ELECTRONICS RESEARCH, INC.
7777 Gardner Road • Chandler, Indiana 47610 • (812) 925-6000 • Fax: (812) 925-4030 • Home Page: www.ERIinc.com

Directional Antenna Installation Certification

In compliance with FCC Regulation 73.316, section (c), paragraph (8), this is to certify that the ERI model 1083-5CP-DA directional antenna for Radio Station WYXB operating at 105.7 Mhz and licensed to Indianapolis, Indiana, has been erected according to design and installation instructions provided by Electronics Research, Incorporated (ERI) of Chandler, Indiana.

This document is in lieu of documentation from the licensed surveyor regarding antenna installation compliance.

The installation was supervised by Mr. William J. Elmer, ERI Vice President of Customer Service. Mr. Elmer has been employed by ERI since 1974, has served in the capacity of Vice President of Customer Service/Technical Support for the past twenty-five (25) years, and has performed and supervised numerous installations.

Date: March 19, 2003

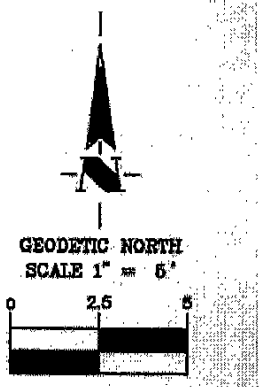
Signature: William J. Elmer
(William J. Elmer, VP Customer Service)

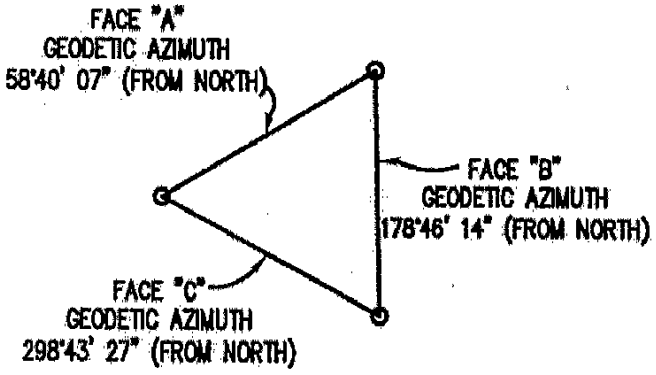
60 Years 1943-2003

Schneider

GEODETIC AZIMUTHS FOR THE BURK ROAD TOWER FOR EMMIS COMMUNICATIONS RADIO STATION WXYB, INDIANAPOLIS, INDIANA ANTENNA STRUCTURE REGISTRATION #1030144

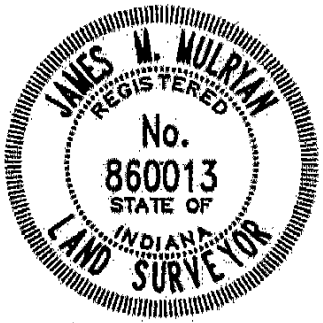
25 March 2003





This Plat is to certify the Geodetic Azimuths of the sides of the Burk Road Tower that the ERI model 1083-5CP-DA directional antenna has been attached to. The tower is located at the southeast corner of Burk Road and Post Road in Indianapolis, Indiana. (address: 9301 East Burk Road). The Geodetic Azimuths are taken from Ellipsoid: GRS80/WGS 84 (NAD83).

James M. Mulryan
Registered Land Surveyor # 860013



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40 Years 1962-2002

THE SCHNEIDER CORPORATION
Historic Fort Harrison 8901 Otis Avenue Indianapolis, Indiana 46216-1037 317-826-7100 Toll free 800-898-0332 Fax 317-826-7200
www.schneidercorp.com

ERI® Electronics Research, Inc.
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 WYXB, Indianapolis, Indiana

October 8, 2002

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 WYXB.

