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May 7, 2014

Shop Order 31660

Proof of Performance Report Acceptance

Attached is the Proof of Performance Report for KBYS licensed to Moss Bluff, LA. Please review or have your consultant review this Proof, to make sure that it complies with all the requirements of the CP and the FCC regulations. If you find the Proof acceptable, please let us know so we can close out our files. If on the other hand you find that there are changes that are required, please let us know.

Approved by Brad Thibodeaux

Title General Manager – KBYS

Date 5-8-14

MEMBER:
NAB BROADCASTERS
SOCIETY OF BROADCAST ENGINEERS
NATIONAL TRANSLATION ASSOCIATION
NRB NATIONAL RELIGIOUS BROADCASTERS

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S.O. 31660

Report of Test 6810-3-SS(0.7)-DA

for

Mcneese State University

KBYS 88.3 MHz Moss Bluff, LA

OBJECTIVE:

The objective of this test was to demonstrate the directional characteristics of a 6810-3-SS(0.7)-DA to meet the needs of KBYS and to comply with the requirements of the FCC construction permit, file number BMPED-20140107APJ. 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 BMPED-20140107APJ indicates that the Horizontal radiation component shall not exceed 1.00 kW at any azimuth and is restricted to the following values at the azimuths specified:

240 - 270 Degrees True: 0.032 kilowatts

From Figure 1A, the maximum radiation of the Horizontal component occurs at 55 Degrees True to 105 Degrees True. At the restricted azimuth of 240 - 270 Degrees True the Horizontal component is 16.082 dB down from the maximum of 1.00 kW, or 0.025 kW

The R.M.S. of the Horizontal component is 0.683. The total Horizontal power gain is 3.031. The R.M.S. of the Vertical component is 0.647. The total Vertical power gain is 2.526. See Figure 4 for calculations. The R.M.S. of the FCC composite pattern is 0.736. The R.M.S. of the measured composite pattern is 0.691. Eighty-five percent (85%) of the original authorized FCC composite pattern is 0.621. Therefore this pattern complies with the FCC requirement of 73.316(c)(2)(ix)(A).

METHOD OF DIRECTIONALIZATION:

One bay of the 6810-3-SS(0.7)-DA was mounted on a tower of precise scale to the Rohn 25 tower at the KBYS 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 BMPED-20140107APJ, a single level of the 6810-3-SS(0.7)-DA was set up on the Shively Labs 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

All testing is carried out in strict accordance with approved procedures under our ISO9001:2008.

TEST PROCEDURES:

The receiving antenna system is mounted so that the horizontal and vertical azimuth patterns are measured independently. The network analyzer was set to 397.35 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.

