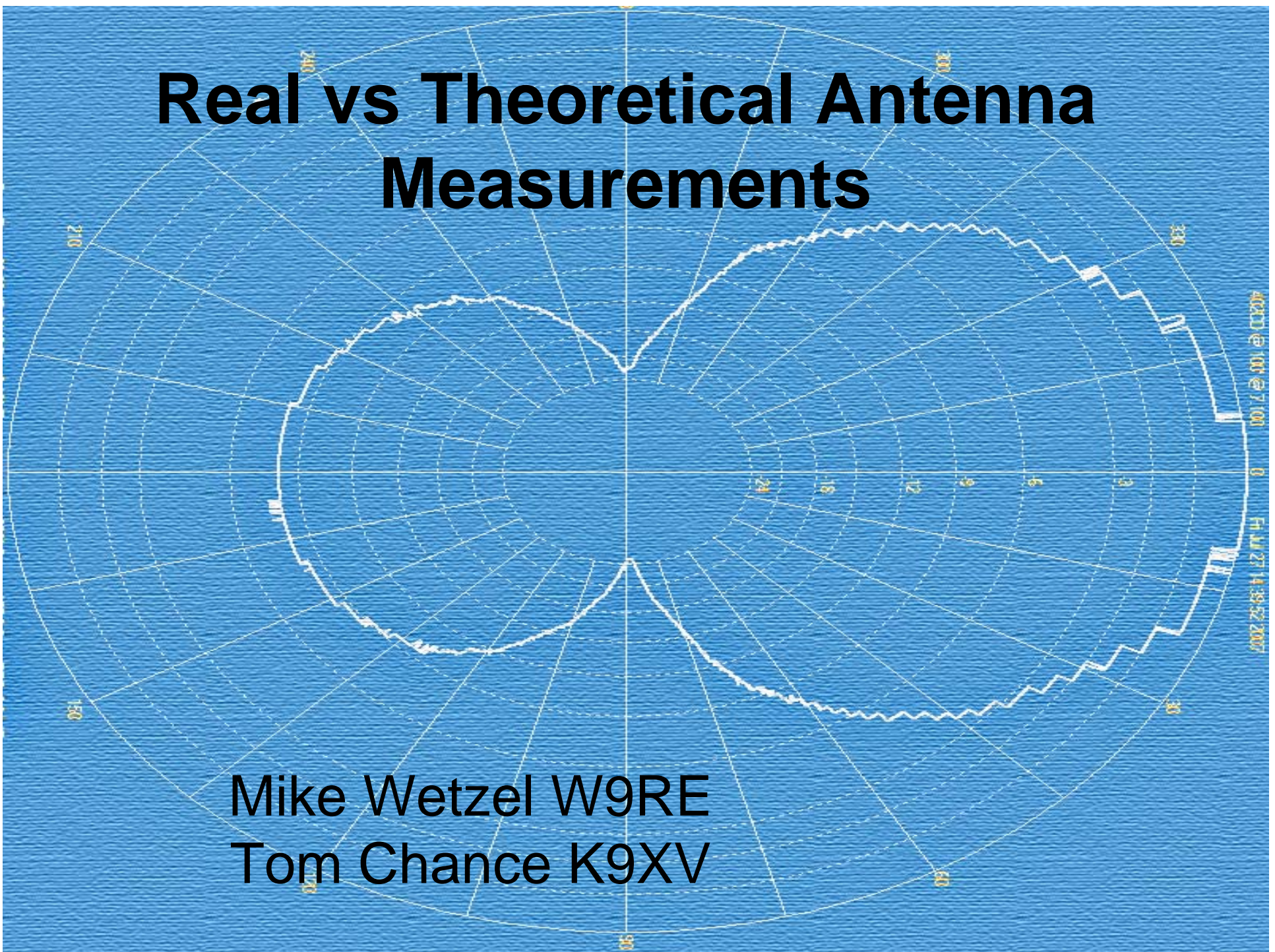


Real vs Theoretical Antenna Measurements



Introductions

- Practical method to antenna measurements
- Antenna measurements are not easy
- Many of us work with Computer generated or manufacture supplied Charts/Graphs
- Lab vs Communication Receiver
- Calibration / Limit Variables

40210 @ 100 @ 7.00 0 Fri Jul 27 14:39:52 2007

Background

- W9RE/K9XV Interested in 40 M Project
- Fighting the constraints of traditional 40M beams (BW vs FB vs GAIN vs Size)
- Attended W6NL Moxon Presentation at Dayton 2007
- Can we evaluate the Moxon?

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Challenges

- Do we have an antenna range?
- 2.3 Miles between sites
- Both locations are line of site
- Path Loss Consistency – Propagation
- Keep variables to a minimum - Repeatability
- Find a tool to capture / plot antenna results

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Discovery

- Found S-Meter Lite
- Method of Calibration and Plotting Receiver Output
- Initial Testing
- Calibration Required
- Determine Testing Sites for Far Field Measurements
- Test Known Antennas

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S-Meter Lite Requirements

- Computer (Windows Based)
- Supported Receiver (ICOM / Yaesu)
- Steady Signal from second site
 - Path/Propagation
 - Steady TX (10 to 25W)
- Calibration of Receiver
- Good constant speed rotator
- Second Communication Path – Start and Stop

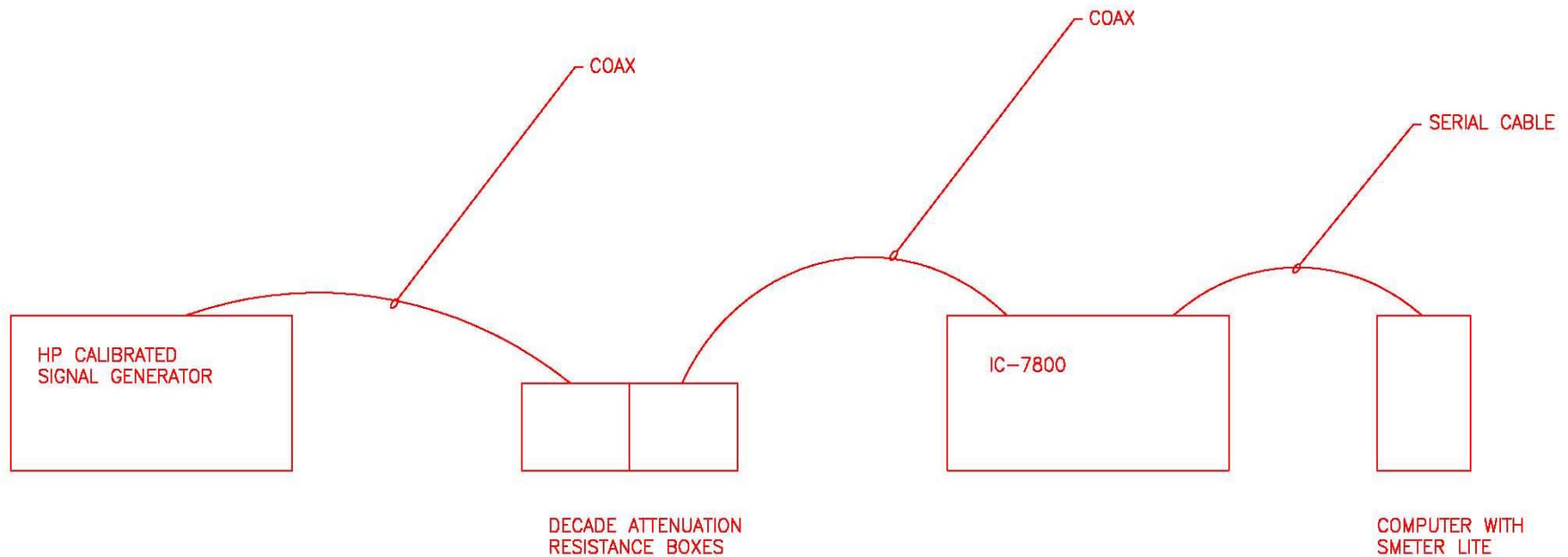
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S-Meter Lite Requirements (cont)

