

K0ZE 80m Loop EZNEC Analysis

Antenna Data

EZNEC ver. 3.0

K0ZE 80 meter horizontal loop

7/11/2001 4:16:14 PM

----- ANTENNA DESCRIPTION -----

Frequency = 3.6 MHz

Wire Loss: Copper -- Resistivity = 1.74E-08 ohm-m, Rel. Perm. = 1

----- WIRES -----

No.	End 1 Coord. (ft)			End 2 Coord. (ft)			Dia (in)	Segs
	Conn.	X	Y Z	Conn.	X	Y Z		
1	W5E1	0,	0.5, 35	W2E1	0,	70, 35	#12	45
2	W1E2	0,	70, 35	W3E1	70,	70, 35	#12	45
3	W2E2	70,	70, 35	W4E1	70,	0, 35	#12	45
4	W3E2	70,	0, 35	W5E2	0.5,	0, 35	#12	45
5	W1E1	0,	0.5, 35	W4E2	0.5,	0, 35	#12	1
6		0,	0.5, 32		0.5,	0, 32	#12	1

Total Segments: 182

----- SOURCES -----

No.	Specified Pos.	Actual Pos.	Amplitude	Phase	Type
Wire #	% From E1	% From E1	Seg (V/A)	(deg.)	
1	6	50.00	50.00	1 1	0 I

----- TRANSMISSION LINES -----

No.	End 1 Specified Pos	End 1 Act	End 2 Specified Pos	End 2 Act	Length	Z0	VF	Rev/Norm
Wire #	% From E1	% From E1	Wire #	% From E1	% From E1 (ft)	(ohms)		
1	5	50.00	50.00	6	50.00	50.00	0.5	450 1 N

Ground type is Real, High-Accuracy

----- MEDIA -----

No.	Cond.	Diel. Const.	Height	R Coord.
(S/m)	(ft)	(ft)		
1	0.005	13	0	0

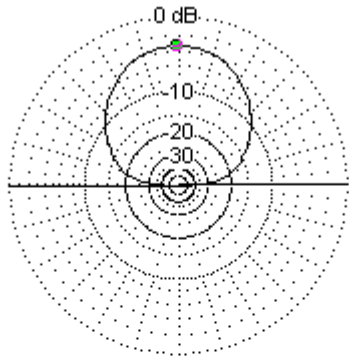
K0ZE Notes

The real 80 meter horizontal loop antenna at K0ZE is roughly square with the corners at 30-35 feet above the ground. Each leg is about 70 feet long with the wires running N/S and E/W. The antenna is fed in the NE corner with 3 feet of 450 ohm ladder line to a 4:1 balun, through about 65 feet of 50 ohm coax to the radio.

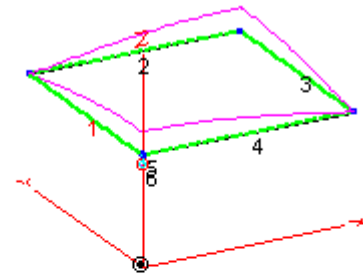
I tweaked the antenna and feed so that I have less than 2:1 VSWR across the 40m, 20m, 17m, 15m, 12m and 10m (cw/ssb) bands. 80m is covered from 3.5-3.65 MHz. No antenna tuner is required for those bands so I can easily crank the linear up to reach that tough DX. The 160m, 75m, and 30m bands can be matched using an antenna tuner.

K0ZE 80m Loop EZNEC Analysis

3.6 MHz



EZNEC

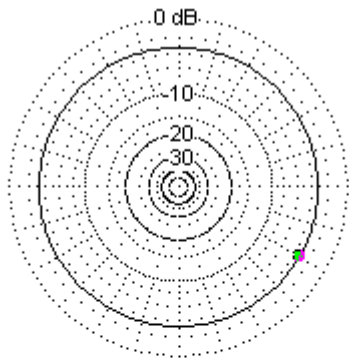


EZNEC

3.6 MHz

Elevation Plot		Cursor Elev	90.0 deg.
Azimuth Angle	330.0 deg.	Gain	6.74 dBi
Outer Ring	10.0dBi		0.0 dBmax

