

**EXHIBIT E-2**

***Directional Antenna System  
for  
KSRV, Ontario, Oregon***

August 31, 2006

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 KSRV.

The antenna is the ERI model MP-6AC-DA-HW-SP configuration. The circular polarized system consists of 6 half-wavelength spaced bays using one driven circular polarized radiating element per bay and one horizontal parasitic element per bay. The antenna was mounted on the North 246 degrees East tower face with bracketry to provide an antenna orientation of North 246 degrees East. The antenna was tested on a 9' Valmont tower, which is the structure the station plans to use to support the array. All tests were performed on a frequency of 96.1 megahertz, which is the center of the FM broadcast channel assigned to KSRV.

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 For KSRV, Ontario, Oregon

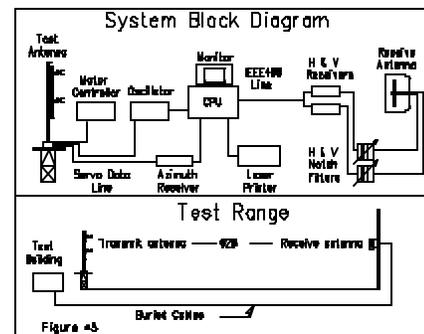
(Continued)

## DESCRIPTION OF THE TEST PROCEDURE

The test antenna consisted of two bay levels of the circular polarized system with the associated horizontal parasitic element. 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 9' 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 North Atlantic Model 8500 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 calibrated 1-05. The frequency of the signal source was set at 96.1 MHz and was constantly monitored by an Anritsu Model ML521B measuring receiver calibrated 6-05.

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 For KSRV, Ontario, Oregon

(Continued)

The signals received by the dipole system were fed to the test building by way of two buried Heliac 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 coordinated graph paper in a clockwise direction. Both horizontal and vertical components were recorded separately.

## CONCLUSIONS

The circular polarized system consists of 6 half-wavelength spaced bays using one driven circular polarized radiating element per bay and one horizontal parasitic element per 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.

The MP-6AC-DA-HW-SP array is to be mounted on the North 246 degrees East tower face of the 9' face tower at a bearing of North 246 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 49 kilowatts (16.902 dBk).

The power at North 96-101 degrees East does not exceed 9.791 kilowatts (9.908 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  
KSRV, Ontario, Oregon

(Continued)

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 41 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.



