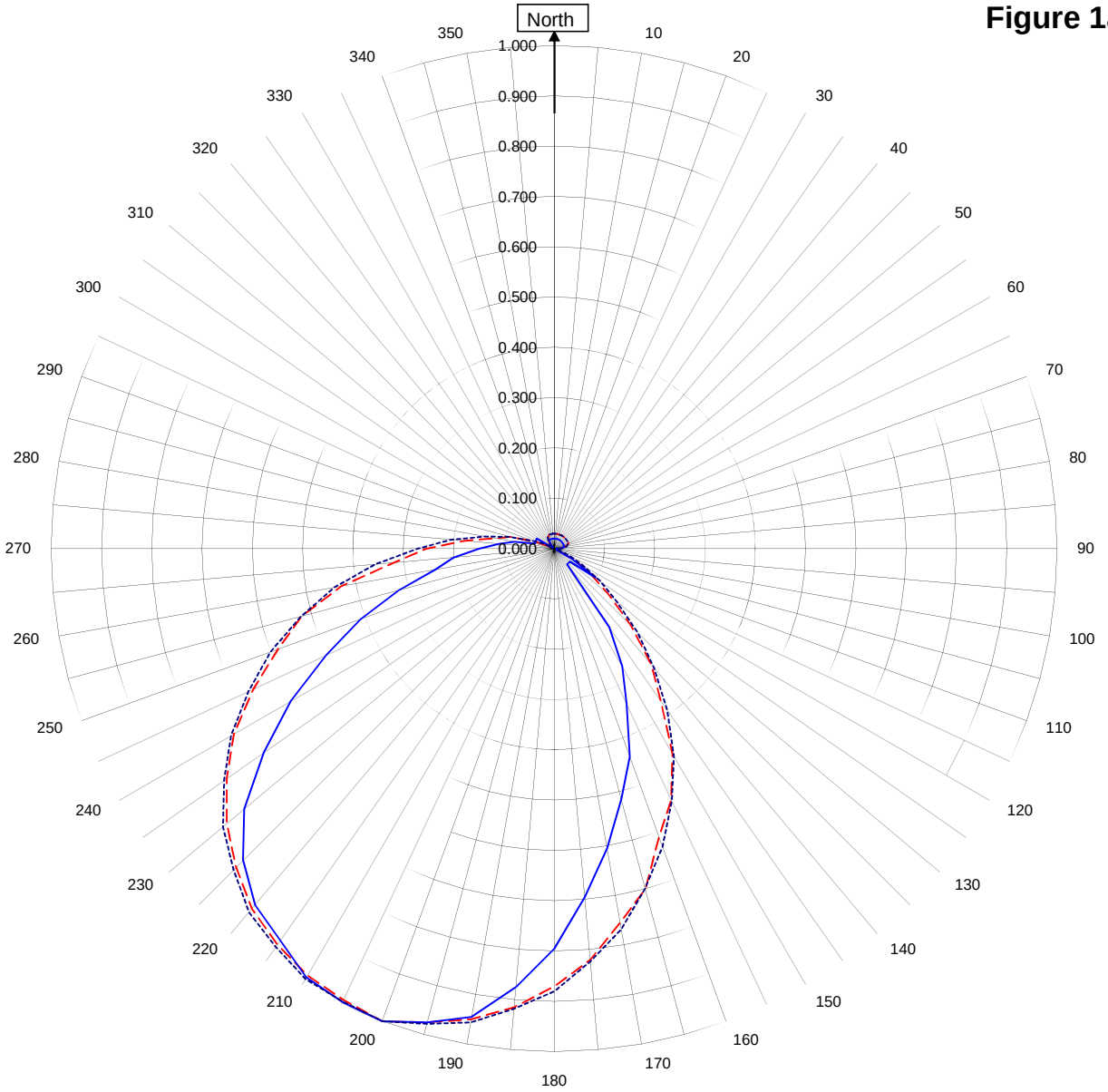
Shively Labs

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

Figure 1a



KHOL Jackson, WY

KHOL

August 9, 2010

Horizontal RMS	0.416
Vertical RMS	0.461
H/V Composite RMS	0.461
FCC Composite RMS	0.467

