

EZNEC Tutorial – Part II

NPARC Presentation
David Berkley, K2MUN
And
Barry Cohen, K2JV
October 13, 2014

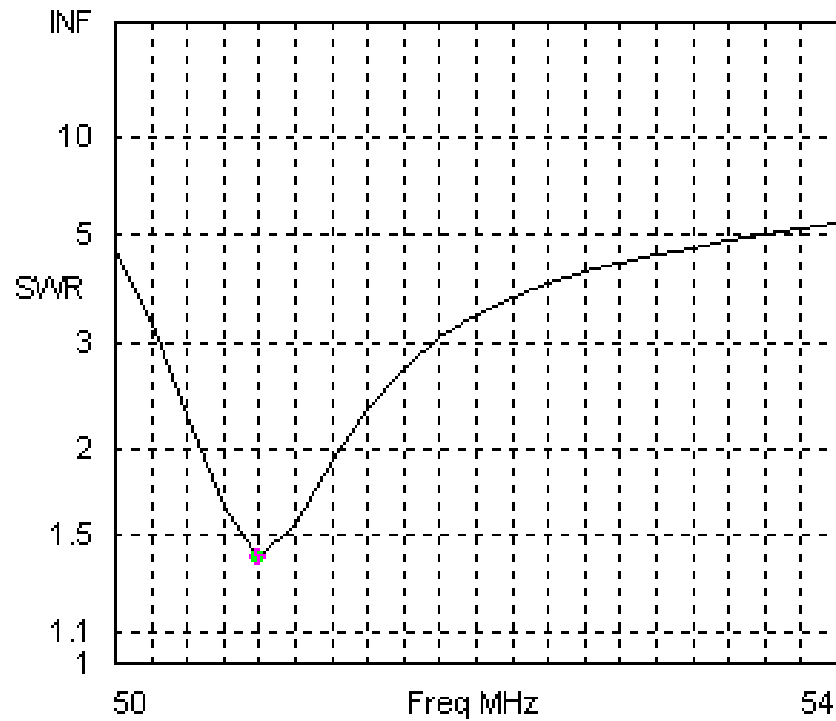
Purpose

- Review of First Tutorial Session
 - Catch up for any new participants
 - Answer questions from previous session
- Some more ‘practical’ examples
 - Review with a 40 meter Doublet
 - A Horizontal loop antenna

How Good is EZNEC?

Compare calculated versus measured:
SWR and Beamwidth (gain)
For the 2 element quad.

