

# Exhibit 9A



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 WKVC, North Myrtle Beach, South Carolina*

October 16, 2014

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 WKVC.

The antenna is the ERI model MP-6E-DA configuration. The circular polarized system consists of 6 full-wavelength spaced bays using one driven circular polarized radiating element, one horizontal parasitic elements placed one quarter wave above and below each bay and two vertical parasitic elements per bay. The antenna was mounted on the North 170 degrees East tower leg with bracketry to provide an antenna orientation of North 156 degrees East. The antenna was tested on a 24" face tower or less, which is the structure the station plans to use to support the array. All tests were performed on a frequency of 88.9 megahertz, which is the center of the FM broadcast channel assigned to WKVC.

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.

7777 Gardner Road  
Chandler, IN 47610-9219  
USA

+1 812 925 6000 (tel)  
+1 812 925 4030 (fax)  
877 ERI-LINE (toll-free)

Sales@eriinc.com  
CustomerSupport@eriinc.com  
WWW.eriinc.com



# Directional Antenna System For WKVC, North Myrtle Beach, South Carolina

(Continued)

## DESCRIPTION OF THE TEST PROCEDURE

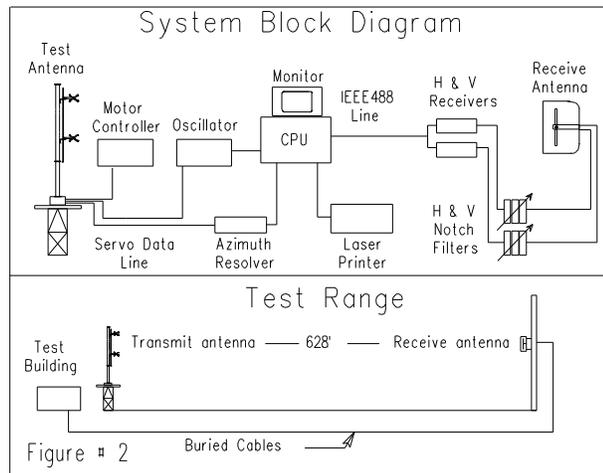
The test antenna consisted of two bay levels of the circular polarized system with the associated horizontal and vertical parasitic elements. The elements and brackets that were used in this test are electrically equivalent to those that will be supplied with the antenna. A section of 3 1/8 inch o.d. 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 or less 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 88.9 MHz and was constantly monitored by a Rohde & Schwarz ESVD measuring receiver.



Directional Antenna System  
For  
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(Continued)

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. 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 coordinated graph paper in a clockwise direction. Both horizontal and vertical components were recorded separately.

### CONCLUSIONS

The circular polarized system consists of 6 full-wavelength spaced bays using one driven circular polarized radiating element, one horizontal parasitic elements placed one quarter wave above and below each bay and two vertical parasitic elements per bay. The power distribution and phase relationship will be fixed when the antenna is manufactured. Proper maintenance of the elements should be all that is required to maintain the pattern in adjustment.

The MP-6E-DA array is to be mounted on the North 170 degrees East tower leg of the 24" face tower or less at a bearing of North 156 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 measured 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 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 100 kilowatts (20.000 dBk).

Directional Antenna System  
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(Continued)

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 70 feet 1 inch.

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 that reads "Tom Scharf". The signature is written in a cursive, flowing style.

