ELECTRONICS RESEARCH, INC. ERI®

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 WQXW, Ossining, New York

October 10, 2013

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 WQXW.

The antenna is the ERI model LP-1E-DA configuration. The circular polarized system consists of one bay using one driven circular polarized radiating element, two horizontal parasitic elements placed one quarter wave above and below the bay and two vertical parasitic elements. The antenna was tested on an 8 5/8" o.d. pole, which is the structure the station plans to use to support the array. All tests were performed on a frequency of 90.3 megahertz, which is the center of the FM broadcast channel assigned to WQXW.

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
WQXW, Ossining, New York

(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 8 5/8" o.d. pole 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.

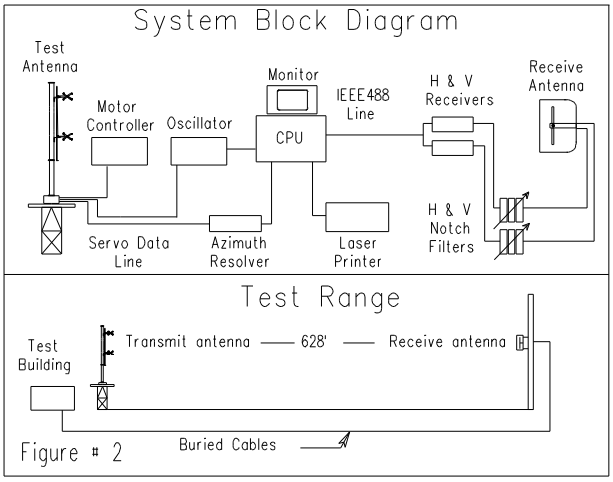


Figure # 2

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 90.3 MHz and was constantly monitored by a Rohde & Schwarz ESVD measuring receiver.

Directional Antenna System
For
WQXW, Ossining, New York

(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 Heliax 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 one bay using one driven circular polarized radiating element, two horizontal parasitic elements placed one quarter wave above and below the bay and two vertical parasitic elements. 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-1E-DA array is to be mounted on the 8 5/8" o.d. pole at a bearing of North 50 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. A calculated vertical plane relative field pattern is shown on Figure #3 attached. The power in the maximum will reach 0.250 kilowatts (-6.021 dBk).

The power at North 180 degrees East does not exceed 0.0190 kilowatts (-17.212 dBk).

Directional Antenna System
For
WQXW, Ossining, New York

(Continued)

The power at North 250-260 degrees East does not exceed 0.0105 kilowatts (-19.788 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.

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.

