# MMANA Modeled Antenna Noise Calculator
USAGE

To use noise temperature and G/T calculator you need to collect some data for your mmana model. In order to do that please follow further instructions.

1. Set the elevation of your mmana model to get the corresponding noise temperature and G/T values. Note that calculator accepts elevation angles in a range of 0° … 45° that is enough so far as typical elevation angle for EME application usually equals to 30°.
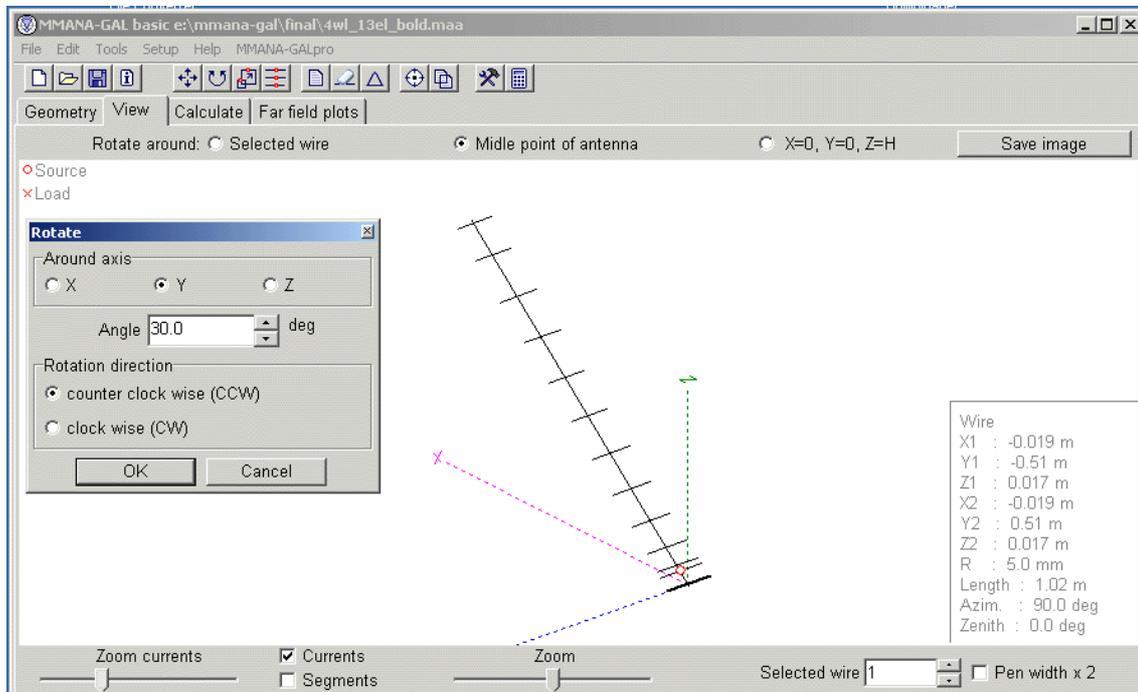
2. Calculate the model and remember frequency, model input resistance and driven element length and diameter.
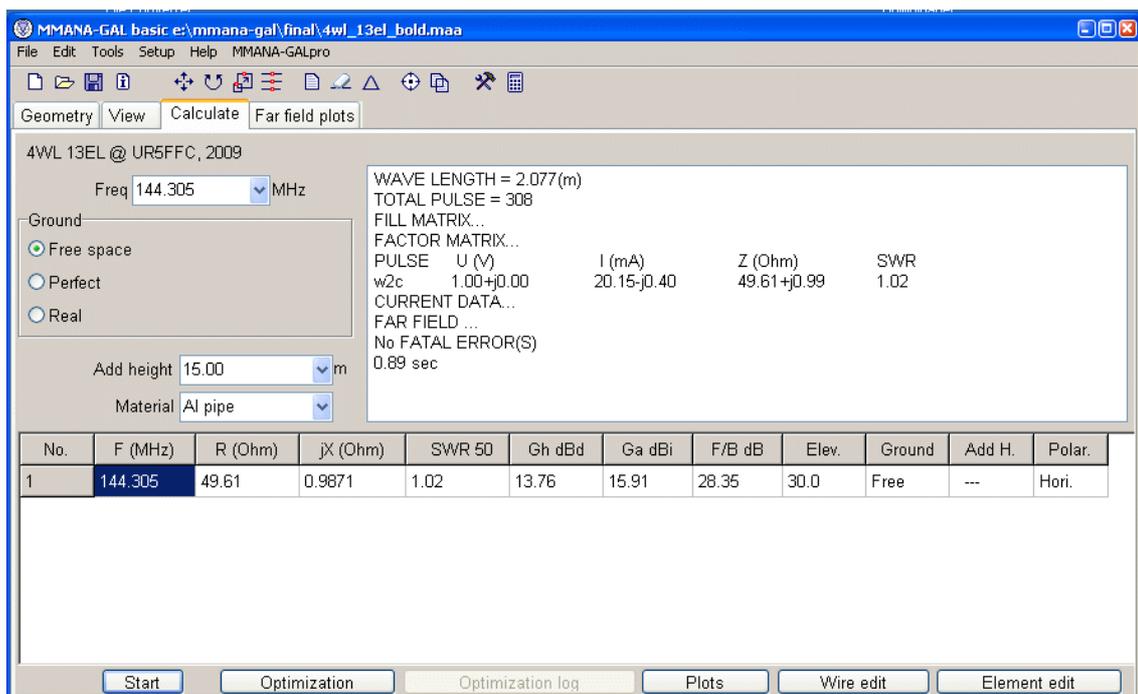
Use "Free space" as a ground parameter. Note the material you have chosen to use it later in an appropriate field of Ta-G/T calculator.

