



3301 E. Deseret Drive, St. George, UT 84790
www.wilsonelectronics.com • info@wilsonelectronics.com
phone 1-800-204-4104 • fax 1-435-656-2432

October 15, 2013

Subject: Antenna Measurements and Testing Data

To Whom It May Concern:

The gains for each antenna were tested using a log periodic antenna calibrated by RTCE labs as the standard. Attached are the Wilson Electronics antenna measurements, the RTCE Antenna Testing Summary, and calibration information.

Sincerely,

A handwritten signature in black ink, appearing to read 'Patrick L. Cook'.

Patrick L. Cook

Senior Research and Development Engineer

Wilson Electronics Antenna Average Gain (dBi)

---cable loss not included

Last updated by Erin Elder 10/15/13

Recommended Band for Use

Marginal Band

Not Recommended Band

Outside Mobile Antennas

Antenna #		698-716	776-787	824-849	1710-1755	1850-1995	Initials	Date Measured
MAGNET MOUNT ANTENNAS								
311103 311125 311128 314202	Gains	-4.8	0.1	2.0	-7.0	2.5	CKA	9/17/2013
311703	Gains	-15.0	-4.2	0.7	-2.0	1.2	CKA	9/17/2013
MINI MAGNET MOUNT ANTENNAS								
301113 301126	Gains	-0.3	-2.2	-1.9	1.2	1.9	CKA	9/17/2013
TRUCKER ANTENNAS								
311101	Gains	-4.5	0.4	1.7	-3.6	6.1	CKA	9/17/2013
311701	Gains	-14.1	-0.7	2.2	-0.2	2.7	CKA	9/17/2013
311119	Gains	-1.4	0.4	1.2	-2.3	3.6	CKA	9/17/2013
311133	Gains	-3.3	0.2	1.2	-4.8	4.2	CKA	9/17/2013
MARINE ANTENNAS								
311130	Gains	-1.0	-1.6	0.7	-1.7	3.6	CKA	9/17/2013
GLASS MOUNT ANTENNAS								
311102	Gains	-3.7	-2.5	-0.9	2.2	3.4	CKA	9/17/2013
MINI GLASS MOUNT ANTENNAS								
311114	Gains	-7.5	-6.1	-5.4	2.6	1.4	CKA	9/17/2013
NMO ANTENNAS								
311104	Gains	-4.1	-0.9	2.5	-3.5	1.8	CKA	9/17/2013
311112	Gains	-3.2	-0.5	2.5	-2.6	-0.7	CKA	9/17/2013
314203	Gains	-1.6	0.5	1.8	-5.7	0.8	CKA	9/17/2013
301105	Gains	4.1	4.1	1.4		-7.0	CKA	6/22/2010

Wilson Electronics Antenna Average Gain (dBi)

---cable loss not included

Last updated by Erin Elder 10/15/13

Recommended Band for Use

Marginal Band

Not Recommended Band

Inside Mobile Antennas

Antenna #		728-746	746-756	869-894	1930-1995	2110-2155	Initials	Date Measured
LOW PROFILE ANTENNAS								
311127	Gains	-1.9	-2.3	2.2	-3.1	-0.5	DD	9/25/2013
311106	Gains	-5.6	-5.6	0.5	0.9	0.1	DD	9/25/2013
ULTRA SLIM ANTENNAS								
301143 301149	Gains	-5.7	-5.7	-6.8	3.9	5.0	CKA	9/27/2010
301143 301149	Gains	-7.0	-7.0	-8.0	-16.0	-15.0	CKA	9/27/2010
CRADLE PLUS ANTENNAS								
301146 301148	Gains	-5.0	-5.0	0.7	2.6	1.5	CKA	11/9/2012
301146 301148	Gains	-7.0	-7.0	-8.0	-16.0	-15.0	CKA	11/9/2012

Wilson Electronics Antenna Average Gain (dBi)

---cable loss not included

Last updated by Erin Elder 10/15/13

Recommended Band for Use

Marginal Band

Not Recommended Band

Outside Fixed Antennas

Antenna #		698-716	776-787	824-849	1710-1755	1850-1995	Initials	Date Measured
EXTERIOR PANEL ANTENNA								
311141	Gains	-2.9	-0.6	1.2	-0.4	5.5	CKA	9/17/2013
OMNI DIRECTIONAL ANTENNAS								
311202	Gains	-1.5	-0.2	0.6	-2.5	5.1	CKA	9/17/2013
YAGI ANTENNAS								
301111	Gains	10.0	10.0	10.8	-6.8	-14.9	CKA	9/17/2013
311124	Gains	2.0	7.2	9.6	-6.7	-12.0	CKA	9/17/2013
311129	Gains	-18.7	-18.7	-23.4	9.1	10.9	CKA	9/17/2013
301142	Gains	-3.6	-3.6	3.7		-10.2	CKA	6/22/2010
YAGI (LOG PERIODIC, WIDE BAND DIRECTIONAL) ANTENNAS								
314411 314475	Gains	7.3	7.2	7.8	7.9	9.1	CKA	9/17/2013
PANEL ANTENNAS								
311135 311155 314451 314471 314452 314472 314453 314473 314447	Gains	3.8	3.6	4.4	8.2	10.0	CKA	9/17/2013

Wilson Electronics Antenna Average Gain (dBi)

---cable loss not included

Last updated by Erin Elder 10/15/13

Recommended Band for Use

Marginal Band

Not Recommended Band

Inside Fixed Antennas

Antenna #		728-746	746-756	869-894	1930-1995	2110-2155	Initials	Date Measured
DESKTOP MOUNT ANTENNAS								
301213	Gains	2.4	2.4	3.1	3.5	-2.7	CKA	9/19/2013
DOME ANTENNAS								
301121	Gains	-2.5	-2.5	1.5	3.0	1.5	CKA	8/18/2010
301151								
301123	Gains	-11.7	-11.7	-20.7	-8.3	-8.3	CKA	8/18/2010
PANEL ANTENNAS								
311135	Gains	4.2	4.2	6.1	9.8	6.7	CKA	9/19/2013
311155								
314451								
314471								
314452								
314472								
314453								
314473								
314447								