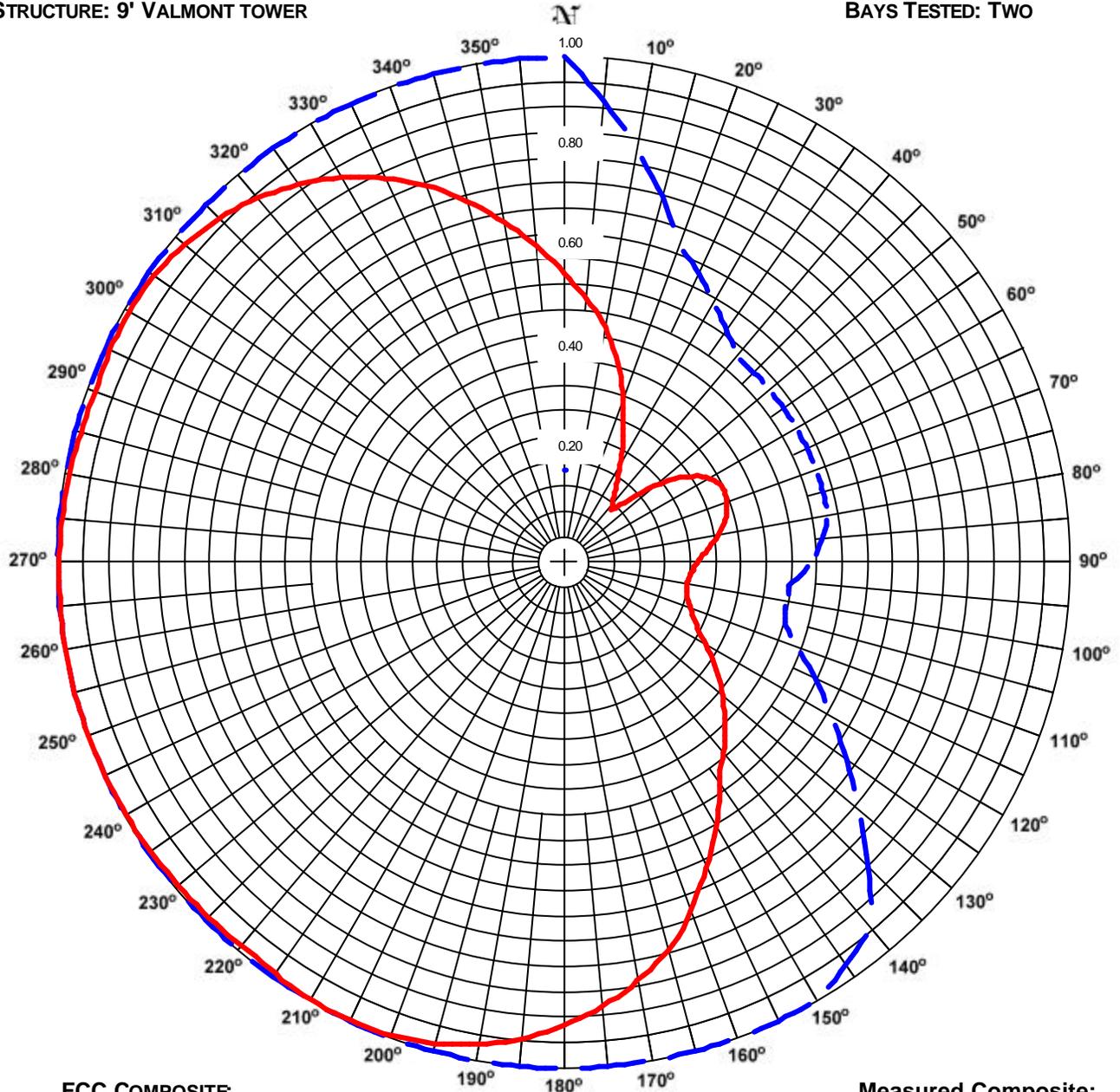
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# ERI<sup>®</sup> Horizontal Plane Relative Field Pattern

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: KSRV  
LOCATION: ONTARIO, OR  
ANTENNA: MP-6AC-DA-HW-SP  
STRUCTURE: 9' VALMONT TOWER

DATE: 8/25/2006  
FREQUENCY: 96.1 MHz  
ORIENTATION: 246° TRUE  
MOUNTING: CUSTOM  
BAYS TESTED: TWO



FCC COMPOSITE  
RMS: 0.872  
MAXIMUM: 1.000 @ 0° TRUE  
MINIMUM: 0.447 @ 96° TRUE

Measured Composite:  
RMS: 0.742  
Maximum: 1.000 @ 206° True  
Minimum: 0.142 @ 42° 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 BPH-20040713AAF

