

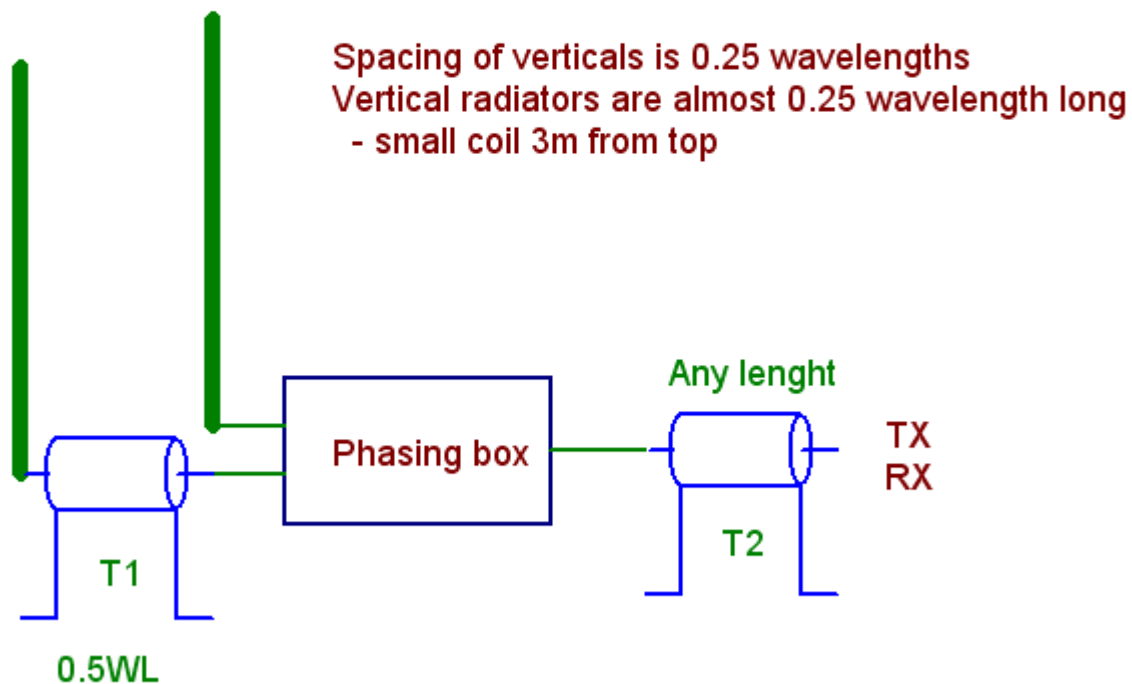


2-element vertical array at OH1NM

Pekka Ketonen
OH1TV

The concept

Opposite voltages fed array by OH1TV
Case: OH1NM



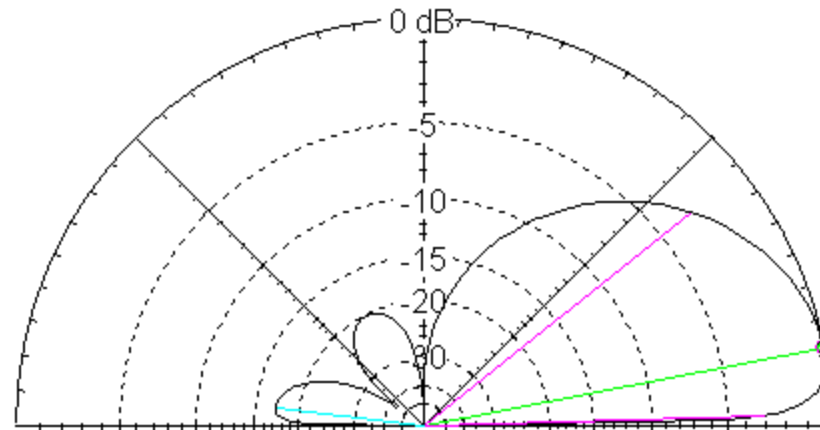


The goal

Total Field

EZNEC

- Seaside QTH
- Elevated radials
- Phasing angle 105 degrees



3.78 MHz

Elevation Plot
Azimuth Angle 0.0 deg.
Outer Ring 7.12 dBi

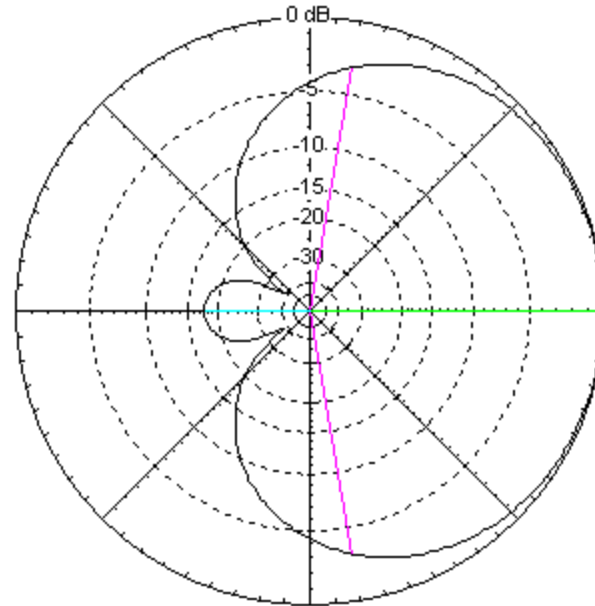
Cursor Elev 11.0 deg.
Gain 7.12 dBi
0.0 dBmax

Slice Max Gain 7.12 dBi @ Elev Angle = 11.0 deg.
Beamwidth 36.7 deg.; -3dB @ 1.8, 38.5 deg.
Sidelobe Gain -10.08 dBi @ Elev Angle = 173.0 deg.
Front/Sidelobe 17.19 dB

..the goal

Total Field

EZNEC

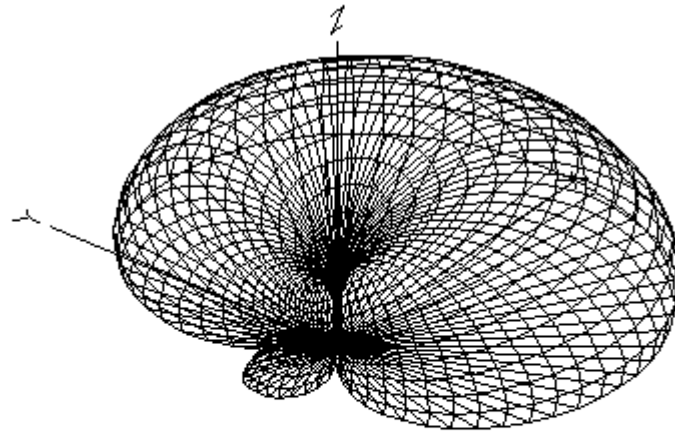


3.78 MHz

Azimuth Plot		Cursor Az	0.0 deg.
Elevation Angle	11.0 deg.	Gain	7.12 dBi
Outer Ring	7.12 dBi		0.0 dBmax
Slice Max Gain	7.12 dBi @ Az Angle = 0.0 deg.		
Front/Back	17.54 dB		
Beamwidth	160.6 deg.; -3dB @ 279.7, 80.3 deg.		
Sidelobe Gain	-10.42 dBi @ Az Angle = 180.0 deg.		
Front/Sidelobe	17.54 dB		