3D Max Gain	6.74 dBi
Slice Max Gain	6.74 dBi @ Elev Angle = 90.0 deg.
Beamwidth	68.8 deg.; -3dB @ 55.8, 124.6 deg.
Sidelobe Gain	< -100 dBi
Front/Sidelobe	> 100 dB



EZNEC

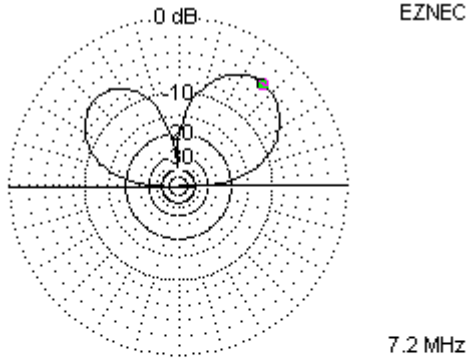
3.6 MHz

Azimuth Plot		Cursor Az	330.0 deg.
Elevation Angle	90.0 deg.	Gain	6.74 dBi
Outer Ring	10.0dBi		0.0 dBmax

3D Max Gain	6.74 dBi
Slice Max Gain	6.74 dBi @ Az Angle = 0.0 deg.
Front/Side	0.0 dB
Beamwidth	?
Sidelobe Gain	< -100 dBi
Front/Sidelobe	> 100 dB

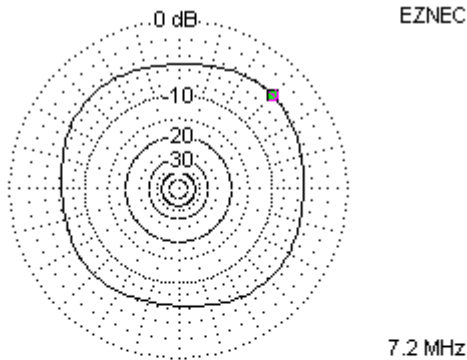
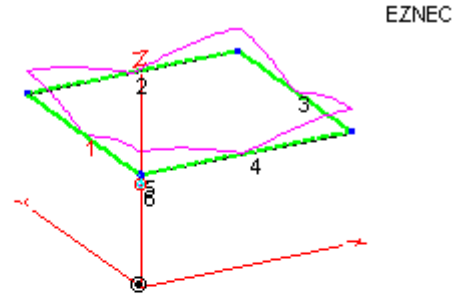
K0ZE 80m Loop EZNEC Analysis

7.2 MHz



Elevation Plot		Cursor Elev	50.0 deg.
Azimuth Angle	44.0 deg.	Gain	5.92 dBi
Outer Ring	10.0dBi		0.0 dBmax

3D Max Gain	5.92 dBi
Slice Max Gain	5.92 dBi @ Elev Angle = 50.0 deg.
Beamwidth	44.2 deg.; -3dB @ 27.2, 71.4 deg.
Sidelobe Gain	4.21 dBi @ Elev Angle = 132.0 deg.
Front/Sidelobe	1.71 dB

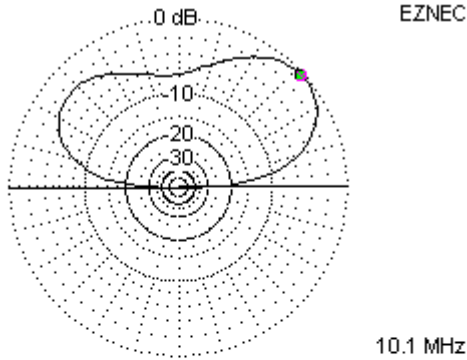


Azimuth Plot		Cursor Az	44.0 deg.
Elevation Angle	50.0 deg.	Gain	5.92 dBi
Outer Ring	10.0dBi		0.0 dBmax

3D Max Gain	5.92 dBi
Slice Max Gain	5.92 dBi @ Az Angle = 44.0 deg.
Front/Back	1.75 dB
Beamwidth	?
Sidelobe Gain	5.27 dBi @ Az Angle = 128.0 deg.
Front/Sidelobe	0.65 dB

