Shively Labs®
a division of Howell Laboratories,Inc.

P. O. Box 389, 188 Harrison Rd.
Bridgton, Maine 04009 USA
(207) 647-3327
888-SHIVELY
Fax: (207) 647-8273
E-mail: sales@shively.com
Web site: www.shively.com

S.O. 36881

Report of Test 6810-5-SS-0.8

for

Alpha Media Licensee LLC

KTLH 107.9 MHz Hallsville, TX

OBJECTIVE:

The objective of this test was to demonstrate the directional characteristics of a 6810-5-SS-0.8 to meet the needs of KTLH and to comply with the requirements of the FCC construction permit, file number BMPH-20171109ACR. 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-20171109ACR 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:

200 Degrees True: 20 kilowatts

From Figure 1A, the maximum radiation of the Horizontal component occurs at 305 Degrees True. At the restricted azimuth of 200 Degrees True, the Horizontal component is 4.852 dB down from the maximum of 50 kW or 16.359 kW.

The R.M.S. of the Horizontal component is 0.763. The total Horizontal power gain is 4.364. The R.M.S. of the Vertical component is 0.744. The total Vertical power gain is 4.165. See Figure 4 for calculations. The R.M.S. of the FCC composite pattern is 0.967. The R.M.S. of the measured composite pattern is 0.828. Eighty-five percent (85%) of the original authorized FCC composite pattern is 0.822. 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-0.8 was mounted on a tower of precise scale to the Rohn 80 tower at the KTLH site. The spacing of the antenna to the tower and vertical parasitics were varied to achieve the horizontal and vertical patterns shown in Figure 1A. See Figure 2 for mechanical details.

METHOD OF MEASUREMENT:

As allowed by the construction permit, file number BMPH-20171109ACR, a single level of the 6810-5-SS-0.8 was set up on the Shively Labs scale model antenna pattern measuring range. A scale of 4.5:1 was used.

EQUIPMENT:

The 4.5:1 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 parabolic dish 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 Hypercell Superflex and Cellflex lCF cabling respectively.

The control building is equipped with:

Hewlett Packard Model 4395-A Network Analyzer

PC Based Controller

Output Standard Printer or 'pdf'

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

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 485.55 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:

John Bliss

John Bliss
Vice President of Operations

S/O 36881
Date 10 Jan 2020

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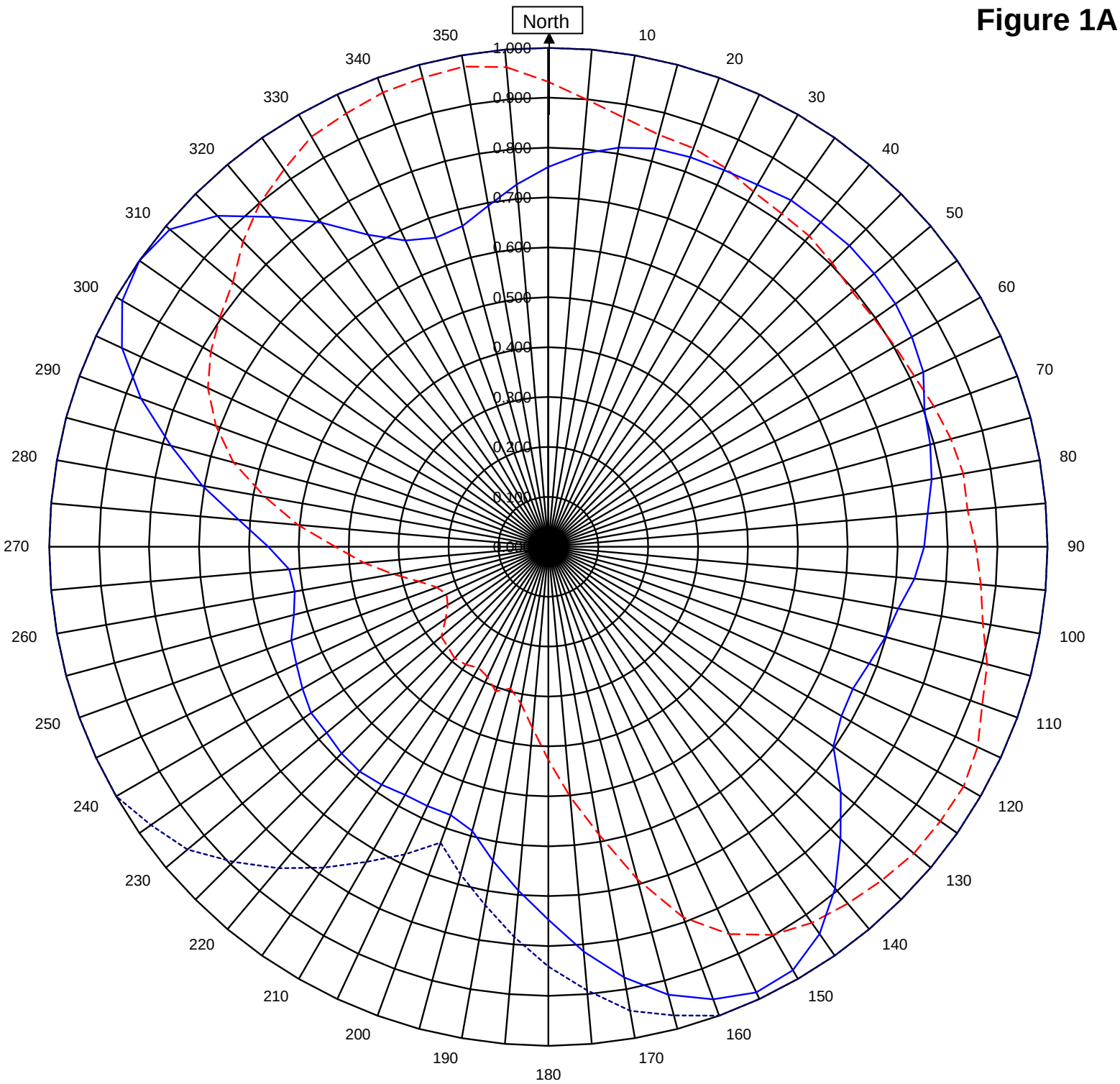
Figure 1A