..the goal

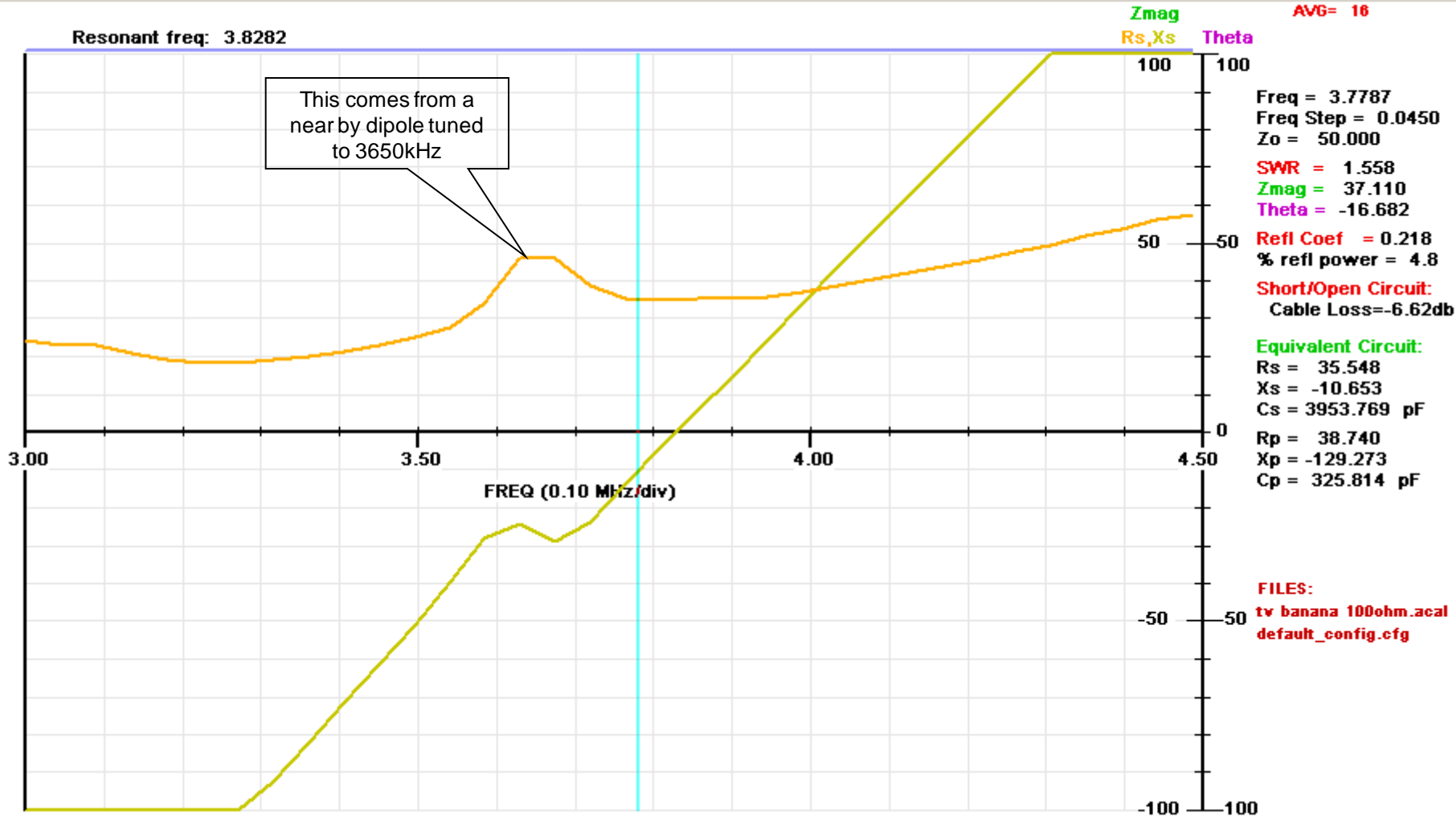
EZNEC



Step 1

- Measure impedances of the two radiating elements
- Two measurements per element
 - Feedpoint impedance, when the other element is open
 - Feedpoint impedance, when the other element is closed (short circuit)
