

KXOT (FM)

**Engineering Exhibit, FCC Form 302 Application for License
Construction Permit BPED-20100618AAX**

January 3, 2013

Response to Special Operating Conditions, KXOT, BPED-20100618AAX

Following are responses to the Special Conditions placed on Permit BPED-20100618AAX.

1. BEFORE PROGRAM TESTS ARE AUTHORIZED, permittee shall submit the results of a complete proof-of-performance to establish the horizontal plane radiation patterns for both the horizontally and vertically polarized radiation components. This proof-of-performance may be accomplished using the complete full size antenna, or individual bays therefrom, mounted on a supporting structure of identical dimensions and configuration as the proposed structure, including all braces, ladders, conduits, coaxial lines, and other appurtenances; or using a carefully manufactured scale model of the entire antenna, or individual bays therefrom, mounted on an equally scaled model of the proposed supporting structure, including all appurtenances. Engineering exhibits should include a description of the antenna testing facilities and equipment employed, including appropriate photographs or sketches and a description of the testing procedures, including scale factor, measurements frequency, and equipment calibration.

Response to Condition 1- Please see the antenna proof of performance (Exhibit A) attached to this document.

2. BEFORE PROGRAM TESTS ARE AUTHORIZED, permittee shall submit an affidavit from a licensed surveyor to establish that the directional antenna has been oriented at the proper azimuth.

Response to Condition 2- Please see the affidavit from a licensed surveyor attached to this document as Exhibit B.

3. BEFORE PROGRAM TESTS ARE AUTHORIZED, permittee/licensee shall submit an affidavit that the installation of the directional antenna system was overseen by a qualified engineer. This affidavit shall include a certification by the engineer that the antenna was installed pursuant to the manufacturer's instructions and list the qualifications of the certifying engineer.

Response to Condition 3- Please see the affidavit from Darin Gerchak of Turnkey Media Solutions certifying that the antenna was properly installed attached below as Exhibit C.

4. BEFORE PROGRAM TESTS ARE AUTHORIZED, the permittee must submit an exhibit demonstrating that the measured directional antenna pattern complies with the appropriate community coverage provisions of 47 C.F.R. Sections 73.315 or 73.515 (See 47 C.F.R. Section 73.316(c)(2)(ix)(B)).

Response to Condition 4- Please see Exhibit D below.

5. The relative field strength of neither the measured horizontally nor vertically polarized radiation component shall exceed at any azimuth the value indicated on the composite radiation pattern authorized by this construction permit. A relative field strength of 1.0 on the composite radiation pattern herein authorized corresponds to the following effective radiated power:
4.3 kilowatts.
Principal minima and their associated field strength limits:
10 - 20 degrees True: 0.135 kilowatt

Response to Condition 5- Please see the antenna proof of performance attached to this document as Exhibit A.

6. The permittee/licensee in coordination with other users of the site must reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency electromagnetic fields in excess of FCC guidelines.

Response to Condition 6- The permittee/ licensee in coordination with other users of this site agrees to reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency electromagnetic fields in access of FCC guidelines.

7. Further modification of KBCS, Bellevue, WA (Facility ID# 4627) will not be construed as a per se modification of KXOT's construction permit (BPED-20100618AAX). (See Educational Information Corporation, 6 FCC Rcd. 2207 (1991)).

Response to Condition 7- The permittee/ licensee understands that further modification of KBCS, Bellevue, WA. will not be construed as a per se modification of KXOT's construction permit.

Respectfully Submitted,



Bertram S. Goldman
Goldman Engineering Management, LLC.



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
KXOT, Tacoma, Washington*

November 14, 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 KXOT.

The antenna is the ERI model 1192-1CP-DA configuration. The circular polarized system consists of one bay using two driven circular polarized radiating element attached to two flat panels and three vertical parasitic elements. The antenna was mounted on the North 173 degrees East tower face with bracketry to provide an antenna orientation of North 173 degrees East. The antenna was tested on a 48" face tower, which is the structure the station plans to use to support the array. All tests were performed on a frequency of 91.7 megahertz, which is the center of the FM broadcast channel assigned to KXOT.

