Short Verticals for Low Band Receiving Options

Joel Harrison, W5ZN

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The Grim Noise Reaper Is NOT Your Friend

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Common Beliefs

If I put up a low noise receive antenna, I will begin to magically hear DX stations that never existed before!

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BALONEY!!!

Propagation Characteristics determines whether you will hear signals or not

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The Beverage Antenna

- Very simply is a long wire antenna close to the ground that has NO gain!
  - It is a "lossy" antenna
- Why no gain?

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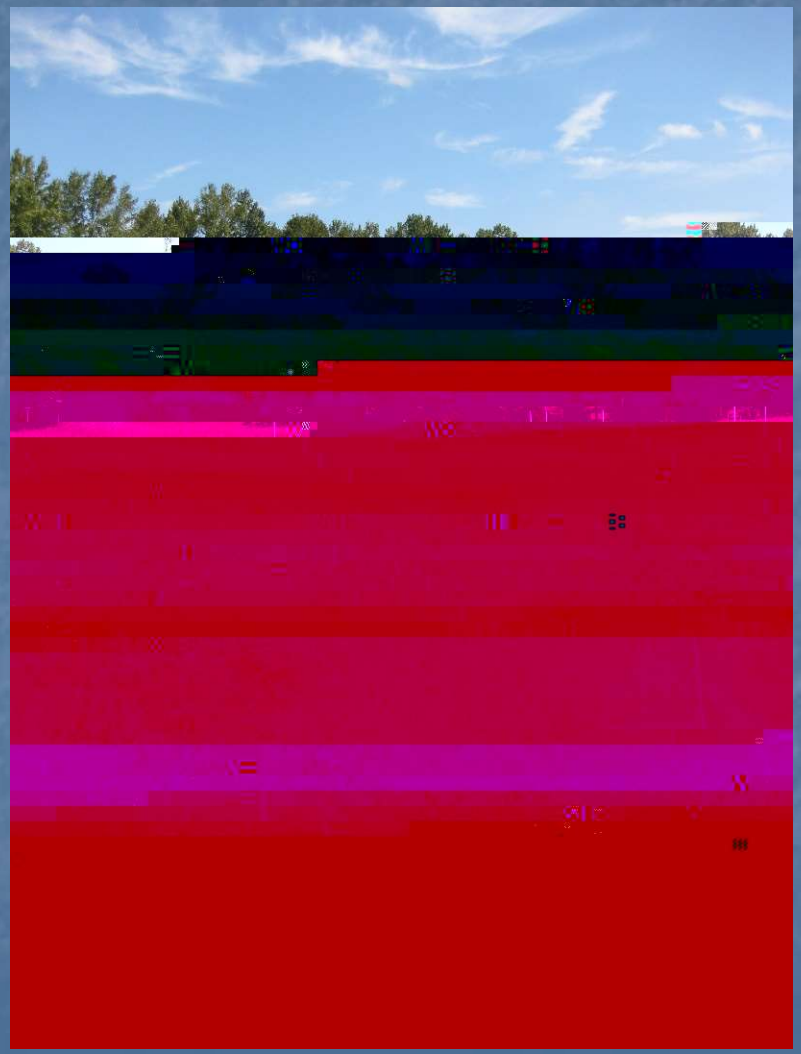
Beverage Antenna

Good for Low Band DX'ing



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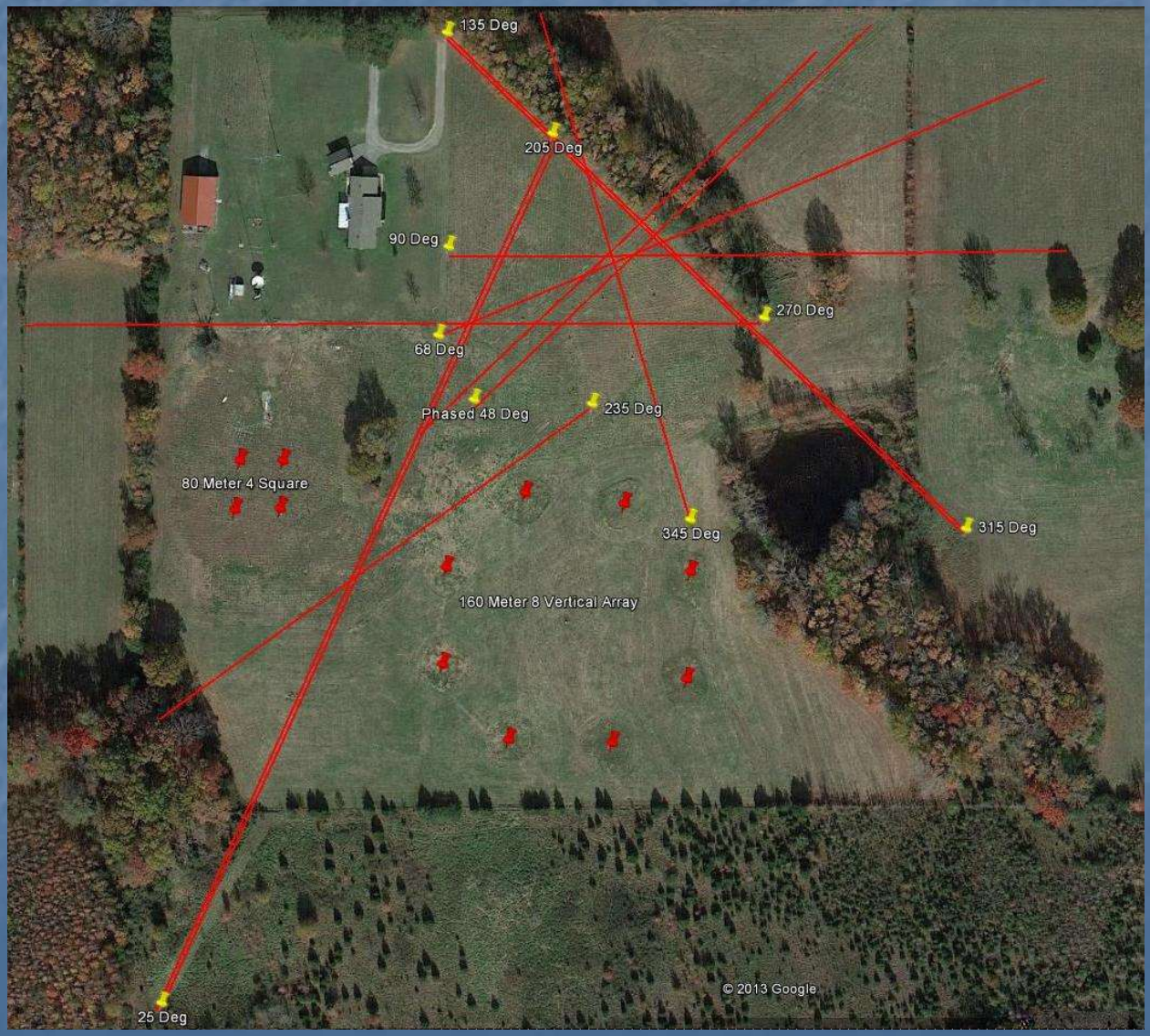
Beverage Antennas
The bad side

- Can be a nuisance to wild animals
- Require lots of maintenance
- Take up considerable space