RTCE Antenna Testing Summary

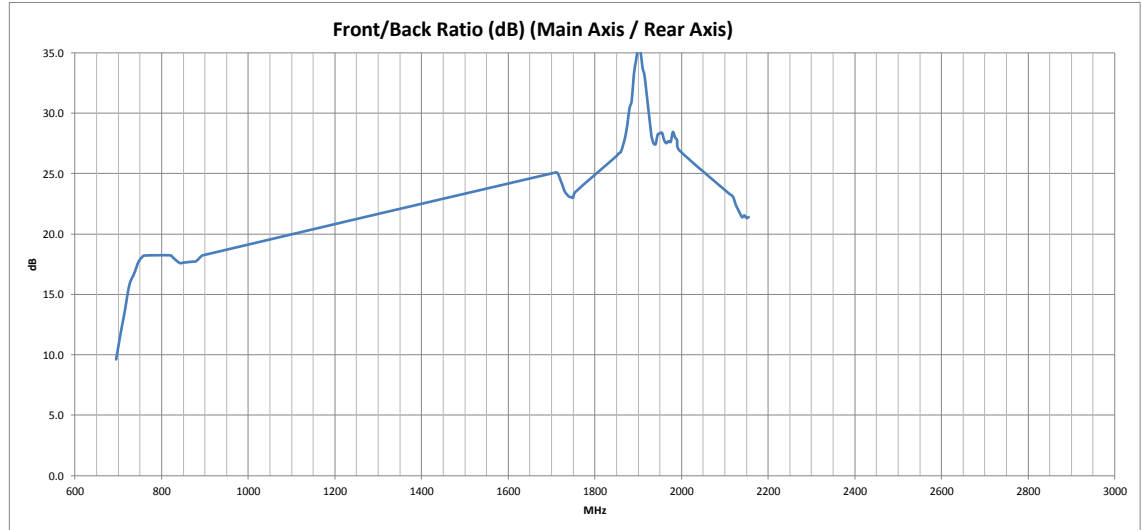
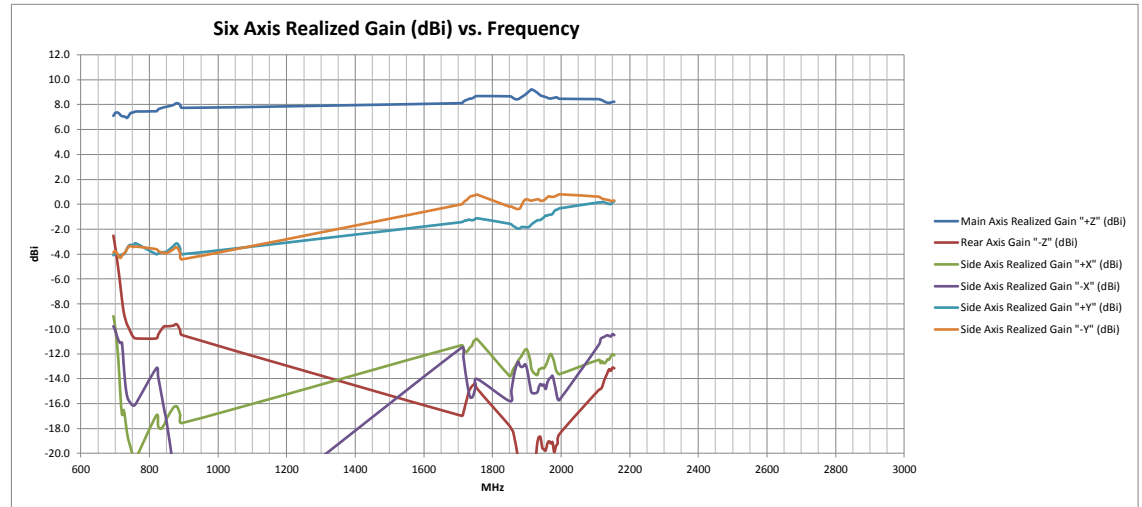
www.RTCE.com

Test Date	Friday, July 19, 2013
Tested By:	Glenn Robb (919) 200-0292 g@RTCE.com
Sample Description	

Axis	Antenna Under Test Orientation Notes (See Coordinate Diagram Tab And Separate Setup Photos)
+Z Axis is Theta= 0 & Phi=any	Axis of intended use
-Z Axis is Theta= 180 & Phi=any	Axis of feed line
Other Coordinate Notes, 3-Axis Cuts in Spherical Coordinates ...	
XZ Cut (Turntable) is Theta=0-360 & Phi=0, or Theta=0-180 & Phi=0 then Theta=180-0 & Phi=180	
YZ Cut is Theta=0-360 & Phi=90, or Theta=0-180 & Phi=90 then Theta=180-0 & Phi=270	
XY Cut is Theta=90 & Phi=0-360	

