



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
KBEX, Brenham, Texas

June 9, 2008

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 KBEX.

The antenna is the ERI model 1092-3CP-DA configuration. The circular polarized system consists of 3 full-wavelength spaced bays using two driven circular polarized radiating element. The antenna was mounted on the North 205 degrees East tower face with bracketry to provide an antenna orientation of North 202 degrees East. The antenna was tested on a 36" face tower, which is the structure the station plans to use to support the array. All tests were performed on a frequency of 89.7 megahertz, which is the center of the FM broadcast channel assigned to KBEX.

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.

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Directional Antenna System Proposed For KBEX, Brenham, Texas

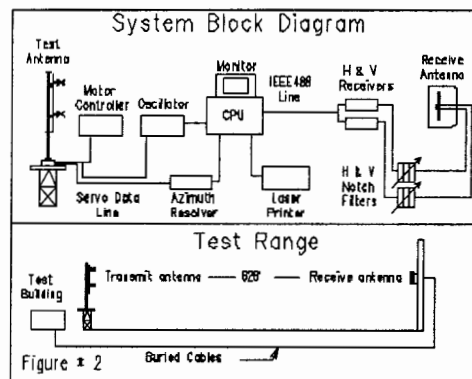
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DESCRIPTION OF THE TEST PROCEDURE

The test antenna consisted of one bay level 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 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 36" 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 89.7 MHz and was constantly monitored by a Rohde & Schwarz ESVD measuring receiver.

