



## **PATTERN CERTIFICATION**

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## **PATTERN CERTIFICATION**

### **Method of Measurement**

The azimuth pattern for "WKSJ", Dielectric Document Sketch # 15, was measured in the following manner.

A single 4.4 to 1 scale model "DCRH" bay radiator was mounted on a similarly scaled model of the tower according to information provided to Dielectric by the customer; refer to Dielectric Document Sketch # 15. The antenna under test, all parasitics, all known tower appurtenances, and the tower section were rotated through 360 degrees while receiving a signal at the appropriate frequency from a linear cavity-backed source antenna. Both the horizontal and vertical polarization azimuth patterns were measured in an anechoic test range.

The transmit and scale model antennas are mounted at identical elevations and at opposite ends of the chamber. A Hewlett Packard model 8752C network analyzer was used to supply the RF signal to the source antenna at 4.4 times the fundamental FM frequency and to receive the signal intercepted by the antenna under test. The received signal was converted to a relative level, referenced to the source. This level was stored on a computer acting as the master controller. The computer controls the measurement system via IEEE-488 control bus through a GPIB card.

### **Statement of Qualifications**

Keith L. Pelletier is a Senior Electrical Engineer here at Dielectric. He received a BS in Electrical Engineering Technology from the University of Maine in 1998. He has over 6 years experience in RF antenna engineering and has been employed by Dielectric Communications since 1997.