# **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: KSRV**

**Location: Ontario, OR**

**Frequency: 96.1 MHz**

**Antenna: MP-6AC-DA-HW-SP**

**Orientation: 246° True**

**Tower: 9' Valmont tower**

**Figure: 1**

**Date: 8/25/2006**

**Reference: ksrv1m.fig**

Angle	Envelope			Polarization	Angle	Envelope			Polarization
	Field	kW	dBk			Field	kW	dBk	
0°	0.573	16.10	12.07	Vertical	180°	0.916	41.11	16.14	Vertical
5°	0.523	13.41	11.27	Vertical	185°	0.945	43.73	16.41	Vertical
10°	0.472	10.91	10.38	Vertical	190°	0.967	45.86	16.61	Vertical
15°	0.409	8.20	9.14	Vertical	195°	0.984	47.46	16.76	Vertical
20°	0.342	5.74	7.59	Vertical	200°	0.995	48.51	16.86	Vertical
25°	0.279	3.80	5.80	Vertical	205°	1.000	48.98	16.90	Vertical
30°	0.222	2.42	3.84	Vertical	210°	0.999	48.86	16.89	Vertical
35°	0.179	1.58	1.98	Vertical	215°	0.994	48.37	16.85	Vertical
40°	0.149	1.09	0.37	Vertical	220°	0.990	47.98	16.81	Horizontal
45°	0.169	1.40	1.47	Horizontal	225°	0.992	48.25	16.84	Horizontal
50°	0.235	2.70	4.32	Horizontal	230°	0.995	48.49	16.86	Horizontal
55°	0.296	4.30	6.33	Horizontal	235°	0.997	48.67	16.87	Horizontal
60°	0.334	5.46	7.37	Horizontal	240°	0.998	48.82	16.89	Horizontal
65°	0.348	5.93	7.73	Horizontal	245°	0.999	48.92	16.90	Horizontal
70°	0.343	5.78	7.62	Horizontal	250°	1.000	48.98	16.90	Horizontal
75°	0.331	5.36	7.29	Horizontal	255°	1.000	49.00	16.90	Horizontal
80°	0.311	4.73	6.74	Horizontal	260°	1.000	48.95	16.90	Horizontal
85°	0.284	3.96	5.98	Horizontal	265°	0.998	48.85	16.89	Horizontal
90°	0.264	3.42	5.34	Horizontal	270°	0.997	48.70	16.87	Horizontal
95°	0.252	3.10	4.92	Horizontal	275°	0.995	48.48	16.86	Horizontal
100°	0.247	2.99	4.76	Horizontal	280°	0.992	48.22	16.83	Horizontal
105°	0.252	3.12	4.94	Horizontal	285°	0.989	47.89	16.80	Horizontal
110°	0.266	3.48	5.41	Horizontal	290°	0.985	47.53	16.77	Vertical
115°	0.289	4.10	6.13	Horizontal	295°	0.990	48.03	16.82	Vertical
120°	0.324	5.14	7.11	Horizontal	300°	0.992	48.22	16.83	Vertical
125°	0.368	6.65	8.23	Horizontal	305°	0.988	47.87	16.80	Vertical
130°	0.409	8.20	9.14	Horizontal	310°	0.979	46.93	16.71	Vertical
135°	0.450	9.91	9.96	Horizontal	315°	0.963	45.43	16.57	Vertical
140°	0.490	11.78	10.71	Horizontal	320°	0.941	43.39	16.37	Vertical
145°	0.538	14.20	11.52	Vertical	325°	0.913	40.86	16.11	Vertical
150°	0.605	17.94	12.54	Vertical	330°	0.879	37.88	15.78	Vertical
155°	0.666	21.72	13.37	Vertical	335°	0.839	34.51	15.38	Vertical
160°	0.733	26.32	14.20	Vertical	340°	0.793	30.82	14.89	Vertical
165°	0.794	30.87	14.90	Vertical	345°	0.741	26.90	14.30	Vertical
170°	0.840	34.61	15.39	Vertical	350°	0.683	22.84	13.59	Vertical
175°	0.881	38.05	15.80	Vertical	355°	0.628	19.33	12.86	Vertical