 - This measurement is needed for mutual impedance calculations
- See results on next pages

West element, east element open



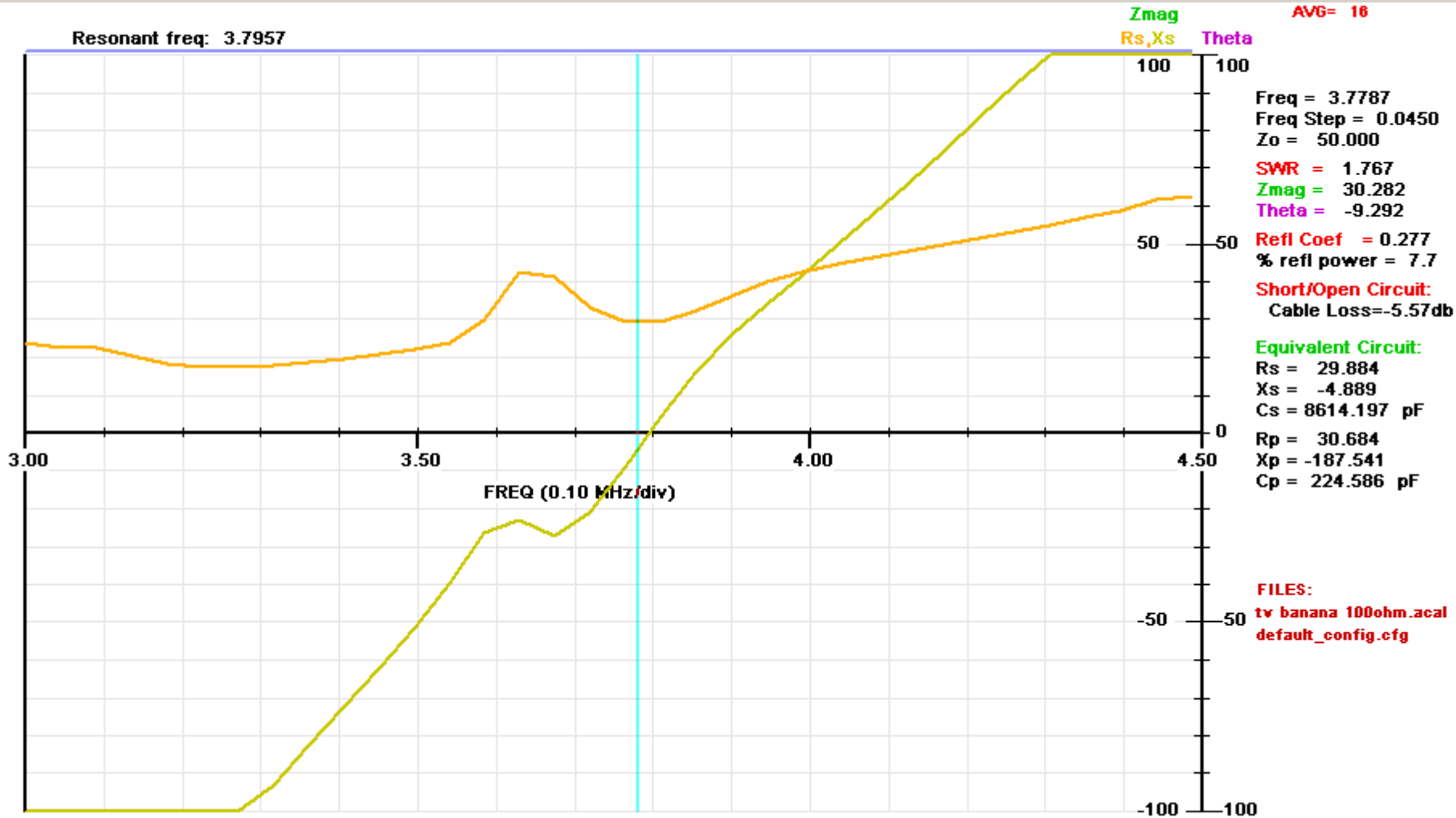
kesä 9, 09 13:56:23 File: oh1nm länsi-itä irti.scnsi keppi yksistään, itä irti

