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a division of Howell Laboratories,Inc.

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P. O. Box 389 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. 24924

Report of Test 6810-2R-DA

for

MALVERN ENTERTAINMENT CORPORATION

KEZG 97.1 MHz CALICO ROCK, AR

OBJECTIVE:

The objective of this test was to demonstrate the directional characteristics of a 6810-2R-DA to meet the needs of KEZG and to comply with the requirements of the FCC construction permit, file number BMPH-20051014ABX.

RESULTS:

The measured azimuth pattern for the 6810-2R-DA is shown in Figure 1. Figure 1A shows the Tabulation of the Horizontal Polarization. Figure 1B shows the Tabulation of the Vertical Polarization. The calculated elevation pattern of the antenna is shown in Figure 3. Construction permit file number BMPH-20051014ABX indicates that the Horizontal radiation component shall not exceed 5.2 kW at any azimuth and is restricted to the following values at the azimuths specified:

030 Degrees T: 0.771 kW

335 Degrees T: 1.853 kW

From Figure 1, the maximum radiation of the Horizontal component occurs at 278 Degrees T to 291 Degrees T. At the restricted azimuth of 030 Degrees T the Horizontal component is 8.636 dB down from the maximum of 5.2 kW, or 0.712 kW. At the restricted azimuth of 335 Degrees T the Vertical component is 4.731 dB down from the maximum of 5.2 kW, or 1.749 kW.

The R.M.S. of the Horizontal component is 0.766. The total Horizontal power gain is 1.760. The R.M.S. of the Vertical component is 0.736. The total Vertical power gain is 1.725. See Figure 4 for calculations. The R.M.S. of the FCC composite pattern is 0.883. The R.M.S. of the measured composite pattern is 0.804. Eighty-five percent (85%) of the original authorized FCC composite pattern is 0.751. Therefore this pattern complies with the FCC requirement of 73.316(c)(2)(ix)(A).

METHOD OF DIRECTIONALIZATION:

One bay of the 6810-2R-DA was mounted on a tower of exact scale to the Rohn-65 tower at the KEZG site. The spacing of the antenna to the tower was varied to achieve the vertical pattern shown in Figure 1. 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 1 was achieved. See Figure 2 for mechanical details.

METHOD OF MEASUREMENT:

As allowed by the construction permit, file number BMPH-20051014ABX, a single level of the 6810-2R-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 Edition 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 436.95 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 1.

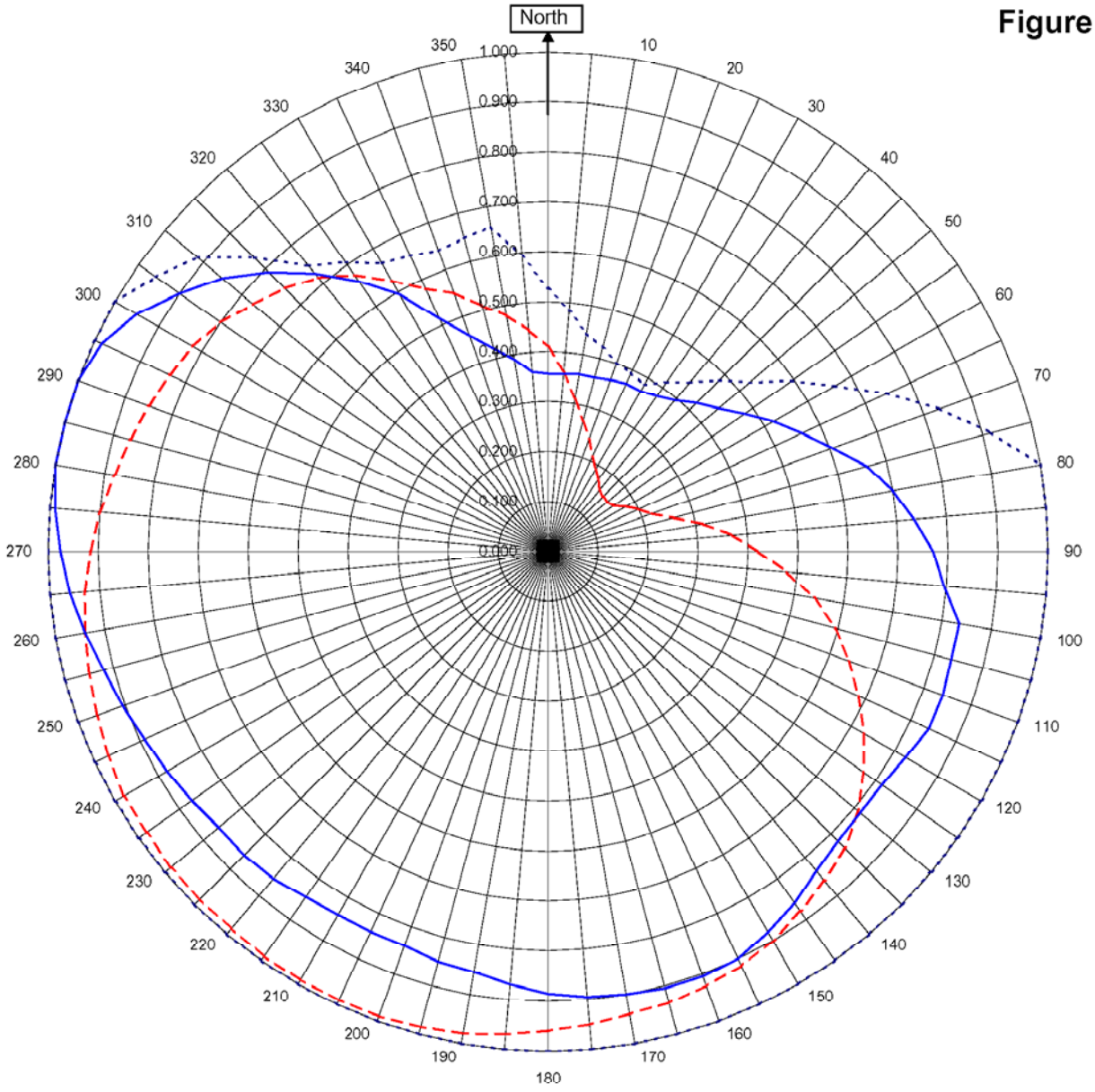
Respectfully submitted by:

Robert A. Surette
Director of Sales Engineering
S/O 24924
August 24, 2006

Shively Labs

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

Figure 1



KEZG Calico Rock, AR

24924

August 24, 2006

Horizontal RMS	0.766
Vertical RMS	0.736
H/V Composite RMS	0.804
FCC Composite RMS	0.883

Frequency	97.1 / 436.95 mHz
Plot	Relative Field
Scale	4.5 : 1
	See Figure 2 for Mechanical Details

Antenna Model	6810-2R-DA
Pattern Type	Directional Azimuth

Figure 1a

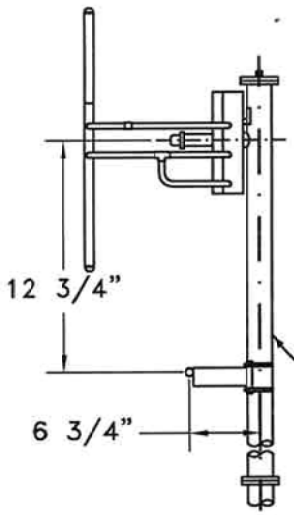
Tabulation of Horizontal Azimuth Pattern
KEZG Calico Rock, AR

Azimuth	Rel Field	Azimuth	Rel Field
0	0.355	180	0.885
10	0.360	190	0.855
20	0.365	200	0.840
30	0.370	210	0.840
40	0.395	220	0.855
45	0.420	225	0.860
50	0.445	230	0.860
60	0.520	240	0.880
70	0.605	250	0.905
80	0.700	260	0.940
90	0.770	270	0.975
100	0.835	280	1.000
110	0.840	290	1.000
120	0.825	300	0.950
130	0.815	310	0.850
135	0.820	315	0.790
140	0.835	320	0.725
150	0.880	330	0.595
160	0.905	340	0.460
170	0.900	350	0.390

