

APPLICATION FOR AM TRANSLATOR  
FOR  
PERRY BROADCASTING COMPANY, INC.  
TO PROVIDE FILL-IN COVERAGE FOR  
KRMP, CLASS D, OKLAHOMA CITY, OK  
1140 KHZ, FACILITY ID. 63794

NOVEMBER 2013

BY:  
BEEM CO.  
ARCADIA, CA  
(626) 446 3468

## ENGINEERING STATEMENT OF JOEL T. SAXBERG

This application for FM translator to operate on CH 221 to carry the audio program material of AM station KRMP, Oklahoma City, Class D. KRMP is a class D facility “daytime AM facility on 1140 kHz, non-directional, 1 kW Daytime power.

Minor change move for K221FQ. A slight change in the location of K221FQ is proposed due to the fact that the antenna support structure for K221FQ is due to be removed leaving K221FQ without an antenna support structure. It is proposed to mount K221FQ on the Richland tower which is very close to its present location.

The proposed site has a ground elevation of 349m AMSL. The structure is 489 m AGL with an overall height of 838 m AMSL. The proposed directional ERI antenna will be mounted at 390m AGL and the contours meet the requirements of an FM translator operated on an AM frequency. KRMP being a daytime facility does not provide suitable coverage over parts of Oklahoma City and this application will improve the coverage of KRMP. It is believed that this is a proper way to use a translator for AM fill in purposes.

No changes are proposed for the directional ERI translator antenna. The ERP will remain at 99 watts. .

Radio Frequency Electromagnetic fields will be less than 0.008 uW/cm<sup>2</sup> at two meters above ground. When necessary for tower crews to go aloft, The transmit facilities of K221FQ will be reduced in ERP or transmissions terminated to protect tower worker from excessive RF fields.