**Polarization:**

**Maximum Field:**

**Minimum Field:**

**RMS:**

**Maximum ERP:**

**Maximum Power Gain:**

**Horizontal Plane Gain:**

**Envelope**

**1.000 @ 206° True**

**0.142 @ 42° True**

**0.742**

**49.000 kW**

**3.602 (5.566 dB)**

**3.448 (5.376 dB)**

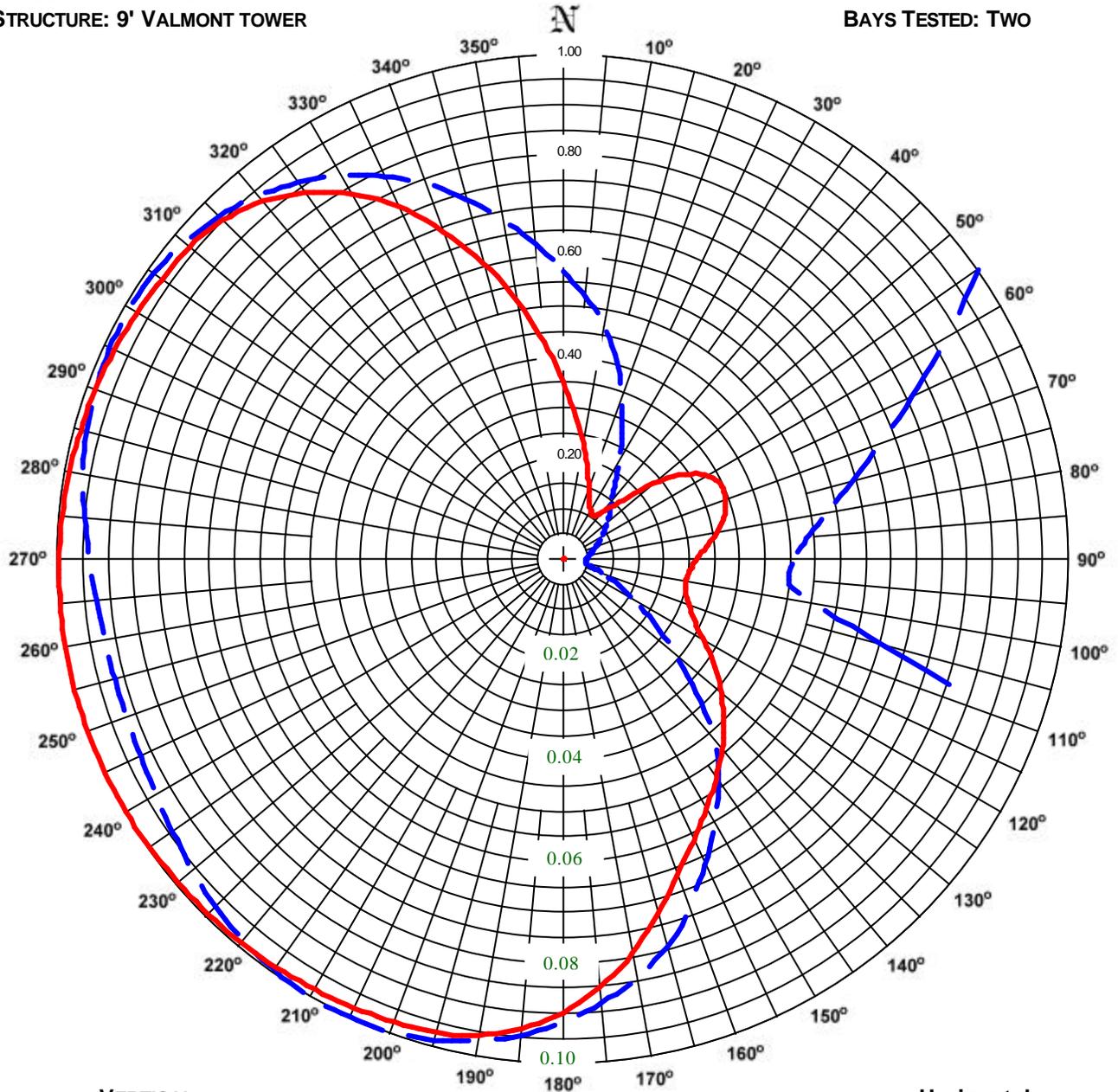
**Total Input Power: 13.602 kW**

# 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 <http://www.eriinc.com/>

FIGURE NO: 2  
STATION: KSRV  
LOCATION: ONTARIO, OR  
ANTENNA: MP-6AC-DA-HW-SP  
STRUCTURE: 9' VALMONT TOWER

DATE: 8/25/2006  
FREQUENCY: 96.1 MHz  
ORIENTATION: 246° TRUE  
MOUNTING: CUSTOM  
BAYS TESTED: TWO



VERTICAL

RMS: 0.715  
MAXIMUM: 1.000 @ 206° TRUE  
MINIMUM: 0.045 @ 95° TRUE

10X Scale

Horizontal

RMS: 0.716  
Maximum: 1.000 @ 254° True  
Minimum: 0.107 @ 34° 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: KSRV**