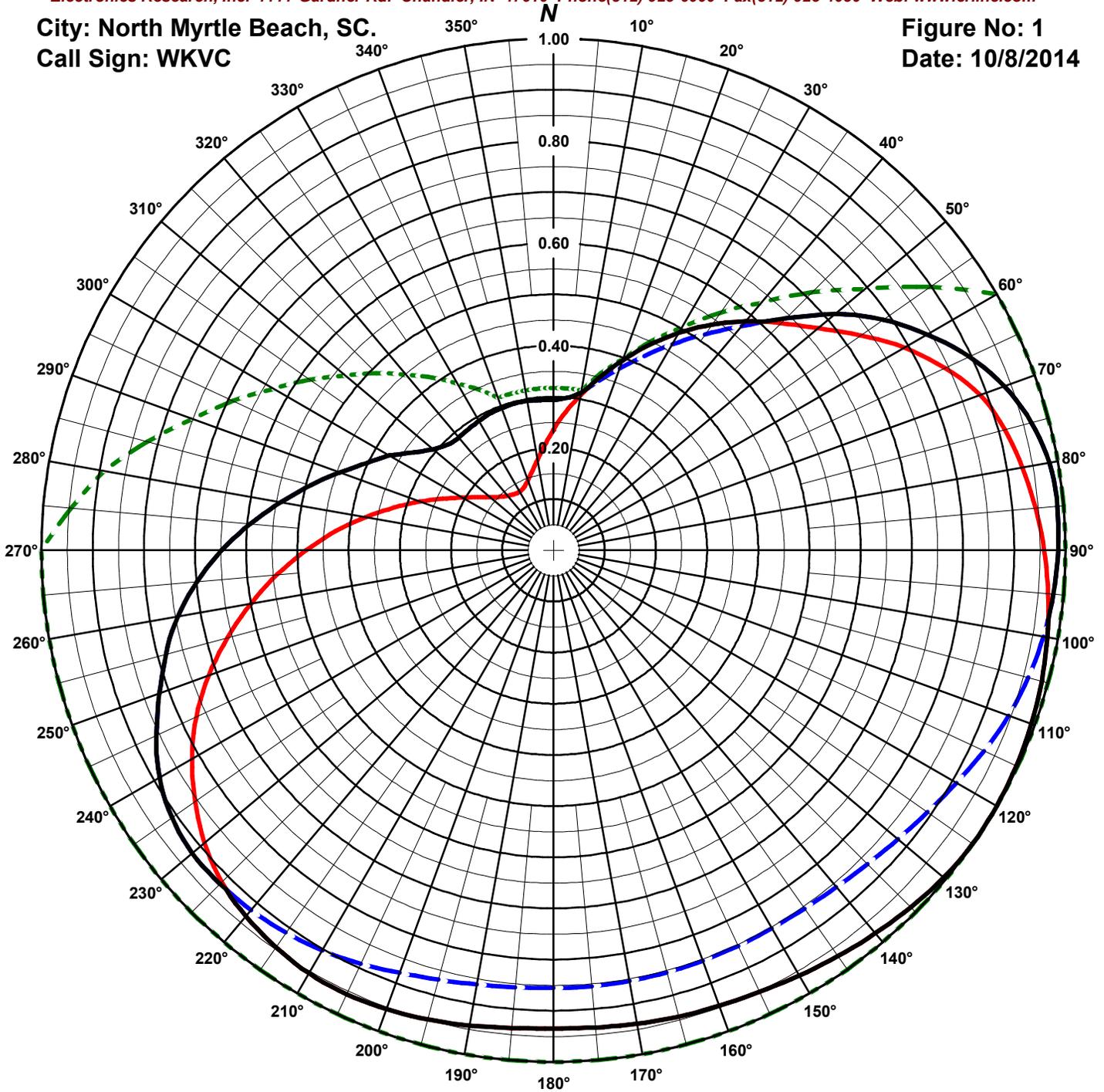
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# ERI<sup>®</sup> Horizontal Plane Relative Field Pattern

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

City: North Myrtle Beach, SC.  
Call Sign: WKVC

Figure No: 1  
Date: 10/8/2014



Antenna Orientation: 156° True

Frequency: 88.9 MHz  
Antenna Type: MP-6E-DA

Antenna Mounting: Custom  
Tower Type: 24" face tower

## HORIZONTAL

RMS: .736  
Maximum: 1 @ 123°  
Minimum: .132 @ 329°

## VERTICAL

RMS: .736  
Maximum: .988 @ 84°  
Minimum: .288 @ 319°

## COMPOSITE

RMS: .77  
Maximum: 1 @ 123°  
Minimum: .288 @ 319°

## FCC ENVELOPE

RMS: .853  
Maximum: 1 @ 60°  
Minimum: .317 @ 0°

Measured patterns of the horizontal and vertical components, with the composite maximum of either the the H or V components and the filed FCC envelope pattern BPED-20130626AAI.