The antenna is the ERI model 1083-5CP-DA configuration. The circular polarized system consists of five levels using three driven circular polarized radiating element attached to three flat panels. The array will incorporate two layers of horizontal parasitic elements placed on all three corners of the system. The horizontal parasitic elements are placed one-quarter wave above and below each bay center. The antenna will mount on the triangular tower at an orientation of North 179 degrees East. The antenna was tested on a 7' Stainless tower, which is the structure the station plans to use to support the array. All tests were performed on a frequency of 105.7 megahertz, which is the center of the FM broadcast channel assigned to WYXB.

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
WYXB, Indianapolis, Indiana

(Continued)

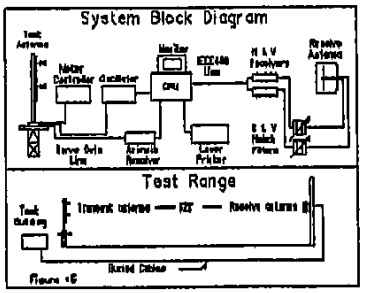
DESCRIPTION OF THE TEST PROCEDURE

The test antenna consisted of one bay of the circular polarized system. The elements and brackets that were used in this test are electrically equivalent to those that will be supplied with the 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 7' Stainless 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 azimuth indicating mechanism, resolution of this azimuth measuring device is one-tenth of a degree.