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.

Directional Antenna System
Proposed For
KBEX, Brenham, Texas

(Continued)

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 3 full-wavelength spaced bays using one driven circular polarized radiating element. 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 1092-3CP-DA array is to be mounted on the North 205 degrees East tower face of the 36" face tower at a bearing of North 202 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 17.5 kilowatts (12.430 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 than 85% of the filed composite pattern.

The clear vertical length of the structure required to support the antenna is 41 feet 10 inches.

Directional Antenna System
Proposed For
KBEX, Brenham, Texas

(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.

A handwritten signature in black ink, appearing to read "Tom Schaefer". The signature is fluid and cursive, with the first name "Tom" and last name "Schaefer" clearly distinguishable.

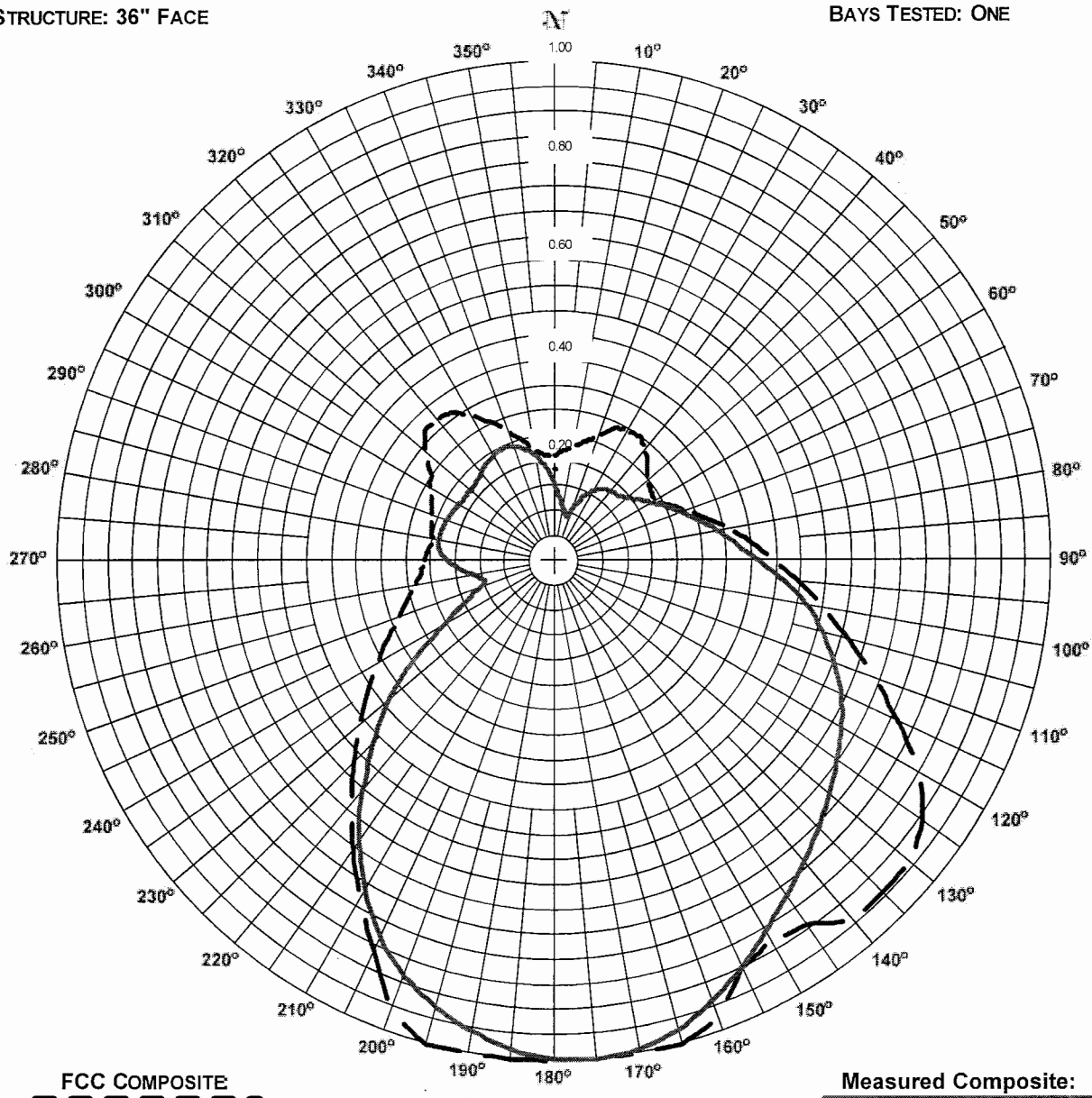
The Microsoft Word document on file electronically at Electronic Research, Inc. governs the specifications, scope, and configuration of the product described. All other representations whether verbal, printed, or electronic are subordinate to the master copy of this document on file at ERI.