Frequency	89.1 / 400.95 mHz
Plot	Relative Field
Scale	4.5 : 1
	See Figure 2 for Mechanical Details

Antenna Model	Scala CLFM-8 H & V
Pattern Type	Directional Azimuth

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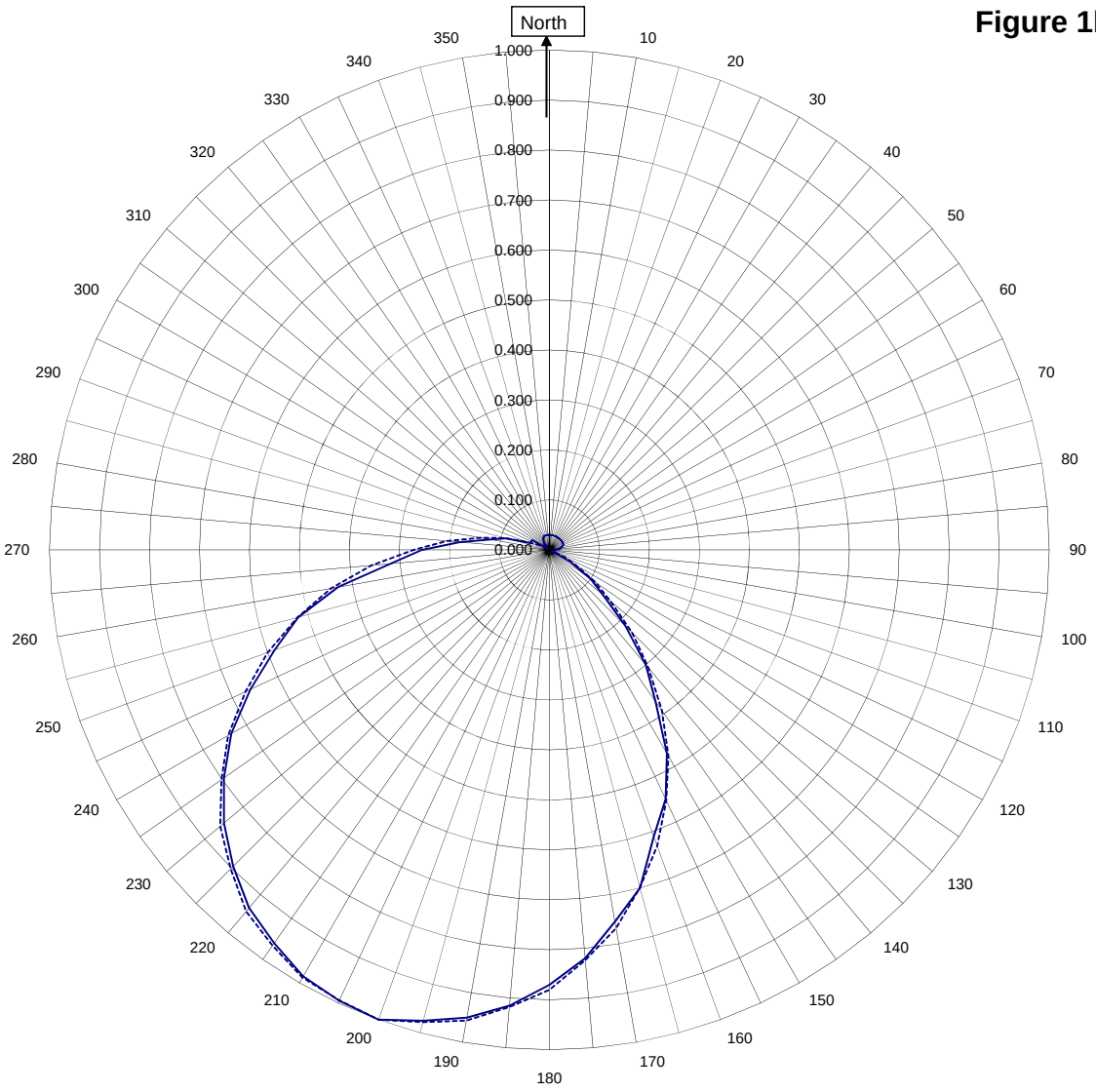
Figure 1b