The antenna under test was operated in the transmitting mode and fed from a Wavetek Model 3000 signal generator. The frequency of the signal source was set at 105.7 MHz and was constantly monitored by an Anritsu Model ML521B measuring receiver.



A broad-band 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 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.

Directional Antenna System
For
WYXB, Indianapolis, Indiana

(Continued)

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 1083-5CP-DA array is to be mounted on the 7' Stainless tower at a bearing of North 179 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.

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.

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 50 kilowatts (16.99 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 46 feet.

Directional Antenna System
For
WYXB, Indianapolis, Indiana

(Continued)

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.

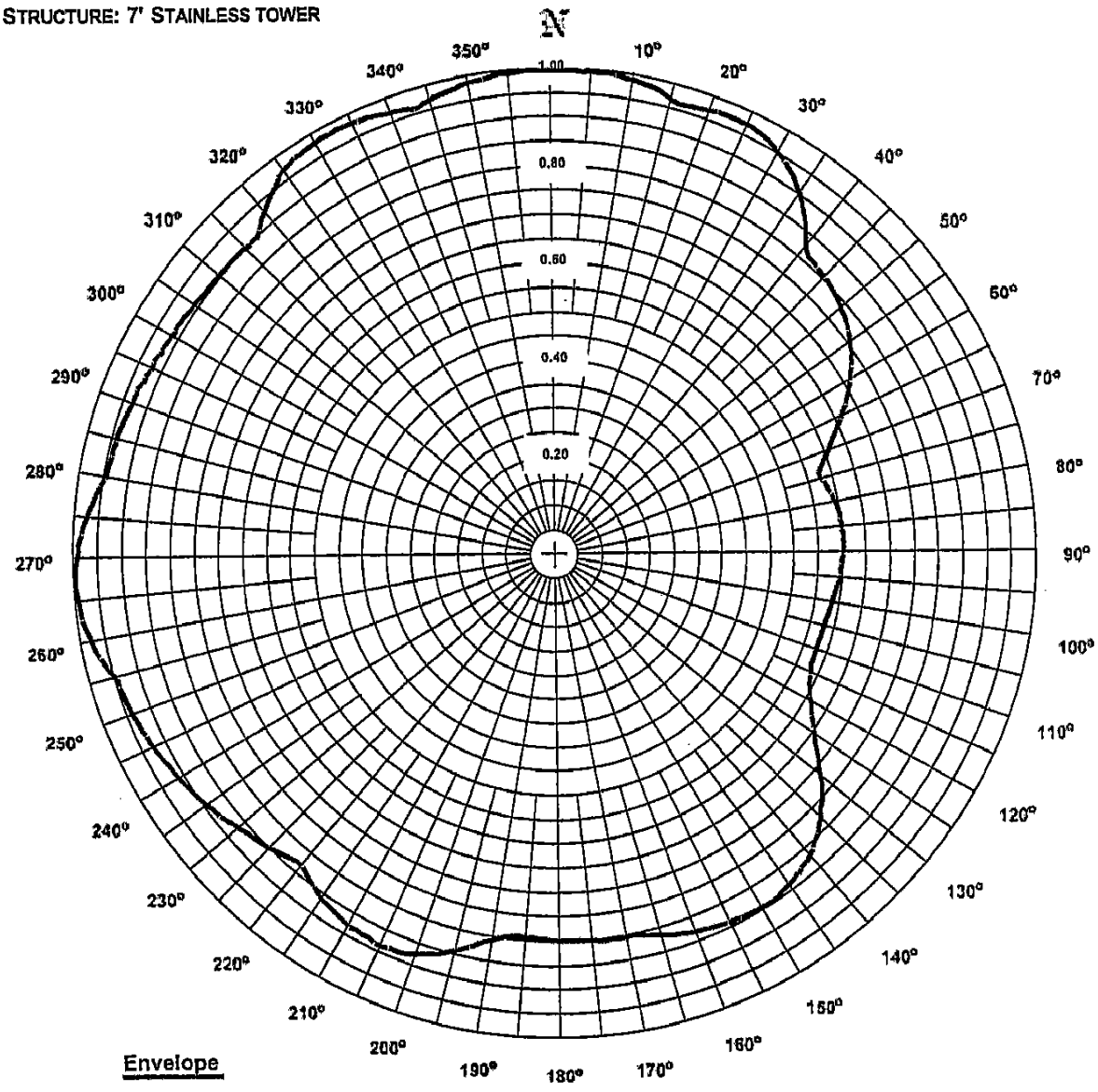
ELECTRONICS RESEARCH, INC.