ERI® *Horizontal Plane Relative Field Pattern*

Electronics Research, Inc. 7777 Gardner Rd. Chandler, In 47610 Phone (812) 925-6000 Fax (812) 925-4030 <http://www.eriinc.com/>

FIGURE NO: 1
STATION: KBEX
LOCATION: BRENHAM, TX
ANTENNA: 1092-3CP-DA
STRUCTURE: 36" FACE

DATE: 6/4/2008
FREQUENCY: 89.7 MHz
ORIENTATION: 202° TRUE
MOUNTING: CUSTOM
BAYS TESTED: ONE



FCC COMPOSITE
RMS: 0.581
MAXIMUM: 1.000 @ 165° TRUE
MINIMUM: 0.212 @ 0° TRUE

Measured Composite:
RMS: 0.522
Maximum: 1.000 @ 175° True
Minimum: 0.093 @ 16° 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 BMPED-20070907AAT.

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: KBEX
Location: Brenham, TX
Frequency: 89.7 MHz

Antenna: 1092-3CP-DA
Orientation: 202° True
Tower: 36" Face

Figure: 1
Date: 6/4/2008
Reference: kbex2m.fig

Angle	Envelope			Polarization	Angle	Envelope			Polarization
	Field	kW	dBk			Field	kW	dBk	
0°	0.159	0.44	-3.57	Horizontal	180°	0.997	17.39	12.40	Vertical
5°	0.130	0.30	-5.26	Horizontal	185°	0.981	16.85	12.27	Vertical
10°	0.109	0.21	-6.79	Horizontal	190°	0.954	15.94	12.03	Horizontal
15°	0.095	0.16	-7.98	Horizontal	195°	0.923	14.90	11.73	Horizontal
20°	0.114	0.23	-6.40	Vertical	200°	0.882	13.63	11.34	Horizontal
25°	0.143	0.36	-4.47	Vertical	205°	0.830	12.05	10.81	Horizontal
30°	0.163	0.47	-3.30	Vertical	210°	0.762	10.17	10.07	Horizontal
35°	0.176	0.54	-2.65	Vertical	215°	0.686	8.24	9.16	Vertical
40°	0.183	0.58	-2.34	Vertical	220°	0.600	6.31	8.00	Vertical
45°	0.187	0.61	-2.15	Vertical	225°	0.519	4.71	6.73	Horizontal
50°	0.197	0.68	-1.69	Vertical	230°	0.440	3.38	5.29	Horizontal
55°	0.214	0.80	-0.97	Vertical	235°	0.350	2.15	3.32	Horizontal
60°	0.233	0.95	-0.22	Vertical	240°	0.260	1.18	0.71	Vertical
65°	0.256	1.15	0.60	Vertical	245°	0.206	0.74	-1.29	Vertical
70°	0.281	1.39	1.42	Vertical	250°	0.165	0.48	-3.20	Vertical
75°	0.309	1.67	2.24	Vertical	255°	0.145	0.37	-4.34	Horizontal
80°	0.340	2.02	3.06	Vertical	260°	0.160	0.45	-3.48	Horizontal
85°	0.374	2.44	3.88	Vertical	265°	0.186	0.60	-2.18	Horizontal
90°	0.418	3.06	4.86	Horizontal	270°	0.214	0.80	-0.97	Horizontal
95°	0.471	3.88	5.89	Horizontal	275°	0.231	0.93	-0.30	Horizontal
100°	0.523	4.78	6.79	Horizontal	280°	0.237	0.99	-0.06	Horizontal
105°	0.565	5.58	7.47	Horizontal	285°	0.236	0.98	-0.09	Horizontal
110°	0.603	6.36	8.04	Horizontal	290°	0.234	0.96	-0.19	Horizontal
115°	0.641	7.18	8.56	Horizontal	295°	0.229	0.92	-0.36	Horizontal
120°	0.670	7.86	8.96	Horizontal	300°	0.225	0.89	-0.53	Horizontal
125°	0.698	8.52	9.30	Horizontal	305°	0.222	0.86	-0.63	Horizontal
130°	0.726	9.23	9.65	Horizontal	310°	0.221	0.86	-0.67	Horizontal
135°	0.756	10.01	10.00	Horizontal	315°	0.224	0.88	-0.57	Horizontal
140°	0.787	10.85	10.35	Horizontal	320°	0.230	0.93	-0.32	Horizontal
145°	0.820	11.75	10.70	Horizontal	325°	0.240	1.01	0.03	Horizontal
150°	0.857	12.85	11.09	Horizontal	330°	0.247	1.06	0.27	Horizontal
155°	0.898	14.11	11.49	Horizontal	335°	0.249	1.09	0.35	Horizontal
160°	0.936	15.33	11.86	Horizontal	340°	0.245	1.05	0.21	Horizontal
165°	0.972	16.52	12.18	Horizontal	345°	0.234	0.95	-0.20	Horizontal
170°	0.992	17.23	12.36	Horizontal	350°	0.215	0.81	-0.91	Horizontal
175°	1.000	17.50	12.43	Horizontal	355°	0.190	0.63	-1.99	Horizontal

Polarization:
Maximum Field: 1.000 @ 175° True
Minimum Field: 0.093 @ 16° True
RMS: 0.522
Maximum ERP: 17.500 kW
Maximum Power Gain: 5.636 (7.509 dB)

