

Assignment Number 1

Half Wave Dipole Antenna

Main [V5.9.3] (F2)

File Edit Settings Calculate Window Show Run Help

Filename Half Wave Dipole.NE Frequency 300 Mhz
Wavelength 0.999 mtr

Voltage Current

Impedance Series comp.
Parallel form Parallel comp.

S.W.R. Input power W
Efficiency % Structure loss W
Radiat-eff. % Network loss W
RDF [dB] Radiat-power W

Environment ☐ Loads ☐ Polar

Free space

Comment



Seg's/patches 11 start stop count step
Pattern lines
Freq/Eval steps 1
Calculation time s

Create New File and Save File as Half Wave Dipole

Press Edit NEC Input-File

Half Wave Dipole.NEC - 4nec2 Edit

File Cell Rows Selection Options

Symbol/Variable with value or equation ☐ Upd ☐ Ins. ☐ Del.  

Symbols Geometry Source/Load Freq./Ground Others Comment

Symbols



Nr	Symbols and equations	comment
1	len=0.47	
2	dia=0.01	

Scaling

☒ Meters
 ☐ Feet
 ☐ Inch
 ☐ Wave-length
 ☐ Custom Factor

Half Wave Dipole.NEC - 4nec2 Edit

File Cell Rows Selection Options

Default straight line wire-element ☐ Upd ☐ Ins. ☐ Del.  

Symbols **Geometry** Source/Load Freq./Ground Others Comment

Geometry (Scaling=Meters) ☐ Use wire tapering

Nr	Type	Tag	Segs	X1	Y1	Z1	X2	Y2	Z2	Radius
1	Wire	1	11	0	-len/2	0	0	len/2	0	dia/2

Half Wave Dipole.NEC - 4nec2 Edit

File Cell Rows Selection Options

Standard Voltage source (Peak value) ☐ Upd

Symbols		Geometry		Source/Load		Freq./Ground		Others		Comment	
Source(s)											
<input checked="" type="checkbox"/> Show source <input type="checkbox"/> Show loads <input type="checkbox"/> Show Tr-line											
Nr	Type	Tag	Seg	(opt)	Real	Imag	Magn	Phase	(norm)		cc
1	Voltage-src	1	6	0	1	0	1	0	0		

Half Wave Dipole.NEC - 4nec2 Edit

File Cell Rows Selection Options

Symbols	Geometry	Source/Load	Freq./Ground	Others	Comment
Frequency Frequency <input type="text" value="300"/> Mhz Nr steps <input type="text"/> <input type="checkbox"/> Sweep Stepsize <input type="text"/>			Ground screen Nr of radials <input type="text"/> Radial length <input type="text"/> mtr Wire radius <input type="text"/> mm		
Environment Ground / Free-space <input type="text" value="Free-space"/> <input type="checkbox"/> Connect wire(s) for Z=0 to ground			Second ground Ground type <input type="text"/> Conductivity <input type="text"/> Diel constant <input type="text"/> Distance <input type="text"/> mtr Depth <input type="text"/> mtr <input type="radio"/> Circular boundary <input type="radio"/> Perpendicular to Y-axis		
Main ground Ground type <input type="text"/> Conductivity <input type="text"/> Diel constant <input type="text"/> <input type="checkbox"/> Use ground-screen <input type="checkbox"/> Use second ground					

Click on Calculate New Output-Data (Run NEC) or Press F7

Generate (F7) [Nec2dXS1k5] X

☒ Use original file

☐ Far Field pattern
☐ Frequency sweep
☐ Near Field pattern

☐ ItsHF 360 degree Gain table
☐ ItsHF Gain @ 30 frequencies

Generate Batch Exit

Click on Far Field Pattern and enter the Parameters

Generate (F7) [Nec2dXS1k5] X

☐ Use original file

☒ Far Field pattern Freq: 300 ☐ from file
☐ Frequency sweep
☐ Near Field pattern

☐ ItsHF 360 degree Gain table
☐ ItsHF Gain @ 30 frequencies

☒ Full ☐ Ver. ☐ Hor.

