13,00 M 7el OWA 12,05 dBI

TYPE : HPSD 7el OWA 13,0 M

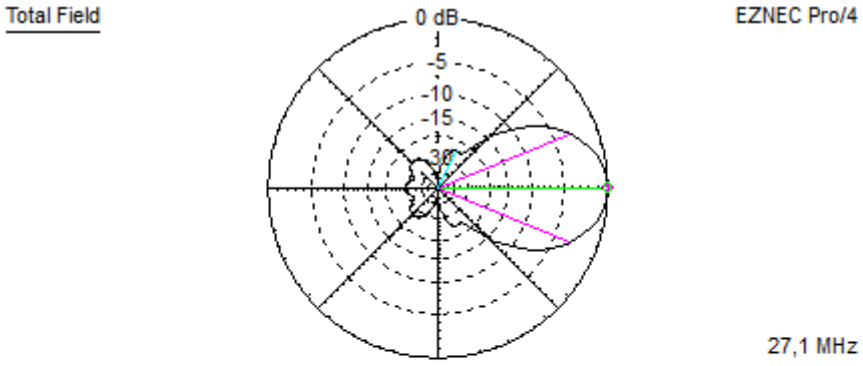
THERE ARE TWO VERSIONS ON THIS PAGE:

Version: april 2013.

Gain: 12,05 dBI (8,07 dBD)
Gain: @ 18m heigth: 17,43 dBI
Front to back: >28,1 dB
Front to side: >23,97 dB
Azimuth-Beamwidth: 45,2 degrees
SWR bandwidth 2:1 1500 Khz
SWR bandwidth 1:1 400 Khz
Max Power: >10Kw
Longest element: 5,58 meter
Boom length: 13,00 meter
Diameter: maco style. (5/8,1/2)

Stacking distance: 9 meter
Stacked Total gain: 14,37 dBI
Element diameter: 5/8, 1/2 inch.

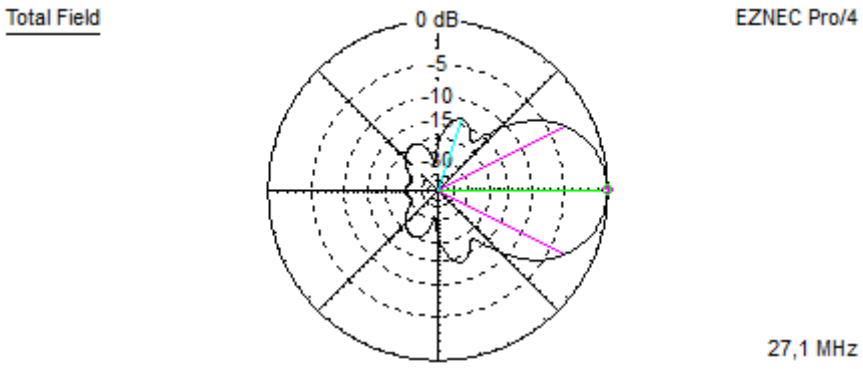
Below the azimuth plot 12,05 dBI @27,1 Mhz



Azimuth Plot		Cursor Az	0,0 deg.
Elevation Angle	0,0 deg.	Gain	12,05 dBi
Outer Ring	12,05 dBi		0,0 dBmax

Slice Max Gain	12,05 dBi @ Az Angle = 0,0 deg.
Front/Back	28,1 dB
Beamwidth	45,2 deg.; -3dB @ 337,4, 22,6 deg.
Sidelobe Gain	-11,92 dBi @ Az Angle = 64,0 deg.
Front/Sidelobe	23,97 dB

