Model ML521B measuring receiver.

This data was interfaced to a Hewlett-Packard Laser Jet 4P printer by means of a Pentium computer system. Relative field strength was plotted as a function of azimuth.

The measurements were performed by rotating the test antenna in a counter-clockwise direction and plotting the received signal on polar co-ordinated graph paper in a clockwise direction. Both horizontal and vertical components were recorded separately.

CONCLUSIONS

The circular polarized system consists of two half-wavelength spaced bays using one driven circular polarized radiating element per bay, one horizontal parasitic element per bay and one vertical parasitic element interleaved between the bays. 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.

The LP-2E-DA-HW array is to be mounted on the 24" face tower at a bearing of North 168° 13' 30" 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 maximum value of either the horizontal or vertical component at any azimuth. The measured horizontal plane relative field pattern, for both the horizontal and vertical polarization components, is shown on Figure #2 attached. The actual measured pattern does not exceed the authorized FCC composite pattern at any azimuth. A calculated vertical plane relative field pattern is shown on Figure #3 attached. The power in the maximum will reach 3.8 kilowatts (5.798 dBk).

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

The composite horizontal and vertical maximum relative field pattern obtained from the measured data as shown on Figure #1 has an RMS that is greater that 85% of the filed composite pattern.

The clear vertical length of the structure required to support the antenna is 20 feet 2 inches, if the antenna is to be top mounted.

Directional Antenna System
For
WKXS, Leland, North Carolina

(Continued)

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.

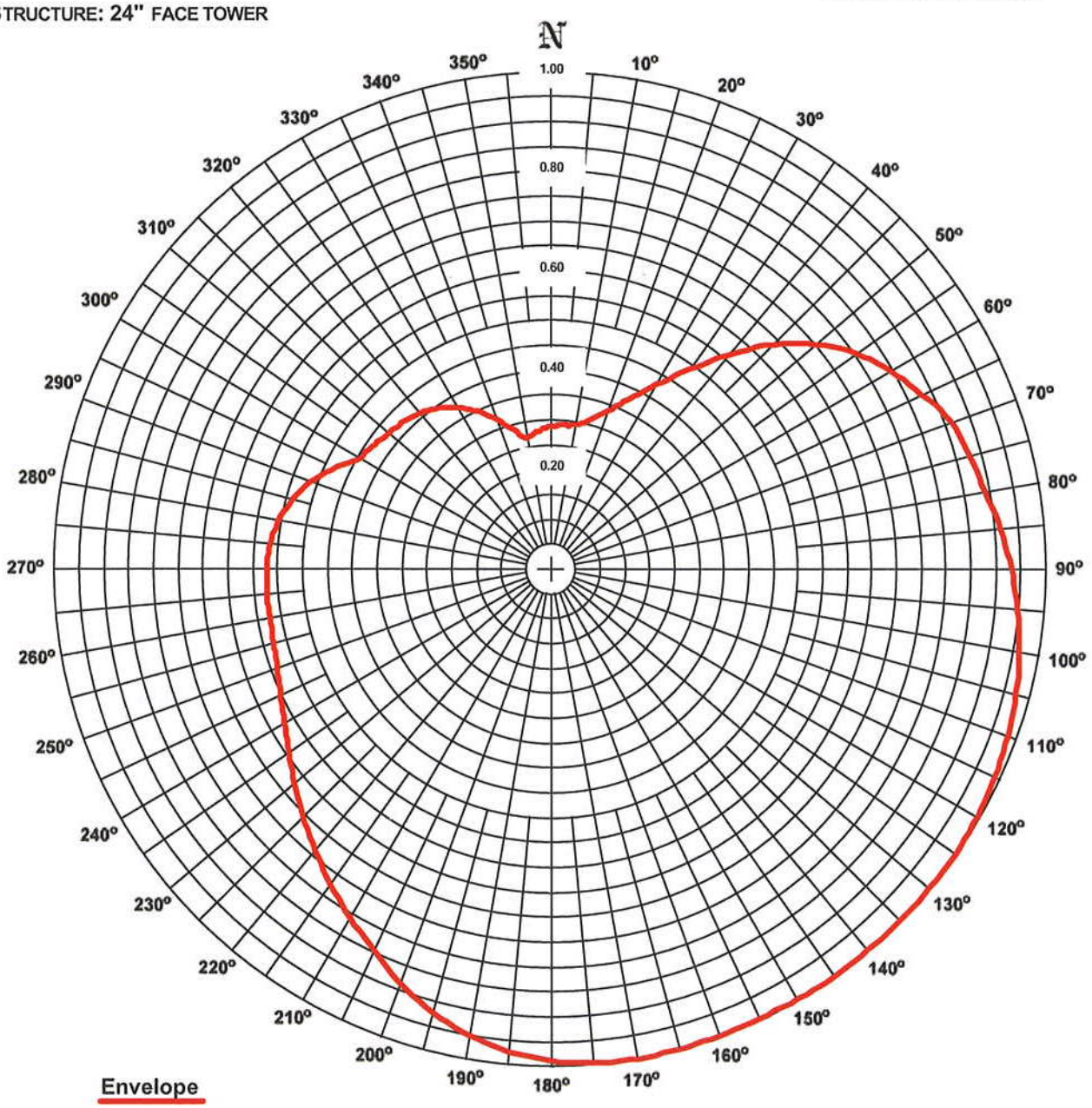
ELECTRONICS RESEARCH, INC.