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 KXOT, Tacoma, Washington

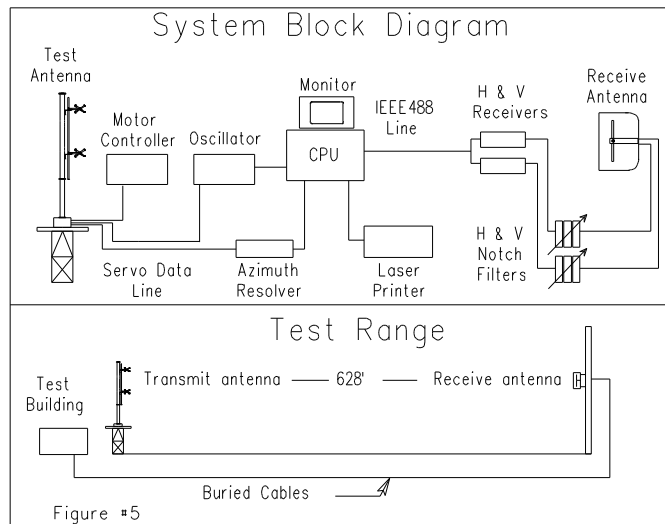
(Continued)

DESCRIPTION OF THE TEST PROCEDURE

The test antenna consisted of a full-scale model of the complete circular polarized system with the associated 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.

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 48" 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 91.7 MHz and was constantly monitored by a Rohde & Schwarz ESVD measuring receiver.

Directional Antenna System For KXOT, Tacoma, Washington

(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 one bay using one driven circular polarized radiating element and three 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 