Signed By: Keith Pelletier

Date: 2/18/04

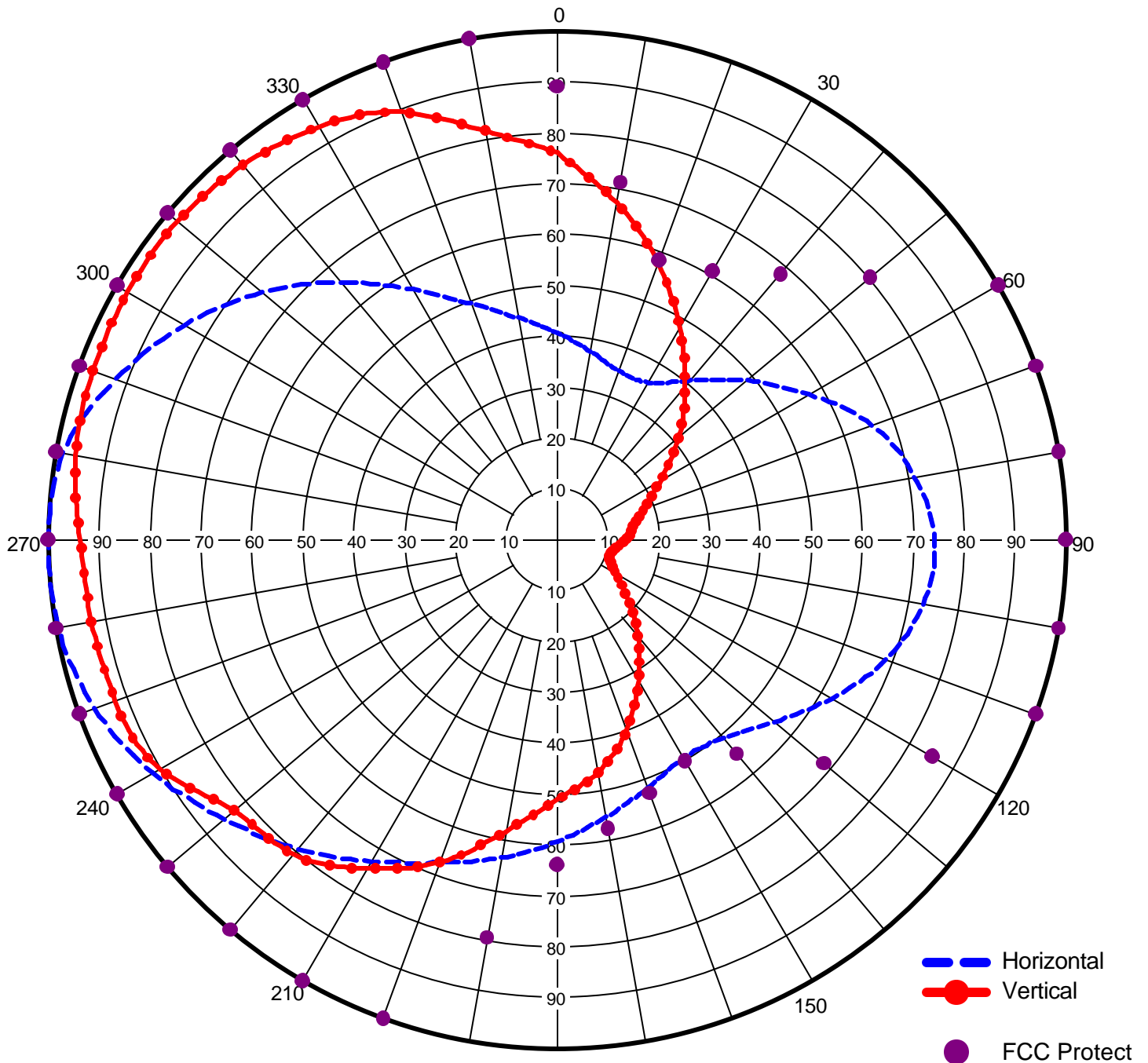


Proposal Number **78708**  
Date **Feb 17, 2004**  
Call Letters **WKSX**  
Location **South Hill, VA**  
Customer **Old Belt Broadcasting**  
Antenna Type **DCRH4ED**

## AZIMUTH PATTERN

85.0% Ccov - 50.6% Hrms - 49.4% Vrms

Gain	<b>2.15 (3.32) HPOL</b>	<b>2.15 (3.32) VPOL</b>	Frequency	<b>101.9</b>
Calculated / Measured	<b>Measured</b>		Drawing #	<b>15</b>





Proposal Number **78708**  
 Date **18-Feb-04**  
 Call Letters **WKSJ**  
 Location **South Hill, VA**  
 Customer **Old Belt Broadcasting**  
 Antenna Type **DCRH4ED**  
 Frequency **101.90 MHz**  
 Drawing #: **15**

## TABULATION OF HORIZONTAL AZIMUTH PATTERN

Angle	Field	dBk	Power kW
0	0.406	-0.048	0.989
10	0.376	-0.715	0.848
20	0.353	-1.263	0.748
30	0.357	-1.165	0.765
40	0.409	0.016	1.004
50	0.487	1.532	1.423
60	0.572	2.929	1.963
70	0.659	4.159	2.606
80	0.714	4.855	3.059
90	0.742	5.190	3.303
100	0.729	5.036	3.189
110	0.688	4.533	2.840
120	0.623	3.671	2.329
130	0.556	2.683	1.855
140	0.509	1.916	1.554
150	0.496	1.691	1.476
160	0.519	2.085	1.616
170	0.553	2.636	1.835
180	0.593	3.243	2.110
190	0.635	3.837	2.419
200	0.675	4.368	2.734
210	0.730	5.048	3.197
220	0.793	5.767	3.773
230	0.854	6.411	4.376