KHOL Jackson, WY

KHOL

August 9, 2010

_____H/VComposite RMS	0.461
……..FCC Composite RMS	0.467

Frequency	89.1 / 400.95 mHz
Plot	Relative Field
Scale	4.5 : 1
	See Figure 2 for Mechanical Details

Antenna Model	Scala CLFM-8 H & V
Pattern Type	Directional H/V Composite

Figure 1a

Tabulation of Horizontal Azimuth Pattern
KHOL Jackson, WY

Azimuth	Rel Field	Azimuth	Rel Field
0	0.020	180	0.795
10	0.020	190	0.945
20	0.020	200	1.000
30	0.020	210	0.985
40	0.020	220	0.925
45	0.020	225	0.875
50	0.020	230	0.805
60	0.020	240	0.605
70	0.020	250	0.410
80	0.020	260	0.240
90	0.010	270	0.150
100	0.005	280	0.080
110	0.005	290	0.040
120	0.040	300	0.040
130	0.040	310	0.004
135	0.040	315	0.004
140	0.040	320	0.010
150	0.270	330	0.020
160	0.440	340	0.020
170	0.605	350	0.020

Figure 1b

Tabulation of Vertical Azimuth Pattern
KHOL Jackson, WY

Azimuth	Rel Field	Azimuth	Rel Field
0	0.030	180	0.870
10	0.030	190	0.950
20	0.030	200	1.000
30	0.030	210	0.980
40	0.030	220	0.935
45	0.030	225	0.895
50	0.030	230	0.850
60	0.030	240	0.735
70	0.030	250	0.585
80	0.020	260	0.430
90	0.010	270	0.255
100	0.006	280	0.120
110	0.004	290	0.040
120	0.050	300	0.004
130	0.140	310	0.006
135	0.215	315	0.010
140	0.300	320	0.014
150	0.470	330	0.024
160	0.610	340	0.030
170	0.755	350	0.030

Figure 1c

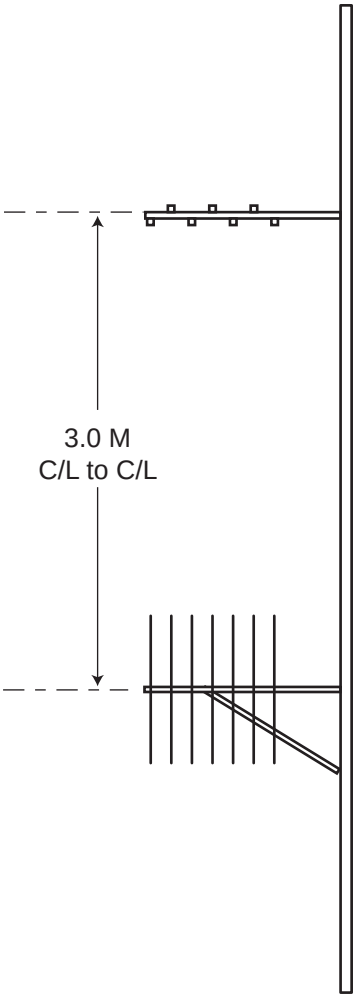
Tabulation of Composite Azimuth Pattern
KHOL Jackson, WY