28.8.2009

OH1TV

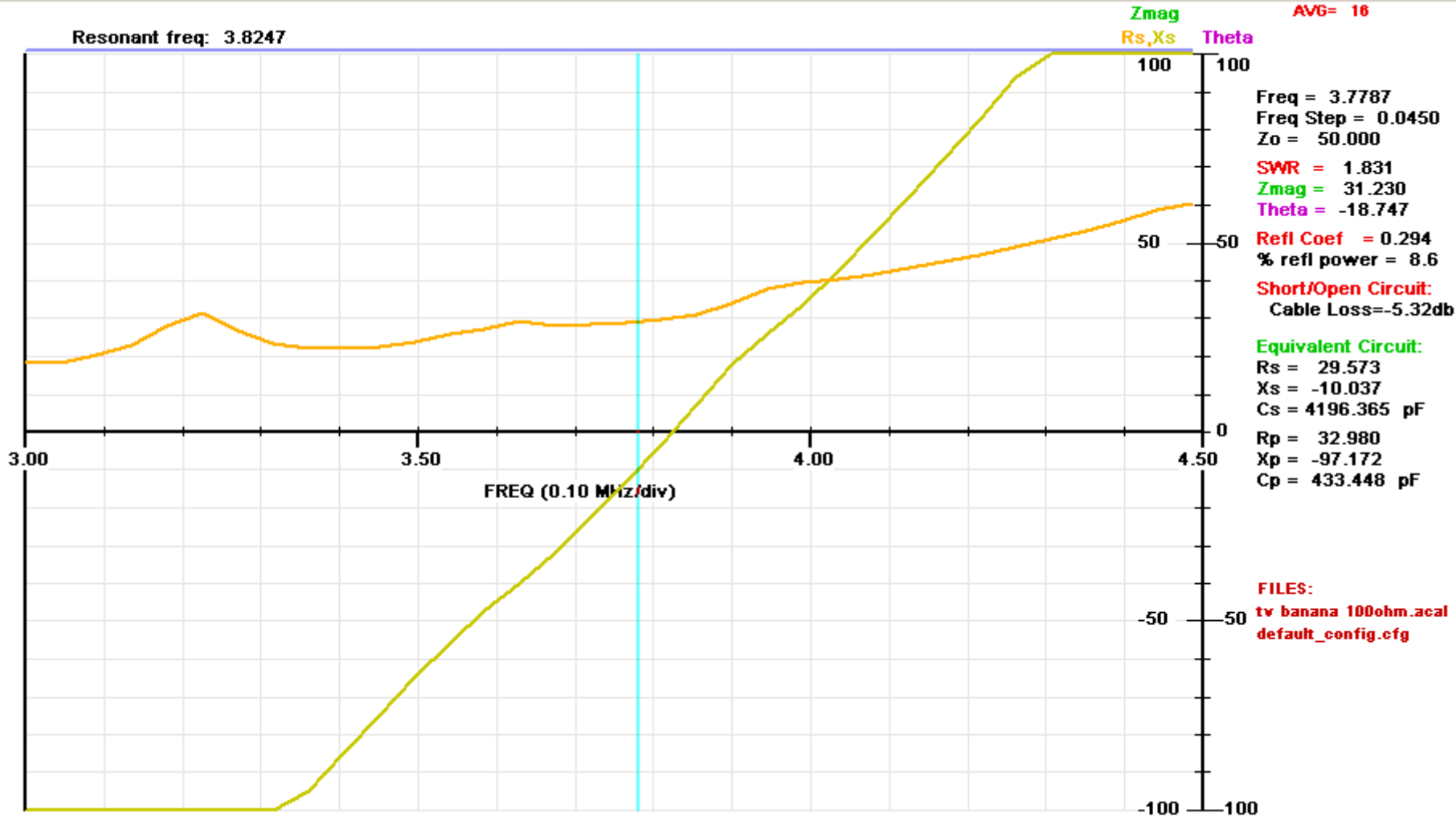
West element, east element closed

Antenna Analyzer - AIM 4170 version 655
File Functions Calibrate Setup Bands Utilities Help



kesä 9, 09 14:01:06 File: oh1nm länsi-itä oikosulussa.scn itä oikosulussa