ERI® Horizontal Plane Relative Field Pattern

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

FIGURE: 1
STATION: WKXS
LOCATION: LELAND, NC
ANTENNA TYPE: LP-2E-DA-HW
STRUCTURE: 24" FACE TOWER

DATE: 11/4/2005
FREQUENCY: 94.5 MHz
ORIENTATION: 168.225° TRUE
MOUNTING: STANDARD



Envelope

RMS: 0.733
Maximum: 1.000 @ 129° True
Minimum: 0.265 @ 350° True

COMMENTS: COMPOSITE PATTERN: THIS PATTERN SHOWS THE MAXIMUM OF EITHER THE H OR V AZIMUTH VALUES. THIS PATTERN IS GREATER THAT 85% OF THE FCC FILED COMPOSITE PATTERN.

ERI® Horizontal Plane Relative Field List

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

Station: WKXS
Location: Leland, NC
Frequency: 94.5 MHz

Antenna: LP-2E-DA-HW
Orientation: 168.225° True
Tower: 24" face tower

Figure: 1
Date: 11/4/2005
Reference: wkxs2m.fig

Angle	Envelope			Polarization	Angle	Envelope			Polarization
	Field	kW	dBk			Field	kW	dBk	
0°	0.285	0.31	-5.11	Horizontal	180°	0.990	3.73	5.71	Vertical
5°	0.288	0.32	-5.00	Horizontal	185°	0.975	3.61	5.58	Vertical
10°	0.293	0.33	-4.86	Horizontal	190°	0.953	3.45	5.38	Vertical
15°	0.309	0.36	-4.40	Horizontal	195°	0.924	3.25	5.11	Vertical
20°	0.337	0.43	-3.66	Horizontal	200°	0.888	3.00	4.77	Vertical
25°	0.376	0.54	-2.71	Horizontal	205°	0.846	2.72	4.35	Horizontal
30°	0.426	0.69	-1.62	Horizontal	210°	0.811	2.50	3.98	Horizontal
35°	0.488	0.90	-0.44	Horizontal	215°	0.775	2.28	3.58	Horizontal
40°	0.561	1.20	0.78	Horizontal	220°	0.740	2.08	3.18	Horizontal
45°	0.636	1.54	1.87	Horizontal	225°	0.707	1.90	2.78	Horizontal
50°	0.701	1.86	2.71	Horizontal	230°	0.675	1.73	2.38	Horizontal
55°	0.753	2.16	3.34	Horizontal	235°	0.645	1.58	1.99	Horizontal
60°	0.794	2.40	3.80	Horizontal	240°	0.620	1.46	1.65	Horizontal
65°	0.827	2.60	4.14	Vertical	245°	0.601	1.37	1.37	Horizontal
70°	0.860	2.81	4.49	Vertical	250°	0.587	1.31	1.17	Horizontal
75°	0.878	2.93	4.67	Vertical	255°	0.578	1.27	1.04	Horizontal
80°	0.891	3.02	4.80	Horizontal	260°	0.575	1.26	0.99	Horizontal
85°	0.912	3.16	5.00	Horizontal	265°	0.574	1.25	0.98	Horizontal
90°	0.931	3.29	5.17	Horizontal	270°	0.572	1.24	0.95	Horizontal
95°	0.947	3.41	5.33	Horizontal	275°	0.568	1.22	0.88	Horizontal
100°	0.961	3.51	5.45	Horizontal	280°	0.556	1.18	0.70	Horizontal
105°	0.973	3.60	5.56	Horizontal	285°	0.537	1.10	0.40	Horizontal
110°	0.983	3.67	5.65	Horizontal	290°	0.511	0.99	-0.03	Horizontal
115°	0.991	3.73	5.72	Horizontal	295°	0.478	0.87	-0.62	Horizontal
120°	0.996	3.77	5.76	Horizontal	300°	0.443	0.75	-1.27	Vertical
125°	0.999	3.79	5.79	Horizontal	305°	0.433	0.71	-1.47	Vertical
130°	1.000	3.80	5.80	Horizontal	310°	0.424	0.68	-1.66	Vertical
135°	1.000	3.80	5.80	Horizontal	315°	0.418	0.66	-1.79	Vertical
140°	1.000	3.80	5.80	Horizontal	320°	0.408	0.63	-2.00	Vertical
145°	1.000	3.80	5.80	Horizontal	325°	0.393	0.59	-2.32	Vertical
150°	0.999	3.79	5.79	Horizontal	330°	0.373	0.53	-2.78	Vertical
155°	0.997	3.78	5.78	Vertical	335°	0.348	0.46	-3.38	Vertical
160°	0.999	3.79	5.79	Vertical	340°	0.317	0.38	-4.17	Vertical
165°	1.000	3.80	5.80	Vertical	345°	0.287	0.31	-5.03	Vertical
170°	1.000	3.80	5.80	Vertical	350°	0.265	0.27	-5.73	Horizontal
175°	0.998	3.79	5.78	Vertical	355°	0.277	0.29	-5.35	Horizontal

Polarization: **Envelope**
Maximum Field: **1.000 @ 129° True**
Minimum Field: **0.265 @ 350° True**
RMS: **0.733**
Maximum ERP: **3.800 kW**
Maximum Power Gain: **1.284 (1.086 dB)**