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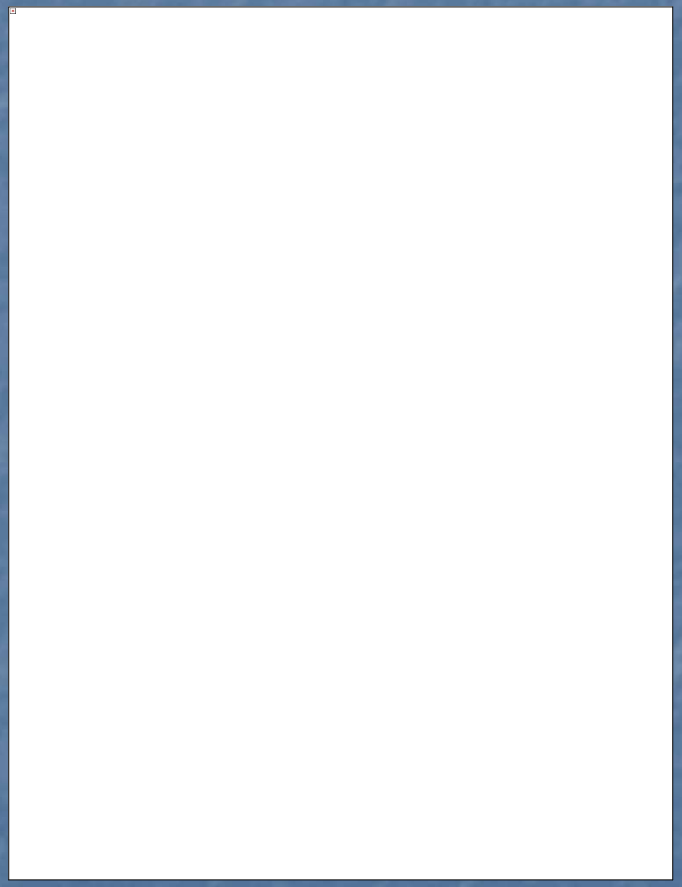
The Search for Superiority

- Short Verticals
  - 18’ to 25’
- End Fire Arrays
- Broad Side Arrays
- Broadside Arrays / End Fire



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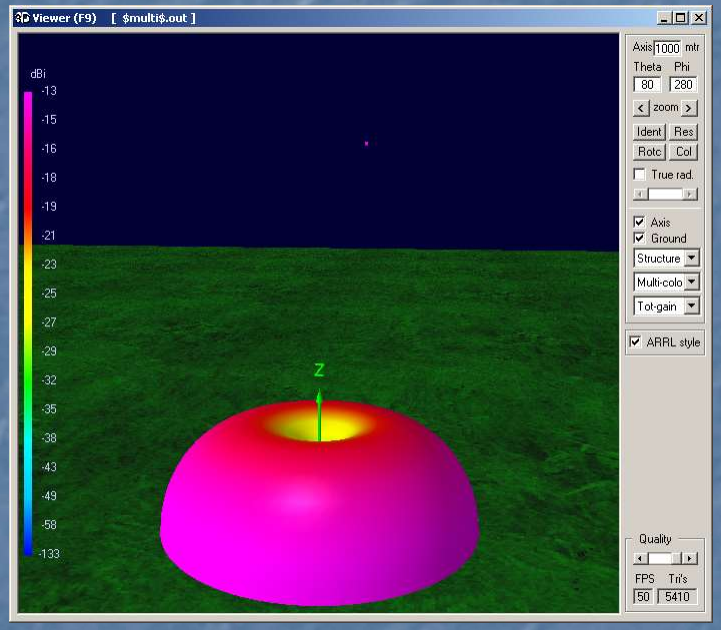
Single Vertical



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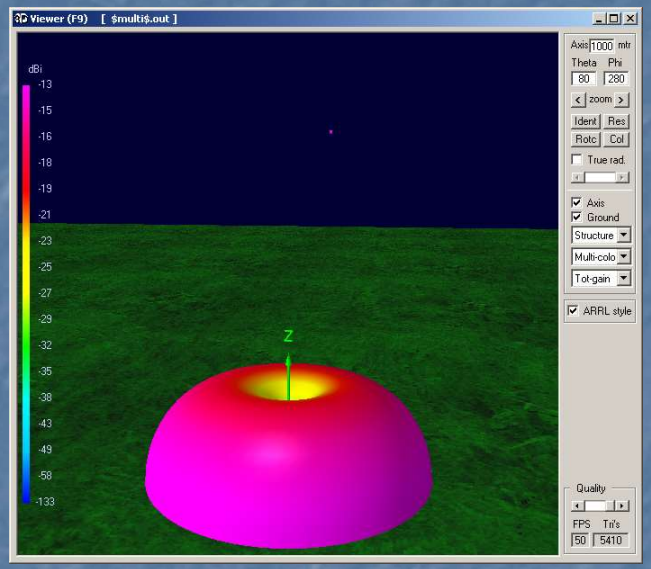
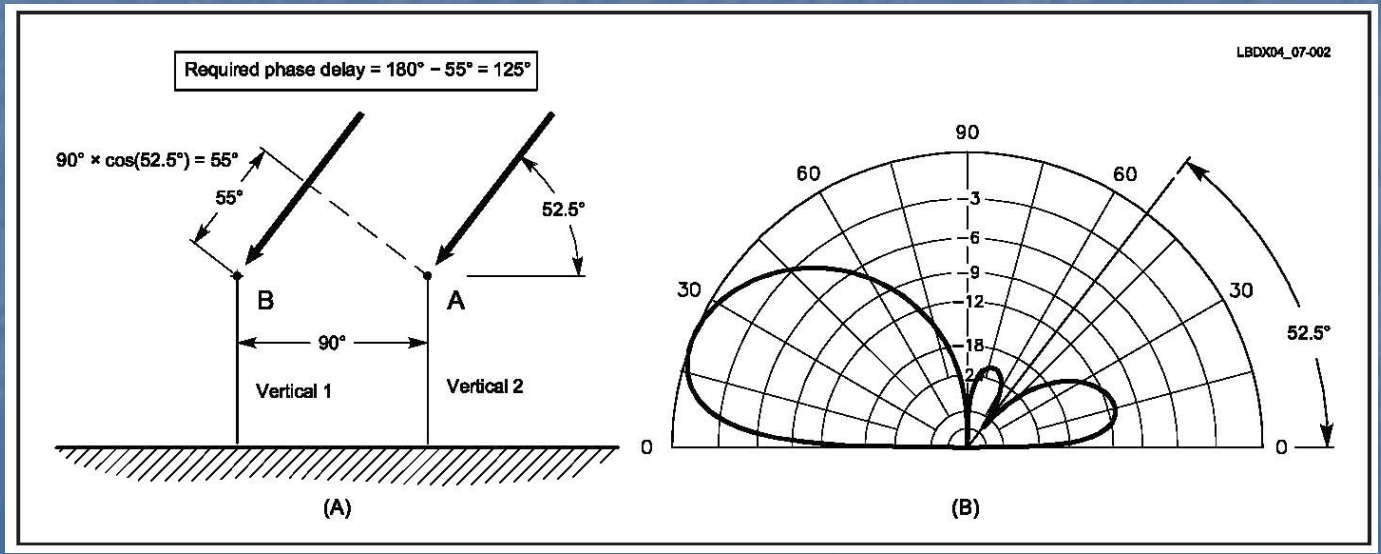
End-fire Principle





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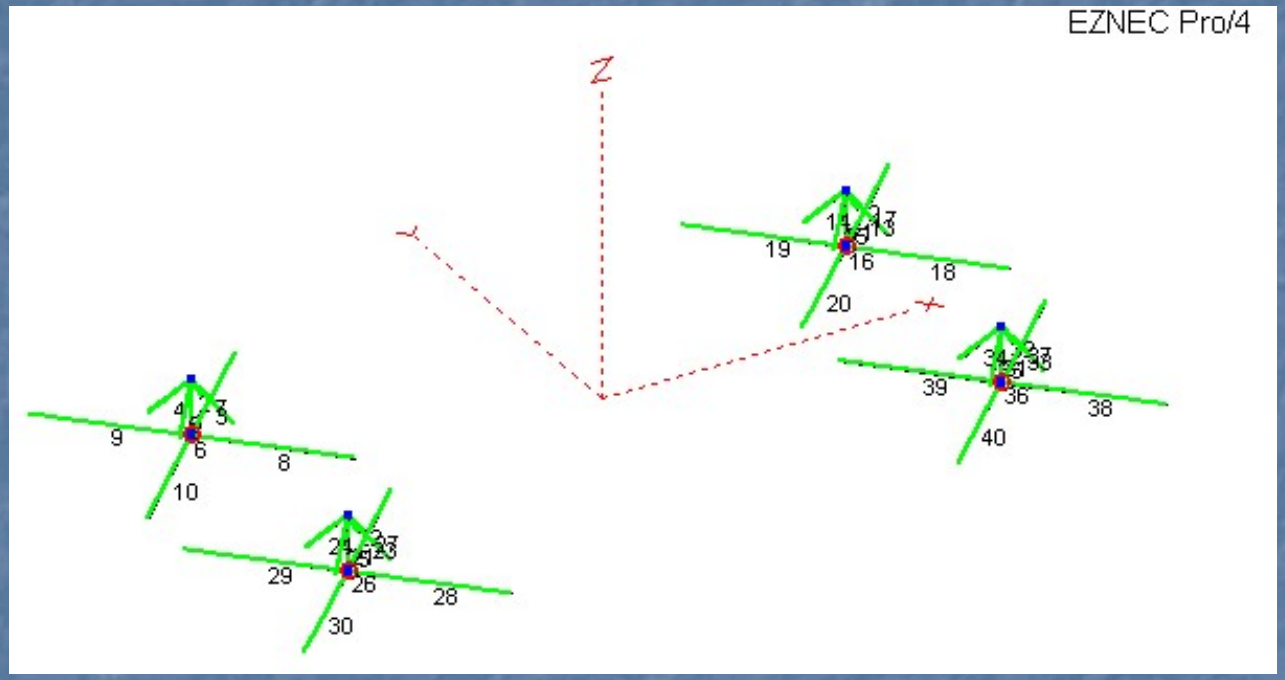
Modeling an End-Fire / Broadside Array of Short Verticals