1192-1CP-DA array is to be mounted on the North 173 degrees East tower face of the 48" face tower at a bearing of North 173 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 4.300 kilowatts (6.335 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
KXOT, Tacoma, Washington

(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 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.

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

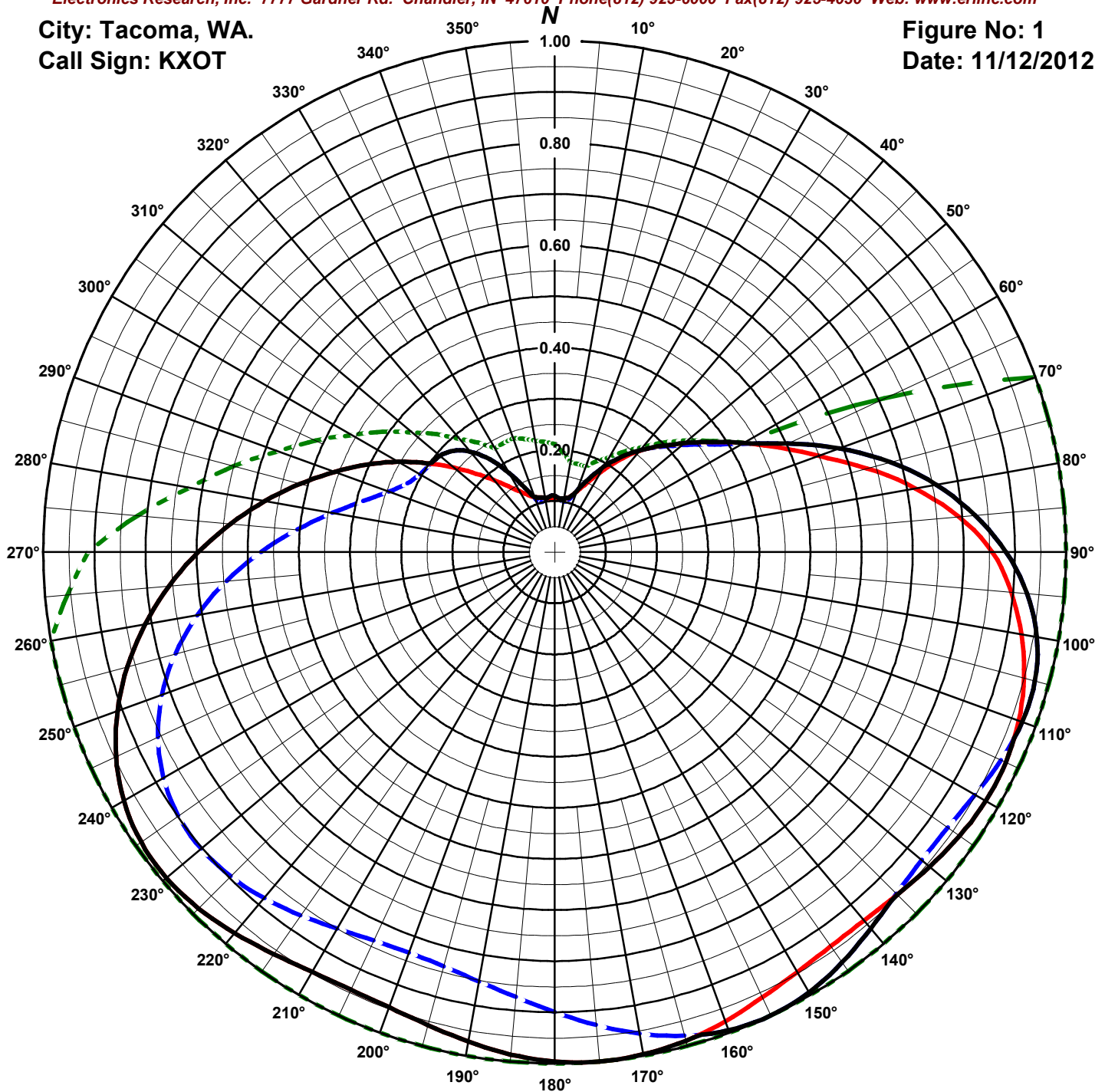
The Microsoft Word document on file electronically at Electronic Research, Inc. governs the specifications, scope, and configuration of the product described. All other representations whether verbal, printed, or electronic are subordinate to the master copy of this document on file at ERI.

