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S.O. 29127

Report of Test 6810-5-SS-DA

for

PACIFIC BROADCASTING OF MISSOURI, LLC

KYRK 106.5 MHz Taft, TX

OBJECTIVE:

The objective of this test was to demonstrate the directional characteristics of a 6810-5-SS-DA to meet the needs of KYRK and to comply with the requirements of the FCC construction permit, file number BMPH-20110404ACT. This test characterizes only the radiation characteristics of the antenna when mounted on the tower as described. It does not represent or imply any guarantee of specific coverage which can be influenced by factors beyond the scope of this test.

RESULTS:

The following Figures are the results of the measurements from our pattern range:

Figure 1A - Measured Azimuth Pattern with the FCC Composite
Figure 1B - Measured Composite Azimuth Pattern with the FCC Composite
Figure 1C - Tabulation of the Horizontal Polarization for the Measured Azimuth Pattern
Figure 1D - Tabulation of the Vertical Polarization for the Measured Azimuth Pattern
Figure 1E - Tabulation of the Measured Composite Azimuth Pattern
Figure 1F - Tabulation of the FCC Composite

The calculated elevation pattern of the antenna is shown in Figure 3.

Construction permit file number BMPH-20110404ACT indicates that the Horizontal radiation component shall not exceed 50 kW at any azimuth and is restricted to the following values at the azimuths specified:

140 Degrees T: 6.125 kW

From Figure 1A, the maximum radiation of the Horizontal component occurs at 269 Degrees T to 286 Degrees T. At the restricted azimuth of 140 Degrees T the Horizontal component is 10.46 dB down from the maximum of 50 kW, or 4.500 kW.

The R.M.S. of the Horizontal component is 0.758. The total Horizontal power gain is 2.900. The R.M.S. of the Vertical component is 0.741. The total Vertical power gain is 2.729. See Figure 4 for calculations. The R.M.S. of the FCC composite pattern is 0.901. The R.M.S. of the measured composite pattern is 0.791. Eighty-five percent (85%) of the original authorized FCC composite pattern is 0.766. Therefore this pattern complies with the FCC requirement of 73.316(c)(2)(ix)(A).

METHOD OF DIRECTIONALIZATION:

One bay of the 6810-5-SS-DA was mounted on a tower of precise scale to the Allied 42-inch facewidth tower at the KYRK site. The spacing of the antenna to the tower was varied to achieve the vertical pattern shown in Figure 1A. A horizontal parasitic element was placed directly under the bay. The position of this horizontal parasitic element was changed until the horizontal pattern shown in Figure 1A was achieved. See Figure 2 for mechanical details.

METHOD OF MEASUREMENT:

As allowed by the construction permit, file number BMPH-20110404ACT, a single level of the 6810-5-SS-DA was set up on the Howell Laboratories scale model antenna pattern measuring range. A scale of 4.5:1 was used.

SUPERVISION:

Mr. Surette was graduated from Lowell Technological Institute, Lowell, Massachusetts in 1973 with the degree of Bachelor of Science in Electrical Engineering. He has been directly involved with design and development of broadcast antennas, filter systems and RF transmission components since 1974, as an RF Engineer for six years with the original Shively Labs in Raymond, ME and for a short period of time with Dielectric Communications. He is currently an Associate Member of the AFCCE and a Senior Member of IEEE. He has authored a chapter on filters and combining systems for the latest edition of the CRC Electronics Handbook and for the 9th and 10th Editions of the NAB Handbook.

EQUIPMENT:

The scale model pattern range consists of a wooden rotating pedestal equipped with a position indicator. The scale model bay is placed on the top of this pedestal and is used in the transmission mode at approximately 20 feet above ground level. The receiving corner reflector is spaced 50 feet away from the rotating pedestal at the same level above ground as the transmitting model. The transmitting and receiving signals are carried to a control building by means of RG-9/U double shielded coax cable.

The control building is equipped with:

Hewlett Packard Model 8753 Network Analyzer

PC Based Controller

Hewlett Packard 7550A Graphics Plotter

The test equipment is calibrated to ANSI/NCSL Z540-1-1994.