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: 1
STATION: WYXB
LOCATION: INDIANAPOLIS, IN
ANTENNA TYPE: 1083-5CP-DA
STRUCTURE: 7' STAINLESS TOWER

DATE: 10/8/02
FREQUENCY: 105.7 MHz
ORIENTATION: 179° TRUE
MOUNTING: CUSTOM



Envelope

RMS: 0.851
Maximum: 1.000 @ 0° True
Minimum: 0.573 @ 110° True

COMMENTS: COMPOSITE PATTERN: THIS PATTERN SHOWS THE MAXIMUM OF EITHER THE H OR V AZIMUTH VALUES. THIS PATTERN DOES NOT EXCEED THE FCC FILED COMPOSITE PATTERN AT ANY AZIMUTH. THE RMS OF THIS PATTERN IS GREATER THAN 85% OF THE FILED FCC COMPOSITE PATTERN.

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: WYXB
Location: Indianapolis, IN
Frequency: 105.7 MHz

Antenna: 1083-5CP-DA
Orientation: 179° True
Tower: 7' Stainless tower

Figure: 1
Date: 10/8/02
Reference: wyxb1m.fig

Angle	Envelope			Polarization	Angle	Envelope			Polarization
	Field	kW	dBk			Field	kW	dBk	
0°	1.000	50.00	16.99	Horizontal	180°	0.793	31.44	14.97	Horizontal
5°	1.000	50.00	16.99	Horizontal	185°	0.789	31.10	14.93	Horizontal
10°	0.994	49.39	16.94	Horizontal	190°	0.801	32.09	15.06	Vertical
15°	0.972	47.28	16.75	Horizontal	195°	0.840	35.31	15.48	Vertical
20°	0.974	47.42	16.76	Vertical	200°	0.870	37.86	15.78	Vertical
25°	0.976	47.65	16.78	Vertical	205°	0.881	38.84	15.89	Vertical
30°	0.954	45.47	16.58	Vertical	210°	0.875	38.29	15.83	Vertical
35°	0.903	40.77	16.10	Vertical	215°	0.859	36.86	15.67	Vertical
40°	0.824	33.96	15.31	Vertical	220°	0.832	34.63	15.39	Vertical
45°	0.806	32.45	15.11	Horizontal	225°	0.846	35.77	15.54	Horizontal
50°	0.787	30.94	14.90	Horizontal	230°	0.867	37.62	15.75	Horizontal
55°	0.756	28.55	14.56	Horizontal	235°	0.890	39.58	15.97	Horizontal
60°	0.713	25.40	14.05	Horizontal	240°	0.909	41.28	16.16	Horizontal
65°	0.658	21.64	13.35	Horizontal	245°	0.924	42.72	16.31	Horizontal
70°	0.603	18.19	12.60	Horizontal	250°	0.937	43.88	16.42	Horizontal
75°	0.570	16.27	12.11	Vertical	255°	0.946	44.78	16.51	Vertical
80°	0.585	17.13	12.34	Vertical	260°	0.980	47.99	16.81	Vertical
85°	0.595	17.68	12.48	Vertical	265°	0.996	49.64	16.96	Vertical
90°	0.598	17.89	12.53	Vertical	270°	0.995	49.51	16.95	Vertical
95°	0.595	17.69	12.48	Vertical	275°	0.979	47.90	16.80	Vertical
100°	0.586	17.15	12.34	Vertical	280°	0.949	45.01	16.53	Vertical
105°	0.577	16.62	12.21	Vertical	285°	0.942	44.37	16.47	Horizontal
110°	0.573	16.43	12.16	Vertical	290°	0.935	43.69	16.40	Horizontal
115°	0.583	17.01	12.31	Vertical	295°	0.926	42.87	16.32	Horizontal
120°	0.610	18.62	12.70	Vertical	300°	0.918	42.11	16.24	Horizontal
125°	0.654	21.38	13.30	Vertical	305°	0.911	41.51	16.18	Horizontal
130°	0.714	25.52	14.07	Vertical	310°	0.906	41.06	16.13	Horizontal
135°	0.772	29.77	14.74	Vertical	315°	0.903	40.76	16.10	Horizontal
140°	0.812	32.97	15.18	Vertical	320°	0.933	43.52	16.39	Vertical
145°	0.836	34.91	15.43	Vertical	325°	0.971	47.12	16.73	Vertical
150°	0.842	35.45	15.50	Vertical	330°	0.988	48.76	16.88	Vertical
155°	0.837	35.06	15.45	Vertical	335°	0.985	48.55	16.86	Vertical
160°	0.827	34.18	15.34	Vertical	340°	0.975	47.54	16.77	Vertical
165°	0.810	32.83	15.16	Vertical	345°	0.974	47.40	16.76	Horizontal
170°	0.799	31.89	15.04	Horizontal	350°	0.990	48.96	16.90	Horizontal
175°	0.797	31.73	15.01	Horizontal	355°	0.998	49.83	16.97	Horizontal

Polarization: Envelope
Maximum Field: 1.000 @ 0° True
Minimum Field: 0.568 @ 74° True
RMS: 0.851
Maximum ERP: 50.000 kW
Maximum Power Gain: 3.733 (5.721 dB)