240	0.917	7.029	5.045
250	0.968	7.499	5.622
260	0.995	7.738	5.940
270	0.999	7.773	5.988
280	0.985	7.650	5.821
290	0.924	7.095	5.123
300	0.845	6.319	4.284
310	0.756	5.352	3.429
320	0.661	4.186	2.622
330	0.568	2.868	1.936
340	0.494	1.656	1.464
350	0.443	0.710	1.177



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Antenna Type **DCRH4ED**  
Frequency **101.90 MHz**  
Drawing #: **15**

## TABULATION OF VERTICAL AZIMUTH PATTERN

Angle	Field	dBk	Power kW
0	0.760	5.398	3.466
10	0.673	4.342	2.718
20	0.579	3.035	2.011
30	0.482	1.442	1.394
40	0.391	-0.375	0.917
50	0.311	-2.363	0.580
60	0.235	-4.797	0.331
70	0.183	-6.969	0.201
80	0.152	-8.582	0.139
90	0.135	-9.612	0.109
100	0.113	-11.157	0.077
110	0.110	-11.391	0.073
120	0.133	-9.741	0.106
130	0.182	-7.017	0.199
140	0.247	-4.365	0.366
150	0.319	-2.143	0.611
160	0.398	-0.221	0.950
170	0.464	1.112	1.292
180	0.510	1.933	1.561
190	0.582	3.080	2.032
200	0.674	4.355	2.726
210	0.746	5.236	3.339
220	0.808	5.930	3.917
230	0.829	6.153	4.123
240	0.901	6.876	4.871
250	0.925	7.104	5.134
260	0.929	7.142	5.178
270	0.937	7.216	5.268
280	0.960	7.427	5.530
290	0.970	7.517	5.645
300	0.975	7.562	5.704
310	0.975	7.562	5.704
320	0.961	7.436	5.541
330	0.937	7.216	5.268
340	0.895	6.818	4.806
350	0.816	6.015	3.995