3. Go to "Far field plots" tab and assign main lobe angles for H and V pattern planes. Any power level of the main lobe is suitable depending on your task. Standard -3db beam width in both planes is used in most cases. However, -20…30dB for the whole forward lobe is also useful sometimes. It does not affect antenna noise temperature and its G/T result, it only changes Ta ratio between side and main lobes in a forward semi sphere.

H- and V-planes -3dB beam width examples are shown on figures below:
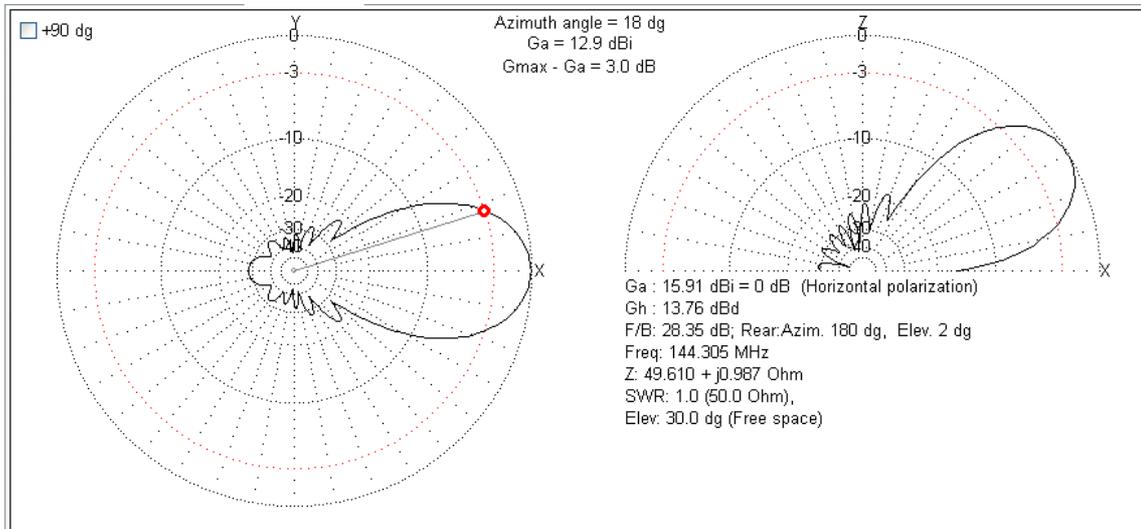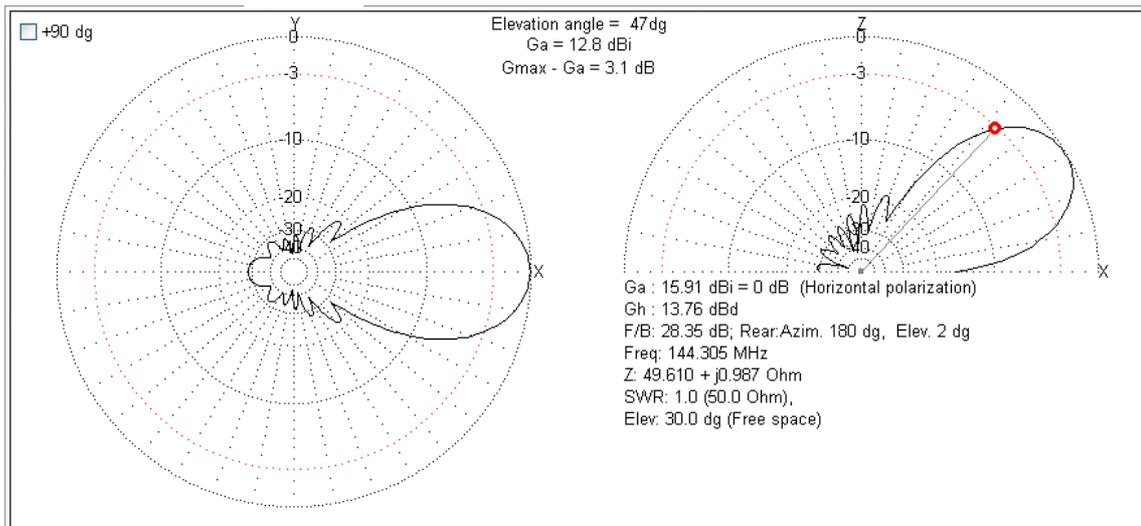

Fig. Horizontal plane ±18°

Fig. Vertical plane ±17°.

You can see H-plane angle shift value at the left horizontal pattern chart directly. Vertical angle shift value corresponding to -3dB level at the right vertical pattern chart calculated as *Pre elevation You had set for model minus V-plane chart Elevation angle You had set on the curve*, or 47° – 30° = 17° in our case.