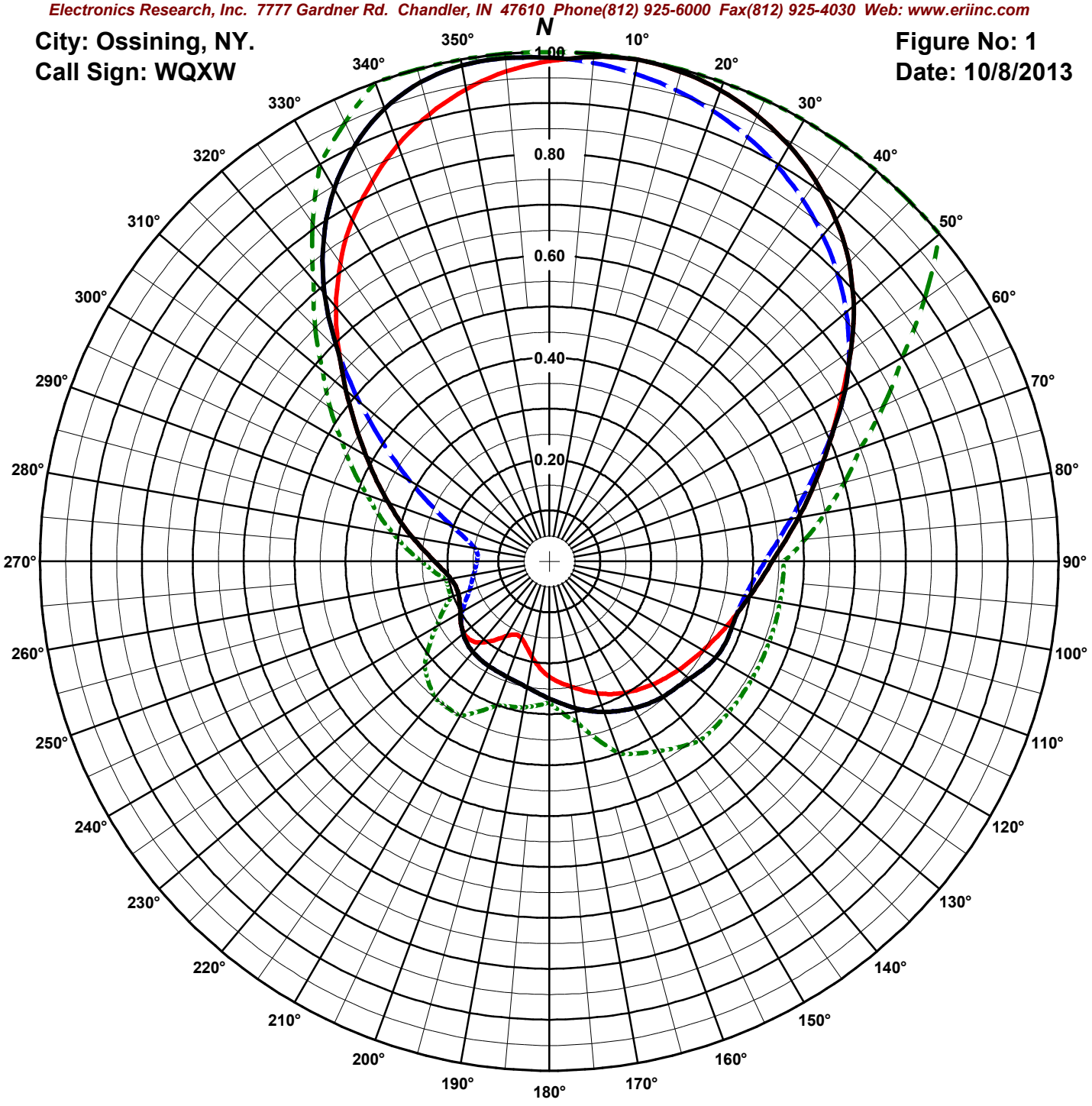
Tom Schaaf

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

City: Ossining, NY.
Call Sign: WQXW

Figure No: 1
Date: 10/8/2013



Antenna Orientation: 50° True

Frequency: 90.3 MHz
Antenna Type: LP-1E-DA

Antenna Mounting: Custom
Tower Type: 8 5\8" Pole

HORIZONTAL	VERTICAL	COMPOSITE	FCC ENVELOPE
RMS: .552	RMS: .552	RMS: .568	RMS: .623
Maximum: 1 @ 11°	Maximum: .991 @ 355°	Maximum: 1 @ 11°	Maximum: 1 @ 0°
Minimum: .158 @ 203°	Minimum: .141 @ 274°	Minimum: .189 @ 252°	Minimum: .205 @ 250°

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-20130513ABL.

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# 1 **Date: 10/8/2013**
Station: WQXW **Antenna: LP-1E-DA**
Location: Ossining, NY. **Antenna Orientation: 50° True**
Frequency: 90.3 MHz **Number of Bays: 1**