Proposal Number **78708**  
 Date **18-Feb-04**  
 Call Letters **WKSK**  
 Location **South Hill, VA**  
 Customer **Old Belt Broadcasting**  
 Antenna Type **DCRH4ED**  
 Frequency **101.90 MHz**  
 Drawing #: **15**

## TABULATION OF HORIZONTAL AZIMUTH PATTERN

Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
0	0.406	45	0.446	90	0.742	135	0.529	180	0.593	225	0.824	270	0.999	315	0.709
1	0.403	46	0.454	91	0.743	136	0.524	181	0.597	226	0.830	271	0.999	316	0.700
2	0.400	47	0.462	92	0.743	137	0.520	182	0.602	227	0.836	272	0.999	317	0.690
3	0.397	48	0.470	93	0.743	138	0.516	183	0.606	228	0.842	273	0.998	318	0.681
4	0.394	49	0.479	94	0.742	139	0.512	184	0.610	229	0.848	274	0.998	319	0.671
5	0.390	50	0.487	95	0.740	140	0.509	185	0.614	230	0.854	275	0.996	320	0.661
6	0.388	51	0.495	96	0.739	141	0.506	186	0.619	231	0.861	276	0.995	321	0.652
7	0.385	52	0.503	97	0.737	142	0.503	187	0.622	232	0.867	277	0.993	322	0.642
8	0.381	53	0.512	98	0.735	143	0.501	188	0.627	233	0.873	278	0.991	323	0.632
9	0.379	54	0.521	99	0.732	144	0.499	189	0.631	234	0.880	279	0.988	324	0.623
10	0.376	55	0.528	100	0.729	145	0.498	190	0.635	235	0.886	280	0.985	325	0.613
11	0.373	56	0.537	101	0.726	146	0.497	191	0.639	236	0.892	281	0.981	326	0.604
12	0.370	57	0.546	102	0.724	147	0.495	192	0.643	237	0.899	282	0.976	327	0.595
13	0.368	58	0.555	103	0.719	148	0.495	193	0.646	238	0.906	283	0.970	328	0.585
14	0.365	59	0.563	104	0.716	149	0.495	194	0.650	239	0.912	284	0.965	329	0.577
15	0.363	60	0.572	105	0.712	150	0.496	195	0.655	240	0.917	285	0.959	330	0.568
16	0.360	61	0.581	106	0.707	151	0.497	196	0.658	241	0.924	286	0.953	331	0.560
17	0.358	62	0.590	107	0.703	152	0.498	197	0.662	242	0.929	287	0.945	332	0.551
18	0.356	63	0.599	108	0.698	153	0.500	198	0.667	243	0.934	288	0.939	333	0.543
19	0.354	64	0.608	109	0.693	154	0.502	199	0.671	244	0.940	289	0.931	334	0.536
20	0.353	65	0.617	110	0.688	155	0.505	200	0.675	245	0.945	290	0.924	335	0.528
21	0.352	66	0.626	111	0.681	156	0.507	201	0.680	246	0.950	291	0.916	336	0.521
22	0.351	67	0.635	112	0.676	157	0.510	202	0.685	247	0.955	292	0.909	337	0.513
23	0.350	68	0.643	113	0.670	158	0.512	203	0.690	248	0.959	293	0.901	338	0.507
24	0.350	69	0.652	114	0.664	159	0.516	204	0.696	249	0.964	294	0.893	339	0.500
25	0.350	70	0.659	115	0.657	160	0.519	205	0.701	250	0.968	295	0.886	340	0.494
26	0.350	71	0.666	116	0.650	161	0.522	206	0.706	251	0.972	296	0.878	341	0.487
27	0.352	72	0.673	117	0.643	162	0.525	207	0.712	252	0.975	297	0.870	342	0.482
28	0.353	73	0.679	118	0.637	163	0.528	208	0.718	253	0.978	298	0.862	343	0.476
29	0.355	74	0.685	119	0.629	164	0.531	209	0.724	254	0.982	299	0.853	344	0.471
30	0.357	75	0.690	120	0.623	165	0.535	210	0.730	255	0.985	300	0.845	345	0.466
31	0.360	76	0.696	121	0.616	166	0.539	211	0.736	256	0.987	301	0.836	346	0.461
32	0.364	77	0.701	122	0.609	167	0.542	212	0.743	257	0.990	302	0.828	347	0.456
33	0.368	78	0.705	123	0.602	168	0.546	213	0.749	258	0.992	303	0.819	348	0.452
34	0.372	79	0.709	124	0.596	169	0.549	214	0.755	259	0.994	304	0.810	349	0.447
35	0.378	80	0.714	125	0.589	170	0.553	215	0.762	260	0.995	305	0.802	350	0.443
36	0.383	81	0.718	126	0.582	171	0.557	216	0.768	261	0.996	306	0.792	351	0.439
37	0.389	82	0.722	127	0.575	172	0.561	217	0.774	262	0.998	307	0.783	352	0.435
38	0.395	83	0.725	128	0.569	173	0.565	218	0.781	263	0.999	308	0.774	353	0.431
39	0.402	84	0.729	129	0.563	174	0.569	219	0.787	264	0.999	309	0.765	354	0.428
40	0.409	85	0.732	130	0.556	175	0.573	220	0.793	265	1.000	310	0.756	355	0.424
41	0.416	86	0.734	131	0.551	176	0.577	221	0.800	266	1.000	311	0.746	356	0.420
42	0.423	87	0.737	132	0.545	177	0.581	222	0.806	267	1.000	312	0.737	357	0.416
43	0.430	88	0.740	133	0.539	178	0.585	223	0.812	268	1.000	313	0.728	358	0.413
44	0.438	89	0.741	134	0.534	179	0.589	224	0.818	269	1.000	314	0.719	359	0.409