ERI[®] 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: Tacoma, WA.
Call Sign: KXOT

Figure No: 1
Date: 11/12/2012



Frequency: 91.7 MHz
Antenna Type: 1192-1CP-DA

Antenna Mounting: Custom
Tower Type: 48" Tower

HORIZONTAL

RMS: .722
Maximum: 1 @ 175°
Minimum: .104 @ 3°

VERTICAL

RMS: .688
Maximum: 1 @ 155°
Minimum: .1 @ 10°

COMPOSITE

RMS: .73
Maximum: 1 @ 155°
Minimum: .105 @ 5°

FCC ENVELOPE

RMS: .794
Maximum: 1 @ 70°
Minimum: .178 @ 10°

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

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: 11/12/2012

Station: KXOT

Antenna: 1192-1CP-DA

Location: Tacoma, WA.

Antenna Orientation: 173° True

Frequency: 91.7 MHz

Number of Bays: 1

Azimuth	Envelope			Polarization	Azimuth	Envelope			Polarization
	Field	kW	dBk	Maximum		Field	kW	dBk	Maximum
0°	0.110	0.052	-12.852	Vertical	180°	0.996	4.268	6.302	Horizontal
5°	0.105	0.047	-13.276	Horizontal	185°	0.986	4.181	6.213	Horizontal
10°	0.106	0.049	-13.124	Horizontal	190°	0.972	4.061	6.087	Horizontal
15°	0.110	0.052	-12.828	Horizontal	195°	0.958	3.942	5.958	Horizontal
20°	0.127	0.069	-11.603	Vertical	200°	0.947	3.859	5.865	Horizontal
25°	0.158	0.107	-9.694	Vertical	205°	0.944	3.831	5.834	Horizontal
30°	0.193	0.160	-7.965	Vertical	210°	0.948	3.865	5.872	Horizontal
35°	0.227	0.222	-6.530	Vertical	215°	0.959	3.954	5.971	Horizontal
40°	0.260	0.290	-5.371	Vertical	220°	0.973	4.071	6.097	Horizontal
45°	0.293	0.370	-4.315	Horizontal	225°	0.985	4.172	6.204	Horizontal
50°	0.331	0.472	-3.259	Horizontal	230°	0.991	4.224	6.257	Horizontal
55°	0.376	0.607	-2.165	Horizontal	235°	0.987	4.193	6.225	Horizontal
60°	0.426	0.782	-1.070	Horizontal	240°	0.973	4.068	6.093	Horizontal
65°	0.502	1.084	0.349	Vertical	245°	0.946	3.850	5.855	Horizontal
70°	0.593	1.510	1.790	Vertical	250°	0.910	3.559	5.513	Horizontal
75°	0.680	1.986	2.979	Vertical	255°	0.865	3.217	5.074	Horizontal
80°	0.758	2.469	3.925	Vertical	260°	0.813	2.843	4.537	Horizontal
85°	0.825	2.928	4.666	Vertical	265°	0.756	2.460	3.910	Horizontal
90°	0.882	3.348	5.248	Vertical	270°	0.697	2.088	3.197	Horizontal
95°	0.927	3.698	5.679	Vertical	275°	0.635	1.736	2.396	Horizontal
100°	0.958	3.942	5.958	Vertical	280°	0.575	1.421	1.526	Horizontal
105°	0.972	4.064	6.089	Vertical	285°	0.515	1.141	0.574	Horizontal
110°	0.973	4.067	6.093	Vertical	290°	0.458	0.902	-0.447	Horizontal
115°	0.973	4.073	6.100	Horizontal	295°	0.405	0.705	-1.516	Horizontal
120°	0.973	4.074	6.100	Horizontal	300°	0.353	0.535	-2.718	Horizontal
125°	0.967	4.020	6.043	Horizontal	305°	0.302	0.393	-4.053	Horizontal
130°	0.957	3.937	5.952	Horizontal	310°	0.292	0.368	-4.344	Vertical
135°	0.947	3.856	5.861	Horizontal	315°	0.280	0.337	-4.722	Vertical
140°	0.961	3.972	5.990	Vertical	320°	0.256	0.283	-5.489	Vertical
145°	0.980	4.126	6.156	Vertical	325°	0.221	0.210	-6.773	Vertical
150°	0.994	4.250	6.284	Vertical	330°	0.179	0.138	-8.612	Vertical
155°	1.000	4.300	6.335	Vertical	335°	0.139	0.083	-10.809	Vertical
160°	0.995	4.255	6.289	Vertical	340°	0.114	0.056	-12.492	Horizontal
165°	0.989	4.208	6.241	Horizontal	345°	0.111	0.053	-12.789	Horizontal
170°	0.997	4.277	6.312	Horizontal	350°	0.108	0.050	-13.021	Horizontal
175°	1.000	4.300	6.335	Horizontal	355°	0.109	0.051	-12.896	Vertical

Horizontal Polarization:

Maximum: 0.881 (-0.551 dB)

Horizontal Plane: 0.881 (-0.551 dB)

Maximum ERP: 4.300 kW

Vertical Polarization:

Maximum: 0.881 (-0.551 dB)

Horizontal Plane: 0.881 (-0.551 dB)

Maximum ERP: 4.300 kW

Total Input Power: 4.881 kW

Reference: KXOT1M.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: 11/12/2012

Station: KXOT

Antenna: 1192-1CP-DA

Location: Tacoma, WA.