Total Input Power: 2.959 kW

ERI® Horizontal Plane Relative Field Pattern

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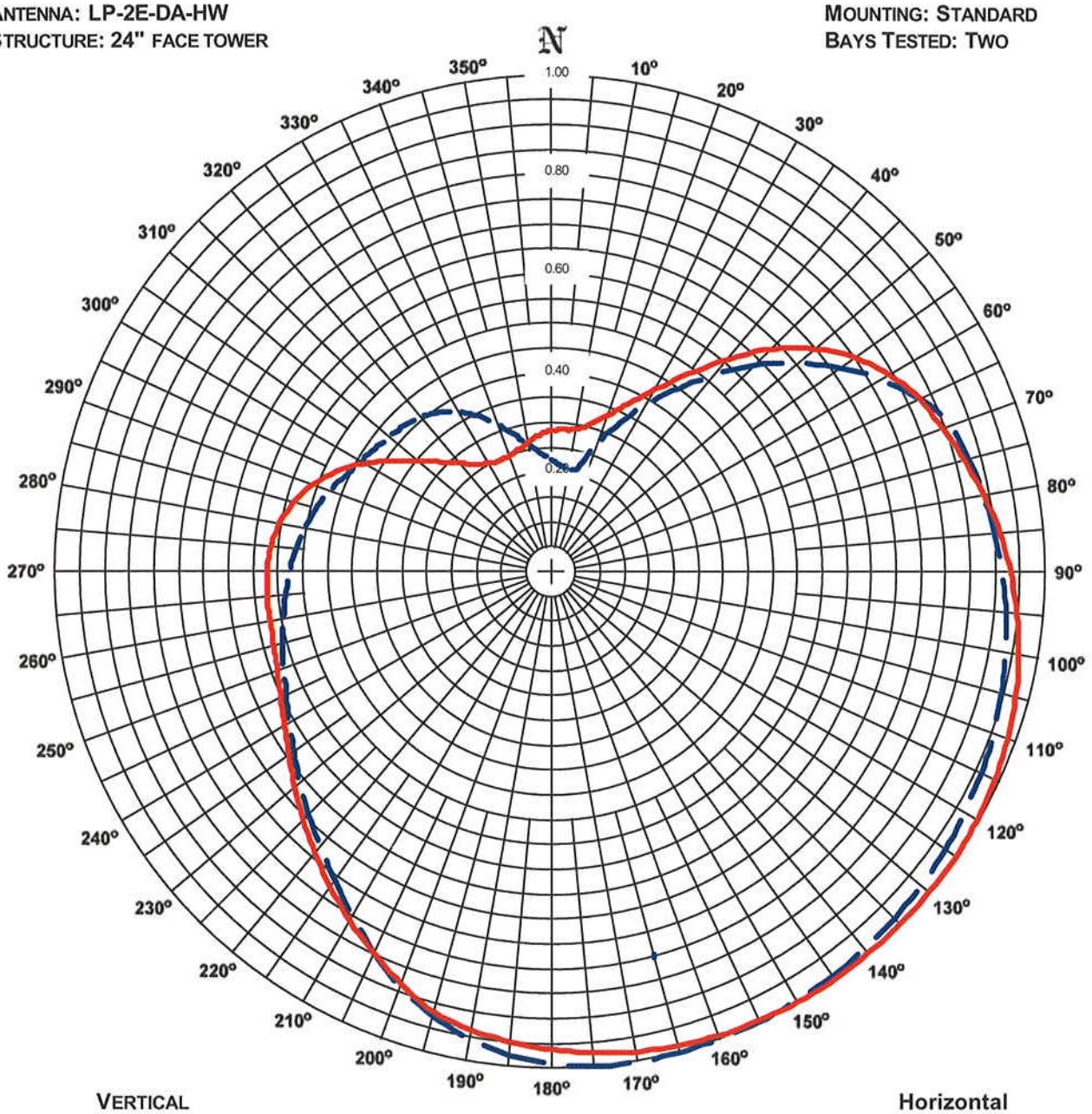
FIGURE NO: 2
STATION: WKXS
LOCATION: LELAND, NC
ANTENNA: LP-2E-DA-HW
STRUCTURE: 24" FACE TOWER

DATE: 11/4/2005
FREQUENCY: 94.5 MHz
ORIENTATION: 168.225° TRUE
MOUNTING: STANDARD
BAYS TESTED: TWO



VERTICAL

RMS: 0.717
MAXIMUM: 1.000 @ 168° TRUE
MINIMUM: 0.212 @ 12° TRUE

Horizontal

RMS: 0.724
Maximum: 1.000 @ 129° True
Minimum: 0.247 @ 336° True

COMMENTS: MEASURED PATTERNS OF THE HORIZONTAL AND VERTICAL COMPONENTS.

