



YB8ZD

ORARI DAERAH 8 SULAWESI SELATAN THE MAKASSAR DIGIMODE CLUB - YB8ZD

Disain Antena Dengan Program MMANA-GAL



Sulwan Dase-YB8EIP

Sulwan Dase – YB8EIP

Pendahuluan

- Program software *MMANA-Antenna Analyzer* pertama kali diciptakan oleh Macoto Mori – JE3HHT, seorang amatir radio dari Jepang (10 Januari 1999).
- Kemudian dikembangkan oleh Alex Schewelew (DL1PBD) dan Igor Gontcharenko (DL2KQ) keduanya amatir radio dari German.
- Dapat di download secara bebas di:
<http://mmhamsoft.amateur-radio.ca/>

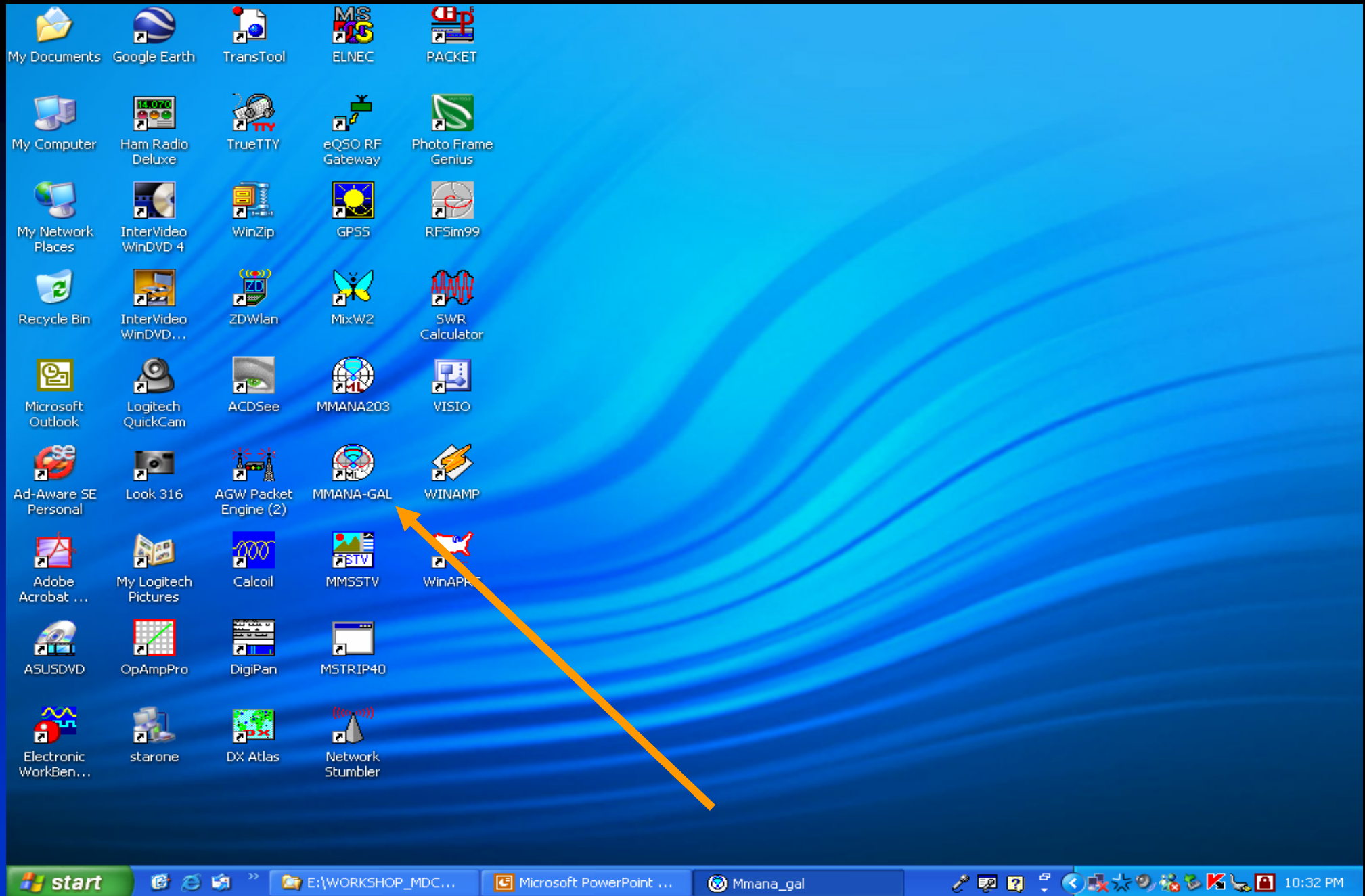
Versi Software MMANA

- Software MMANA sudah diterjemahkan dalam berbagai Bahasa dari bahasa alinya (Jepang).
- Versi MMANA yang dikenal selama ini, yaitu:
 - ◆ MMANA Ver 0.5 dan Ver 0.72
 - ◆ MMANA Ver 2.03 (12 -12- 2005)
 - ◆ MMANA-GAL (20 Mei 2006)

Bagaimana Menggunakan Program MMANA-GAL?

- Tahap-1:
- Install software MMANA-GAL yang sudah di download.
- Bila hasil install sudah benar, maka akan muncul icon desktop pada layar monitor, seperti pada gambar-1 berikut.

Gambar-1



Tahap-2

- Double click Icon pada desktop layar monitor.
- Pada layar monitor akan muncul tampilan seperti pada Gambar-2

Gambar-2. Tampilan layar MMANA-GAL

The screenshot displays the MMANA-GAL software interface. At the top, there is a menu bar with 'File', 'Edit', 'Service', 'Tools', and 'Help'. Below the menu bar is a toolbar with icons for file operations and editing. The main interface is divided into several sections:

- Geometry Section:** Includes a 'Name' field, a 'Freq' dropdown set to '14.150' MHz, a checkbox for 'lambda', and 'Auto segmentation' parameters: DM1 (800), DM2 (80), SC (2.0), and EC (1). There is also a checkbox for 'Keep connect.'.
- Wires Table:** A table with columns: No., X1(m), Y1(m), Z1(m), X2(m), Y2(m), Z2(m), R(mm), and Seg. The first row is labeled 'next'.
- Sources Section:** Labeled 'Sources 0' with a checked 'Auto Voltage' option. It contains a table with columns: No., PULSE, Phase dg, and Volt. V. The first row is labeled 'next'.
- Loads Section:** Labeled 'Loads 0' with a checked 'Use loads' option. It contains a table with columns: No., PULSE, Type, L(uH), C(pF), Q, and F(MHz). The first row is labeled 'next'.

The Windows taskbar at the bottom shows the Start button, several open applications (including '11. Unknow...', 'Microsoft Po...', 'E:\BACKUP ...', 'Mmana_gal', and 'HTML Help'), and the system clock showing '11:48 PM'.

Tahap - 3

- Dua pilihan yang mungkin: apakah Anda ingin mendisain antena dari contoh yang ada atau memulai disain baru sesuai dengan keinginan anda?
- Untuk tahap awal, kita bisa belajar dari contoh disain yang sudah tersedia sebelumnya yang di disain oleh Macoto Mori dkk.

Tahap-4: Membuka File Hasil Disain

- Click File -> Open (*.maa)
- Tampilan seperti gambar-3.
- Pada layar utama akan muncul kotak dialog “ Open Antenna Files”.
- Double click “ANT” dalam kotak dialog. Tampilan seperti pada Gambar-4.

Gambar-3

MMANA-GAL

File Edit Service Tools Help

Geometry View Calculate Far field plots

Name: [] Freq: 14.150 MHz lambda

Wires 0 Auto segmentation: DM1 800 DM2 80 SC 2.0 EC 1 Keep connect.

No.	X1(m)	Y1(m)	Z1(m)	X2(m)	Y2(m)	Z2(m)	R(mm)	Seg.
next								

Open antenna files

Look in: MMANA-GAL

- ANT
- Language
- temp.maa

File name: [] Open

Files of type: MMANA-GAL (*.maa) Cancel

Sources 0 Auto Voltage

No.	PULSE	Phase dg	Volt. V
next			

Loads 0 Use loads

No.	PULSE	Type	L(uH)	C(pF)	Q	F(MHz)
next						

start 13. Unknow... Microsoft Po... E:\BACKUP ... Mmana_gal HTML Help 11:55 PM

Gambar-4

The screenshot displays the MMANA-GAL software interface. At the top, the title bar reads 'MMANA-GAL'. Below it is a menu bar with 'File', 'Edit', 'Service', 'Tools', and 'Help'. A toolbar contains icons for file operations and simulation. The main window has tabs for 'Geometry', 'View', 'Calculate', and 'Far field plots'. The 'Geometry' tab is active, showing a 'Name' field, a 'Freq' dropdown set to '14.150' MHz, and a checkbox for 'lambda'. Below this, 'Wires 0' is shown with 'Auto segmentation' parameters: DM1 (800), DM2 (80), SC (2.0), and EC (1), along with a 'Keep connect.' checkbox. A table with columns 'No.', 'X1(m)', 'Y1(m)', 'Z1(m)', 'X2(m)', 'Y2(m)', 'Z2(m)', 'R(mm)', and 'Seg.' is partially visible, with a 'next' button. An 'Open antenna files' dialog box is open in the center, showing a file explorer view of the 'ANT' directory. The dialog lists folders: Active, Aperiodic, Feeders, HF beams, HF multibands, HF simple, Match, My antennas, Phased, Radiation of feeder, Receive, Short, Stacks, VHF, and VHF beams. It includes a 'File name:' field, a 'Files of type:' dropdown set to 'MMANA-GAL (*.maa)', and 'Open' and 'Cancel' buttons. At the bottom, 'Sources 0' and 'Loads 0' sections are visible, each with a checked checkbox ('Auto Voltage' and 'Use loads') and a table with columns for parameters like 'PULSE', 'Phase dg', 'Volt. V', 'Type', 'L(uH)', 'C(pF)', 'Q', and 'F(MHz)'. The Windows taskbar at the bottom shows the start button, several open applications, and the system clock at 11:59 PM.