# 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: 10/8/2014

Station: WKVC

Antenna: MP-6E-DA

Location: North Myrtle Beach, SC.

Antenna Orientation: 156° True

Frequency: 88.9 MHz

Number of Bays: 6

Azimuth	Envelope			Polarization Maximum	Azimuth	Envelope			Polarization Maximum
	Field	kW	dBk			Field	kW	dBk	
0°	0.294	8.633	9.362	Vertical	180°	0.934	87.316	19.411	Horizontal
5°	0.299	8.931	9.509	Vertical	185°	0.937	87.822	19.436	Horizontal
10°	0.312	9.750	9.890	Vertical	190°	0.943	88.935	19.491	Horizontal
15°	0.350	12.244	10.879	Horizontal	195°	0.949	90.070	19.546	Horizontal
20°	0.395	15.597	11.930	Horizontal	200°	0.954	91.060	19.593	Horizontal
25°	0.442	19.568	12.915	Horizontal	205°	0.957	91.593	19.619	Horizontal
30°	0.491	24.074	13.816	Horizontal	210°	0.955	91.158	19.598	Horizontal
35°	0.538	28.967	14.619	Horizontal	215°	0.946	89.549	19.521	Horizontal
40°	0.584	34.099	15.327	Horizontal	220°	0.934	87.263	19.408	Horizontal
45°	0.641	41.075	16.136	Vertical	225°	0.921	84.908	19.289	Vertical
50°	0.719	51.696	17.135	Vertical	230°	0.921	84.791	19.284	Vertical
55°	0.786	61.758	17.907	Vertical	235°	0.910	82.809	19.181	Vertical
60°	0.842	70.942	18.509	Vertical	240°	0.888	78.916	18.972	Vertical
65°	0.896	80.234	19.044	Vertical	245°	0.856	73.252	18.648	Vertical
70°	0.937	87.806	19.435	Vertical	250°	0.819	67.065	18.265	Vertical
75°	0.966	93.356	19.701	Vertical	255°	0.783	61.386	17.881	Vertical
80°	0.983	96.672	19.853	Vertical	260°	0.745	55.464	17.440	Vertical
85°	0.988	97.606	19.895	Vertical	265°	0.698	48.744	16.879	Vertical
90°	0.986	97.131	19.874	Vertical	270°	0.648	41.957	16.228	Vertical
95°	0.980	96.065	19.826	Vertical	275°	0.594	35.267	15.474	Vertical
100°	0.980	95.961	19.821	Horizontal	280°	0.540	29.187	14.652	Vertical
105°	0.987	97.494	19.890	Horizontal	285°	0.491	24.074	13.816	Vertical
110°	0.993	98.670	19.942	Horizontal	290°	0.444	19.718	12.949	Vertical
115°	0.997	99.483	19.977	Horizontal	295°	0.403	16.243	12.107	Vertical
120°	1.000	99.927	19.997	Horizontal	300°	0.370	13.726	11.375	Vertical
125°	1.000	99.912	19.996	Horizontal	305°	0.333	11.115	10.459	Vertical
130°	0.995	99.029	19.958	Horizontal	310°	0.307	9.437	9.749	Vertical
135°	0.987	97.335	19.883	Horizontal	315°	0.292	8.522	9.306	Vertical
140°	0.977	95.529	19.801	Horizontal	320°	0.288	8.278	9.179	Vertical
145°	0.968	93.770	19.721	Horizontal	325°	0.289	8.358	9.221	Vertical
150°	0.960	92.080	19.642	Horizontal	330°	0.291	8.495	9.292	Vertical
155°	0.952	90.683	19.575	Horizontal	335°	0.294	8.654	9.372	Vertical
160°	0.947	89.747	19.530	Horizontal	340°	0.296	8.758	9.424	Vertical
165°	0.943	89.018	19.495	Horizontal	345°	0.297	8.805	9.447	Vertical
170°	0.940	88.269	19.458	Horizontal	350°	0.296	8.776	9.433	Vertical
175°	0.936	87.624	19.426	Horizontal	355°	0.295	8.680	9.385	Vertical