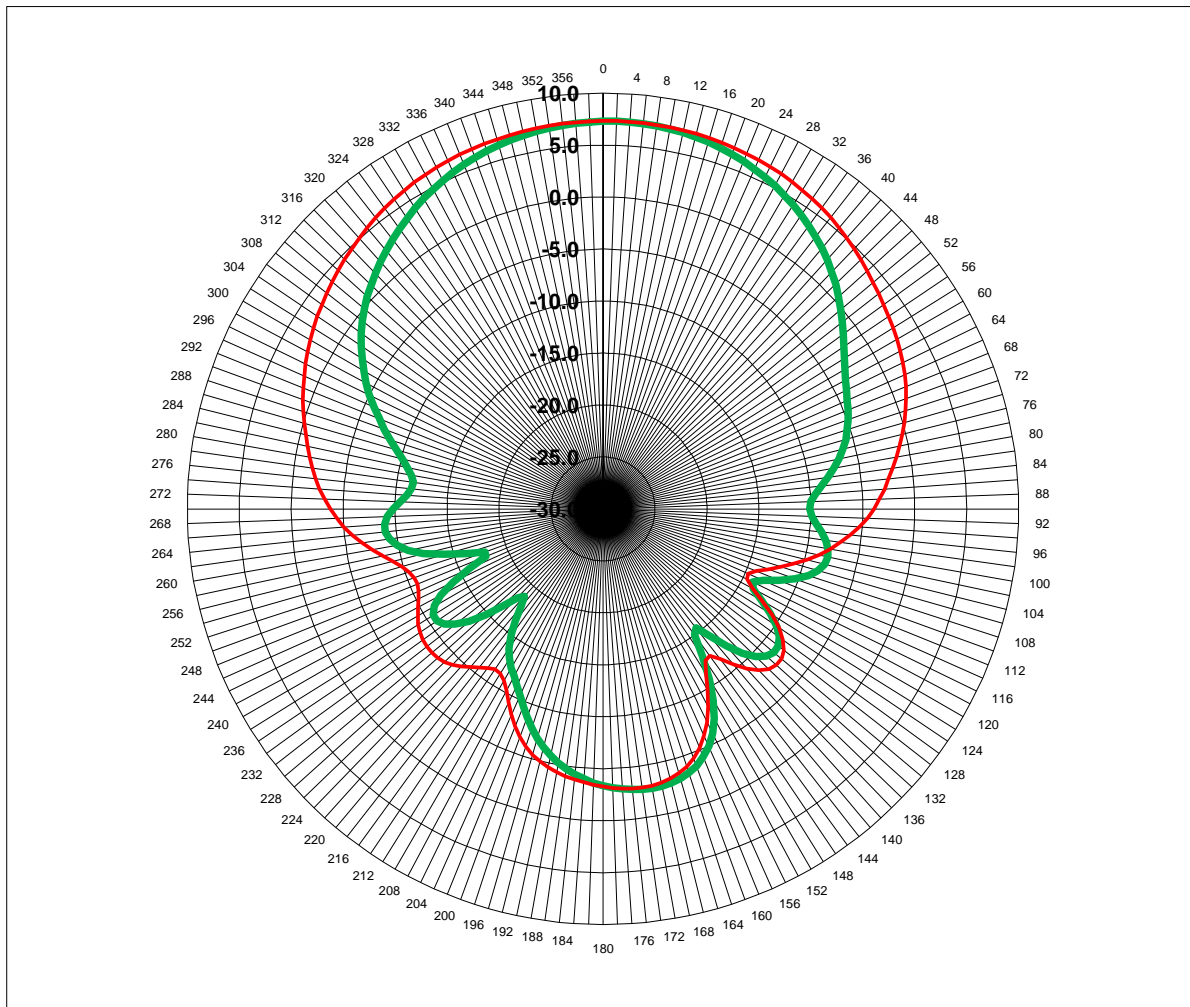
Notes And Observations

Frequency (MHz)	Main Axis Realized Gain "+Z" (dBi)	Rear Axis Gain "-Z" (dBi)	Front/Back Ratio (dB)	Side Axis Realized Gain "+X" (dBi)	Side Axis Realized Gain "-X" (dBi)	Side Axis Realized Gain "+Y" (dBi)	Side Axis Realized Gain "-Y" (dBi)
695	7.1	-2.5	9.6	-9.0	-9.8	-4.1	-3.9
700	7.3	-3.4	10.7	-9.8	-10.1	-3.9	-3.8
705	7.4	-4.3	11.7	-11.1	-10.6	-4.0	-3.9
710	7.3	-5.3	12.7	-12.7	-10.9	-4.1	-4.1
715	7.2	-6.4	13.6	-15.1	-11.1	-4.2	-4.3
720	7.1	-7.7	14.7	-16.9	-11.1	-4.0	-4.1
725	7.1	-8.7	15.7	-16.5	-12.9	-4.0	-4.0
730	7.0	-9.2	16.2	-17.3	-14.5	-3.9	-3.8
735	6.9	-9.7	16.6	-18.4	-15.4	-3.5	-3.6
740	7.1	-9.9	17.1	-19.0	-15.8	-3.3	-3.4
745	7.3	-10.3	17.6	-19.5	-16.0	-3.3	-3.4
750	7.4	-10.5	17.9	-20.0	-16.1	-3.3	-3.4
755	7.4	-10.7	18.1	-20.4	-16.2	-3.2	-3.4
760	7.5	-10.8	18.2	-20.4	-16.0	-3.1	-3.4
820	7.5	-10.8	18.2	-17.0	-13.2	-4.0	-3.6
825	7.6	-10.5	18.1	-17.8	-13.8	-4.0	-3.7
830	7.7	-10.3	17.9	-18.0	-14.5	-3.9	-3.8
835	7.7	-10.1	17.8	-18.0	-15.3	-3.9	-3.9
840	7.8	-9.9	17.6	-17.8	-16.0	-3.9	-3.9
845	7.8	-9.8	17.6	-17.6	-16.8	-3.8	-3.9
850	7.8	-9.8	17.6	-17.2	-17.4	-3.8	-3.9
870	8.0	-9.7	17.7	-16.3	-21.2	-3.4	-3.6
875	8.1	-9.6	17.7	-16.2	-22.6	-3.2	-3.5
880	8.1	-9.6	17.8	-16.2	-24.1	-3.1	-3.5
885	8.1	-9.9	17.9	-16.5	-25.6	-3.3	-3.6
890	8.0	-10.2	18.1	-16.9	-27.4	-3.6	-4.0
895	7.7	-10.5	18.2	-17.6	-29.0	-4.0	-4.4
1710	8.1	-17.0	25.1	-11.3	-11.5	-1.4	0.0
1715	8.2	-16.7	25.0	-11.6	-12.2	-1.4	0.1
1720	8.3	-16.2	24.5	-11.9	-13.3	-1.3	0.3
1725	8.4	-15.7	24.1	-11.8	-14.2	-1.3	0.4
1730	8.4	-15.1	23.6	-11.7	-15.0	-1.2	0.5
1735	8.5	-14.8	23.3	-11.5	-15.5	-1.3	0.6
1740	8.5	-14.6	23.1	-11.4	-15.5	-1.3	0.7