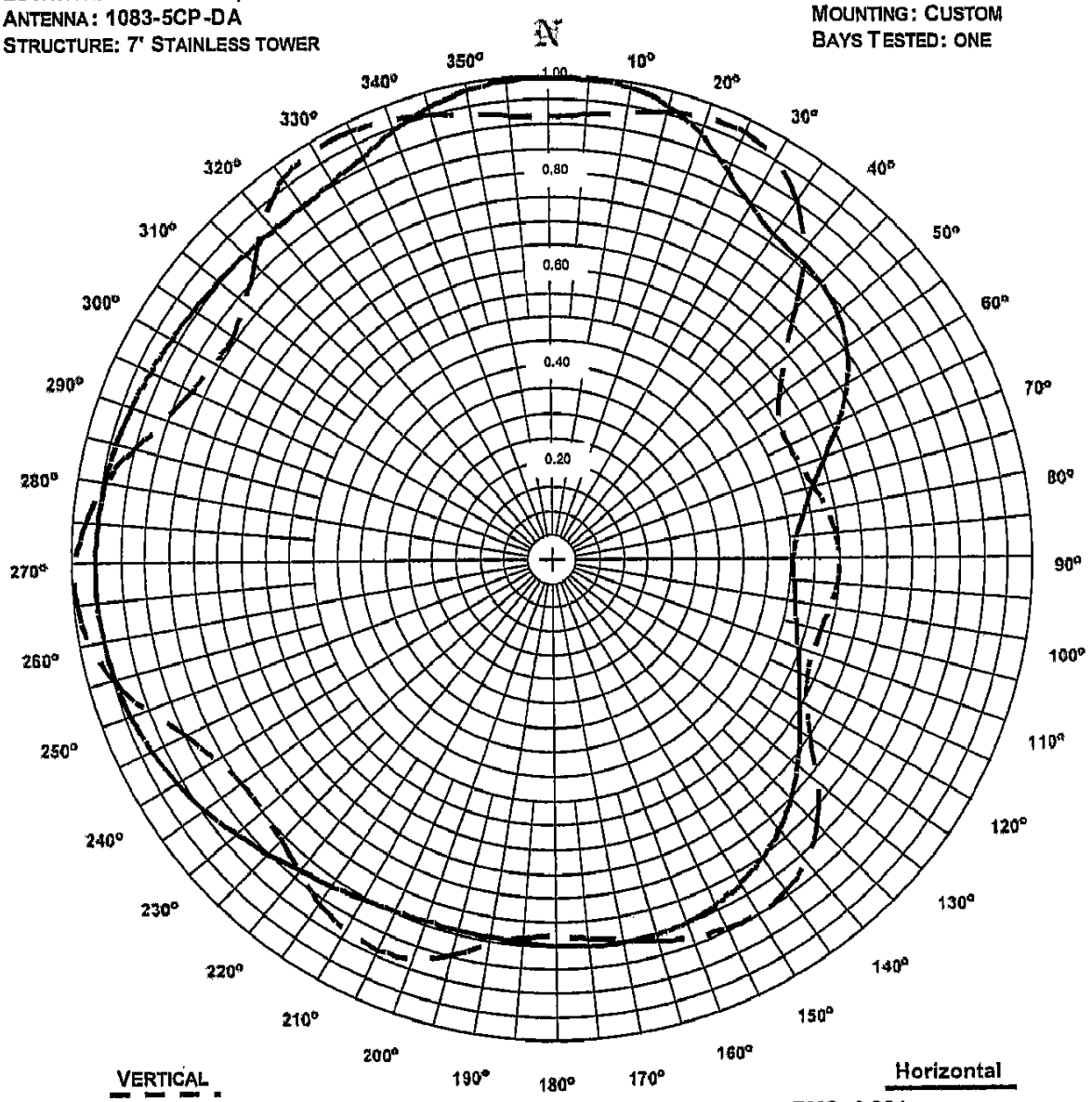
Total Input Power: 13.394 kW

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.erinc.com/

FIGURE NO: 2
STATION: WYXB
LOCATION: INDIANAPOLIS, IN
ANTENNA: 1083-5CP-DA
STRUCTURE: 7' STAINLESS TOWER

DATE: 10/8/02
FREQUENCY: 105.7 MHz
ORIENTATION: 179° TRUE
MOUNTING: CUSTOM
BAYS TESTED: ONE



VERTICAL

RMS: 0.824
MAXIMUM: 0.998 @ 267° TRUE
MINIMUM: 0.549 @ 62° TRUE

Horizontal

RMS: 0.824
Maximum: 1.000 @ 0° True
Minimum: 0.503 @ 90° True

COMMENTS: MEASURED PATTERNS OF THE HORIZONTAL AND VERTICAL COMPONENTS.