KTLH Hallsville, TX

36881

January 3, 2020

Horizontal RMS	0.763
Vertical RMS	0.744
H/V Composite RMS	0.828
FCC Composite RMS	0.967

Frequency	107.9 / 485.55 mHz
Plot	Relative Field
Scale	4.5 : 1
	See Figure 2 for Mechanical Details

Antenna Model	6810-5-SS-0.8
Pattern Type	Directional Azimuth

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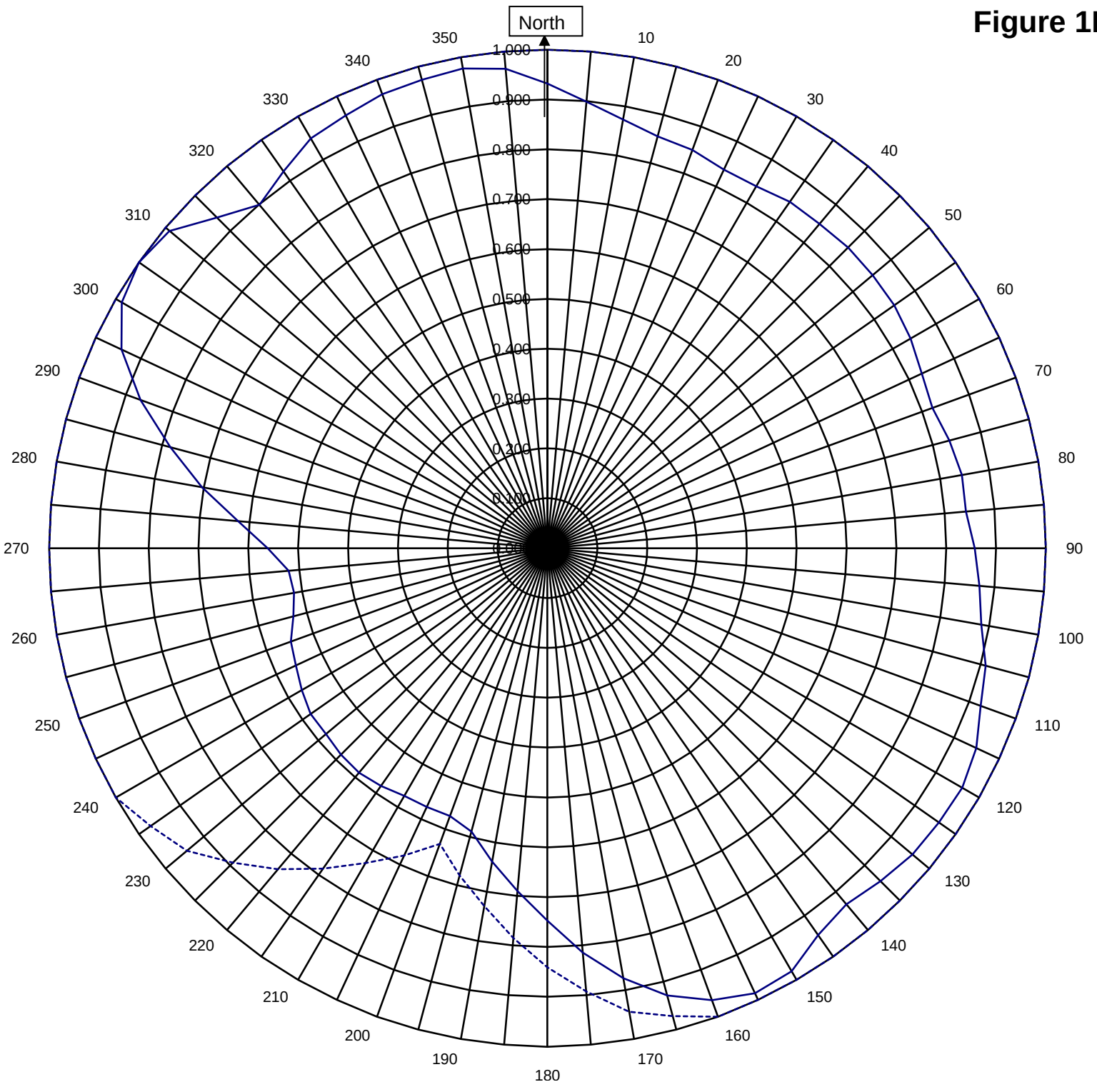
Figure 1B