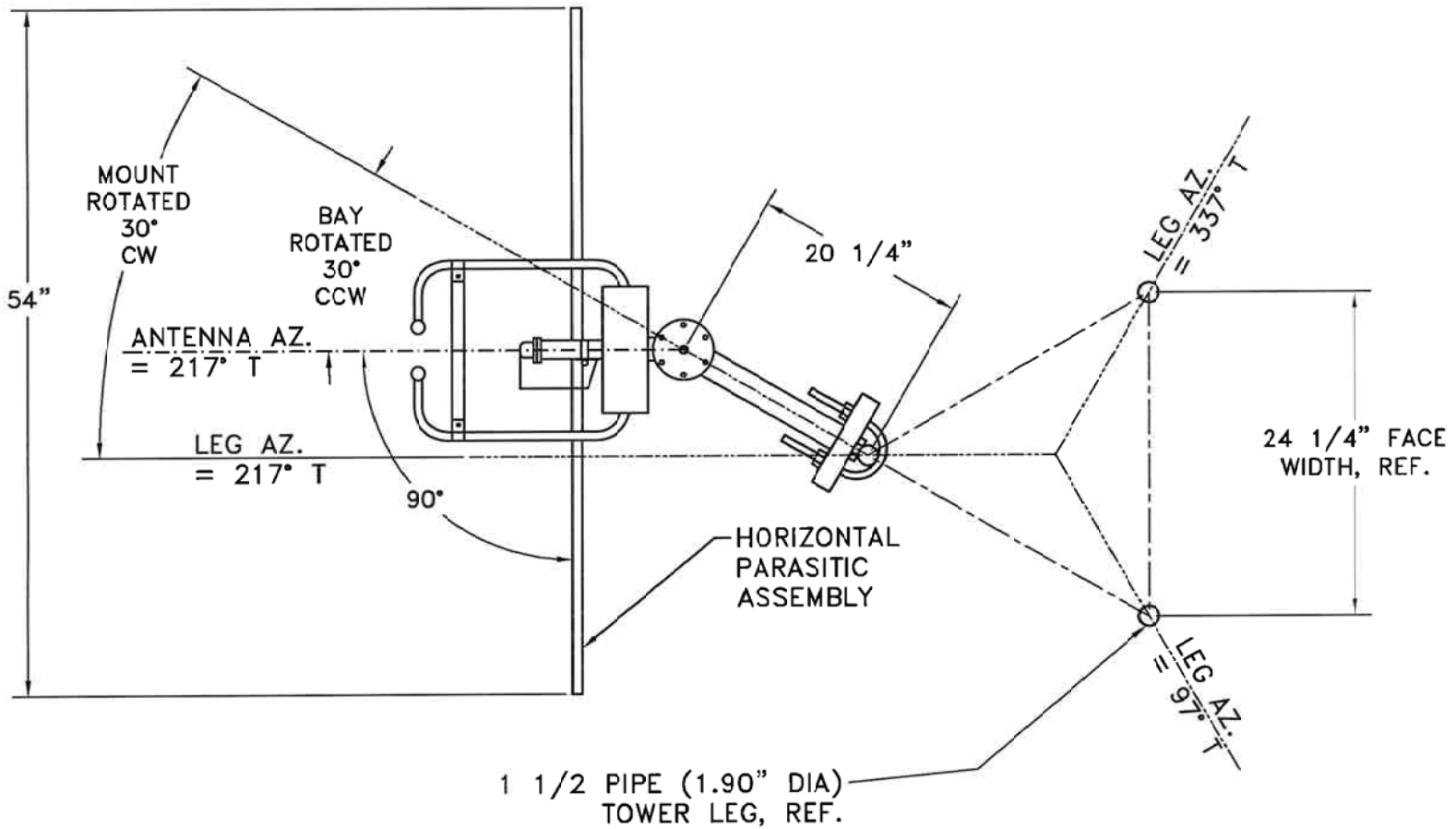
Figure 1b

Tabulation of Vertical Azimuth Pattern
KEZG Calico Rock, AR

Azimuth	Rel Field	Azimuth	Rel Field
0	0.410	180	0.960
10	0.310	190	0.980
20	0.240	200	0.990
30	0.190	210	0.990
40	0.160	220	0.985
45	0.155	225	0.985
50	0.155	230	0.985
60	0.180	240	0.980
70	0.220	250	0.960
80	0.315	260	0.940
90	0.420	270	0.915
100	0.540	280	0.880
110	0.640	290	0.850
120	0.730	300	0.820
130	0.810	310	0.770
135	0.840	315	0.745
140	0.860	320	0.715
150	0.900	330	0.625
160	0.925	340	0.550
170	0.940	350	0.480