MMANA-GAL

File Edit Service Tools Help

Geometry View Calculate Far field plots

Name Freq 14.150 MHz lambda

Wires 0 Auto segmentation: DM1 800 DM2 80 SC 2.0 EC 1 Keep connect.

No.	X1(m)	Y1(m)	Z1(m)	X2(m)	Y2(m)	Z2(m)	R(mm)	Seg.
next								

Open antenna files

Look in: ANT

- Active
- Aperiodic
- Feeders
- HF beams
- HF multibands
- HF simple
- Match
- My antennas
- Phased
- Radiation of feeder
- Receive
- Short
- Stacks
- VHF
- VHF beams

File name: Open

Files of type: MMANA-GAL (*.maa) Cancel

Sources 0 Auto Voltage

No.	PULSE	Phase dg	Volt. V
next			

Loads 0 Use loads

No.	PULSE	Type	L(uH)	C(pF)	Q	F(MHz)
next						

start 14. Unknow... Microsoft Po... E:\BACKUP ... Mmana_gal HTML Help 11:59 PM

Tahap-5: Membuka file Antena

- Double click salah satu folder antena yang ada dalam kotak, misalnya VHF Beam. Maka semua file disain Antena VHF Beam akan ditampilkan pada layar dialog.
- Tampilan seperti Gambar-5.
- Double click salah satu file, maka di[eroleh tampilan seperti pada Gambar-6.

Gambar-5. Memilih nama file Antena hasil disain sebelumnya

The screenshot shows the MMANA-GAL software interface. The main window has a menu bar (File, Edit, Service, Tools, Help) and a toolbar. Below the toolbar are tabs for Geometry, View, Calculate, and Far field plots. The main area contains a 'Name' field, a 'Freq' dropdown set to 14.150 MHz, and a 'Wires 0' section with 'Auto segmentation' parameters: DM1 (800), DM2 (80), SC (2.0), and EC (1). There are also checkboxes for 'lambda' and 'Keep connect.'. Below this is a table for wire coordinates:

No.	X1(m)	Y1(m)	Z1(m)	X2(m)	Y2(m)	Z2(m)	R(mm)	Seg.
next								

At the bottom, there are sections for 'Sources 0' (with 'Auto Voltage' checked) and 'Loads 0', each with a table for defining source and load parameters.

An 'Open antenna files' dialog box is open, showing the 'VHF beams' folder. The file list includes:

- 3DQ6.MAA
- 3el Quads.maa
- 3HENT.MAA
- 4DELTA6.MAA
- 5CQ2.MAA
- 5ELTWIND.MAA
- 5ELTWIND.MAA
- 6EL6MW.MAA
- 6el Yagi.maa
- 7EL6M.MAA
- 8EL2MW.MAA
- 8EL6M.MAA
- 8EL6MW.MAA
- 12CQ430.MAA
- 12EL23CM.MAA
- 12EL430.MAA
- 15EL23CM.MAA
- 144-5Yagi.maa

The 'File name' field contains '12EL430' and the 'Files of type' is set to 'MMANA-GAL (*.maa)'. A red arrow points from the text 'Click nama file' to the '12EL430.MAA' file, and a blue arrow points from the same file to the 'Open' button.

Click nama file

Gambar-6. Data file yang sudah terbuka

D:\SOFTWARE_ANTENNA\MMANA-GALVANTVHF beams\144-5Yagi.maa

File Edit Service Tools Help

Geometry View Calculate Far field plots

Name: wide band 5 el Yagi 144 Freq: 144.5 MHz lambda

Wires 5 Auto segmentation: DM1: 400 DM2: 40 SC: 2 EC: 1 Keep connect.

No.	X1(m)	Y1(m)	Z1(m)	X2(m)	Y2(m)	Z2(m)	R(mm)	Seg.
1	-0.0	-0.515	0.0	0.0	0.515	0.0	2.0	-1
2	0.32	-0.491	0.0	0.32	0.491	0.0	2.0	-1
3	0.43	-0.4675	0.0	0.43	0.4675	0.0	2.0	-1
4	0.93	-0.465	0.0	0.93	0.465	0.0	2.0	-1
5	1.535	-0.455	0.0	1.535	0.455	0.0	2.0	-1
next								

Sources 1 Auto Voltage

No.	PULSE	Phase dg	Volt. V
1	w2c	0.0	1.0
next			

Loads 0 Use loads

No.	PULSE	Type	L(uH)	C(pF)	Q	F(MHz)
next						

Comments

Gambar-7: Click "View" untuk Tampilan konstruksi antenna

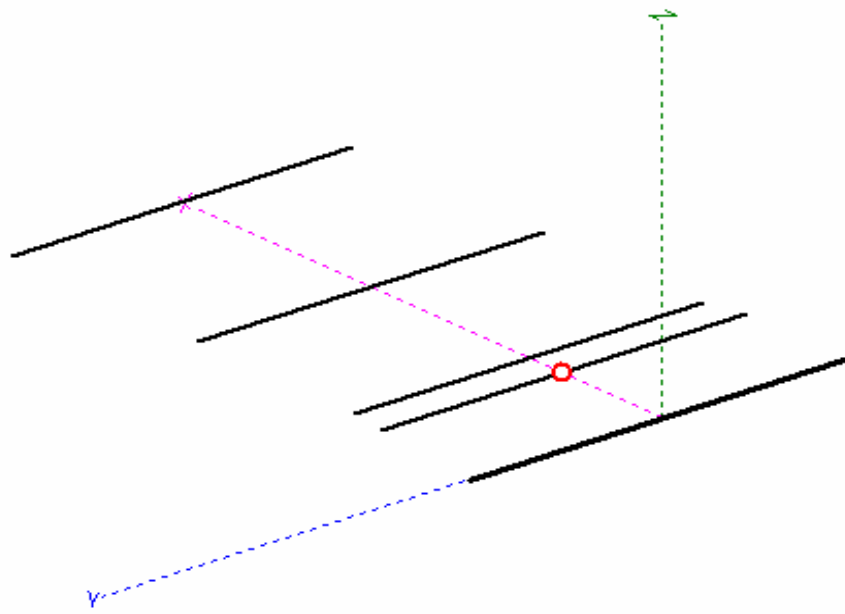
D:\SOFTWARE_ANTENNA\MANA-GALVANTVHF beams1144-5Yagi.maa

File Edit Service Tools Help

Geometry View Calculate Far field plots

Rotate around : Selected wire Middle point of antenna X=0, Y=0, Z=H Save image

Source
 Load



Wire No.1
X1 : -0.0 m
Y1 : -0.515 m
Z1 : 0.0 m
X2 : 0.0 m
Y2 : 0.515 m
Z2 : 0.0 m
R : 2.0 mm
Length : 1.03 m
Azim. : 0.0 deg
Zenith : 90.0 deg

Zoom Currents Segments Zoom currents Selected wire 1 Pen width x 2

Tahap-8: Click "Calculate" -> "Start"

The screenshot shows the Mmana software interface. The 'Calculate' button in the top menu is highlighted with a red box, and a red arrow points from it to the 'Start' button at the bottom left. The interface displays the following information:

wide band 5 el Yagi 144

Freq: 144.5 MHz

Ground: Free space, Perfect, Real

Add height: 0.00 m

Material: Al pipe

Output window text:

```
WAVE LENGTH = 2.075 (m)
TOTAL PULSE = 107
FILL MATRIX...
FACTOR MATRIX...
PULSE    U (V)          I (mA)          Z (Ohm)        SWR
w2c      1.00+j0.00        19.78-j0.07    50.55+j0.18    1.01
CURRENT DATA...
FAR FIELD ...
NO FATAL ERROR(S)
0.28 sec
```

