

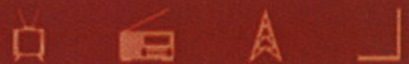
***Directional Antenna System
for
KFLO, Blanchard, Louisiana***

April 1, 2010

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 KFLO.

The antenna is the ERI model MP-4C-DA-HW configuration. The circular polarized system consists of 4 half-wavelength spaced bays using one driven circular polarized radiating element per bay, three horizontal parasitic elements per bay and one vertical parasitic element interleaved between alternate bay pairs. The antenna was mounted on the North 300 degrees East tower leg with bracketry to provide an antenna orientation of North 318 degrees 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 89.1 megahertz, which is the center of the FM broadcast channel assigned to KFLO.

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.



Directional Antenna System Proposed For KFLO, Blanchard, Louisiana

(Continued)

DESCRIPTION OF THE TEST PROCEDURE

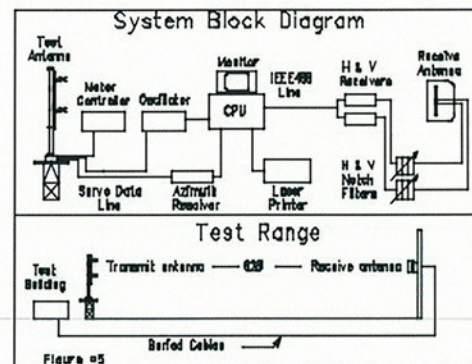
The test antenna consisted of two bay levels of the circular polarized system with the associated horizontal and vertical parasitic elements. The elements and brackets that were used in this test are electrically equivalent to those that will be supplied with the antenna. A section of 3 1/8 inch o.d. rigid coaxial line was used to feed the test antenna, and a section of 3 1/8 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 a US Digital angle position indicator. The resolution of this angle position indicator is one-hundredth of a degree.

The antenna under test was operated in the transmitting mode and fed from a HP8657D signal generator. The frequency of the signal source was set at 89.1 MHz and was constantly monitored by a Rohde & Schwarz ESVD measuring receiver.

A broadband 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.



Directional Antenna System
Proposed For
KFLO, Blanchard, Louisiana

(Continued)

The signals received by the dipole system were fed to the test building by way of two buried Heliac cables to a Rohde & Schwarz measuring receiver. This data was interfaced to a laser jet printer by means of a 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 4 half-wavelength spaced bays using one driven circular polarized radiating element per bay, three horizontal parasitic elements per bay and one vertical parasitic element interleaved between alternate bay pairs. 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 MP-4C-DA-HW array is to be mounted on the North 300 degrees East tower leg of the 24" face tower at a bearing of North 318 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 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 38 kilowatts (15.798 dBk).

The power at North 80 degrees East does not exceed 11.08 kilowatts (10.445 dBk).

The power at North 150-170 degrees East does not exceed 30.10 kilowatts (14.786 dBk).

The power at North 210 degrees East does not exceed 17.57 kilowatts (12.448 dBk).

Directional Antenna System
Proposed For
KFLO, Blanchard, Louisiana

(Continued)

The power at North 270 degrees East does not exceed 21.95 kilowatts (13.414 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 than 85% of the filed composite pattern.

The clear vertical length of the structure required to support the antenna is 32 feet if the antenna is to be top mounted.

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.