TEST PROCEDURES:

The corner reflector is mounted so that the horizontal and vertical azimuth patterns are measured independently by rotating the corner reflector by 90 degrees. The network analyzer was set to 479.25 MHz. Calibrated pads are used to check the linearity of the measuring system. For example, 6 dB padding yields a scale reading of 50 from an unpadded reading of 100 in voltage. From the recorded patterns, the R.M.S. values are calculated and recorded as shown in Figure 1A. All testing is carried out in strict accordance with procedures approved under ISO 9001:2008.

Respectfully submitted by:

Robert A. Surette
Director of Sales Engineering
S/O 29127
June 22, 2011

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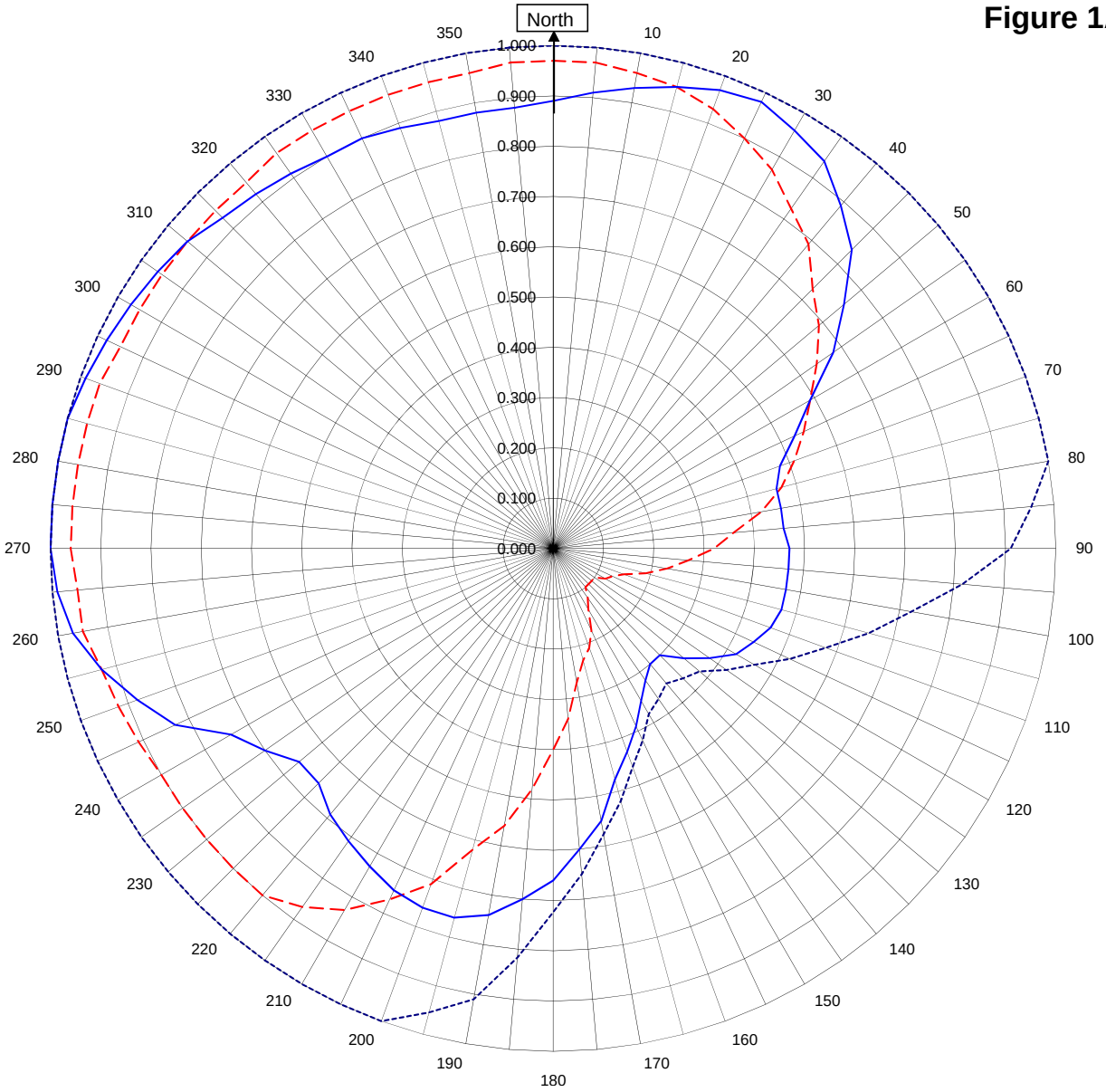
Figure 1A