**Location: Ontario, OR**

**Frequency: 96.1 MHz**

**Antenna: MP-6AC-DA-HW-SP**

**Orientation: 246° True**

**Tower: 9' Valmont tower**

**Figure: 2**

**Date: 8/25/2006**

**Reference: ksrv1m.fig**

Angle	Horizontal			Vertical			Angle	Horizontal			Vertical		
	Field	kW	dBk	Field	kW	dBk		Field	kW	dBk	Field	kW	dBk
0°	0.353	6.10	7.86	0.573	16.10	12.07	180°	0.896	39.36	15.95	0.916	41.11	16.14
5°	0.288	4.06	6.08	0.523	13.41	11.27	185°	0.932	42.53	16.29	0.945	43.73	16.41
10°	0.233	2.66	4.25	0.472	10.91	10.38	190°	0.956	44.79	16.51	0.967	45.86	16.61
15°	0.187	1.71	2.33	0.409	8.20	9.14	195°	0.969	46.04	16.63	0.984	47.46	16.76
20°	0.151	1.12	0.49	0.342	5.74	7.59	200°	0.974	46.48	16.67	0.995	48.51	16.86
25°	0.126	0.78	-1.10	0.279	3.80	5.80	205°	0.979	46.92	16.71	1.000	48.98	16.90
30°	0.111	0.61	-2.18	0.222	2.42	3.84	210°	0.983	47.31	16.75	0.999	48.86	16.89
35°	0.108	0.57	-2.43	0.179	1.58	1.98	215°	0.986	47.67	16.78	0.994	48.37	16.85
40°	0.127	0.79	-1.04	0.149	1.09	0.37	220°	0.990	47.98	16.81	0.985	47.53	16.77
45°	0.169	1.40	1.47	0.131	0.84	-0.74	225°	0.992	48.25	16.84	0.973	46.35	16.66
50°	0.235	2.70	4.32	0.115	0.65	-1.89	230°	0.995	48.49	16.86	0.957	44.86	16.52
55°	0.296	4.30	6.33	0.100	0.49	-3.07	235°	0.997	48.67	16.87	0.942	43.45	16.38
60°	0.334	5.46	7.37	0.087	0.37	-4.26	240°	0.998	48.82	16.89	0.930	42.39	16.27
65°	0.348	5.93	7.73	0.076	0.29	-5.45	245°	0.999	48.92	16.90	0.922	41.67	16.20
70°	0.343	5.78	7.62	0.067	0.22	-6.60	250°	1.000	48.98	16.90	0.918	41.28	16.16
75°	0.331	5.36	7.29	0.059	0.17	-7.68	255°	1.000	49.00	16.90	0.917	41.24	16.15
80°	0.311	4.73	6.74	0.053	0.14	-8.63	260°	1.000	48.95	16.90	0.921	41.53	16.18
85°	0.284	3.96	5.98	0.049	0.12	-9.38	265°	0.998	48.85	16.89	0.927	42.12	16.25
90°	0.264	3.42	5.34	0.046	0.10	-9.88	270°	0.997	48.70	16.87	0.937	43.01	16.34
95°	0.252	3.10	4.92	0.045	0.10	-10.08	275°	0.995	48.48	16.86	0.950	44.22	16.46
100°	0.247	2.99	4.76	0.051	0.13	-9.01	280°	0.992	48.22	16.83	0.965	45.60	16.59
105°	0.252	3.12	4.94	0.066	0.21	-6.68	285°	0.989	47.89	16.80	0.976	46.71	16.69
110°	0.266	3.48	5.41	0.092	0.41	-3.86	290°	0.985	47.52	16.77	0.985	47.53	16.77
115°	0.289	4.10	6.13	0.127	0.79	-1.04	295°	0.980	47.09	16.73	0.990	48.03	16.82
120°	0.324	5.14	7.11	0.172	1.44	1.59	300°	0.975	46.60	16.68	0.992	48.22	16.83
125°	0.368	6.65	8.23	0.226	2.51	3.99	305°	0.970	46.07	16.63	0.988	47.87	16.80
130°	0.409	8.20	9.14	0.291	4.14	6.17	310°	0.964	45.58	16.59	0.979	46.93	16.71
135°	0.450	9.91	9.96	0.373	6.82	8.34	315°	0.952	44.39	16.47	0.963	45.43	16.57
140°	0.490	11.78	10.71	0.467	10.69	10.29	320°	0.927	42.06	16.24	0.941	43.39	16.37
145°	0.528	13.67	11.36	0.538	14.20	11.52	325°	0.889	38.69	15.88	0.913	40.86	16.11
150°	0.569	15.85	12.00	0.605	17.94	12.54	330°	0.838	34.40	15.37	0.879	37.88	15.78
155°	0.613	18.39	12.65	0.666	21.72	13.37	335°	0.775	29.40	14.68	0.839	34.51	15.38
160°	0.664	21.59	13.34	0.733	26.32	14.20	340°	0.693	23.57	13.72	0.793	30.82	14.89
165°	0.726	25.82	14.12	0.794	30.87	14.90	345°	0.609	18.16	12.59	0.741	26.90	14.30
170°	0.792	30.74	14.88	0.840	34.61	15.39	350°	0.522	13.36	11.26	0.683	22.84	13.59
175°	0.850	35.38	15.49	0.881	38.05	15.80	355°	0.432	9.16	9.62	0.628	19.33	12.86

