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**Introduction:**

360°RF has been retained to test the performance of the Discone antenna pictured at right.

Type: Discone antenna 850-6000 MHz



This discone antenna was compared against a 260-1500 MHz Log Periodic, and a 1.0-12 GHz ridged horn reference antennas.

These values were then used to determine Antenna Factors for the encapsulated Discone.

Testing was in Free Space, i.e., no ground plane was used.

What follows are the **findings** from our independent analysis:

In testing, it quickly became obvious that the sample discone antenna had high

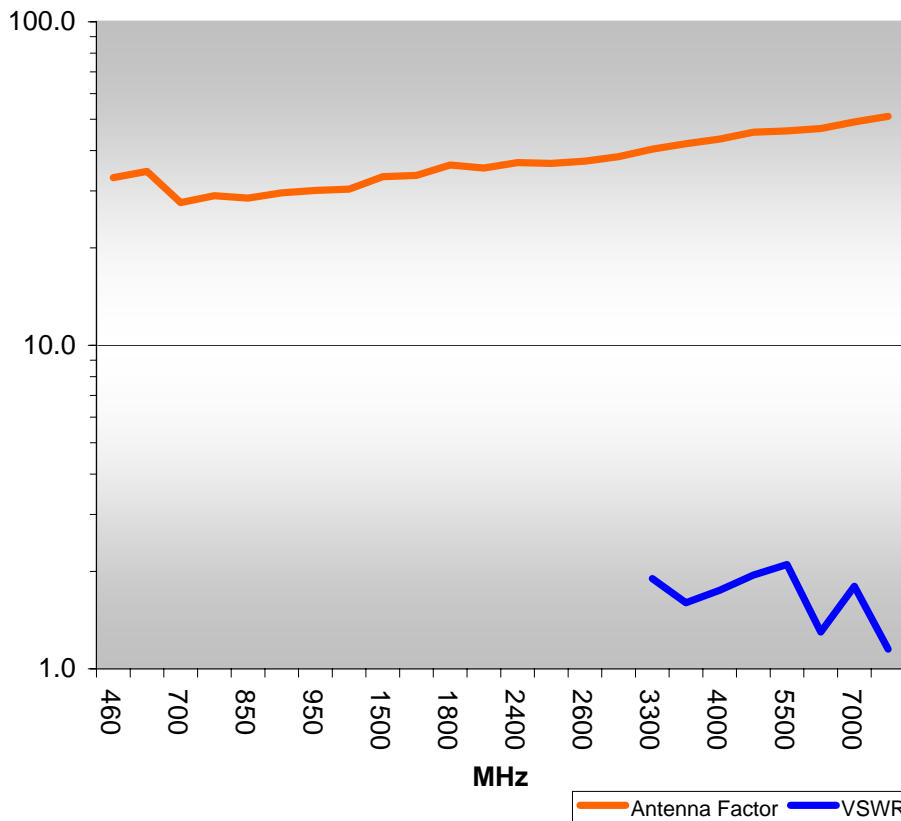


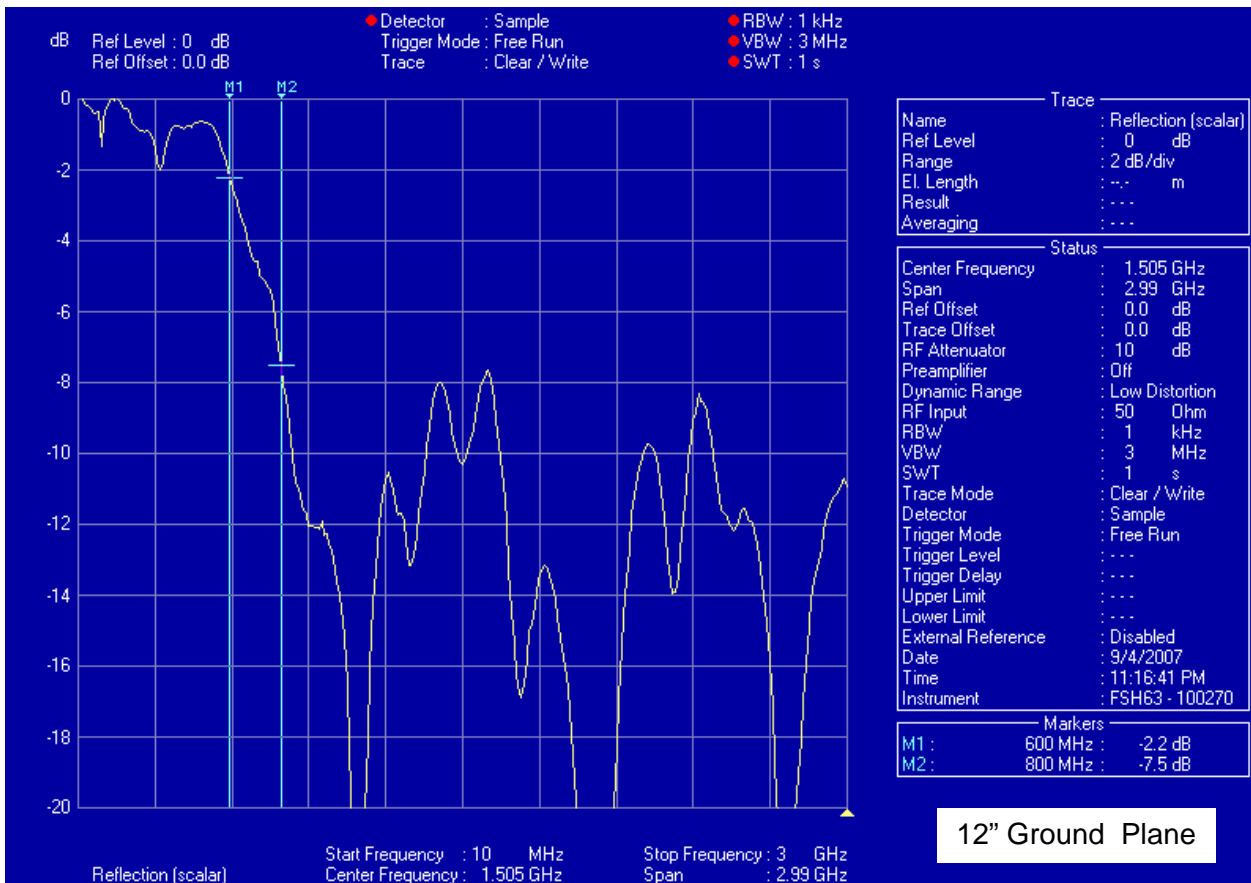
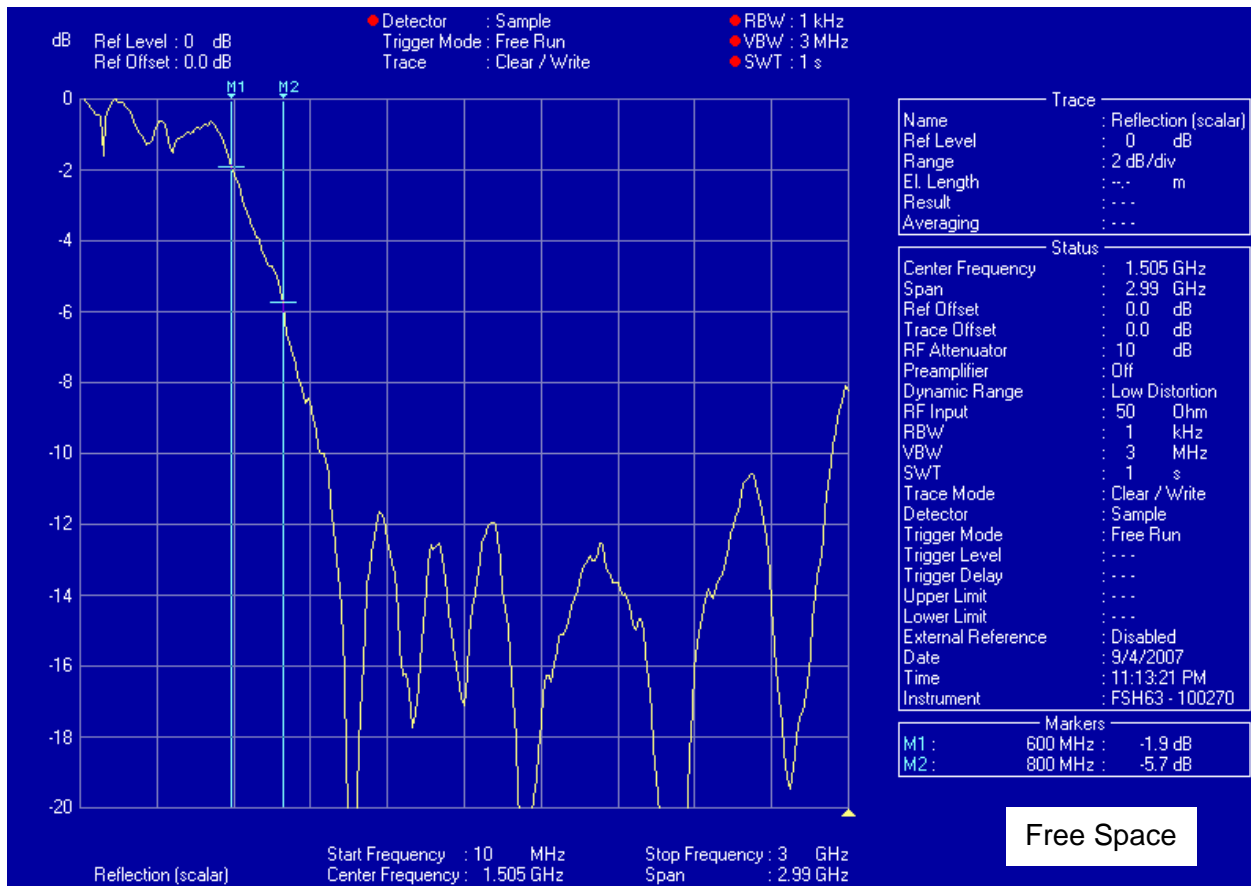
coupling to the feedline. At 2 GHz, the gain of the antenna varied nearly 10 dB as the antenna was rotated 360°. In response, several Ferrite Beads were added to the UT-141 coax between the SMA connector and peak of the cone. This modification improved uniformity about 6 dB. Next, after a variety of ferrites were tried, the cavity between the cone and the base was filled with Carbon Foam absorber, which greatly reduced feedline coupling. Modified as described, the antenna was tested, and the following data generated.