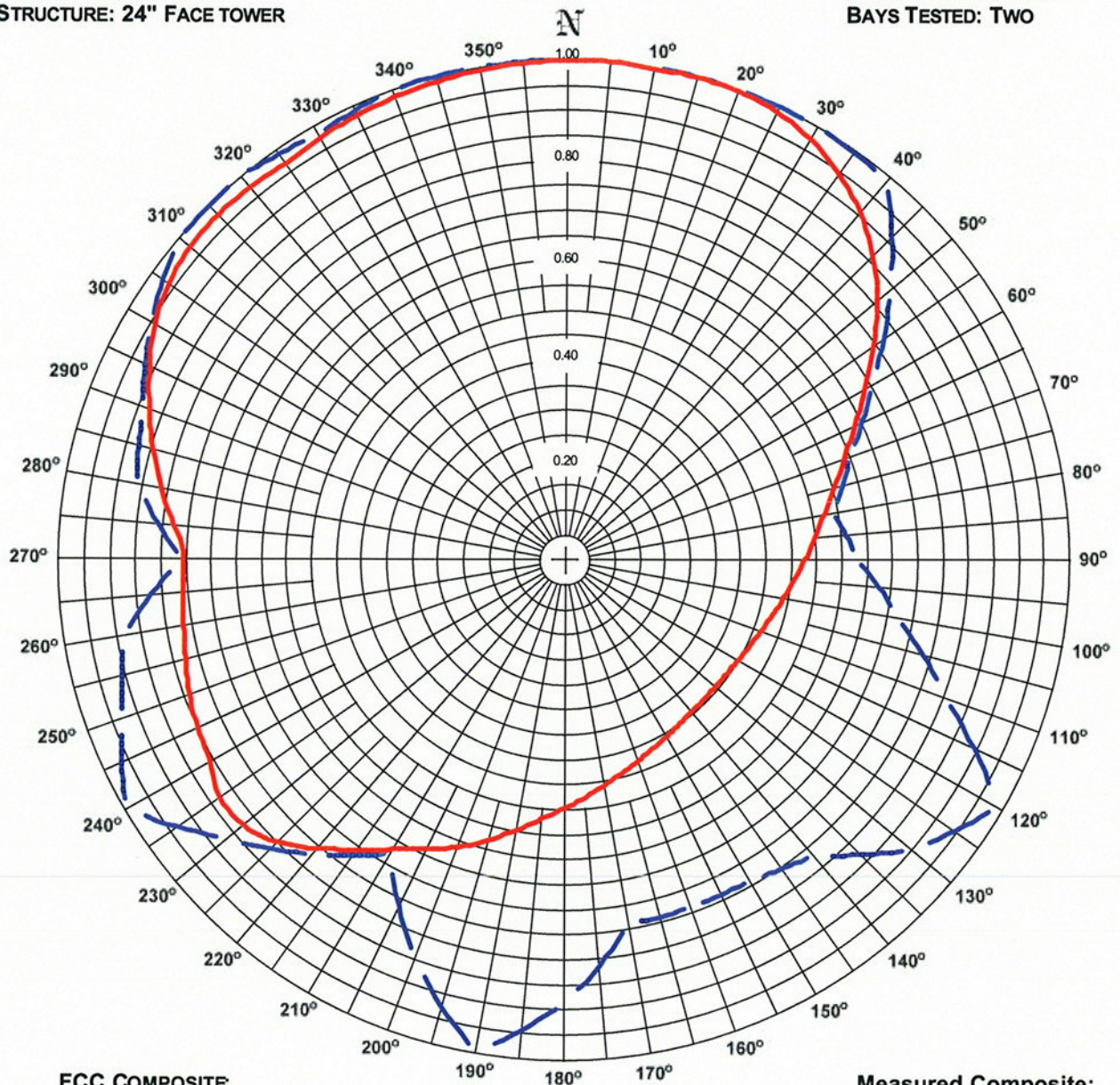
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ERI® *Horizontal Plane Relative Field Pattern*

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

FIGURE NO: 1
STATION: KFLO
LOCATION: BLANCHARD, LA
ANTENNA: MP-4C-DA-HW
STRUCTURE: 24" FACE TOWER

DATE: 4/1/2010
FREQUENCY: 89.1 MHz
ORIENTATION: 318° TRUE
MOUNTING: STANDARD
BAYS TESTED: TWO



FCC COMPOSITE

RMS: 0.869
MAXIMUM: 1.000 @ 0° TRUE
MINIMUM: 0.540 @ 80° TRUE

Measured Composite:

RMS: 0.751
Maximum: 1.000 @ 4° True
Minimum: 0.393 @ 132° True

COMMENTS: COMPOSITE PATTERN: THIS PATTERN SHOWS THE MAXIMUM OF EITHER THE H OR V AZIMUTH VALUES. THIS PATTERN IS GREATER THAN 85% OF THE FCC FILED COMPOSITE PATTERN BPED-20080508ACM.

