
YC2YIZ

Memaksimalkan Antena Portable Untuk komunikasi via Satellite

Oleh YC2YIZ

ANTENNA

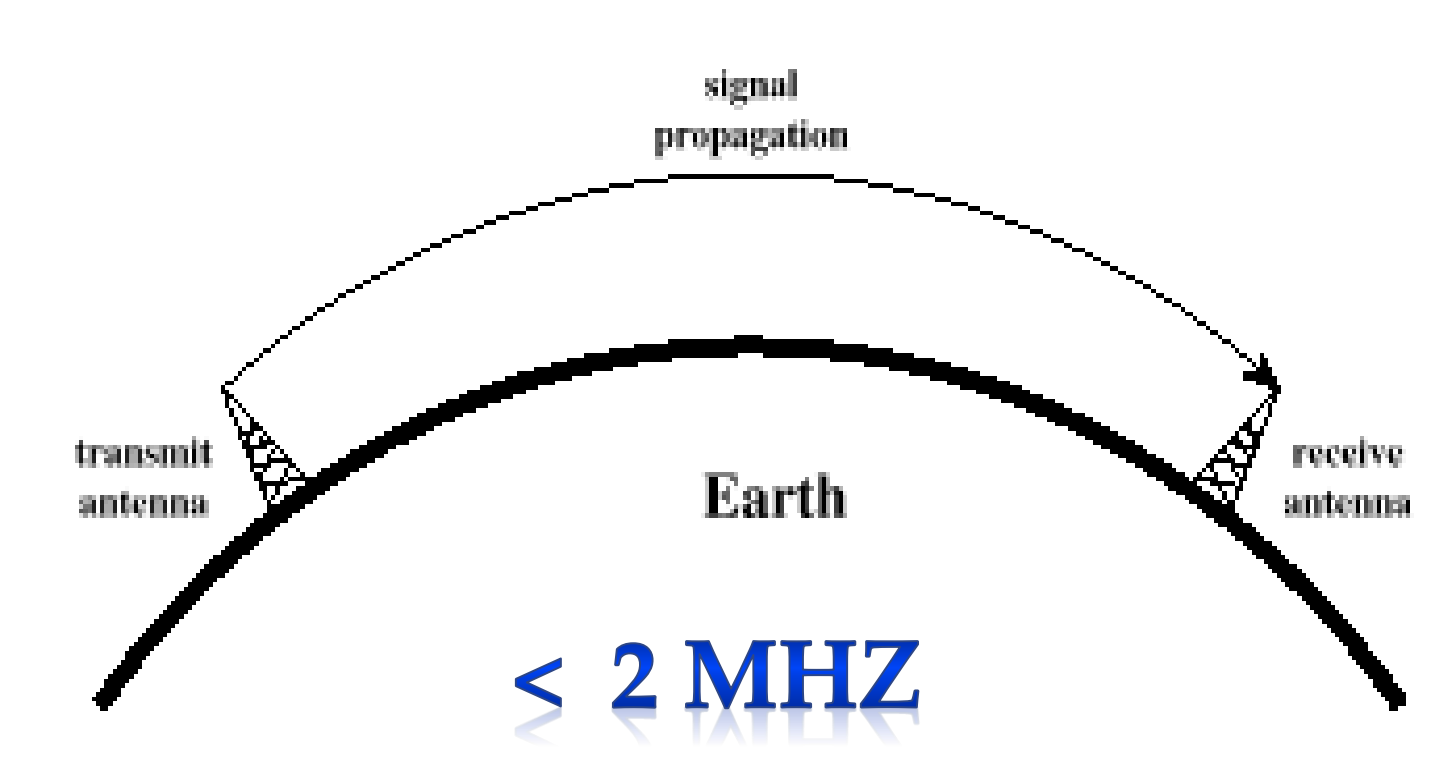
Antenna adalah media konduktif untuk memancarkan atau menerima gelombang Electromagnetic dari sebuah perangkat .