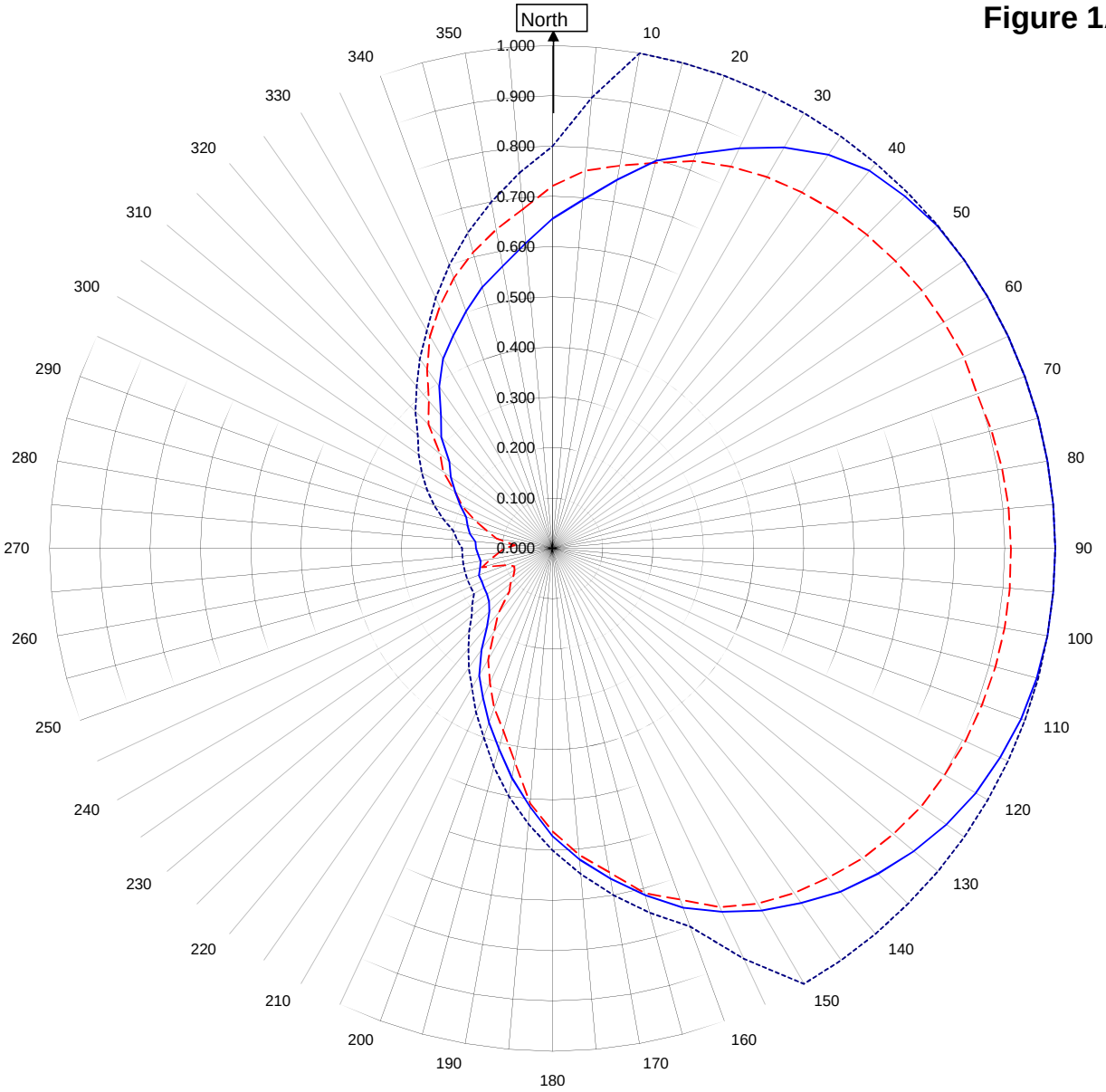
Respectfully submitted by:

Robert A. Surette
Director of Sales Engineering
S/O 31660
May 7, 2014

Shively Labs

Shively Labs, a division of Howell Laboratories, Inc. Bridgton, ME (207)647-3327

Figure 1A



KBYS MOSS BLUFF, LA.

31660

May 6, 2014

Horizontal RMS	0.683
Vertical RMS	0.647
H/V Composite RMS	0.691
FCC Composite RMS	0.736

Frequency	88.3 / 397.35 mHz
Plot	Relative Field
Scale	4.5 : 1
	See Figure 2 for Mechanical Details