ERI® Horizontal Plane Relative Field List

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Station: WKXS
Location: Leland, NC
Frequency: 94.5 MHz

Antenna: LP-2E-DA-HW
Orientation: 168.225° True
Tower: 24" face

Figure: 2
Date: 11/4/2005
Reference: wkxs2m.fig

Angle	Horizontal			Vertical			Angle	Horizontal			Vertical		
	Field	kW	dBk	Field	kW	dBk		Field	kW	dBk	Field	kW	dBk
0°	0.285	0.31	-5.11	0.227	0.20	-7.07	180°	0.960	3.50	5.45	0.990	3.73	5.71
5°	0.288	0.32	-5.00	0.217	0.18	-7.46	185°	0.949	3.42	5.34	0.975	3.61	5.58
10°	0.293	0.33	-4.86	0.212	0.17	-7.66	190°	0.936	3.33	5.22	0.953	3.45	5.38
15°	0.309	0.36	-4.40	0.224	0.19	-7.19	195°	0.916	3.19	5.04	0.924	3.25	5.11
20°	0.337	0.43	-3.66	0.277	0.29	-5.36	200°	0.883	2.96	4.72	0.888	3.00	4.77
25°	0.376	0.54	-2.71	0.333	0.42	-3.77	205°	0.846	2.72	4.35	0.846	2.72	4.34
30°	0.426	0.69	-1.62	0.391	0.58	-2.35	210°	0.811	2.50	3.98	0.800	2.43	3.86
35°	0.488	0.90	-0.44	0.454	0.78	-1.06	215°	0.775	2.28	3.58	0.760	2.20	3.42
40°	0.561	1.20	0.78	0.520	1.03	0.12	220°	0.740	2.08	3.18	0.724	1.99	2.99
45°	0.636	1.54	1.87	0.591	1.33	1.22	225°	0.707	1.90	2.78	0.691	1.81	2.59
50°	0.701	1.86	2.71	0.658	1.64	2.16	230°	0.675	1.73	2.38	0.661	1.66	2.20
55°	0.753	2.16	3.34	0.717	1.96	2.91	235°	0.645	1.58	1.99	0.633	1.52	1.83
60°	0.794	2.40	3.80	0.776	2.29	3.59	240°	0.620	1.46	1.65	0.609	1.41	1.49
65°	0.824	2.58	4.12	0.827	2.60	4.14	245°	0.601	1.37	1.37	0.589	1.32	1.21
70°	0.846	2.72	4.34	0.860	2.81	4.49	250°	0.587	1.31	1.17	0.573	1.25	0.96
75°	0.868	2.86	4.57	0.878	2.93	4.67	255°	0.578	1.27	1.04	0.560	1.19	0.77