KTLH Hallsville, TX

36881

January 3, 2020

_____H/VComposite RMS	0.828
……..FCC Composite RMS	0.967

Frequency	107.9 / 485.55 mHz
Plot	Relative Field
Scale	4.5 : 1
	See Figure 2 for Mechanical Details

Antenna Model	6810-5-SS-0.8
Pattern Type	Directional H/V Composite

Figure 1C

Tabulation of Horizontal Azimuth Pattern
KTLH Hallsville, TX

Azimuth	Rel Field	Azimuth	Rel Field
0	0.761	180	0.747
10	0.812	190	0.639
20	0.831	200	0.572
30	0.838	210	0.574
40	0.849	220	0.588
45	0.853	225	0.586
50	0.852	230	0.580
60	0.841	240	0.569
70	0.802	250	0.548
80	0.780	260	0.516
90	0.753	270	0.561
100	0.712	280	0.704
110	0.684	290	0.869
120	0.678	300	0.986
130	0.765	310	0.990
135	0.828	315	0.938
140	0.894	320	0.863
150	0.980	330	0.722
160	0.965	340	0.659
170	0.876	350	0.694

Figure 1D

Tabulation of Vertical Azimuth Pattern
KTLH Hallsville, TX

Azimuth	Rel Field	Azimuth	Rel Field
0	0.932	180	0.427
10	0.873	190	0.318
20	0.850	200	0.308
30	0.822	210	0.280
40	0.813	220	0.292
45	0.804	225	0.284
50	0.795	230	0.280
60	0.802	240	0.233
70	0.822	250	0.238
80	0.844	260	0.316
90	0.857	270	0.427
100	0.884	280	0.576
110	0.925	290	0.709
120	0.961	300	0.781
130	0.956	310	0.825
135	0.945	315	0.865
140	0.933	320	0.899
150	0.898	330	0.949
160	0.790	340	0.969
170	0.586	350	0.977

