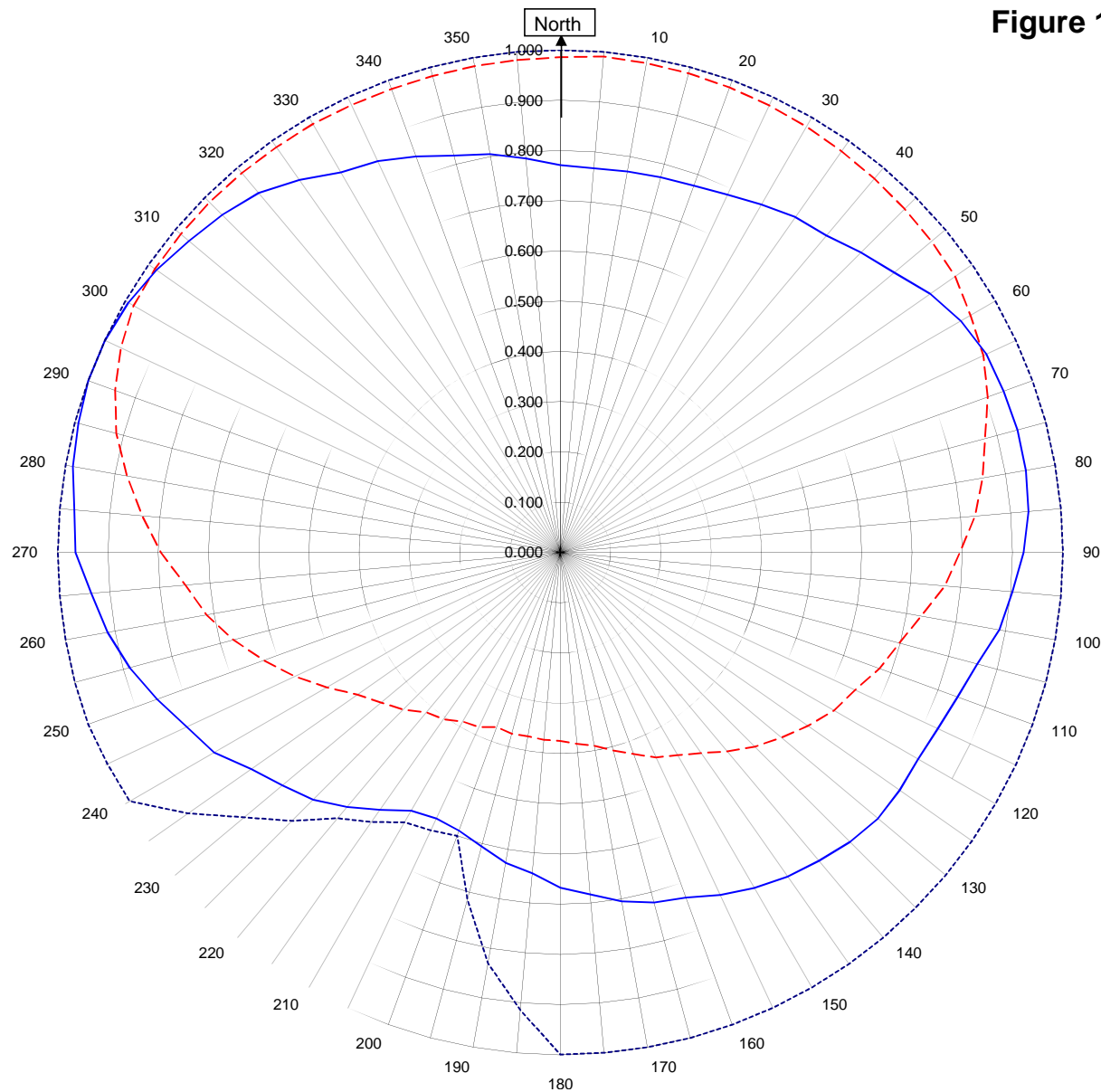


Shively Labs

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

Figure 1A



W267BQ BOSTON, MA.