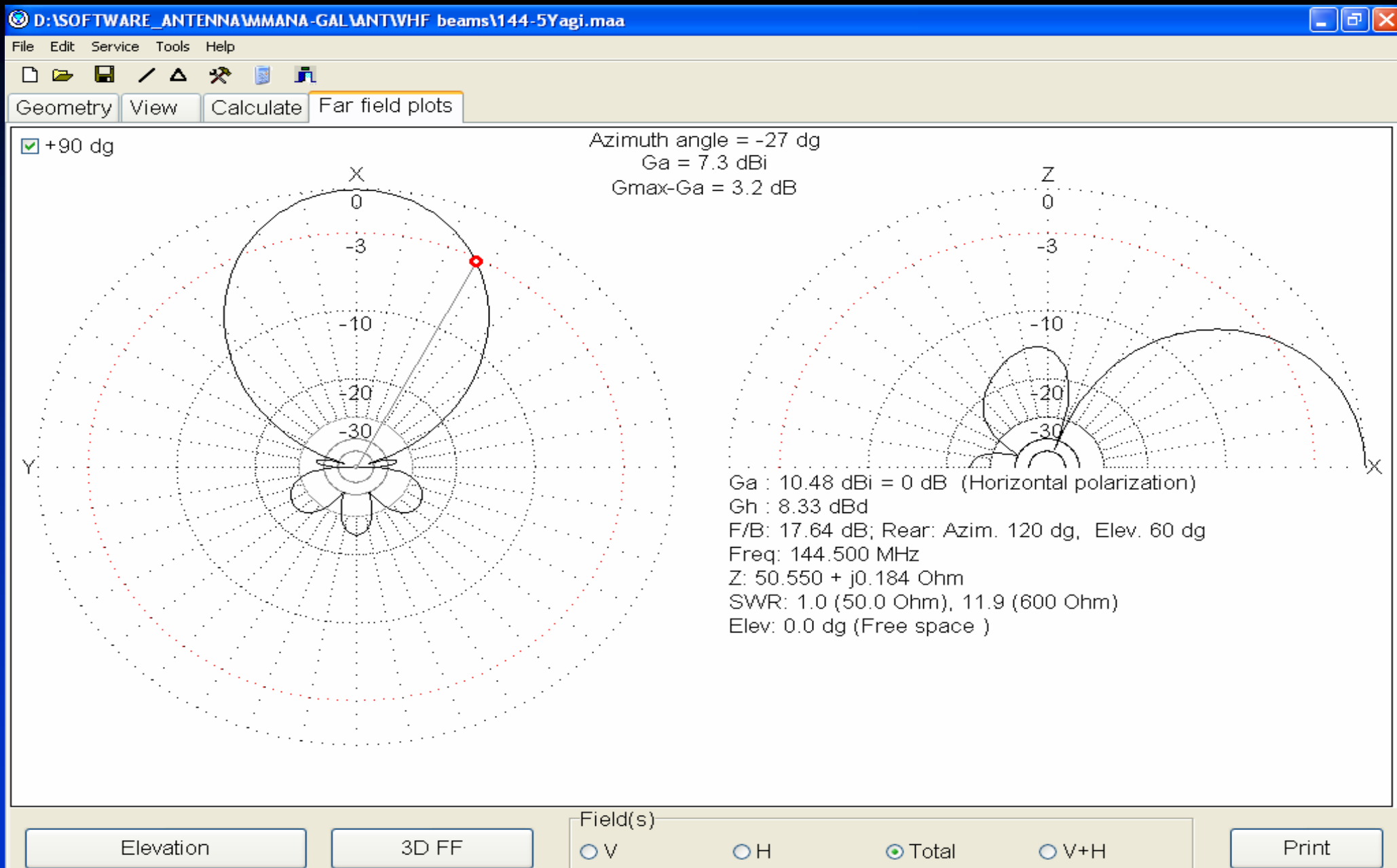
No.	F (MHz)	R (Ohm)	jX (Ohm)	SWR 50	Gh dBd	Ga dBi	F/B dB	Elev.	Ground	Add H.	Polar.
1	144.5	50.55	0.184	1.01	8.33	10.48	17.64	---	Free	---	hori.

Buttons at the bottom: Start, Optimization, Optimization log, Plots, Wire edit, Element edit

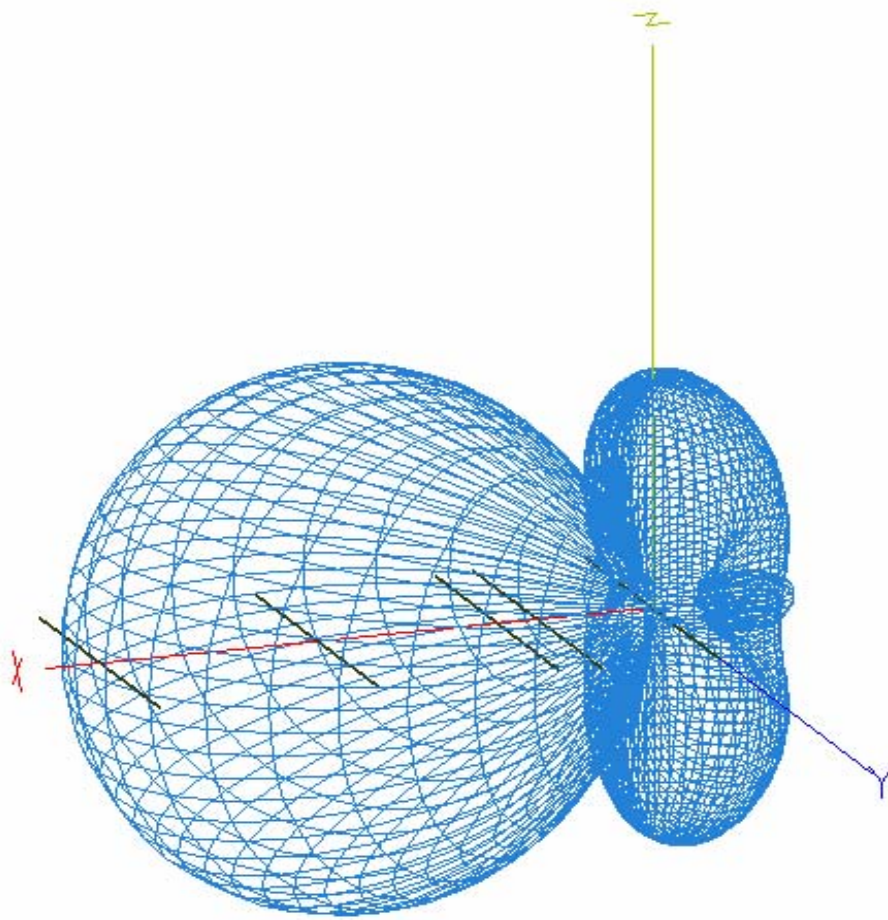
Tahap-9: Tampilan Polaradiasi Antena

- Click “ Far Field Plot”, maka akan terlihat tampilan pola radiasi seperti Gambar-9.
- Untuk tampilan 3 dimensi, Click Kotak 3D FF pada sisi bawa layar. Hasil seperti pada Gambar-10

Gambar-9. Polaradiasi Antena Hasil Disain



Gambar-10. Polaradiasi tampilan 3D

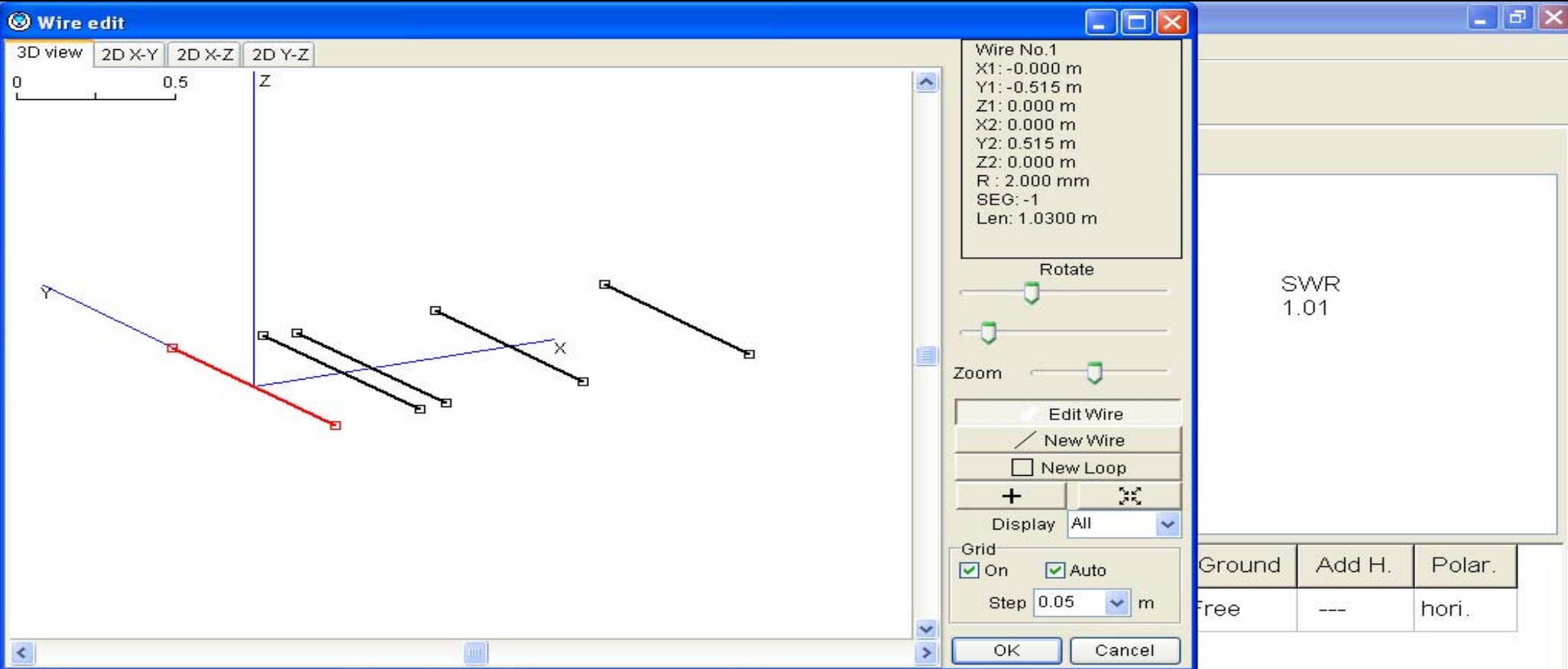


V H Total Zoom All 0

Tahap-10: Mengubah Dimensi Antena

- Tujuan: mengubah dimensi atau jumlah elemen antena.
- Untuk memulai, Click “Calculate”. Kemudian Click kotak “Wire Edit”. Tampilan seperti Gambar-11.
- Tampilan normal adalah dalam kordinat “xyz”. Untuk redesign click 2D X-Y, 2D X-Z atau 2D Y-Z.