Antenna Model	6810-3-SS(0.7)-DA
Pattern Type	Directional Azimuth

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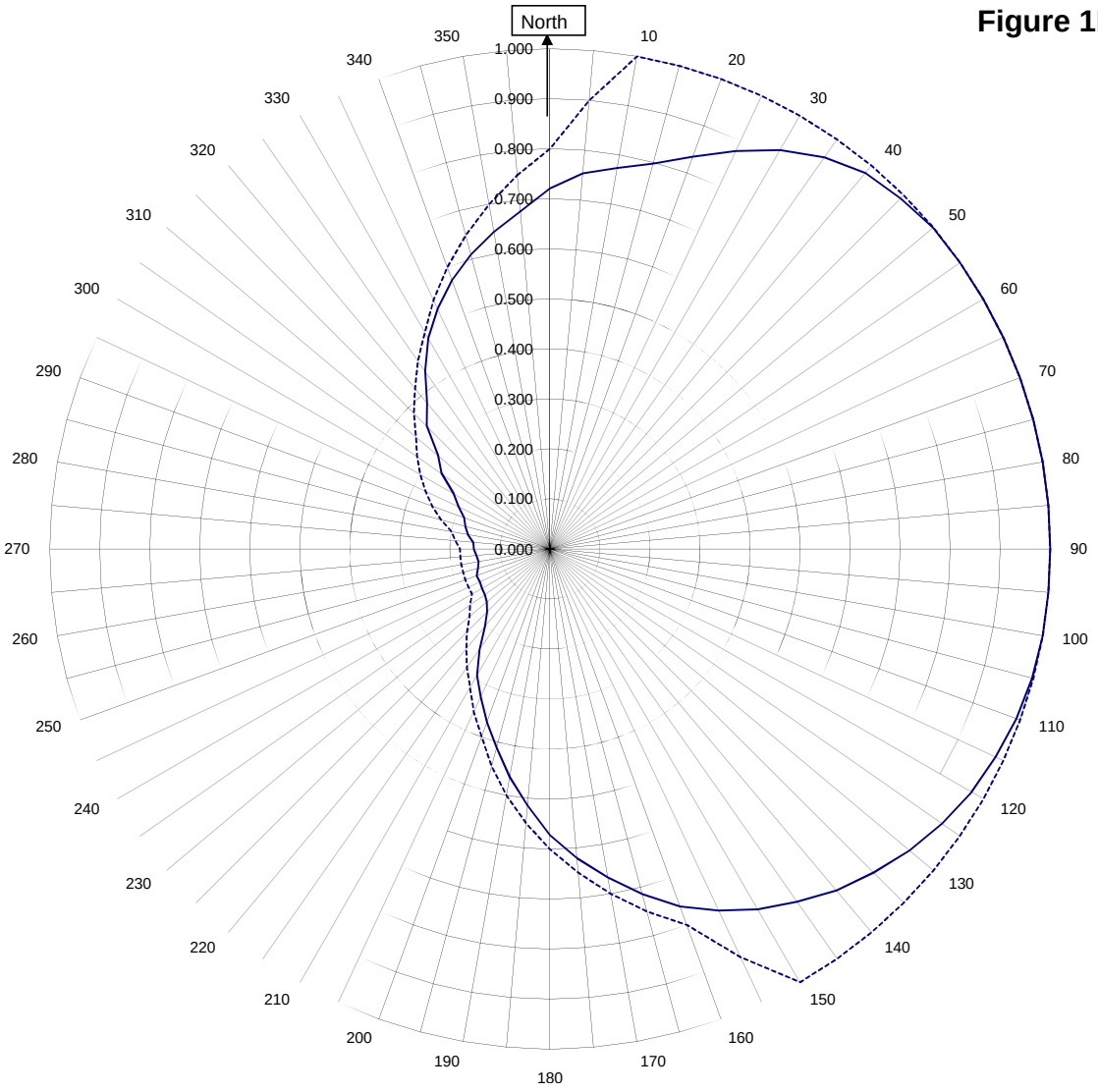
Figure 1B



KBYS MOSS BLUFF, LA.

31660

May 6, 2014

_____H/VComposite RMS	0.691
……FCC Composite RMS	0.736

Frequency	88.3 / 397.35 mHz
Plot	Relative Field
Scale	4.5 : 1
	See Figure 2 for Mechanical Details

Antenna Model	6810-3-SS(0.7)-DA
Pattern Type	Directional H/V Composite

Figure 1C

Tabulation of Horizontal Azimuth Pattern
KBYS MOSS BLUFF, LA.

Azimuth	Rel Field	Azimuth	Rel Field
0	0.656	180	0.572
10	0.745	190	0.463
20	0.835	200	0.369
30	0.921	210	0.292
40	0.981	220	0.203
45	0.991	225	0.178
50	0.999	230	0.165
60	1.000	240	0.157
70	1.000	250	0.156
80	1.000	260	0.145
90	1.000	270	0.152
100	1.000	280	0.167
110	0.992	290	0.183
120	0.973	300	0.223
130	0.937	310	0.268
135	0.915	315	0.313
140	0.891	320	0.345
150	0.831	330	0.435
160	0.760	340	0.502
170	0.667	350	0.570

Figure 1D

Tabulation of Vertical Azimuth Pattern
KBYS MOSS BLUFF, LA.