Azimuth	Envelope			Polarization	Azimuth	Envelope			Polarization
	Field	kW	dBk	Maximum		Field	kW	dBk	Maximum
0°	0.989	0.244	-6.119	Vertical	180°	0.269	0.018	-17.412	Vertical
5°	0.994	0.247	-6.071	Horizontal	185°	0.259	0.017	-17.744	Vertical
10°	1.000	0.250	-6.021	Horizontal	190°	0.251	0.016	-18.022	Vertical
15°	0.995	0.248	-6.062	Horizontal	195°	0.245	0.015	-18.228	Vertical
20°	0.984	0.242	-6.163	Horizontal	200°	0.241	0.015	-18.364	Vertical
25°	0.966	0.233	-6.320	Horizontal	205°	0.239	0.014	-18.447	Vertical
30°	0.942	0.222	-6.540	Horizontal	210°	0.237	0.014	-18.511	Vertical
35°	0.912	0.208	-6.824	Horizontal	215°	0.236	0.014	-18.580	Vertical
40°	0.875	0.192	-7.177	Horizontal	220°	0.233	0.014	-18.683	Vertical
45°	0.832	0.173	-7.620	Horizontal	225°	0.228	0.013	-18.857	Vertical
50°	0.780	0.152	-8.177	Horizontal	230°	0.221	0.012	-19.135	Vertical
55°	0.723	0.131	-8.842	Horizontal	235°	0.212	0.011	-19.503	Horizontal
60°	0.670	0.112	-9.497	Vertical	240°	0.202	0.010	-19.914	Horizontal
65°	0.616	0.095	-10.226	Vertical	245°	0.194	0.009	-20.262	Horizontal
70°	0.573	0.082	-10.863	Horizontal	250°	0.190	0.009	-20.457	Horizontal
75°	0.533	0.071	-11.490	Horizontal	255°	0.190	0.009	-20.428	Horizontal
80°	0.497	0.062	-12.090	Horizontal	260°	0.197	0.010	-20.151	Horizontal
85°	0.465	0.054	-12.673	Horizontal	265°	0.208	0.011	-19.650	Horizontal
90°	0.438	0.048	-13.190	Horizontal	270°	0.225	0.013	-18.964	Horizontal
95°	0.417	0.043	-13.623	Horizontal	275°	0.247	0.015	-18.167	Horizontal
100°	0.399	0.040	-14.000	Horizontal	280°	0.273	0.019	-17.305	Horizontal
105°	0.384	0.037	-14.338	Horizontal	285°	0.303	0.023	-16.399	Horizontal
110°	0.381	0.036	-14.398	Vertical	290°	0.336	0.028	-15.494	Horizontal
115°	0.381	0.036	-14.405	Vertical	295°	0.374	0.035	-14.572	Horizontal
120°	0.377	0.036	-14.489	Vertical	300°	0.415	0.043	-13.651	Horizontal
125°	0.369	0.034	-14.684	Vertical	305°	0.464	0.054	-12.683	Horizontal
130°	0.359	0.032	-14.927	Vertical	310°	0.521	0.068	-11.688	Horizontal
135°	0.352	0.031	-15.101	Vertical	315°	0.588	0.086	-10.633	Vertical
140°	0.347	0.030	-15.218	Vertical	320°	0.686	0.118	-9.290	Vertical
145°	0.341	0.029	-15.377	Vertical	325°	0.772	0.149	-8.264	Vertical
150°	0.333	0.028	-15.579	Vertical	330°	0.844	0.178	-7.489	Vertical
155°	0.324	0.026	-15.806	Vertical	335°	0.902	0.203	-6.916	Vertical
160°	0.315	0.025	-16.065	Vertical	340°	0.945	0.223	-6.509	Vertical
165°	0.304	0.023	-16.365	Vertical	345°	0.974	0.237	-6.249	Vertical
170°	0.292	0.021	-16.701	Vertical	350°	0.988	0.244	-6.121	Vertical
175°	0.281	0.020	-17.057	Vertical	355°	0.991	0.246	-6.096	Vertical

Horizontal Polarization:
Maximum: 1.439 (1.579 dB)
Horizontal Plane: 1.439 (1.579 dB)
Maximum ERP: 0.250 kW

Vertical Polarization:
Maximum: 1.414 (1.504 dB)
Horizontal Plane: 1.414 (1.504 dB)
Maximum ERP: 0.246 kW

Total Input Power: 0.174 kW
Reference: WQXW2M.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: 10/8/2013**
Station: WQXW **Antenna: LP-1E-DA**
Location: Ossining, NY. **Antenna Orientation: 50° True**
Frequency: 90.3 MHz **Number of Bays: 1**