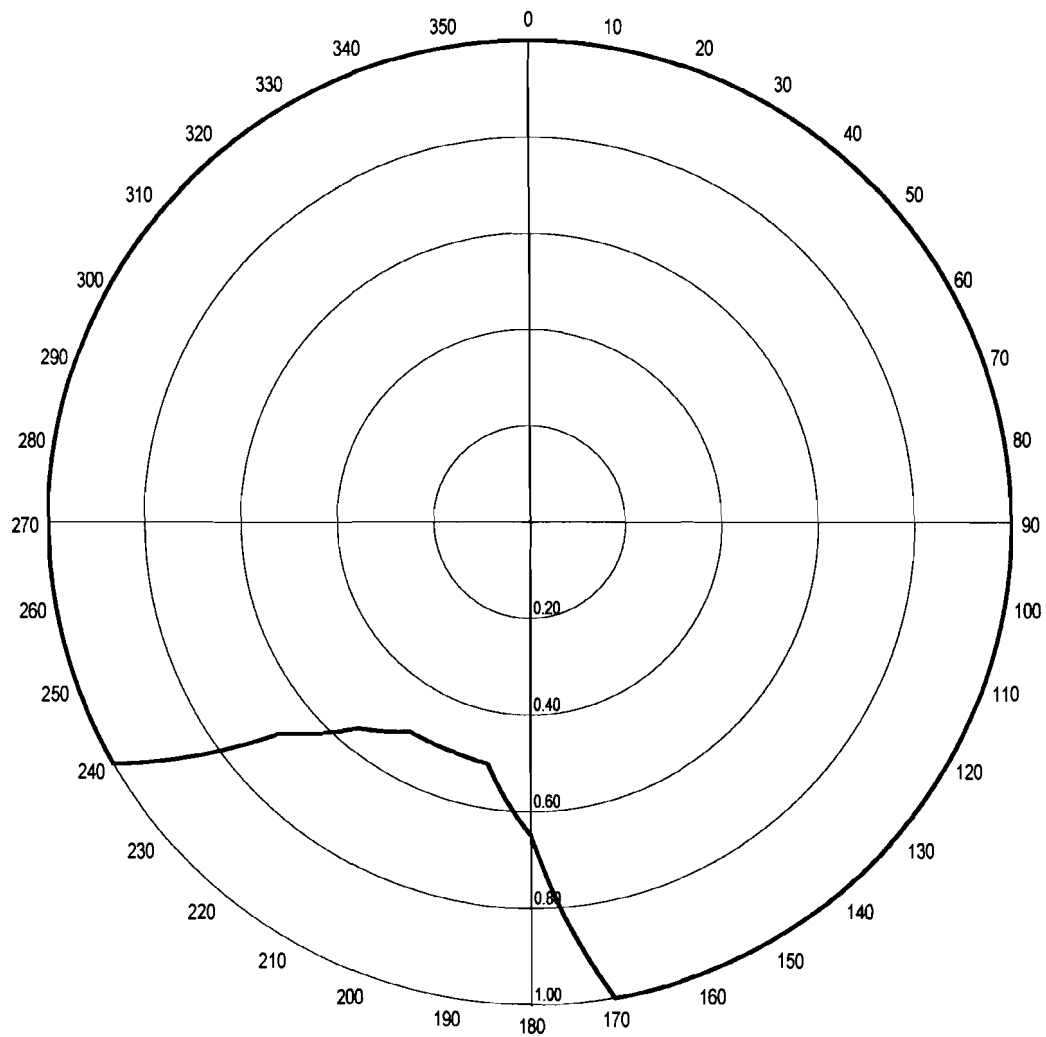
## ENGINEERING CERTIFICATION

**JOEL T. SAXBERG** deposes and says:

1. That he is President of Broadcast Engineering and Equipment Maintenance Company, "**BEEM CO.**", radio engineering consultants. **BEEM CO.** maintains offices at: 2322 S. Second Avenue, Arcadia, CA 91006. Telephone (626) 446-3468
2. That he was graduated from California State University at Los Angeles, February 1966, with a Bachelor of Science degree in Electronic Engineering. He received a MS degree in Electronic Engineering Technology in August 1996.
3. That he has submitted many applications to the Federal Communications Commission for broadcast and auxiliary broadcast construction permits and licenses.
4. That his experience in broadcast engineering is a matter of record and he has spent over thirty years working in the field of radio engineering.
5. That the attached engineering exhibit(s) and report(s) were prepared by him or under his direction and supervision. That he believes the facts stated therein to be both true and accurate. Statements that are based on information supplied by others are also believed to be true and accurate.
6. That he has performed field work on AM and FM broadcast transmitting systems throughout this country and continues to provide technical consulting services on a daily basis to broadcasters.
7. That he declares under penalty of perjury the foregoing is true and correct.