**Polarization:**

**Maximum Field:**

**Minimum Field:**

**RMS:**

**Maximum ERP:**

**Maximum Power Gain:**

**Horizontal Plane Gain:**

**Horizontal**

**1.000 @ 254° True**

**0.107 @ 34° True**

**0.716**

**49.000 kW**

**3.602 (5.566 dB)**

**3.448 (5.376 dB)**

**Vertical**

**1.000 @ 206° True**

**0.045 @ 95° True**

**0.715**

**49.000 kW**

**3.602 (5.566 dB)**

**3.448 (5.376 dB)**

**Total Input Power: 13.602 kW**

ELECTRONICS RESEARCH, INC.  
7777 GARDNER ROAD  
CHANDLER, IN. 47610

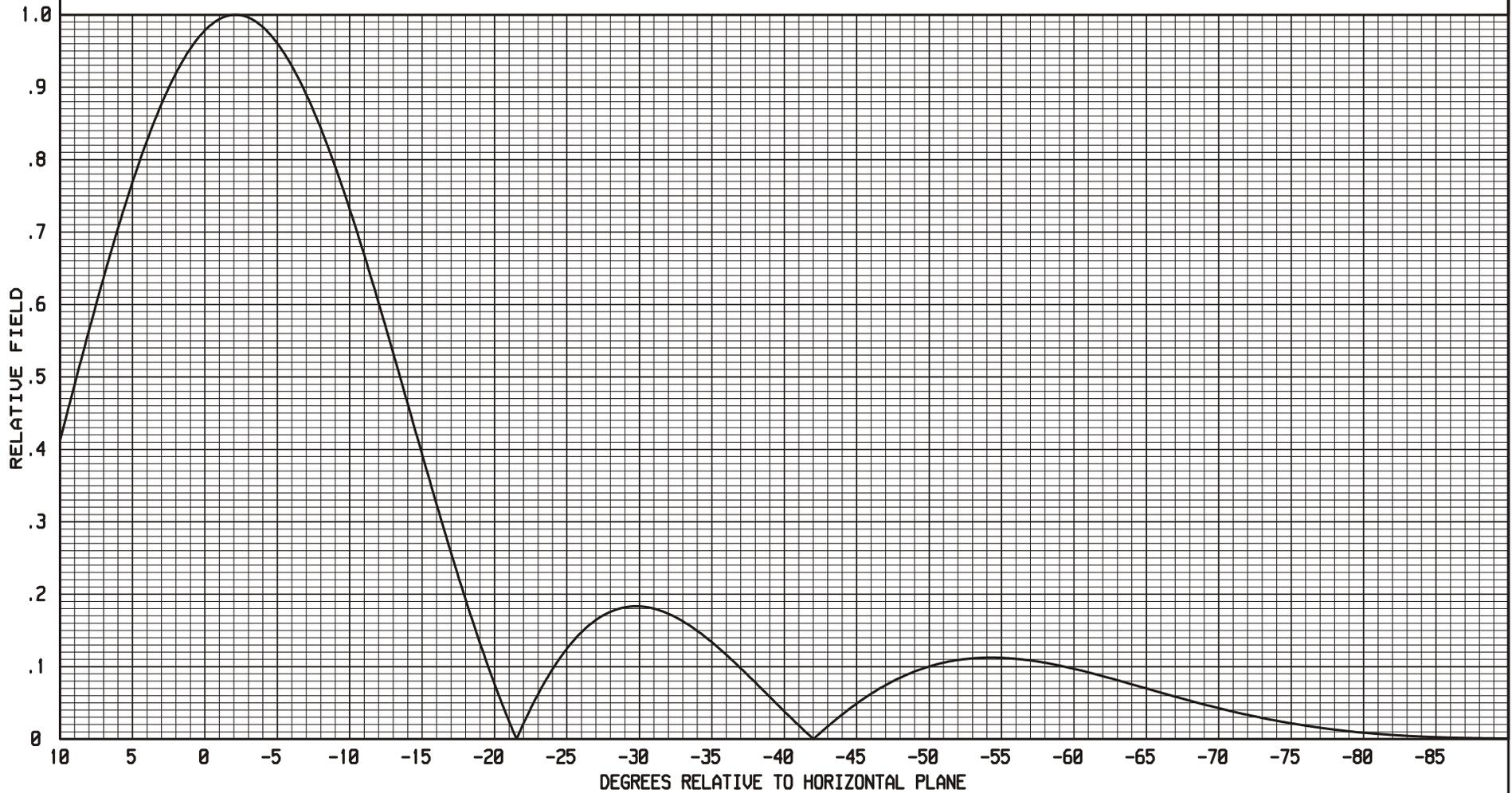
FIGURE 3

----THEORETICAL----  
VERTICAL PLANE RELATIVE FIELD

ERI TYPE MP-6AC-DA-HW ANTENNA  
-2.1 DEGREE(S) ELECTRICAL BEAM TILT  
0 PERCENT FIRST NULL FILL  
0 PERCENT SECOND NULL FILL

96.1 MHz.

ELEMENT SPACING:  
HALF-WAVE



# Directional Antenna System for KSRV, Ontario, Oregon

(Continued)