Azimuth	Horizontal			Vertical			Azimuth	Horizontal			Vertical		
	Field	kW	dBk	Field	kW	dBk		Field	kW	dBk	Field	kW	dBk
0°	0.982	0.241	-6.176	0.989	0.244	-6.119	180°	0.226	0.013	-18.926	0.269	0.018	-17.412
5°	0.994	0.247	-6.071	0.982	0.241	-6.176	185°	0.210	0.011	-19.560	0.259	0.017	-17.744
10°	1.000	0.250	-6.021	0.972	0.236	-6.266	190°	0.191	0.009	-20.384	0.251	0.016	-18.022
15°	0.995	0.248	-6.062	0.958	0.230	-6.390	195°	0.173	0.007	-21.259	0.245	0.015	-18.228
20°	0.984	0.242	-6.163	0.941	0.221	-6.549	200°	0.160	0.006	-21.923	0.241	0.015	-18.364
25°	0.966	0.233	-6.320	0.920	0.212	-6.744	205°	0.158	0.006	-22.028	0.239	0.014	-18.447
30°	0.942	0.222	-6.540	0.896	0.200	-6.979	210°	0.170	0.007	-21.419	0.237	0.014	-18.511
35°	0.912	0.208	-6.824	0.867	0.188	-7.257	215°	0.189	0.009	-20.485	0.236	0.014	-18.580
40°	0.875	0.192	-7.177	0.836	0.175	-7.581	220°	0.208	0.011	-19.642	0.233	0.014	-18.683
45°	0.832	0.173	-7.620	0.800	0.160	-7.957	225°	0.219	0.012	-19.222	0.228	0.013	-18.857
50°	0.780	0.152	-8.177	0.761	0.145	-8.391	230°	0.219	0.012	-19.211	0.221	0.012	-19.135
55°	0.723	0.131	-8.842	0.719	0.129	-8.892	235°	0.212	0.011	-19.503	0.211	0.011	-19.542
60°	0.665	0.111	-9.565	0.670	0.112	-9.497	240°	0.202	0.010	-19.914	0.197	0.010	-20.121
65°	0.616	0.095	-10.231	0.616	0.095	-10.226	245°	0.194	0.009	-20.262	0.181	0.008	-20.883
70°	0.573	0.082	-10.863	0.566	0.080	-10.970	250°	0.190	0.009	-20.457	0.167	0.007	-21.572
75°	0.533	0.071	-11.490	0.521	0.068	-11.686	255°	0.190	0.009	-20.428	0.158	0.006	-22.070
80°	0.497	0.062	-12.090	0.482	0.058	-12.355	260°	0.197	0.010	-20.151	0.151	0.006	-22.456
85°	0.465	0.054	-12.673	0.450	0.051	-12.957	265°	0.208	0.011	-19.650	0.146	0.005	-22.756
90°	0.438	0.048	-13.190	0.424	0.045	-13.477	270°	0.225	0.013	-18.964	0.142	0.005	-22.969
95°	0.417	0.043	-13.623	0.404	0.041	-13.895	275°	0.247	0.015	-18.167	0.141	0.005	-23.025
100°	0.399	0.040	-14.000	0.390	0.038	-14.194	280°	0.273	0.019	-17.305	0.149	0.006	-22.581
105°	0.384	0.037	-14.338	0.383	0.037	-14.361	285°	0.303	0.023	-16.399	0.169	0.007	-21.464
110°	0.371	0.034	-14.627	0.381	0.036	-14.398	290°	0.336	0.028	-15.494	0.204	0.010	-19.846
115°	0.359	0.032	-14.912	0.381	0.036	-14.405	295°	0.374	0.035	-14.572	0.253	0.016	-17.973
120°	0.349	0.030	-15.159	0.377	0.036	-14.489	300°	0.415	0.043	-13.651	0.316	0.025	-16.028
125°	0.340	0.029	-15.390	0.369	0.034	-14.684	305°	0.464	0.054	-12.683	0.394	0.039	-14.116
130°	0.332	0.027	-15.607	0.359	0.032	-14.927	310°	0.521	0.068	-11.688	0.486	0.059	-12.290
135°	0.323	0.026	-15.824	0.352	0.031	-15.101	315°	0.584	0.085	-10.688	0.588	0.086	-10.633
140°	0.315	0.025	-16.043	0.347	0.030	-15.218	320°	0.652	0.106	-9.739	0.686	0.118	-9.290
145°	0.307	0.024	-16.285	0.341	0.029	-15.377	325°	0.715	0.128	-8.932	0.772	0.149	-8.264
150°	0.298	0.022	-16.542	0.333	0.028	-15.579	330°	0.773	0.150	-8.253	0.844	0.178	-7.489
155°	0.288	0.021	-16.847	0.324	0.026	-15.806	335°	0.823	0.169	-7.711	0.902	0.203	-6.916
160°	0.276	0.019	-17.213	0.315	0.025	-16.065	340°	0.870	0.189	-7.229	0.945	0.223	-6.509
165°	0.263	0.017	-17.629	0.304	0.023	-16.365	345°	0.909	0.207	-6.849	0.974	0.237	-6.249
170°	0.250	0.016	-18.059	0.292	0.021	-16.701	350°	0.941	0.222	-6.546	0.988	0.244	-6.121
175°	0.239	0.014	-18.466	0.281	0.020	-17.057	355°	0.966	0.233	-6.324	0.991	0.246	-6.096