Executed on \_\_\_\_11/5/2013\_\_\_\_\_

Joel T. Saxberg



Azim	Rel.FS	ERP [W]	dBk	Azim	Rel.FS	ERP [W]	dBk	Azim	Rel.FS	ERP [W]	dBk	Azim	Rel.FS	ERP [W]	dBk
0.0	1.000	99.000	-10.044	90.0	1.000	99.000	-10.044	180.0	0.648	41.570	-13.812	270.0	1.000	99.000	-10.044
5.0	1.000	99.000	-10.044	95.0	1.000	99.000	-10.044	185.0	0.578	33.074	-14.805	275.0	1.000	99.000	-10.044
10.0	1.000	99.000	-10.044	100.0	1.000	99.000	-10.044	190.0	0.508	25.548	-15.926	280.0	1.000	99.000	-10.044
15.0	1.000	99.000	-10.044	105.0	1.000	99.000	-10.044	195.0	0.504	25.148	-15.995	285.0	1.000	99.000	-10.044
20.0	1.000	99.000	-10.044	110.0	1.000	99.000	-10.044	200.0	0.501	24.849	-16.047	290.0	1.000	99.000	-10.044
25.0	1.000	99.000	-10.044	115.0	1.000	99.000	-10.044	205.0	0.501	24.849	-16.047	295.0	1.000	99.000	-10.044
30.0	1.000	99.000	-10.044	120.0	1.000	99.000	-10.044	210.0	0.501	24.849	-16.047	300.0	1.000	99.000	-10.044
35.0	1.000	99.000	-10.044	125.0	1.000	99.000	-10.044	215.0	0.529	27.704	-15.575	305.0	1.000	99.000	-10.044
40.0	1.000	99.000	-10.044	130.0	1.000	99.000	-10.044	220.0	0.557	30.715	-15.127	310.0	1.000	99.000	-10.044
45.0	1.000	99.000	-10.044	135.0	1.000	99.000	-10.044	225.0	0.619	37.933	-14.210	315.0	1.000	99.000	-10.044
50.0	1.000	99.000	-10.044	140.0	1.000	99.000	-10.044	230.0	0.682	46.047	-13.368	320.0	1.000	99.000	-10.044
55.0	1.000	99.000	-10.044	145.0	1.000	99.000	-10.044	235.0	0.841	70.021	-11.548	325.0	1.000	99.000	-10.044
60.0	1.000	99.000	-10.044	150.0	1.000	99.000	-10.044	240.0	1.000	99.000	-10.044	330.0	1.000	99.000	-10.044
65.0	1.000	99.000	-10.044	155.0	1.000	99.000	-10.044	245.0	1.000	99.000	-10.044	335.0	1.000	99.000	-10.044
70.0	1.000	99.000	-10.044	160.0	1.000	99.000	-10.044	250.0	1.000	99.000	-10.044	340.0	1.000	99.000	-10.044
75.0	1.000	99.000	-10.044	165.0	1.000	99.000	-10.044	255.0	1.000	99.000	-10.044	345.0	1.000	99.000	-10.044
80.0	1.000	99.000	-10.044	170.0	1.000	99.000	-10.044	260.0	1.000	99.000	-10.044	350.0	1.000	99.000	-10.044
85.0	1.000	99.000	-10.044	175.0	0.824	67.219	-11.725	265.0	1.000	99.000	-10.044	355.0	1.000	99.000	-10.044

## ***Directional Antenna System for K221FQ, Oklahoma City, Oklahoma***

February 20, 2012

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 K221FQ.

The antenna is the ERI model LP-2E-DA configuration. The circular polarized system consists of two driven circular polarized radiating element. 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 antenna will be mounted on a 12' face tower, which is the structure the station plans to use to support the array. K221FQ will operate on a frequency of 92.1 megahertz, which is the center of the FM broadcast channel for the station.

The LP-2E-DA array is to be mounted on the 12' face tower at a bearing of North 90 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 maximum value of either the horizontal or vertical component at any azimuth. The power in the maximum will reach 0.099 kW (-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  
For  
K221FQ, Oklahoma City, Oklahoma

(Continued)

The clear vertical length of the structure required to support the antenna is 30 feet. 8 inches

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.

A handwritten signature in black ink, appearing to read "Tom Schaefer". The signature is fluid and cursive, with a large initial "T" and a stylized "S".

The Microsoft Word document on file electronically at Electronic Research, Inc. governs the specifications, scope, and configuration of the product described. All other representations whether verbal, printed, or electronic are subordinate to the master copy of this document on file at ERI