East element, west element open



kesä 9, 09 14:11:16 File: oh1nm itä-länsi auki.scn Itä keppi, länsi auki

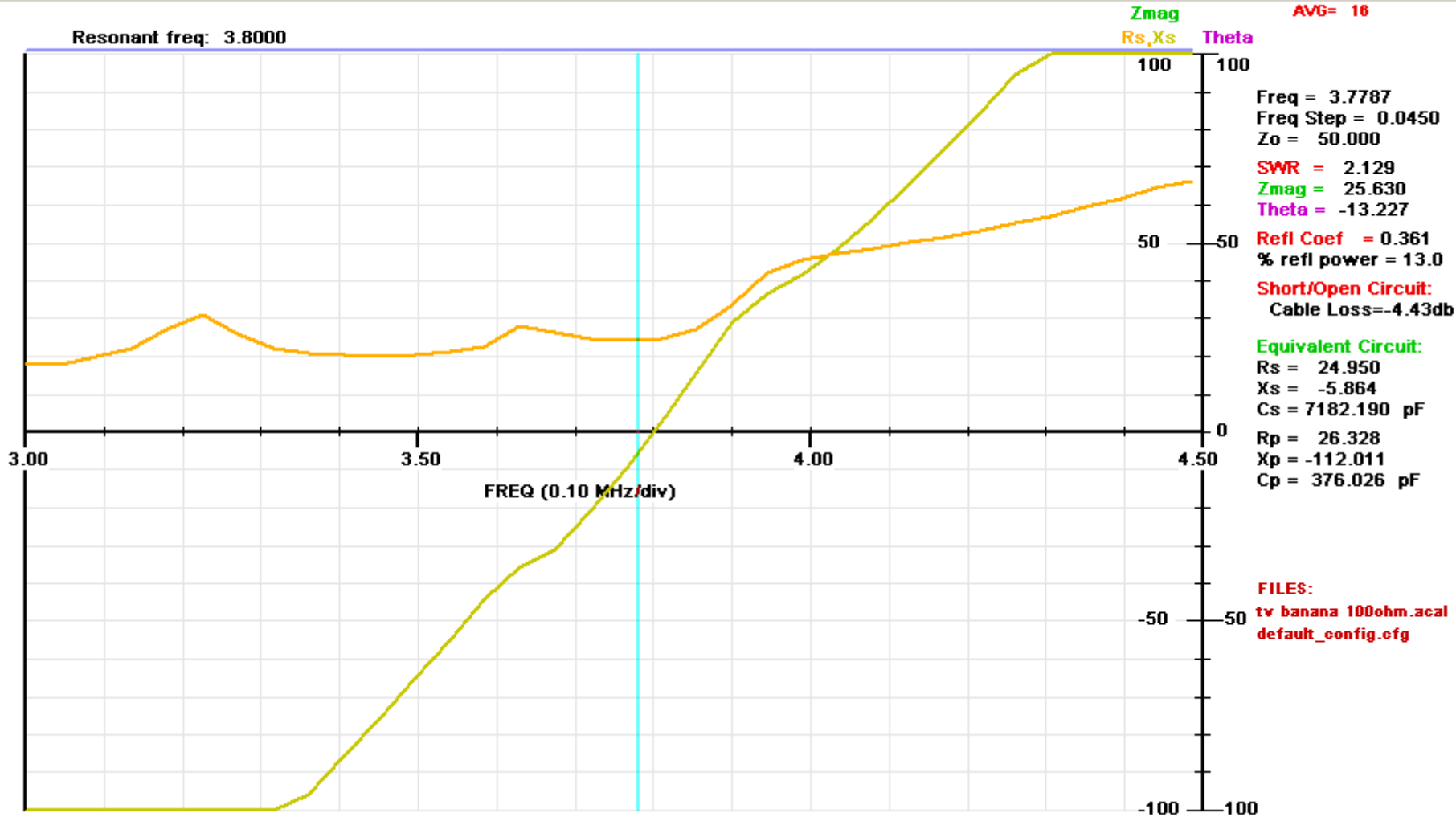
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OH1TV