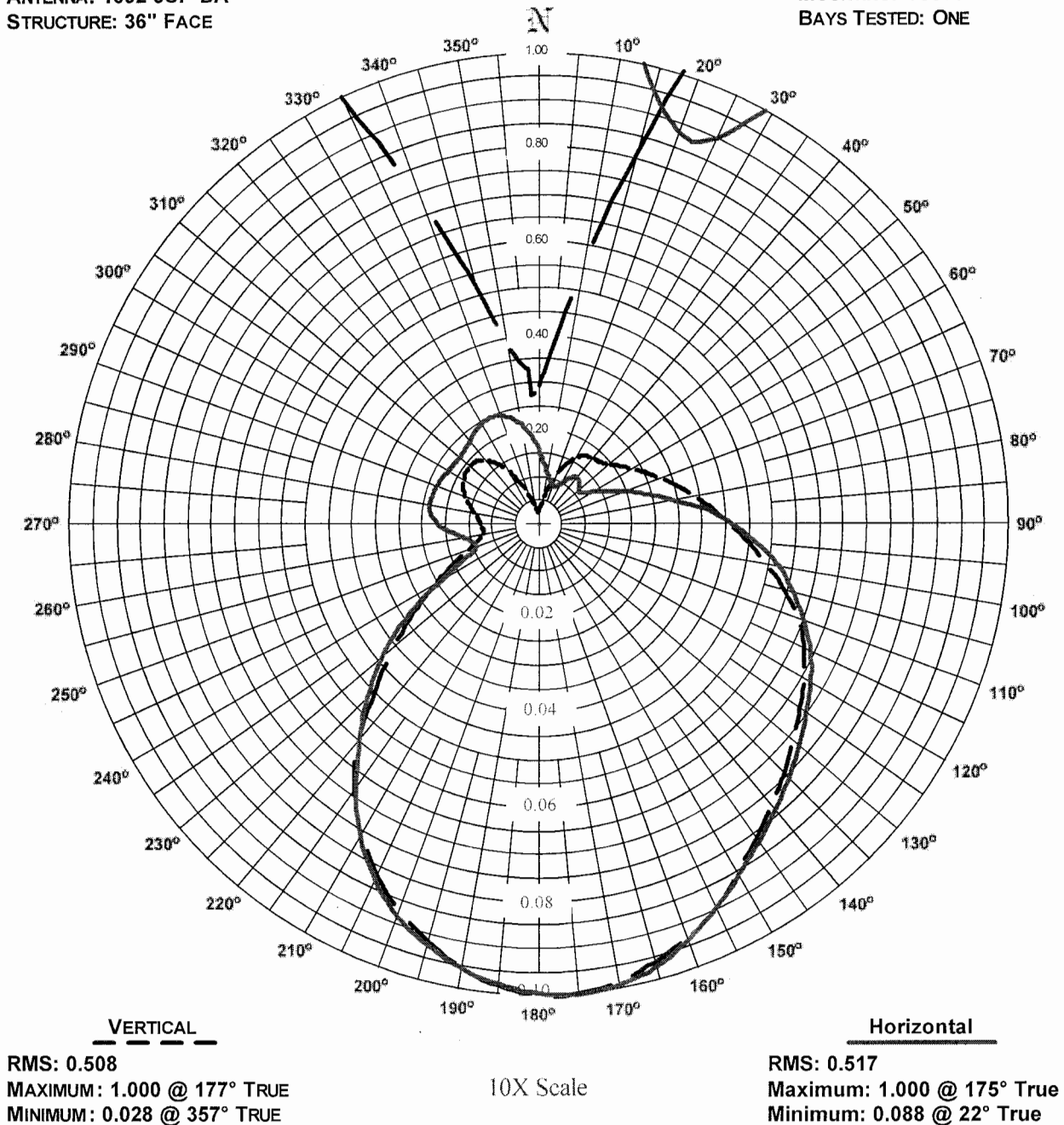
Total Input Power: 3.105 kW

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.eriinc.com/>

FIGURE NO: 2
STATION: KBEX
LOCATION: BRENHAM, TX
ANTENNA: 1092-3CP-DA
STRUCTURE: 36" FACE

DATE: 6/4/2008
FREQUENCY: 89.7 MHz
ORIENTATION: 202° TRUE
MOUNTING: CUSTOM
BAYS TESTED: ONE



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: KBEX
Location: Brenham, TX
Frequency: 89.7 MHz