Antenna harus di atur sesuai frekuensi pada band yang sama sehingga terjadi koneksitas yang seimbang

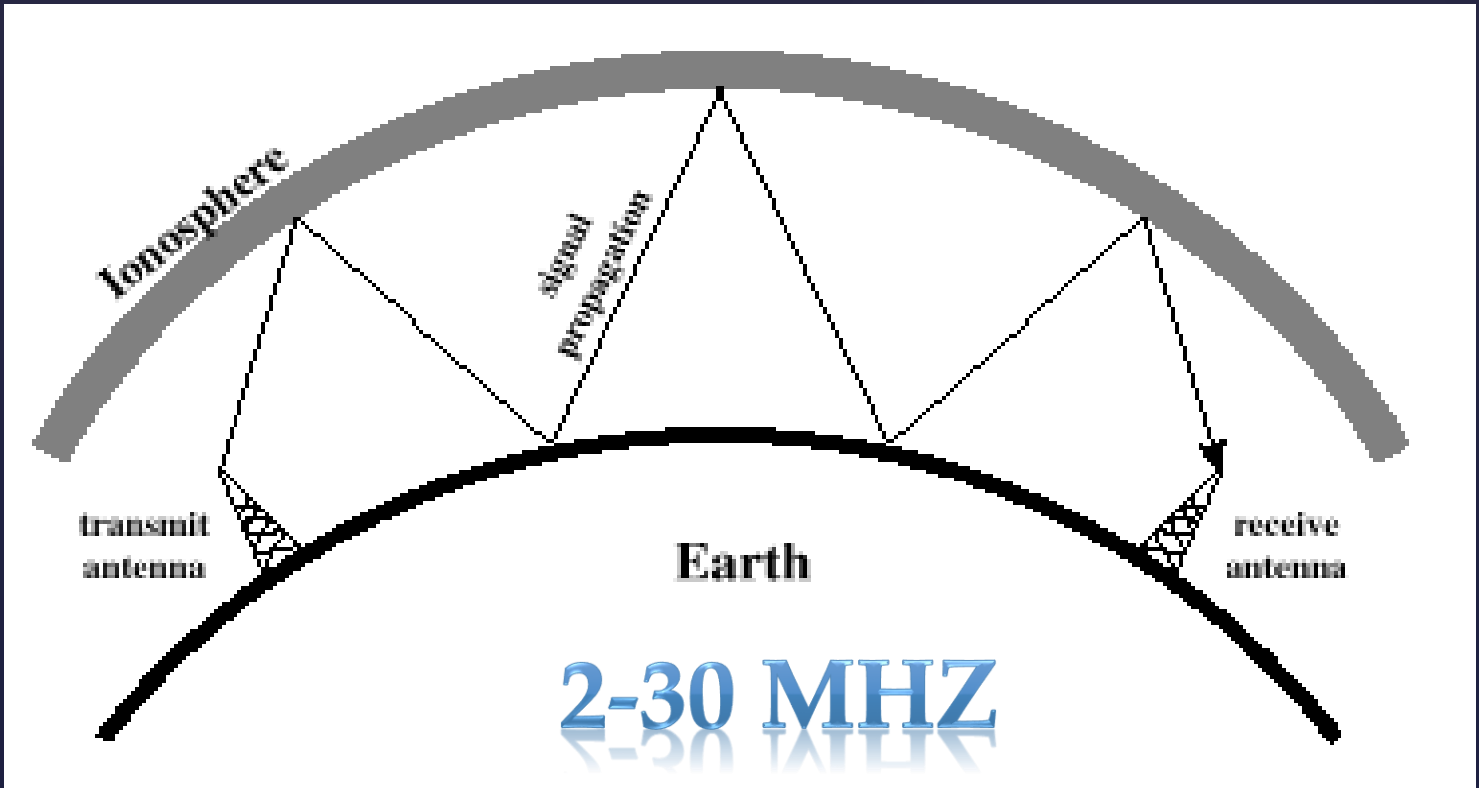
Propagation Modes

- Ground-wave (< 2MHz) propagation
- Sky-wave (2 – 30 MHz) propagation
- Line-of-sight (> 30 MHz) propagation