KYRK Taft, TX

29127

June 22, 2011

Horizontal RMS	0.758
Vertical RMS	0.741
H/V Composite RMS	0.791
FCC Composite RMS	0.901

Frequency	106.5 / 479.25 mHz
Plot	Relative Field
Scale	4.5 : 1
	See Figure 2 for Mechanical Details

Antenna Model	6810-5-SS-DA
Pattern Type	Directional Azimuth

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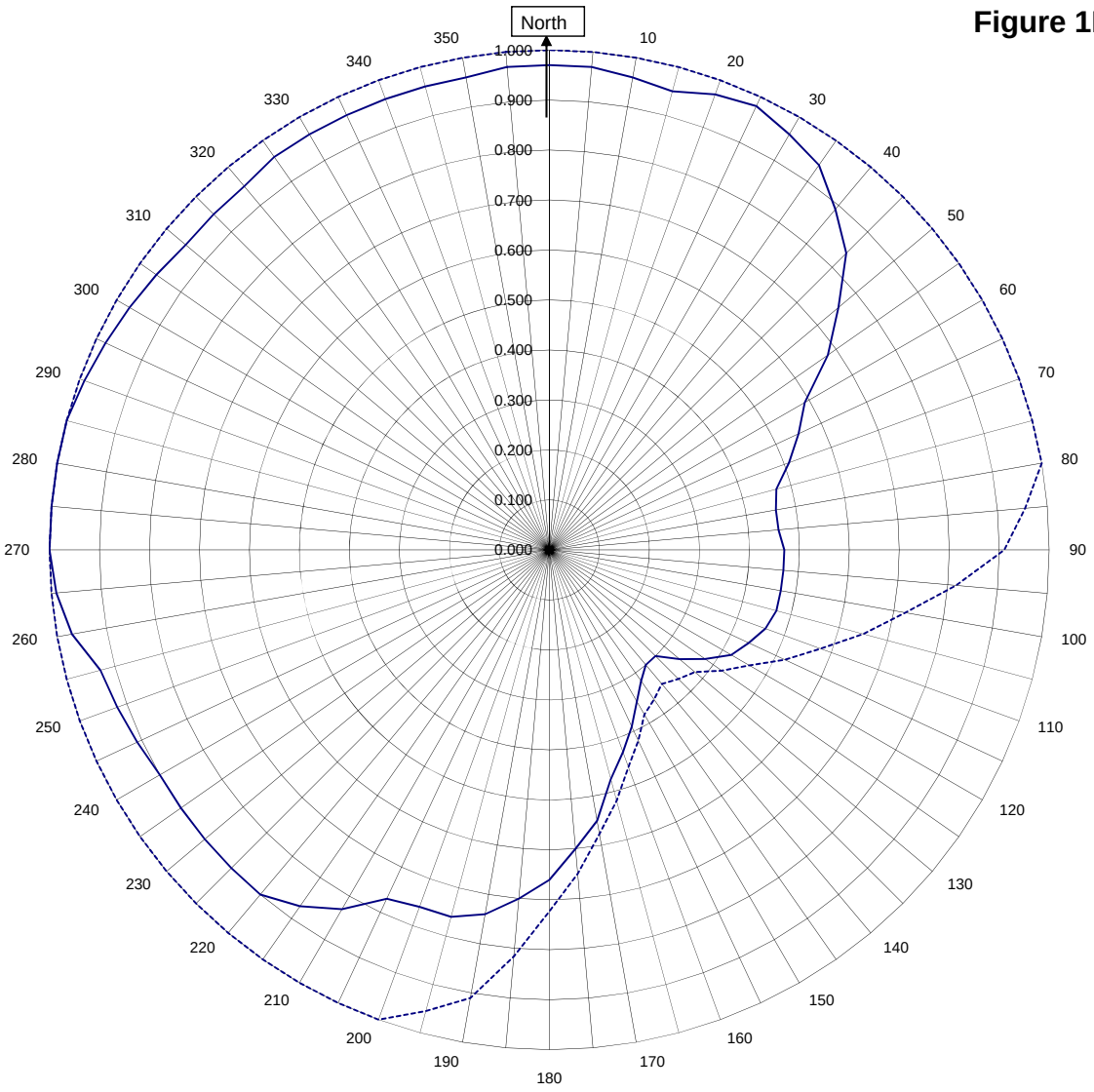
Figure 1B