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

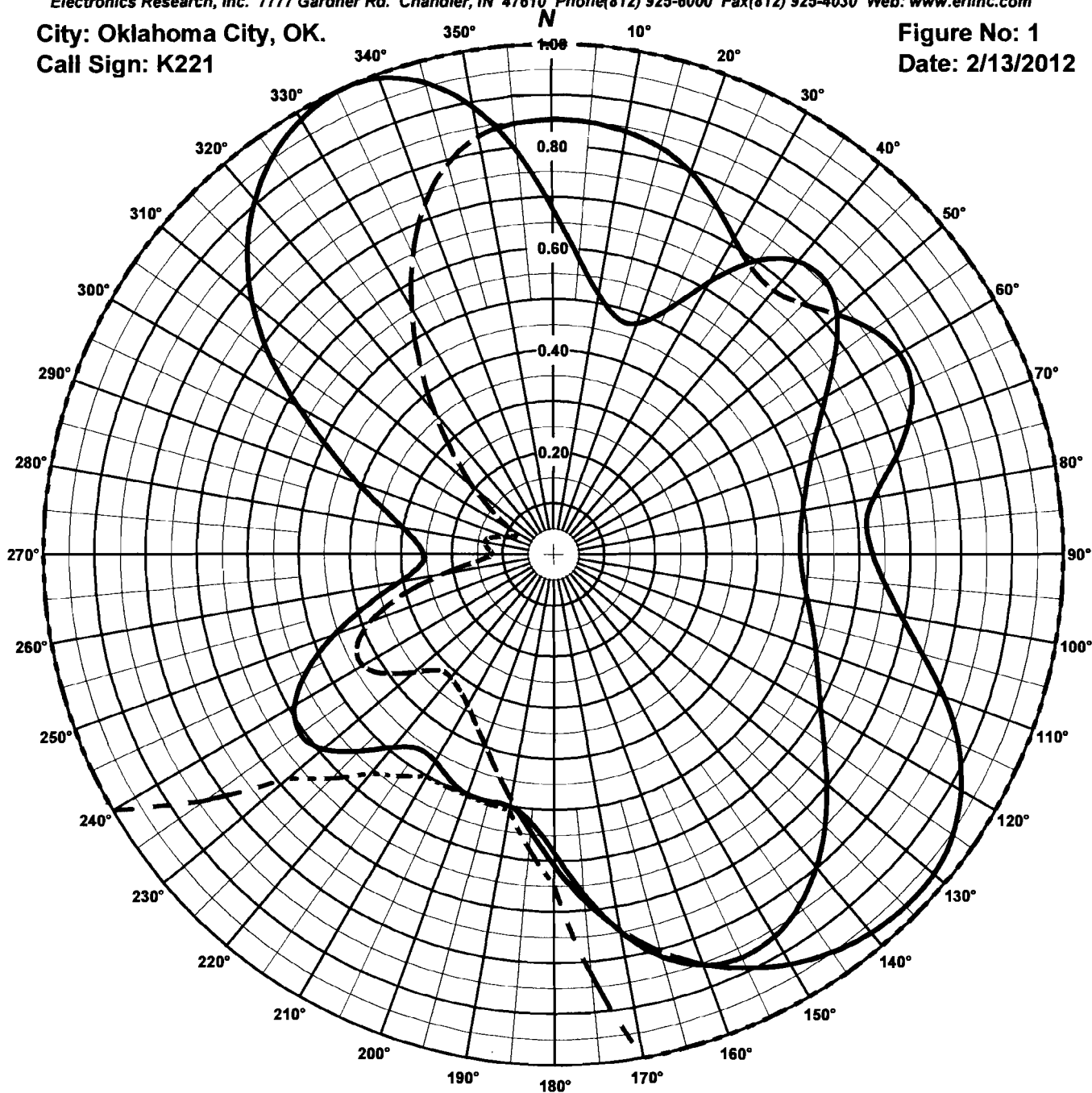
Electronics Research, Inc. 7777 Gardner Rd. Chandler, IN 47610 Phone(812) 925-6000 Fax(812) 925-4030 Web: [www.eriinc.com](http://www.eriinc.com)

City: Oklahoma City, OK.

Call Sign: K221

Figure No: 1

Date: 2/13/2012



Antenna Orientation: 90° True

Frequency: 92.1 MHz

Antenna Type: LP-2E-DA

Antenna Mounting: Standard

Tower Type: 12' Tower

## HORIZONTAL

RMS: .641

Maximum: 1 @ 336°

Minimum: .255 @ 269°

## VERTICAL

RMS: .641

Maximum: .976 @ 133°

Minimum: .082 @ 295°

## COMPOSITE

RMS: .723

Maximum: 1 @ 336°

Minimum: .255 @ 269°

## FCC ENVELOPE

RMS: .941

Maximum: 1 @ 0°

Minimum: .501 @ 205°

Measured patterns of the horizontal and 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# 1

Date: 2/13/2012

Station: K221

Antenna: LP-2E-DA

Location: Oklahoma City, OK.