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East element, west element closed

Antenna Analyzer - AIM 4170 version 655
File Functions Calibrate Setup Bands Utilities Help



kesä 9, 09 14:16:30 File: oh1nm itä-länsi oikosulussa.scnnsi oikosulussa

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OH1TV

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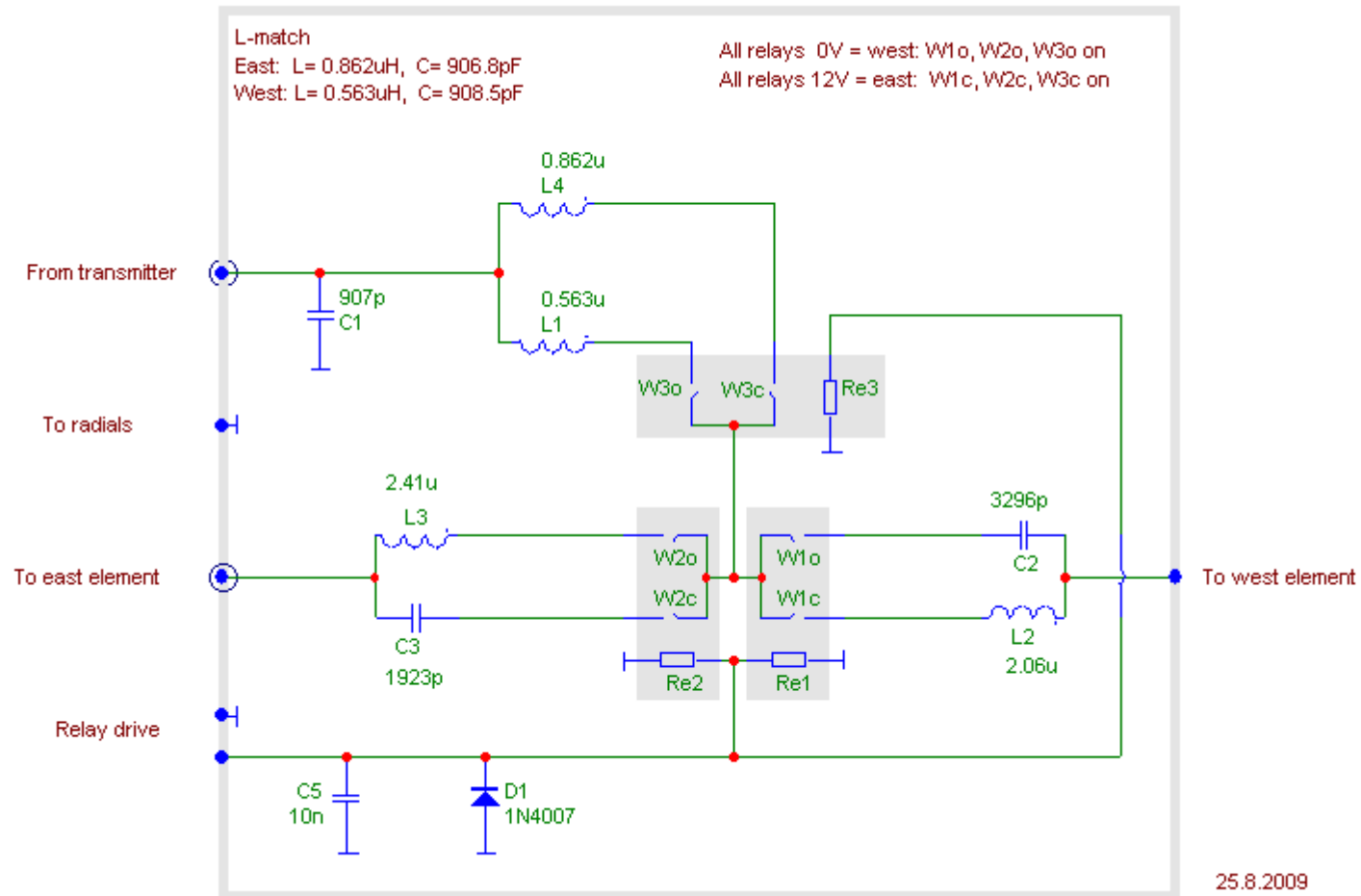
Step 2