4. Save calculated antenna pattern into an Angle/Gain 3D-table CSV-file using .csv or .txt extension.
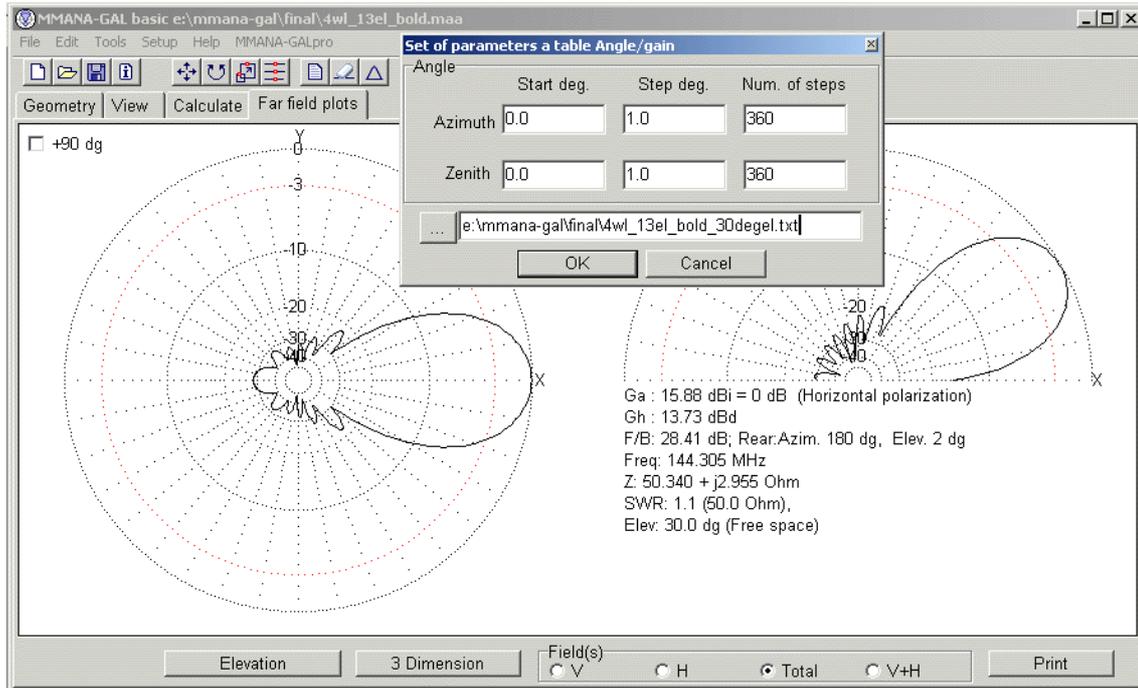
Use 1, 2 or 3 deg step resolution to get full diagram description in the space.
Lower step gives a higher calculation precision, but