SIDE VIEW



TOP VIEW

TOWER: ROHN 65

ANTENNA HEADING: 217° TRUE NORTH

SHIVELY LABS A DIVISION OF HOWELL LABORATORIES INC.,BRIDGTON, MAINE			
SHOP ORDER: 24924	FREQUENCY: 97.1	SCALE: N.T.S.	DRAWN BY: ASP APPROVED BY: DAB
TITLE: MODEL-6810-2R-DIRECTIONAL ANTENNA			
DATE: 8/1/06	FIGURE 2		

Antenna Mfg.:	Shively Labs			Date: 8/24/2006
Antenna Type:	6810-2R-DA			
Station:	KEZG	Beam Tilt	0	
Frequency:	97.1	Gain (Max)	1.760	2.456 dB
Channel #:	246	Gain (Horizon)	1.760	2.456 dB
Figure:	3			

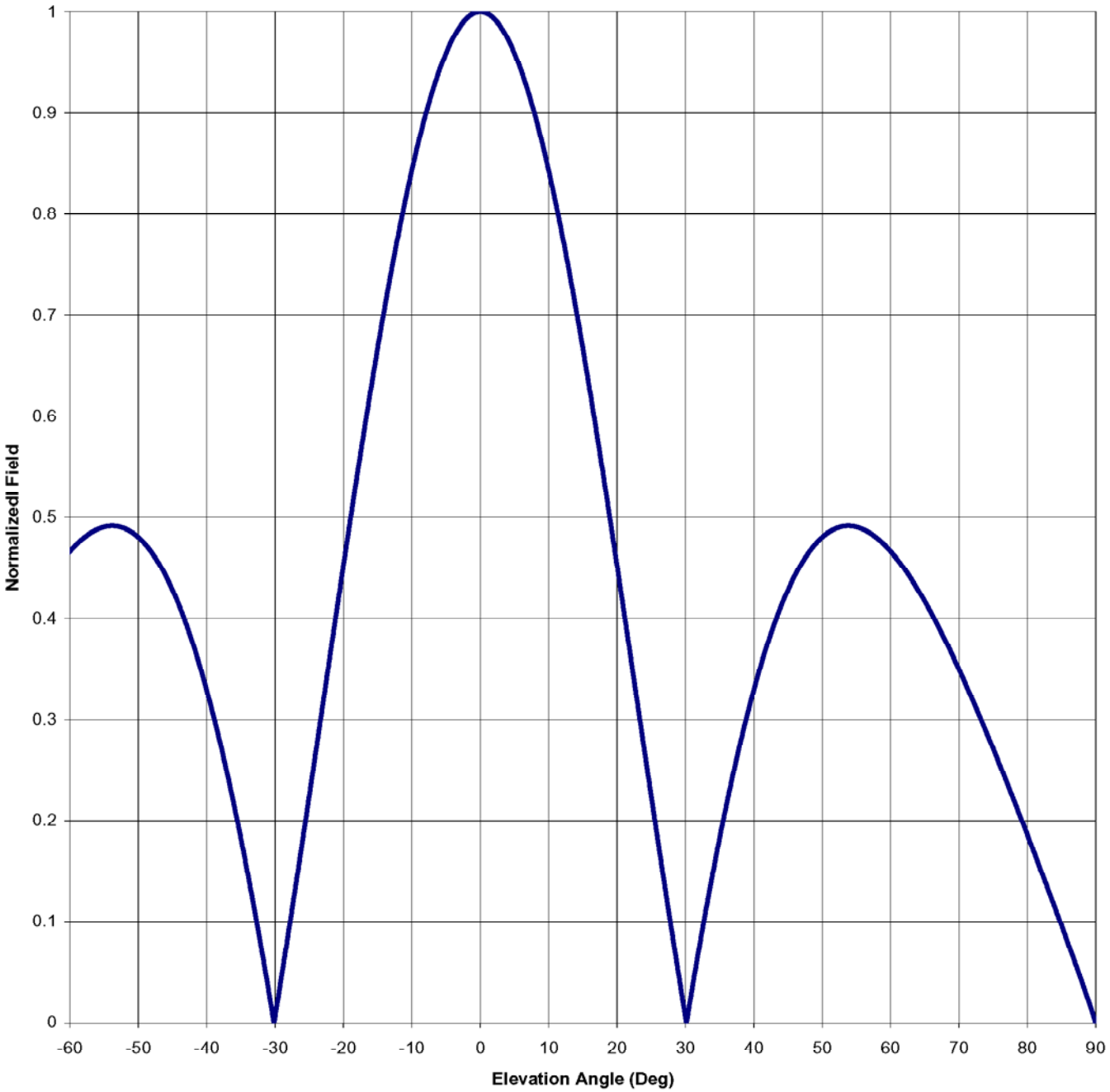


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Figure: 3

Beam Tilt 0
Gain (Max) 1.760 — 2.456 dB
Gain (Horizon) 1.760 — 2.456 dB

Date: 8/24/2006

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	0.413	0	1.000	46	0.443
-89	0.021	-43	0.395	1	0.998	47	0.455
-88	0.040	-42	0.375	2	0.993	48	0.465
-87	0.059	-41	0.353	3	0.985	49	0.474
-86	0.078	-40	0.329	4	0.974	50	0.481
-85	0.096	-39	0.304	5	0.960	51	0.486
-84	0.114	-38	0.276	6	0.942	52	0.489
-83	0.132	-37	0.247	7	0.922	53	0.491
-82	0.150	-36	0.216	8	0.898	54	0.492
-81	0.168	-35	0.183	9	0.872	55	0.491
-80	0.186	-34	0.148	10	0.844	56	0.488
-79	0.203	-33	0.112	11	0.813	57	0.485
-78	0.221	-32	0.074	12	0.779	58	0.480
-77	0.238	-31	0.034	13	0.744	59	0.474
-76	0.255	-30	0.006	14	0.706	60	0.467
-75	0.271	-29	0.048	15	0.667	61	0.458
-74	0.288	-28	0.091	16	0.627	62	0.449
-73	0.304	-27	0.135	17	0.585	63	0.439
-72	0.319	-26	0.179	18	0.542	64	0.429
-71	0.335	-25	0.224	19	0.497	65	0.417
-70	0.350	-24	0.270	20	0.453	66	0.405
-69	0.364	-23	0.316	21	0.407	67	0.392
-68	0.378	-22	0.362	22	0.362	68	0.378
-67	0.392	-21	0.407	23	0.316	69	0.364
-66	0.405	-20	0.453	24	0.270	70	0.350
-65	0.417	-19	0.497	25	0.224	71	0.335
-64	0.429	-18	0.542	26	0.179	72	0.319
-63	0.439	-17	0.585	27	0.135	73	0.304