Horizontal Polarization:
Maximum: 1.439 (1.579 dB)
Horizontal Plane: 1.439 (1.579 dB)
Maximum ERP: 0.250 kW

Vertical Polarization:
Maximum: 1.414 (1.504 dB)
Horizontal Plane: 1.414 (1.504 dB)
Maximum ERP: 0.246 kW

Total Input Power: 0.174 kW
Reference: WQXW2M.FIG

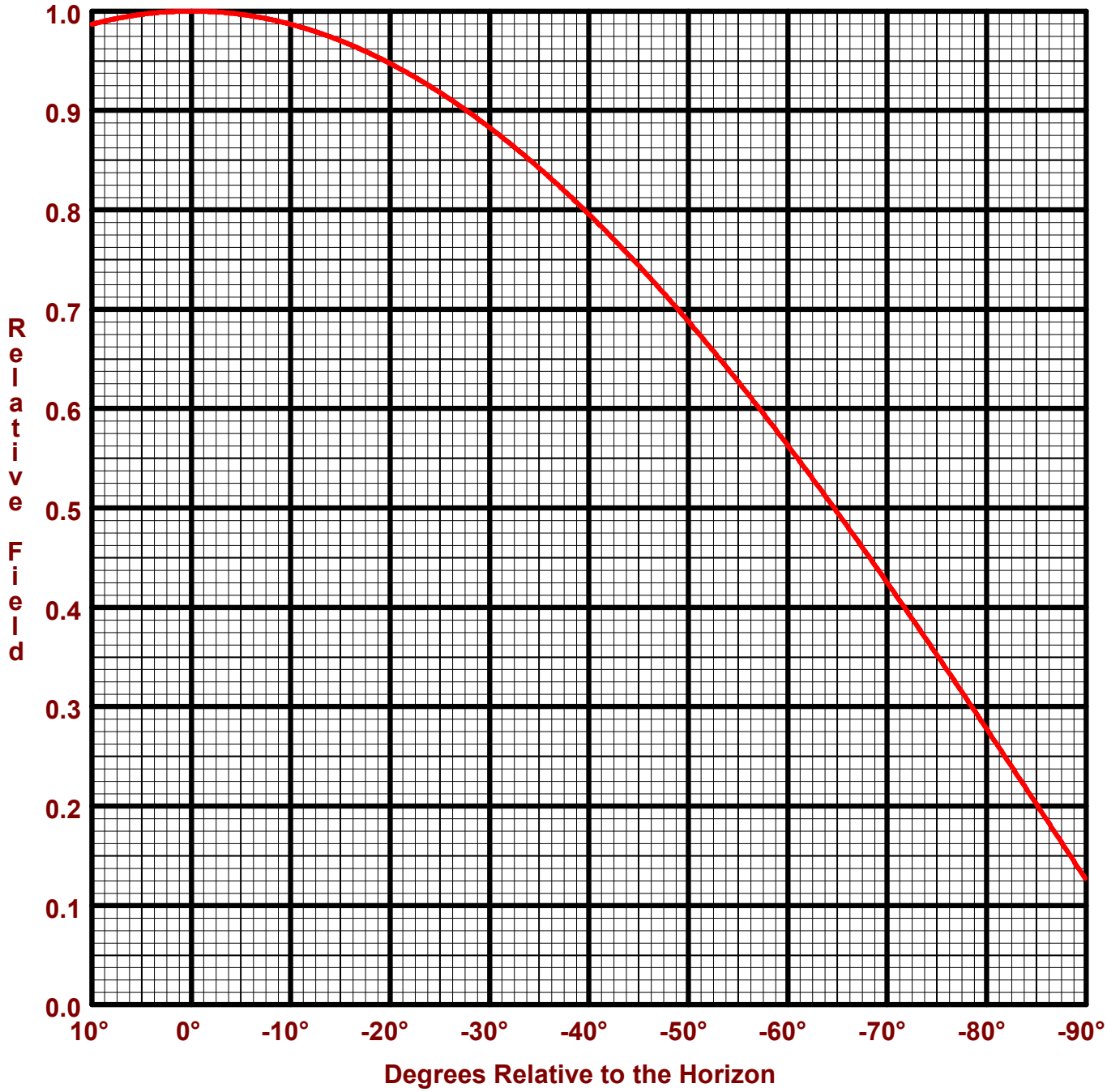
This list shows the azimuth values for the horizontal and vertical components.