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: KFLO
Location: Blanchard, La
Frequency: 89.1 MHz

Antenna: MP-4C-DA-HW
Orientation: 318° True
Tower: 24" Face tower

Figure: 1
Date: 4/1/2010
Reference: kflo1m.fig

Angle	Envelope			Polarization	Angle	Envelope			Polarization
	Field	kW	dBk			Field	kW	dBk	
0°	0.999	37.93	15.79	Vertical	180°	0.499	9.44	9.75	Horizontal
5°	1.000	37.99	15.80	Vertical	185°	0.521	10.33	10.14	Horizontal
10°	0.996	37.73	15.77	Horizontal	190°	0.550	11.48	10.60	Vertical
15°	1.000	37.99	15.80	Horizontal	195°	0.582	12.88	11.10	Vertical
20°	0.998	37.86	15.78	Horizontal	200°	0.613	14.28	11.55	Vertical
25°	0.989	37.15	15.70	Horizontal	205°	0.641	15.60	11.93	Vertical
30°	0.971	35.80	15.54	Horizontal	210°	0.671	17.10	12.33	Horizontal
35°	0.944	33.83	15.29	Horizontal	215°	0.710	19.17	12.83	Horizontal
40°	0.907	31.28	14.95	Horizontal	220°	0.756	21.73	13.37	Horizontal
45°	0.862	28.25	14.51	Horizontal	225°	0.801	24.35	13.87	Horizontal
50°	0.808	24.80	13.94	Horizontal	230°	0.828	26.07	14.16	Horizontal
55°	0.747	21.18	13.26	Horizontal	235°	0.831	26.22	14.19	Horizontal
60°	0.687	17.93	12.54	Horizontal	240°	0.808	24.79	13.94	Horizontal
65°	0.633	15.24	11.83	Horizontal	245°	0.801	24.38	13.87	Vertical
70°	0.589	13.17	11.20	Horizontal	250°	0.790	23.74	13.75	Vertical
75°	0.553	11.62	10.65	Horizontal	255°	0.777	22.92	13.60	Vertical
80°	0.522	10.37	10.16	Horizontal	260°	0.766	22.30	13.48	Vertical
85°	0.498	9.41	9.73	Horizontal	265°	0.759	21.92	13.41	Vertical
90°	0.476	8.63	9.36	Horizontal	270°	0.757	21.78	13.38	Vertical
95°	0.458	7.97	9.01	Horizontal	275°	0.778	23.02	13.62	Horizontal
100°	0.442	7.41	8.70	Horizontal	280°	0.813	25.12	14.00	Horizontal
105°	0.428	6.95	8.42	Horizontal	285°	0.846	27.17	14.34	Horizontal
110°	0.416	6.58	8.18	Horizontal	290°	0.878	29.27	14.66	Horizontal
115°	0.407	6.29	7.99	Horizontal	295°	0.910	31.48	14.98	Horizontal
120°	0.400	6.08	7.84	Horizontal	300°	0.940	33.58	15.26	Horizontal
125°	0.395	5.94	7.74	Horizontal	305°	0.961	35.12	15.46	Horizontal
130°	0.393	5.87	7.69	Horizontal	310°	0.972	35.91	15.55	Horizontal
135°	0.393	5.88	7.69	Horizontal	315°	0.975	36.09	15.57	Horizontal
140°	0.396	5.96	7.75	Horizontal	320°	0.972	35.92	15.55	Horizontal
145°	0.401	6.11	7.86	Horizontal	325°	0.967	35.54	15.51	Horizontal
150°	0.408	6.33	8.01	Horizontal	330°	0.972	35.93	15.55	Vertical
155°	0.418	6.62	8.21	Horizontal	335°	0.979	36.43	15.62	Vertical
160°	0.429	7.00	8.45	Horizontal	340°	0.985	36.87	15.67	Vertical
165°	0.443	7.46	8.73	Horizontal	345°	0.990	37.24	15.71	Vertical
170°	0.459	8.02	9.04	Horizontal	350°	0.994	37.54	15.74	Vertical
175°	0.478	8.68	9.38	Horizontal	355°	0.997	37.77	15.77	Vertical