Azimuth	Rel Field	Azimuth	Rel Field
0	0.721	180	0.562
10	0.773	190	0.431
20	0.820	200	0.338
30	0.853	210	0.256
40	0.875	220	0.168
45	0.883	225	0.121
50	0.890	230	0.109
60	0.899	240	0.087
70	0.899	250	0.095
80	0.909	260	0.125
90	0.912	270	0.096
100	0.913	280	0.113
110	0.909	290	0.165
120	0.901	300	0.223
130	0.884	310	0.292
135	0.872	315	0.349
140	0.854	320	0.383
150	0.815	330	0.487
160	0.743	340	0.573
170	0.654	350	0.644

Figure 1E

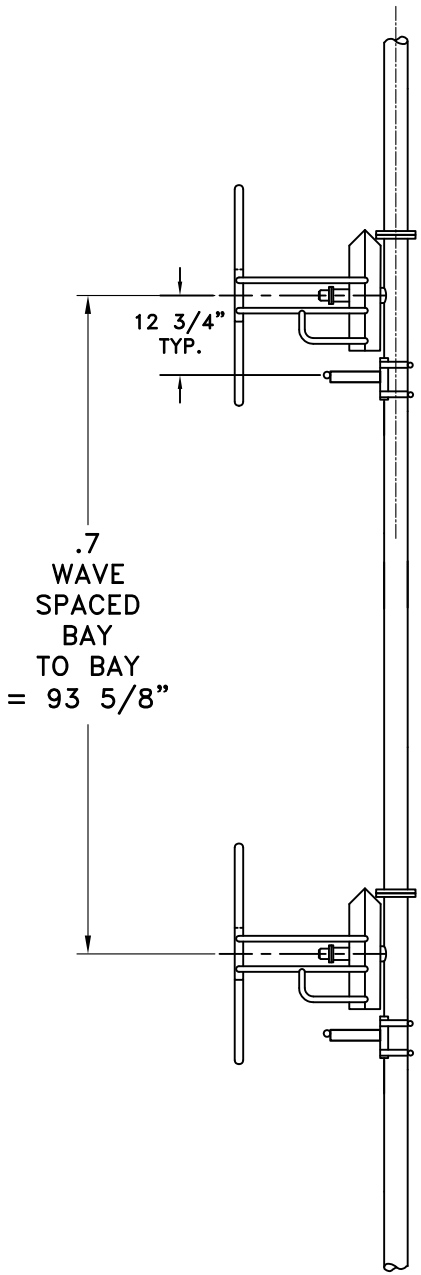
Tabulation of Composite Azimuth Pattern
KBYS MOSS BLUFF, LA.

Azimuth	Rel Field	Azimuth	Rel Field
0	0.721	180	0.572
10	0.773	190	0.463
20	0.835	200	0.369
30	0.921	210	0.292
40	0.981	220	0.203
45	0.991	225	0.178
50	0.999	230	0.165
60	1.000	240	0.157
70	1.000	250	0.156
80	1.000	260	0.145
90	1.000	270	0.152
100	1.000	280	0.167
110	0.992	290	0.183
120	0.973	300	0.223
130	0.937	310	0.292
135	0.915	315	0.349
140	0.891	320	0.383
150	0.831	330	0.487
160	0.760	340	0.573
170	0.667	350	0.644