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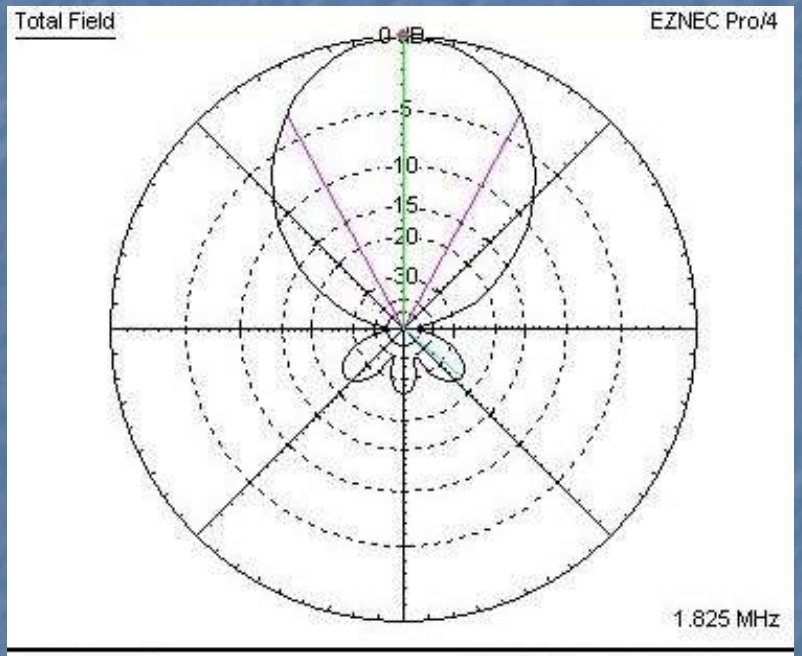
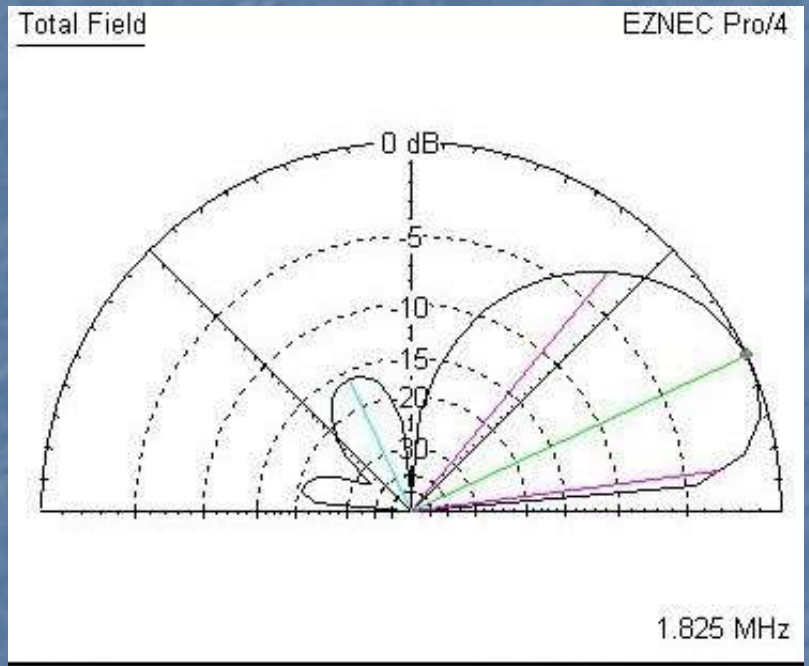
Model Pattern of Array



Azimuth Plot		Cursor Az	90.0 deg.
Elevation Angle	25.0 deg.	Gain	-11.21 dBi
Outer Ring	-11.21 dBi		0.0 dBmax
			0.0 dBmax3D
3D Max Gain	-11.21 dBi		
Slice Max Gain	-11.21 dBi @ Az Angle = 90.0 deg.		
Front/Back	25.75 dB		
Beamwidth	56.8 deg.; -3dB @ 61.6, 118.4 deg.		
Sidelobe Gain	-34.48 dBi @ Az Angle = 320.0 deg.		
Front/Sidelobe	23.27 dB		



Elevation Plot		Cursor Elev	25.0 deg.
Azimuth Angle	90.0 deg.	Gain	-11.21 dBi
Outer Ring	-11.21 dBi		0.0 dBmax
			0.0 dBmax3D
3D Max Gain	-11.21 dBi		
Slice Max Gain	-11.21 dBi @ Elev Angle = 25.0 deg.		
Beamwidth	43.1 deg.; -3dB @ 7.5, 50.6 deg.		
Sidelobe Gain	-27.04 dBi @ Elev Angle = 115.0 deg.		
Front/Sidelobe	15.83 dB		

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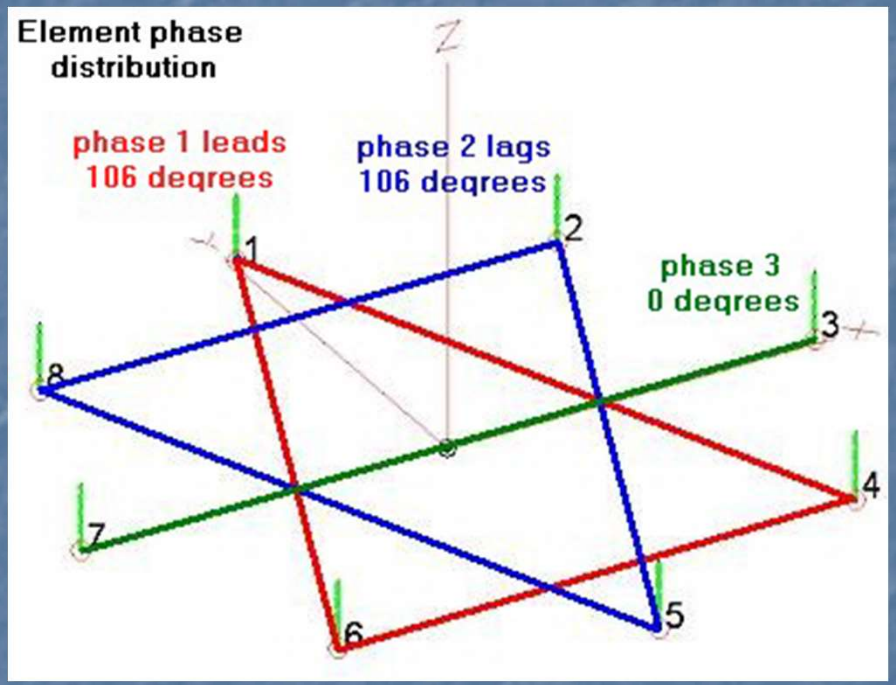
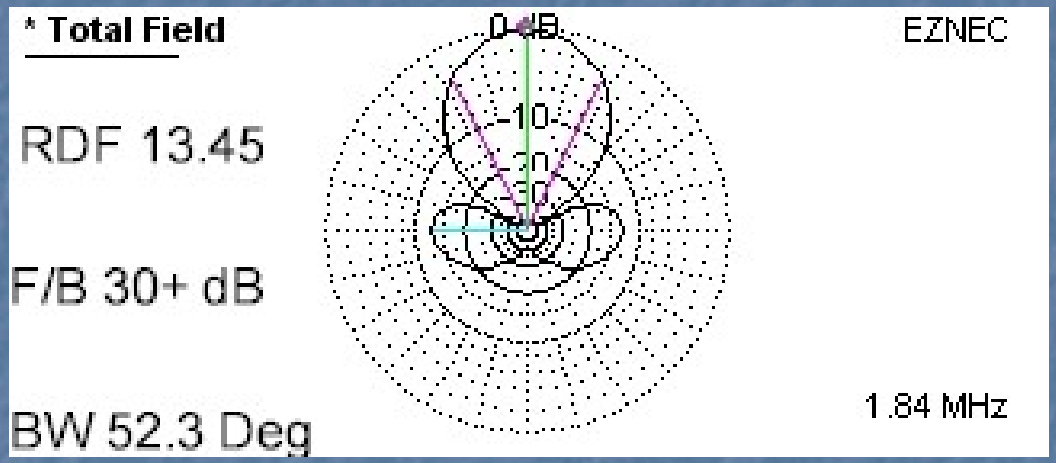
Other Phased Vertical Arrays
HiZ Antennas