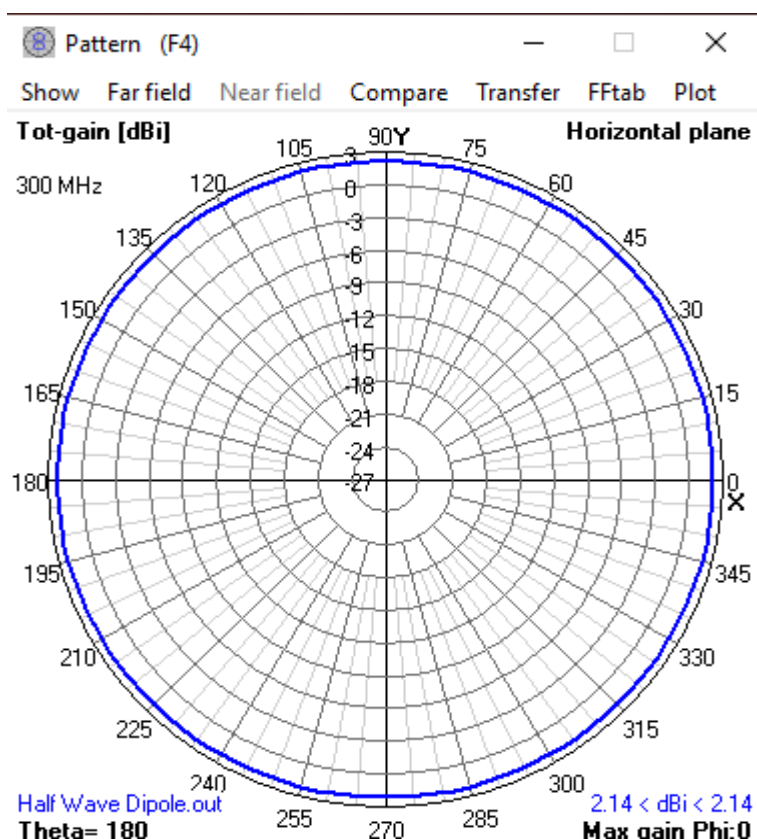
Resol. 3 deg.

☐ Surface-wave ☐ Run Average Gain Test
☐ E-fld distance

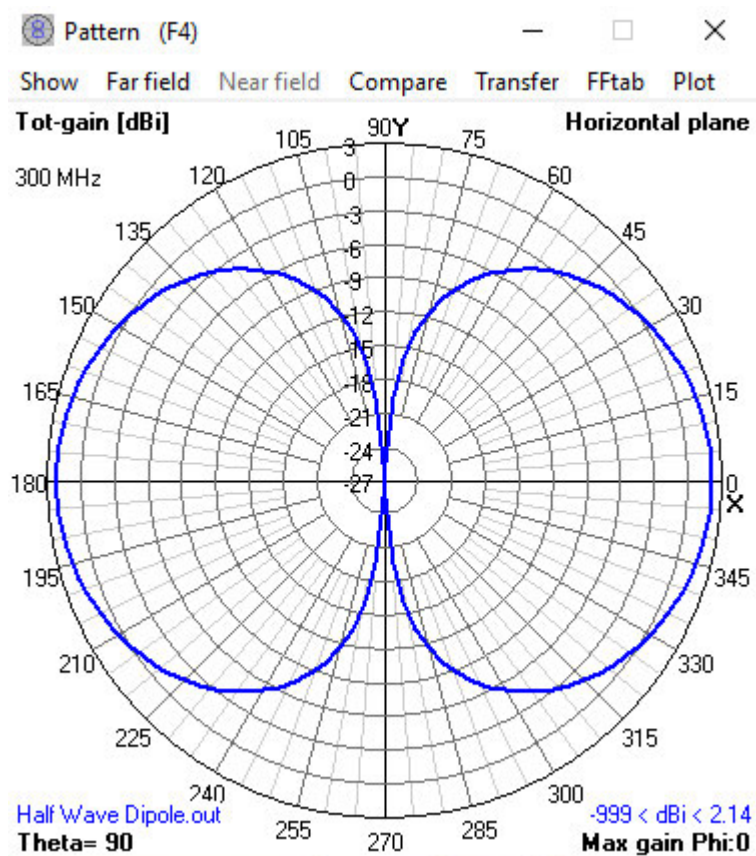
Expert settings

Generate Batch Exit

Click on Generate



Press Spacebar to change from Vertical to Horizontal Plane



Press Up/Down or Left/Right Arrows to change the Angle

Click 3D on the Main Window

Main [V5.9.3] (F2)