Antenna Orientation: 173° True

Frequency: 91.7 MHz

Number of Bays: 1

Azimuth	Horizontal			Vertical			Azimuth	Horizontal			Vertical		
	Field	kW	dBk	Field	kW	dBk		Field	kW	dBk	Field	kW	dBk
0°	0.105	0.047	-13.276	0.110	0.052	-12.852	180°	0.996	4.268	6.302	0.899	3.478	5.413
5°	0.105	0.047	-13.276	0.104	0.047	-13.284	185°	0.986	4.181	6.213	0.873	3.279	5.158
10°	0.106	0.049	-13.124	0.100	0.043	-13.641	190°	0.972	4.061	6.087	0.853	3.125	4.949
15°	0.110	0.052	-12.828	0.106	0.049	-13.137	195°	0.958	3.942	5.958	0.839	3.025	4.807
20°	0.125	0.067	-11.708	0.127	0.069	-11.603	200°	0.947	3.859	5.865	0.834	2.988	4.754
25°	0.149	0.096	-10.195	0.158	0.107	-9.694	205°	0.944	3.831	5.834	0.838	3.019	4.799
30°	0.181	0.141	-8.511	0.193	0.160	-7.965	210°	0.948	3.865	5.872	0.850	3.108	4.925
35°	0.219	0.207	-6.850	0.227	0.222	-6.530	215°	0.959	3.954	5.971	0.867	3.230	5.092
40°	0.259	0.288	-5.408	0.260	0.290	-5.371	220°	0.973	4.071	6.097	0.883	3.355	5.256
45°	0.293	0.370	-4.315	0.291	0.364	-4.391	225°	0.985	4.172	6.204	0.896	3.454	5.384
50°	0.331	0.472	-3.259	0.326	0.456	-3.414	230°	0.991	4.224	6.257	0.902	3.502	5.443
55°	0.376	0.607	-2.165	0.367	0.581	-2.361	235°	0.987	4.193	6.225	0.899	3.472	5.406
60°	0.426	0.782	-1.070	0.423	0.770	-1.135	240°	0.973	4.068	6.093	0.883	3.353	5.254
65°	0.484	1.007	0.031	0.502	1.084	0.349	245°	0.946	3.850	5.855	0.856	3.150	4.982
70°	0.549	1.298	1.133	0.593	1.510	1.790	250°	0.910	3.559	5.513	0.817	2.872	4.582
75°	0.632	1.720	2.356	0.680	1.986	2.979	255°	0.865	3.217	5.074	0.768	2.535	4.040
80°	0.716	2.205	3.434	0.758	2.469	3.925	260°	0.813	2.843	4.537	0.709	2.163	3.351
85°	0.793	2.701	4.315	0.825	2.928	4.666	265°	0.756	2.460	3.910	0.644	1.783	2.511
90°	0.855	3.147	4.979	0.882	3.348	5.248	270°	0.697	2.088	3.197	0.574	1.419	1.520
95°	0.896	3.453	5.381	0.927	3.698	5.679	275°	0.635	1.736	2.396	0.505	1.097	0.403
100°	0.927	3.695	5.676	0.958	3.942	5.958	280°	0.575	1.421	1.526	0.441	0.838	-0.770
105°	0.950	3.882	5.890	0.972	4.064	6.089	285°	0.515	1.141	0.574	0.387	0.644	-1.908
110°	0.966	4.009	6.030	0.973	4.067	6.093	290°	0.458	0.902	-0.447	0.345	0.513	-2.901
115°	0.973	4.073	6.100	0.963	3.986	6.006	295°	0.405	0.705	-1.516	0.318	0.435	-3.615
120°	0.973	4.074	6.100	0.949	3.875	5.883	300°	0.353	0.535	-2.718	0.304	0.398	-4.003
125°	0.967	4.020	6.043	0.939	3.791	5.788	305°	0.302	0.393	-4.053	0.298	0.382	-4.176
130°	0.957	3.937	5.952	0.937	3.775	5.769	310°	0.257	0.283	-5.475	0.292	0.368	-4.344
135°	0.947	3.856	5.861	0.945	3.840	5.843	315°	0.217	0.202	-6.953	0.280	0.337	-4.722
140°	0.941	3.806	5.805	0.961	3.972	5.990	320°	0.183	0.144	-8.410	0.256	0.283	-5.489
145°	0.941	3.808	5.807	0.980	4.126	6.156	325°	0.157	0.106	-9.750	0.221	0.210	-6.773
150°	0.948	3.866	5.872	0.994	4.250	6.284	330°	0.137	0.081	-10.921	0.179	0.138	-8.612
155°	0.961	3.971	5.989	1.000	4.300	6.335	335°	0.123	0.065	-11.844	0.139	0.083	-10.809
160°	0.976	4.097	6.125	0.995	4.255	6.289	340°	0.114	0.056	-12.492	0.112	0.054	-12.714
165°	0.989	4.208	6.241	0.979	4.123	6.152	345°	0.111	0.053	-12.789	0.102	0.044	-13.535
170°	0.997	4.277	6.312	0.956	3.930	5.944	350°	0.108	0.050	-13.021	0.104	0.047	-13.324
175°	1.000	4.300	6.335	0.928	3.704	5.687	355°	0.106	0.048	-13.185	0.109	0.051	-12.896

Horizontal Polarization:

Maximum: 0.881 (-0.551 dB)

Horizontal Plane: 0.881 (-0.551 dB)

Maximum ERP: 4.300 kW

Vertical Polarization:

Maximum: 0.881 (-0.551 dB)

Horizontal Plane: 0.881 (-0.551 dB)