2 – Element and 4 – Element versions also available

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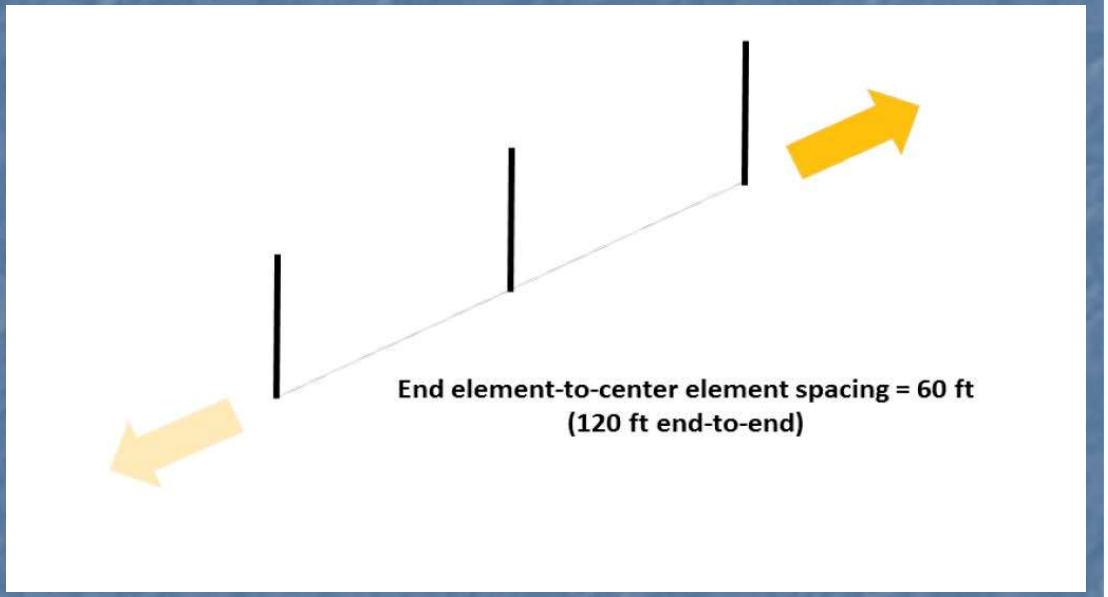
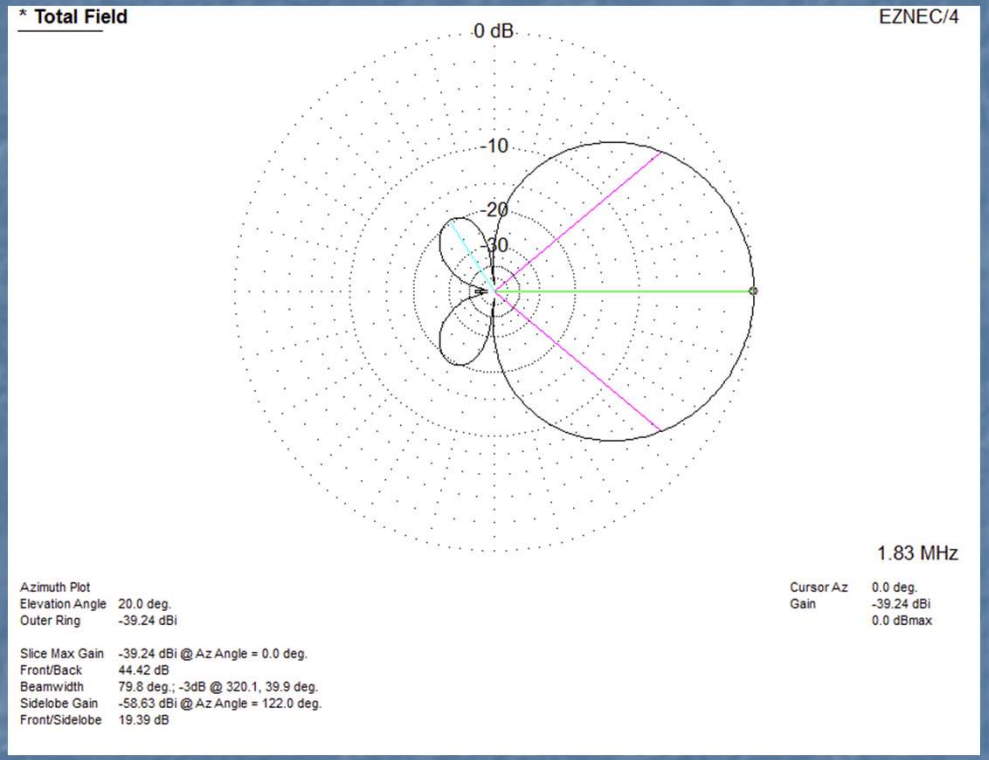
Other Phased Vertical Arrays
W1FV 9-Vertical Array