Antenna: 1092-3CP-DA
Orientation: 202° True
Tower: 36" Face

Figure: 2
Date: 6/4/2008
Reference: kbex2m.fig

Angle	Horizontal			Vertical			Angle	Horizontal			Vertical		
	Field	kW	dBk	Field	kW	dBk		Field	kW	dBk	Field	kW	dBk
0°	0.159	0.44	-3.57	0.030	0.02	-18.15	180°	0.994	17.29	12.38	0.997	17.39	12.40
5°	0.130	0.30	-5.26	0.039	0.03	-15.73	185°	0.978	16.73	12.24	0.981	16.85	12.27
10°	0.109	0.21	-6.79	0.057	0.06	-12.53	190°	0.954	15.94	12.03	0.953	15.89	12.01
15°	0.095	0.16	-7.98	0.082	0.12	-9.31	195°	0.923	14.90	11.73	0.912	14.56	11.63
20°	0.088	0.14	-8.64	0.114	0.23	-6.40	200°	0.882	13.63	11.34	0.869	13.23	11.22
25°	0.090	0.14	-8.46	0.143	0.36	-4.47	205°	0.830	12.05	10.81	0.818	11.71	10.68
30°	0.104	0.19	-7.25	0.163	0.47	-3.30	210°	0.762	10.17	10.07	0.757	10.02	10.01
35°	0.121	0.26	-5.89	0.176	0.54	-2.65	215°	0.680	8.10	9.08	0.686	8.24	9.16
40°	0.128	0.29	-5.42	0.183	0.58	-2.34	220°	0.596	6.22	7.94	0.600	6.31	8.00
45°	0.122	0.26	-5.84	0.187	0.61	-2.15	225°	0.519	4.71	6.73	0.496	4.31	6.34
50°	0.113	0.22	-6.54	0.197	0.68	-1.69	230°	0.440	3.38	5.29	0.405	2.86	4.57
55°	0.116	0.24	-6.26	0.214	0.80	-0.97	235°	0.350	2.15	3.32	0.326	1.86	2.69
60°	0.141	0.35	-4.60	0.233	0.95	-0.22	240°	0.252	1.11	0.46	0.260	1.18	0.71
65°	0.169	0.50	-2.99	0.256	1.15	0.60	245°	0.176	0.54	-2.65	0.206	0.74	-1.29
70°	0.204	0.73	-1.38	0.281	1.39	1.42	250°	0.142	0.35	-4.50	0.165	0.48	-3.20
75°	0.246	1.06	0.23	0.309	1.67	2.24	255°	0.145	0.37	-4.34	0.137	0.33	-4.81
80°	0.296	1.53	1.85	0.340	2.02	3.06	260°	0.160	0.45	-3.48	0.122	0.26	-5.83
85°	0.361	2.28	3.59	0.374	2.44	3.88	265°	0.186	0.60	-2.18	0.119	0.25	-6.03
90°	0.418	3.06	4.86	0.411	2.95	4.70	270°	0.214	0.80	-0.97	0.123	0.26	-5.79
95°	0.471	3.88	5.89	0.452	3.57	5.52	275°	0.231	0.93	-0.30	0.129	0.29	-5.35
100°	0.523	4.78	6.79	0.496	4.31	6.35	280°	0.237	0.99	-0.06	0.139	0.34	-4.72
105°	0.565	5.58	7.47	0.546	5.21	7.17	285°	0.236	0.98	-0.09	0.152	0.40	-3.95
110°	0.603	6.36	8.04	0.590	6.10	7.85	290°	0.234	0.96	-0.19	0.166	0.48	-3.16
115°	0.641	7.18	8.56	0.626	6.85	8.36	295°	0.229	0.92	-0.36	0.178	0.55	-2.57
120°	0.670	7.86	8.96	0.654	7.49	8.74	300°	0.225	0.89	-0.53	0.186	0.61	-2.17
125°	0.698	8.52	9.30	0.682	8.13	9.10	305°	0.222	0.86	-0.63	0.191	0.64	-1.94
130°	0.726	9.23	9.65	0.711	8.84	9.46	310°	0.221	0.86	-0.67	0.193	0.65	-1.85
135°	0.756	10.01	10.00	0.743	9.66	9.85	315°	0.224	0.88	-0.57	0.189	0.62	-2.05
140°	0.787	10.85	10.35	0.777	10.56	10.23	320°	0.230	0.93	-0.32	0.177	0.55	-2.60
145°	0.820	11.75	10.70	0.812	11.54	10.62	325°	0.240	1.01	0.03	0.158	0.44	-3.57
150°	0.857	12.85	11.09	0.853	12.73	11.05	330°	0.247	1.06	0.27	0.132	0.31	-5.14
155°	0.898	14.11	11.49	0.897	14.07	11.48	335°	0.249	1.09	0.35	0.100	0.18	-7.56
160°	0.936	15.33	11.86	0.933	15.22	11.82	340°	0.245	1.05	0.21	0.073	0.09	-10.35
165°	0.972	16.52	12.18	0.960	16.13	12.08	345°	0.234	0.95	-0.20	0.052	0.05	-13.20
170°	0.992	17.23	12.36	0.985	16.99	12.30	350°	0.215	0.81	-0.91	0.039	0.03	-15.69
175°	1.000	17.50	12.43	0.998	17.44	12.42	355°	0.190	0.63	-1.99	0.033	0.02	-17.08