1745	8.6	-14.5	23.1	-11.0	-15.3	-1.3	0.7
1750	8.7	-14.4	23.0	-10.9	-14.7	-1.2	0.7
1755	8.7	-14.8	23.5	-10.8	-14.0	-1.1	0.8
1850	8.7	-17.8	26.5	-13.8	-15.8	-1.6	-0.2
1855	8.6	-18.0	26.7	-13.7	-15.0	-1.6	-0.2
1860	8.5	-18.3	26.8	-13.3	-14.1	-1.7	-0.3
1865	8.5	-18.9	27.4	-13.1	-13.4	-1.8	-0.3
1870	8.4	-19.6	28.0	-12.8	-12.9	-1.9	-0.4
1875	8.4	-20.6	29.1	-12.5	-12.6	-2.0	-0.4
1880	8.5	-21.9	30.4	-12.4	-13.0	-1.9	-0.3
1885	8.6	-22.4	31.0	-12.2	-13.1	-1.8	-0.1
1890	8.7	-24.5	33.2	-11.9	-13.0	-1.8	0.2
1895	8.8	-25.6	34.4	-11.7	-12.8	-1.8	0.4
1900	8.9	-26.5	35.4	-11.7	-13.1	-1.9	0.4
1905	9.0	-26.2	35.2	-12.0	-13.9	-1.8	0.4
1910	9.1	-24.6	33.8	-12.6	-14.7	-1.7	0.3
1915	9.2	-23.8	33.0	-13.3	-15.1	-1.6	0.3
1930	9.0	-19.3	28.3	-13.7	-15.1	-1.3	0.4
1935	8.9	-18.7	27.5	-13.3	-14.7	-1.3	0.4
1940	8.7	-18.7	27.4	-13.2	-14.4	-1.3	0.3
1945	8.7	-19.5	28.2	-13.1	-14.6	-1.2	0.3
1950	8.7	-19.7	28.3	-13.2	-14.5	-1.1	0.3
1955	8.6	-19.8	28.4	-13.0	-14.8	-0.9	0.4
1960	8.6	-19.2	27.8	-12.6	-14.3	-0.9	0.6
1965	8.5	-19.0	27.5	-12.2	-14.0	-0.8	0.7
1970	8.5	-19.2	27.7	-12.0	-13.9	-0.8	0.6
1975	8.5	-19.1	27.6	-12.3	-13.8	-0.8	0.6
1980	8.5	-19.9	28.4	-12.7	-14.3	-0.6	0.6
1985	8.6	-19.4	28.0	-13.3	-15.0	-0.5	0.7
1990	8.6	-19.2	27.7	-13.5	-15.6	-0.4	0.7
1995	8.5	-18.5	26.9	-13.6	-15.7	-0.3	0.8
2110	8.4	-14.9	23.3	-12.5	-11.3	0.2	0.6
2115	8.4	-14.8	23.2	-12.8	-10.8	0.1	0.5
2120	8.4	-14.6	23.0	-12.6	-10.7	0.2	0.5
2125	8.3	-14.2	22.4	-12.8	-10.7	0.2	0.4
2130	8.2	-13.9	22.1	-12.7	-10.6	0.1	0.4
2135	8.2	-13.6	21.7	-12.5	-10.5	0.1	0.4
2140	8.2	-13.2	21.4	-12.5	-10.6	0.0	0.3
2145	8.2	-13.4	21.5	-12.2	-10.6	0.0	0.3
2150	8.2	-13.1	21.3	-12.0	-10.4	0.2	0.3
2155	8.2	-13.2	21.4	-12.1	-10.5	0.3	0.3