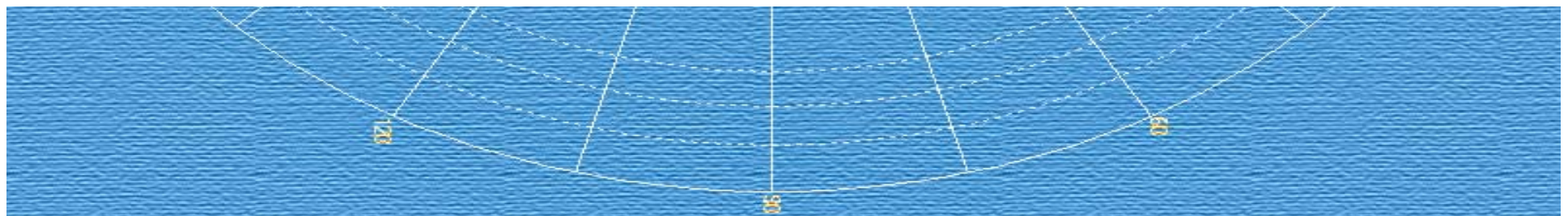
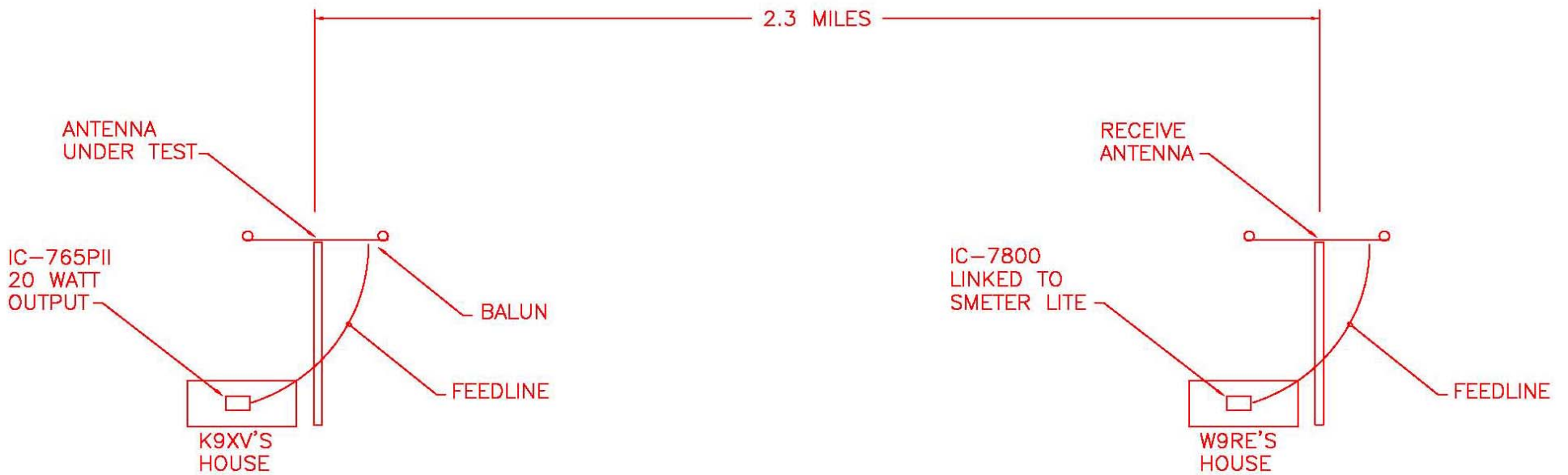
- SMeter Capture / Logging
- Adjust Sampling rates to rotor speed
- Practice Hard Starts and Stops
- Practice Antenna Plotting Features
- When running tests be aware of the dynamic range (F/B & F/S)

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Software Calibration



Path Loss Diagram



My Computer Norton AntiVirus 2001 6.83

My Documents cluster.w9zrx...