KYRK Taft, TX

29127

June 22, 2011

_____H/VComposite RMS	0.791
……..FCC Composite RMS	0.901

Frequency	106.5 / 479.25 mHz
Plot	Relative Field
Scale	4.5 : 1
	See Figure 2 for Mechanical Details

Antenna Model	6810-5-SS-DA
Pattern Type	Directional H/V Composite

Figure 1C

Tabulation of Horizontal Azimuth Pattern
KYRK Taft, TX

Azimuth	Rel Field	Azimuth	Rel Field
0	0.890	180	0.660
10	0.930	190	0.740
20	0.970	200	0.760
30	0.960	210	0.730
40	0.890	220	0.690
45	0.840	225	0.660
50	0.755	230	0.660
60	0.590	240	0.740
70	0.480	250	0.880
80	0.460	260	0.970
90	0.470	270	1.000
100	0.470	280	1.000
110	0.460	290	0.990
120	0.420	300	0.970
130	0.340	310	0.950
135	0.300	315	0.930
140	0.300	320	0.920
150	0.350	330	0.900
160	0.430	340	0.890
170	0.550	350	0.880

Figure 1D

Tabulation of Vertical Azimuth Pattern
KYRK Taft, TX

Azimuth	Rel Field	Azimuth	Rel Field
0	0.970	180	0.400
10	0.960	190	0.560
20	0.930	200	0.710
30	0.870	210	0.830
40	0.790	220	0.900
45	0.730	225	0.900
50	0.690	230	0.900
60	0.590	240	0.900
70	0.510	250	0.920
80	0.420	260	0.950
90	0.320	270	0.960
100	0.230	280	0.960
110	0.150	290	0.960
120	0.120	300	0.950
130	0.100	310	0.950
135	0.100	315	0.950
140	0.100	320	0.950
150	0.140	330	0.960
160	0.210	340	0.960
170	0.270	350	0.960

Figure 1E

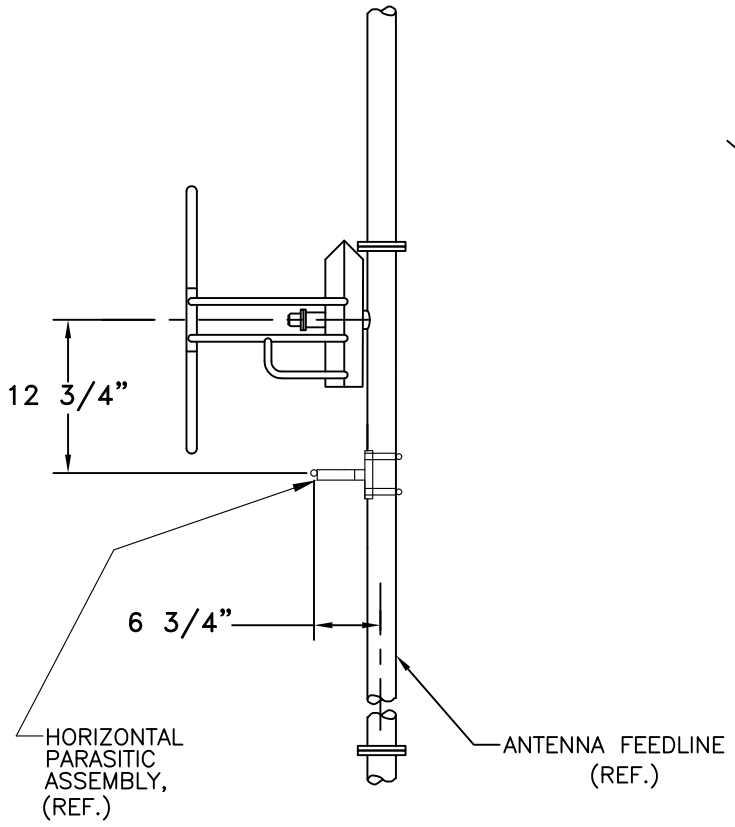
Tabulation of Composite Azimuth Pattern
KYRK Taft, TX