Gambar-11. Tampilan Wire-Edit



Tahap-12:

- Click 2D-XY, tampilan seperti Gambar-12.
- Untuk menambah elemen, click kotak “New wire” sisi kanan layar (Gambar-13)
- Letakkan lursor di titik awal kemudian tarik garis sambil menekan Mouse sebelah kiri (Gambar-14). Setelah itu, click “OK”

Gambar-12. Tampilan 2D X-Y

Wire edit

3D view 2D X-Y 2D X-Z 2D Y-Z

0 0.5 Y

X

Wire No.1
X1: -0.000 m
Y1: -0.515 m
Z1: 0.000 m
X2: 0.000 m
Y2: 0.515 m
Z2: 0.000 m
R: 2.000 mm
SEG: -1
Len: 1.0300 m
Deg: 90.0

X: 1.058 m
Y: -0.667 m

Zoom

Edit Wire
New Wire
New Loop

Display All

Grid
 On Auto
Step 0.05 m

OK Cancel

SWR
1.01

Ground	Add H.	Polar.
Free	---	hori.

Start Optimization Optimization log Plots Wire edit Element edit

Gambar-13. Penambahan elemen

The screenshot displays the 'Wire edit' software interface. The main window shows a 2D grid with several vertical wires. A red wire is on the left, and four black wires are to its right. A properties panel on the right shows details for 'Wire No.1'.

Wire No.1
X1: -0.000 m
Y1: -0.515 m
Z1: 0.000 m
X2: 0.000 m
Y2: 0.515 m
Z2: 0.000 m
R : 2.000 mm
SEG: -1
Len: 1.0300 m
Deg: 90.0

X: 2.362 m
Y: -0.246 m

Zoom

Edit Wire
 New Wire
 New Loop

+ -

Display All

Grid
 On Auto
Step 0.05 m

OK Cancel

SWR 1.01

Ground	Add H.	Polar.
Free	---	hori.

Start

Optimization

Optimization log

Plots

Wire edit

Element edit

start

E:\WORKSHOP_MDC...

Microsoft PowerPoint ...

Mmana_gal

11:13 PM

Gambar-14. Tambahkan elemen pada antenna

The 'Wire edit' window displays a 2D X-Y grid with several vertical wires. A red arrow points to a new wire being added on the right. The right panel displays properties for 'Wire No.6' and a table with SWR 1.01.

Wire No.6
X1: 2.250 m
Y1: 0.450 m
Z1: 0.000 m
X2: 2.250 m
Y2: -0.450 m
Z2: 0.000 m
R : 2.000 mm
SEG: -1
Len: 0.9000 m
Deg:-90.0

X: 2.053 m
Y: -0.522 m

SWR
1.01

Ground	Add H.	Polar.
Free	---	hori.

Start

Optimization

Optimization log

Plots

Wire edit

Element edit

Tahap-13:

- Menghitung hasil penambahan 1 elemen antena.
- Click “Calculate” kemudian click “Start”.
- Hasilnya seperti pada Gambar-15.
- Perhatikan bahwa telah terjadi perubahan Impedansi antena, Gain dan Polaradiasi.

Gambar-15. Hasil perhitungan setelah penambahan 1 elemen antenna

D:\SOFTWARE_ANTENNA\MANA-GALVANTVHF beams\144-5Yagi.maa

File Edit Service Tools Help

Geometry View Calculate Far field plots

wide band 5 el Yagi 144

Freq 144.5 MHz

Ground

Free space

Perfect

Real

Add height 0.00 m

Material Al pipe

WAVE LENGTH = 2.075 (m)
 TOTAL PULSE = 128
 FILL MATRIX...
 FACTOR MATRIX...
 PULSE U (V) I (mA) Z (Ohm) SWR
 w2c 1.00+j0.00 16.60+j7.98 48.93-j23.54 1.60
 CURRENT DATA...
 FAR FIELD ...
 NO FATAL ERROR(S)
 0.36 sec

No.	F (MHz)	R (Ohm)	jX (Ohm)	SWR 50	Gh dBd	Ga dBi	F/B dB	Elev.	Ground	Add H.	Polar.
2	144.5	48.927	-23.538	1.6	9.1	11.25	15.87	---	Free	---	hori.
1	144.5	50.55	0.184	1.01	8.33	10.48	17.64	---	Free	---	hori.