ERI® 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: WQXW
Location: Ossining, NY.
Frequency: 90.3 MHz
1 bay LP-1E-DA antenna

Date: 10/8/2013
H/V Power Ratio: .983
1 Wave-length Spacing
0° Beam Tilt
0% First Null Fill



Horizontal Polarization:
Maximum: 1.439 (1.579 dB)
Horizontal Plane: 1.439 (1.579 dB)
Maximum ERP: 0.250 kW

Vertical Polarization:
Maximum: 1.414 (1.504 dB)
Horizontal Plane: 1.414 (1.504 dB)
Maximum ERP: 0.246 kW

Directional Antenna System
for
WQXW, Ossining, New York

(Continued)

ANTENNA SPECIFICATIONS

Antenna Type:	LP-1E-DA
Frequency:	90.3 MHz
Number of Bays:	One

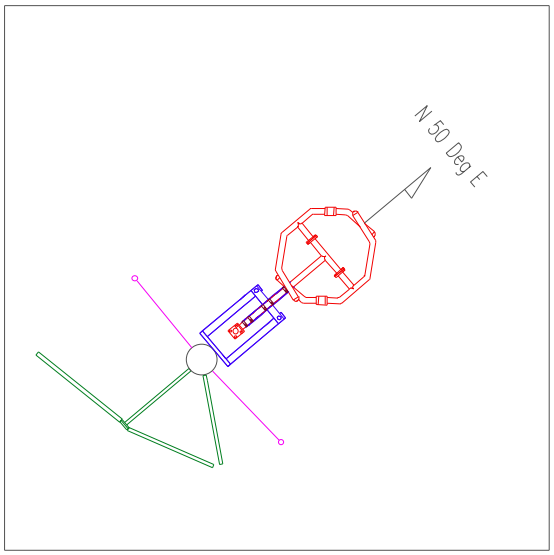
MECHANICAL SPECIFICATIONS

Mounting:	Standard
System length:	8 ft 10 in
Aperture length required:	20 ft
Orientation:	50° true

Input flange to the antenna: 1 5/8” female.