Internet Explorer ar505enu.exe

Recycle Bin lowband.txt

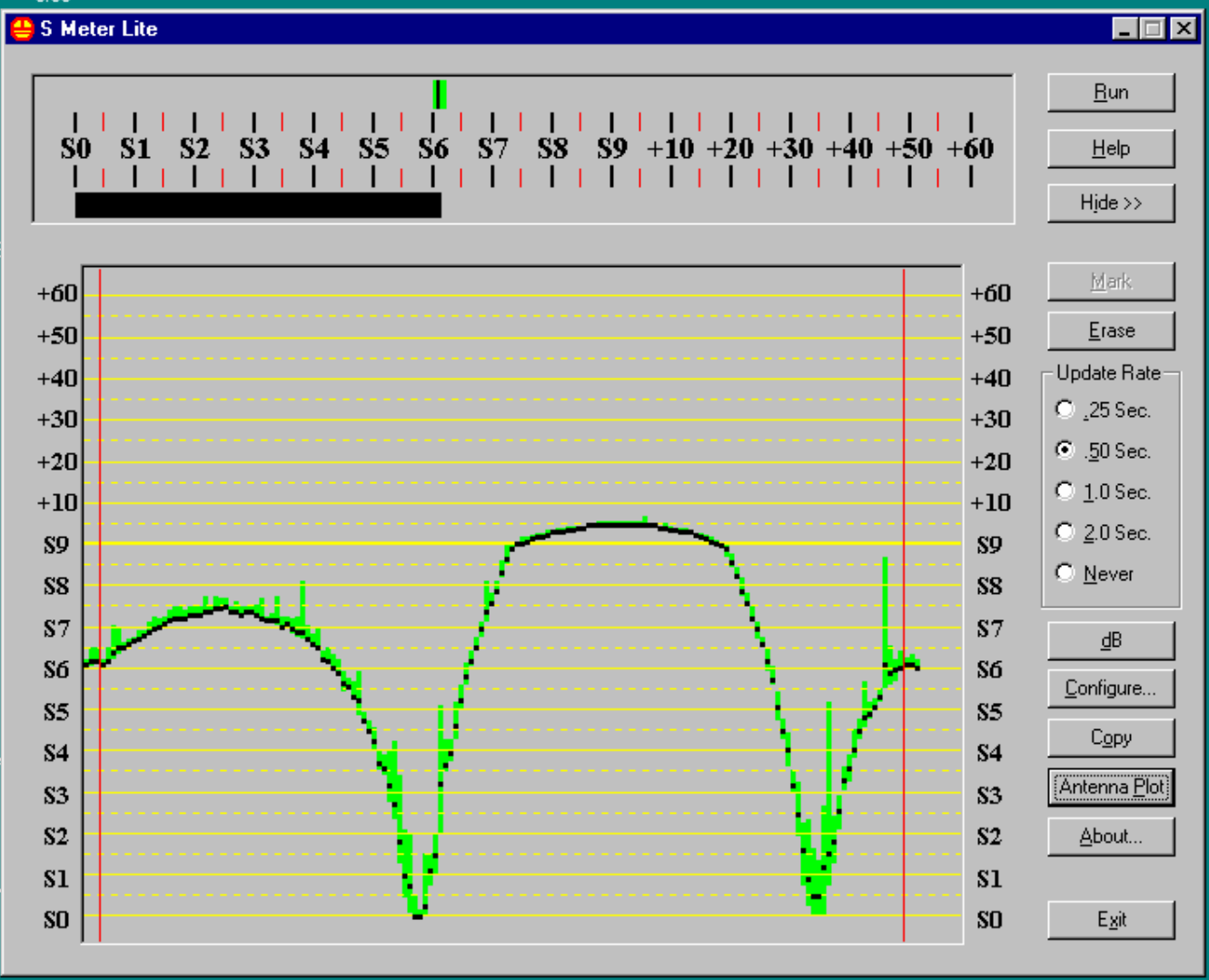
Wetzel_EE LOG.DAT

Shortcut to HYPERTRM... server.dat

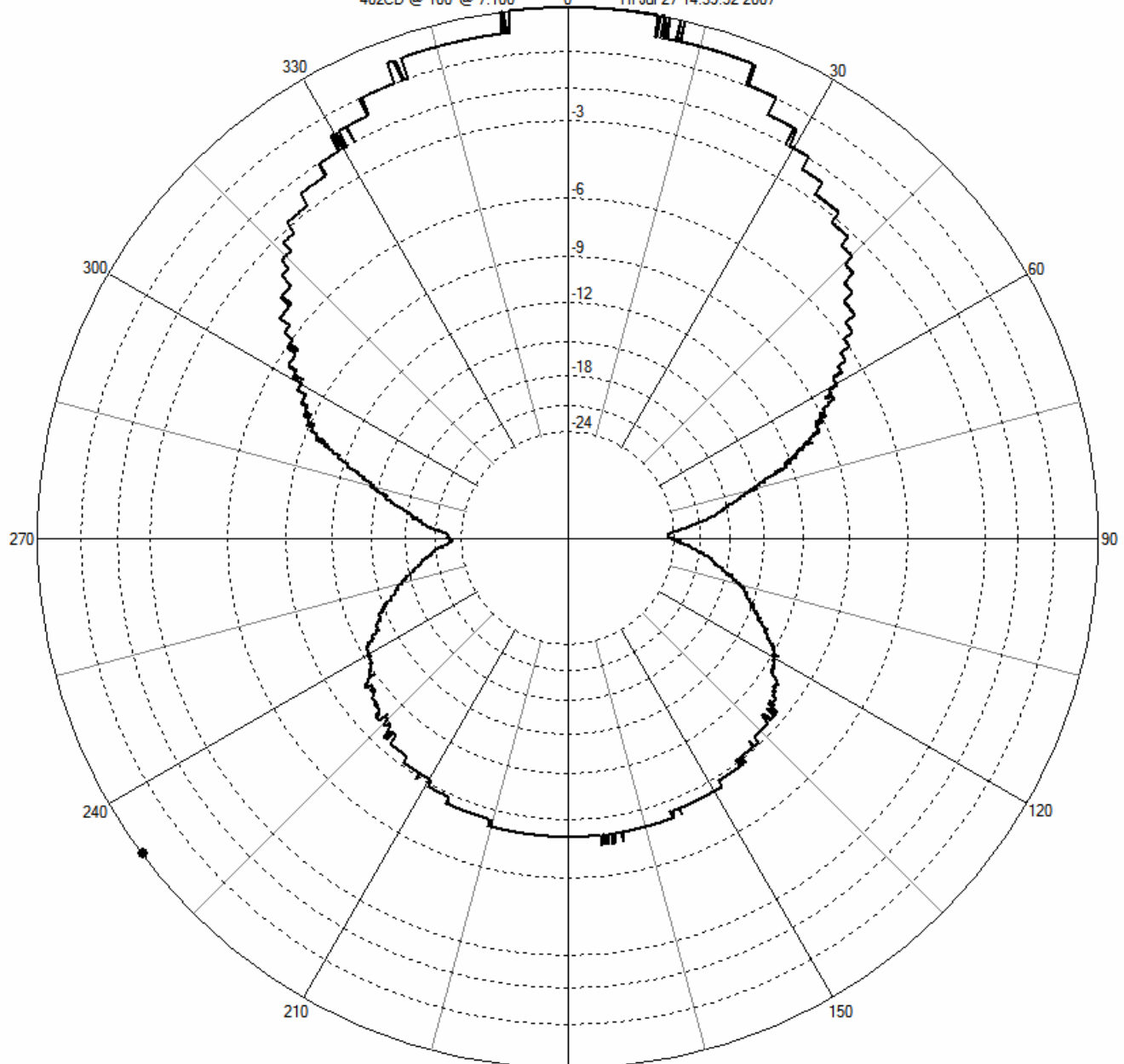
Shortcut to tnc.ht 6.79

alpha.ht WinZip

AlphaRemot... 6.82



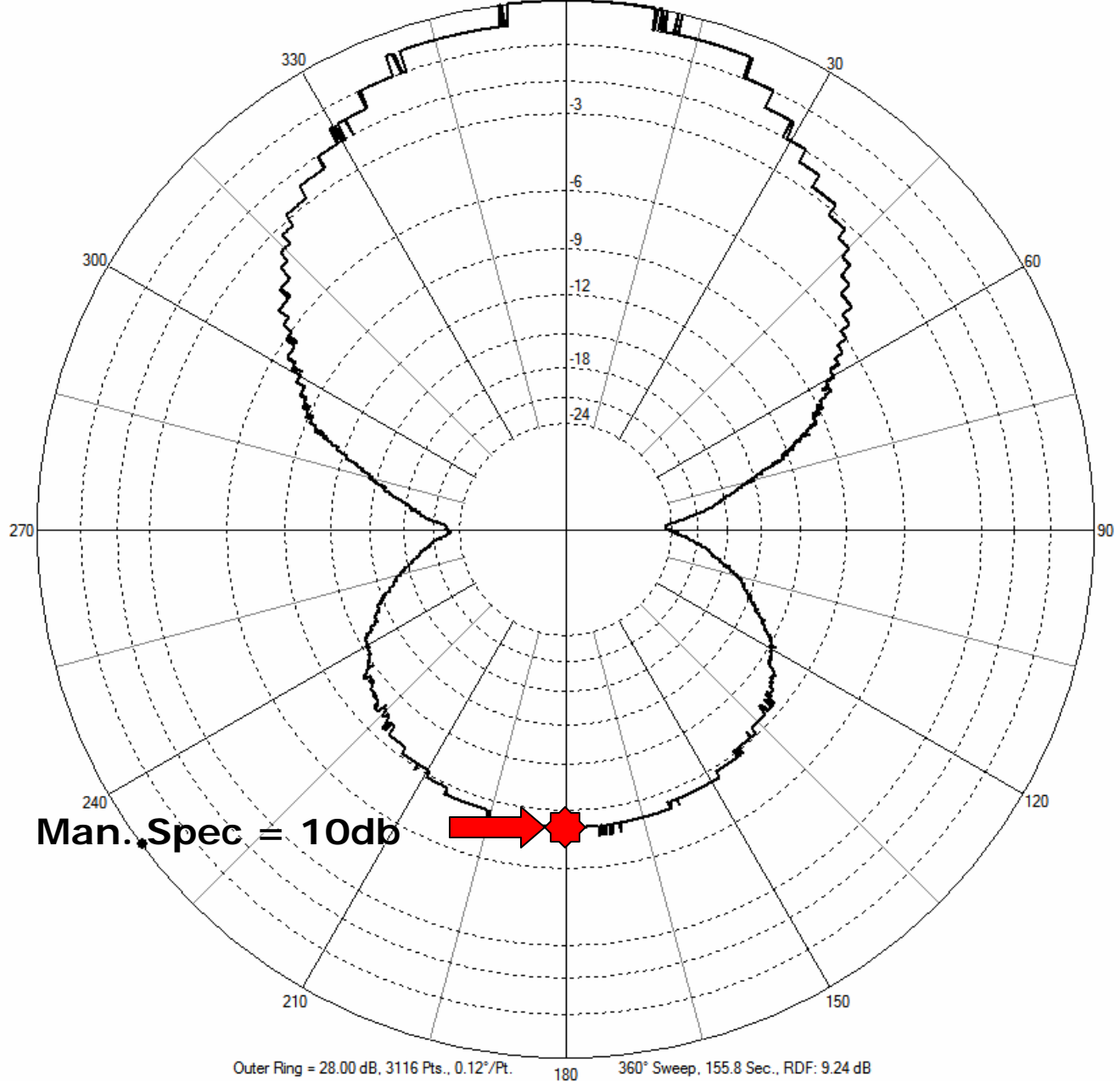
402CD @ 100' @ 7.100 0 Fri Jul 27 14:39:52 2007