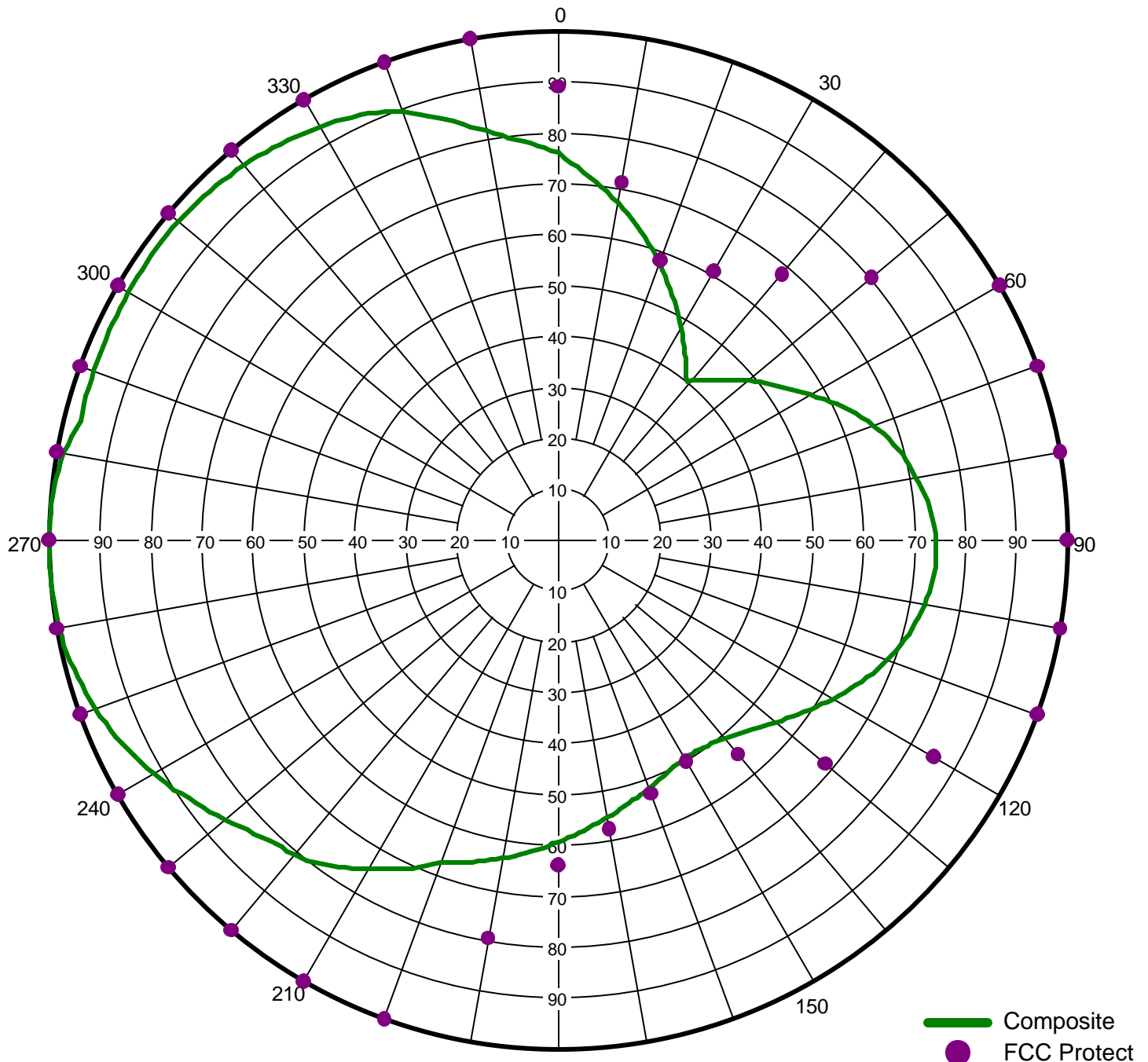


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## AZIMUTH PATTERN

85.0% Ccov - 50.6% Hrms - 49.4% Vrms

Gain	<b>2.15 (3.32) HPOL</b>	<b>2.15 (3.32) VPOL</b>	Frequency	<b>101.9</b>
Calculated / Measured	<b>Measured</b>		Drawing #	<b>15</b>





Proposal Number	<b>78708</b>
Date	<b>18-Feb-04</b>
Call Letters	<b>WSKS</b>
Location	<b>South Hill, VA</b>
Customer	<b>Old Belt Broadcasting</b>
Antenna Type	<b>DCRH4ED</b>
Frequency	<b>101.90 MHz</b>
Drawing #:	<b>15</b>

## TABULATION OF COMPOSITE AZIMUTH PATTERN

Angle	Field	dBk	Power kW	Input Power
0	0.760	5.398	3.466	6.000
10	0.673	4.342	2.718	6.000
20	0.579	3.035	2.011	6.000
30	0.482	1.442	1.394	6.000
40	0.409	0.016	1.004	6.000
50	0.487	1.532	1.423	6.000
60	0.572	2.929	1.963	6.000
70	0.659	4.159	2.606	6.000
80	0.714	4.855	3.059	6.000
90	0.742	5.190	3.303	6.000
100	0.729	5.036	3.189	6.000
110	0.688	4.533	2.840	6.000
120	0.623	3.671	2.329	6.000
130	0.556	2.683	1.855	6.000
140	0.509	1.916	1.554	6.000
150	0.496	1.691	1.476	6.000
160	0.519	2.085	1.616	6.000
170	0.553	2.636	1.835	6.000
180	0.593	3.243	2.110	6.000
190	0.635	3.837	2.419	6.000
200	0.675	4.368	2.734	6.000
210	0.746	5.236	3.339	6.000
220	0.808	5.930	3.917	6.000
230	0.854	6.411	4.376	6.000
240	0.917	7.029	5.045	6.000
250	0.968	7.499	5.622	6.000
260	0.995	7.738	5.940	6.000
270	0.999	7.773	5.988	6.000
280	0.985	7.650	5.821	6.000
290	0.970	7.517	5.645	6.000
300	0.975	7.562	5.704	6.000
310	0.975	7.562	5.704	6.000
320	0.961	7.436	5.541	6.000
330	0.937	7.216	5.268	6.000
340	0.895	6.818	4.806	6.000
350	0.816	6.015	3.995	6.000



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Antenna Type	<b>DCRH4ED</b>
Frequency	<b>101.90 MHz</b>
Drawing #	<b>15</b>