**Horizontal Polarization:**

**Maximum: 5.785 (7.623 dB)**

**Horizontal Plane: 5.785 (7.623 dB)**

**Maximum ERP: 100.000 kW**

**Vertical Polarization:**

**Maximum: 5.648 (7.519 dB)**

**Horizontal Plane: 5.648 (7.519 dB)**

**Maximum ERP: 97.630 kW**

**Total Input Power: 17.286 kW**

**Reference: WKVC1M.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: 10/8/2014

Station: WKVC

Antenna: MP-6E-DA

Location: North Myrtle Beach, SC.

Antenna Orientation: 156° True

Frequency: 88.9 MHz

Number of Bays: 6

Azimuth	Horizontal			Vertical			Azimuth	Horizontal			Vertical		
	Field	kW	dBk	Field	kW	dBk		Field	kW	dBk	Field	kW	dBk
0°	0.236	5.548	7.441	0.294	8.633	9.362	180°	0.934	87.316	19.411	0.855	73.183	18.644
5°	0.271	7.328	8.650	0.299	8.931	9.509	185°	0.937	87.822	19.436	0.857	73.468	18.661
10°	0.308	9.512	9.783	0.312	9.750	9.890	190°	0.943	88.935	19.491	0.862	74.232	18.706
15°	0.350	12.244	10.879	0.344	11.803	10.720	195°	0.949	90.070	19.546	0.869	75.482	18.778
20°	0.395	15.597	11.930	0.378	14.288	11.550	200°	0.954	91.060	19.593	0.879	77.229	18.878
25°	0.442	19.568	12.915	0.419	17.565	12.446	205°	0.957	91.593	19.619	0.891	79.470	19.002
30°	0.491	24.074	13.816	0.465	21.594	13.343	210°	0.955	91.158	19.598	0.903	81.564	19.115
35°	0.538	28.967	14.619	0.515	26.547	14.240	215°	0.946	89.549	19.521	0.912	83.177	19.200
40°	0.584	34.099	15.327	0.571	32.635	15.137	220°	0.934	87.263	19.408	0.918	84.295	19.258
45°	0.628	39.399	15.955	0.641	41.075	16.136	225°	0.916	83.994	19.242	0.921	84.908	19.289
50°	0.675	45.565	16.586	0.719	51.696	17.135	230°	0.889	79.074	18.980	0.921	84.791	19.284
55°	0.732	53.584	17.290	0.786	61.758	17.907	235°	0.854	73.015	18.634	0.910	82.809	19.181
60°	0.792	62.746	17.976	0.842	70.942	18.509	240°	0.815	66.467	18.226	0.888	78.916	18.972
65°	0.843	71.050	18.516	0.896	80.234	19.044	245°	0.770	59.219	17.725	0.856	73.252	18.648
70°	0.887	78.631	18.956	0.937	87.806	19.435	250°	0.717	51.344	17.105	0.819	67.065	18.265
75°	0.912	83.230	19.203	0.966	93.356	19.701	255°	0.659	43.400	16.375	0.783	61.386	17.881
80°	0.930	86.461	19.368	0.983	96.672	19.853	260°	0.600	36.002	15.563	0.745	55.464	17.440
85°	0.945	89.318	19.509	0.988	97.606	19.895	265°	0.541	29.302	14.669	0.698	48.744	16.879
90°	0.958	91.861	19.631	0.986	97.131	19.874	270°	0.483	23.352	13.683	0.648	41.957	16.228
95°	0.970	94.080	19.735	0.980	96.065	19.826	275°	0.427	18.215	12.604	0.594	35.267	15.474
100°	0.980	95.961	19.821	0.972	94.418	19.751	280°	0.372	13.874	11.422	0.540	29.187	14.652
105°	0.987	97.494	19.890	0.960	92.206	19.648	285°	0.322	10.381	10.162	0.491	24.074	13.816
110°	0.993	98.670	19.942	0.946	89.450	19.516	290°	0.278	7.712	8.872	0.444	19.718	12.949
115°	0.997	99.483	19.977	0.928	86.175	19.354	295°	0.239	5.689	7.550	0.403	16.243	12.107
120°	1.000	99.927	19.997	0.909	82.610	19.170	300°	0.206	4.237	6.270	0.370	13.726	11.375
125°	1.000	99.912	19.996	0.892	79.572	19.008	305°	0.180	3.248	5.117	0.333	11.115	10.459
130°	0.995	99.029	19.958	0.878	77.119	18.872	310°	0.161	2.592	4.137	0.307	9.437	9.749
135°	0.987	97.335	19.883	0.867	75.225	18.764	315°	0.148	2.185	3.394	0.292	8.522	9.306
140°	0.977	95.529	19.801	0.859	73.873	18.685	320°	0.139	1.939	2.875	0.288	8.278	9.179
145°	0.968	93.770	19.721	0.855	73.046	18.636	325°	0.134	1.789	2.526	0.289	8.358	9.221
150°	0.960	92.080	19.642	0.853	72.738	18.618	330°	0.132	1.745	2.417	0.291	8.495	9.292
155°	0.952	90.683	19.575	0.853	72.765	18.619	335°	0.136	1.845	2.661	0.294	8.654	9.372
160°	0.947	89.747	19.530	0.853	72.840	18.624	340°	0.145	2.115	3.253	0.296	8.758	9.424
165°	0.943	89.018	19.495	0.854	72.960	18.631	345°	0.160	2.568	4.097	0.297	8.805	9.447
170°	0.940	88.269	19.458	0.855	73.081	18.638	350°	0.180	3.233	5.096	0.296	8.776	9.433
175°	0.936	87.624	19.426	0.855	73.155	18.642	355°	0.205	4.190	6.223	0.295	8.680	9.385