Figure 1E

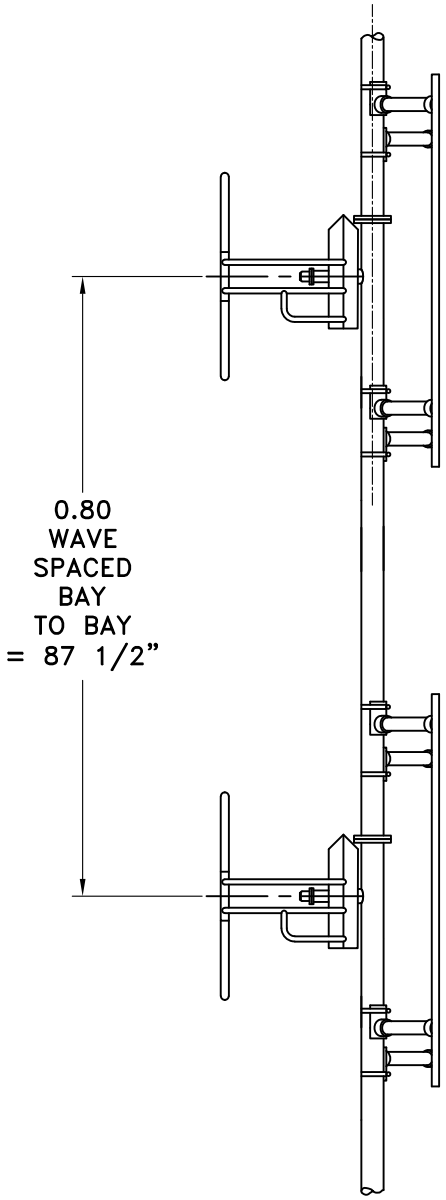
Tabulation of Composite Azimuth Pattern
KTLH Hallsville, TX

Azimuth	Rel Field	Azimuth	Rel Field
0	0.932	180	0.747
10	0.873	190	0.639
20	0.850	200	0.572
30	0.838	210	0.574
40	0.849	220	0.588
45	0.853	225	0.586
50	0.852	230	0.580
60	0.841	240	0.569
70	0.822	250	0.548
80	0.844	260	0.516
90	0.857	270	0.561
100	0.884	280	0.704
110	0.925	290	0.869
120	0.961	300	0.986
130	0.956	310	0.990
135	0.945	315	0.938
140	0.933	320	0.899
150	0.980	330	0.949
160	0.965	340	0.969
170	0.876	350	0.977

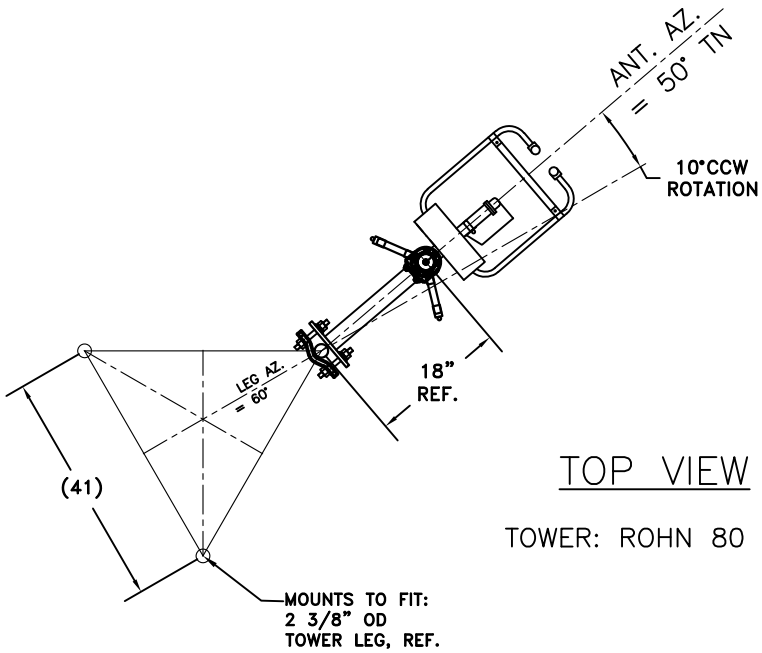
Figure 1F

Tabulation of FCC Directional Composite
KTLH Hallsville, TX

Azimuth	Rel Field	Azimuth	Rel Field
0	1.000	180	0.841
10	1.000	190	0.729
20	1.000	200	0.631
30	1.000	210	0.729
40	1.000	220	0.841
50	1.000	230	0.944
60	1.000	240	1.000
70	1.000	250	1.000
80	1.000	260	1.000
90	1.000	270	1.000
100	1.000	280	1.000
110	1.000	290	1.000
120	1.000	300	1.000
130	1.000	310	1.000
140	1.000	320	1.000
150	1.000	330	1.000
160	1.000	340	1.000
170	0.944	350	1.000