33267
February 12, 2016

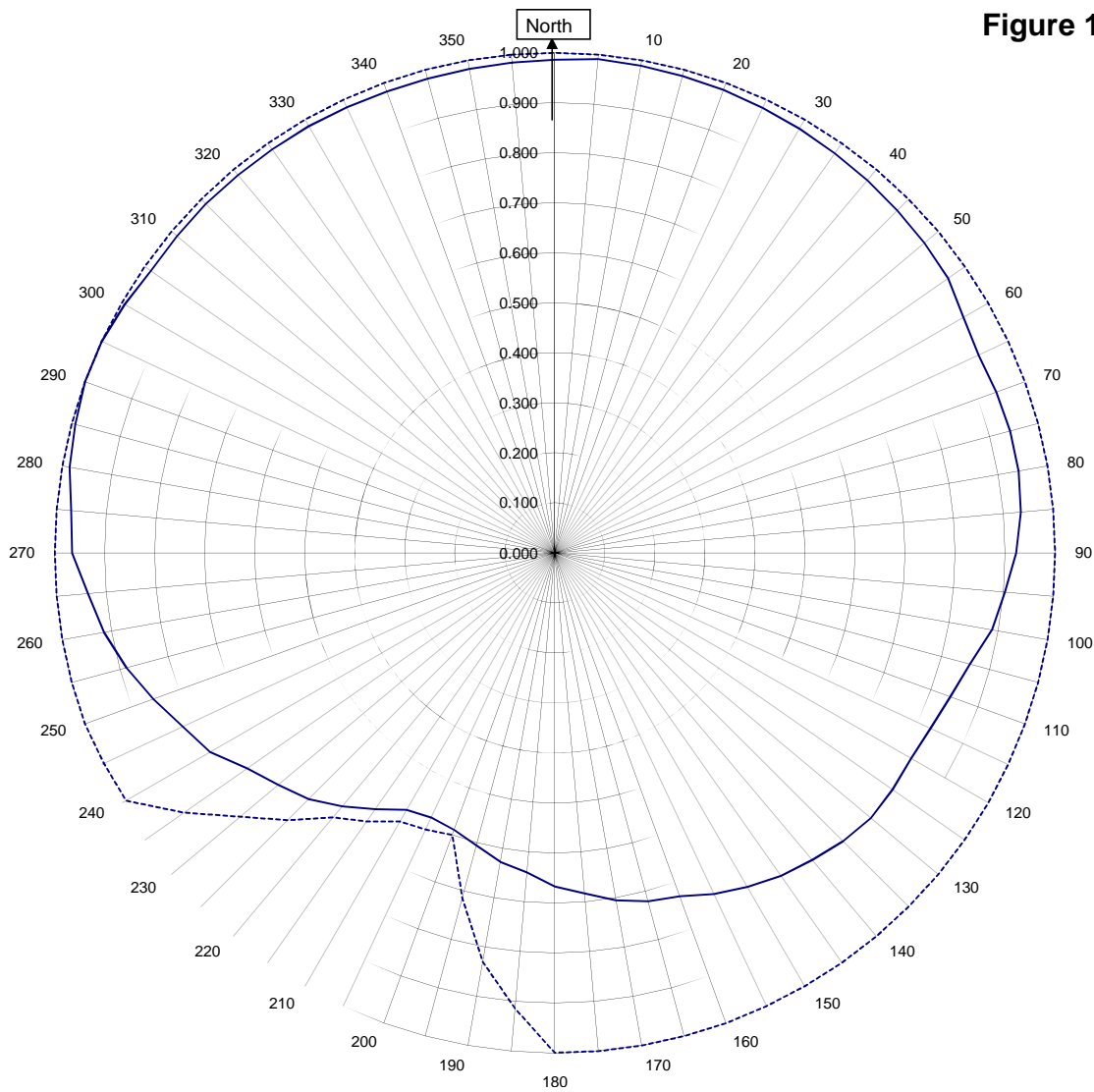
Horizontal RMS	0.832	Frequency	103.7 / 466.65 mHz
Vertical RMS	0.775	Plot	Relative Field
H/V Composite RMS	0.879	Scale	4.5 : 1
FCC Composite RMS	0.966	See Figure 2 for Mechanical Details	

Antenna Model	6810-1R-DA
Pattern Type	Directional Azimuth

Shively Labs

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Figure 1B



W267BQ BOSTON, MA.

33267
February 12, 2016

—————H/VComposite RMS	0.879	Frequency	103.7 / 466.65 mHz
.....FCC Composite RMS	0.966	Plot	Relative Field
		Scale	4.5 : 1
			See Figure 2 for Mechanical Details

Antenna Model	6810-1R-DA
Pattern Type	Directional H/V Composite

Figure 1C

Tabulation of Horizontal Azimuth Pattern
W267BQ BOSTON, MA.