Azimuth	Rel Field	Azimuth	Rel Field
0	0.030	180	0.870
10	0.030	190	0.950
20	0.030	200	1.000
30	0.030	210	0.985
40	0.030	220	0.935
45	0.030	225	0.895
50	0.030	230	0.850
60	0.030	240	0.735
70	0.030	250	0.585
80	0.020	260	0.430
90	0.010	270	0.255
100	0.006	280	0.120
110	0.005	290	0.040
120	0.050	300	0.040
130	0.140	310	0.006
135	0.215	315	0.010
140	0.300	320	0.014
150	0.470	330	0.024
160	0.610	340	0.030
170	0.755	350	0.030

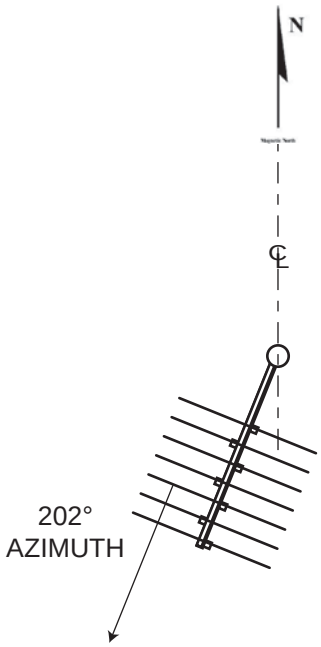
Figure 1d

Tabulation of FCC Directional Composite
KHOL Jackson, WY

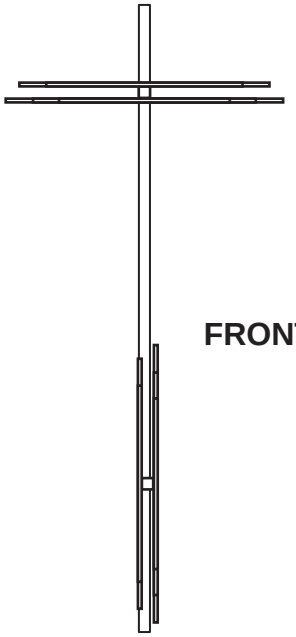
Azimuth	Rel Field	Azimuth	Rel Field
0	0.030	180	0.880
10	0.030	190	0.956
20	0.030	200	1.000
30	0.030	210	0.988
40	0.030	220	0.944
50	0.030	230	0.860
60	0.030	240	0.742
70	0.030	250	0.600
80	0.024	260	0.444
90	0.014	270	0.272
100	0.007	280	0.140
110	0.006	290	0.043
120	0.062	300	0.005
130	0.160	310	0.008
140	0.308	320	0.016
150	0.476	330	0.026
160	0.630	340	0.030
170	0.768	350	0.030