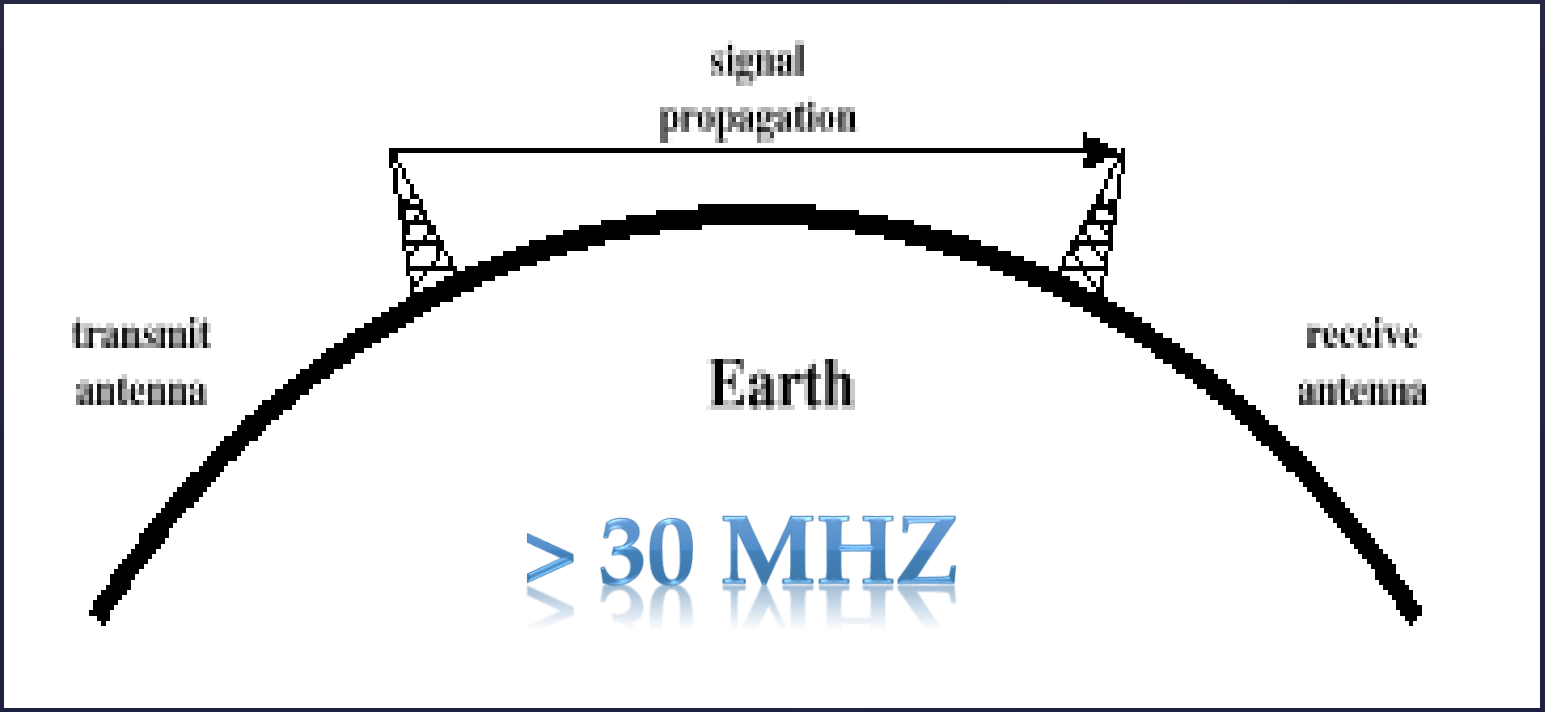
Ground Wave Propagation



Sky Wave Propagation



Line-of-Sight Propagation



Basic Antenna Parameter

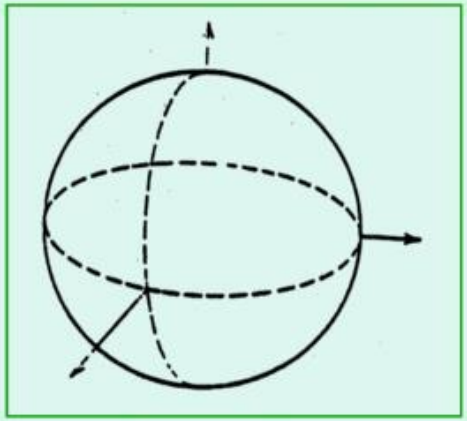
1. Radiation Resistance
2. Input Impedance
3. Polarization