ERI® Horizontal Plane Relative Field List

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Station: WYXB
Location: Indianapolis, IN
Frequency: 105.7 MHz

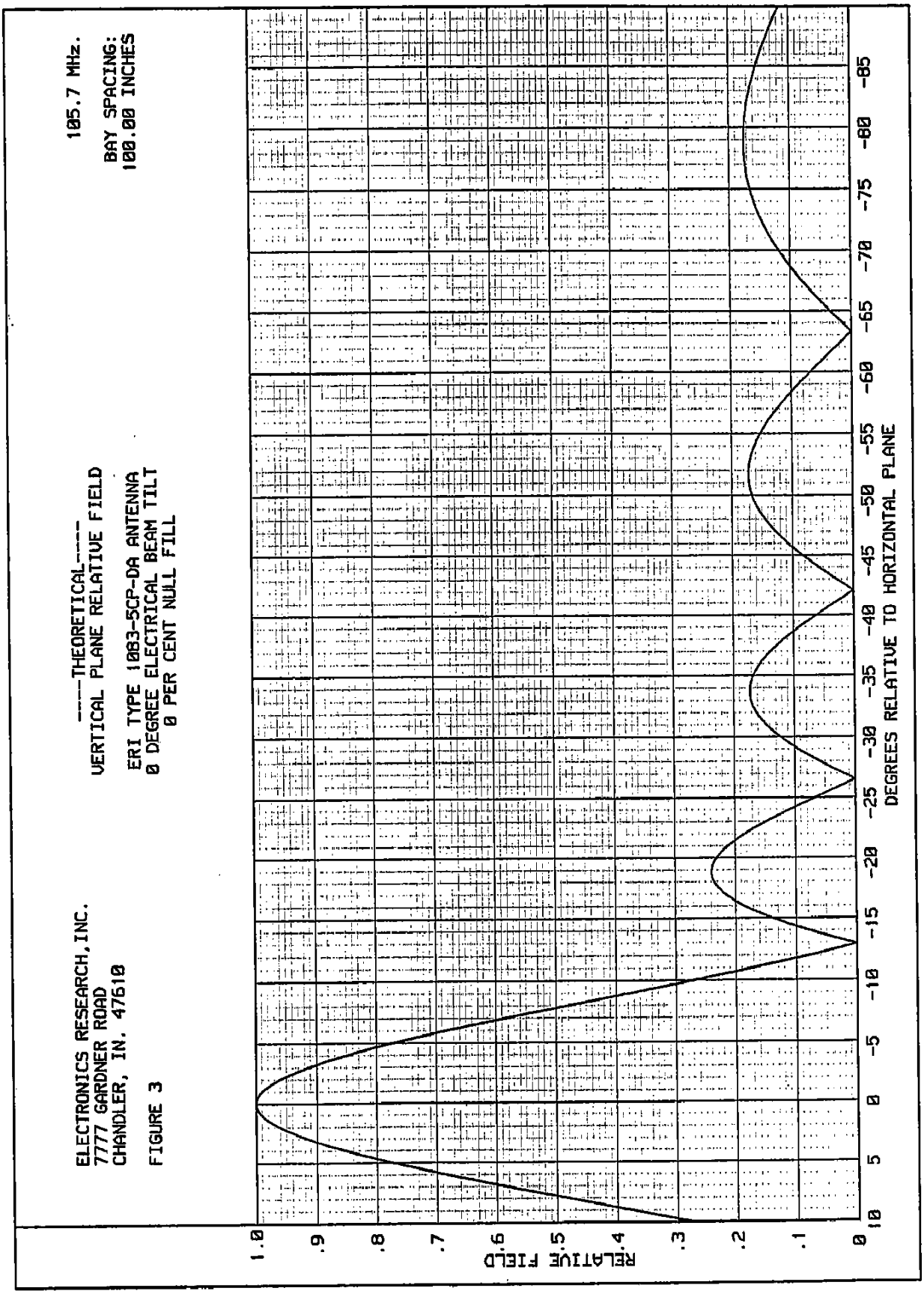
Antenna: 1083-5CP-DA
Orientation: 179° True
Tower: 7' Stainless tower