Antenna Orientation: 90° True

Frequency: 92.1 MHz

Number of Bays: 2

Azimuth	Envelope			Polarization	Azimuth	Envelope			Polarization
	Field	kW	dBk			Field	kW	dBk	
0°	0.851	0.072	-11.441	Vertical	180°	0.609	0.037	-14.345	Vertical
5°	0.849	0.071	-11.461	Vertical	185°	0.544	0.029	-15.330	Vertical
10°	0.841	0.070	-11.548	Vertical	190°	0.501	0.025	-16.048	Horizontal
15°	0.825	0.067	-11.710	Vertical	195°	0.500	0.025	-16.072	Horizontal
20°	0.797	0.063	-12.014	Vertical	200°	0.500	0.025	-16.069	Horizontal
25°	0.757	0.057	-12.460	Vertical	205°	0.486	0.023	-16.318	Horizontal
30°	0.714	0.051	-12.964	Vertical	210°	0.467	0.022	-16.654	Horizontal
35°	0.703	0.049	-13.103	Horizontal	215°	0.463	0.021	-16.723	Horizontal
40°	0.749	0.055	-12.557	Horizontal	220°	0.492	0.024	-16.205	Horizontal
45°	0.757	0.057	-12.460	Horizontal	225°	0.544	0.029	-15.334	Horizontal
50°	0.730	0.053	-12.781	Vertical	230°	0.592	0.035	-14.598	Horizontal
55°	0.766	0.058	-12.363	Vertical	235°	0.609	0.037	-14.355	Horizontal
60°	0.785	0.061	-12.145	Vertical	240°	0.587	0.034	-14.670	Horizontal
65°	0.777	0.060	-12.234	Vertical	245°	0.533	0.028	-15.509	Horizontal
70°	0.741	0.054	-12.651	Vertical	250°	0.458	0.021	-16.825	Horizontal
75°	0.689	0.047	-13.283	Vertical	255°	0.377	0.014	-18.514	Horizontal
80°	0.639	0.040	-13.938	Vertical	260°	0.307	0.009	-20.290	Horizontal
85°	0.617	0.038	-14.243	Vertical	265°	0.265	0.007	-21.593	Horizontal
90°	0.626	0.039	-14.108	Vertical	270°	0.256	0.006	-21.888	Horizontal
95°	0.652	0.042	-13.753	Vertical	275°	0.270	0.007	-21.405	Horizontal
100°	0.693	0.048	-13.226	Vertical	280°	0.301	0.009	-20.474	Horizontal
105°	0.749	0.055	-12.559	Vertical	285°	0.347	0.012	-19.240	Horizontal
110°	0.816	0.066	-11.814	Vertical	290°	0.408	0.016	-17.827	Horizontal
115°	0.876	0.076	-11.192	Vertical	295°	0.485	0.023	-16.334	Horizontal
120°	0.923	0.084	-10.742	Vertical	300°	0.577	0.033	-14.826	Horizontal
125°	0.955	0.090	-10.445	Vertical	305°	0.678	0.045	-13.420	Horizontal
130°	0.972	0.094	-10.288	Vertical	310°	0.769	0.059	-12.321	Horizontal
135°	0.975	0.094	-10.263	Vertical	315°	0.846	0.071	-11.497	Horizontal
140°	0.967	0.093	-10.334	Vertical	320°	0.907	0.081	-10.890	Horizontal
145°	0.951	0.089	-10.483	Vertical	325°	0.953	0.090	-10.461	Horizontal
150°	0.926	0.085	-10.710	Vertical	330°	0.984	0.096	-10.186	Horizontal
155°	0.893	0.079	-11.023	Vertical	335°	0.999	0.099	-10.052	Horizontal
160°	0.855	0.072	-11.407	Horizontal	340°	0.993	0.098	-10.109	Horizontal
165°	0.815	0.066	-11.826	Horizontal	345°	0.956	0.091	-10.431	Horizontal
170°	0.749	0.056	-12.549	Horizontal	350°	0.890	0.078	-11.054	Horizontal
175°	0.680	0.046	-13.392	Vertical	355°	0.847	0.071	-11.488	Vertical