Impedansi antenna

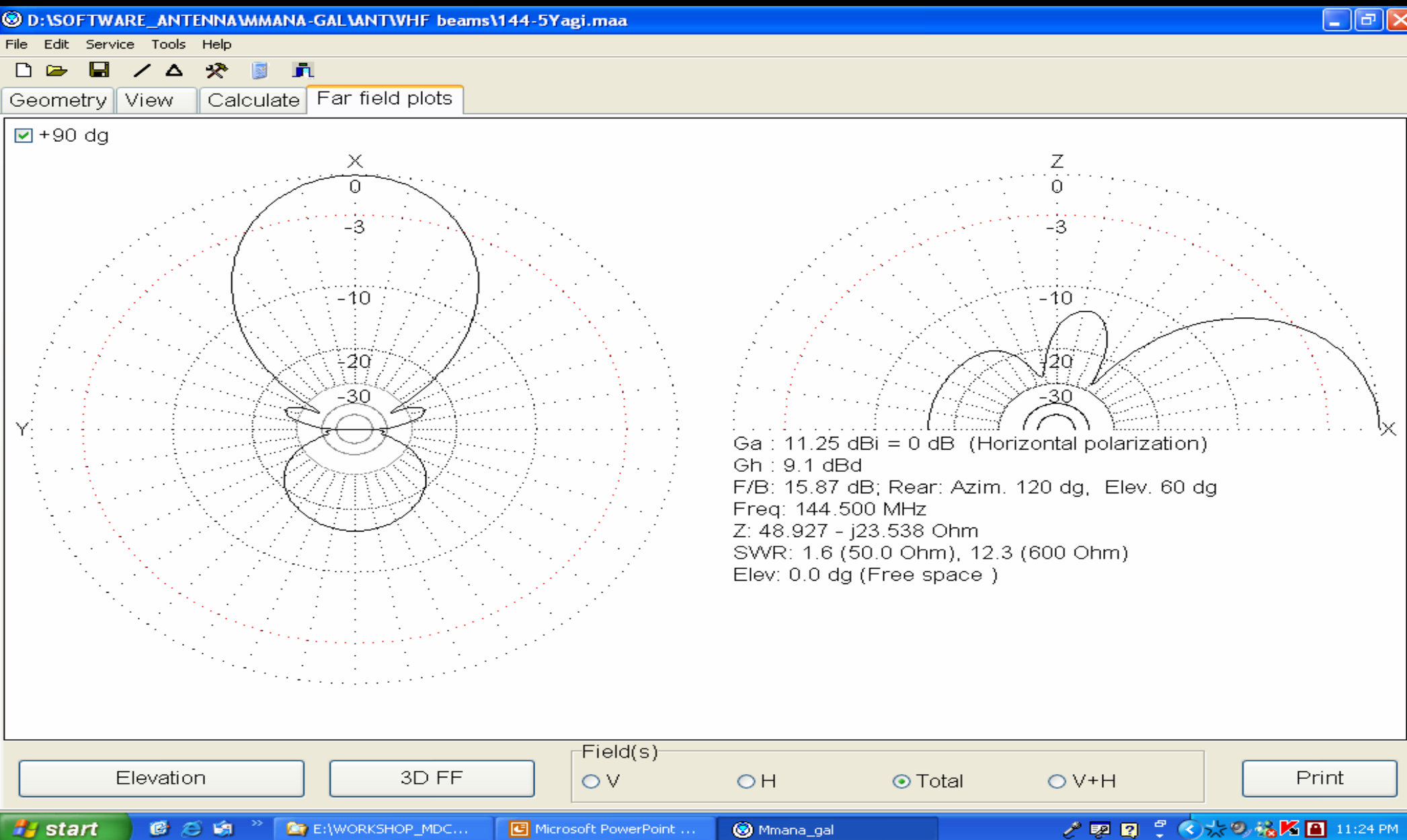
SWR

Gain

Start Optimization Optimization log Plots Wire edit Element edit

start E:\WORKSHOP_MDC... Microsoft PowerPoint ... Mmana_gal 11:19 PM

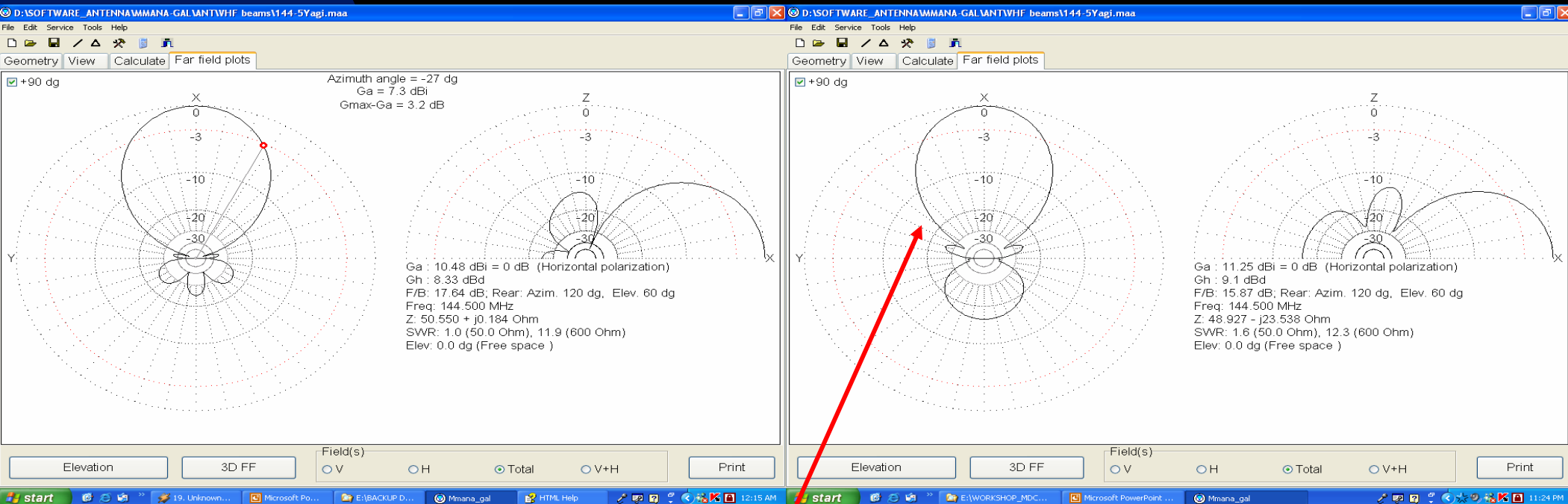
Gambar-16. Polaradiasi hasil tambahan 1 elemen antenna



Gambar-17. Perbandingan Polaradiasi sebelum dan setelah ada tambahan 1 elemen

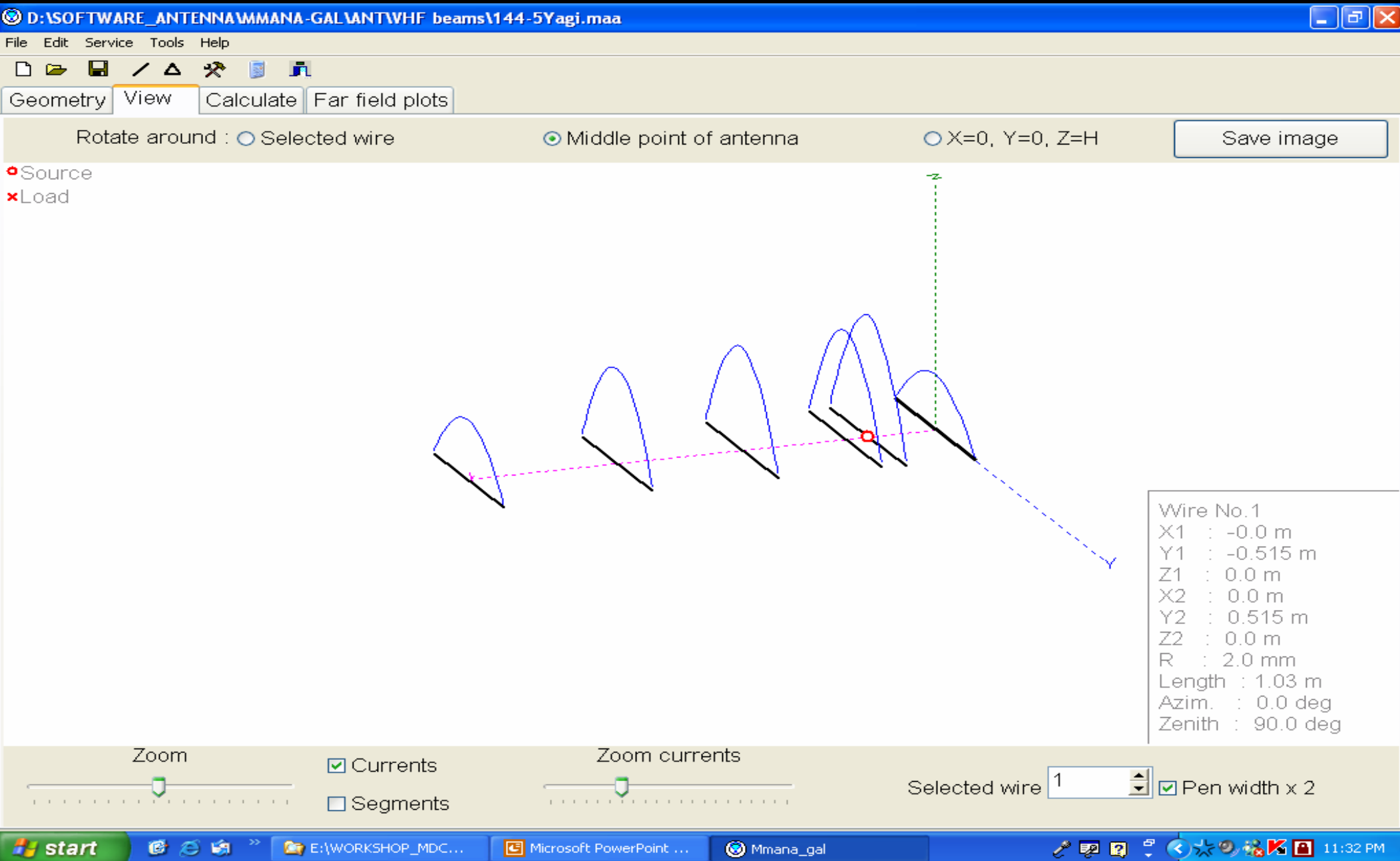
Sebelumnya

Setelah ada tambahan 1 elemen



Direktivitas lebih besar

Gambar-18. Tampilan distribusi arus pada tiap elemen antenna



wide band 5 el Yagi 144

Freq 144.5

WAVE LENGTH = 2.075 (m)

- Ground
- Free space
 - Perfect
 - Real

Add height 0.00

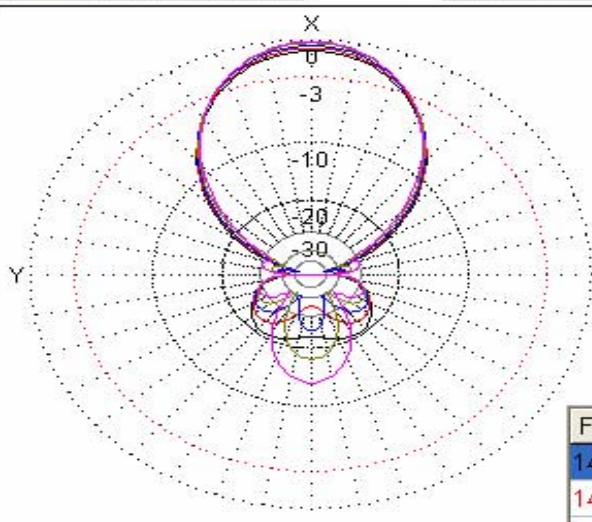
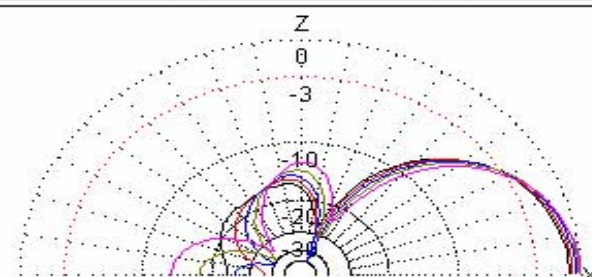
Material Al pipe

No.	F (MHz)	R
5	146.0	75.
4	145.5	63.
3	143.5	44.
2	142.5	41.
1	144.5	50.55

Plots [X]