File Edit Settings Calculate Window Show Run Help

Filename: Half Wave Dipole.out

Frequency: 300 Mhz

Wavelength: 0.999 mtr

Voltage: $88.9 + j0$ V

Current: $1.13 - j0.18$ A

Impedance: $76.9 + j12.6$

Parallel form: $79 // j481$

S.W.R.50: 1.61

Efficiency: 100 %

Radiat-eff: %

RDF [dB]:

Series comp.: 42 pF

Parallel comp.: 1.103 pF

Input power: 100 W

Structure loss: 0 uW

Network loss: 0 uW

Radiat-power: 100 W

Environment: FREE SPACE

Comment:

Seg's/patches: 11

Pattern lines: 0

Freq/Eval steps: 1

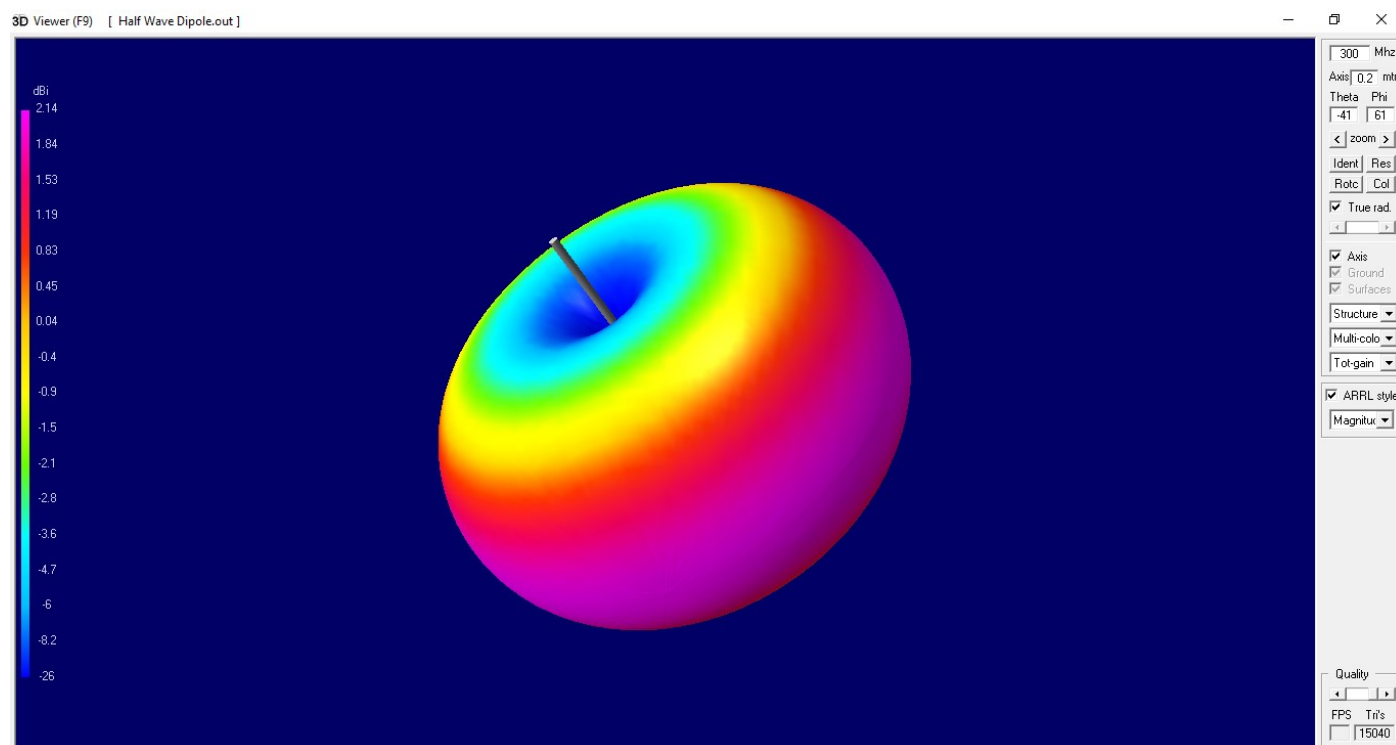
Calculation time: 0.000 s

Theta start stop count step

Phi

☐ Loads ☐ Polar

Change the Parameters Accordingly to obtain the following 3D figure



Again Go to Generate and Select Frequency Sweep

Generate (F7) [Nec2dXS1k5]

☐ Use original file

☐ Far Field pattern

☒ **Frequency sweep** ☐ from file

☐ Near Field pattern

☐ ItsHF 360 degree Gain table

☐ ItsHF Gain @ 30 frequencies

☐ Gain ☒ Ver. ☐ Hor. ☐ Full/3D

Resol. **3** deg.