80°	0.891	3.02	4.80	0.891	3.01	4.79	260°	0.575	1.26	0.99	0.547	1.14	0.57
85°	0.912	3.16	5.00	0.903	3.10	4.91	265°	0.574	1.25	0.98	0.537	1.10	0.40
90°	0.931	3.29	5.17	0.914	3.17	5.02	270°	0.572	1.24	0.95	0.527	1.05	0.23
95°	0.947	3.41	5.33	0.925	3.25	5.12	275°	0.568	1.22	0.88	0.517	1.02	0.07
100°	0.961	3.51	5.45	0.934	3.32	5.21	280°	0.556	1.18	0.70	0.504	0.96	-0.16
105°	0.973	3.60	5.56	0.944	3.38	5.29	285°	0.537	1.10	0.40	0.490	0.91	-0.39
110°	0.983	3.67	5.65	0.952	3.45	5.37	290°	0.511	0.99	-0.03	0.474	0.86	-0.68
115°	0.991	3.73	5.72	0.960	3.50	5.44	295°	0.478	0.87	-0.62	0.458	0.80	-0.98
120°	0.996	3.77	5.76	0.967	3.55	5.51	300°	0.437	0.73	-1.39	0.443	0.75	-1.27
125°	0.999	3.79	5.79	0.974	3.60	5.57	305°	0.391	0.58	-2.36	0.433	0.71	-1.47
130°	1.000	3.80	5.80	0.979	3.64	5.62	310°	0.349	0.46	-3.35	0.424	0.68	-1.66
135°	1.000	3.80	5.80	0.984	3.68	5.66	315°	0.314	0.37	-4.26	0.418	0.66	-1.79
140°	1.000	3.80	5.80	0.989	3.71	5.70	320°	0.287	0.31	-5.06	0.408	0.63	-2.00
145°	1.000	3.80	5.80	0.992	3.74	5.73	325°	0.266	0.27	-5.70	0.393	0.59	-2.32
150°	0.999	3.79	5.79	0.995	3.76	5.76	330°	0.253	0.24	-6.13	0.373	0.53	-2.78
155°	0.996	3.77	5.76	0.997	3.78	5.78	335°	0.247	0.23	-6.33	0.348	0.46	-3.38
160°	0.992	3.74	5.73	0.999	3.79	5.79	340°	0.249	0.24	-6.28	0.317	0.38	-4.17
165°	0.986	3.70	5.68	1.000	3.80	5.80	345°	0.255	0.25	-6.07	0.287	0.31	-5.03
170°	0.979	3.64	5.61	1.000	3.80	5.80	350°	0.265	0.27	-5.73	0.262	0.26	-5.82
175°	0.970	3.58	5.54	0.998	3.79	5.78	355°	0.277	0.29	-5.35	0.242	0.22	-6.51