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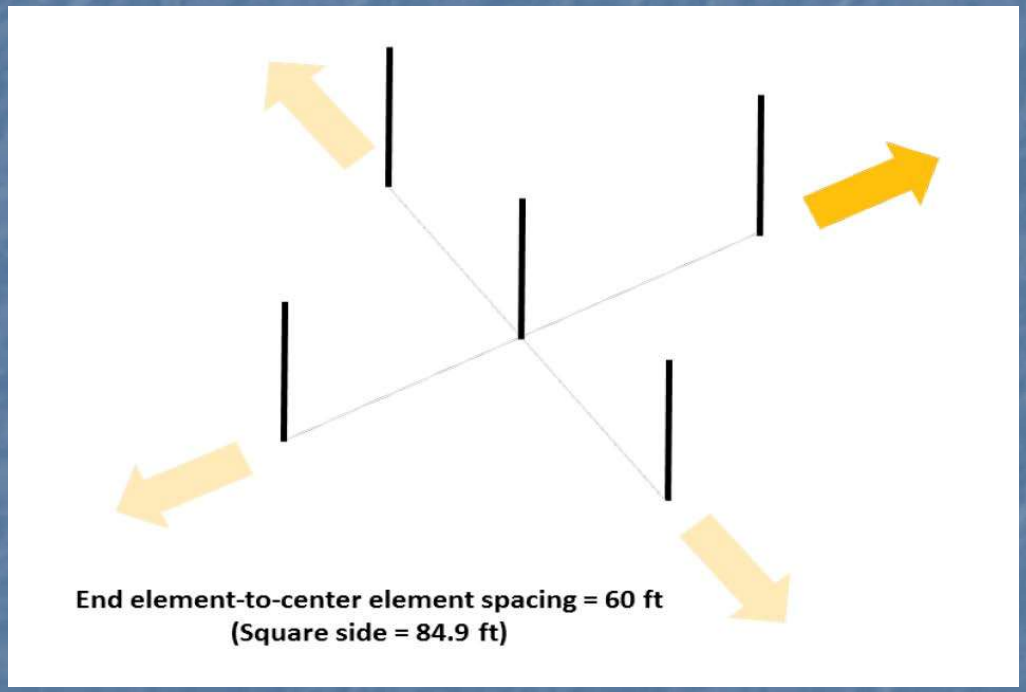
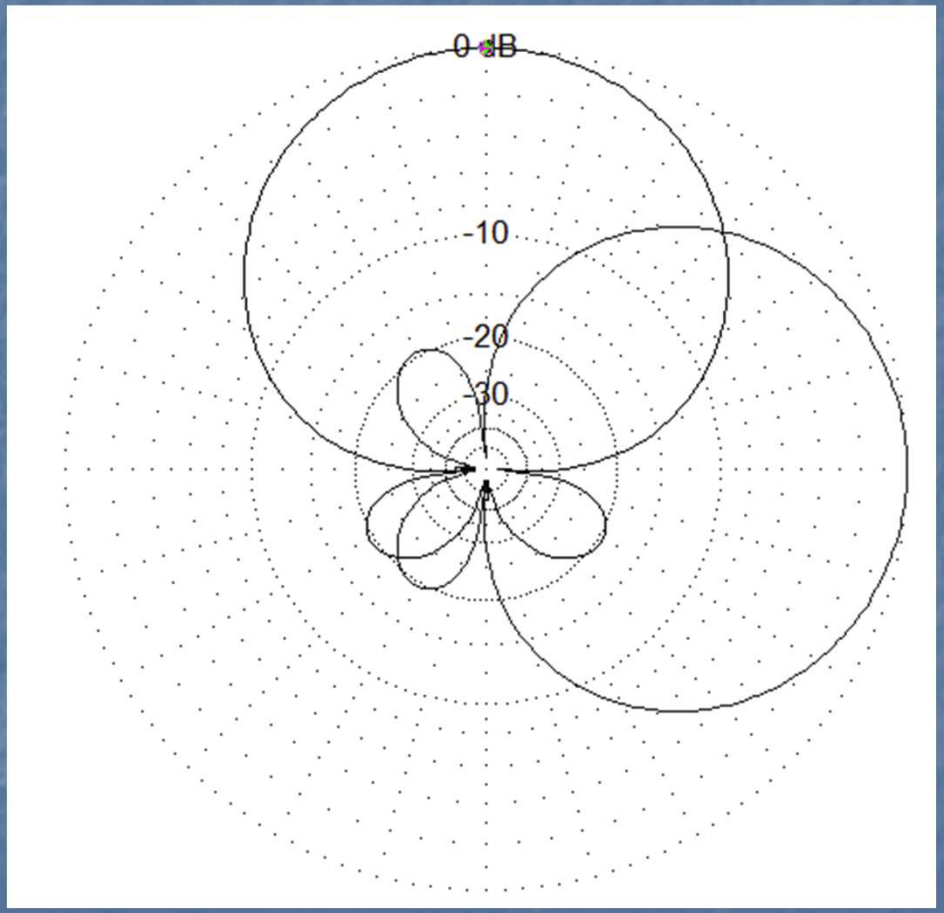
Other Phased Vertical Arrays
W1FV 9-Vertical Array





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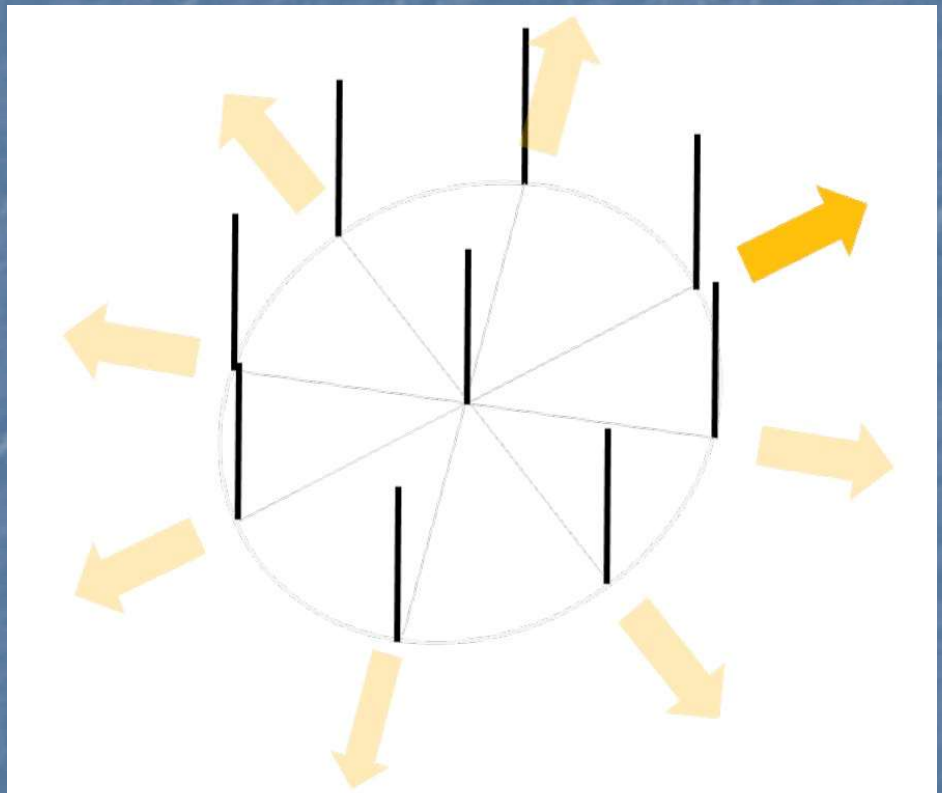
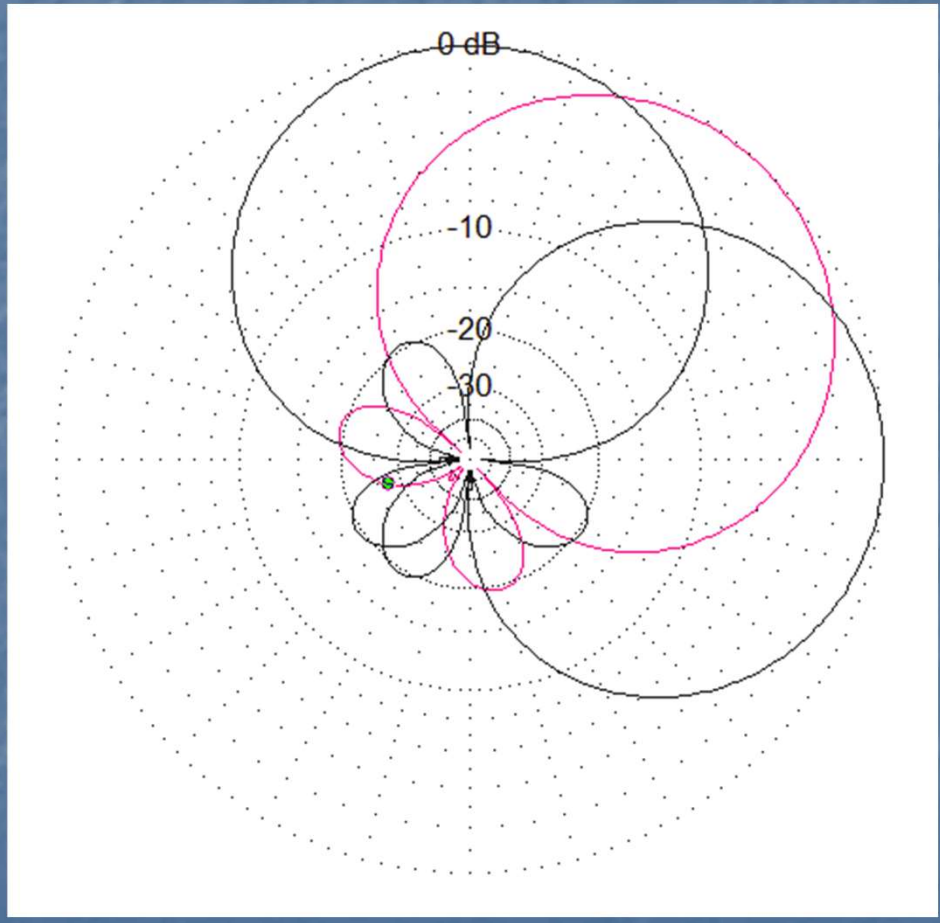
Other Phased Vertical Arrays
W1FV 9-Vertical Array



Outer element-to-center element spacing = 60 ft
(Circle diameter = 120 ft)



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Stop the Madness Enough of the Technical Junk

Does it Really Work in the Real World??????