**Horizontal Polarization:**

**Maximum: 5.785 (7.623 dB)**

**Horizontal Plane: 5.785 (7.623 dB)**

**Maximum ERP: 100.000 kW**

**Vertical Polarization:**

**Maximum: 5.648 (7.519 dB)**

**Horizontal Plane: 5.648 (7.519 dB)**

**Maximum ERP: 97.630 kW**

**Total Input Power: 17.286 kW**

**Reference: WKVC1M.FIG**

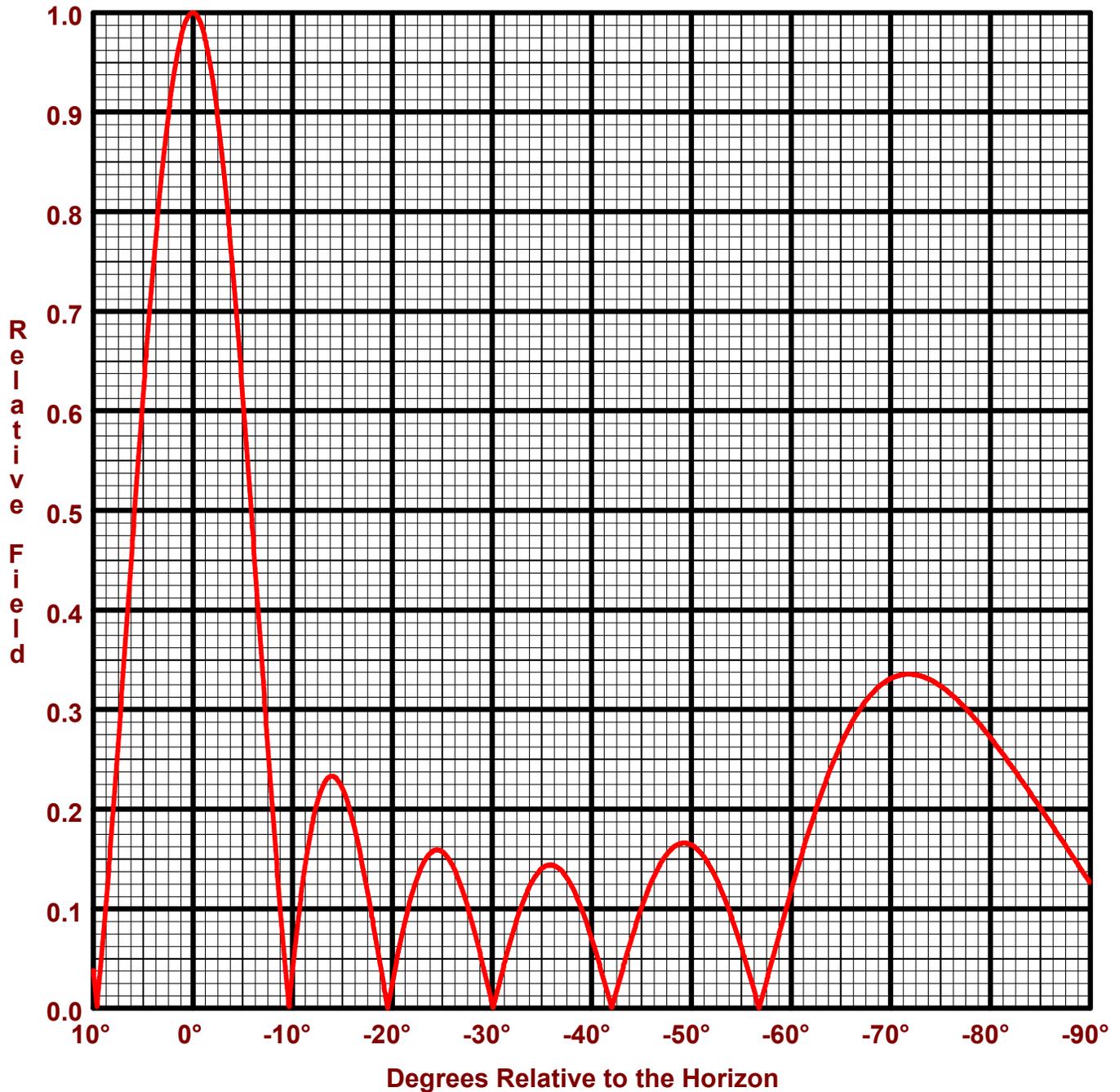
This list shows the azimuth values for the horizontal and vertical components.

# 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.eriinc.com

Figure No: 3  
Call Sign: WKVC  
Location: North Myrtle Beach, SC.  
Frequency: 88.9 MHz  
6 bay MP-6E-DA antenna

Date: 10/8/2014  
H/V Power Ratio: 0.976  
1 Wave-length Spacing  
0° Beam Tilt  
0% First Null Fill



Horizontal Polarization:  
Maximum: 5.785 (7.623 dB)  
Horizontal Plane: 5.785 (7.623 dB)  
Maximum ERP: 100.000 kW

Vertical Polarization:  
Maximum: 5.648 (7.519 dB)  
Horizontal Plane: 5.648 (7.519 dB)  
Maximum ERP: 97.630 kW

# Directional Antenna System for WKVC, North Myrtle Beach, South Carolina

(Continued)

## ANTENNA SPECIFICATIONS

Antenna Type:	MP-6E-DA
Frequency:	88.9 MHz
Number of Bays:	Six

## MECHANICAL SPECIFICATIONS

Mounting:	Custom
System length:	64 ft
Aperture length required:	70 ft 1 in
Orientation:	156° true

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

## ELECTRICAL SPECIFICATIONS

(For directional use)

Maximum horizontal ERP:	100 kW (20.000 dBk)
Horizontal maximum power gain:	5.785 (7.623 dB)
Maximum vertical ERP:	97.63 kW (19.896 dBk)
Vertical maximum power gain:	5.648 (7.519 dB)
Total input power:	17.286 kW (12.377 dBk)