402-CD
CF = 7.1 MHz
BW = 77 deg
FB = 9.24dB

Outer Ring = 28.00 dB, 3116 Pts., 0.12"/Pt. 180 360° Sweep, 155.8 Sec., RDF: 9.24 dB

402CD @ 100' @ 7.100 0 Fri Jul 27 14:39:52 2007



402-CD
CF = 7.1 MHz
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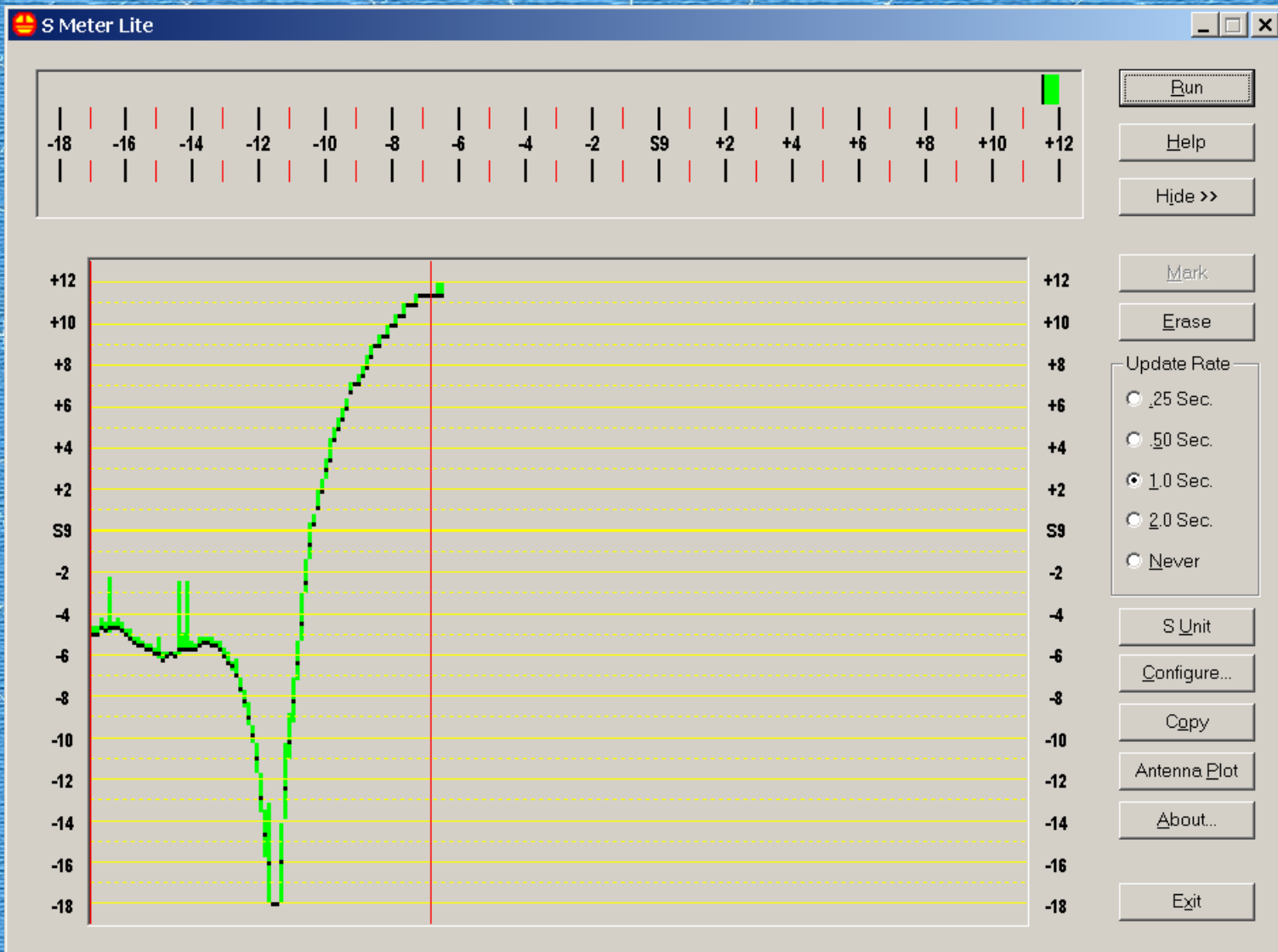
Man. Spec = 10db