causes in larger file size and slower calculation process.

5. Run Noise Calculator and load saved file using File->Open Pattern menu.
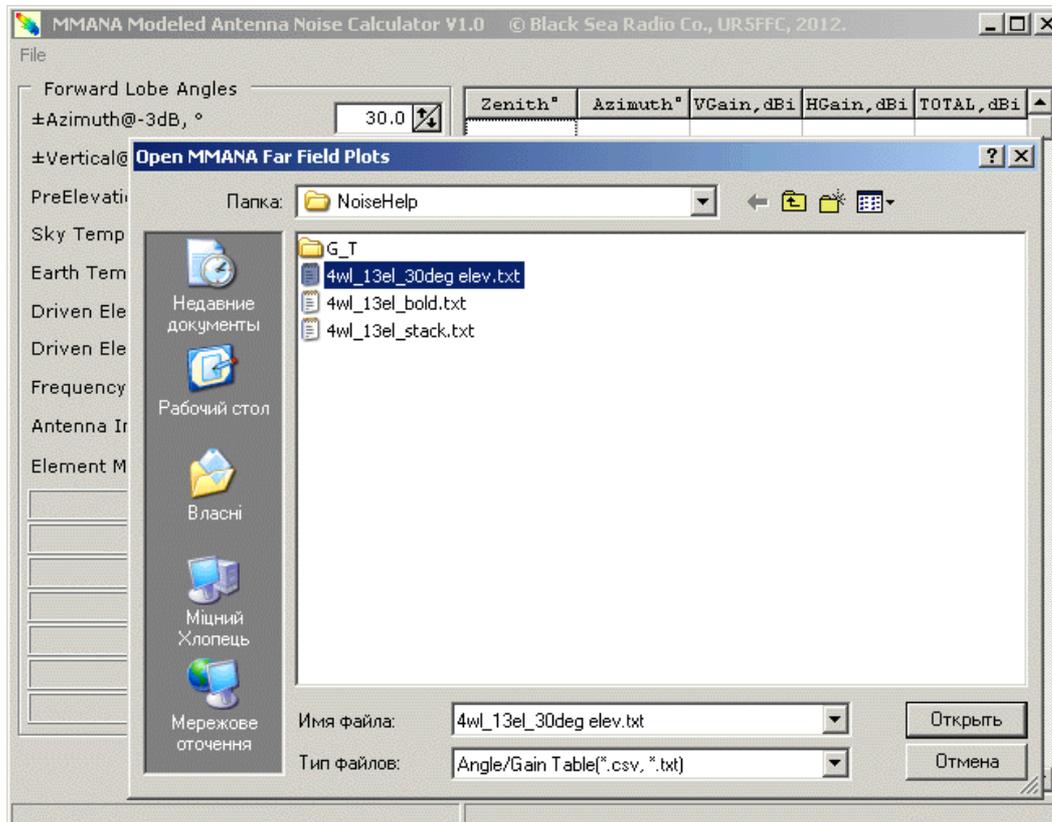
6. Fill all fields according to your model parameters and data previously used in MMANA.