ELECTRICAL SPECIFICATIONS
(For directional use)

Maximum horizontal ERP:	0.250 kW (-6.021 dBk)
Horizontal maximum power gain:	1.439 (1.579 dB)
Maximum vertical ERP:	0.246 kW (-6.096 dBk)
Vertical maximum power gain:	1.414 (1.504 dB)
Total input power:	0.174 kW (-7.595 dBk)



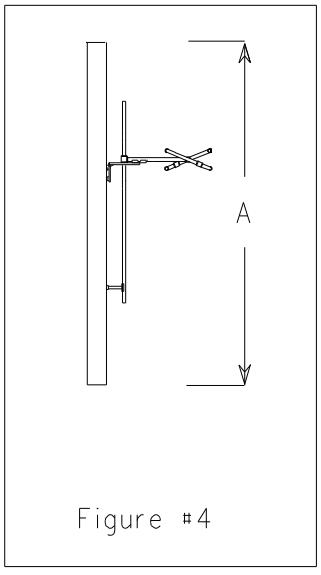


Figure #4

MCNALLY
ENGINEERING, LLC.

January 22, 2014

Steve Shultis
Chief Technology Officer
New York Public Radio
160 Varick St.
New York, NY 10013

Re: Antenna Placement for WQXW Station
Location: 7 Morningview Court, Chappaqua, NY 10514
Tax ID: 89/99.10-2-2

Dear Mr. Schultis,

This is to certify that on January 15, 2014, our survey crew worked with the crew from Mikab Corporation of Dumont, New Jersey to place a reference stake for the orientation of the WQXW antenna at the above noted site. The stake was oriented to true north based upon the plan specification of fifty degrees (50°), or N 50° E, as depicted on the following document:

"Directional Antenna System for WQXW, Ossining, New York," Dated October 10, 2013, and prepared by Tom Schaaf of Electronics Research, Inc. 7777 Gardner Rd. Chandler, IN 47610.

A Spectra Precision Epoch 25 L1/L2 GPS system (±5 mm +0 .5 ppm RMS) was used in conjunction with the Leica Smartnet North America RTK network, NYVH CORS (continuously operating reference station) to establish state plane coordinates.

Survey coordinates are based on 1983 North American Datum (NAD 83) or Grid North. True North is located 0°47" east of Grid North as per U.S. Geological Survey Ossining, NY 7½-Minute Quadrangle Map. Said Map indicated that Magnetic North is located 13° 18' west of True North. Based on the approximate Latitude and Longitude values we had for the site, we visited the U.S. Department of Commerce National Oceanic and Atmospheric Administration website, and determined a more accurate declination angle from True North to Magnetic North, that being 12°43'41" West.