SIDE VIEW



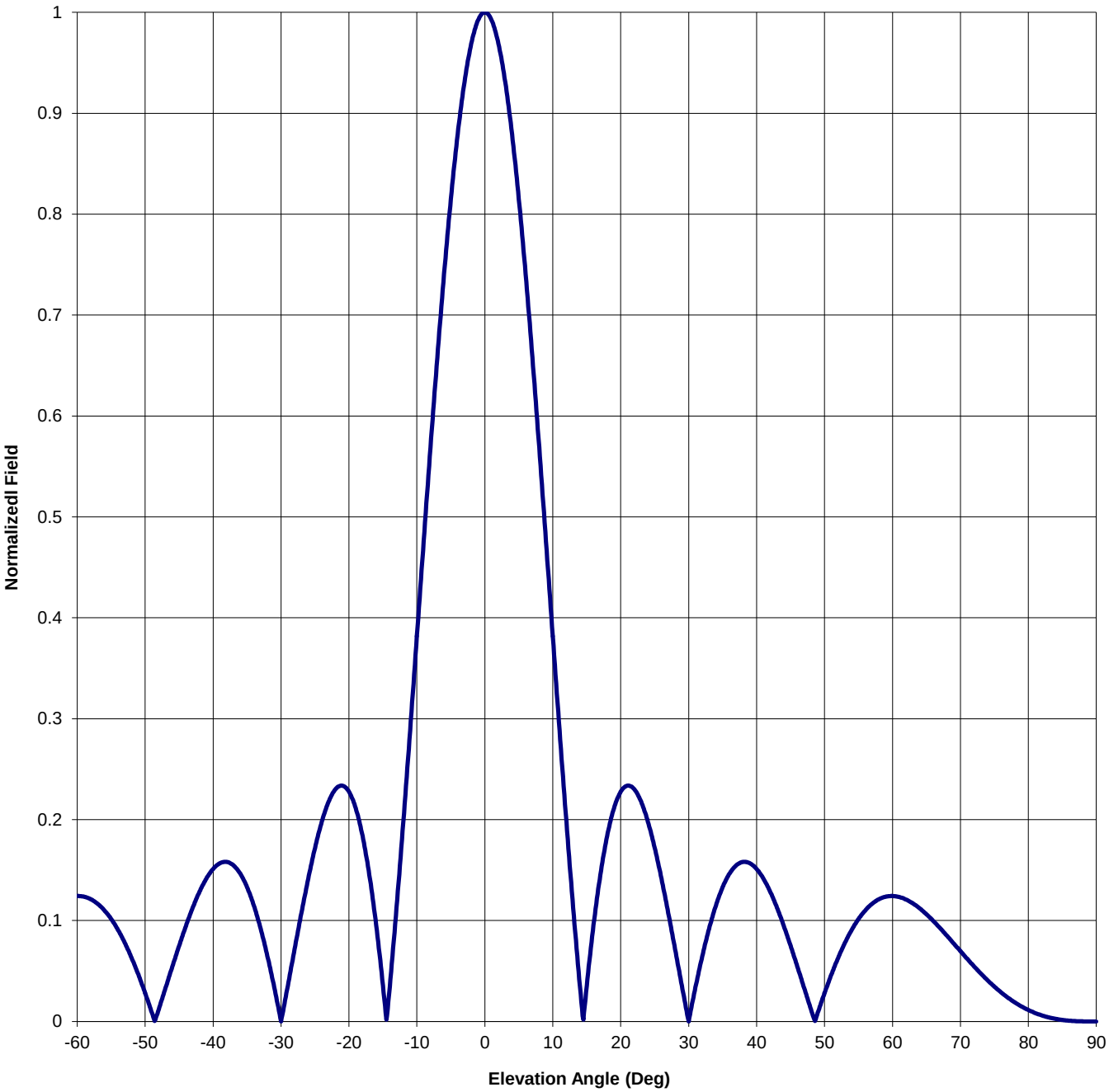
TOP VIEW

TOWER: ROHN 80

ANTENNA HEADING 50° TRUE NORTH

SHIVELY LABS A DIVISION OF HOWELL LABORATORIES INC.,BRIDGTON, MAINE			
SHOP ORDER: 36881	FREQUENCY: 107.9	SCALE: N.T.S.	DRAWN BY: ASP APPROVED BY: _
TITLE: MODEL-6810-5-.80SS-DIRECTIONAL ANTENNA			
DATE: 1/9/20	FIGURE 2		

Antenna Mfg.:	**Shively Labs**			**Date:**	**1/3/2020**
Antenna Type:	**6810-5-SS-0.8**				
Station:	**KTLH**	**Beam Tilt**	**0**		
Frequency:	**107.9**	**Gain (Max)**	**2.479**	**3.943**	**dB**
Channel #:	**300**	**Gain (Horizon)**	**2.479**	**3.943**	**dB**
Figure:	**Figure 3**				