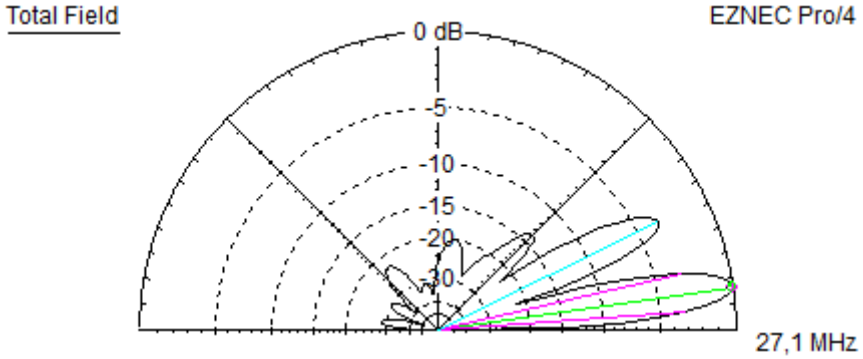
Below the elevation plot:



Elevation Plot		Cursor Elev	0,0 deg.
Azimuth Angle	0,0 deg.	Gain	12,05 dBi
Outer Ring	12,05 dBi		0,0 dBmax

Slice Max Gain	12,05 dBi @ Elev Angle = 0,0 deg.
Front/Back	28,1 dB
Beamwidth	53,4 deg.; -3dB @ 333,3, 26,7 deg.
Sidelobe Gain	-1,85 dBi @ Elev Angle = 71,0 deg.
Front/Sidelobe	13,9 dB

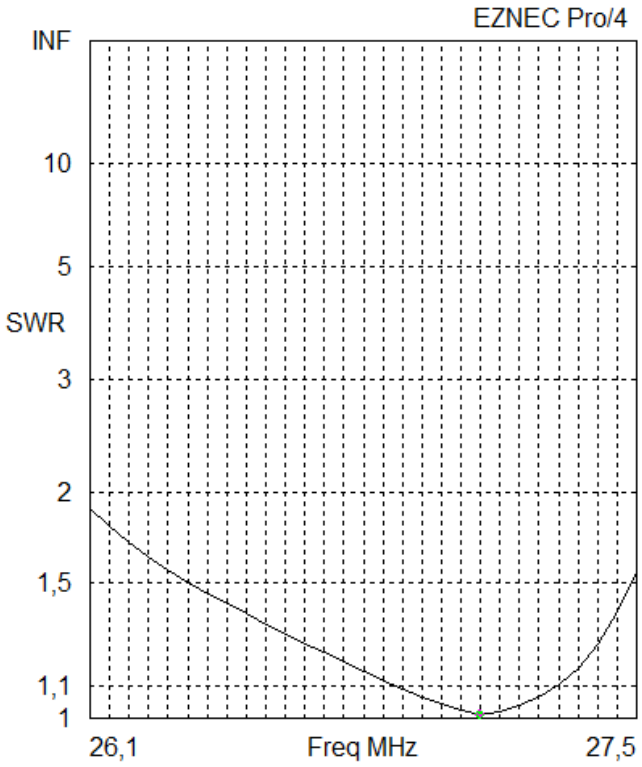
At 18 meter heigth the antenna is producing 17,43dBI above average ground.



Elevation Plot		Cursor Elev	8,0 deg.
Azimuth Angle	0,0 deg.	Gain	17,43 dBi
Outer Ring	17,43 dBi		0,0 dBmax

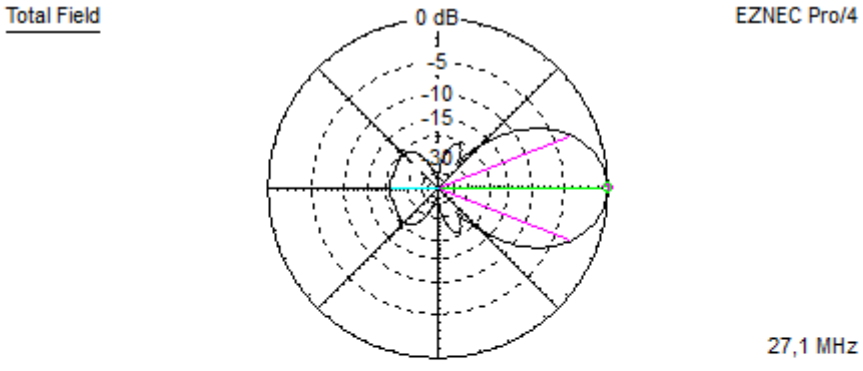
Slice Max Gain	17,43 dBi @ Elev Angle = 8,0 deg.
Beamwidth	8,7 deg.; -3dB @ 4,2, 12,9 deg.
Sidelobe Gain	14,09 dBi @ Elev Angle = 26,0 deg.
Front/Sidelobe	3,34 dB