Azimuth	Rel Field	Azimuth	Rel Field
0	0.771	180	0.667
10	0.770	190	0.627
20	0.777	200	0.589
30	0.800	210	0.593
40	0.824	220	0.661
45	0.845	225	0.696
50	0.867	230	0.721
60	0.921	240	0.796
70	0.939	250	0.854
80	0.941	260	0.915
90	0.922	270	0.965
100	0.887	280	0.985
110	0.841	290	1.000
120	0.822	300	0.993
130	0.824	310	0.965
135	0.815	315	0.951
140	0.801	320	0.934
150	0.771	330	0.874
160	0.731	340	0.839
170	0.705	350	0.805

Figure 1D

Tabulation of Vertical Azimuth Pattern
W267BQ BOSTON, MA.

Azimuth	Rel Field	Azimuth	Rel Field
0	0.986	180	0.375
10	0.989	190	0.371
20	0.985	200	0.370
30	0.979	210	0.389
40	0.972	220	0.415
45	0.968	225	0.442
50	0.964	230	0.465
60	0.943	240	0.537
70	0.905	250	0.628
80	0.853	260	0.715
90	0.795	270	0.795
100	0.729	280	0.876
110	0.676	290	0.943
120	0.629	300	0.981
130	0.573	310	0.986
135	0.547	315	0.987
140	0.517	320	0.986
150	0.465	330	0.985
160	0.427	340	0.982
170	0.391	350	0.983

Figure 1E

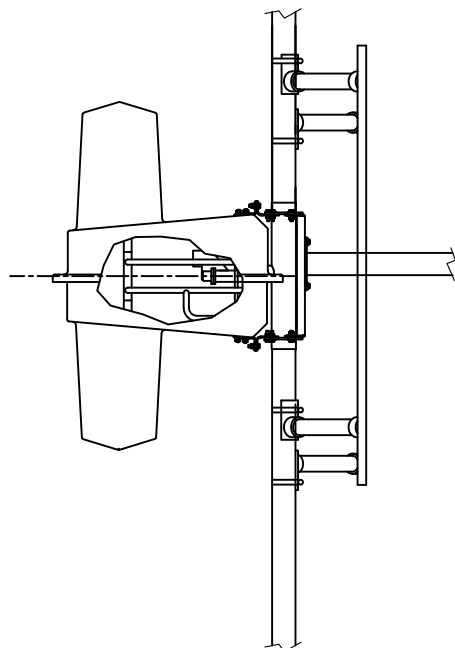
Tabulation of Composite Azimuth Pattern
W267BQ BOSTON, MA.

Azimuth	Rel Field	Azimuth	Rel Field
0	0.986	180	0.667
10	0.989	190	0.627
20	0.985	200	0.589
30	0.979	210	0.593
40	0.972	220	0.661
45	0.968	225	0.696
50	0.964	230	0.721
60	0.943	240	0.796
70	0.939	250	0.854
80	0.941	260	0.915
90	0.922	270	0.965
100	0.887	280	0.985
110	0.841	290	1.000
120	0.822	300	0.993
130	0.824	310	0.986
135	0.815	315	0.987
140	0.801	320	0.986
150	0.771	330	0.985
160	0.731	340	0.982
170	0.705	350	0.983