Polarization:
Maximum Field:
Minimum Field:
RMS:
Maximum ERP:
Maximum Power Gain:

Envelope
1.000 @ 4° True
0.393 @ 132° True
0.751
38.000 kW
2.272 (3.564 dB)

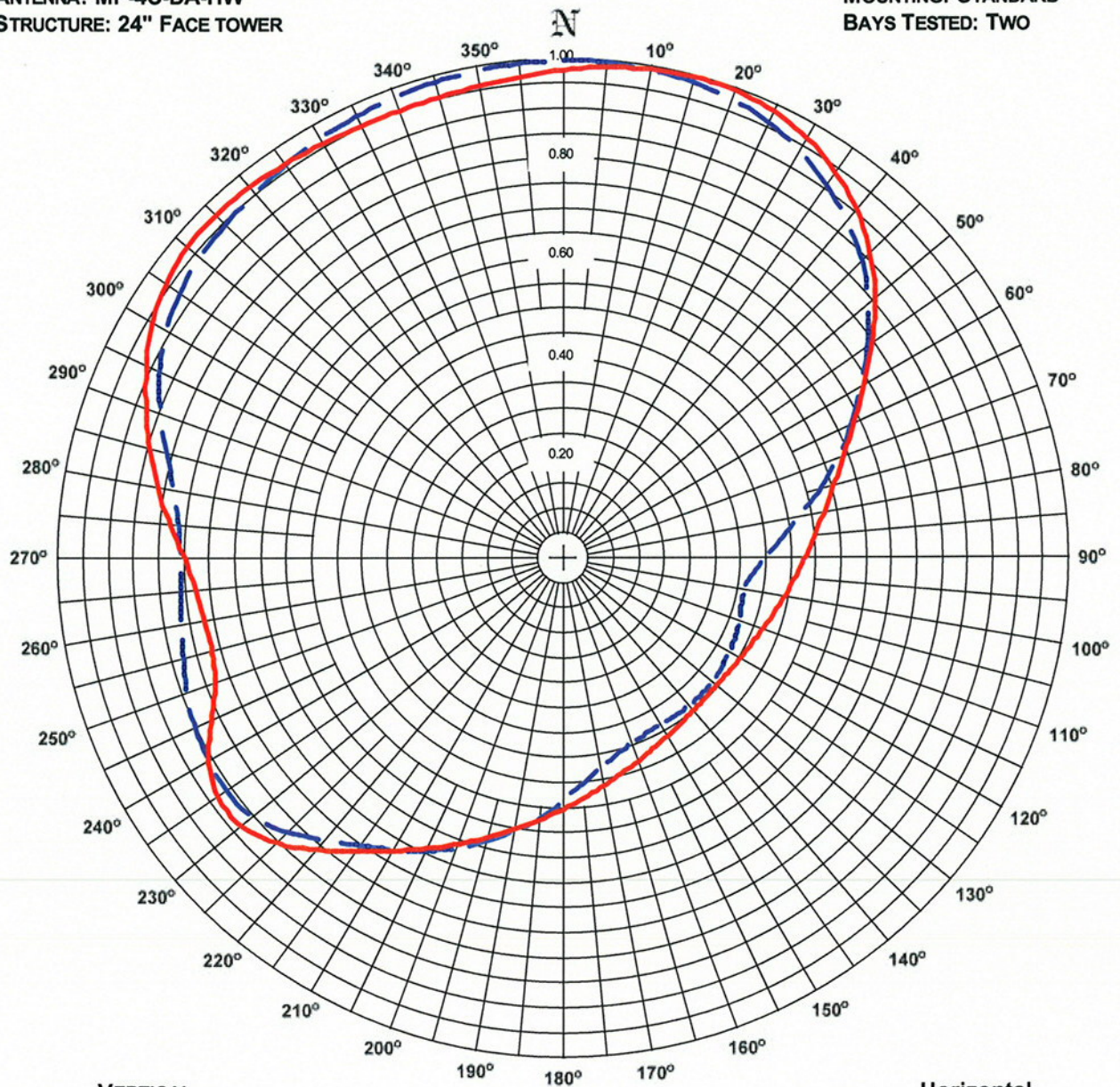
Total Input Power: 16.724 kW

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 NO: 2
STATION: KFLO
LOCATION: BLANCHARD, LA
ANTENNA: MP-4C-DA-HW
STRUCTURE: 24" FACE TOWER