MMANA Modeled Antenna Noise Calculator V1.0   © Black Sea Radio Co., UR5FFC, 2012.

File

Forward Lobe Angles

±Azimuth@-3dB, °	18.0
±Vertical@-3dB, °	17.0
PreElevation, °	30.0
Sky Temperature, °K	200
Earth Temperature, °K	1000
Driven Element Length, m	1.020
Driven Element Diameter, mm	5.00
Frequency, MHz	144.3
Antenna Input Resistance, Ohm	50
Element Material	Aluminium 30um anod

Maximal Gain: 13.73 dBd

Calculate

Zenith°	Azimuth°	VGain,dBi	HGain,dBi	TOTAL,dBi
41.0	0.0	-77.08	11.84	11.84
42.0	0.0	-77.32	12.35	12.35
43.0	0.0	-77.62	12.81	12.81
44.0	0.0	-77.96	13.22	13.22
45.0	0.0	-78.37	13.59	13.59
46.0	0.0	-78.83	13.93	13.93
47.0	0.0	-79.35	14.23	14.23
48.0	0.0	-79.94	14.49	14.49
49.0	0.0	-80.60	14.73	14.73
50.0	0.0	-81.35	14.95	14.95
51.0	0.0	-82.19	15.13	15.13
52.0	0.0	-83.16	15.30	15.30
53.0	0.0	-84.27	15.44	15.44
54.0	0.0	-85.56	15.56	15.56
55.0	0.0	-87.11	15.66	15.66
56.0	0.0	-89.02	15.74	15.74
57.0	0.0	-91.50	15.80	15.80
58.0	0.0	-95.01	15.84	15.84
59.0	0.0	-101.02	15.87	15.87
60.0	0.0	-221.02	15.88	15.88
61.0	0.0	-101.02	15.87	15.87
62.0	0.0	-95.01	15.84	15.84

E:\MMANA-GAL\FINAL\4wl_13el_bold_30deg.txt 129600 data lines loaded.

7. Push the Calculate button to get the result.

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File

Forward Lobe Angles

±Azimuth@-3dB, °	18.0
±Vertical@-3dB, °	17.0
PreElevation, °	30.0
Sky Temperature, °K	200
Earth Temperature, °K	1000
Driven Element Length, m	1.020
Driven Element Diameter, mm	10.00
Frequency, MHz	144.3
Antenna Input Resistance, Ohm	50
Element Material	Aluminium 30um anod

Maximal Gain:	13.73 dBd
Forward Lobe Temperature:	130.48 °K
Side Lobes Temperature:	72.24 °K
Backward Lobes Temperature:	32.26 °K
Ohmic Loss Temperature:	2.18 °K
Antenna Noise Temperature:	237.16 °K
Antenna G/T:	-7.86 dBi

Calculate

Calculation done.

Zenith°	Azimuth°	VGain,dBi	HGain,dBi	TOTAL,dBi
41.0	0.0	-77.08	11.84	11.84
42.0	0.0	-77.32	12.35	12.35
43.0	0.0	-77.62	12.81	12.81
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