## ANTENNA SPECIFICATIONS

Antenna Type:	MP-6AC-DA-HW-SP
Frequency:	96.1 MHZ
Number of Bays:	six

## MECHANICAL SPECIFICATIONS

Mounting:	Custom
System length:	30 ft
Aperture length required:	41 ft 5 in
Orientation:	246° true

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

## ELECTRICAL SPECIFICATIONS

(For directional use)  
(with -2.1 degrees of beam tilt)

Maximum horizontal ERP:	49.000 kW (16.902 dBk)
Horizontal maximum power gain:	3.602 (5.566 dB)
H Pol Horizontal Plane Power Gain:	3.448 (5.376 dB)
Maximum vertical ERP:	49.000 kW (16.902 dBk)
Vertical maximum power gain:	3.602 (5.566 dB)
V Pol Horizontal Plane Power Gain:	3.448 (5.376 dB)
Total input power:	13.602 kW (11.336 dBk)

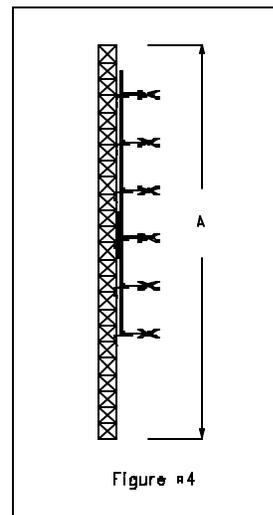
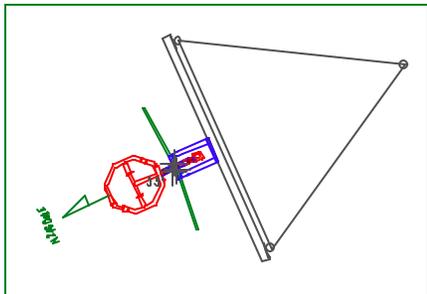


Figure #4