-62	0.449	-16	0.627	28	0.091	74	0.288
-61	0.458	-15	0.667	29	0.048	75	0.271
-60	0.467	-14	0.706	30	0.006	76	0.255
-59	0.474	-13	0.744	31	0.034	77	0.238
-58	0.480	-12	0.779	32	0.074	78	0.221
-57	0.485	-11	0.813	33	0.112	79	0.203
-56	0.488	-10	0.844	34	0.148	80	0.186
-55	0.491	-9	0.872	35	0.183	81	0.168
-54	0.492	-8	0.898	36	0.216	82	0.150
-53	0.491	-7	0.922	37	0.247	83	0.132
-52	0.489	-6	0.942	38	0.276	84	0.114
-51	0.486	-5	0.960	39	0.304	85	0.096
-50	0.481	-4	0.974	40	0.329	86	0.078
-49	0.474	-3	0.985	41	0.353	87	0.059
-48	0.465	-2	0.993	42	0.375	88	0.040
-47	0.455	-1	0.998	43	0.395	89	0.021
-46	0.443	0	1.000	44	0.413	90	0.000
-45	0.428			45	0.428		

S.O. 24924 Figure 4

VALIDATION OF TOTAL POWER GAIN CALCULATION

KEZG CALICO ROCK, AR

MODEL 6810-2R-DA

Elevation Gain of Antenna 0.992

The RMS values are calculated utilizing the data of a planimeter

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

H RMS 0.766 V RMS 0.736 H/V Ratio 1.041

Elevation Gain of Horizontal Component 1.032

Elevation Gain of Vertical Component 0.953

Horizontal Azimuth Gain equals 1/(RMS)SQ. 1.704

Vertical Azimuth Gain equals 1/(RMS/Max Vert)SQ. 1.809
Max. Vertical 0.99

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

Total Horizontal Power Gain = **1.760**

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

Total Vertical Power Gain = **1.725**

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ERP divided by Horizontal Power Gain equals Antenna Input Power

5.2 KW ERP Equals 2.955 KW Antenna Input Power

Antenna Input Power times Vertical Power Gain equals Vertical ERP

2.955 KW Times 1.725 KW Equals 5.097 KW ERP

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

0.99 Equals 5.097 KW Vertical ERP

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