ELEVATION VIEW



TOP VIEW



FRONT VIEW

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SHIVELY LABS

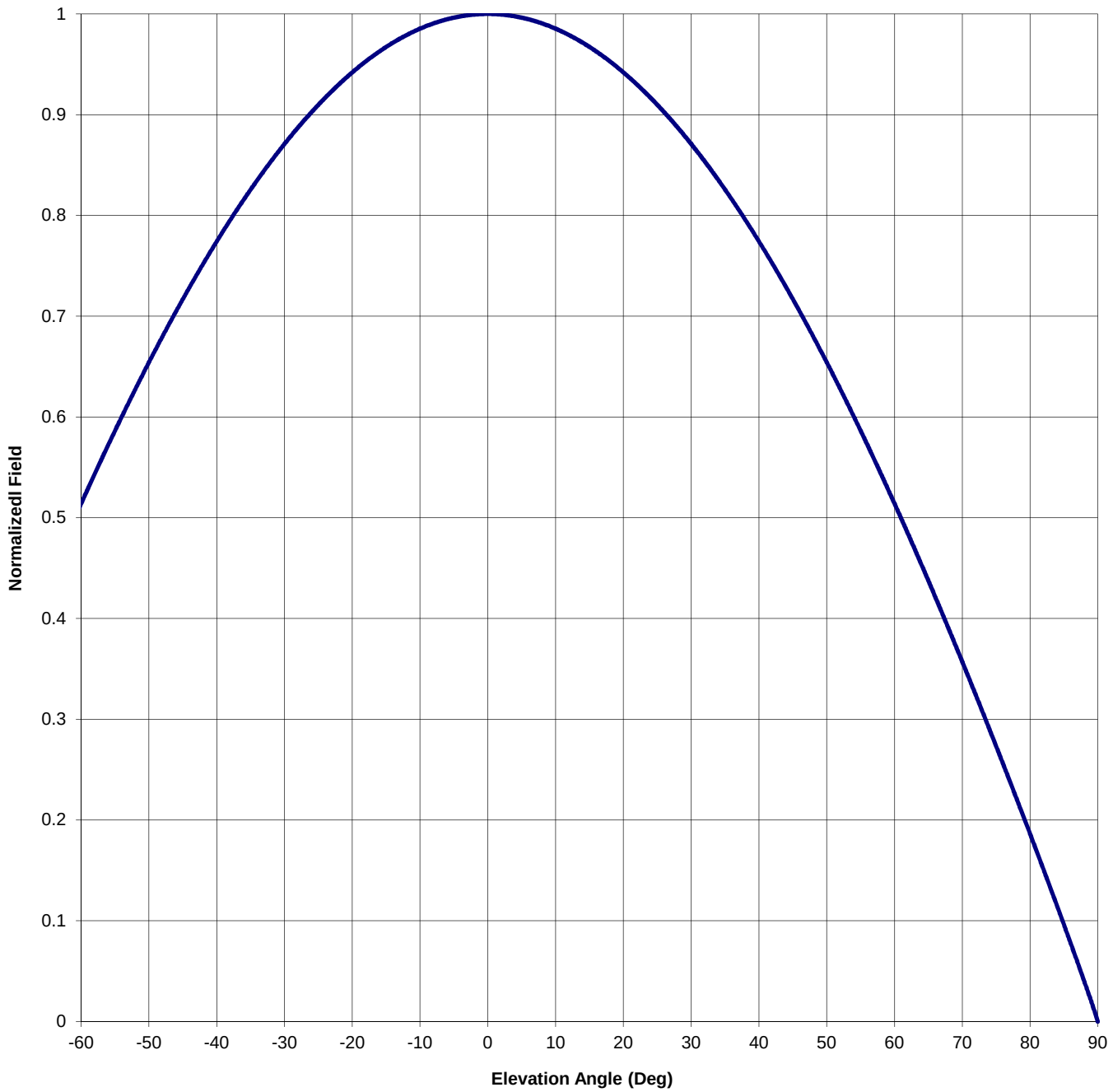
DIV. HOWELL LABS **BRIDGTON, MAINE USA**

FIGURE 2, KHOL
SCALA YAGI, 89.1 MHz

SIZE	CODE IDENT. NO.	DRAWING NO.	REV
A	26750	AGF110407-001	—

SCALE		SHEET
NONE		1 OF 1

Antenna Mfg.:	**Shively Labs**			**Date:**	**4/6/2011**
Antenna Type:	**Scala CLFM-8 H&V**				
Station:	**KHOL**	**Beam Tilt**	**0**		
Frequency:	**89.1**	**Gain (Max)**	**5.647**	**7.518**	**dB**
Channel #:	**206**	**Gain (Horizon)**	**5.647**	**7.518**	**dB**
Figure:	**Figure 3**				