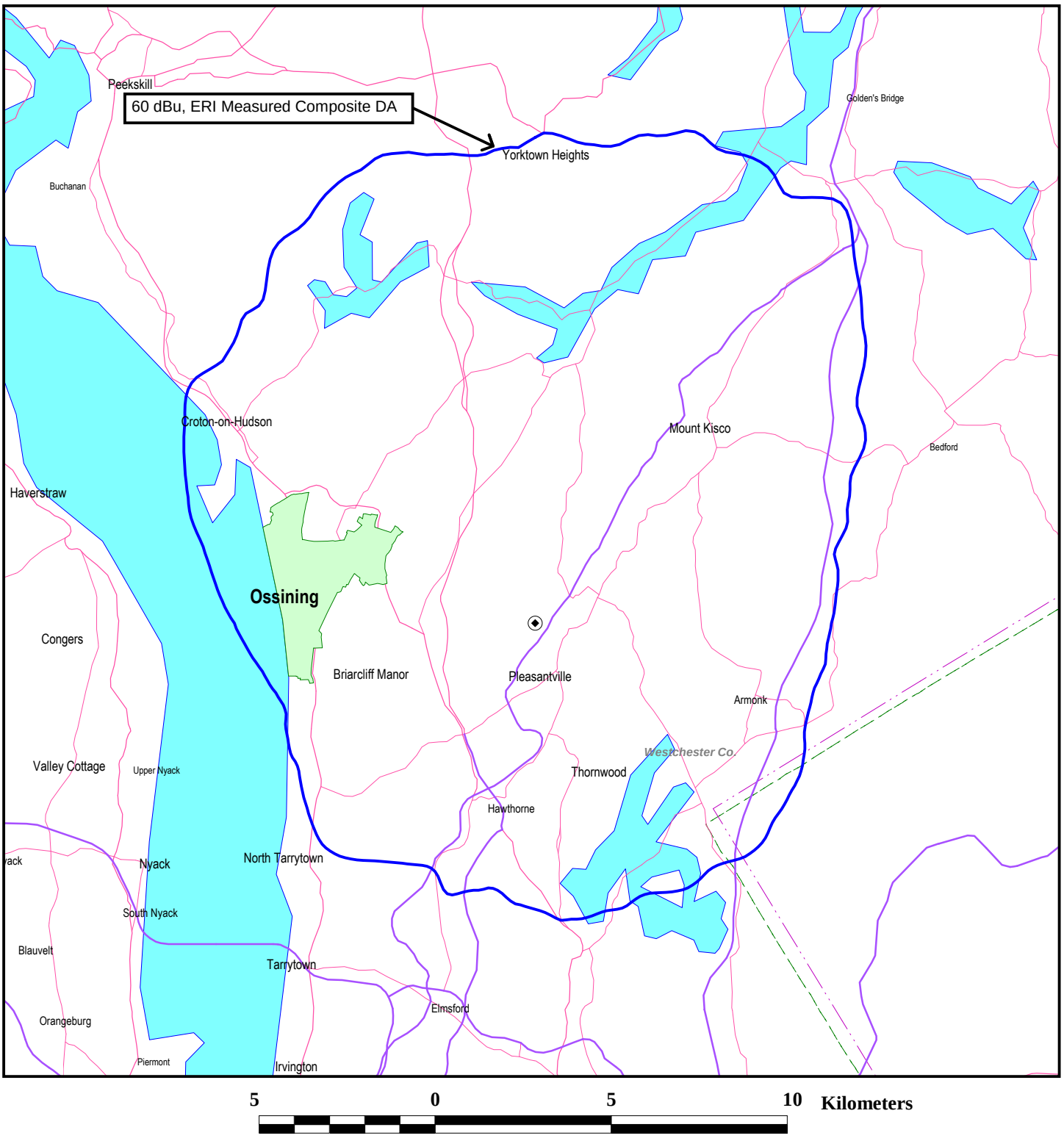
Additional field equipment utilized on site included a Trimble S-6 Total Station, maximum range: 2,500 ft/8202 m (1 prism), 18,044 ft/5500 m (1 prism, Long Range mode), distance accuracy: ±2mm+2ppm, angular accuracy: 2" and a Suunto Compass model # KB−14/360R, accuracy: 1/3°.

If you should have any questions concerning this information, please do not hesitate to contact me. Sincerely,

Kevin S. Bogerman, P.L.S., NY License # 50475

169 RAMAPO VALLEY ROAD, OAKLAND, NEW JERSEY 07436
TEL: 201.337.9051 • FAX: 201.337.3391 • WEB: www.mcnallyeng.com

Figure 1



COMPLIANCE WITH SECTION 73.515

STATION WQXW
OSSINING, NEW YORK
CH 212A (90.3 MHZ) 0.25 KW (DA) 145 M

du Treil, Lundin & Rackley, Inc. Sarasota, Florida

MIKAB corporation

January 22, 2014

Mr. Steven Shultis
WQXW
160 Varick Street, 7th Floor
New York NY 10013

Re: WQXW-FM Chappaqua NY

Dear Steve:

This letter is to certify that Mikab Corp. has completed the work and improvements associated with the FM facility located at the above referenced property. The equipment was installed as specified by the manufacturer and industry standards.

Mikab Corp. has been in existence since 1971 and the Installation Technician who installed the antenna has been with the company since 1985.

Very truly yours,
MIKAB CORPORATION

David Hauck

David Hauck

WQXWpeLetter

P.O. Box 36 • Dumont, New Jersey • 07628 • (201) 387-7700 • Fax (201) 385-0424
Shipping Address 29 Aladdin Ave., Dumont, New Jersey 07628
www.mikabcorp.com • E-mail mikab@mikabcorp.com