☐ Surface-wave ☐ Run Average Gain Test

☐ E-fld distance

FR: Start **290** Stop **310** Step **1**

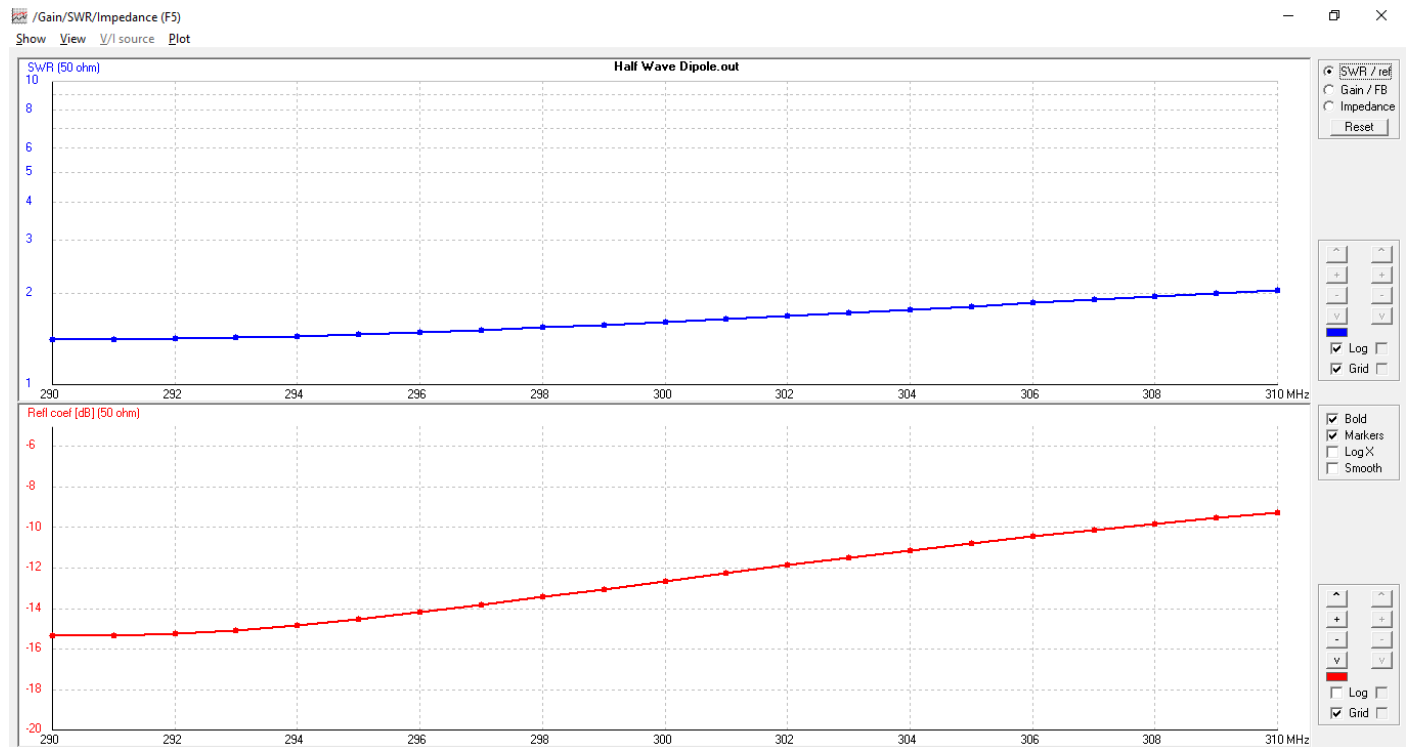
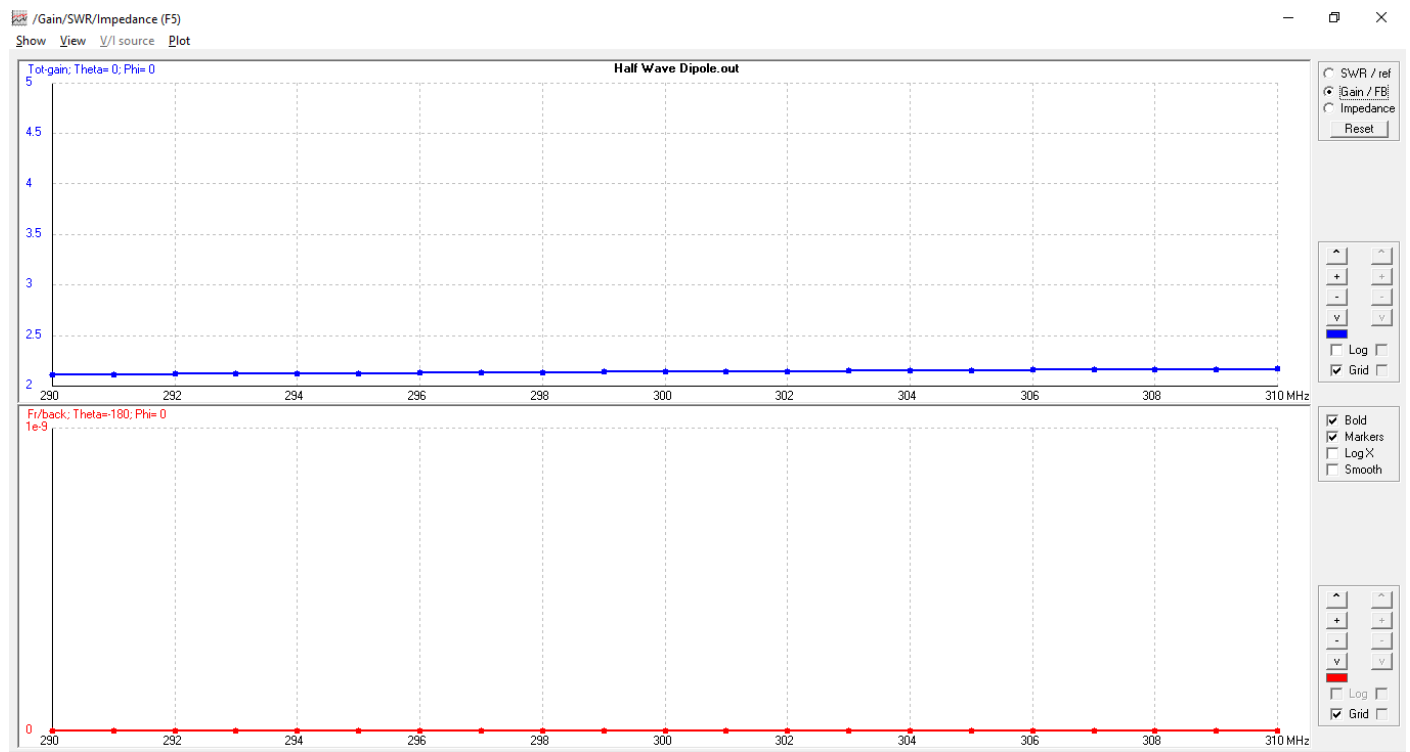
Graphs: Theta Phi d-Thet