Outer Ring = 28.00 dB, 3116 Pts., 0.12°/Pt. 180 360° Sweep, 155.8 Sec., RDF: 9.24 dB

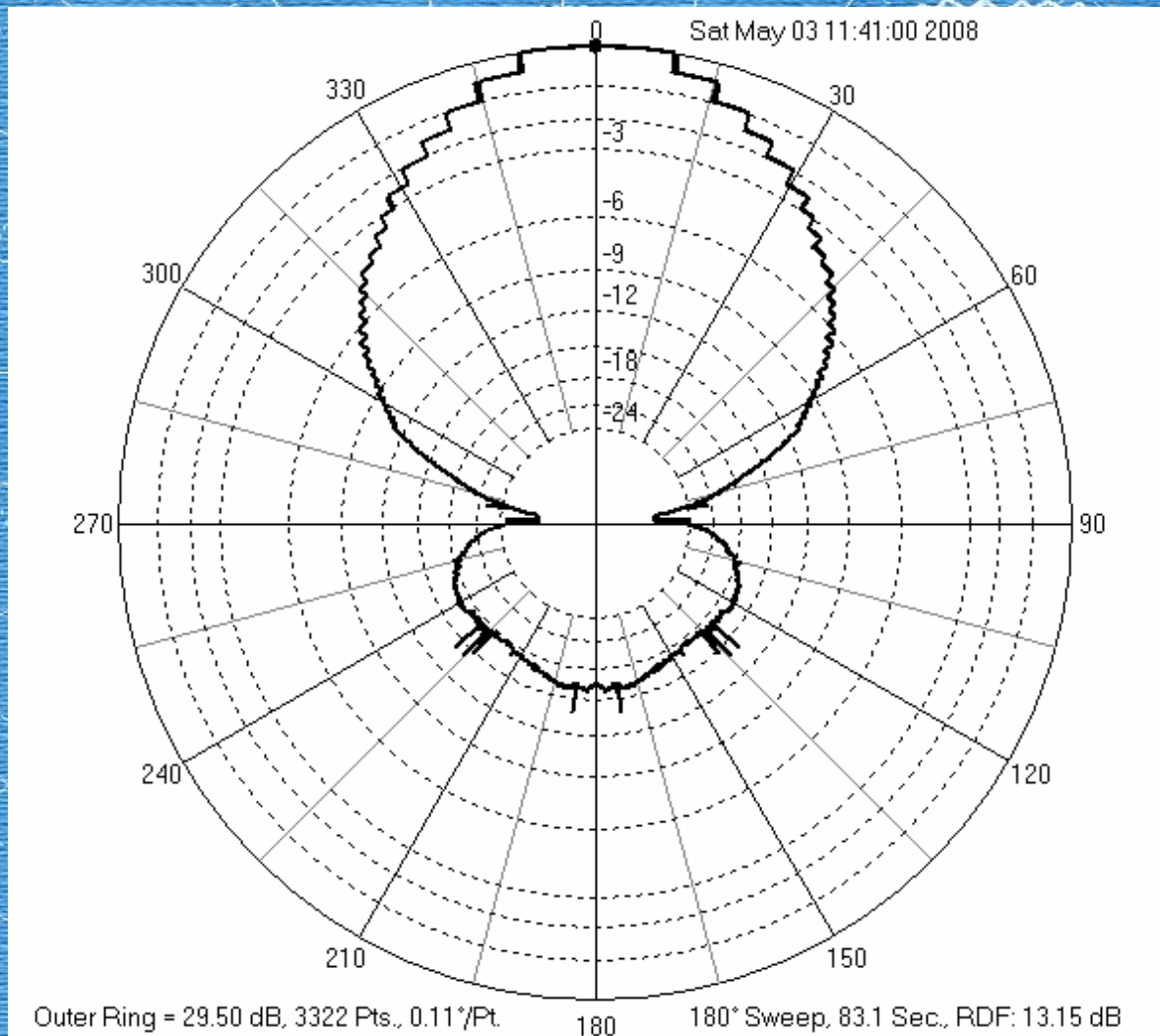


The Reference Dipole

K9XV Moxon Measurement @ 100' @ 7.1MHz

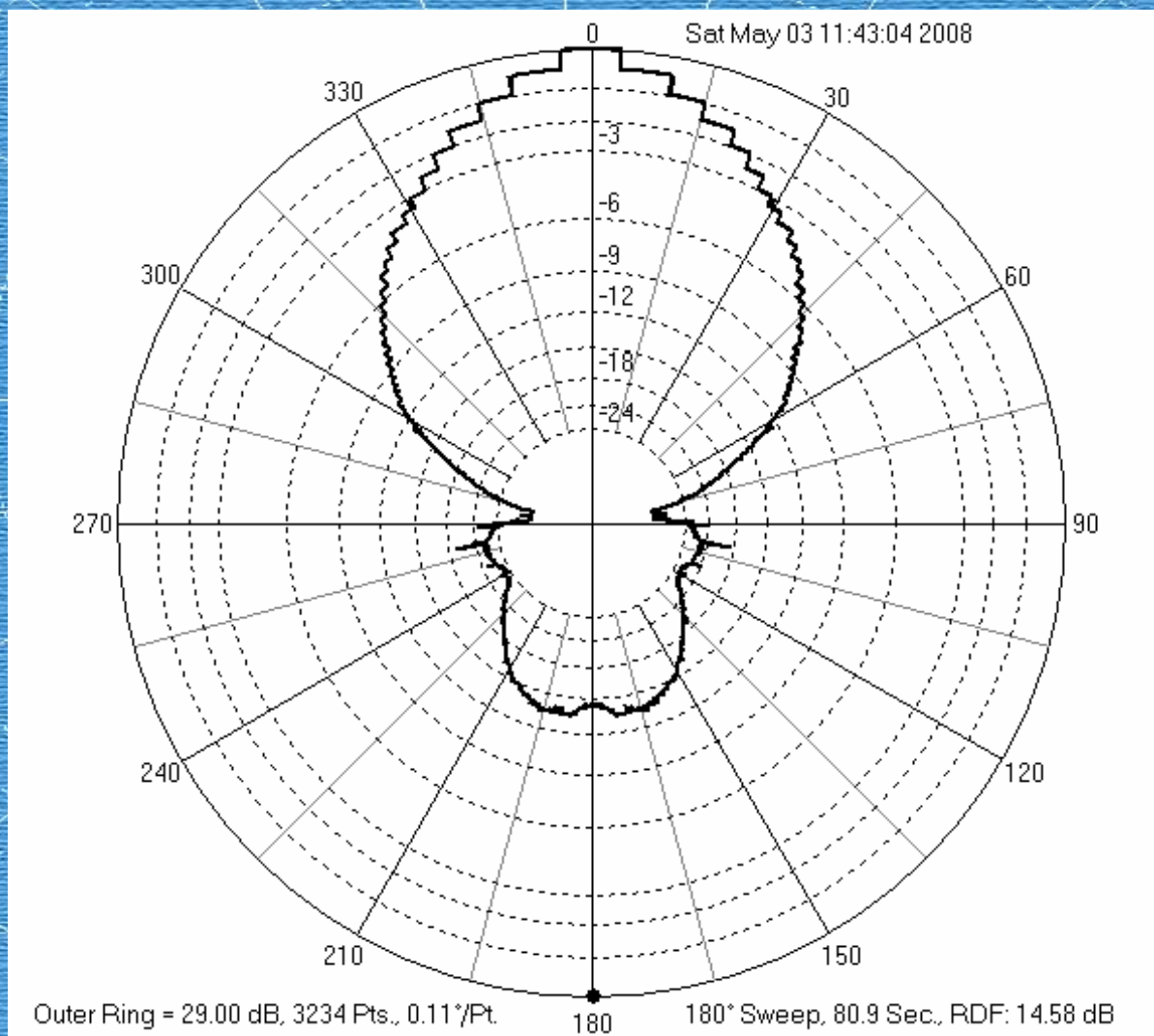


K9XV Moxon Measurement @ 100' @ 7.1 MHz



0000 @ 100' @ 7.100 0 Fri Jul 27 14:39:52 2007

K9XV Moxon Measurement @ 100' @ 7.0 MHz