Four Slides from Quad Presentation

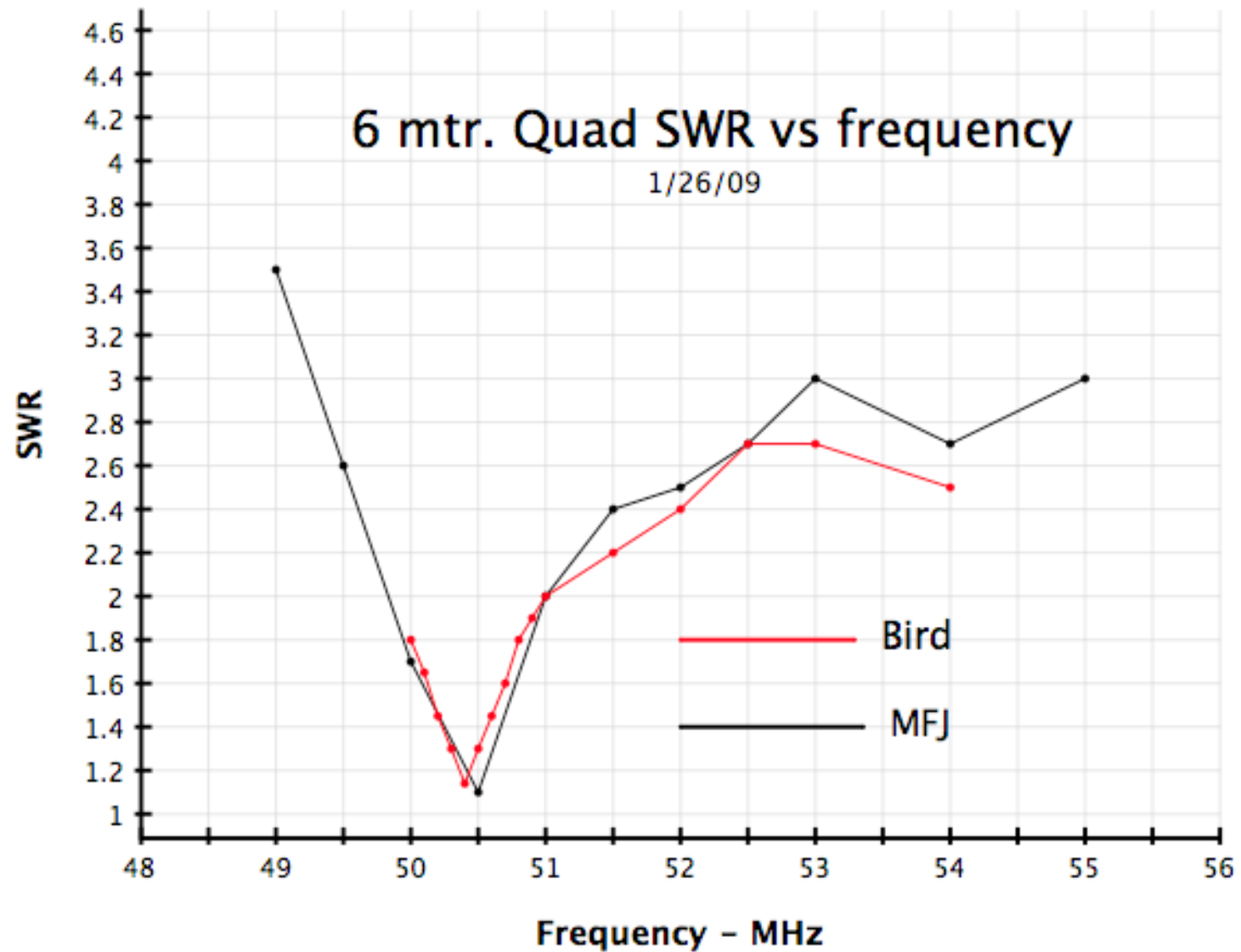


Freq 50.8 MHz Source # 1
 SWR 1.4 Z0 50 ohms
 Z 67.66 - j 8.346 ohms
 Refl Coeff 0.1656 at -21.24 deg.

SWR Plot for 6 Meter Quad

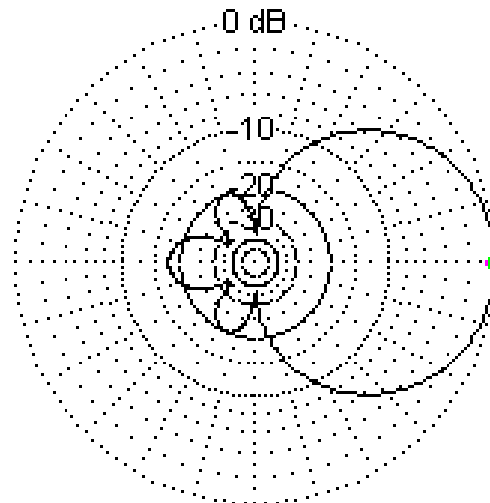
6 mtr. Quad SWR vs frequency

1/26/09



*** Total Field**

EZNEC



51 MHz

Azimuth Plot

Elevation Angle 5.0 deg.

Outer Ring 13.08 dBi

Cursor Az 0.0 deg.

Gain 13.08 dBi

0.0 dBmax

Slice Max Gain 13.08 dBi @ Az Angle = 0.0 deg.