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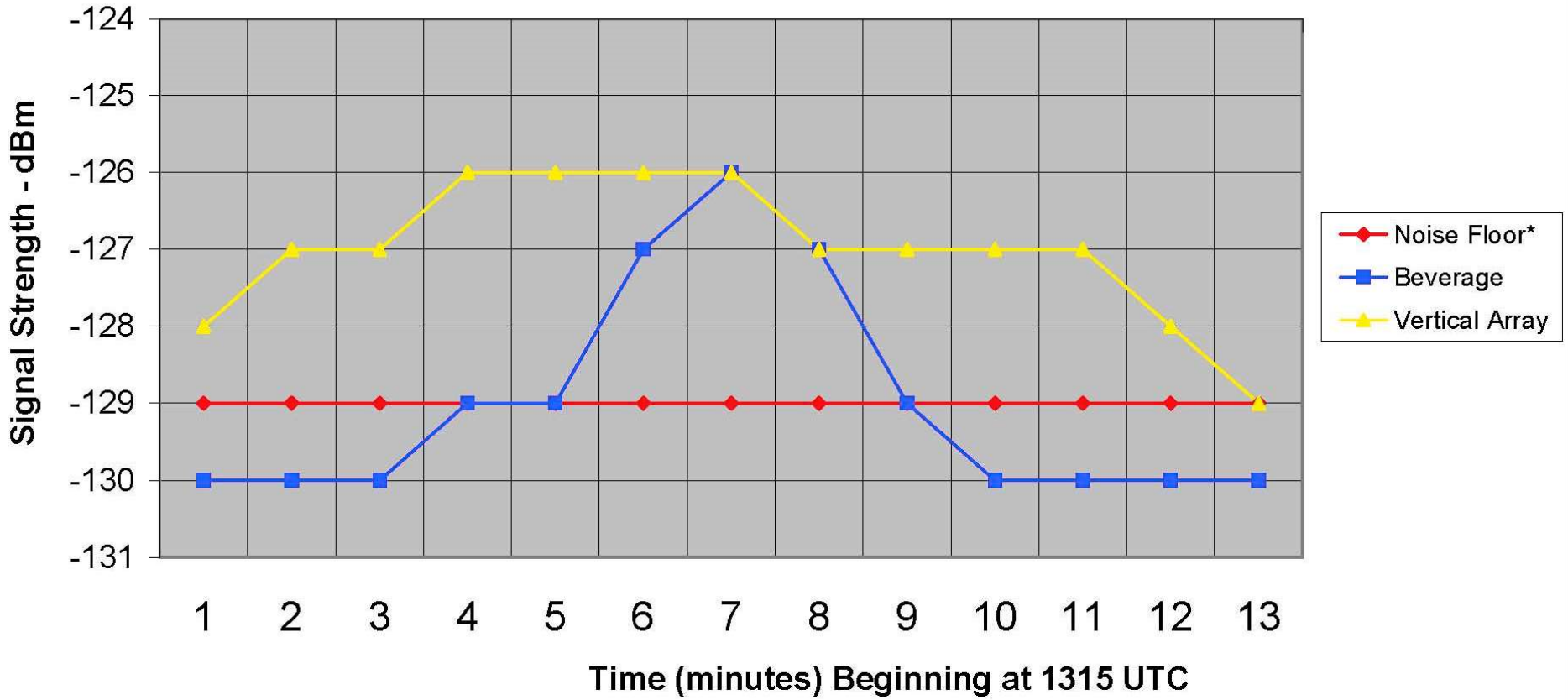
Noise Floor Measurements

Direction	8 Circle Vertical Array Noise Floor	Beverage Noise Floor	K9AY Loop	Shunt Fed 135' HF Tower 160 Meter Xmit	½ λ Inverted Vee
N	-129 dBm	-125 dBm	N/A	-100 dBm[2]	-105 dBm[2]
NE	-125 dBm	-120 dBm	-132 dBm[1]	-100 dBm[2]	-105 dBm[2]
E	-125 dBm	-124 dBm	N/A	-100 dBm[2]	-105 dBm[2]
SE	-126 dBm	-123 dBm	-130 dBm[1]	-100 dBm[2]	-105 dBm[2]
S	-126 dBm	-120 dBm	N/A	-100 dBm[2]	-105 dBm[2]
SW	-125 dBm	-120 dBm	-132 dBm[1]	-100 dBm[2]	-105 dBm[2]
W	-126 dBm	-125 dBm	N/A	-100 dBm[2]	-105 dBm[2]
NW	-130 dBm	-128 dBm	-132 dBm[1]	-100 dBm[2]	-105 dBm[2]

Beverage -vs- Vertical Array Signal Comparison
JD1BMH - Ogaswara
December 28, 2008



*Average Noise Floor - Actual is Beverage -128 dBm / Vertical Array -130 dBm. Signal levels shown below the noise floor are only to indicate signals not copyable and are not measurements

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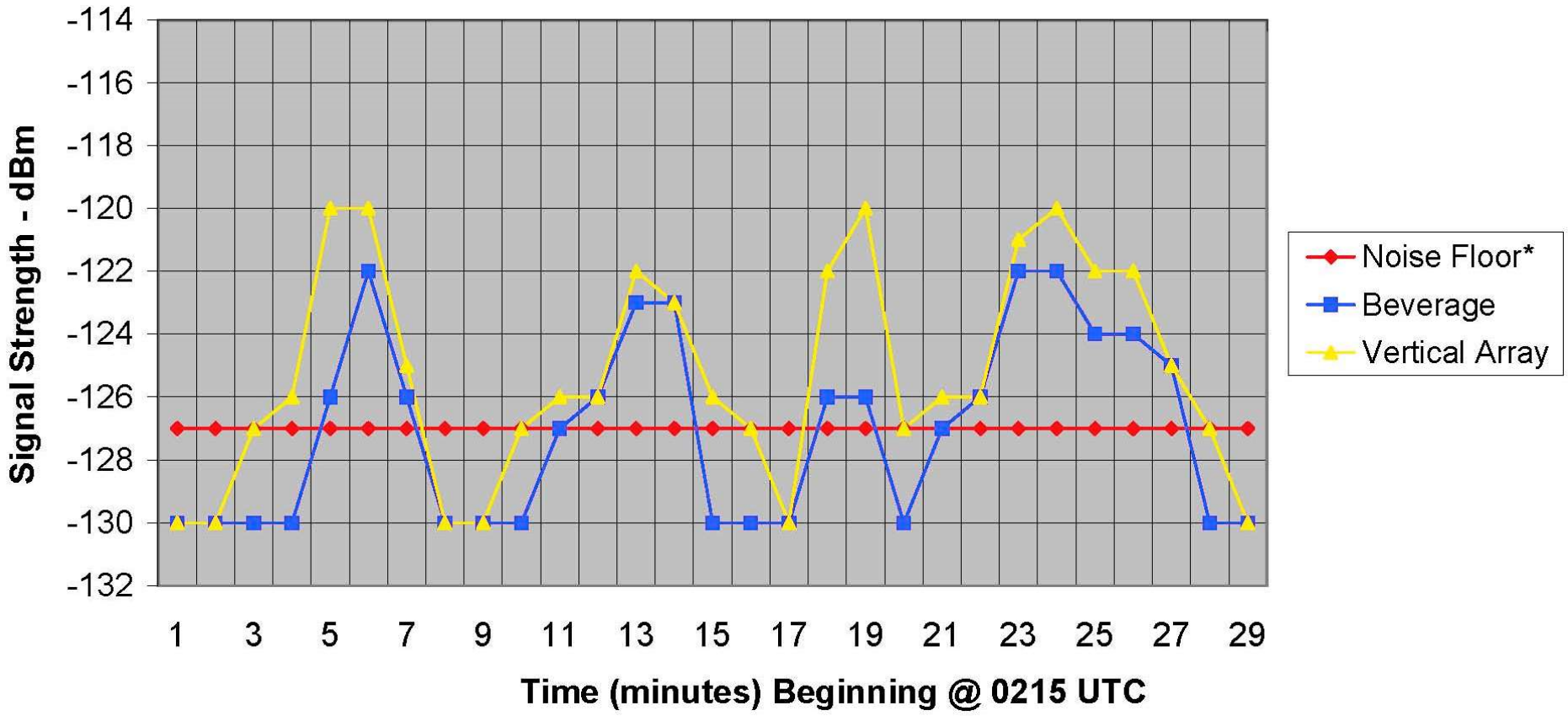
Beverage -vs- Vertical Array Signal Comparison
JW/OZ1TCK - Svalbard Island