0000 @ 100' @ 7.00 0 Fri Jul 27 14:39:52 2007

K9XV Moxon



0000 @ 100 @ 7.00 0 Fri Jul 27 14:39:52 2007

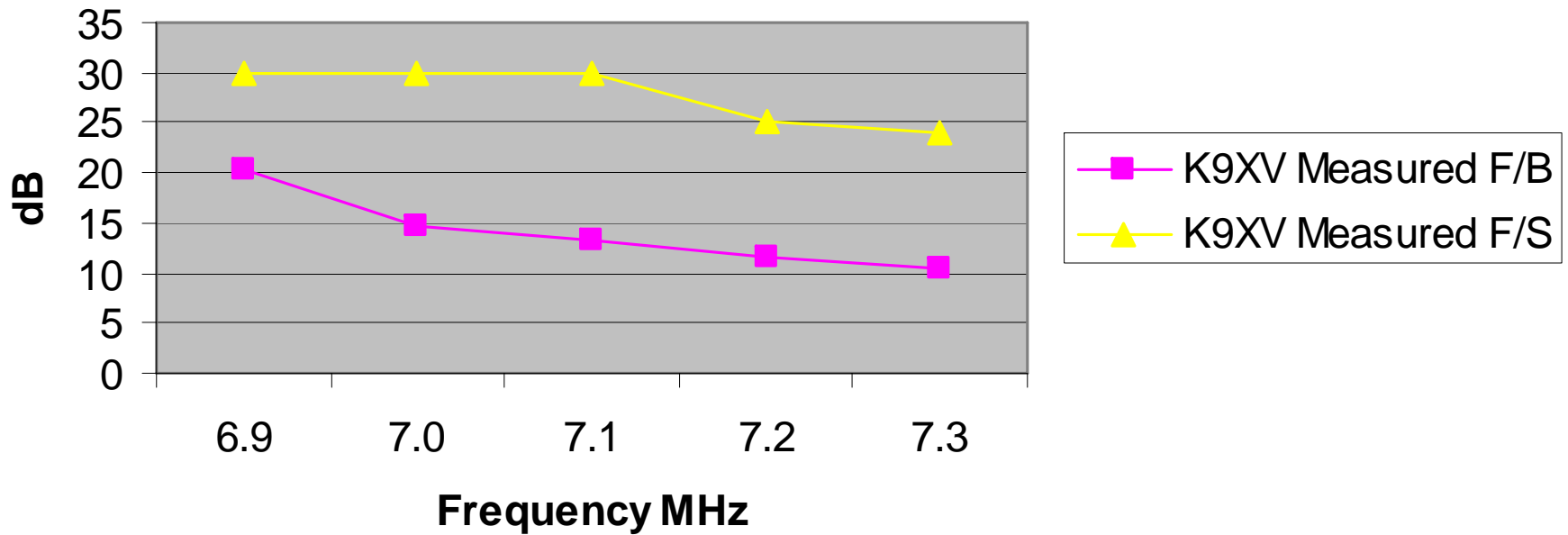
The Moxon Advantage

- No Coils
- Better Bandwidth than 3 element 40M
- Good pattern (F/B, SWR, Gain)
- Similar Performance to full size 3 element 40M beam
- Dramatic Size and Weight Reduction
- Does it really work?