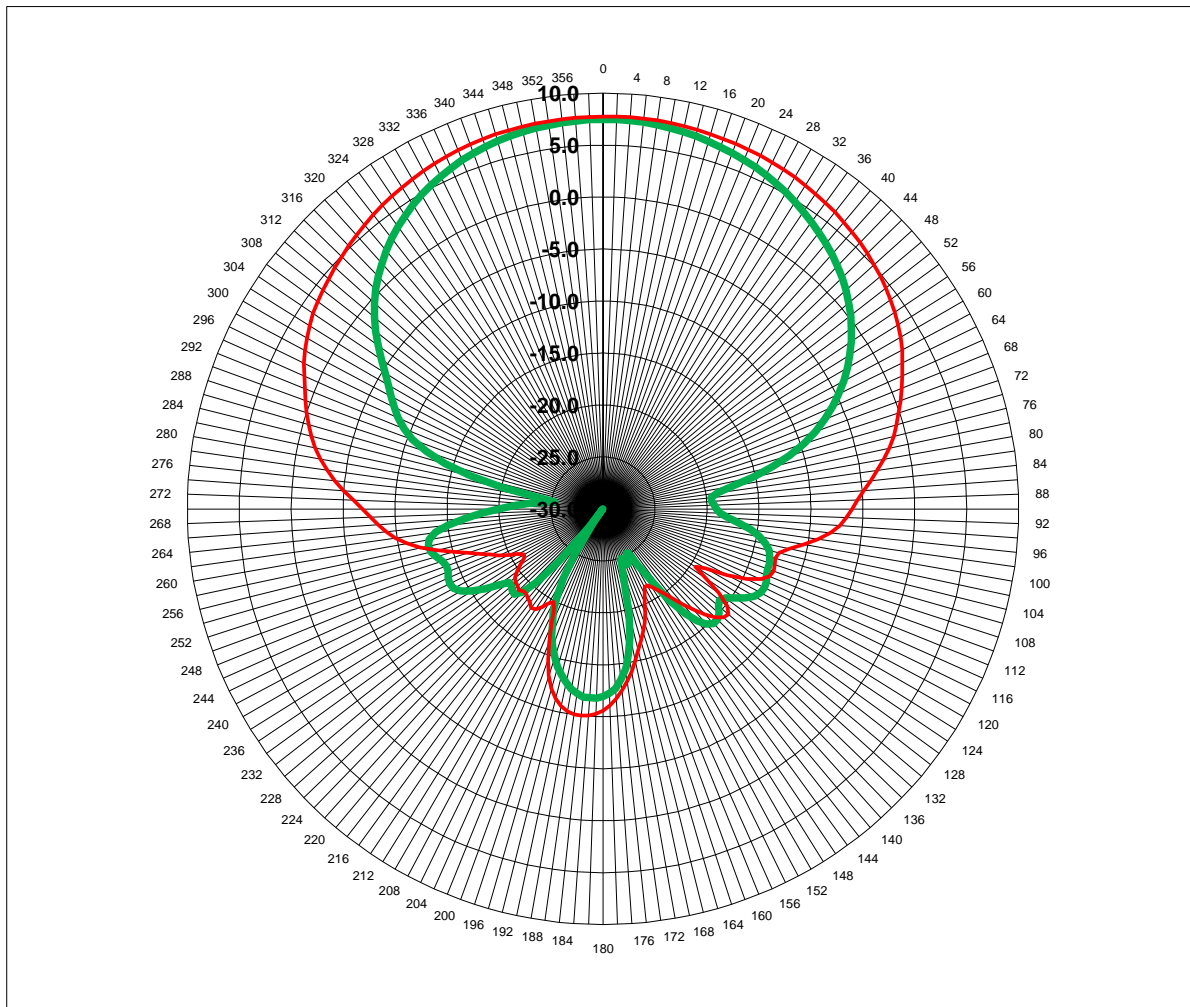
Angle (Degrees)	XZ-Plane Gain (dBi)	YZ-Plane Gain (dBi)
0	7.3	7.3
2	7.3	7.4
4	7.3	7.4
6	7.3	7.3
8	7.2	7.3
10	7.1	7.3
12	7.0	7.3
14	6.9	7.2
16	6.7	7.1
18	6.5	7.1
20	6.3	7.0
22	6.1	6.9
24	5.8	6.8
26	5.5	6.6
28	5.2	6.5
30	4.9	6.4
32	4.5	6.2
34	4.1	6.0
36	3.7	5.8
38	3.2	5.6
40	2.8	5.3
42	2.2	5.1
44	1.7	4.8
46	1.1	4.5
48	0.5	4.2
50	-0.2	3.9
52	-0.8	3.7
54	-1.4	3.4
56	-2.1	3.2
58	-2.6	2.9
60	-3.1	2.7
62	-3.6	2.4
64	-4.0	2.1
66	-4.3	1.8
68	-4.6	1.4
70	-4.9	1.1
72	-5.3	0.6
74	-5.7	0.2
76	-6.2	-0.3
78	-6.8	-0.8
80	-7.4	-1.4
82	-8.2	-1.9
84	-8.9	-2.4
86	-9.5	-2.8
88	-10.0	-3.4
90	-10.1	-3.9
92	-9.9	-4.5
94	-9.4	-5.2
96	-8.9	-6.0
98	-8.3	-6.9
100	-8.0	-7.8
102	-7.9	-8.8
104	-8.0	-9.8
106	-8.5	-10.9
108	-9.2	-12.0
110	-10.3	-13.0
112	-11.7	-14.1
114	-13.1	-14.7
116	-14.0	-14.6

Antenna Gain in dB Isotropic	
Green "XZ-Plane" (Phi=0) "E-Plane"	0.5 dBi Average Gain In Cut
Red "YZ-Plane" (Phi=90) "H-Plane"	2.1 dBi Average Gain In Cut
Average Gain In Both Cuts	1.4 dBi Average Gain In Both Cuts
Test Frequency: (See Tab Label)	