The SWR pattern:



Freq	27,1 MHz	Source #	1
SWR	**1,011**	Z0	50 ohms
Z	49,52 at 0,28 deg.		
	= 49,52 + j 0,2442 ohms		
Refl Coeff	0,005442 at 153,06 deg.		
	= -0,004852 + j 0,002466		
Ret Loss	45,3 dB		

Below 2 x HPSD 7el OWA in a stack configuration. (9 meter seperated). Producing 14,37 dBI gain.



Azimuth Plot		Cursor Az	0,0 deg.
Elevation Angle	0,0 deg.	Gain	14,37 dBi
Outer Ring	14,37 dBi		0,0 dBmax

Slice Max Gain	14,37 dBi @ Az Angle = 0,0 deg.
Front/Back	21,31 dB
Beamwidth	43,6 deg.; -3dB @ 338,2, 21,8 deg.
Sidelobe Gain	-6,94 dBi @ Az Angle = 180,0 deg.
Front/Sidelobe	21,31 dB

ELEMENT DIAMETER

Each element is made out of tubing "maco" uses.
In metric this will be : 15,875mm diameter (5/8 inch) for the central part of the element, which is 1,8288 Meter long.
Inserted goes the 12,7 mm diameter tubing (1/2 inch) to make up for the rest of the element length.

DO NOT CHANGE ELEMENT DIAMETERS OR INDIVIDUAL SECTION LENGTHS.

ELEMENT DISTANCES

Reflector - radiator : 1,45 Meter
Reflector - director 1 : 1,84 Meter
Reflector - director 2 : 3,63 Meter
Reflector - director 3 : 6,425 Meter
Reflector - director 4 : 9,835 Meter
Reflector - director 5 : 13,00 Meter

ELEMENT LENGTHS:

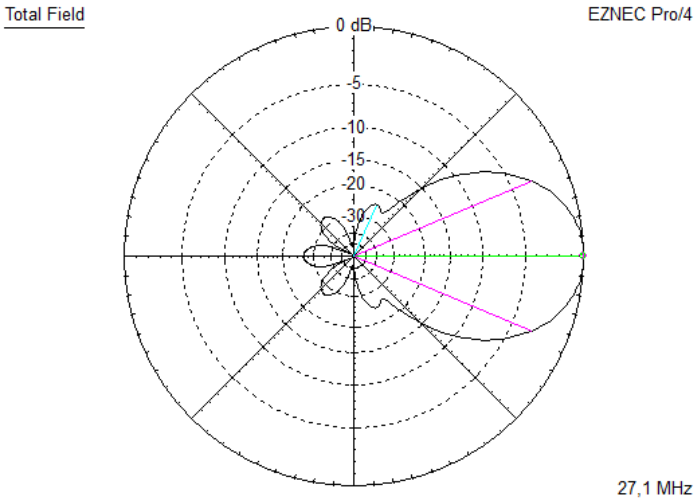
Reflector: 5,58 Meter
Radiator: 5,46 Meter
Director 1: 5,20 Meter
Director 2: 5,17 Meter
Director 3: 5,084 Meter
Director 4: 5,016 Meter
Director 5: 4,832 meter

FEEDING THE ANTENNA:

The antenna has 50 ohms impedance. It can be "direct" fed.
All you need to do is split the radiating element in half, isolate it from the boom and attach the coax on it.
Of course a RF choke / 1:1 balun is advised.