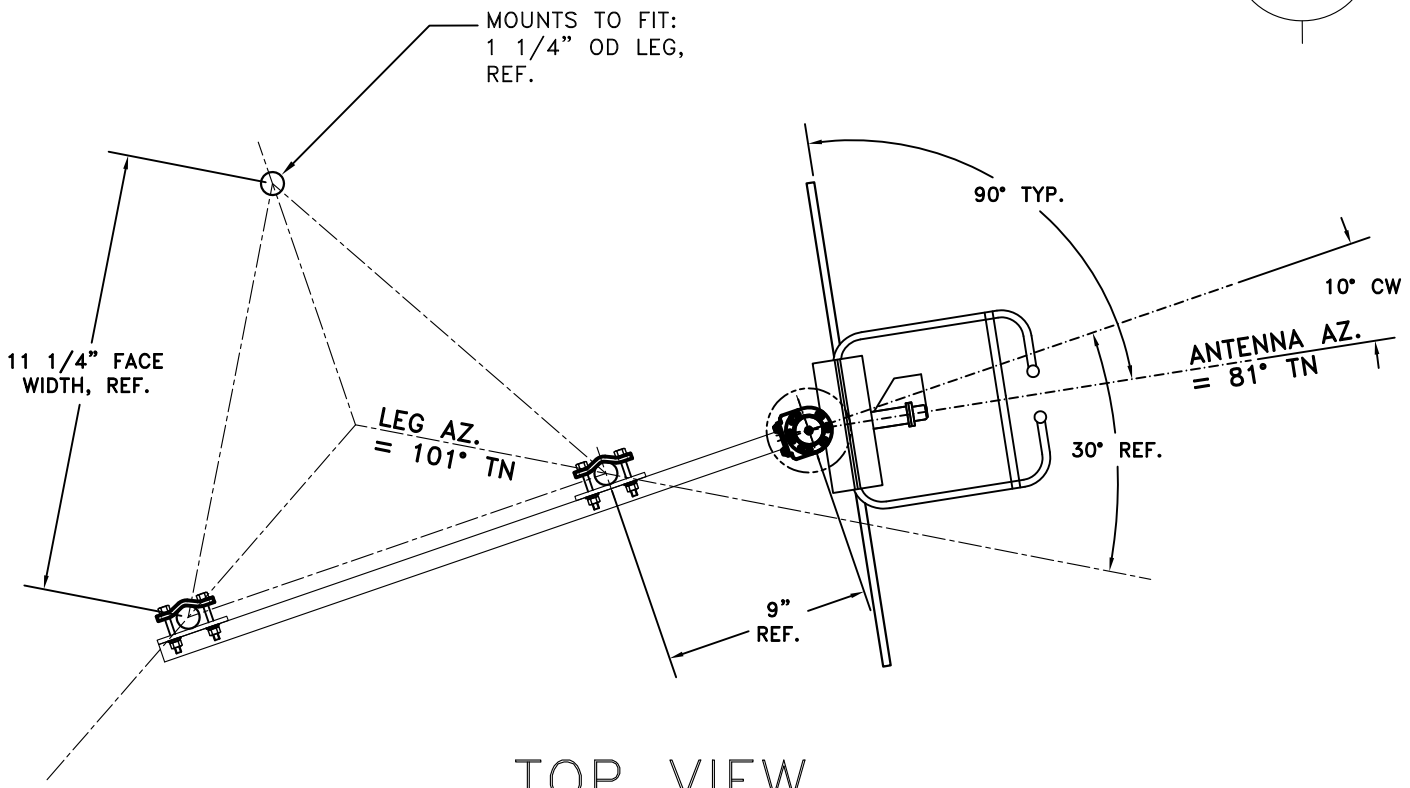
Figure 1F

Tabulation of FCC Directional Composite
KBYS MOSS BLUFF, LA.

Azimuth	Rel Field	Azimuth	Rel Field
0	0.800	180	0.600
10	1.000	190	0.500
20	1.000	200	0.400
30	1.000	210	0.320
40	1.000	220	0.260
50	1.000	230	0.210
60	1.000	240	0.180
70	1.000	250	0.180
80	1.000	260	0.180
90	1.000	270	0.180
100	1.000	280	0.200
110	1.000	290	0.250
120	1.000	300	0.300
130	1.000	310	0.350
140	1.000	320	0.420
150	1.000	330	0.500
160	0.800	340	0.600
170	0.700	350	0.700