Maximum ERP: 4.300 kW

Total Input Power: 4.881 kW

Reference: KXOT1M.FIG

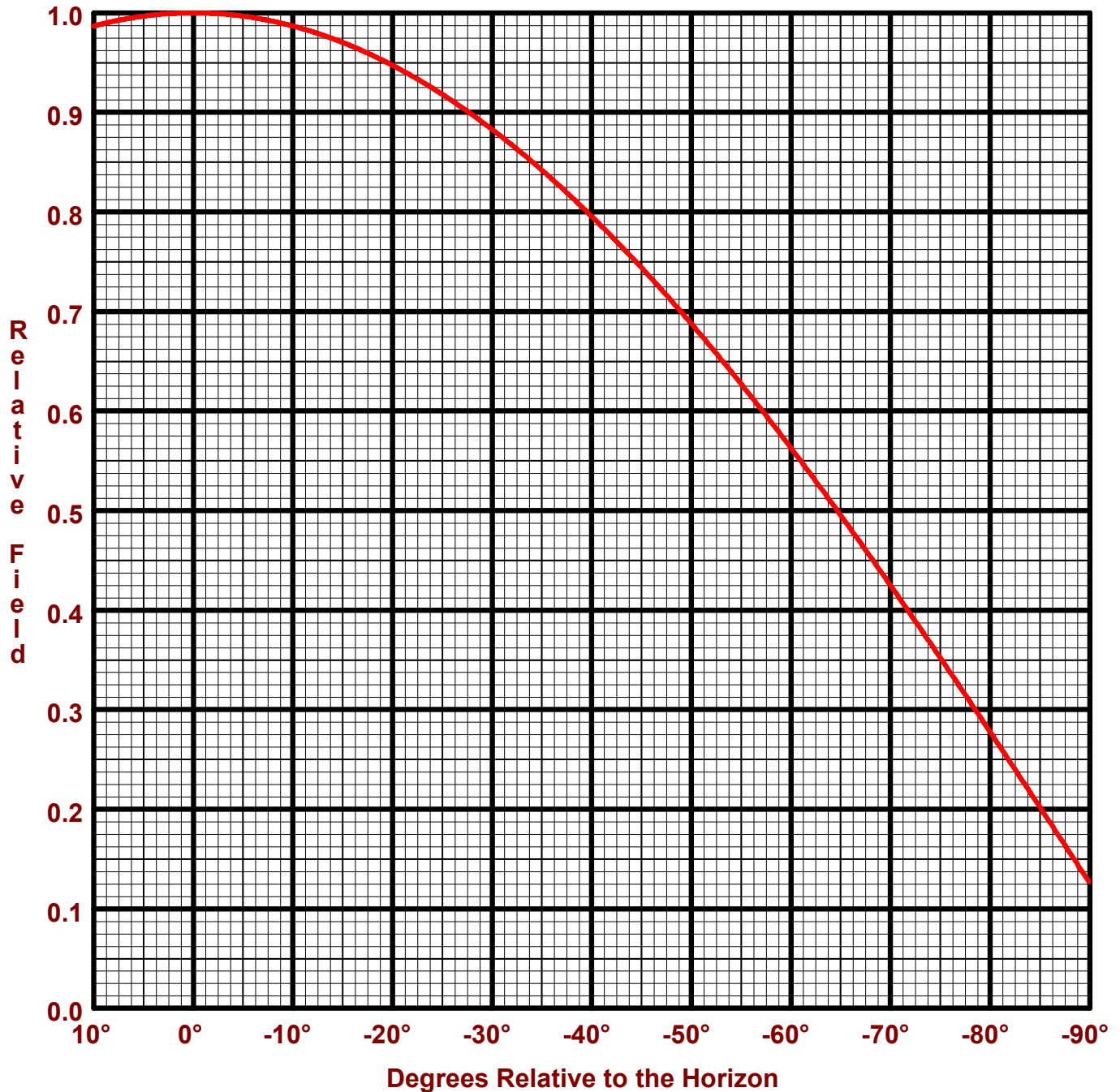
This list shows the azimuth values for the horizontal and vertical components.