Frequency MHz	Antenna Factor	VSWR	Notes
460	33.0	See Plot	Use with care due to the low efficiency of the antenna
650	34.5	See Plot	Use with care due to the low efficiency of the antenna
700	27.6	See Plot	
825	29.0	See Plot	
850	28.5	See Plot	
900	29.6	See Plot	
950	30.1	See Plot	
1000	30.4	See Plot	
1500	33.2	See Plot	
1700	33.5	See Plot	
1800	36.1	See Plot	
2000	35.3	See Plot	
2400	36.7	See Plot	
2500	36.5	See Plot	
2600	37.1	See Plot	
2700	38.3	See Plot	
3300	40.4	1.9	
3600	42.0	1.6	
4000	43.4	1.8	
5000	45.6	2.0	
5500	46.0	2.1	
6000	46.8	1.3	
7000	49.0	1.8	Use with care due to ripple in the response
8000	51.0	1.2	Use with care due to ripple in the response

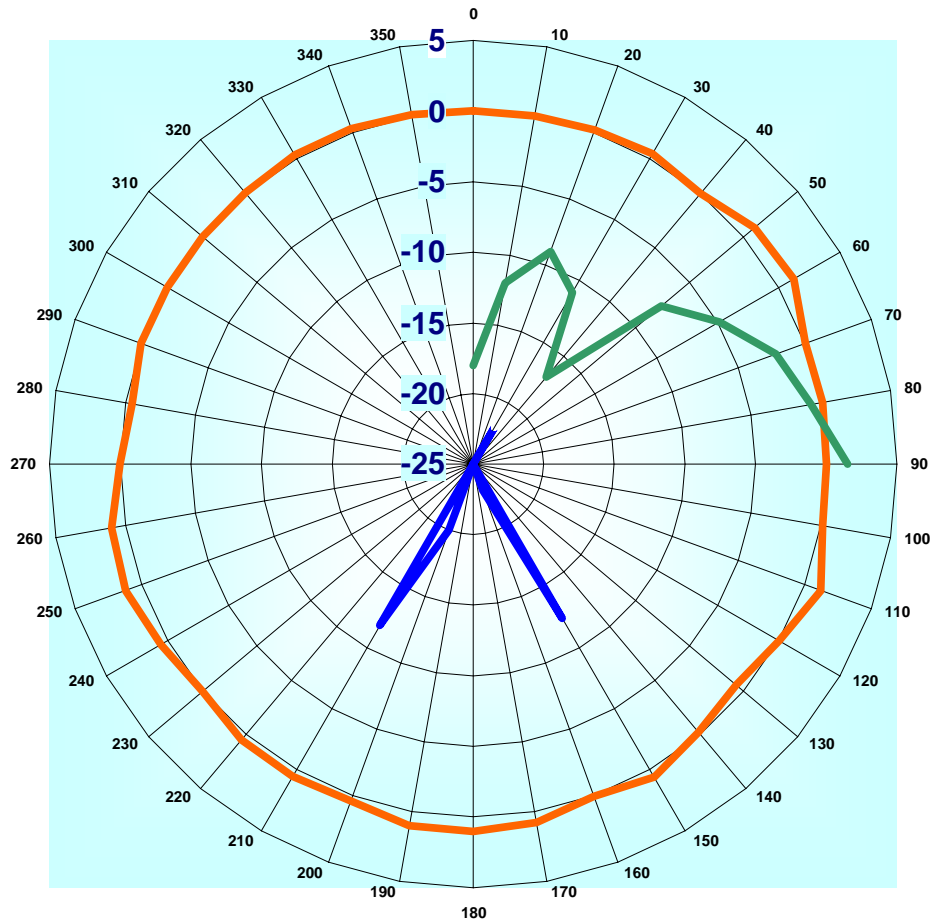
**Antenna Factor & VSWR**





Angle°	dBi Gain		
	Elevation	SMA > South	Hz (XPol)
0	0.0	-18.0	-25.0
10	0.0	-12.0	-25.0
20	0.2	-9.0	-25.0
30	0.4	-11.0	-22.0
40	0.0	-17.0	-25.0
50	1.0	-7.6	-25.0
60	1.2	-4.9	-25.0
70	0.0	-2.2	-25.0
80	0.1	-0.7	-25.0
90	0.0	1.5	-25.0
100	0.1		-25.0
110	1.2		-25.0
120	0.0		-25.0
130	-0.7		-25.0
140	-0.2		-25.0
150	0.6		-12.4
160	0.0		-23.0
170	0.8		-25.0
180	1.0		-25.0
190	1.0		-25.0
200	0.4		-20.0
210	0.5		-11.8
220	0.5		-25.0
230	0.0		-25.0
240	0.5		-25.0
250	1.2		-25.0
260	1.0		-25.0
270	0.0	0.0	-25.0
280	-0.5	-1.5	-25.0
290	0.0	-1.8	-25.0
300	0.0	-3.2	-25.0
310	0.0	-5.3	-25.0
320	0.1	-8.0	-25.0
330	0.3	-10.0	-25.0
340	0.3	-9.0	-25.0
350	0.1	-16.0	-25.0

## Discone Antenna 2500 MHz Patterns



— Elevation — Horizon (Cross - Pol) — Elevation SMA pointing South

\* Yellow shaded data cells denote that dBi reading was below the listed -25 dBi

**Conclusion:**

The antenna behaved as a Discone antenna between 700 MHz and 6 GHz. Below 700 MHz the antenna behaved as a short monopole. Above 6 GHz the antenna is still behaving as a Discone antenna, but there are a variety of interactions and resonances in the structure.