SIDE VIEW



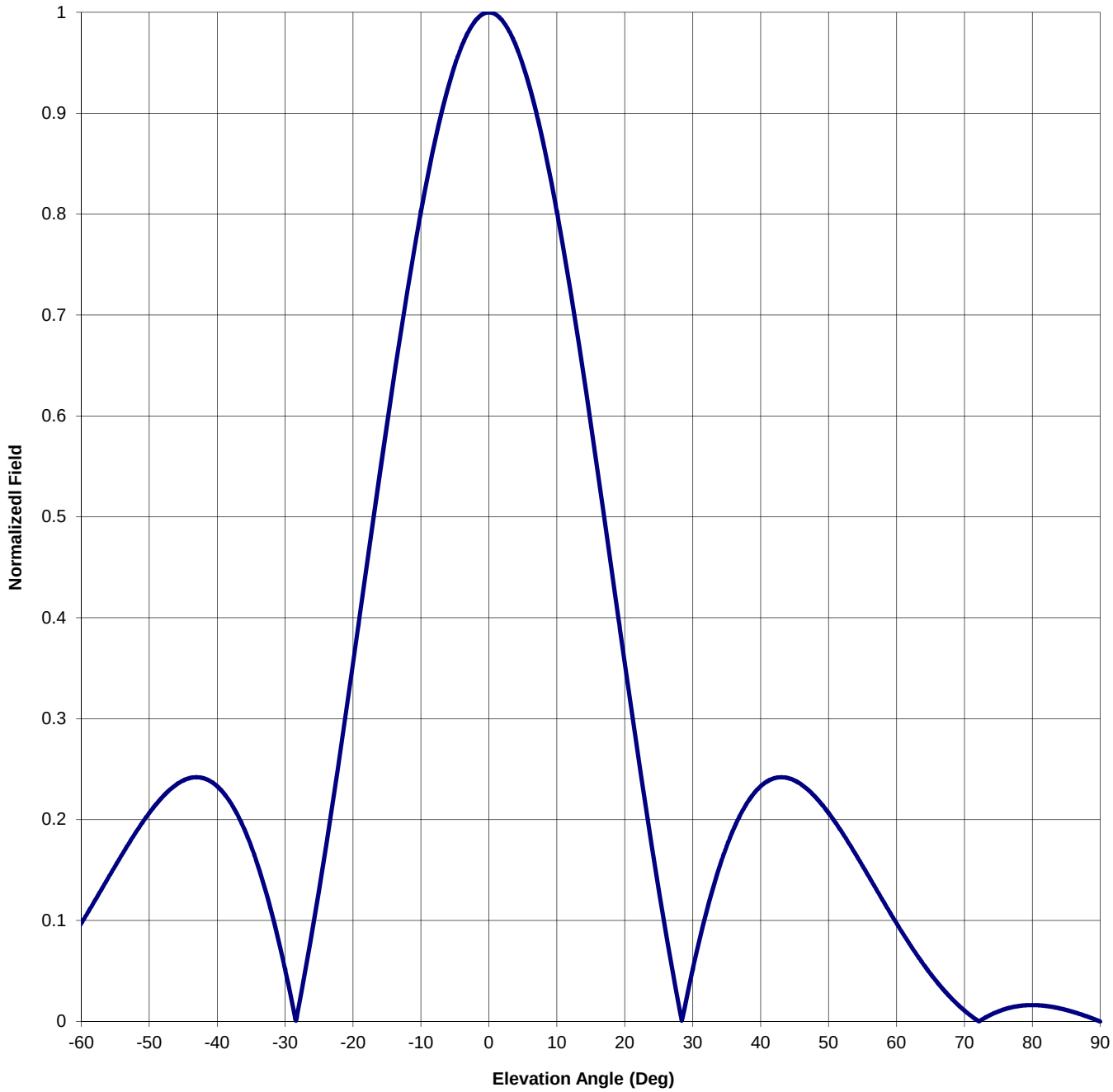
TOP VIEW

TOWER: ROHN 25

ANTENNA HEADING 81° TRUE NORTH

SHIVELY LABS A DIVISION OF HOWELL LABORATORIES INC.,BRIDGTON, MAINE			
SHOP ORDER: 31660	FREQUENCY: 88.3	SCALE: N.T.S.	DRAWN BY: ASP APPROVED BY: DAB
TITLE: MODEL-6810-3-.7SS-DIRECTIONAL ANTENNA			
DATE: 5-6-14	FIGURE 2		

Antenna Mfg.:	**Shively Labs**			**Date:**	**5/7/2014**
Antenna Type:	**6810-3-SS(0.7)-DA**				
Station:	**KBYS**	**Beam Tilt**	**0**		
Frequency:	**88.3**	**Gain (Max)**	**3.031**	**4.816**	**dB**
Channel #:	**202**	**Gain (Horizon)**	**3.031**	**4.816**	**dB**
Figure:	**Figure 3**				