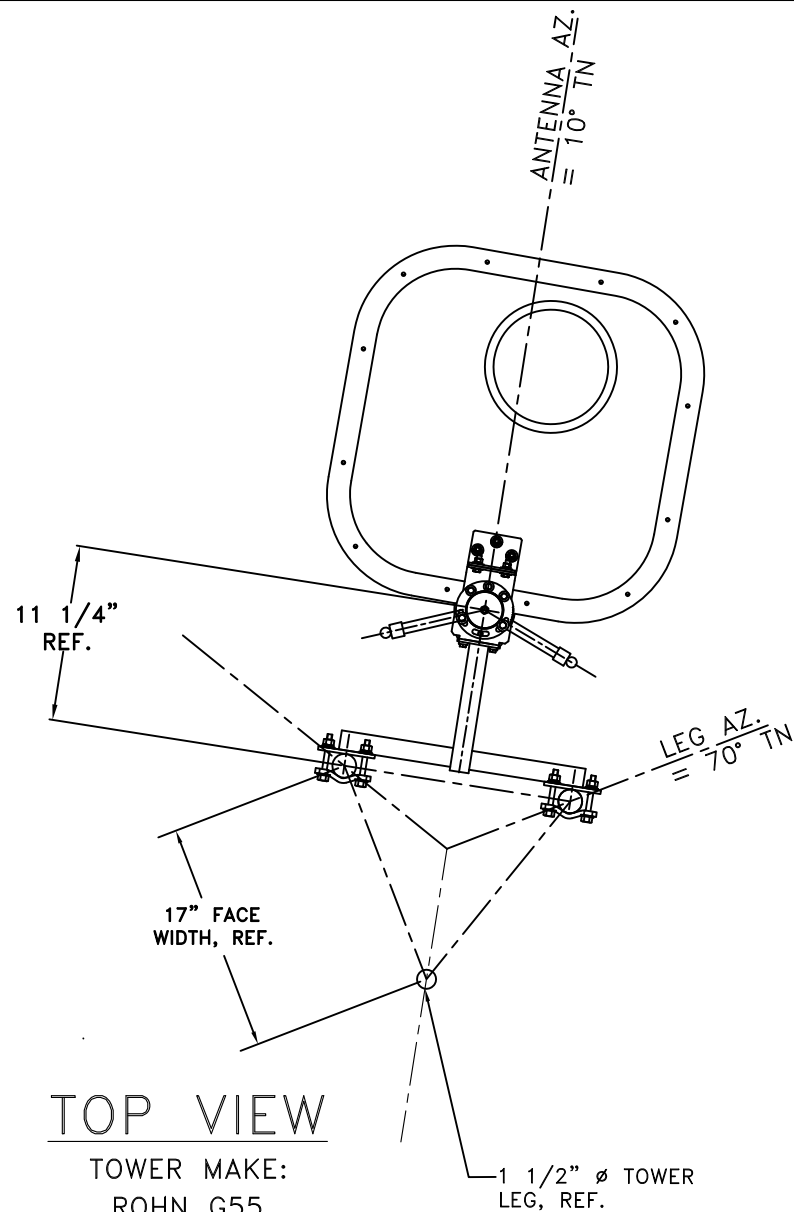
Figure 1F

Tabulation of FCC Directional Composite
W267BQ BOSTON, MA.

Azimuth	Rel Field	Azimuth	Rel Field
0	1.000	180	0.999
10	1.000	190	0.830
20	1.000	200	0.600
30	1.000	210	0.620
40	1.000	220	0.690
50	1.000	230	0.820
60	1.000	240	0.990
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	1.000	350	1.000

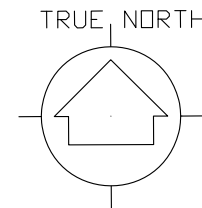


SIDE VIEW



TOP VIEW

TOWER MAKE:
ROHN G55



ANTENNA HEADING 70° TRUE NORTH

SHIVELY LABS			
A DIVISION OF HOWELL LABORATORIES INC., BRIDGTON, MAINE			
SHOP ORDER:	FREQUENCY:	SCALE:	DRAWN BY:
33267	103.7	N.T.S.	ASP
TITLE:		APPROVED BY:	
MODEL-6810-1R-DIRECTIONAL ANTENNA		DAB	
DATE:			
2-12-16		FIGURE 2	