	Horizontal	Vertical
Polarization:		
Maximum Field:	**1.000 @ 129° True**	**1.000 @ 168° True**
Minimum Field:	**0.247 @ 336° True**	**0.212 @ 12° True**
RMS:	**0.724**	**0.717**
Maximum ERP:	**3.800 kW**	**3.800 kW**
Maximum Power Gain:	**1.284 (1.086 dB)**	**1.284 (1.086 dB)**

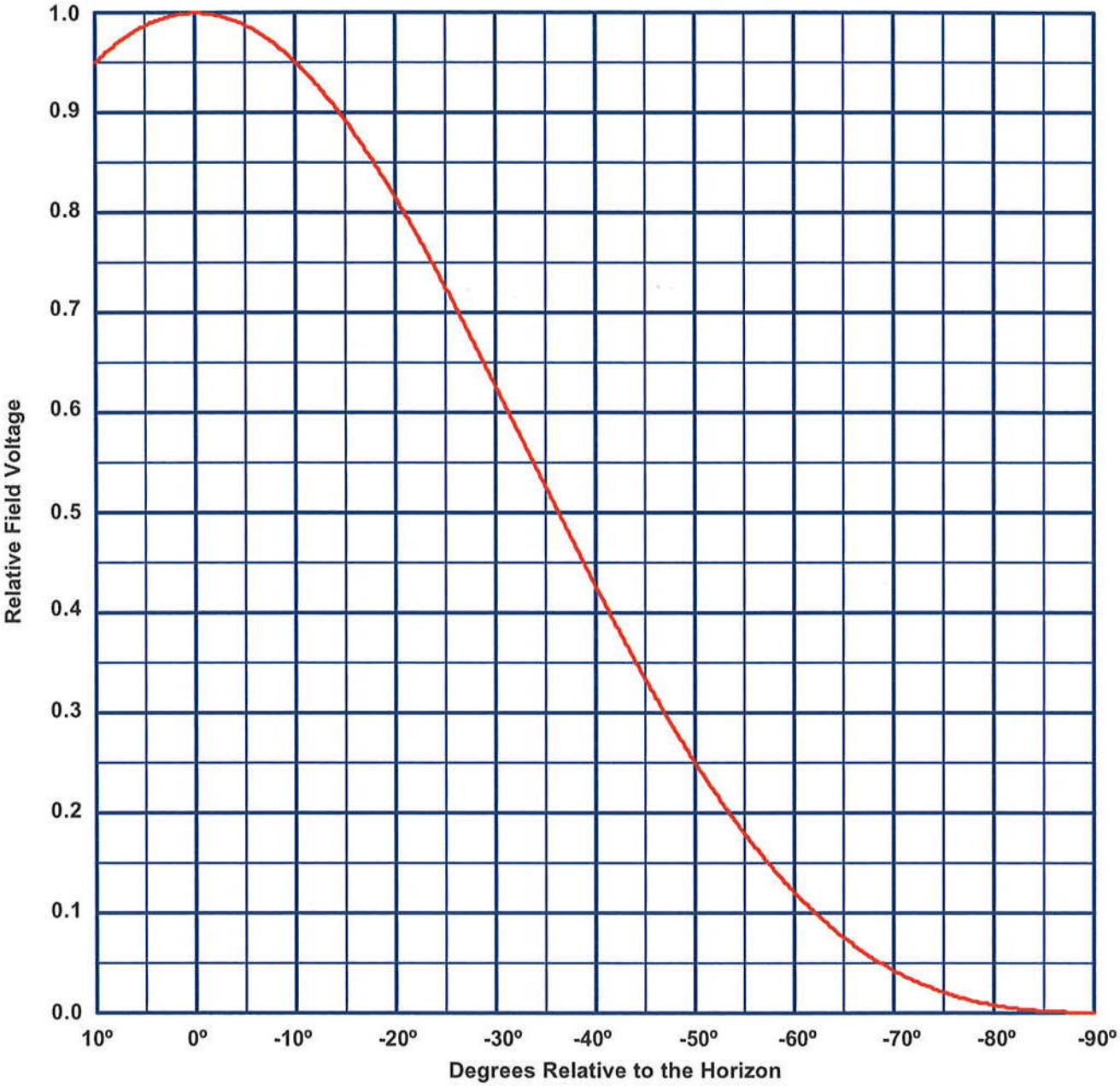
Total Input Power: 2.959 kW

ERI® Vertical Plane Relative Field Pattern

WKXS, Leland, NC, 94.5 MHz

Figure#: 3 Date: 11/4/2005

A 2 level, .5 wave-length spaced LP-2E-DA-HW directional antenna with 0° beam tilt, 0% null fill and a H/V maximum power ratio of 1.000



Vertical Polarization Gain:	Horizontal Polarization Gain:
Maximum: 1.284 (1.086 dB) Horizontal Plane: 1.284 (1.086 dB)	Maximum: 1.284 (1.086 dB) Horizontal Plane: 1.284 (1.086 dB)