Horizontal Polarization:

Maximum: 2.305 (3.628 dB)

Horizontal Plane: 2.305 (3.628 dB)

Maximum ERP: 0.099 kW

Vertical Polarization:

Maximum: 2.194 (3.413 dB)

Horizontal Plane: 2.194 (3.413 dB)

Maximum ERP: 0.094 kW

Total Input Power: 0.043 kW

Reference: K2211M.FIG

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



# 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

Figure# 1A

Date: 2/13/2012

Station: K221

Antenna: LP-2E-DA

Location: Oklahoma City, OK.

Antenna Orientation: 90° True

Frequency: 92.1 MHz

Number of Bays: 2

Azimuth	Horizontal			Vertical			Azimuth	Horizontal			Vertical		
	Field	kW	dBk	Field	kW	dBk		Field	kW	dBk	Field	kW	dBk
0°	0.679	0.046	-13.406	0.851	0.072	-11.441	180°	0.584	0.034	-14.711	0.609	0.037	-14.345
5°	0.584	0.034	-14.722	0.849	0.071	-11.461	185°	0.526	0.027	-15.631	0.544	0.029	-15.330
10°	0.517	0.027	-15.767	0.841	0.070	-11.548	190°	0.501	0.025	-16.048	0.487	0.023	-16.299
15°	0.481	0.023	-16.395	0.825	0.067	-11.710	195°	0.500	0.025	-16.072	0.437	0.019	-17.224
20°	0.481	0.023	-16.401	0.797	0.063	-12.014	200°	0.500	0.025	-16.069	0.396	0.016	-18.079
25°	0.527	0.027	-15.612	0.757	0.057	-12.460	205°	0.486	0.023	-16.318	0.364	0.013	-18.829
30°	0.616	0.038	-14.250	0.714	0.051	-12.964	210°	0.467	0.022	-16.654	0.339	0.011	-19.437
35°	0.703	0.049	-13.103	0.683	0.046	-13.354	215°	0.463	0.021	-16.723	0.323	0.010	-19.868
40°	0.749	0.055	-12.557	0.674	0.045	-13.464	220°	0.492	0.024	-16.205	0.314	0.010	-20.092
45°	0.757	0.057	-12.460	0.693	0.048	-13.225	225°	0.544	0.029	-15.334	0.320	0.010	-19.944
50°	0.729	0.053	-12.793	0.730	0.053	-12.781	230°	0.592	0.035	-14.598	0.358	0.013	-18.966
55°	0.675	0.045	-13.459	0.766	0.058	-12.363	235°	0.609	0.037	-14.355	0.405	0.016	-17.887
60°	0.618	0.038	-14.226	0.785	0.061	-12.145	240°	0.587	0.034	-14.670	0.433	0.019	-17.304
65°	0.571	0.032	-14.910	0.777	0.060	-12.234	245°	0.533	0.028	-15.509	0.426	0.018	-17.454