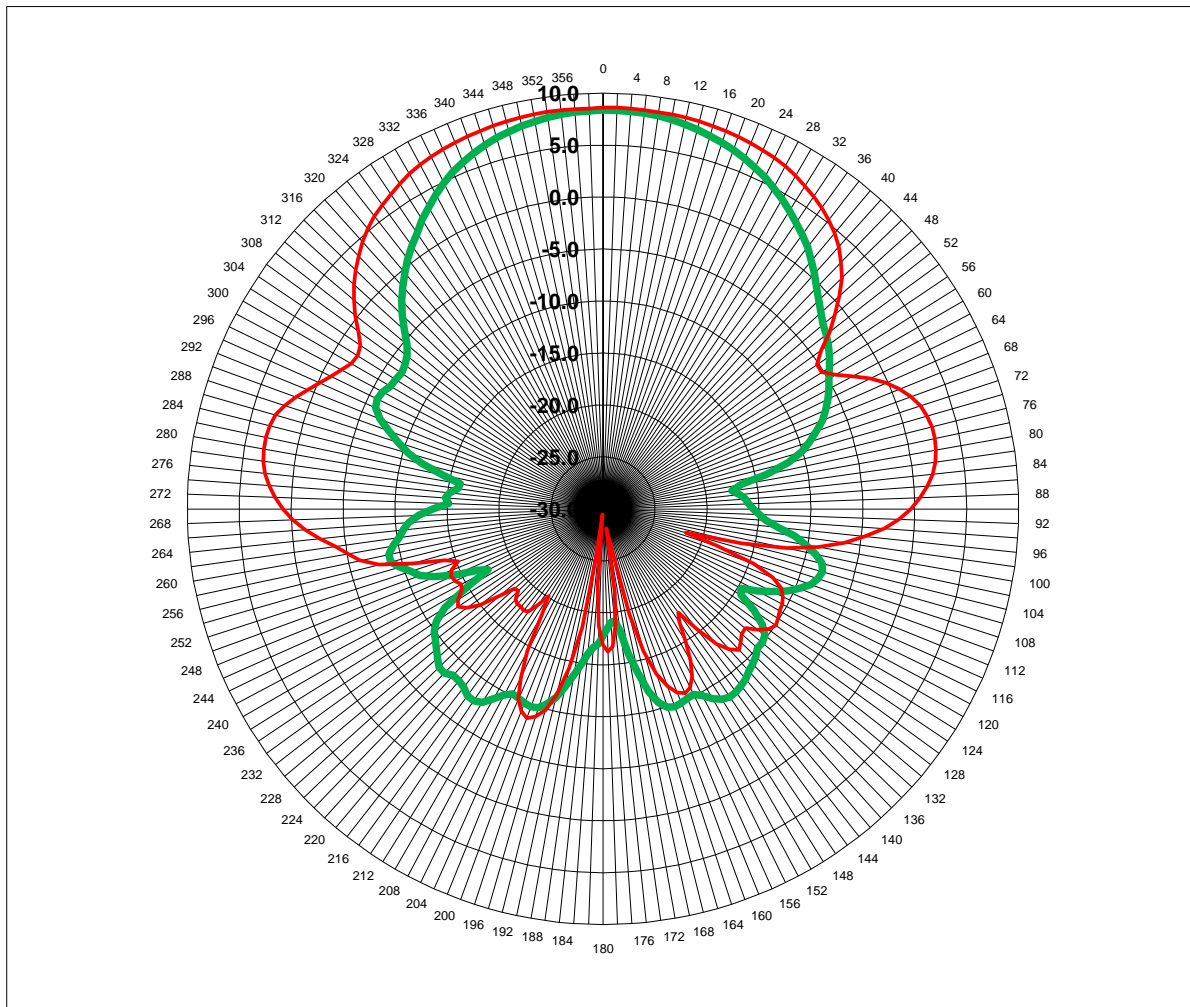
Angle (Degrees)	XZ-Plane Gain (dBi)	YZ-Plane Gain (dBi)
0	7.5	7.8
2	7.5	7.8
4	7.5	7.8
6	7.4	7.8
8	7.3	7.8
10	7.2	7.7
12	7.1	7.7
14	7.0	7.6
16	6.8	7.5
18	6.6	7.5
20	6.4	7.4
22	6.2	7.3
24	6.0	7.2
26	5.7	7.1
28	5.5	7.0
30	5.2	6.9
32	4.8	6.7
34	4.5	6.6
36	4.1	6.4
38	3.8	6.2
40	3.4	6.1
42	2.9	5.8
44	2.5	5.6
46	2.0	5.4
48	1.5	5.1
50	0.9	4.8
52	0.2	4.5
54	-0.4	4.2
56	-1.2	3.9
58	-2.0	3.5
60	-2.8	3.1
62	-3.7	2.6
64	-4.8	2.1
66	-5.8	1.5
68	-7.0	1.0
70	-8.2	0.5
72	-9.7	-0.1
74	-11.3	-0.6
76	-13.2	-1.2
78	-15.2	-1.8
80	-17.3	-2.6
82	-18.9	-3.3
84	-19.6	-4.1
86	-19.5	-4.8
88	-19.3	-5.5
90	-19.1	-6.0
92	-18.7	-6.6
94	-18.0	-7.1
96	-16.8	-8.0
98	-15.6	-9.1
100	-14.7	-10.3
102	-14.0	-11.6
104	-13.5	-12.5
106	-13.3	-12.8
108	-13.1	-12.6
110	-13.1	-12.5
112	-13.1	-12.7
114	-12.8	-13.4
116	-12.7	-14.6

Antenna Gain in dB Isotropic	
Green "XZ-Plane" (Phi=0) "E-Plane"	0.4 dBi Average Gain In Cut
Red "YZ-Plane" (Phi=90) "H-Plane"	2.3 dBi Average Gain In Cut
Average Gain In Both Cuts	1.5 dBi Average Gain In Both Cuts
Test Frequency: (See Tab Label)	