Antenna Mfg.: Shively Labs **Date:** 1/3/2020

Antenna Type: 6810-5-SS-0.8

Station: KTLH **Beam Tilt** 0

Frequency: 107.9 **Gain (Max)** 2.479 3.943 dB

Channel #: 300 **Gain (Horizon)** 2.479 3.943 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	0.095	0	1.000	46	0.054
-89	0.000	-43	0.113	1	0.992	47	0.033
-88	0.000	-42	0.129	2	0.969	48	0.012
-87	0.000	-41	0.142	3	0.931	49	0.008
-86	0.001	-40	0.151	4	0.879	50	0.028
-85	0.001	-39	0.157	5	0.815	51	0.046
-84	0.003	-38	0.158	6	0.741	52	0.063
-83	0.004	-37	0.155	7	0.658	53	0.078
-82	0.006	-36	0.146	8	0.569	54	0.091
-81	0.008	-35	0.133	9	0.476	55	0.102
-80	0.011	-34	0.115	10	0.382	56	0.110
-79	0.015	-33	0.092	11	0.288	57	0.117
-78	0.019	-32	0.065	12	0.198	58	0.121
-77	0.024	-31	0.034	13	0.113	59	0.124
-76	0.029	-30	0.000	14	0.034	60	0.124
-75	0.035	-29	0.035	15	0.035	61	0.123
-74	0.041	-28	0.072	16	0.096	62	0.121
-73	0.048	-27	0.108	17	0.145	63	0.117
-72	0.055	-26	0.141	18	0.184	64	0.112
-71	0.062	-25	0.172	19	0.211	65	0.106
-70	0.070	-24	0.198	20	0.228	66	0.100
-69	0.077	-23	0.218	21	0.234	67	0.093
-68	0.085	-22	0.230	22	0.230	68	0.085
-67	0.093	-21	0.234	23	0.218	69	0.077
-66	0.100	-20	0.228	24	0.198	70	0.070
-65	0.106	-19	0.211	25	0.172	71	0.062
-64	0.112	-18	0.184	26	0.141	72	0.055
-63	0.117	-17	0.145	27	0.108	73	0.048
-62	0.121	-16	0.096	28	0.072	74	0.041
-61	0.123	-15	0.035	29	0.035	75	0.035
-60	0.124	-14	0.034	30	0.000	76	0.029
-59	0.124	-13	0.113	31	0.034	77	0.024
-58	0.121	-12	0.198	32	0.065	78	0.019
-57	0.117	-11	0.288	33	0.092	79	0.015
-56	0.110	-10	0.382	34	0.115	80	0.011
-55	0.102	-9	0.476	35	0.133	81	0.008
-54	0.091	-8	0.569	36	0.146	82	0.006
-53	0.078	-7	0.658	37	0.155	83	0.004
-52	0.063	-6	0.741	38	0.158	84	0.003
-51	0.046	-5	0.815	39	0.157	85	0.001
-50	0.028	-4	0.879	40	0.151	86	0.001
-49	0.008	-3	0.931	41	0.142	87	0.000
-48	0.012	-2	0.969	42	0.129	88	0.000
-47	0.033	-1	0.992	43	0.113	89	0.000
-46	0.054	0	1.000	44	0.095	90	0.000
-45	0.075			45	0.075		

S.O. 36881 Figure 4

VALIDATION OF TOTAL POWER GAIN CALCULATION

KTLH Hallsville, TX

MODEL 6810-5-SS-0.8

Elevation Gain of Antenna 2.479

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

H RMS 0.763337 V RMS 0.744246 H/V Ratio 1.026

Elevation Gain of Horizontal Component 2.543

Elevation Gain of Vertical Component 2.417

Horizontal Azimuth Gain equals $1/(RMS)^2$. 1.716

Vertical Azimuth Gain equals $1/(RMS/Max\ Vert)^2$. 1.723

Max. Vertical 0.977

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

Total Horizontal Power Gain = **4.364**

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

Total Vertical Power Gain = **4.165**

==========

ERP divided by Horizontal Power Gain equals Antenna Input Power

50 kW ERP Divided by H Gain 4.364 equals 11.458 kW H Antenna Input Power

Antenna Input Power times Vertical Power Gain equals Vertical ERP

11.458 kW Times V Gain 4.165 equals 47.726 kW V ERP

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

(0.977)^2 Times 50.00 Equals 47.726 kW Vertical ERP

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