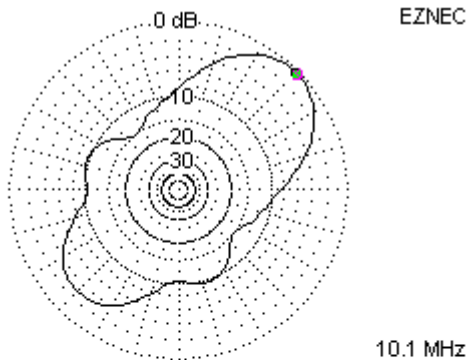
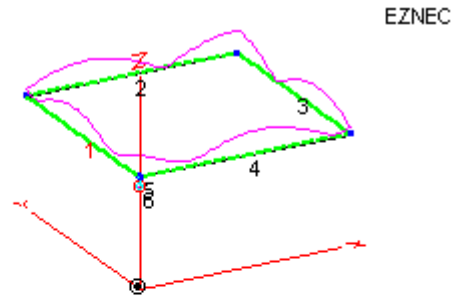
K0ZE 80m Loop EZNEC Analysis

10.1 MHz



Elevation Plot	Cursor Elev	42.0 deg.
Azimuth Angle	Gain	9.82 dBi
Outer Ring		0.0 dBmax

3D Max Gain	9.82 dBi
Slice Max Gain	9.82 dBi @ Elev Angle = 42.0 deg.
Beamwidth	46.5 deg.; -3dB @ 20.2, 66.7 deg.
Sidelobe Gain	7.21 dBi @ Elev Angle = 140.0 deg.
Front/Sidelobe	2.61 dB

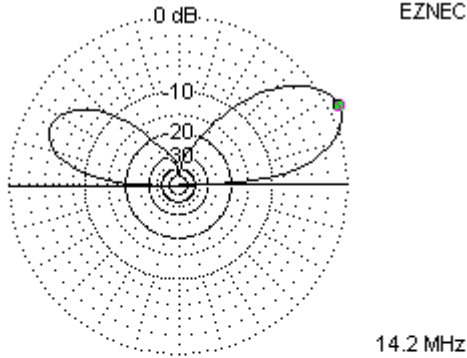


Azimuth Plot	Cursor Az	44.0 deg.
Elevation Angle	Gain	9.82 dBi
Outer Ring		0.0 dBmax

3D Max Gain	9.82 dBi
Slice Max Gain	9.82 dBi @ Az Angle = 44.0 deg.
Front/Back	2.62 dB
Beamwidth	50.8 deg.; -3dB @ 19.6, 70.4 deg.
Sidelobe Gain	7.2 dBi @ Az Angle = 224.0 deg.
Front/Sidelobe	2.62 dB

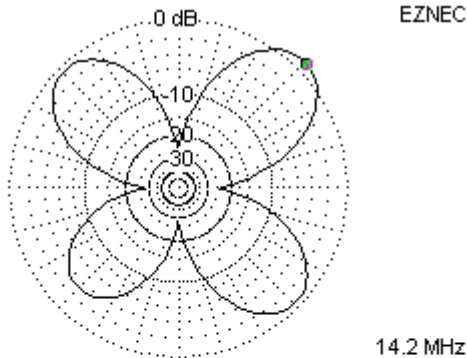
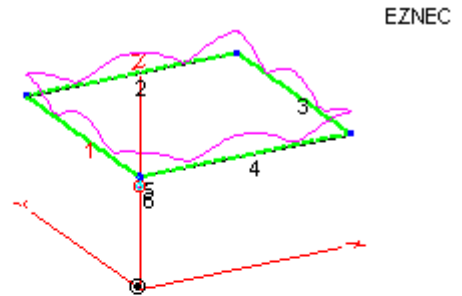
K0ZE 80m Loop EZNEC Analysis

14.2 MHz



Elevation Plot	Cursor Elev	26.0 deg.
Azimuth Angle	Gain	10.99 dBi
Outer Ring		0.0 dBmax

3D Max Gain	10.99 dBi
Slice Max Gain	10.99 dBi @ Elev Angle = 26.0 deg.
Beamwidth	28.4 deg.; -3dB @ 13.1, 41.5 deg.
Sidelobe Gain	6.94 dBi @ Elev Angle = 154.0 deg.
Front/Sidelobe	4.05 dB