## **CUSTOMER GAIN SUMMARY**

<b>Azimuth Pattern Gain of Horizontal Polarization</b>	<b>2.15</b>
<b>Elevation Pattern Gain Per Polarization</b>	<b>2.10</b>
<b>Peak Gain at Horizontal Polarization</b>	<b>4.52</b>



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## ELEVATION PATTERN

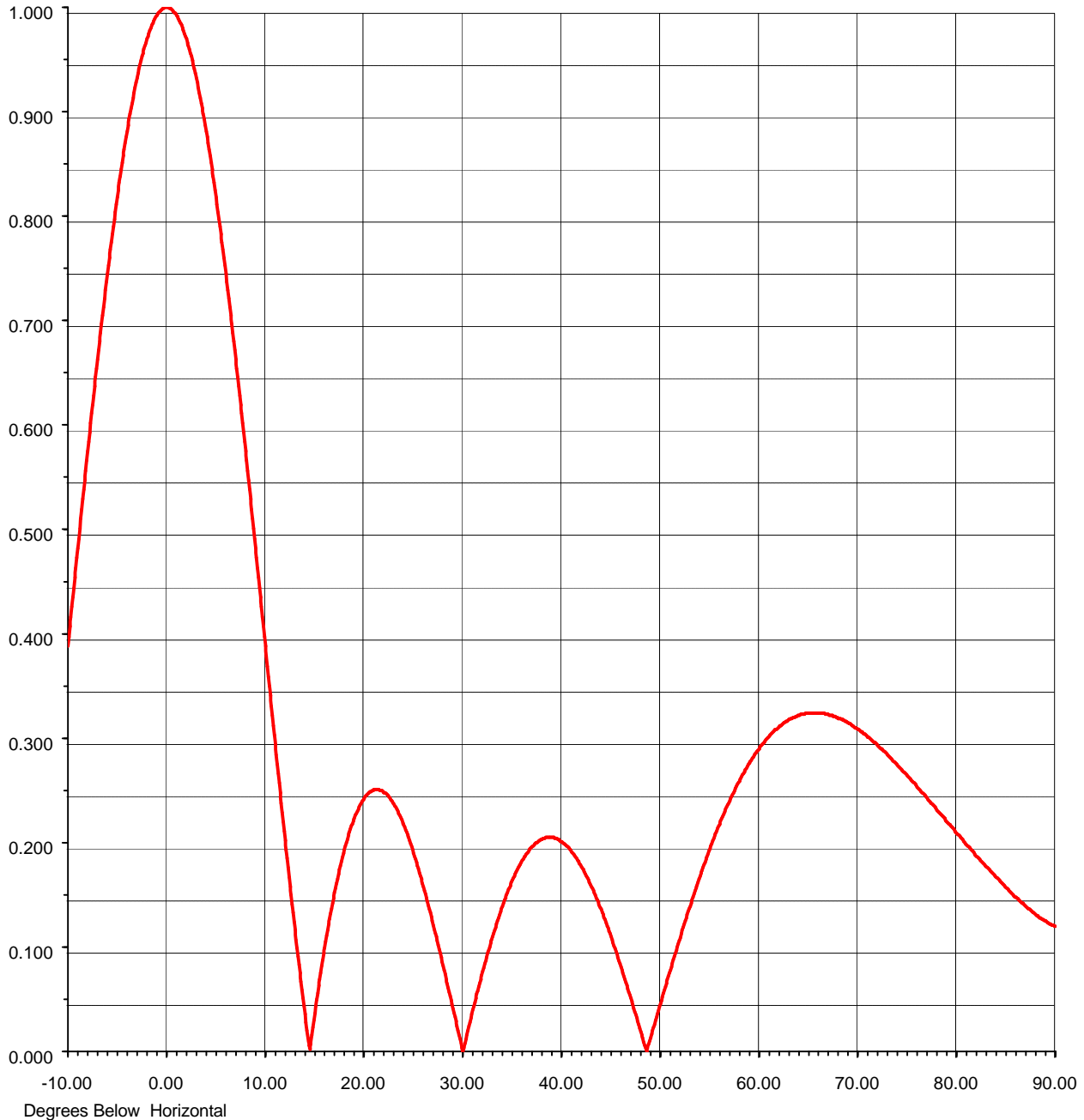
RMS Gain at Main Lobe **2.10**

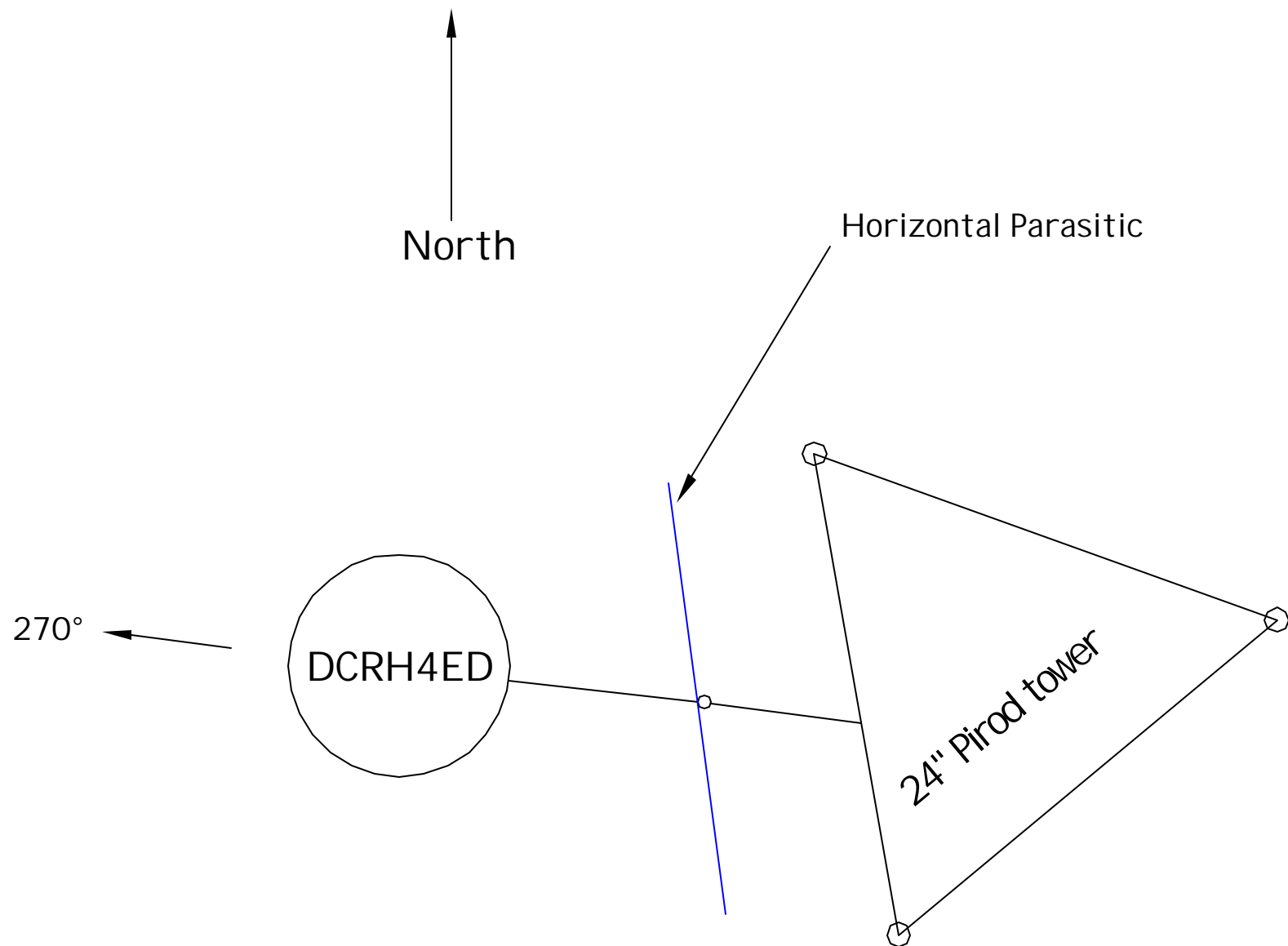
Beam Tilt **0.00 deg**

RMS Gain at Horizontal

Frequency **101.90 MHz**

Calculated / Measured **Calculated**





WKSK - 101.9

Document sketch #15

Leg Azimuths @ 67°, 187°, 307°

**Dielectric**