January 12, 2009



* Noise Floor Average - Actual is Beverage -125 dBm / Vertical Array -129 dBm. Signal levels shown below the noise floor are only to indicate signals not copyable and are not measurements

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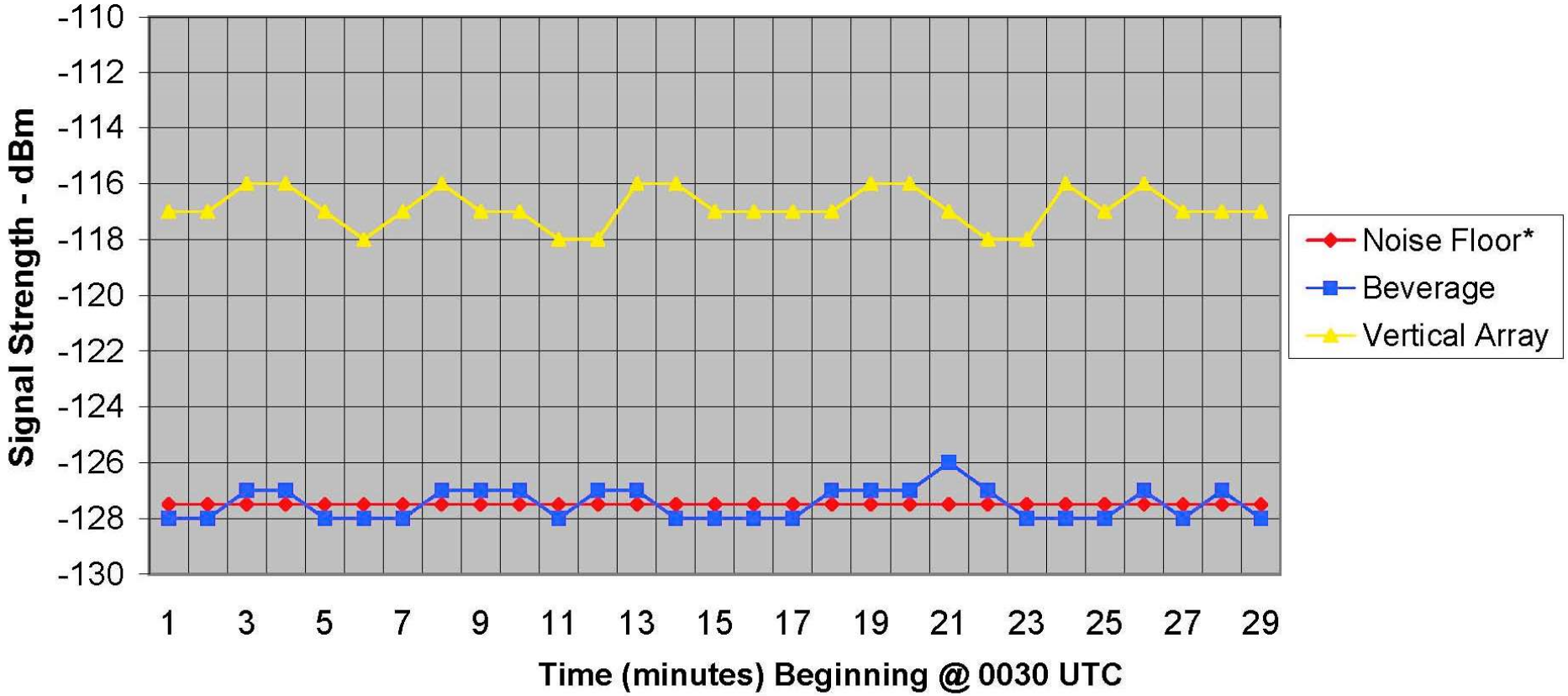
Beverage -vs- Vertical Array Signal Comparison
EY8MM - Tajikistan
January 23, 2009



*Noise Floor Average - Actual is Beverage -125 dBm / Vertical Array -130 dBm. Signal levels shown below the noise floor are only to indicate signals not copyable and are not measurements

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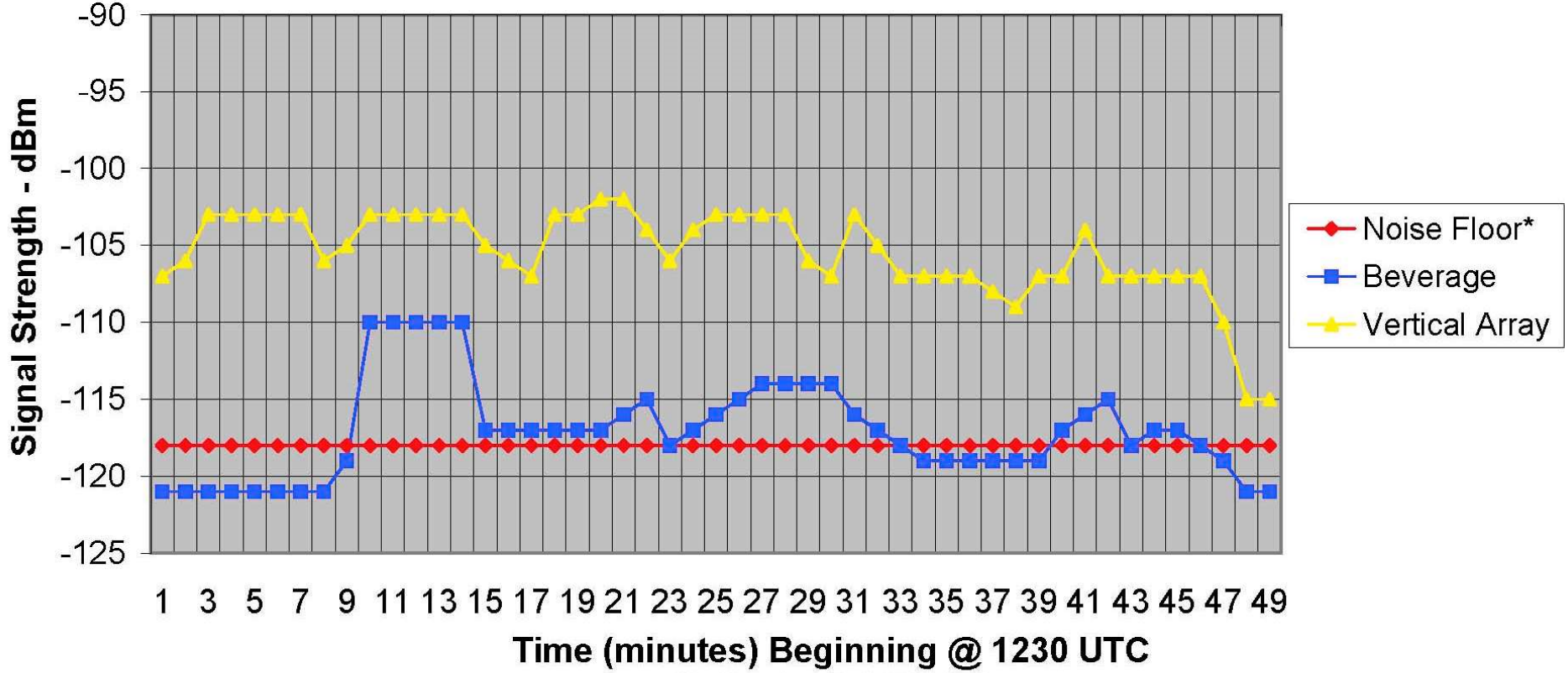
Beverage -vs- Vertical Array Signal Comparison
FW5RE - Wallis Island