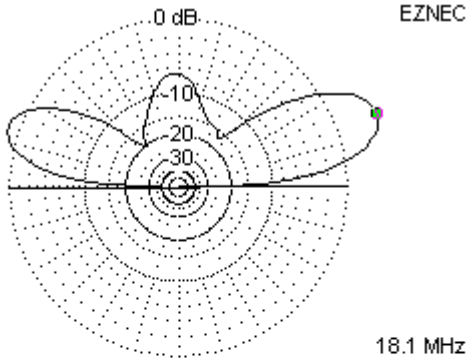


Azimuth Plot	Cursor Az	44.0 deg.
Elevation Angle	Gain	10.99 dBi
Outer Ring		0.0 dBmax

3D Max Gain	10.99 dBi
Slice Max Gain	10.99 dBi @ Az Angle = 44.0 deg.
Front/Back	4.05 dB
Beamwidth	35.2 deg.; -3dB @ 27.4, 62.6 deg.
Sidelobe Gain	9.48 dBi @ Az Angle = 316.0 deg.
Front/Sidelobe	1.52 dB

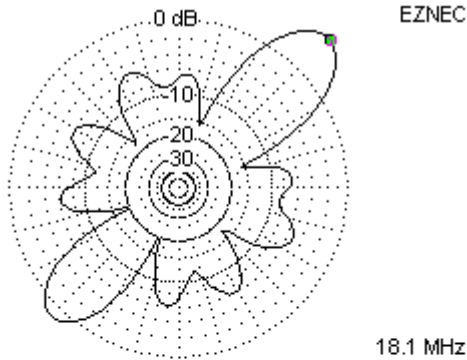
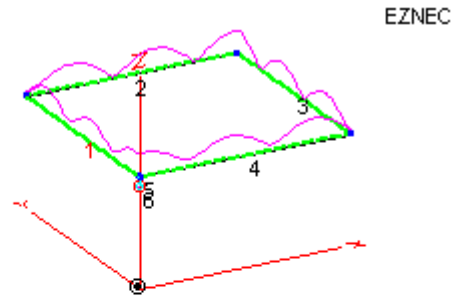
K0ZE 80m Loop EZNEC Analysis

18.1 MHz



Elevation Plot		Cursor Elev	20.0 deg.
Azimuth Angle	44.0 deg.	Gain	13.92 dBi
Outer Ring	10.0dBi		0.0 dBmax

3D Max Gain	13.92 dBi
Slice Max Gain	13.92 dBi @ Elev Angle = 20.0 deg.
Beamwidth	22.1 deg.; -3dB @ 9.9, 32.0 deg.
Sidelobe Gain	11.19 dBi @ Elev Angle = 160.0 deg.
Front/Sidelobe	2.73 dB

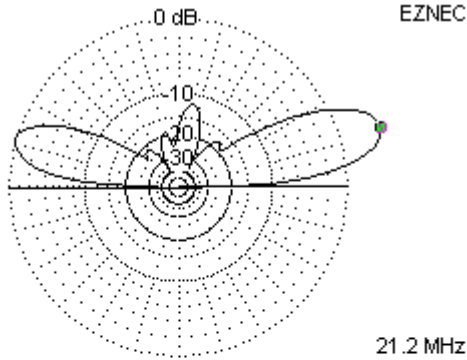


Azimuth Plot		Cursor Az	44.0 deg.
Elevation Angle	20.0 deg.	Gain	13.92 dBi
Outer Ring	10.0dBi		0.0 dBmax

3D Max Gain	13.92 dBi
Slice Max Gain	13.92 dBi @ Az Angle = 44.0 deg.
Front/Back	2.73 dB
Beamwidth	24.0 deg.; -3dB @ 33.0, 57.0 deg.
Sidelobe Gain	13.92 dBi @ Az Angle = 44.0 deg.
Front/Sidelobe	0.0 dB