DATE: 4/1/2010
FREQUENCY: 89.1 MHz
ORIENTATION: 318° TRUE
MOUNTING: STANDARD
BAYS TESTED: TWO



VERTICAL

RMS: 0.734
MAXIMUM: 1.000 @ 4° TRUE
MINIMUM: 0.361 @ 102° TRUE

Horizontal

RMS: 0.744
Maximum: 1.000 @ 16° True
Minimum: 0.393 @ 132° True

COMMENTS: MEASURED PATTERNS OF THE HORIZONTAL AND VERTICAL COMPONENTS.

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: KFLO
Location: Blanchard, La
Frequency: 89.1 MHz

Antenna: MP-4C-DA-HW
Orientation: 318° True
Tower: 24" Face tower

Figure: 2
Date: 4/1/2010
Reference: kflo1m.fig

Angle	Horizontal			Vertical			Angle	Horizontal			Vertical		
	Field	kW	dBk	Field	kW	dBk		Field	kW	dBk	Field	kW	dBk
0°	0.981	36.57	15.63	0.999	37.93	15.79	180°	0.499	9.44	9.75	0.482	8.81	9.45
5°	0.990	37.24	15.71	1.000	37.99	15.80	185°	0.521	10.33	10.14	0.519	10.22	10.10
10°	0.996	37.73	15.77	0.996	37.67	15.76	190°	0.547	11.35	10.55	0.550	11.48	10.60
15°	1.000	37.99	15.80	0.990	37.22	15.71	195°	0.574	12.52	10.98	0.582	12.88	11.10
20°	0.998	37.86	15.78	0.980	36.47	15.62	200°	0.604	13.86	11.42	0.613	14.28	11.55
25°	0.989	37.15	15.70	0.964	35.31	15.48	205°	0.636	15.37	11.87	0.641	15.60	11.93
30°	0.971	35.80	15.54	0.940	33.56	15.26	210°	0.671	17.10	12.33	0.668	16.96	12.29
35°	0.944	33.83	15.29	0.911	31.55	14.99	215°	0.710	19.17	12.83	0.696	18.40	12.65
40°	0.907	31.28	14.95	0.877	29.25	14.66	220°	0.756	21.73	13.37	0.731	20.33	13.08
45°	0.862	28.25	14.51	0.839	26.74	14.27	225°	0.801	24.35	13.87	0.770	22.56	13.53
50°	0.808	24.80	13.94	0.790	23.74	13.75	230°	0.828	26.07	14.16	0.799	24.27	13.85
55°	0.747	21.18	13.26	0.735	20.53	13.12	235°	0.831	26.22	14.19	0.809	24.88	13.96
60°	0.687	17.93	12.54	0.679	17.52	12.43	240°	0.808	24.79	13.94	0.808	24.78	13.94
65°	0.633	15.24	11.83	0.627	14.95	11.75	245°	0.767	22.33	13.49	0.801	24.38	13.87