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: KXOT
Location: Tacoma, WA.
Frequency: 91.7 MHz
1 bay 1192-1CP-DA antenna

Date: 11/12/2012
H/V Power Ratio: 1
1 Wave-length Spacing
0° Beam Tilt
0% First Null Fill



Horizontal Polarization:
Maximum: 0.881 (-0.551 dB)
Horizontal Plane: 0.881 (-0.551 dB)
Maximum ERP: 4.300 kW

Vertical Polarization:
Maximum: 0.881 (-0.551 dB)
Horizontal Plane: 0.881 (-0.551 dB)
Maximum ERP: 4.300 kW

Directional Antenna System for KXOT, Tacoma, Washington

(Continued)

ANTENNA SPECIFICATIONS

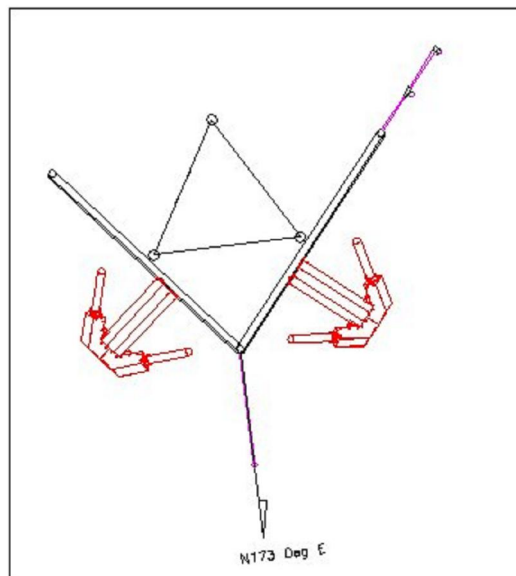
Antenna Type: KXOT
Frequency: 91.7 MHz
Number of Bays: One

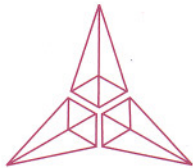
MECHANICAL SPECIFICATIONS

Mounting: Custom
System length: 10ft
Aperture length required: 20 ft
Orientation: 173 ° true
Input flange to the antenna: 1 5/8" female.

ELECTRICAL SPECIFICATIONS (For directional use)

Maximum horizontal ERP: 4.300 kW (6.335 dBk)
Horizontal maximum power gain: 0.881 (-0.551 dB)
Maximum vertical ERP: 4.300 kW (6.335 dBk)
Vertical maximum power gain: 0.881 (-0.551 dB)
Total input power: 4.881 kW (6.885 dBk)





AES
CONSULTANTS, INC.

PROFESSIONAL LAND SURVEYORS

P.O. BOX 930 • 3472 N.W. LOWELL "OLD TOWNE" • SILVERDALE, WA 98383 • 360-692-6400 • FAX 360-692-8927

January 3, 2013

RPC Tacoma-1 LLC
5277 Manhattan Circle #210
Boulder, CO 80303

Atten: Steve Newsom

RE: Antenna Installation Certification

Dear Steve:

On Wednesday, January 2, 2013, we returned to the Gold Mountain antenna site to verify the orientation of the installation of the new FM antenna, Model No. 1192-1CP-DA.

The antenna was attached to the southerly face of the existing tower at an approximate height of 575 feet. The antenna orientation was measured at 173 deg East of True North (within 0.5 degree) as specified in the manufacturer's installation instructions.

Sincerely,

Steve Ottmar PLS



PRC Tacoma- ILLC- KXOT
Form 302- FM, December 2012

This is a certification that KXOT directional antenna system authorized in construction permit File No. BPED-20100618AAX was installed pursuant to instructions provided by the manufacturer, Electronics Research, Inc. (ERI).

I personally witnessed and assisted in the field assembly and installation of this antenna between December 28th and December 29th. To the best of my ability and knowledge the new antenna was installed in full compliance with the included installation drawings from ERI project 30610/1

The proper azimuth alignment of the tower and antenna has been checked and verified as correct by Steve Ottmar PLS a licensed surveyor.

I presently hold an FCC general Class Radiotelephone Operator's License and Society of Broadcast Engineers certification. I have gained over 20 years of experience in the field of engineering at various TV and FM broadcast stations.

A handwritten signature in cursive script that reads "Darin Gerchak".

Darin Gerchak
KXOT Engineer
PRC Tacoma ILLC
December 30, 2012

KXOT Community Coverage Exhibit