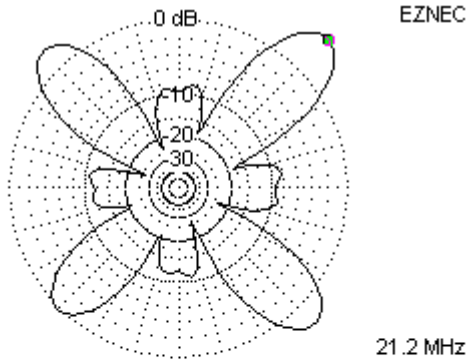
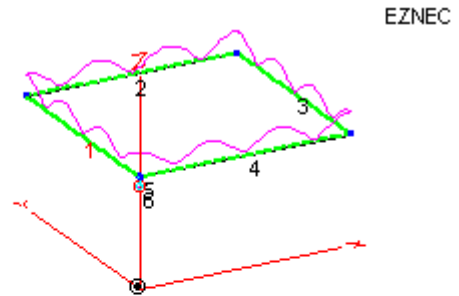
K0ZE 80m Loop EZNEC Analysis

21.2 MHz



Elevation Plot	Cursor Elev	16.0 deg.
Azimuth Angle	Gain	13.84 dBi
Outer Ring		0.0 dBmax

3D Max Gain	13.84 dBi
Slice Max Gain	13.84 dBi @ Elev Angle = 16.0 deg.
Beamwidth	18.0 deg.; -3dB @ 8.1, 26.1 deg.
Sidelobe Gain	10.2 dBi @ Elev Angle = 164.0 deg.
Front/Sidelobe	3.64 dB

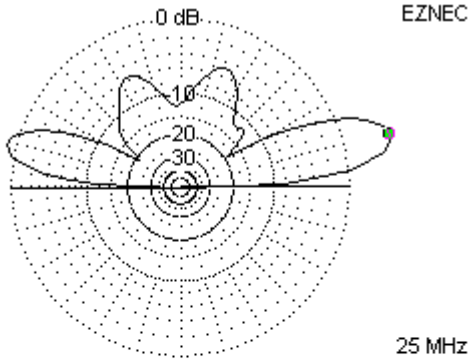


Azimuth Plot	Cursor Az	44.0 deg.
Elevation Angle	Gain	13.84 dBi
Outer Ring		0.0 dBmax

3D Max Gain	13.84 dBi
Slice Max Gain	13.84 dBi @ Az Angle = 44.0 deg.
Front/Back	3.64 dB
Beamwidth	21.6 deg.; -3dB @ 34.2, 55.8 deg.
Sidelobe Gain	12.27 dBi @ Az Angle = 134.0 deg.
Front/Sidelobe	1.57 dB

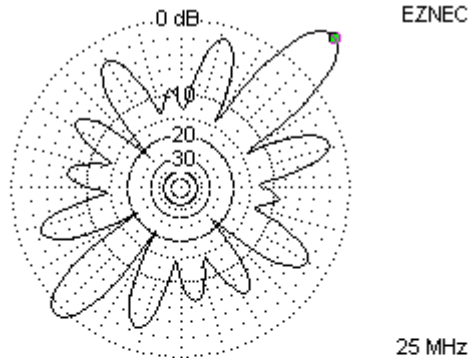
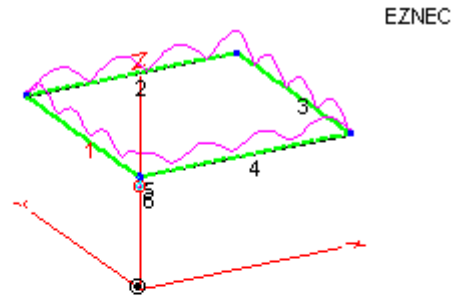
K0ZE 80m Loop EZNEC Analysis

25 MHz



Elevation Plot	Cursor Elev	14.0 deg.
Azimuth Angle	Gain	14.26 dBi
Outer Ring		0.0 dBmax

3D Max Gain	14.26 dBi
Slice Max Gain	14.26 dBi @ Elev Angle = 14.0 deg.
Beamwidth	15.1 deg.; -3dB @ 7.0, 22.1 deg.
Sidelobe Gain	10.94 dBi @ Elev Angle = 166.0 deg.
Front/Sidelobe	3.31 dB