Speculation All points Detailed Resonance **Print** BW 4000 KHz

Z SWR Gain/FB Far fields Setup

10.8(dBi) = 0dB

Colours

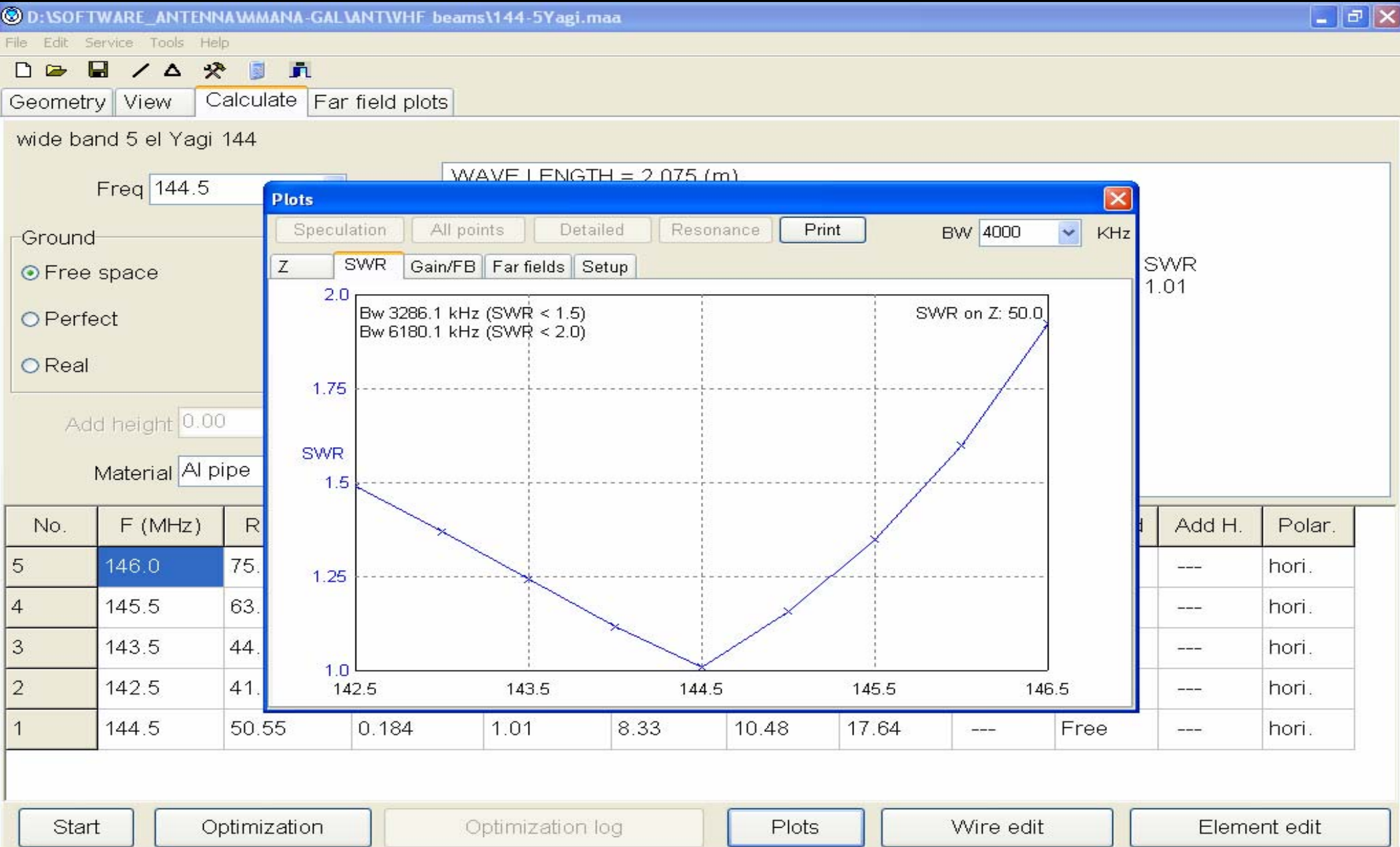
Freq	R	jX	Ga	F/B	ON
142.5	41.7	-16.4	10.1	16.3	On
143.5	44.7	-9.0	10.3	16.8	On
144.5	50.6	0.2	10.5	17.6	On
145.5	63.6	10.3	10.7	17.4	On
146.5	93.9	12.4	10.8	13.3	On

Field(s) V H Total V+H

SWR 1.01

Add H.	Polar.
---	hori.
---	hori.
---	hori.
---	hori.
---	hori.

Grafik SWR Antena vs Frekuensi



Grafik Impedansi vs Frekuensi



Gain Antena vs Frekuensi



Tahap-14: Disain Antena

- Tujuan: mendisain antena baru.
- Untuk mudahnya, pada contoh akan didisain antena dipole $\lambda/2$ yang bekerja pada frekuensi 7.055 MHz.
- Click “File” kemudian click “New”. Click “Geometry” pada layar monitor.
- Tulis nama antena pada kotak dialog “Name”. Kemudian tulis frekuensi pada kotak “Freq”.
- Selanjutnya click “Calculate”

Gambar-19. Disain baru

The screenshot displays the MMANA-GAL software interface. At the top, the title bar reads "MMANA-GAL" and the menu bar includes "File", "Edit", "Service", "Tools", and "Help". Below the menu bar is a toolbar with icons for file operations and editing. The main interface is divided into several sections:

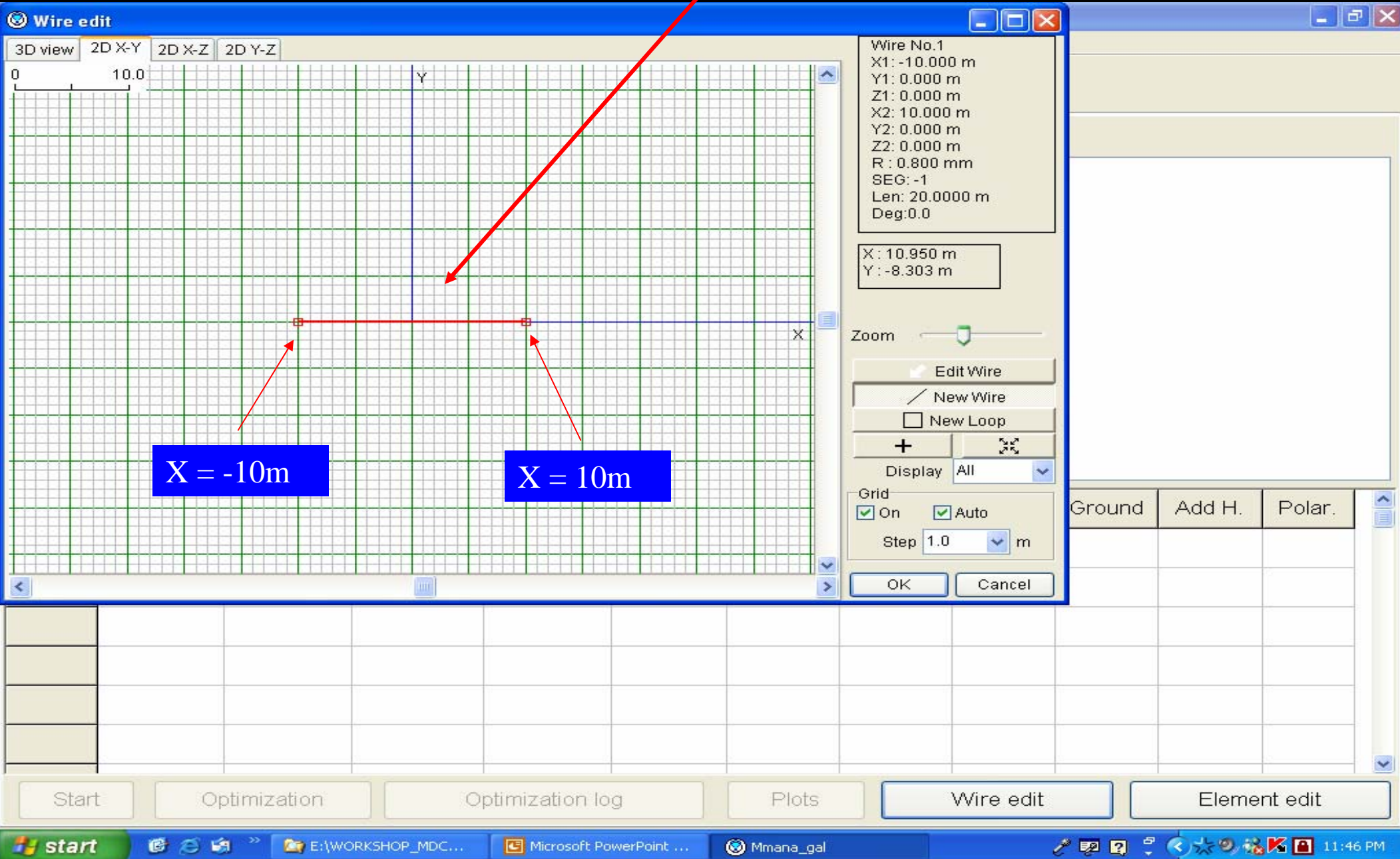
- Geometry:** Includes buttons for "View", "Calculate", and "Far field plots".
- Name:** A text field containing "Dipole 40m".
- Freq:** A dropdown menu set to "7.055" MHz, with a checkbox for "lambda".
- Wires 0:** A section for defining wire segments with "Auto segmentation" options: DM1 (800), DM2 (80), SC (2.0), and EC (1). A checkbox for "Keep connect." is also present.
- Wires Table:** A table with columns: No., X1(m), Y1(m), Z1(m), X2(m), Y2(m), Z2(m), R(mm), and Seg. The first row is labeled "next".
- Sources 0:** A section with a checked "Auto Voltage" option. It includes a table with columns: No., PULSE, Phase dg, and Volt. V. The first row is labeled "next".
- Loads 0:** A section with a checked "Use loads" option. It includes a table with columns: No., PULSE, Type, L(uH), C(pF), Q, and F(MHz). The first row is labeled "next".

At the bottom, the Windows taskbar shows the "start" button, several application icons, and the system tray with the time "11:43 PM".

Tahap-15:

- Click “Calculate” kemudian click “Wire Edit”.
- Click “New edit” kemudian click 2D X-Y.
- Tarik garis dari sumbu $x = -10\text{m}$ ke $x = 10\text{m}$. Sumbu $y = 0$. Lihat Gambar-20.
- Selanjutnya click “Ok”
- Click “Geometry”. Isi kotak “PULSE” dengan $wc1$. **Artinya:** Tempatkan titik catu di tengah (center) pada wire no 1.

Gambar-20. Menarik garis pada layar disain.



Gambar-21. Setting titik catu pada kawat (wire) antenna.

The screenshot shows the MMANA-GAL software interface. The main window title is "MMANA-GAL". The menu bar includes "File", "Edit", "Service", "Tools", and "Help". The toolbar contains icons for file operations and editing. The "Geometry" tab is active, showing "View", "Calculate", and "Far field plots" sub-tabs.

The "Name" field is set to "Dipole 40m". The "Freq" is set to "7.055" MHz. There are checkboxes for "lambda" and "Keep connect.". The "Wires 1" section shows "Auto segmentation" with "DM1" set to 800, "DM2" set to 80, "SC" set to 2, and "EC" set to 1.