Any futher questions please feel free to mail !

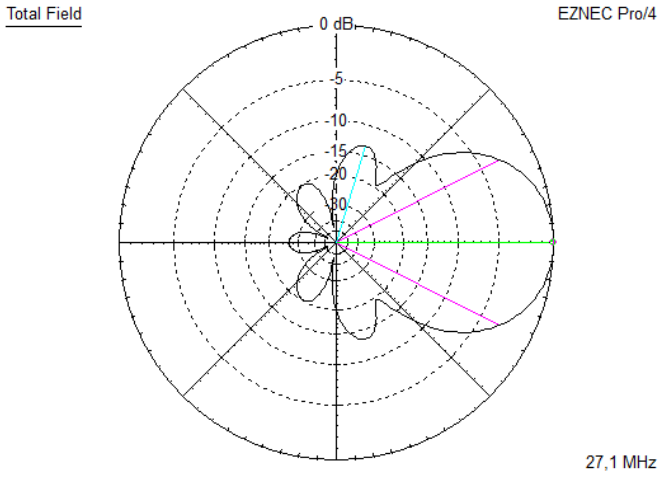
VERSION TWO: 12,01 dBI wide SWR



Azimuth Plot		Cursor Az	0,0 deg.
Elevation Angle	0,0 deg.	Gain	12,01 dBi
Outer Ring	12,01 dBi		0,0 dBmax

Slice Max Gain	12,01 dBi @ Az Angle = 0,0 deg.
Front/Back	26,17 dB
Beamwidth	45,6 deg.; -3dB @ 337,2, 22,8 deg.
Sidelobe Gain	-12,1 dBi @ Az Angle = 66,0 deg.
Front/Sidelobe	24,11 dB

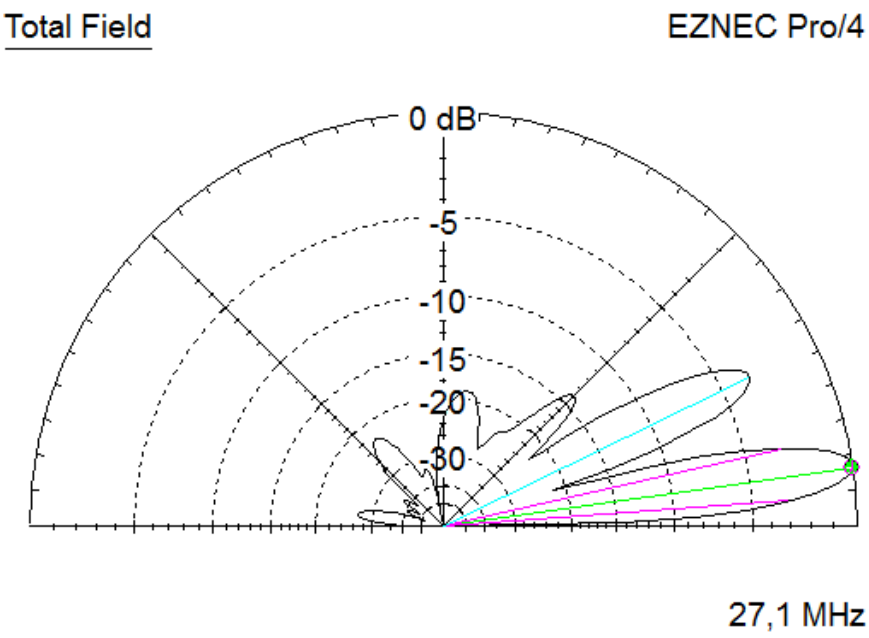
Above the free space azimuth plot :