Figure: 2
Date: 10/8/02
Reference: wyxb1m.fig

Angle	Horizontal			Vertical			Angle	Horizontal			Vertical		
	Field	kW	dBk	Field	kW	dBk		Field	kW	dBk	Field	kW	dBk
0°	1.000	50.00	16.99	0.922	42.53	16.29	180°	0.793	31.44	14.97	0.775	30.03	14.78
5°	1.000	50.00	16.99	0.928	43.02	16.34	185°	0.789	31.10	14.93	0.779	30.32	14.82
10°	0.994	49.39	16.94	0.942	44.34	16.47	190°	0.786	30.89	14.90	0.801	32.09	15.06
15°	0.972	47.28	16.75	0.961	46.22	16.65	195°	0.785	30.81	14.89	0.840	35.31	15.48
20°	0.936	43.78	16.41	0.974	47.42	16.76	200°	0.787	30.97	14.91	0.870	37.86	15.78
25°	0.886	39.27	15.94	0.976	47.65	16.78	205°	0.792	31.38	14.97	0.881	38.84	15.89
30°	0.846	35.82	15.54	0.954	45.47	16.58	210°	0.801	32.06	15.06	0.875	38.29	15.83
35°	0.822	33.78	15.29	0.903	40.77	16.10	215°	0.812	33.01	15.19	0.859	36.86	15.67
40°	0.813	33.03	15.19	0.824	33.96	15.31	220°	0.828	34.24	15.35	0.832	34.63	15.39
45°	0.806	32.45	15.11	0.722	26.03	14.16	225°	0.846	35.77	15.54	0.809	32.76	15.15
50°	0.787	30.94	14.90	0.637	20.29	13.07	230°	0.867	37.62	15.75	0.797	31.76	15.02
55°	0.756	28.55	14.56	0.581	16.86	12.27	235°	0.890	39.58	15.97	0.797	31.73	15.01
60°	0.713	25.40	14.05	0.553	15.27	11.84	240°	0.909	41.28	16.16	0.813	33.07	15.19
65°	0.658	21.64	13.35	0.551	15.16	11.81	245°	0.924	42.72	16.31	0.847	35.83	15.54
70°	0.603	18.19	12.60	0.558	15.55	11.92	250°	0.937	43.88	16.42	0.896	40.18	16.04
75°	0.560	15.69	11.96	0.570	16.27	12.11	255°	0.946	44.74	16.51	0.946	44.78	16.51
80°	0.529	14.00	11.46	0.585	17.13	12.34	260°	0.952	45.30	16.56	0.980	47.99	16.81
85°	0.510	13.01	11.14	0.595	17.68	12.48	265°	0.954	45.55	16.58	0.996	49.64	16.96
90°	0.503	12.65	11.02	0.598	17.89	12.53	270°	0.954	45.50	16.58	0.995	49.51	16.95
95°	0.506	12.80	11.07	0.595	17.69	12.48	275°	0.952	45.28	16.56	0.979	47.90	16.80
100°	0.514	13.19	11.20	0.586	17.15	12.34	280°	0.948	44.90	16.52	0.949	45.01	16.53
105°	0.526	13.85	11.42	0.577	16.62	12.21	285°	0.942	44.37	16.47	0.905	40.98	16.13
110°	0.544	14.79	11.70	0.573	16.43	12.16	290°	0.935	43.69	16.40	0.862	37.13	15.70
115°	0.566	16.03	12.05	0.583	17.01	12.31	295°	0.926	42.87	16.32	0.832	34.60	15.39
120°	0.594	17.61	12.46	0.610	18.62	12.70	300°	0.918	42.11	16.24	0.816	33.26	15.22
125°	0.626	19.57	12.92	0.654	21.38	13.30	305°	0.911	41.51	16.18	0.815	33.19	15.21
130°	0.662	21.92	13.41	0.714	25.52	14.07	310°	0.906	41.06	16.13	0.836	34.92	15.43
135°	0.696	24.24	13.84	0.772	29.77	14.74	315°	0.903	40.76	16.10	0.878	38.52	15.86
140°	0.725	26.31	14.20	0.812	32.97	15.18	320°	0.901	40.61	16.09	0.933	43.52	16.39
145°	0.750	28.11	14.49	0.836	34.91	15.43	325°	0.903	40.75	16.10	0.971	47.12	16.73
150°	0.769	29.58	14.71	0.842	35.45	15.50	330°	0.911	41.53	16.18	0.988	48.76	16.88
155°	0.784	30.72	14.87	0.837	35.06	15.45	335°	0.927	43.00	16.33	0.985	48.55	16.86
160°	0.794	31.49	14.98	0.827	34.18	15.34	340°	0.951	45.17	16.55	0.975	47.54	16.77
165°	0.798	31.87	15.03	0.810	32.83	15.16	345°	0.974	47.40	16.76	0.957	45.84	16.61
170°	0.799	31.89	15.04	0.793	31.41	14.97	350°	0.990	48.96	16.90	0.938	44.04	16.44
175°	0.797	31.73	15.01	0.781	30.49	14.84	355°	0.998	49.83	16.97	0.927	42.94	16.33