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Performance Measurements

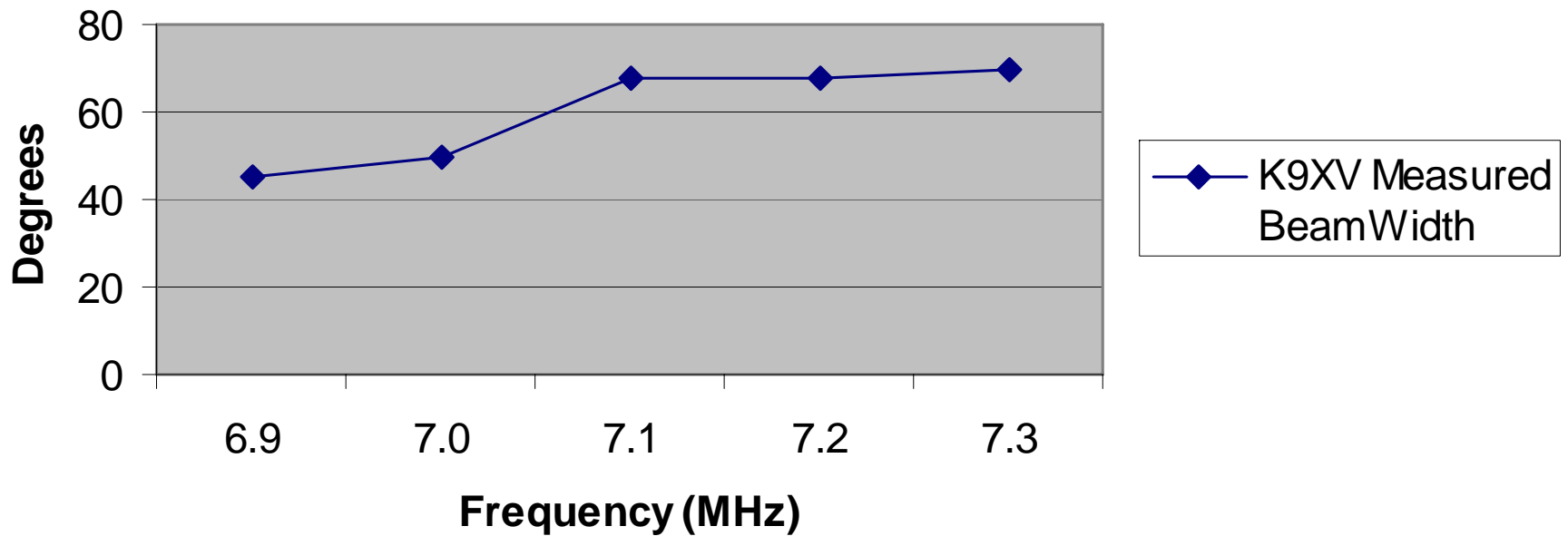
K9XV Moxon Measured Performance



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Measured Beamwidth

K9XV Moxon Measured BeamWidth



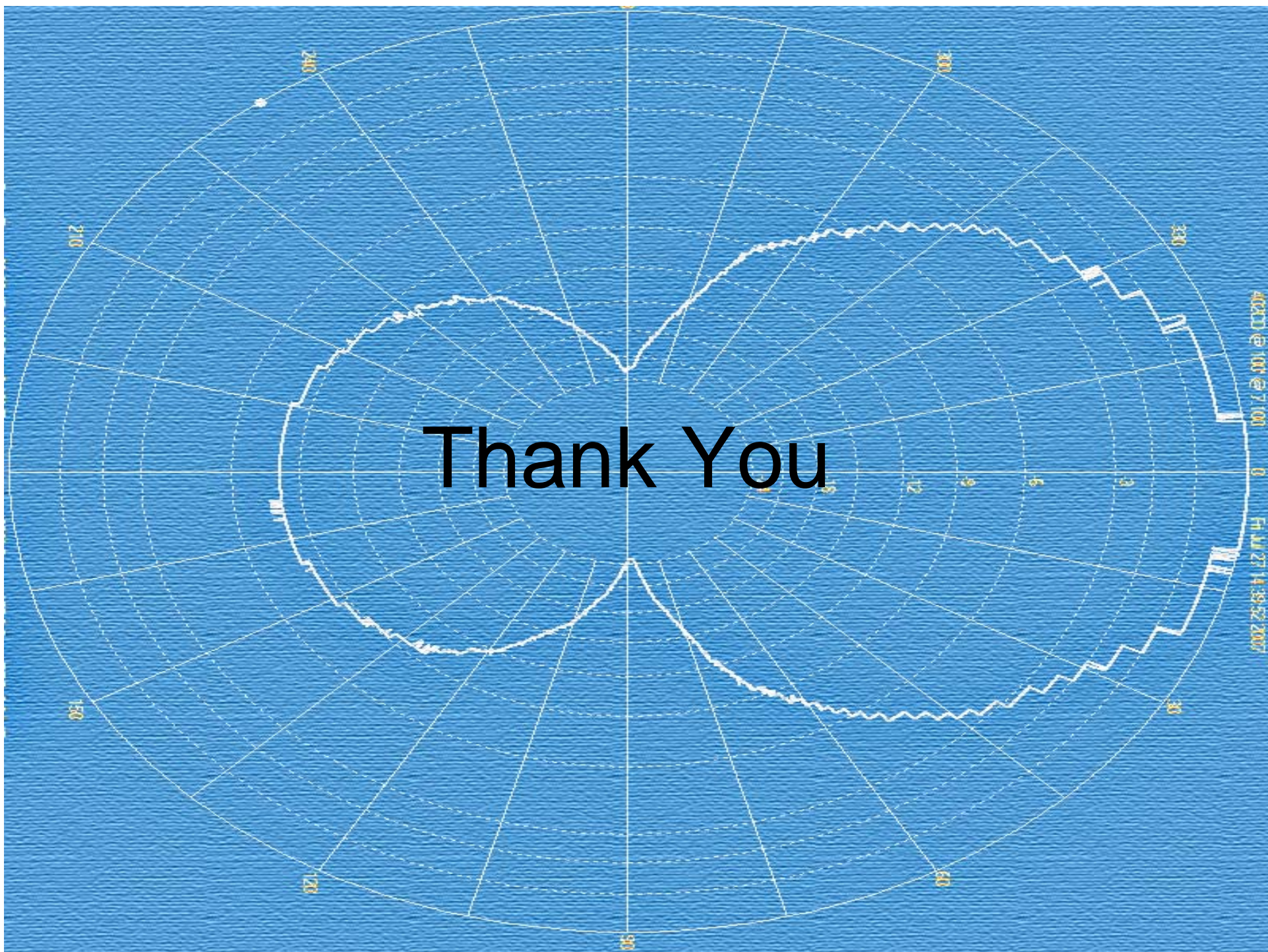
4000 @ 100 @ 7.00 0 Fri Jul 27 14:39:52 2007

Conclusions

- Still not Satisfied with the Model
- Good Operation Results
- Shift C-Freq; Fwd Gain 3.5dBd
- 65 LBS
- SMeter Lite – Nice Tool
- NEC2 has problem with crossing wires