70°	0.589	13.17	11.20	0.575	12.58	11.00	250°	0.732	20.36	13.09	0.790	23.74	13.75
75°	0.553	11.62	10.65	0.522	10.35	10.15	255°	0.718	19.59	12.92	0.777	22.92	13.60
80°	0.522	10.37	10.16	0.471	8.41	9.25	260°	0.719	19.66	12.94	0.766	22.30	13.48
85°	0.498	9.41	9.73	0.429	6.98	8.44	265°	0.728	20.16	13.05	0.759	21.92	13.41
90°	0.476	8.63	9.36	0.396	5.95	7.74	270°	0.747	21.19	13.26	0.757	21.78	13.38
95°	0.458	7.97	9.01	0.372	5.27	7.22	275°	0.778	23.02	13.62	0.764	22.16	13.46
100°	0.442	7.41	8.70	0.361	4.96	6.96	280°	0.813	25.12	14.00	0.782	23.21	13.66
105°	0.428	6.95	8.42	0.363	4.99	6.98	285°	0.846	27.17	14.34	0.810	24.96	13.97
110°	0.416	6.58	8.18	0.368	5.13	7.10	290°	0.878	29.27	14.66	0.848	27.31	14.36
115°	0.407	6.29	7.99	0.373	5.29	7.23	295°	0.910	31.48	14.98	0.882	29.56	14.71
120°	0.400	6.08	7.84	0.376	5.36	7.29	300°	0.940	33.58	15.26	0.909	31.40	14.97
125°	0.395	5.94	7.74	0.379	5.44	7.36	305°	0.961	35.12	15.46	0.929	32.77	15.16
130°	0.393	5.87	7.69	0.381	5.52	7.42	310°	0.972	35.91	15.55	0.941	33.63	15.27
135°	0.393	5.88	7.69	0.383	5.57	7.46	315°	0.975	36.09	15.57	0.948	34.13	15.33
140°	0.396	5.96	7.75	0.382	5.55	7.44	320°	0.972	35.92	15.55	0.956	34.74	15.41
145°	0.401	6.11	7.86	0.381	5.53	7.43	325°	0.967	35.54	15.51	0.965	35.36	15.49
150°	0.408	6.33	8.01	0.382	5.55	7.44	330°	0.962	35.15	15.46	0.972	35.93	15.55
155°	0.418	6.62	8.21	0.384	5.61	7.49	335°	0.958	34.87	15.42	0.979	36.43	15.62
160°	0.429	7.00	8.45	0.391	5.82	7.65	340°	0.957	34.78	15.41	0.985	36.87	15.67
165°	0.443	7.46	8.73	0.404	6.19	7.92	345°	0.958	34.91	15.43	0.990	37.24	15.71
170°	0.459	8.02	9.04	0.423	6.80	8.32	350°	0.963	35.26	15.47	0.994	37.54	15.74
175°	0.478	8.68	9.38	0.449	7.66	8.84	355°	0.971	35.83	15.54	0.997	37.77	15.77