70°	0.537	0.029	-15.438	0.741	0.054	-12.651	250°	0.458	0.021	-16.825	0.382	0.014	-18.400
75°	0.513	0.026	-15.833	0.689	0.047	-13.283	255°	0.377	0.014	-18.514	0.309	0.009	-20.255
80°	0.497	0.024	-16.121	0.639	0.040	-13.938	260°	0.307	0.009	-20.290	0.222	0.005	-23.132
85°	0.487	0.023	-16.302	0.617	0.038	-14.243	265°	0.265	0.007	-21.593	0.149	0.002	-26.578
90°	0.484	0.023	-16.349	0.626	0.039	-14.108	270°	0.256	0.006	-21.888	0.121	0.001	-28.395
95°	0.491	0.024	-16.219	0.652	0.042	-13.753	275°	0.270	0.007	-21.405	0.128	0.002	-27.869
100°	0.506	0.025	-15.960	0.693	0.048	-13.226	280°	0.301	0.009	-20.474	0.137	0.002	-27.341
105°	0.526	0.027	-15.627	0.749	0.055	-12.559	285°	0.347	0.012	-19.240	0.126	0.002	-28.014
110°	0.547	0.030	-15.276	0.816	0.066	-11.814	290°	0.408	0.016	-17.827	0.100	0.001	-30.019
115°	0.573	0.032	-14.887	0.876	0.076	-11.192	295°	0.485	0.023	-16.334	0.082	0.001	-31.798
120°	0.605	0.036	-14.403	0.923	0.084	-10.742	300°	0.577	0.033	-14.826	0.098	0.001	-30.249
125°	0.648	0.042	-13.817	0.955	0.090	-10.445	305°	0.678	0.045	-13.420	0.143	0.002	-26.937
130°	0.698	0.048	-13.166	0.972	0.094	-10.288	310°	0.769	0.059	-12.321	0.204	0.004	-23.857
135°	0.751	0.056	-12.535	0.975	0.094	-10.263	315°	0.846	0.071	-11.497	0.276	0.008	-21.217
140°	0.800	0.063	-11.985	0.967	0.093	-10.334	320°	0.907	0.081	-10.890	0.360	0.013	-18.911
145°	0.839	0.070	-11.564	0.951	0.089	-10.483	325°	0.953	0.090	-10.461	0.455	0.020	-16.886
150°	0.864	0.074	-11.313	0.926	0.085	-10.710	330°	0.984	0.096	-10.186	0.554	0.030	-15.181
155°	0.870	0.075	-11.250	0.893	0.079	-11.023	335°	0.999	0.099	-10.052	0.647	0.041	-13.820
160°	0.855	0.072	-11.407	0.852	0.072	-11.432	340°	0.993	0.098	-10.109	0.731	0.053	-12.770
165°	0.815	0.066	-11.826	0.803	0.064	-11.948	345°	0.956	0.091	-10.431	0.792	0.062	-12.074
170°	0.749	0.056	-12.549	0.746	0.055	-12.592	350°	0.890	0.078	-11.054	0.831	0.068	-11.647
175°	0.666	0.044	-13.576	0.680	0.046	-13.392	355°	0.794	0.062	-12.048	0.847	0.071	-11.488