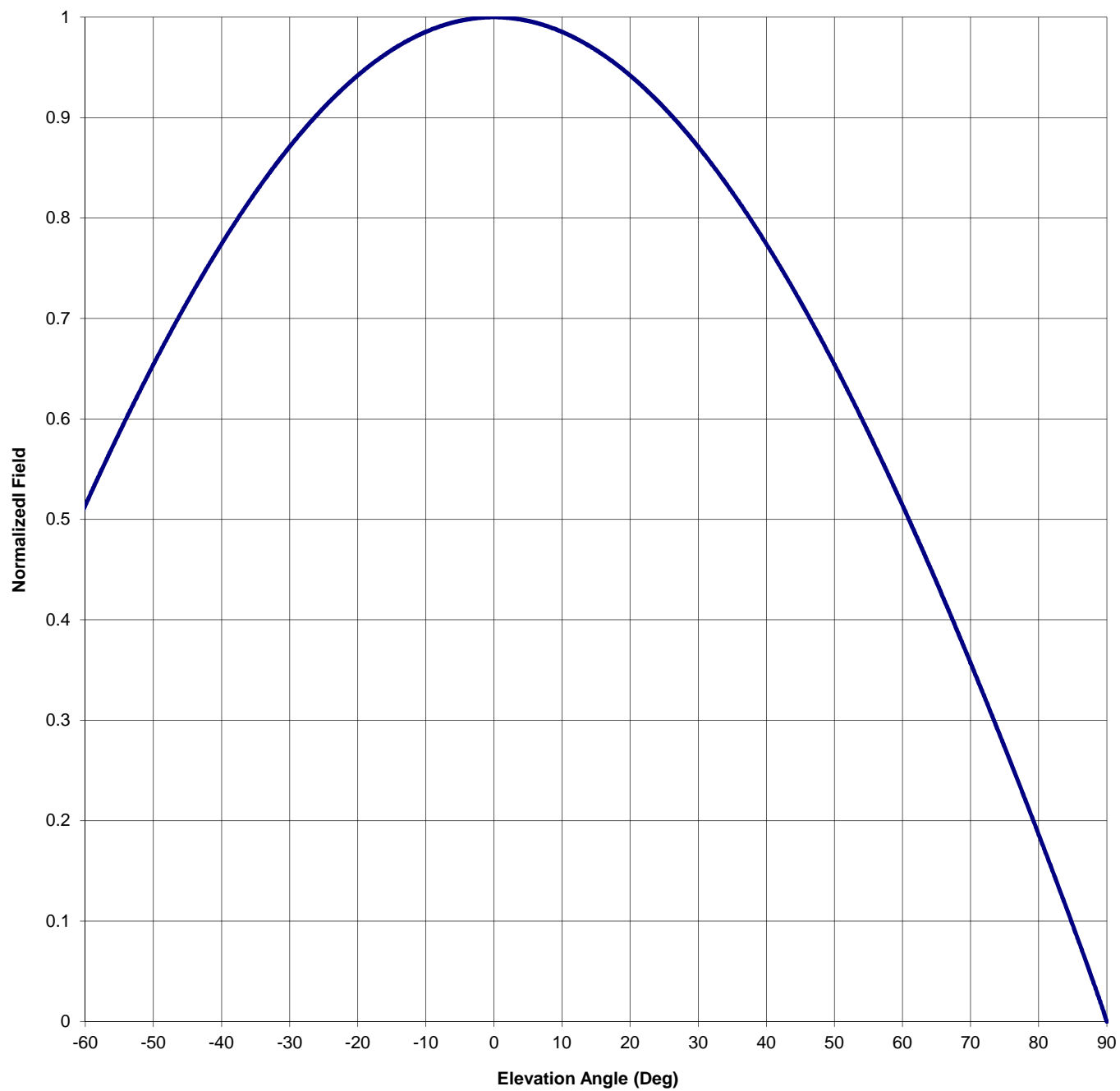
Antenna Mfg.: Shively Labs
Antenna Type: 6810-1R-DA

Date: 2/12/2016

Station: W279BQ
Frequency: 103.7
Channel #: 279

Beam Tilt	0	
Gain (Max)	0.714	-1.463 dB
Gain (Horizon)	0.714	-1.463 dB

Figure: Figure 3



Antenna Mfg.: Shively Labs

Date: 2/12/2016

Antenna Type: 6810-1R-DA

Station: W279BQ

Beam Tilt 0

Frequency: 103.7

Gain (Max) 0.714

-1.463 dB

Channel #: 279

Gain (Horizon) 0.714

-1.463 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		

VALIDATION OF TOTAL POWER GAIN CALCULATION

W267BQ BOSTON, MA.

MODEL 6810-1R-DA

Elevation Gain of Antenna

0.46

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

H RMS

0.832194

V RMS

0.774669

H/V Ratio

1.074

Elevation Gain of Horizontal Component

0.494

Elevation Gain of Vertical Component

0.428

Horizontal Azimuth Gain equals $1/(\text{RMS})^2$.

1.444

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

1.620

Max. Vertical

0.986

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

Total Horizontal Power Gain =

0.714

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

Total Vertical Power Gain =

0.694

ERP divided by Horizontal Power Gain equals Antenna Input Power

0.01

kW ERP

Divided by H Gain

0.714

equals

0.014

kW H Antenna Input Power

Antenna Input Power times Vertical Power Gain equals Vertical ERP

0.014 kW

Times V Gain

0.694

equals

0.010

kW V ERP

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

 $(0.986)^2$ Times 0.01 Equals 0.010 kW Vertical ERP

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