Polarization:	Horizontal	Vertical
Maximum Field:	1.000 @ 175° True	1.000 @ 177° True
Minimum Field:	0.088 @ 22° True	0.028 @ 357° True
RMS:	0.517	0.508
Maximum ERP:	17.500 kW	17.500 kW
Maximum Power Gain:	5.636 (7.509 dB)	5.636 (7.509 dB)

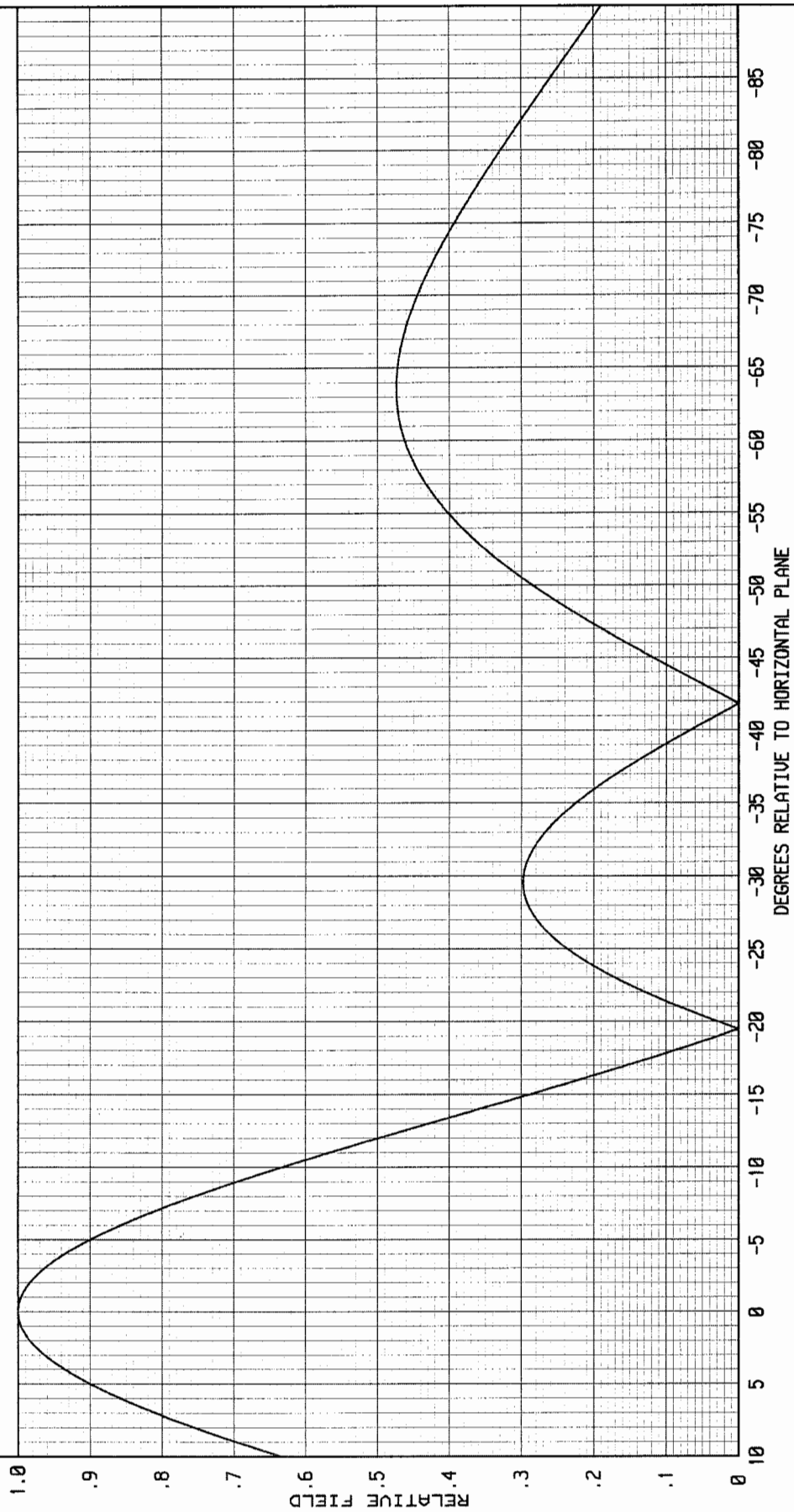
Total Input Power: 3.105 kW

ELECTRONICS RESEARCH, INC.
7777 GARDNER ROAD
CHANDLER, IN. 47618

FIGURE 3

-----THEORETICAL-----
VERTICAL PLANE RELATIVE FIELD
ERI TYPE 1092-3CP-DA BROADCAST ANTENNA
0 DEGREE BEAM TILT
0 PERCENT FIRST NULL FILL
0 PERCENT SECOND NULL FILL