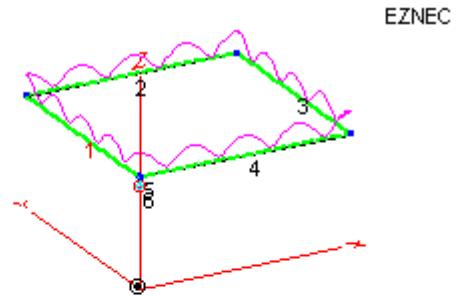
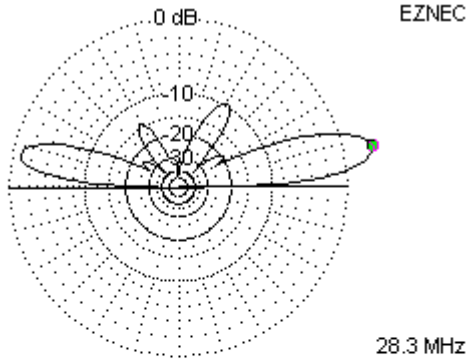


Azimuth Plot	Cursor Az	44.0 deg.
Elevation Angle	Gain	14.26 dBi
Outer Ring		0.0 dBmax

3D Max Gain	14.26 dBi
Slice Max Gain	14.26 dBi @ Az Angle = 44.0 deg.
Front/Back	3.31 dB
Beamwidth	15.6 deg.; -3dB @ 37.2, 52.8 deg.
Sidelobe Gain	10.94 dBi @ Az Angle = 224.0 deg.
Front/Sidelobe	3.31 dB

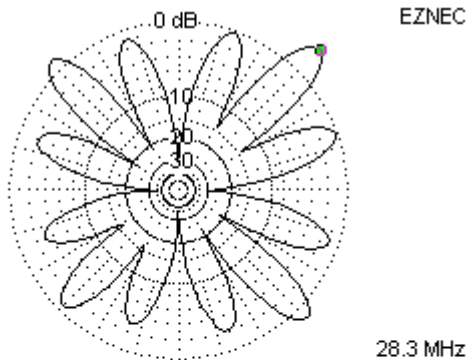
K0ZE 80m Loop EZNEC Analysis

28.3 MHz



Elevation Plot	Cursor Elev	12.0 deg.
Azimuth Angle	Gain	12.88 dBi
Outer Ring		0.0 dBmax

3D Max Gain	12.88 dBi
Slice Max Gain	12.88 dBi @ Elev Angle = 12.0 deg.
Beamwidth	12.9 deg.; -3dB @ 5.8, 18.7 deg.
Sidelobe Gain	9.27 dBi @ Elev Angle = 168.0 deg.
Front/Sidelobe	3.61 dB

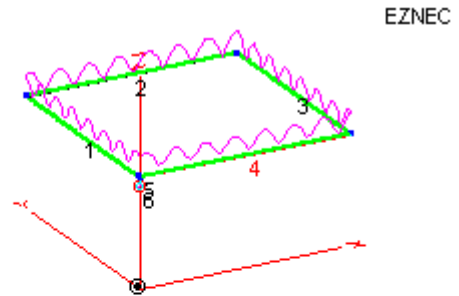
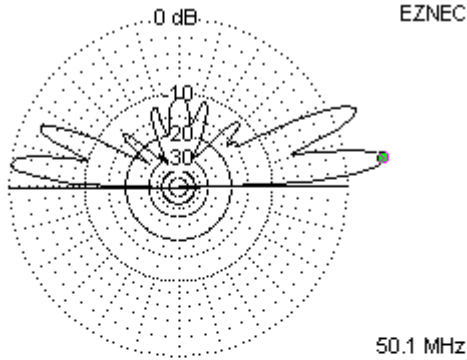


Azimuth Plot	Cursor Az	44.0 deg.
Elevation Angle	Gain	12.88 dBi
Outer Ring		0.0 dBmax

3D Max Gain	12.88 dBi
Slice Max Gain	12.88 dBi @ Az Angle = 44.0 deg.
Front/Back	3.61 dB
Beamwidth	13.4 deg.; -3dB @ 38.3, 51.7 deg.
Sidelobe Gain	11.25 dBi @ Az Angle = 134.0 deg.
Front/Sidelobe	1.62 dB