No.	X1(m)	Y1(m)	Z1(m)	X2(m)	Y2(m)	Z2(m)	R(mm)	Seg.
1	-10.0	0.0	0.0	10.0	0.0	0.0	0.8	-1
next								

A callout box with the text "Setting titik catu" points to the "PULSE" column in the "Sources 1" table.

No.	PULSE	Phase dg	Volt. V
1	wc1	0.0	1.0
next			

No.	PULSE	Type	L(uH)	C(pF)	Q	F(MHz)
next						

Tahap-16.

- Click “Calulate” dan ulangi semua proses seperti semula.
- Hasil yang diperoleh seperti pada gambar berikut.

Tampilan layar baru untuk disain baru

MMANA-GAL File Edit Service Tools Help

Geometry View Calculate Far field plots

Name Freq MHz lambda

Wires 1 Auto segmentation: DM1 DM2 SC EC Keep connect.

No.	X1(m)	Y1(m)	Z1(m)	X2(m)	Y2(m)	Z2(m)	R(mm)	Seg.
1	-10.0	0.0	0.0	10.0	0.0	0.0	0.8	-1
next								

Sources 1 Auto Voltage

No.	PULSE	Phase dg	Volt. V
1	wc1	0.0	1.0
next			

Loads 0 Use loads

No.	PULSE	Type	L(uH)	C(pF)	Q	F(MHz)
next						

Disain antenna dipole $\lambda/2$ untuk frekuensi 7.055 MHz

MMANA-GAL

File Edit Service Tools Help

Geometry View Calculate Far field plots

Dipole 40m

Freq 7.055 MHz

Ground

Free space

Perfect

Real

Add height 0.00 m

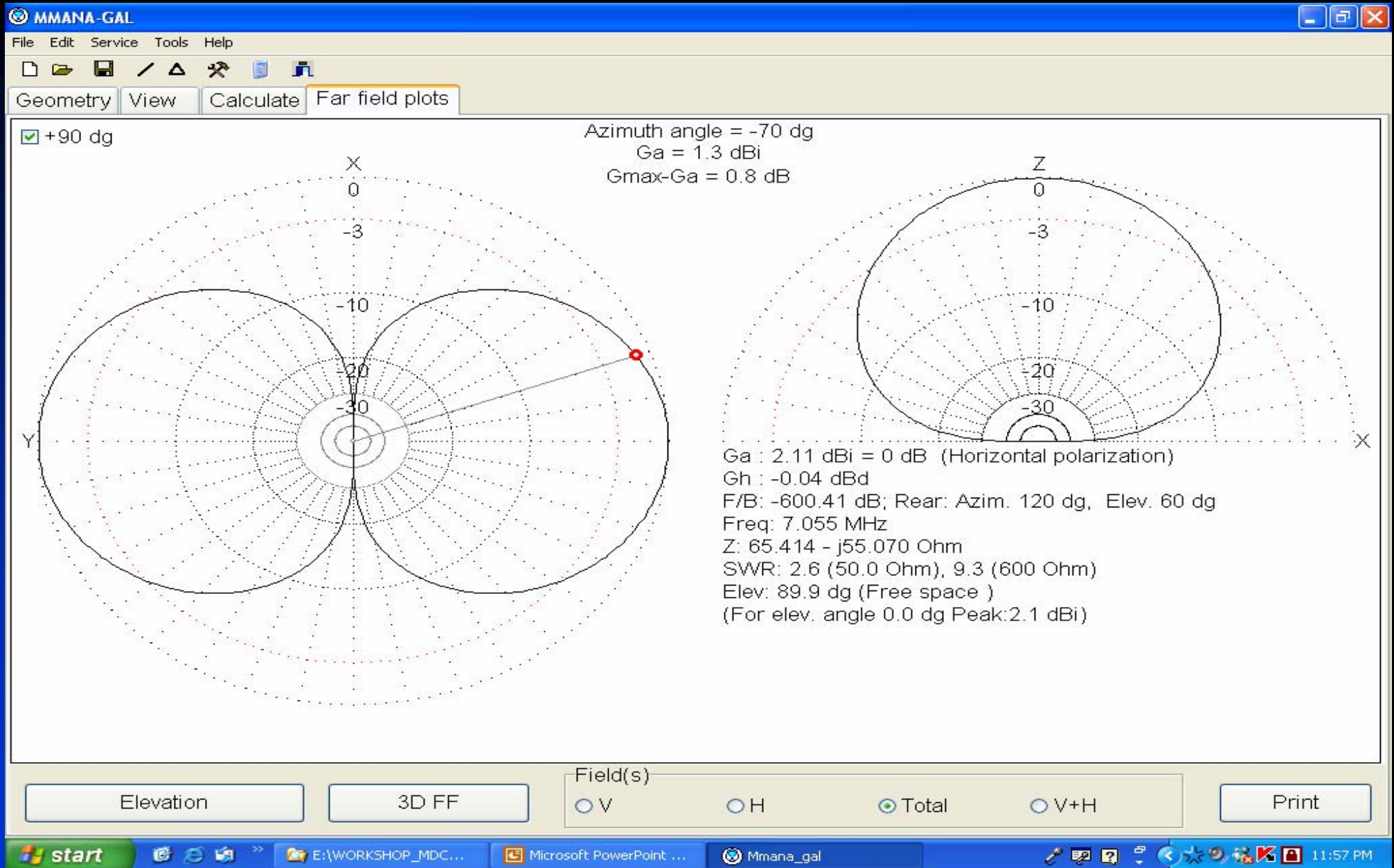
Material No loss

WAVE LENGTH = 42.494 (m)
 TOTAL PULSE = 41
 FILL MATRIX...
 FACTOR MATRIX...
 PULSE U (V) I (mA) Z (Ohm) SWR
 wc1 1.00+j0.00 8.95+j7.53 65.41-j55.07 2.62
 CURRENT DATA...
 FAR FIELD ...
 NO FATAL ERROR(S)
 0.11 sec

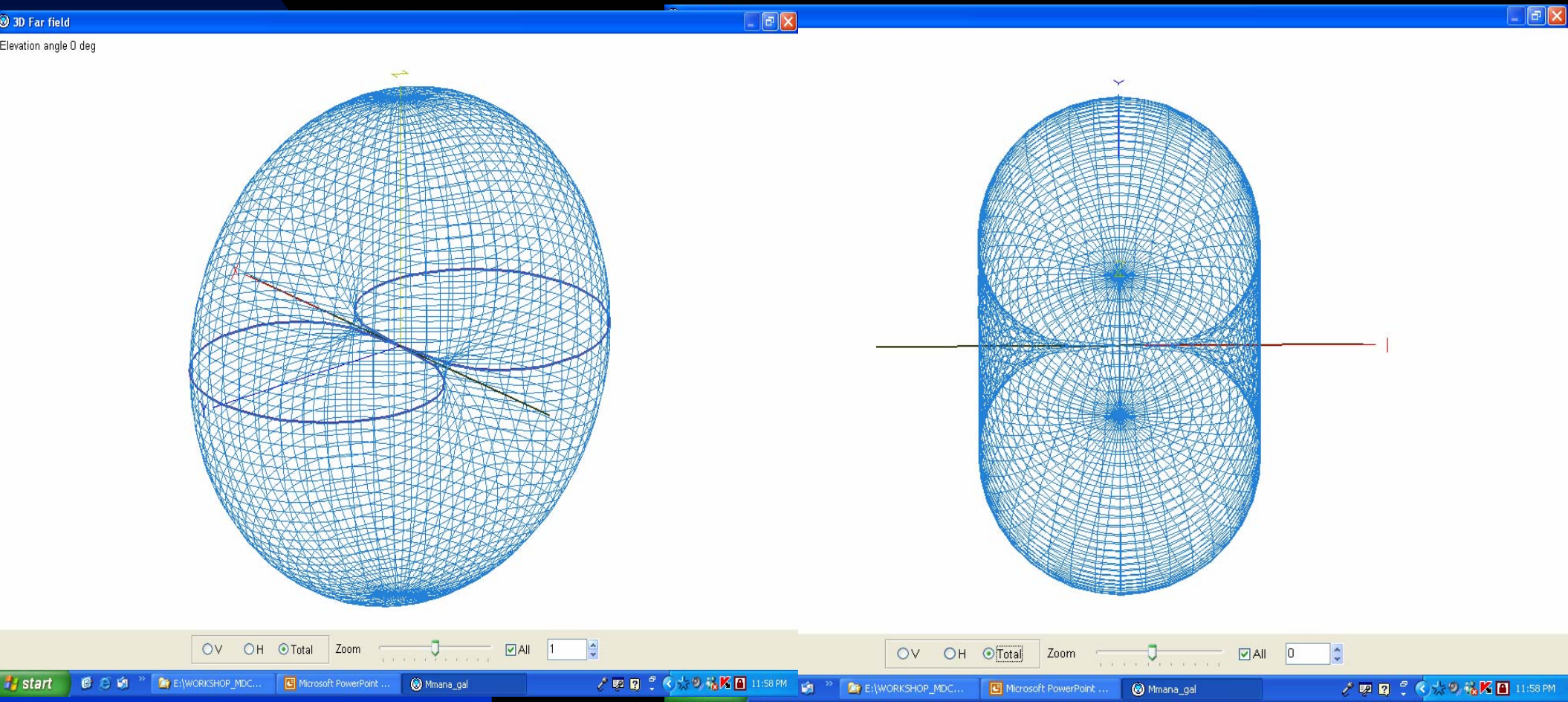
No.	F (MHz)	R (Ohm)	jX (Ohm)	SWR 50	Gh dBd	Ga dBi	F/B dB	Elev.	Ground	Add H.	Polar.
1	7.055	65.414	-55.07	2.62	-0.04	2.11	-600.41	89.9	Free	---	hori.