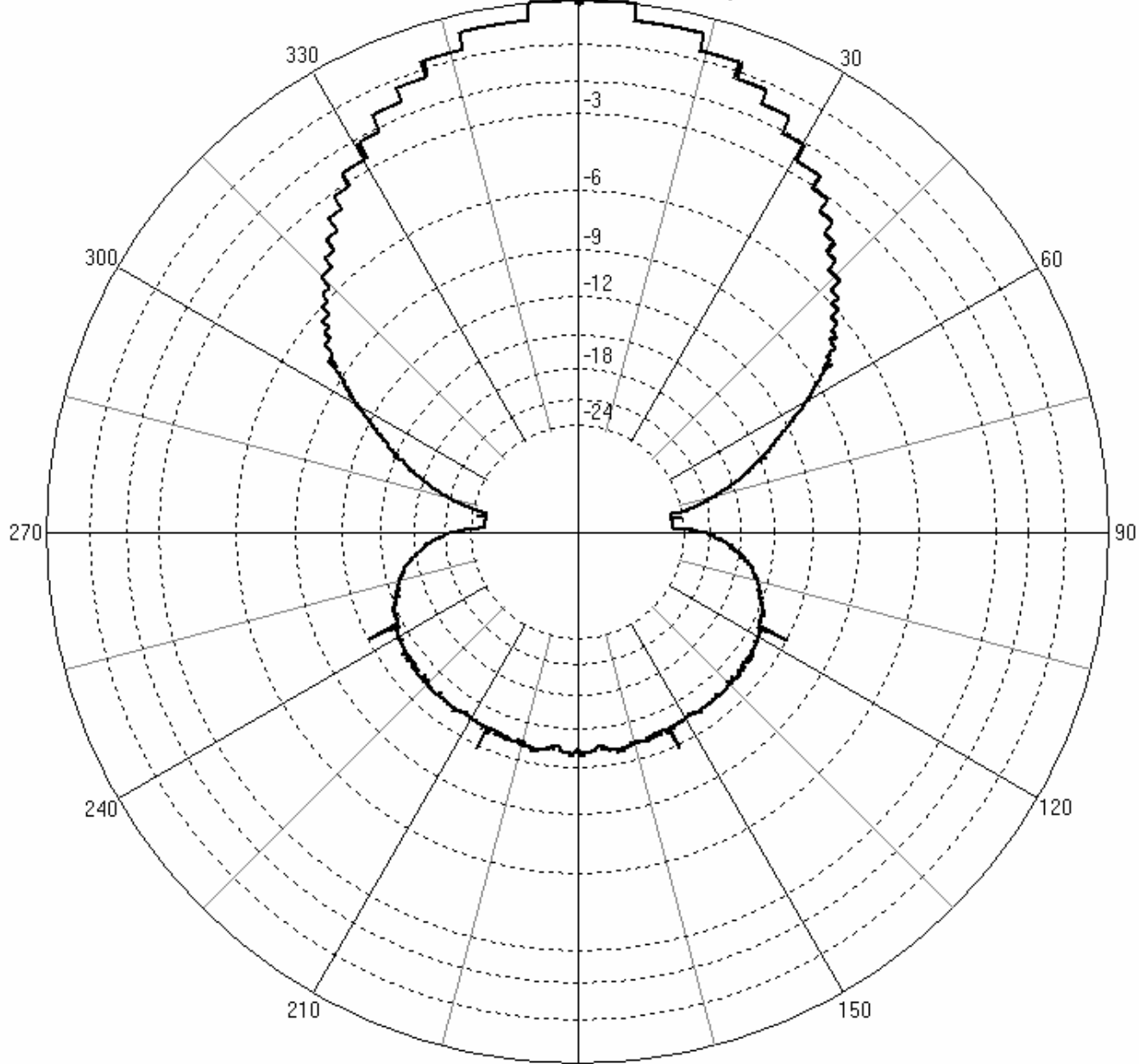
40210 @ 100 @ 7.100 0
Fri Jul 27 14:39:52 2007

Thank You



K9XV Moxon @ 7.2 MHz

Tue May 06 12:52:45 2008



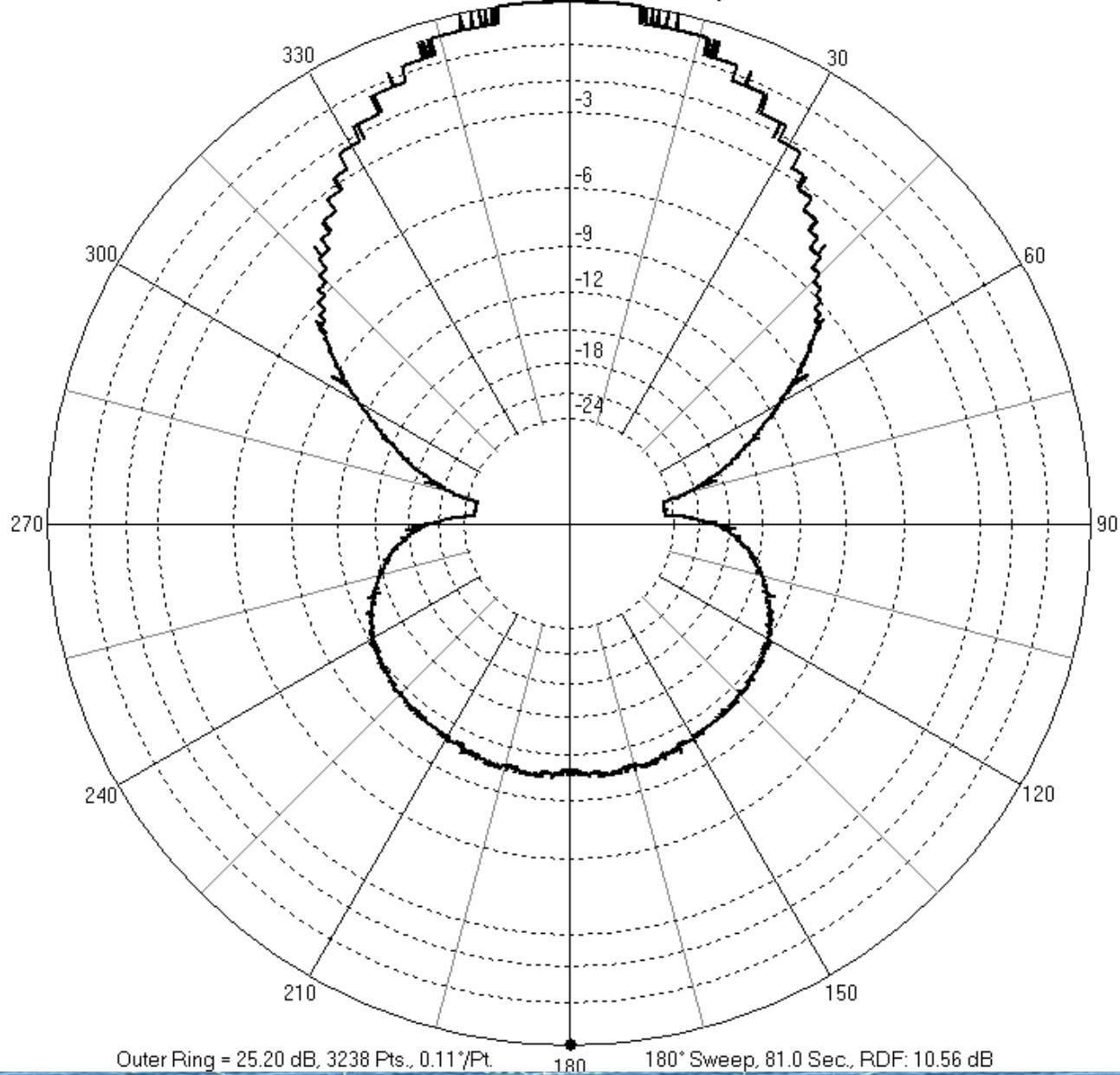
Outer Ring = 25.60 dB, 3178 Pts., 0.11°/Pt.

180° Sweep, 79.5 Sec., RDF: 11.60 dB

4000 @ 100 @ 7.00 0 Fri Jul 27 14:39:52 2007

K9XV Moxon @ 7.3 MHz

Tue May 06 12:55:45 2008



4000 @ 100 @ 7.00 0 Fri Jul 27 14:39:52 2007