- Calculate mutual impedance. The result shall be about the same both ways. If there is more than 1 ohm difference, there must be an error in the measurement or disturbing other element close by
- Calculate phasing components
- Calculate input impedance of the array
- Calculate L-match components

- Results are shown in the phasing box schematic

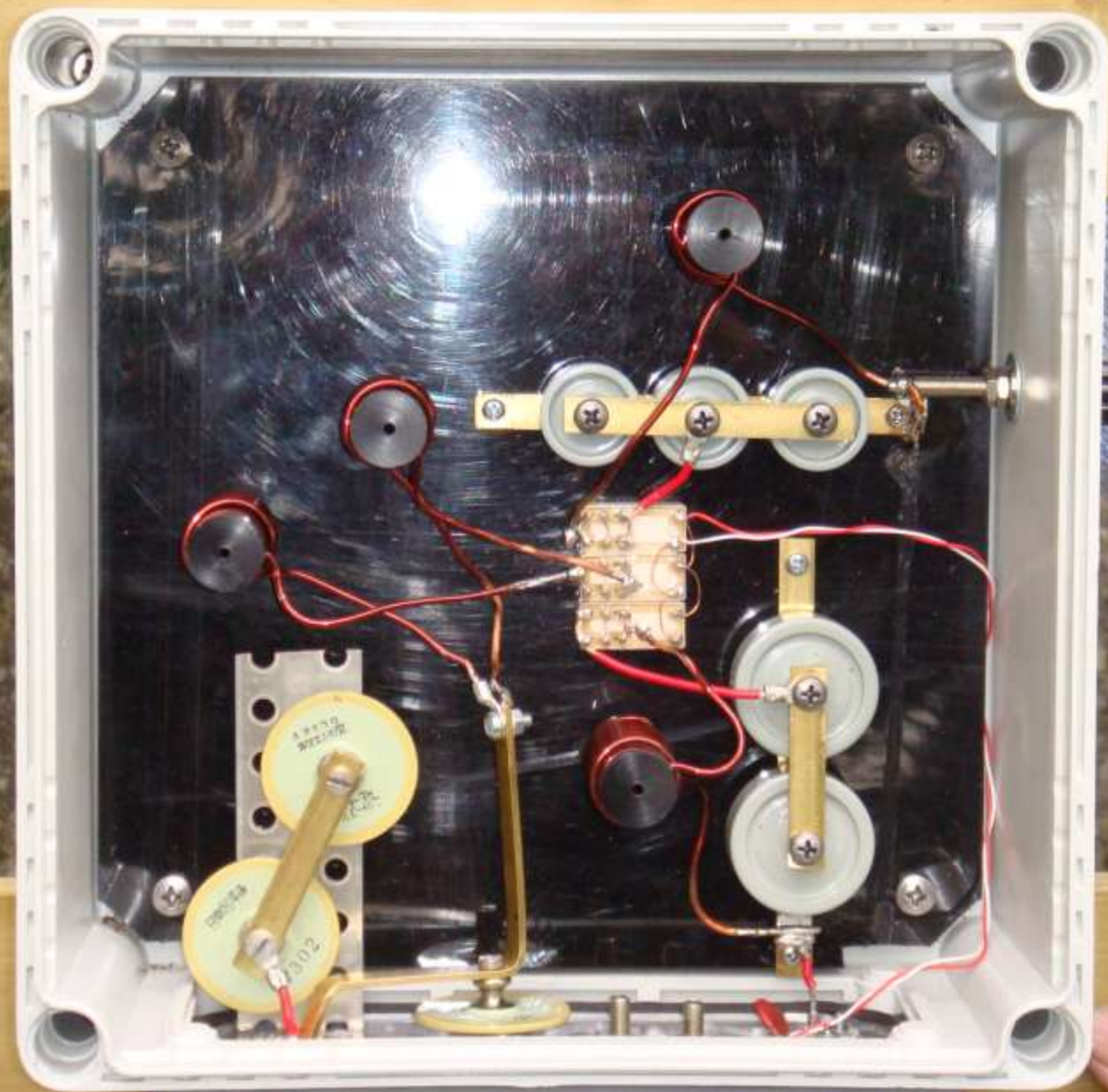
Phasing box, schematic