Antenna Mfg.: Shively Labs **Date:** 4/6/2011

Antenna Type: Scala CLFM-8 H&V

Station: KHOL **Beam Tilt** 0

Frequency: 89.1 **Gain (Max)** 5.647 7.518 dB

Channel #: 206 **Gain (Horizon)** 5.647 7.518 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	0.729	0	1.000	46	0.705
-89	0.021	-43	0.741	1	1.000	47	0.693
-88	0.040	-42	0.752	2	0.999	48	0.680
-87	0.059	-41	0.763	3	0.999	49	0.667
-86	0.078	-40	0.774	4	0.998	50	0.654
-85	0.096	-39	0.785	5	0.996	51	0.641
-84	0.114	-38	0.796	6	0.995	52	0.628
-83	0.133	-37	0.806	7	0.993	53	0.614
-82	0.151	-36	0.816	8	0.991	54	0.600
-81	0.168	-35	0.826	9	0.988	55	0.586
-80	0.186	-34	0.835	10	0.985	56	0.572
-79	0.204	-33	0.845	11	0.982	57	0.558
-78	0.221	-32	0.854	12	0.979	58	0.544
-77	0.239	-31	0.862	13	0.975	59	0.529
-76	0.256	-30	0.871	14	0.971	60	0.514
-75	0.273	-29	0.879	15	0.967	61	0.499
-74	0.290	-28	0.887	16	0.963	62	0.484
-73	0.307	-27	0.895	17	0.958	63	0.469
-72	0.324	-26	0.903	18	0.953	64	0.453
-71	0.341	-25	0.910	19	0.948	65	0.437
-70	0.357	-24	0.917	20	0.942	66	0.422
-69	0.373	-23	0.924	21	0.936	67	0.406
-68	0.390	-22	0.930	22	0.930	68	0.390
-67	0.406	-21	0.936	23	0.924	69	0.373
-66	0.422	-20	0.942	24	0.917	70	0.357
-65	0.437	-19	0.948	25	0.910	71	0.341
-64	0.453	-18	0.953	26	0.903	72	0.324
-63	0.469	-17	0.958	27	0.895	73	0.307
-62	0.484	-16	0.963	28	0.887	74	0.290
-61	0.499	-15	0.967	29	0.879	75	0.273
-60	0.514	-14	0.971	30	0.871	76	0.256
-59	0.529	-13	0.975	31	0.862	77	0.239
-58	0.544	-12	0.979	32	0.854	78	0.221
-57	0.558	-11	0.982	33	0.845	79	0.204
-56	0.572	-10	0.985	34	0.835	80	0.186
-55	0.586	-9	0.988	35	0.826	81	0.168
-54	0.600	-8	0.991	36	0.816	82	0.151
-53	0.614	-7	0.993	37	0.806	83	0.133
-52	0.628	-6	0.995	38	0.796	84	0.114
-51	0.641	-5	0.996	39	0.785	85	0.096
-50	0.654	-4	0.998	40	0.774	86	0.078
-49	0.667	-3	0.999	41	0.763	87	0.059
-48	0.680	-2	0.999	42	0.752	88	0.040
-47	0.693	-1	1.000	43	0.741	89	0.021
-46	0.705	0	1.000	44	0.729	90	0.000
-45	0.717			45	0.717		

S.O. KHOL Figure 4

VALIDATION OF TOTAL POWER GAIN CALCULATION

KHOL Jackson, WY

Scala CLFM - 8 H & V

Elevation Gain of Antenna 1.0807

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

H RMS	0.416	V RMS	0.46	H/V Ratio	0.904

Elevation Gain of Horizontal Component 0.977

Elevation Gain of Vertical Component 1.195

Horizontal Azimuth Gain equals $1/(RMS)^2$. 5.778

Vertical Azimuth Gain equals $1/(RMS/Max\ Vert)^2$. 4.726

Max. Vertical 1

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

Total Horizontal Power Gain = **5.647**

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

Total Vertical Power Gain = **5.647**

==========

ERP divided by Horizontal Power Gain equals Antenna Input Power

0.6	kW ERP	Divided by H Gain	5.647	equals	0.106	kW H Antenna Input Power

Antenna Input Power times Vertical Power Gain equals Vertical ERP

0.11	kW	Times V Gain	5.647	equals	0.60	kW V ERP

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

(1)^2	Times	0.60	Equals	0.60	kW Vertical ERP

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