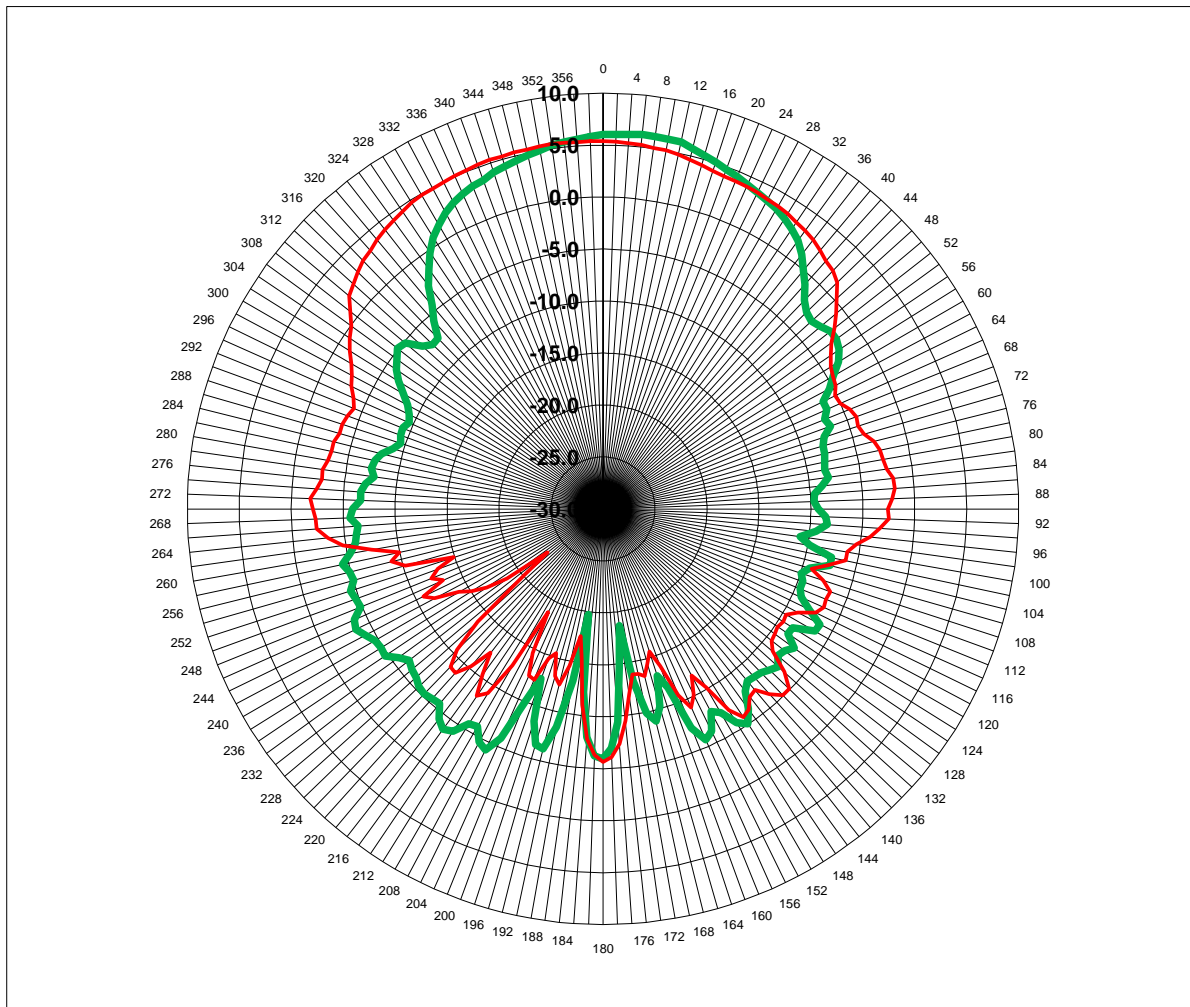
Angle (Degrees)	XZ-Plane Gain (dBi)	YZ-Plane Gain (dBi)
0	8.4	8.6
2	8.4	8.6
4	8.3	8.6
6	8.3	8.6
8	8.2	8.6
10	8.1	8.5
12	7.9	8.5
14	7.6	8.4
16	7.4	8.3
18	7.1	8.2
20	6.8	8.1
22	6.4	8.0
24	6.0	7.8
26	5.5	7.6
28	5.0	7.4
30	4.4	7.0
32	3.8	6.7
34	3.2	6.2
36	2.6	5.8
38	2.0	5.3
40	1.2	4.7
42	0.4	3.9
44	-0.4	3.0
46	-1.1	1.9
48	-1.8	0.6
50	-2.3	-0.8
52	-2.8	-2.3
54	-3.2	-4.0
56	-3.7	-5.2
58	-4.3	-5.2
60	-4.9	-4.1
62	-5.4	-2.8
64	-6.0	-1.4
66	-6.5	-0.2
68	-7.2	0.8
70	-8.2	1.5
72	-9.1	2.1
74	-10.1	2.4
76	-11.6	2.6
78	-13.9	2.6
80	-16.5	2.5
82	-17.5	2.3
84	-16.8	1.9
86	-16.3	1.3
88	-16.0	0.5
90	-15.5	-0.4
92	-15.0	-1.5
94	-14.3	-2.9
96	-13.1	-4.6
98	-11.4	-6.5
100	-10.2	-8.9
102	-9.1	-11.9
104	-8.3	-16.3
106	-8.0	-21.7
108	-8.3	-18.6
110	-8.7	-14.6
112	-9.6	-12.4
114	-10.6	-11.2

Antenna Gain in dB Isotropic	
Green "XZ-Plane" (Phi=0) "E-Plane"	0.5 dBi Average Gain In Cut
Red "YZ-Plane" (Phi=90) "H-Plane"	2.6 dBi Average Gain In Cut
Average Gain In Both Cuts	1.7 dBi Average Gain In Both Cuts
Test Frequency: (See Tab Label)	