phasing angle 105 degrees



Step 3

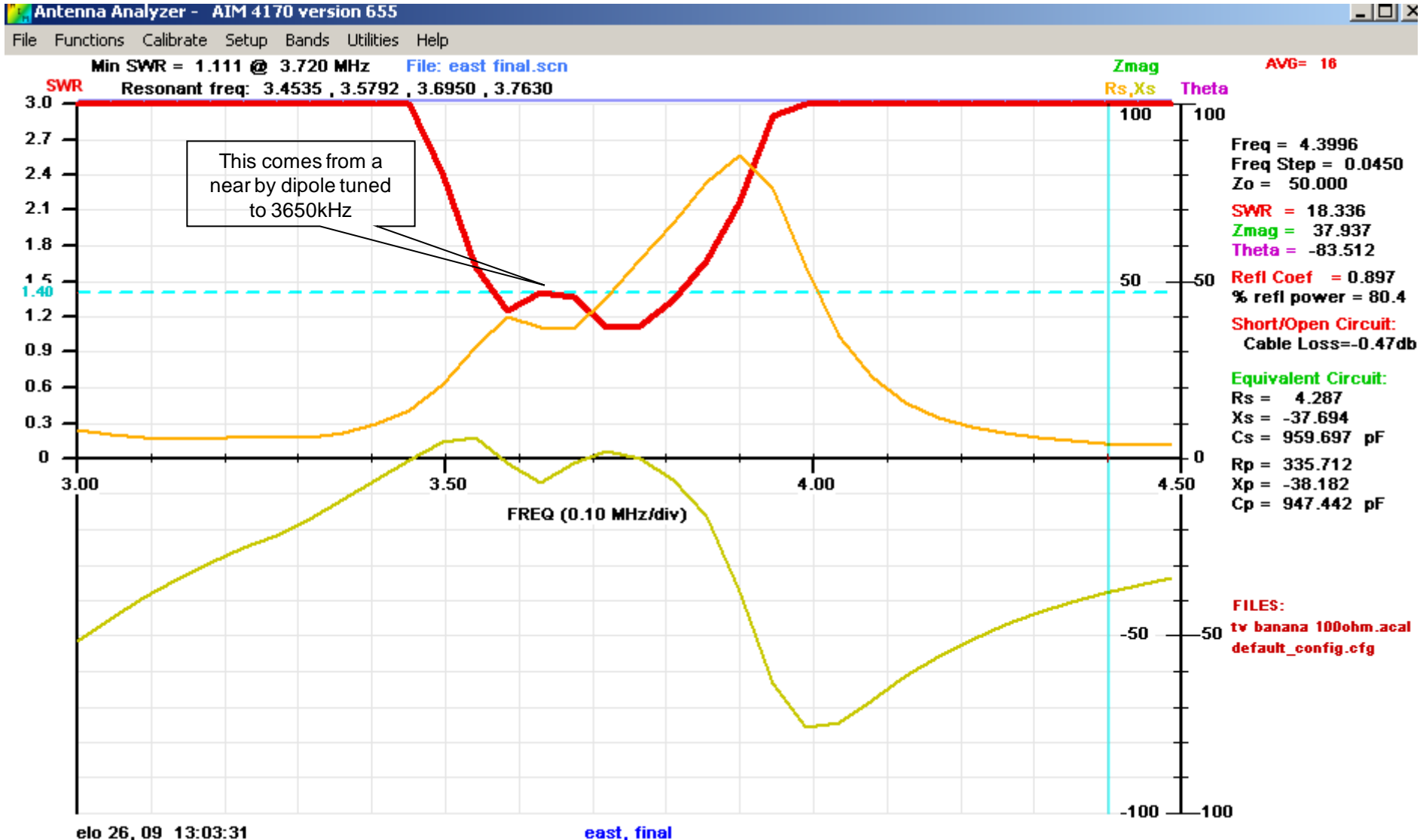
- Build the phasing box, make the 0.5 lamda cable, install
 - Measure SWR in both directions
 - If the work so far has been done carefully, componets selected with 2% tolerance, no tuning is needed after installation.
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- See results on next pages







Array SWR, direction east



Array SWR, direction west