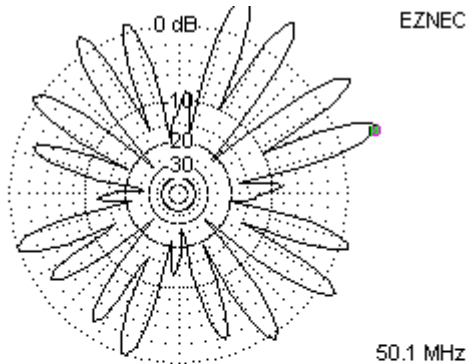
KOZE 80m Loop EZNEC Analysis

50.1 MHz



Elevation Plot	Cursor Elev	8.0 deg.
Azimuth Angle	Gain	13.54 dBi
Outer Ring		0.0 dBmax

3D Max Gain	13.54 dBi
Slice Max Gain	13.54 dBi @ Elev Angle = 8.0 deg.
Beamwidth	8.3 deg.; -3dB @ 4.0, 12.3 deg.
Sidelobe Gain	12.47 dBi @ Elev Angle = 24.0 deg.
Front/Sidelobe	1.07 dB

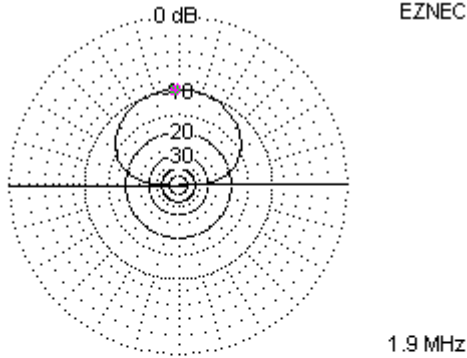


Azimuth Plot	Cursor Az	18.0 deg.
Elevation Angle	Gain	13.54 dBi
Outer Ring		0.0 dBmax

3D Max Gain	13.54 dBi
Slice Max Gain	13.54 dBi @ Az Angle = 18.0 deg.
Front/Back	3.48 dB
Beamwidth	7.9 deg.; -3dB @ 14.8, 22.7 deg.
Sidelobe Gain	13.54 dBi @ Az Angle = 72.0 deg.
Front/Sidelobe	0.0 dB

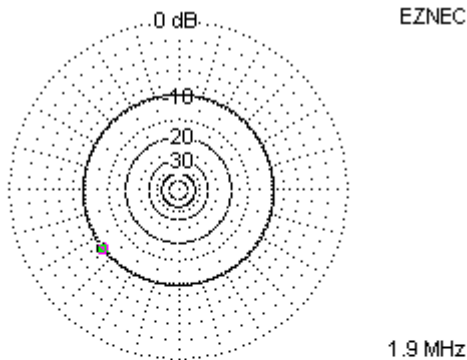
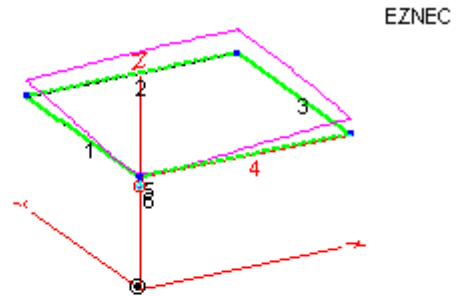
K0ZE 80m Loop EZNEC Analysis

1.9 MHz



Elevation Plot	Cursor Elev	92.0 deg.
Azimuth Angle	38.0 deg.	Gain 0.24 dBi
Outer Ring	10.0dBi	0.0 dBmax