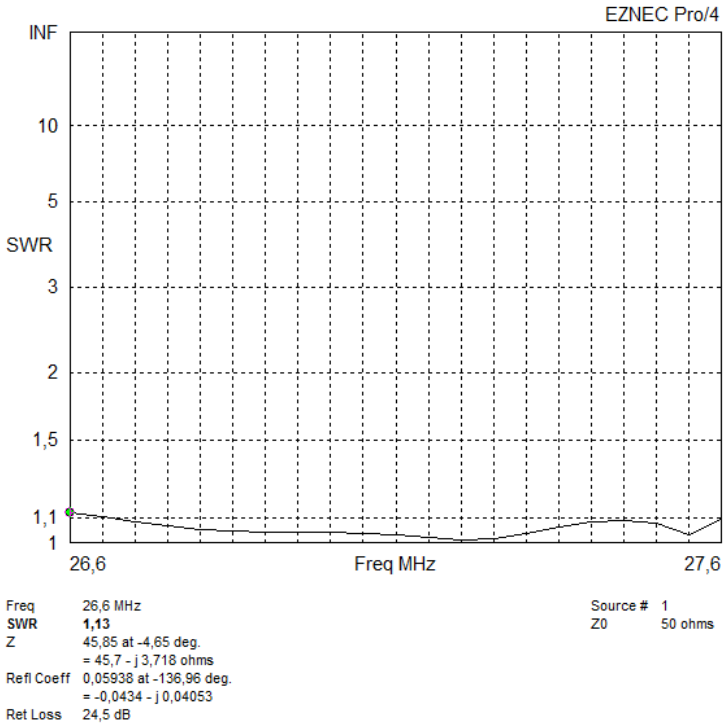
Elevation Plot		Cursor Elev	0,0 deg.
Azimuth Angle	0,0 deg.	Gain	12,01 dBi
Outer Ring	12,01 dBi		0,0 dBmax

Slice Max Gain	12,01 dBi @ Elev Angle = 0,0 deg.
Front/Back	26,17 dB
Beamwidth	54,0 deg.; -3dB @ 333,0, 27,0 deg.
Sidelobe Gain	-1,25 dBi @ Elev Angle = 73,0 deg.
Front/Sidelobe	13,26 dB