Azimuth	Rel Field	Azimuth	Rel Field
0	0.970	180	0.660
10	0.960	190	0.740
20	0.970	200	0.760
30	0.960	210	0.830
40	0.890	220	0.900
45	0.840	225	0.900
50	0.755	230	0.900
60	0.590	240	0.900
70	0.510	250	0.920
80	0.460	260	0.970
90	0.470	270	1.000
100	0.470	280	1.000
110	0.460	290	0.990
120	0.420	300	0.970
130	0.340	310	0.950
135	0.300	315	0.950
140	0.300	320	0.950
150	0.350	330	0.960
160	0.430	340	0.960
170	0.550	350	0.960

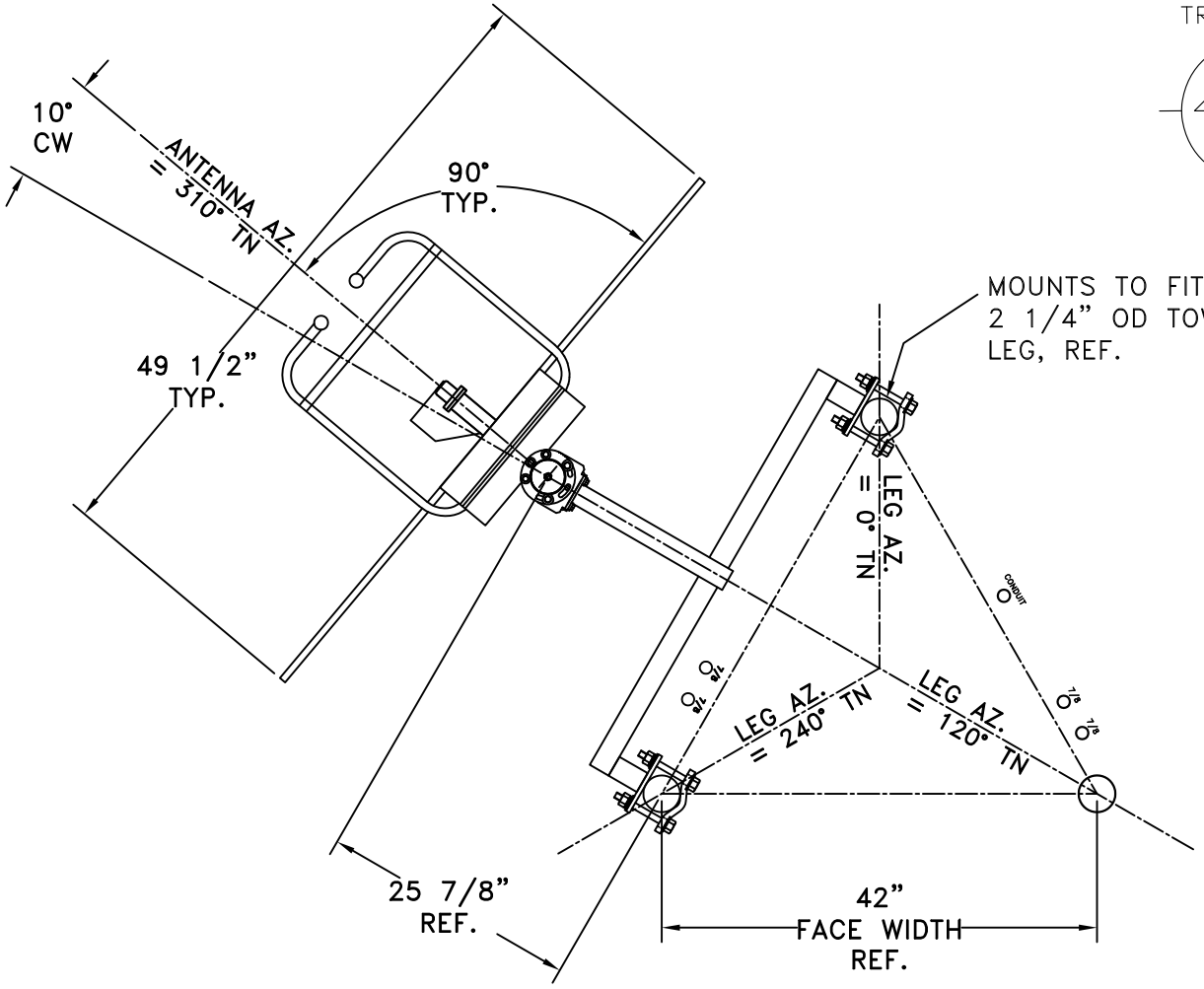
Figure 1F

Tabulation of FCC Directional Composite
KYRK Taft, TX

Azimuth	Rel Field	Azimuth	Rel Field
0	1.000	180	0.723
10	1.000	190	0.910
20	1.000	200	1.000
30	1.000	210	1.000
40	1.000	220	1.000
50	1.000	230	1.000
60	1.000	240	1.000
70	1.000	250	1.000
80	1.000	260	1.000
90	0.910	270	1.000
100	0.723	280	1.000
110	0.577	290	1.000
120	0.462	300	1.000
130	0.380	310	1.000
140	0.350	320	1.000
150	0.380	330	1.000
160	0.462	340	1.000
170	0.577	350	1.000