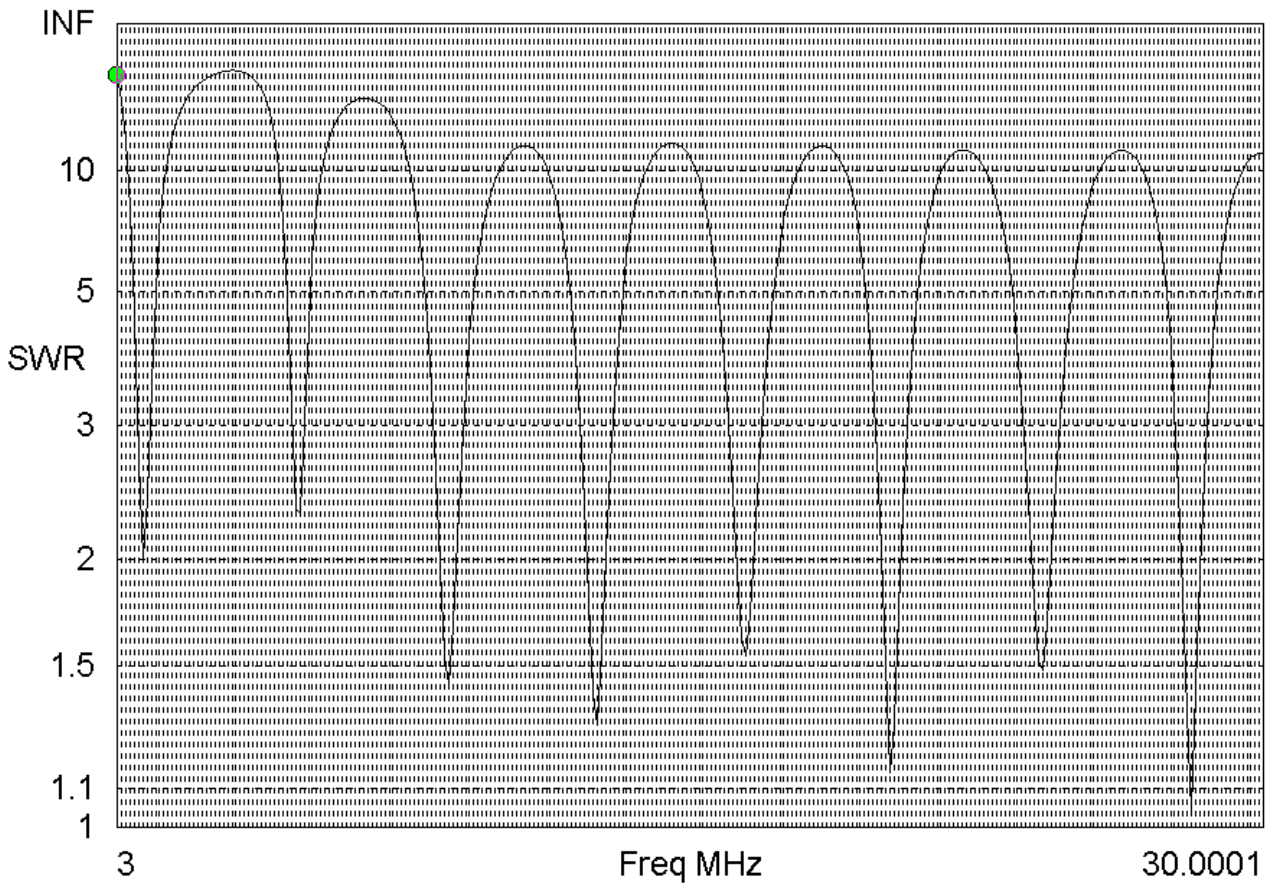
3D Max Gain	0.24 dBi
Slice Max Gain	0.24 dBi @ Elev Angle = 92.0 deg.
Beamwidth	100.7 deg.; -3dB @ 40.1, 140.8 deg.
Sidelobe Gain	< -100 dBi
Front/Sidelobe	> 100 dB



Azimuth Plot	Cursor Az	218.0 deg.
Elevation Angle	88.0 deg.	Gain 0.24 dBi
Outer Ring	10.0dBi	0.0 dBmax

3D Max Gain	0.24 dBi
Slice Max Gain	0.24 dBi @ Az Angle = 222.0 deg.
Front/Side	0.01 dB
Beamwidth	?
Sidelobe Gain	0.24 dBi @ Az Angle = 220.0 deg.
Front/Sidelobe	0.0 dB

K0ZE 80m Loop EZNEC Analysis



Freq 3 MHz
 SWR 30.6
 Z 59.93 - j 569.2 ohms
 Refl Coeff 0.9368 at -38.37 deg.

Source # 1
 Z0 200 ohms

Minima (MHz):

3.6 7.2 10.8 14.3 17.8 21.2 24.8 28.3