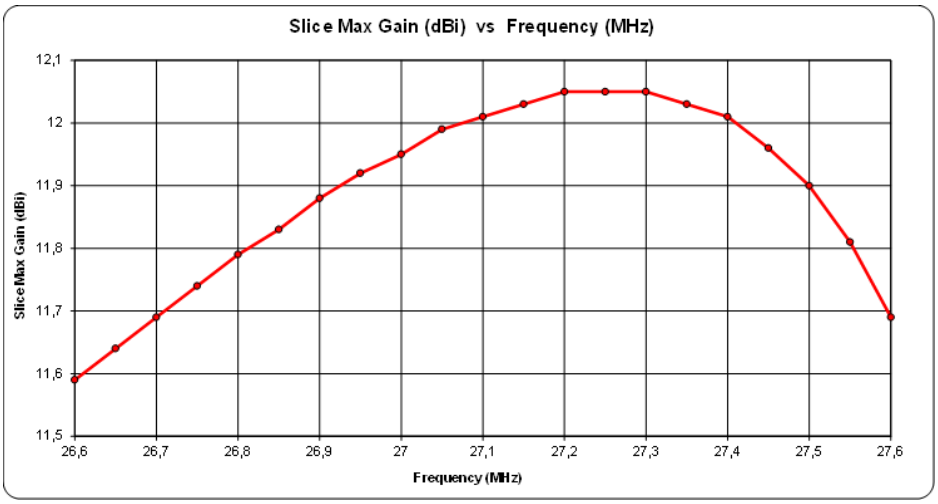
Above the free space elevation plot



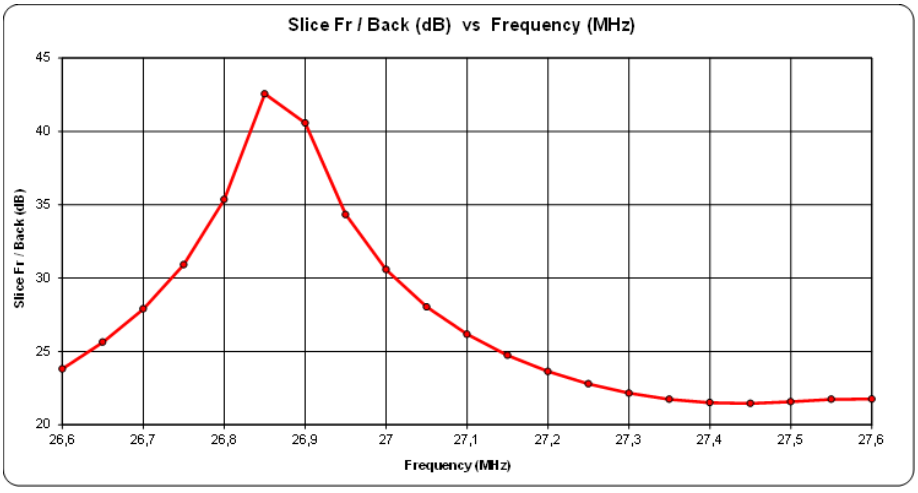
Above the antenna placed at 18 meters above average ground (including ground gain)



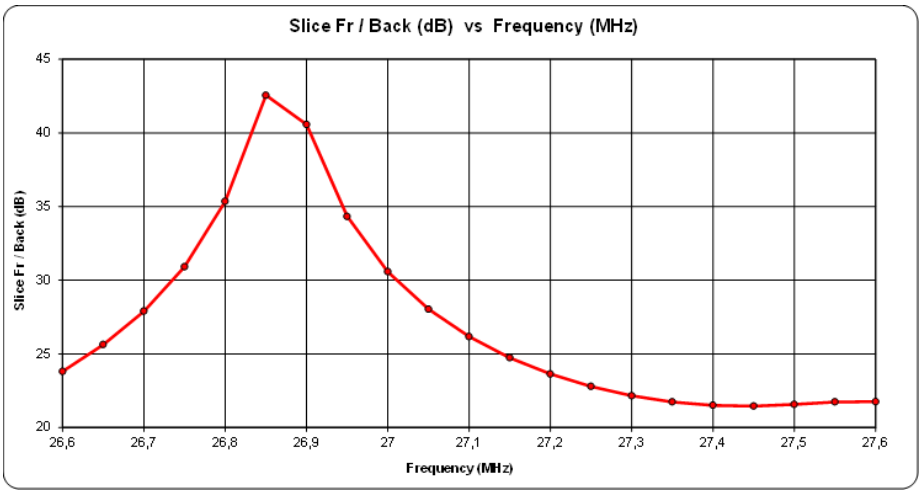
Above the swr:



Above gain versus frequency:



Above front to rear versus frequency:



Above front to back versus frequency:

ELEMENT DIAMETER

Each element is made out of tubing "maco" uses.
In metric this will be : 15,875mm diameter (5/8 inch) for the central part of the element, which is 1,8288 Meter long.
Inserted goes the 12,7 mm diameter tubing (1/2 inch) to make up for the rest of the element length.

DO NOT CHANGE ELEMENT DIAMETERS OR INDIVIDUAL SECTION LENGTHS.

ELEMENT DISTANCES

Reflector - radiator :	1,47 Meter
Reflector - director 1 :	1,86 Meter
Reflector - director 2 :	3,63 Meter
Reflector - director 3 :	6,54 Meter
Reflector - director 4 :	9,80 Meter
Reflector - director 5 :	13,00 Meter

ELEMENT LENGTHS:

Reflector:	5,64 Meter
Radiator:	5,56 Meter
Director 1:	5,26 Meter
Director 2:	5,152 Meter
Director 3:	5,074 Meter
Director 4:	5,019 Meter
Director 5:	4,840 meter

FEEDING THE ANTENNA:

The antenna has 50 ohms impedance. It can be "direct" fed.
All you need to do is split the radiating element in half, isolate it from the boom and attach the coax on it.
Of course a RF choke / 1:1 balun is advised.