SIDE VIEW



TOP VIEW
TOWER: ALLIED 42" FACE

ANTENNA HEADING 310° TRUE NORTH

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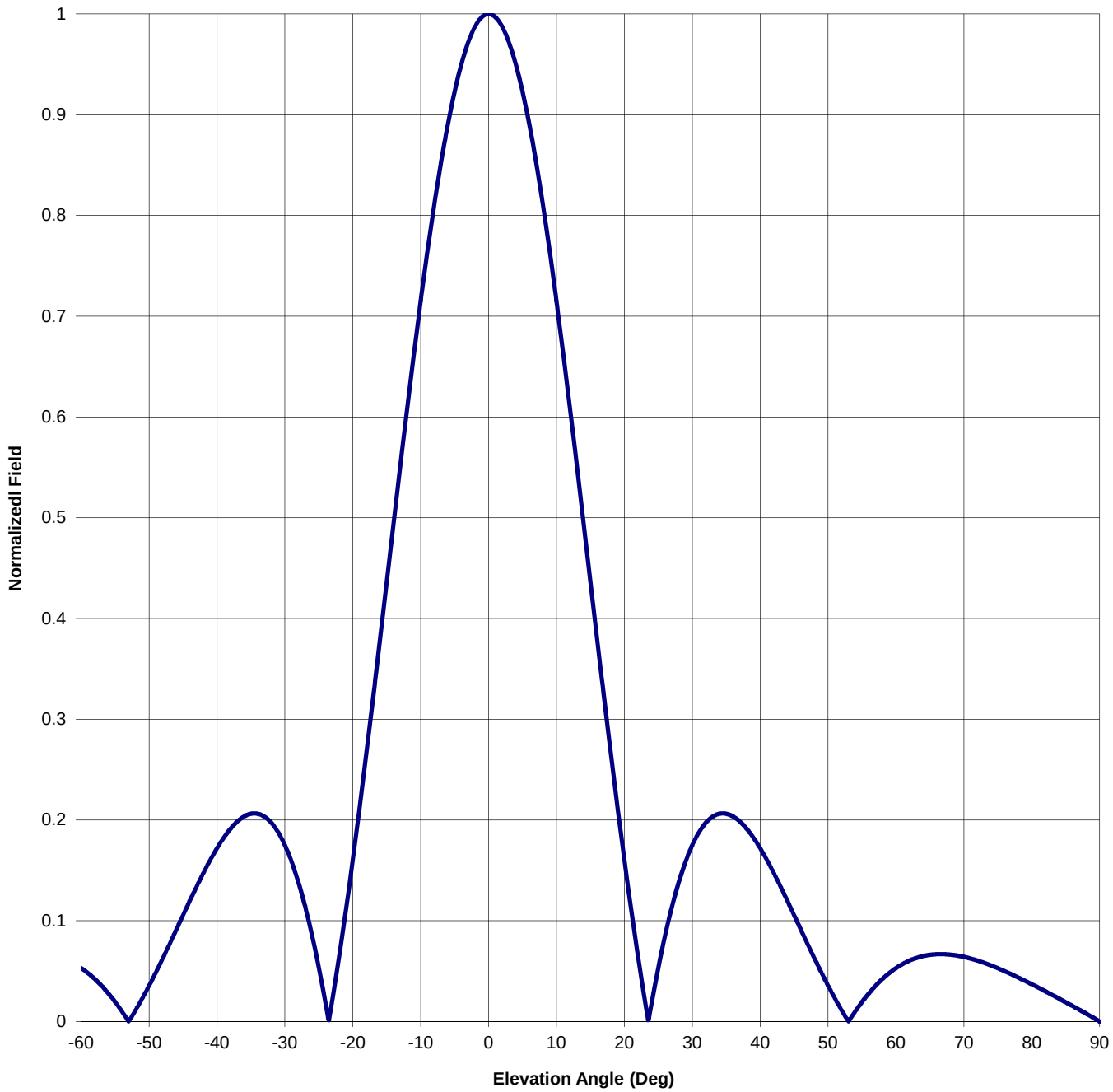
SHOP ORDER:	FREQUENCY:	SCALE:	DRAWN BY:
29127	106.5	N.T.S.	ASP
			APPROVED BY: DAB

TITLE: MODEL-6810-5-SS-DIRECTIONAL ANTENNA

DATE: 6/21/11

FIGURE 2

Antenna Mfg.:	**Shively Labs**			**Date: 6/22/2011**
Antenna Type:	**6810-5-SS-DA**			
Station:	**KYRK**	**Beam Tilt**	**0**	
Frequency:	**106.5**	**Gain (Max)**	**2.900**	**4.624 dB**
Channel #:	**293**	**Gain (Horizon)**	**2.900**	**4.624 dB**
Figure:	**3**			



Antenna Mfg.: Shively Labs
Antenna Type: 6810-5-SS-DA
Station: KYRK
Frequency: 106.5
Channel #: 293
Figure: 3