Angle (Degrees)	XZ-Plane Gain (dBi)	YZ-Plane Gain (dBi)
0	6.0	5.4
2	6.1	5.3
4	6.1	5.3
6	6.3	5.2
8	6.2	5.1
10	6.1	5.1
12	6.1	4.9
14	5.7	4.7
16	5.4	4.4
18	5.1	4.2
20	4.8	4.1
22	4.5	4.0
24	4.2	4.0
26	3.9	3.9
28	3.6	3.7
30	3.4	3.7
32	3.0	3.5
34	2.5	3.3
36	1.9	3.1
38	1.1	2.8
40	0.0	2.5
42	-0.9	2.1
44	-2.1	1.8
46	-2.7	1.3
48	-3.0	0.2
50	-2.7	-0.7
52	-2.2	-1.7
54	-2.3	-2.9
56	-2.6	-3.6
58	-3.3	-4.1
60	-4.4	-4.5
62	-5.3	-4.7
64	-6.4	-5.2
66	-6.4	-5.0
68	-7.0	-4.4
70	-6.7	-4.0
72	-7.6	-4.2
74	-8.0	-3.9
76	-8.0	-3.1
78	-8.2	-2.8
80	-8.4	-2.6
82	-8.1	-2.4
84	-8.8	-1.9
86	-9.6	-1.9
88	-9.7	-2.2
90	-9.3	-2.6
92	-8.6	-2.5
94	-8.4	-3.3
96	-9.4	-4.1
98	-10.8	-5.4
100	-9.8	-6.1
102	-7.5	-6.1
104	-7.5	-7.7
106	-9.3	-9.1
108	-10.0	-7.7
110	-9.5	-6.7
112	-9.6	-6.9
114	-9.1	-6.7

Antenna Gain in dB Isotropic	
Green "XZ-Plane" (Phi=0) "E-Plane"	-1.1 dBi Average Gain In Cut
Red "YZ-Plane" (Phi=90) "H-Plane"	-0.2 dBi Average Gain In Cut
Average Gain In Both Cuts	-0.6 dBi Average Gain In Both Cuts
Test Frequency: (See Tab Label)	



From IEEE Std 149 (1979) "IEEE Standard Test Procedures for Antennas"

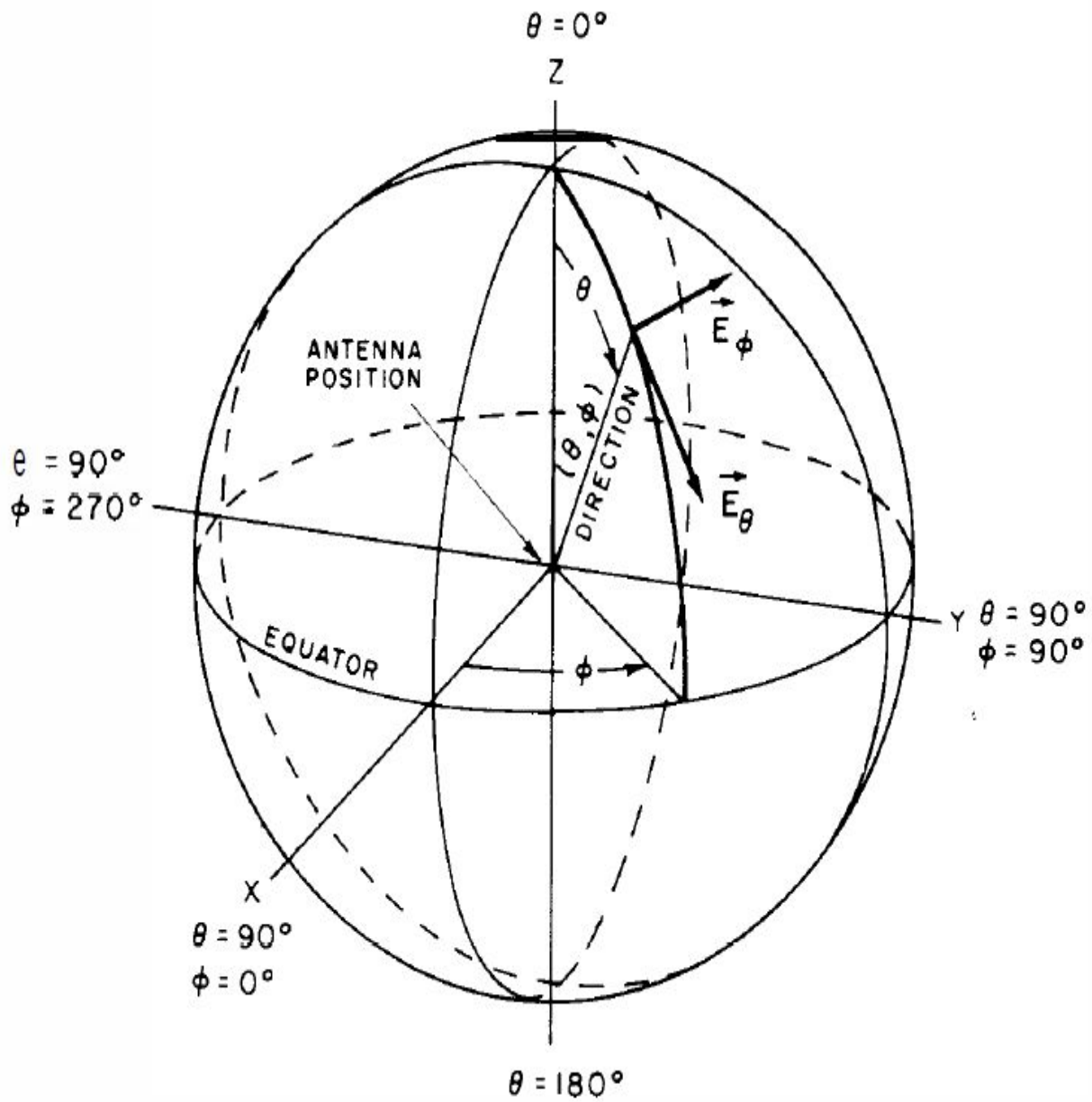


Fig 2
Standard Spherical Coordinate System Used in Antenna Measurements