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Directional Antenna System
for
WKXS, Leland, North Carolina

(Continued)

ANTENNA SPECIFICATIONS

Antenna Type:	LP-2E-DA-HW
Frequency:	94.5 MHz
Number of Bays:	Two

MECHANICAL SPECIFICATIONS

Mounting:	Standard
System length:	13 ft 10 in
Aperture length required:	20 ft 2 in
Orientation:	168.225° true

Input flange to the antenna 1 5/8 inch female

ELECTRICAL SPECIFICATIONS
(For directional use)

Maximum horizontal ERP:	3.8 kW (5.798 dBk)
Horizontal maximum power gain:	1.284 (1.086 dB)
Maximum vertical ERP:	3.8 kW (5.798 dBk)
Vertical maximum power gain:	1.284 (1.086 dB)
Total input power:	2.959 kW (4.711 dBk)

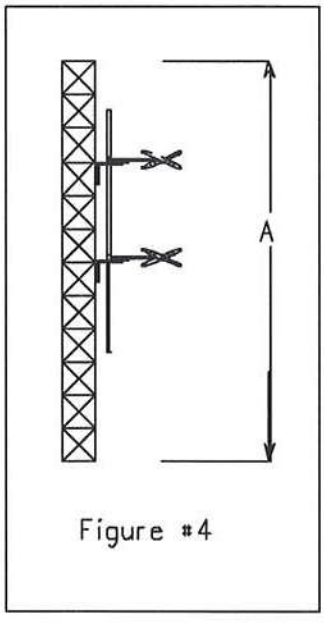

Figure #4