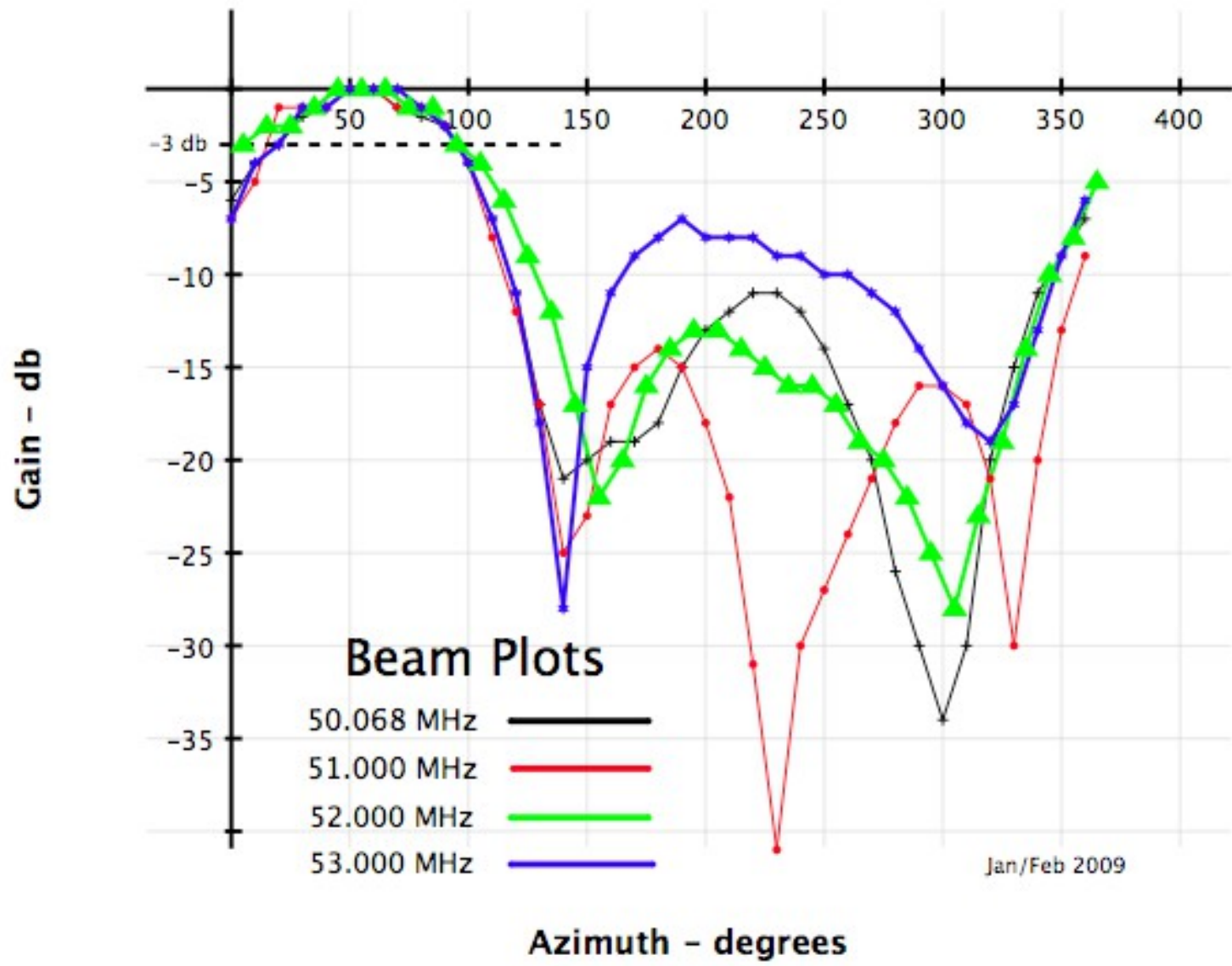
Front/Back 17.48 dB

Beamwidth 74.4 deg.; -3dB @ 322.8, 37.2 deg.

Sidelobe Gain -4.4 dBi @ Az Angle = 180.0 deg.

Front/Sidelobe 17.48 dB

Horizontal Radiation Pattern at 5 degrees
elevation



Review of Part I

- Use of the Control Panel
 - Setting defaults (units, freq., etc.)
 - Types of grounds
 - Entering Data
- Use of the Action Buttons
 - Elevation vs. Azimuth Plots
 - Far Field (2D & 3D)
 - SWR vs. Frequency Calculations

The 40 meter Backyard Dipole

- Based on EZNEC's "BYDipole" file.
- Setup by modifying "BYDipole", or from scratch, in WIRES panel.
- First setup in "free space," then over a "Perfect Ground."
- Number of elements vs. number of Segments.
- Add a Source at the antenna center.

For all Antennas

- 1 Set Ground to Free Space or Real
- 2 Calculate Elevation Pattern and pick out the Major Lobe in that pattern.
- 3 Select Azimuth Pattern.
- 4 Set Elevation Angle to Major Lobe.
- 5 Calculate Azimuth Pattern.
- 6 Calculate SWR over Frequency range.

Go to EZNEC

opens "LAST"

If LAST is NOT "BYDipole"

open "BYDipole"

Tutorial – Part II

- 80 Meter Loop
- Easy to create with Wires 'Loop' command
 - Explore Model Convergence
 - Number of segments
 - variations in source impedance
 - Total radiation in lossless design (~100% of input)
 - Explore other properties of Loop antenna
 - Effect of height
 - Effect of source location

For all Antennas

- 1 Set Ground to Free Space or Real
- 2 Calculate elevation pattern and pick out the Major Lobe in that pattern.
- 3 Select Azimuth pattern.
- 4 Set Elevation Angle to Major Lobe.
- 5 Calculate Azimuth Pattern.
- 6 Calculate SWR over Frequency range.

Go to EZNEC

opens “LAST”

If LAST is NOT “BYDipole”

open “BYDipole”

Generate

Horizontal Loop with 70 foot sides

at height = 40 feet

Tutorial – Part II

Things we haven't covered

- Naming and documenting files
 - Various 'save' commands
- Scaling to adjust to desired frequency
 - Quickly covered in Part I
- Adjusting antenna height
- Feedlines, multielement systems, loading elements, etc.
- Applying common sense to results!

Summary

Try to introduce members to a new tool and put it in their hands for future use!

Hope to make antenna design fun.

The full version is well worth the money if you want to design complex antennas

There are alternatives (some using better underlying models – including EZNEC Pro).

The End

THANKS!