BAY SPACING:
FULL - WAVELENGTH



Directional Antenna System for KBEX, Brenham, Texas

(Continued)

ANTENNA SPECIFICATIONS

Antenna Type:	1092-3CP-DA
Frequency:	89.7 MHz
Number of Bays:	Three

MECHANICAL SPECIFICATIONS

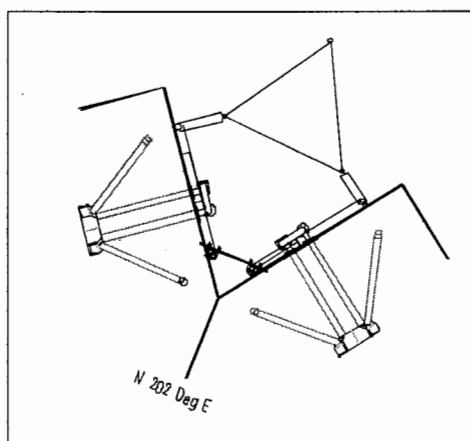
Mounting:	Custom
System length:	32 ft 9 in
Aperture length required:	41 ft 10 in
Orientation:	202° true

Input flange to the antenna 1 5/8" female.

ELECTRICAL SPECIFICATIONS

(For directional use)

Maximum horizontal ERP:	17.5 kW (12.43 dBk)
Horizontal maximum power gain:	5.636 (7.509 dB)
Maximum vertical ERP:	17.5 kW (12.43 dBk)
Vertical maximum power gain:	5.636 (7.509 dB)
Total input power:	3.105 kW (4.921 dBk)



SURVEYOR'S CERTIFICATE

G & W ENGINEERS, INC.

205 W. Live Oak Port Lavaca, Texas 77979 (361) 552-4509 Fax (361) 552-4987

September 11, 2008

KSEJ Radio
P. O. Box 187
Humble, Texas 77347

Attn.: George Schank

Mr. Schank,

This letter is in reference to the newly erected antenna on the tower located in Austin County, Texas near the Community of Welcome.

A field survey was conducted on Wednesday, September 10, 2008 and the following information was determined:

1.) Tower location:

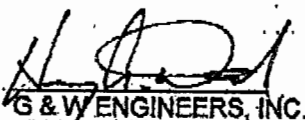
X = 2788539 and Y = 816167 TSP SC (NAD'27)

2.) Antenna orientation:

Geodetic Azimuth = 202°

If you have any questions or need other information, please do not hesitate to contact me.

Thank you for this opportunity to provide you with our Professional Surveying Services.


G & W ENGINEERS, INC.

Henry A. Danysh
Registered Professional Land Surveyor
Texas License No. 5088



George A. Schank
Chief Operator of KBEX-FM
Brenham, Texas

George A. Schank, being duly sworn, and upon his oath, deposes and states that:

He is the full-time Chief Operator for KBEX-FM, Brenham, Texas.

He has been engaged in the practice of broadcast engineering for over 40 years;

He holds General Radiotelephone License PG-9-10461, issued by the Federal Communications Commission; certification as a Professional Broadcast Engineer by the Society of Broadcast Engineers;

His qualifications are a matter of record with the Commission;

And, he is qualified to construct radio transmitting facilities.

He further states that:

He has personally supervised the construction of the radio transmitting facility authorized in a construction permit issued by the Commission on July 7, 2008, to operate on 89.7 MHz and be licensed to Brenham, Texas;

That all construction work has been accomplished according to said construction permit;

And, specifically, that the directional antenna system of said radio station has been installed according to the manufacturer's specifications, and oriented in compliance with the terms of the construction permit; as further evidenced by the report of a survey performed by a registered professional surveyor (attached).

George A. Schank Date September 4, 2008
George A. Schank

Subscribed and sworn to before me this 4th day of September, 2008.

Kathy L. Cone Date 09/04/2008
Kathy Cone
Notary Public in and for the State of Texas