Polarization:	Horizontal	Vertical
Maximum Field:	1.000 @ 16° True	1.000 @ 4° True
Minimum Field:	0.393 @ 132° True	0.361 @ 102° True
RMS:	0.744	0.734
Maximum ERP:	38.000 kW	38.000 kW
Maximum Power Gain:	2.272 (3.564 dB)	2.272 (3.564 dB)

Total Input Power: 16.724 kW



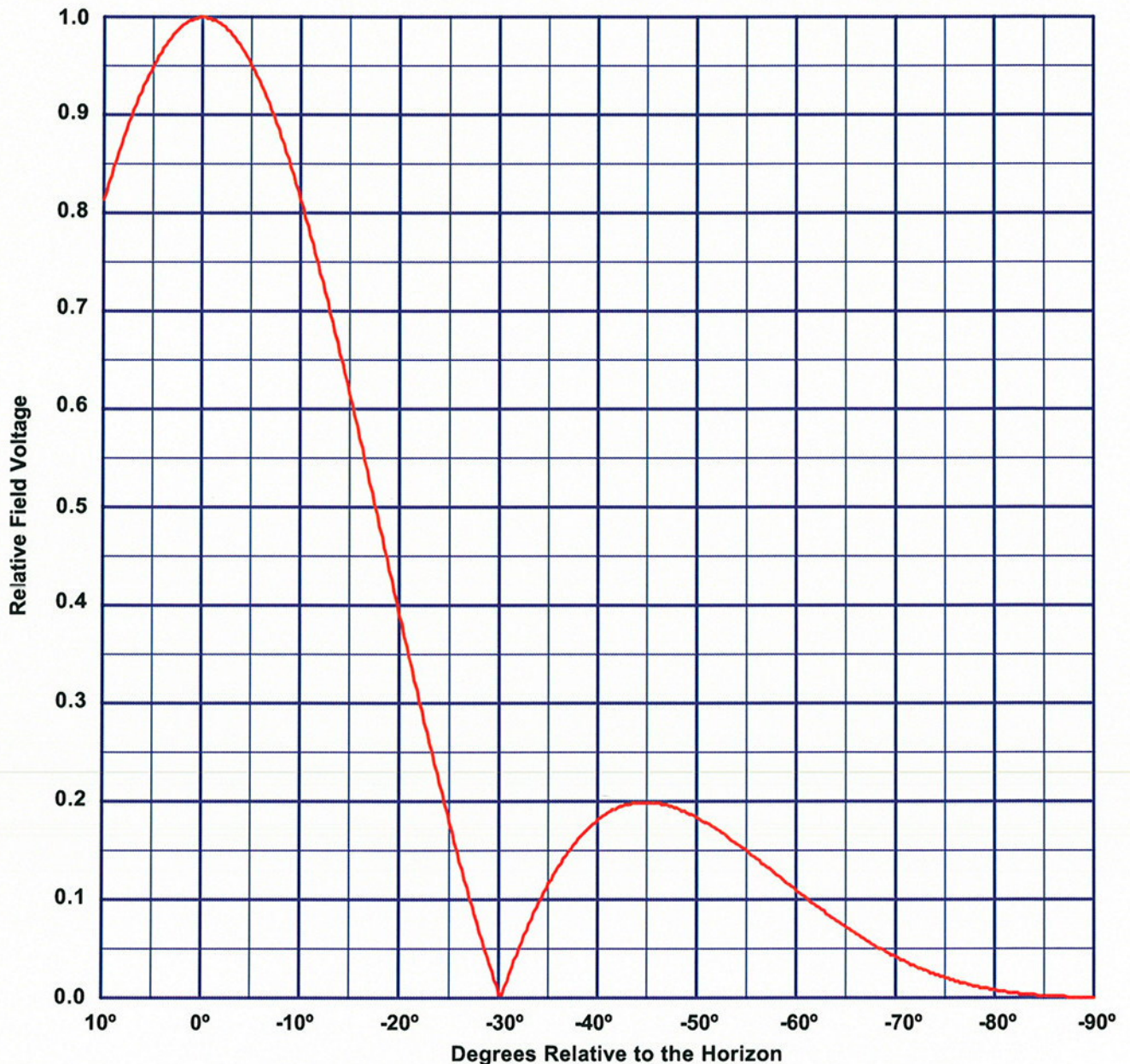
Vertical Plane Relative Field Pattern

KFLO, Blanchard, La, 89.1 MHz

Figure#: 3

Date: 4/1/2010

A 4 level, .5 wave-length spaced MP-4C-DA-HW directional antenna with 0° beam tilt, 0% null fill and a H/V maximum power ratio of 1.000



Vertical Polarization Gain:

Maximum: 2.272 (3.564 dB)

Horizontal Plane: 2.272 (3.564 dB)

Horizontal Polarization Gain:

Maximum: 2.272 (3.564 dB)

Horizontal Plane: 2.272 (3.564 dB)

Directional Antenna System
for
KFLO, Blanchard, Louisiana

(Continued)

ANTENNA SPECIFICATIONS

Antenna Type:	MP-4C-D-HW
Frequency:	89.1MHz
Number of Bays:	Four

MECHANICAL SPECIFICATIONS

Mounting:	Standard
System length:	20. ft 6 in
Aperture length required:	36. ft 6 in
The approximate weight:	495 lbs
The approximate windload:	22.38 ft ² CaAa
Orientation:	318° true

Input flange to the antenna 3 1/8" female.

ELECTRICAL SPECIFICATIONS
(For directional use)

Maximum horizontal ERP:	38.00 kW (15.798 dBk)
Horizontal maximum power gain:	2.272 (3.564 dB)
Maximum vertical ERP:	38.00 kW (15.798 dBk)
Vertical maximum power gain:	2.272 (3.564 dB)
Total input power:	16.724 kW (12.234 dBk)