Forward **0** **0** **0**

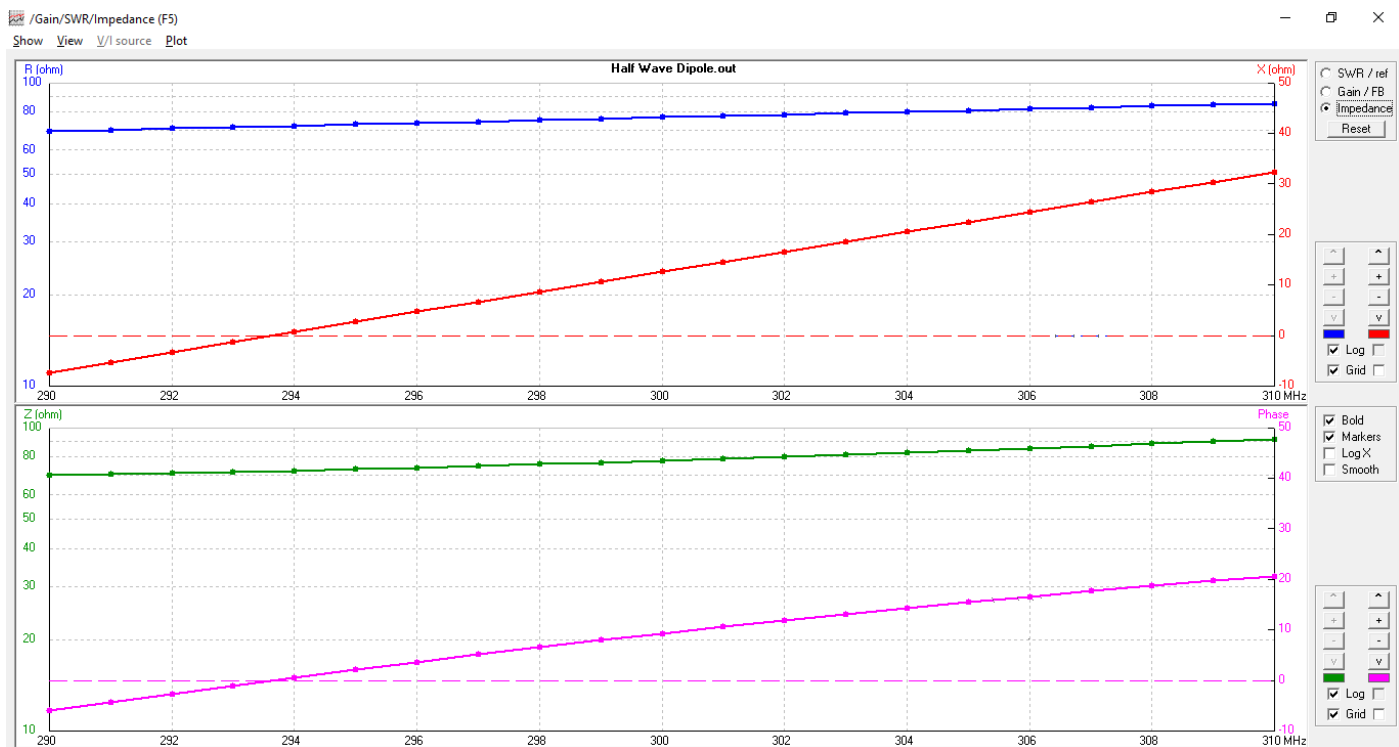
Backward **-180** **0** **0**

Change the Parameters accordingly

Observe the Graphs



Changing the Length of the Antenna to 0.455



We see the difference in SWR as follows

Half Wave Dipole.NEC - 4nec2 Edit

File Cell Rows Selection Options

Symbol/Variable with value or equation

Upd Ins Del

Symbols Geometry Source/Load Freq./Ground Others Comment

Symbols

Nr	Symbols and equations	comment
1	len=0.455	
2	dia=0.01	

Scaling

☒ Meters
 ☐ Feet
 ☐ Inch
 ☐ Wave-length
 ☐ Custom Factor