Antenna Mfg.: Shively Labs **Date:** 5/7/2014

Antenna Type: 6810-3-SS(0.7)-DA

Station: KBYS **Beam Tilt** 0

Frequency: 88.3 **Gain (Max)** 3.031 4.816 dB

Channel #: 202 **Gain (Horizon)** 3.031 4.816 dB

Figure: Figure 3

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	0.241	0	1.000	46	0.235
-89	0.003	-43	0.242	1	0.998	47	0.229
-88	0.005	-42	0.241	2	0.992	48	0.223
-87	0.007	-41	0.238	3	0.981	49	0.215
-86	0.009	-40	0.233	4	0.967	50	0.207
-85	0.011	-39	0.226	5	0.948	51	0.197
-84	0.013	-38	0.216	6	0.926	52	0.187
-83	0.014	-37	0.205	7	0.900	53	0.177
-82	0.015	-36	0.190	8	0.871	54	0.166
-81	0.016	-35	0.174	9	0.838	55	0.154
-80	0.016	-34	0.154	10	0.803	56	0.143
-79	0.016	-33	0.132	11	0.765	57	0.131
-78	0.015	-32	0.108	12	0.724	58	0.120
-77	0.014	-31	0.081	13	0.682	59	0.108
-76	0.012	-30	0.052	14	0.638	60	0.097
-75	0.010	-29	0.020	15	0.592	61	0.086
-74	0.007	-28	0.015	16	0.546	62	0.076
-73	0.004	-27	0.051	17	0.498	63	0.066
-72	0.001	-26	0.090	18	0.451	64	0.056
-71	0.005	-25	0.130	19	0.403	65	0.047
-70	0.011	-24	0.173	20	0.355	66	0.039
-69	0.017	-23	0.217	21	0.308	67	0.031
-68	0.024	-22	0.262	22	0.262	68	0.024
-67	0.031	-21	0.308	23	0.217	69	0.017
-66	0.039	-20	0.355	24	0.173	70	0.011
-65	0.047	-19	0.403	25	0.130	71	0.005
-64	0.056	-18	0.451	26	0.090	72	0.001
-63	0.066	-17	0.498	27	0.051	73	0.004
-62	0.076	-16	0.546	28	0.015	74	0.007
-61	0.086	-15	0.592	29	0.020	75	0.010
-60	0.097	-14	0.638	30	0.052	76	0.012
-59	0.108	-13	0.682	31	0.081	77	0.014
-58	0.120	-12	0.724	32	0.108	78	0.015
-57	0.131	-11	0.765	33	0.132	79	0.016
-56	0.143	-10	0.803	34	0.154	80	0.016
-55	0.154	-9	0.838	35	0.174	81	0.016
-54	0.166	-8	0.871	36	0.190	82	0.015
-53	0.177	-7	0.900	37	0.205	83	0.014
-52	0.187	-6	0.926	38	0.216	84	0.013
-51	0.197	-5	0.948	39	0.226	85	0.011
-50	0.207	-4	0.967	40	0.233	86	0.009
-49	0.215	-3	0.981	41	0.238	87	0.007
-48	0.223	-2	0.992	42	0.241	88	0.005
-47	0.229	-1	0.998	43	0.242	89	0.003
-46	0.235	0	1.000	44	0.241	90	0.000
-45	0.239			45	0.239		

S.O. 31660 Figure 4

VALIDATION OF TOTAL POWER GAIN CALCULATION

KBYS MOSS BLUFF, LA.

MODEL 6810-3-SS(0.7)-DA

Elevation Gain of Antenna 1.339

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

H RMS 0.682997 V RMS 0.646887 H/V Ratio 1.056

Elevation Gain of Horizontal Component 1.414

Elevation Gain of Vertical Component 1.268

Horizontal Azimuth Gain equals $1/(RMS)^2$. 2.144

Vertical Azimuth Gain equals $1/(RMS/Max\ Vert)^2$. 1.992

Max. Vertical 0.913

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

Total Horizontal Power Gain = **3.031**

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

Total Vertical Power Gain = **2.526**

==========

ERP divided by Horizontal Power Gain equals Antenna Input Power

1 kW ERP Divided by H Gain 3.031 equals 0.330 kW H Antenna Input Power

Antenna Input Power times Vertical Power Gain equals Vertical ERP

0.330 kW Times V Gain 2.526 equals 0.834 kW V ERP

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

(0.913)^2 Times 1.00 Equals 0.834 kW Vertical ERP

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