Start Optimization Optimization log Plots Wire edit Element edit

Polarradiasi antenna $\lambda/2$ 40m



Polaradiasi 3D



Plot Far Field

MMANA-GAL

File Edit Service Tools Help

Geometry View Calculate Far field plots

Dipole 40m

Freq 7.055 WAVE LENGTH = 42.494 (m)

Ground

- Free space
- Perfect
- Real

Add height 0.00

Material No loss

No.	F (MHz)	R
1	7.055	65.4

Plots

Speculation All points Detailed Resonance Print BW 120 KHz

Z SWR Gain/FB Far fields Setup

Field(s)

V H Total V+H

Freq	R	jX	Ga	F/B	ON
6.995					Off
7.025					Off
7.055	65.4	-55.1	2.1	-600.4	On
7.085					Off
7.115					Off

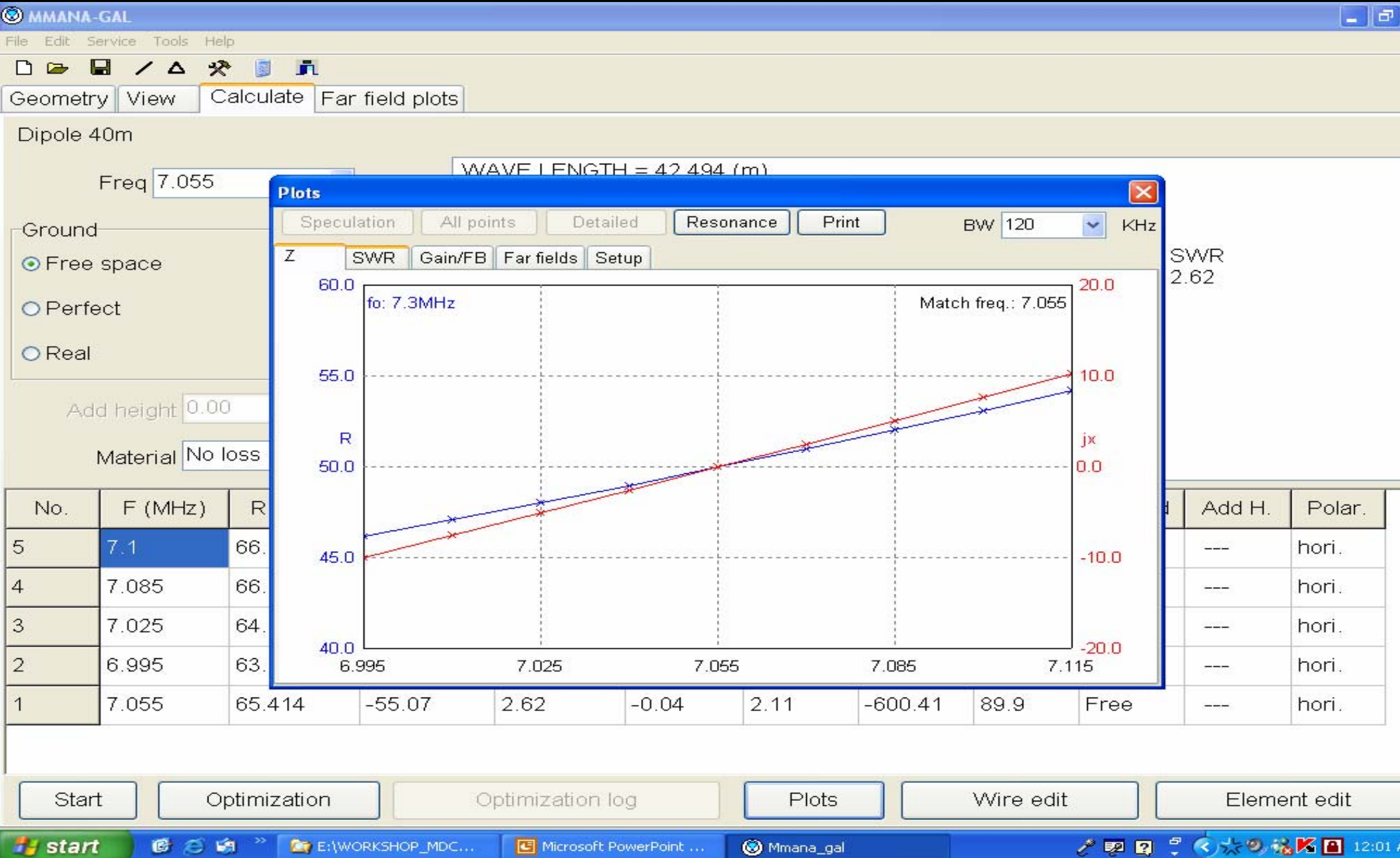
SWR 2.62

Add H. Polar. hori.

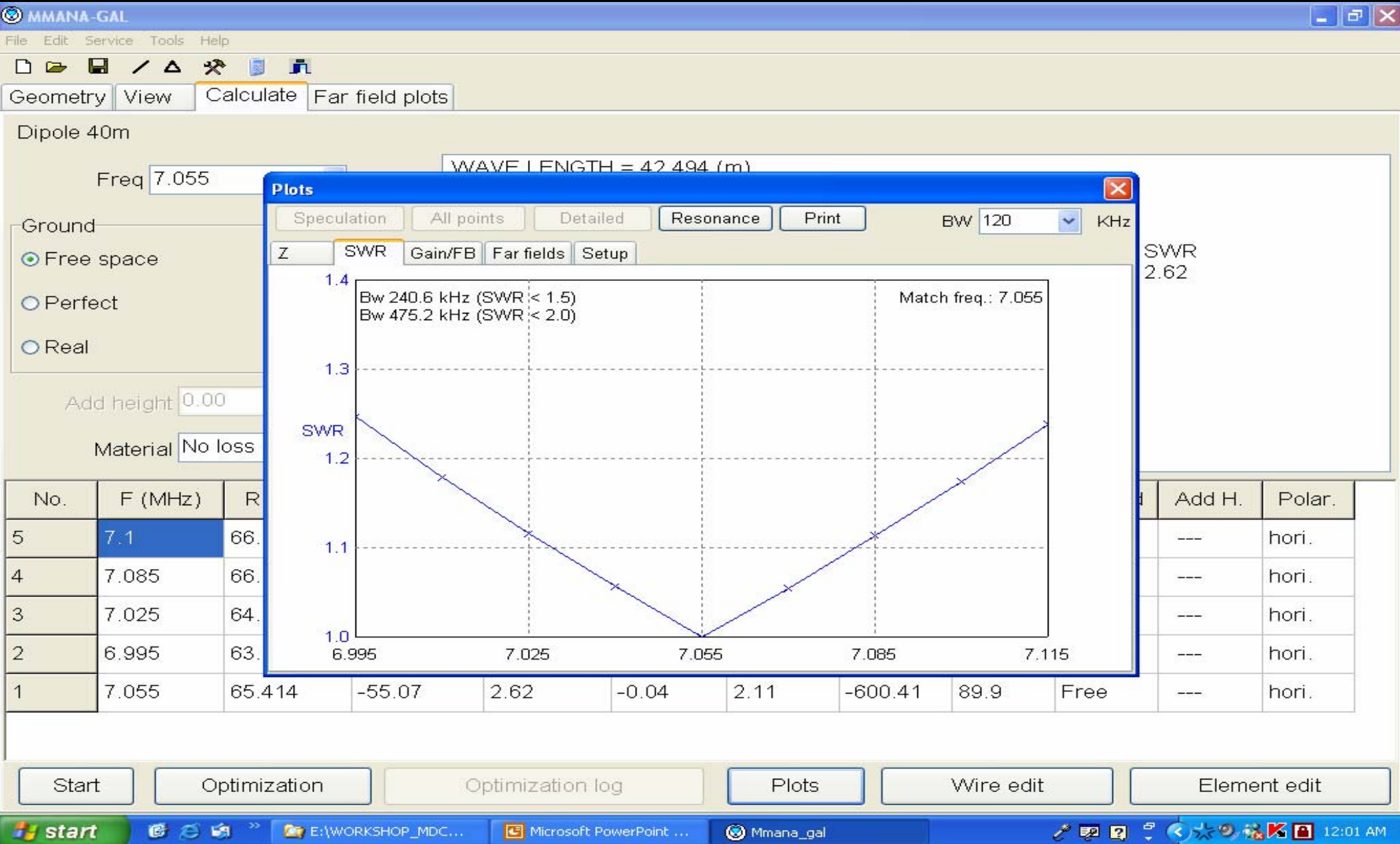
Start Optimization Optimization log Plots Wire edit Element edit

Microsoft PowerPoint - [Disain Antena Dengan Software MMANA]

Grafik Impedansi vs Frekuensi



Grafik SWR vs Frekuensi



Penutup

- Untuk menghasilkan hasil disain yang baik, sebaiknya panjang dan jarak antar elemen dihitung terlebih dahulu sesuai dengan teori yang ada.
- Letak titik catu selalu ditengah wire (garis).
- Program MMANA-GAL kurang akurat untuk frekuensi diatas 1 GHz.

Terima Kasih Atas Perhatiannya de YB8EIP

“Go around the World with digimode”