February 6, 2009



My Sunrise @ 1302 UTC

***Noise Floor Average - Actual is Beverage -115 dBm / Vertical Array -121 dBm. Signal levels shown below the noise floor are only to indicate signals not copyable and are not measurements**

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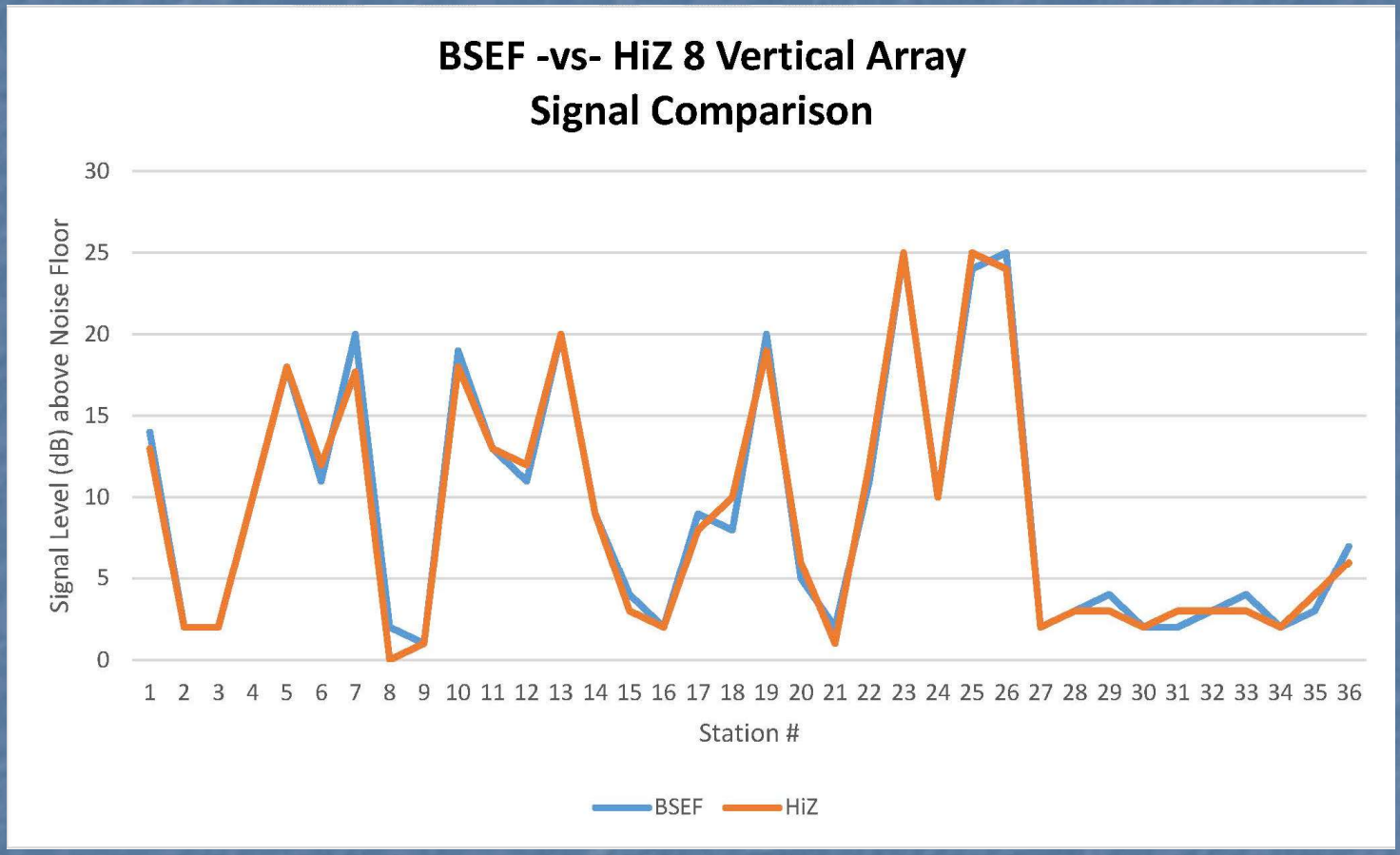
Comparison of Vertical Arrays



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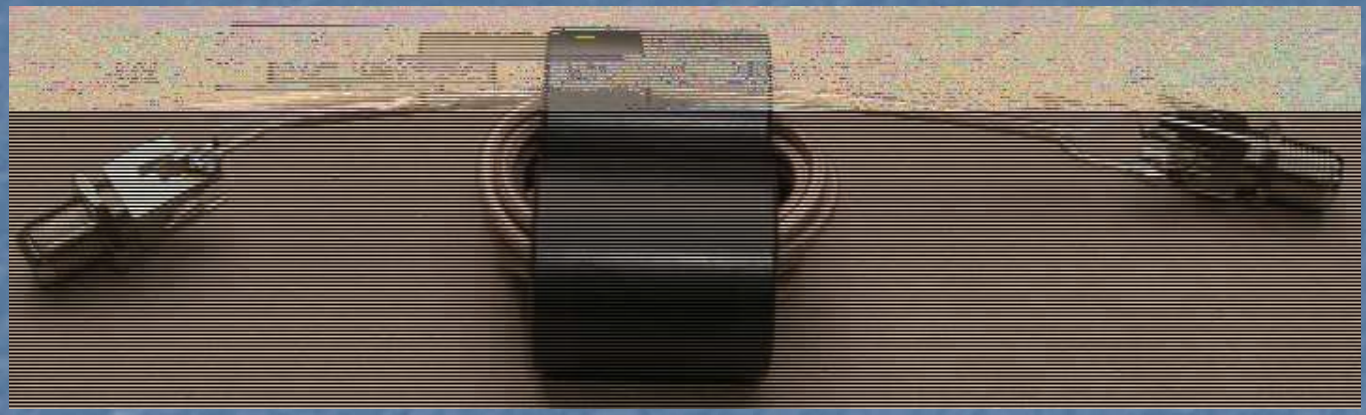
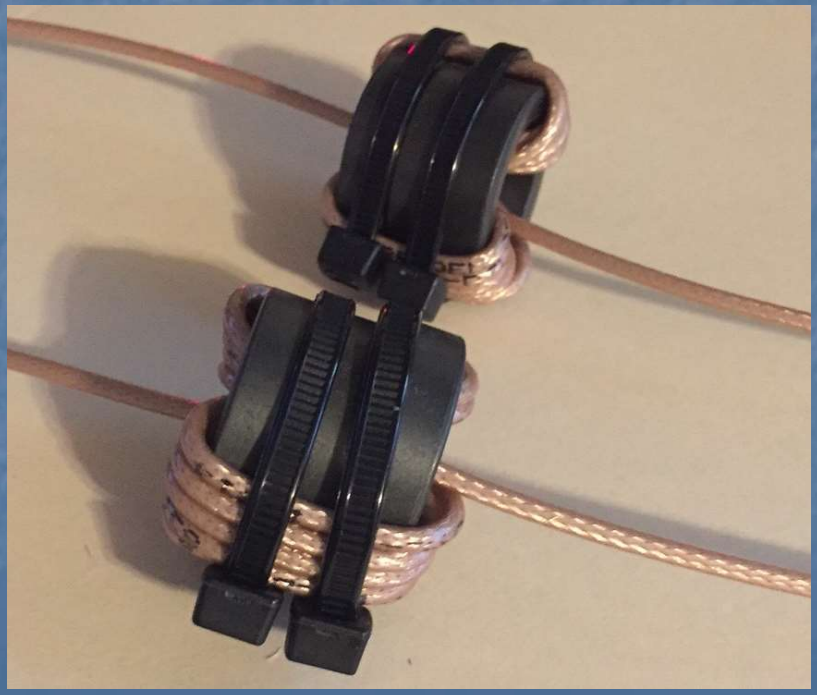
Common Mode Noise





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Design, Construction & Evaluation of the 8 Circle Vertical Array

Joel Harrison, W5ZN and Bob McGwier, N4HY

- Download a copy at www.w5zn.org
- QEX Article in March/April Issue
- Antenna Forum at Dayton Hamvention

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