Beam Tilt 0
Gain (Max) 2.900 **4.624 dB**
Gain (Horizon) 2.900 **4.624 dB**

Date: 6/22/2011

Angle of Depression (Deg)	Relative Field	Angle of Depression (Deg)	Relative Field	Angle of Depression (Deg)	Relative Field	Angle of Depression (Deg)	Relative Field
-90	0.000	-44	0.120	0	1.000	46	0.091
-89	0.004	-43	0.134	1	0.997	47	0.077
-88	0.008	-42	0.147	2	0.987	48	0.063
-87	0.012	-41	0.160	3	0.972	49	0.049
-86	0.016	-40	0.172	4	0.950	50	0.036
-85	0.019	-39	0.182	5	0.923	51	0.023
-84	0.023	-38	0.191	6	0.890	52	0.011
-83	0.026	-37	0.199	7	0.853	53	0.000
-82	0.030	-36	0.204	8	0.811	54	0.010
-81	0.034	-35	0.206	9	0.765	55	0.020
-80	0.037	-34	0.206	10	0.715	56	0.028
-79	0.040	-33	0.203	11	0.663	57	0.036
-78	0.044	-32	0.197	12	0.608	58	0.042
-77	0.047	-31	0.188	13	0.552	59	0.048
-76	0.050	-30	0.175	14	0.494	60	0.053
-75	0.053	-29	0.158	15	0.437	61	0.057
-74	0.056	-28	0.138	16	0.379	62	0.061
-73	0.058	-27	0.114	17	0.322	63	0.063
-72	0.060	-26	0.086	18	0.266	64	0.065
-71	0.063	-25	0.054	19	0.212	65	0.066
-70	0.064	-24	0.018	20	0.160	66	0.067
-69	0.066	-23	0.022	21	0.111	67	0.067
-68	0.066	-22	0.065	22	0.065	68	0.066
-67	0.067	-21	0.111	23	0.022	69	0.066
-66	0.067	-20	0.160	24	0.018	70	0.064
-65	0.066	-19	0.212	25	0.054	71	0.063
-64	0.065	-18	0.266	26	0.086	72	0.060
-63	0.063	-17	0.322	27	0.114	73	0.058
-62	0.061	-16	0.379	28	0.138	74	0.056
-61	0.057	-15	0.437	29	0.158	75	0.053
-60	0.053	-14	0.494	30	0.175	76	0.050
-59	0.048	-13	0.552	31	0.188	77	0.047
-58	0.042	-12	0.608	32	0.197	78	0.044
-57	0.036	-11	0.663	33	0.203	79	0.040
-56	0.028	-10	0.715	34	0.206	80	0.037
-55	0.020	-9	0.765	35	0.206	81	0.034
-54	0.010	-8	0.811	36	0.204	82	0.030
-53	0.000	-7	0.853	37	0.199	83	0.026
-52	0.011	-6	0.890	38	0.191	84	0.023
-51	0.023	-5	0.923	39	0.182	85	0.019
-50	0.036	-4	0.950	40	0.172	86	0.016
-49	0.049	-3	0.972	41	0.160	87	0.012
-48	0.063	-2	0.987	42	0.147	88	0.008
-47	0.077	-1	0.997	43	0.134	89	0.004
-46	0.091	0	1.000	44	0.120	90	0.000
-45	0.106			45	0.106		

S.O. 29127 Figure 4

VALIDATION OF TOTAL POWER GAIN CALCULATION

KYRK 106.5 MHz Taft, TX

Model 6810-5-SS-DA

Elevation Gain of Antenna 1.629

Horizontal RMS value divided by the Vertical RMS value equals the Horiz. - Vert. Ratio

H RMS 0.758 V RMS 0.741 H/V Ratio 1.023

Elevation Gain of Horizontal Component 1.666

Elevation Gain of Vertical Component 1.592

Horizontal Azimuth Gain equals $1/(RMS)^2$. 1.740

Vertical Azimuth Gain equals $1/(RMS/Max\ Vert)^2$. 1.714

Max. Vertical 0.97

***Total Horizontal Power Gain is the Elevation Gain Times the Azimuth Gain**

Total Horizontal Power Gain = **2.900**

***Total Vertical Power Gain is the Elevation Gain Times the Azimuth Gain**

Total Vertical Power Gain = **2.729**

==========

ERP divided by Horizontal Power Gain equals Antenna Input Power

50 kW ERP Divided by H Gain 2.900 equals 17.240 kW H Antenna Input Power

Antenna Input Power times Vertical Power Gain equals Vertical ERP

17.240 kW Times V Gain 2.729 equals 47.045 kW V ERP

Maximum Value of the Vertical Component squared times the Maximum ERP equals the Vertical ERP

(0.97)^2 Times 50.00 Equals 47.045 kW Vertical ERP

NOTE: Calculating the ERP of the Vertical Component by two methods validates the total power gain calculations