	Horizontal	Vertical
Polarization:		
Maximum Field:	**1.000 @ 0° True**	**0.998 @ 267° True**
Minimum Field:	**0.503 @ 90° True**	**0.549 @ 62° True**
RMS:	**0.824**	**0.824**
Maximum ERP:	**50.000 kW**	**49.834 kW**
Maximum Power Gain:	**3.733 (5.721 dB)**	**3.721 (5.706 dB)**

Total Input Power: 13.394 kW


105.7 MHz.
BAY SPACING:
100.00 INCHES
---THEORETICAL---
VERTICAL PLANE RELATIVE FIELD
ERI TYPE 1083-5CP-DA ANTENNA
0 DEGREE ELECTRICAL BEAM TILT
0 PER CENT NULL FILL
ELECTRONICS RESEARCH,INC.
7777 GARDNER ROAD
CHANDLER, IN. 47610
FIGURE 3
RELATIVE FIELD
1.0
.9
.8
.7
.6
.5
.4
.3
.2
.1
0
10 5 0 -5 -10 -15 -20 -25 -30 -35 -40 -45 -50 -55 -60 -65 -70 -75 -80 -85
DEGREES RELATIVE TO HORIZONTAL PLANE

Directional Antenna System
for
WYXB, Indianapolis, Indiana

(Continued)

ANTENNA SPECIFICATIONS

Antenna Type:	1083-5CP-DA
Frequency:	105.7 MHz
Number of Bays:	5

MECHANICAL SPECIFICATIONS

Mounting:	Custom
System length:	37 ft
Aperture length required:	57 ft.
Orientation:	179° true

Input flange to the antenna 3 1/8 inch female

ELECTRICAL SPECIFICATIONS
(For directional use)

Maximum horizontal ERP:	50 kW (16.99 dBk)
Horizontal maximum power gain:	3.734 (5.722 dB)
Maximum vertical ERP:	49.834 kW (16.975 dBk)
Vertical maximum power gain:	3.722 (5.707 dB)
Total input power:	13.39 kW (11.268 dBk)