Horizontal Polarization:

Maximum: 2.305 (3.628 dB)

Horizontal Plane: 2.305 (3.628 dB)

Maximum ERP: 0.099 kW

Vertical Polarization:

Maximum: 2.194 (3.413 dB)

Horizontal Plane: 2.194 (3.413 dB)

Maximum ERP: 0.094 kW

Total Input Power: 0.043 kW

Reference: K2211M.FIG

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

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

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

Figure No: 3

Call Sign: K221

Location: Oklahoma City, OK.

Frequency: 92.1 MHz

2 bay LP-2E-DA antenna

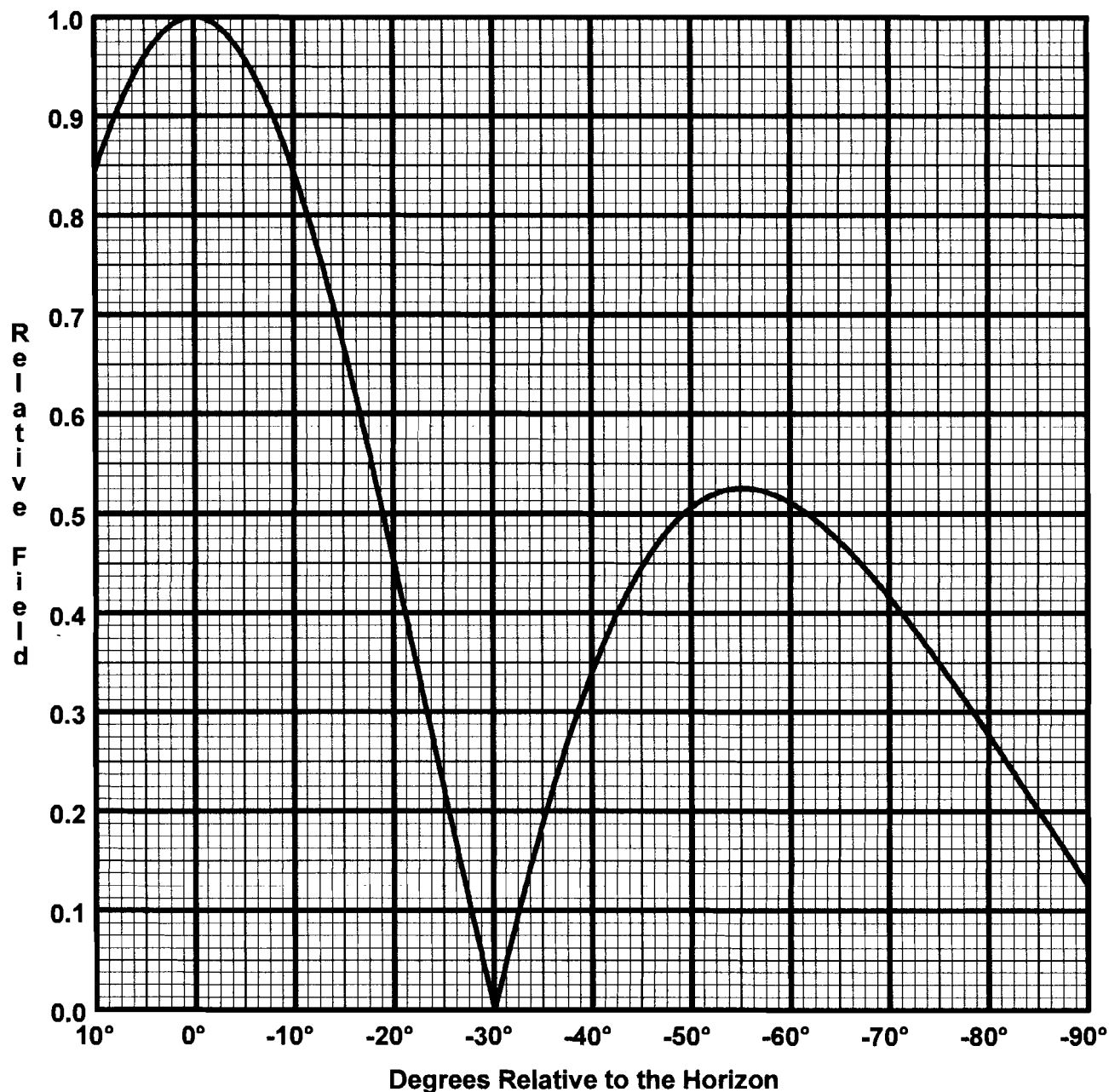
Date: 2/13/2012

H/V Power Ratio: 1

1 Wave-length Spacing

0° Beam Tilt

0% First Null Fill



Horizontal Polarization:

Maximum: 2.305 (3.628 dB)

Horizontal Plane: 2.305 (3.628 dB)

Maximum ERP: 0.099 kW

Vertical Polarization:

Maximum: 2.194 (3.413 dB)

Horizontal Plane: 2.194 (3.413 dB)

Maximum ERP: 0.094 kW

Directional Antenna System  
for  
K221FQ, Oklahoma City, Oklahoma

(Continued)

ANTENNA SPECIFICATIONS

Antenna Type:	LP-2E-DA
Frequency:	92.1 MHz
Number of Bays:	Two

MECHANICAL SPECIFICATIONS

Mounting:	Standard
System length:	19 ft 5 in
Aperture length required:	30ft 8 in
Orientation:	90° true
Input flange to the antenna 1 5/8" female.	

ELECTRICAL SPECIFICATIONS  
(For directional use)

Maximum horizontal ERP:	0.099 kW (-10.044dBk)
Horizontal maximum power gain:	2.305 (3.627 dB)
Maximum vertical ERP:	0.094 kW (-10.255dBk)
Vertical maximum power gain:	2.194 (3.413 dB)
Total input power:	0.043 kW (-13.665 dBk)