TYPE OF ANTENNA

1. Isotropic Antenna
   Radiated power equally in all direction
   Example : Mono pole antenna
2. Omni Directional Antenna
   Radiation power in plane
   > Omni directional vertical example : vertical ground plane
   > Omnidirectional horizontal example : turnstile
   > Omnidirectional circular example : QFH
3. Directional Antenna
   Radiation power in particular direction
   > Directional vertical antenna example : yagi vertical
   > Directional horizontal antenna example : yagi horizontal
   > Directional Circular antenna example : cross yagi
   > Parabolic reflective antenna example : dish antenna

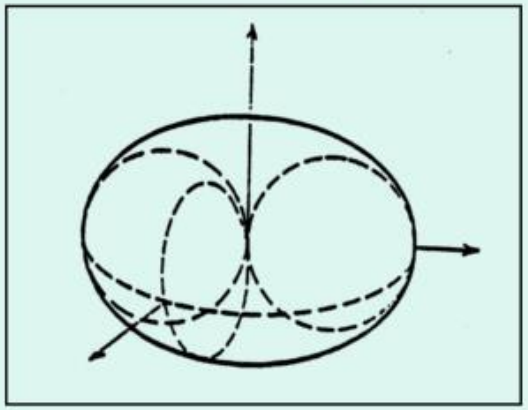
Types of Radiation Patterns

Idealized Point Radiator



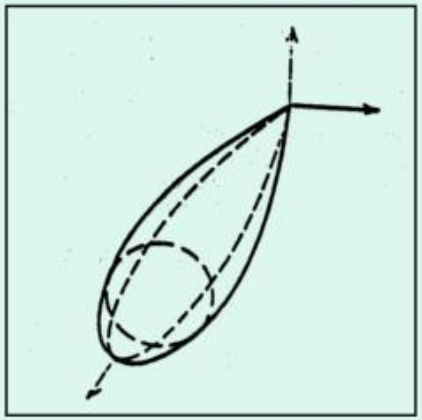
Isotropic

Vertical Dipole



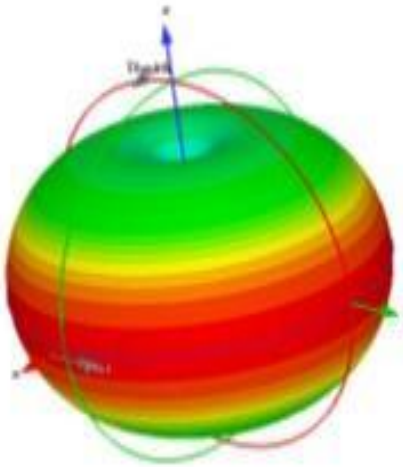
Omni-directional

Radar Dish



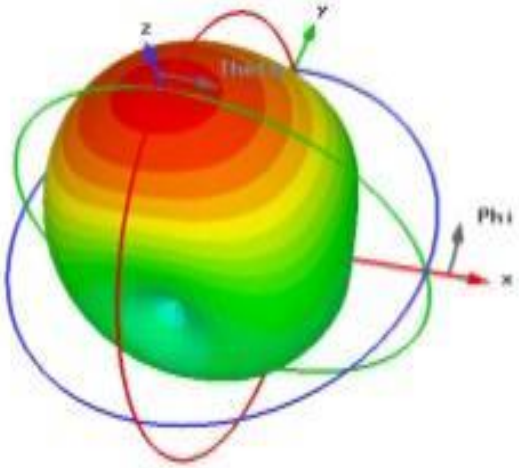
Directional

Different radiation patterns

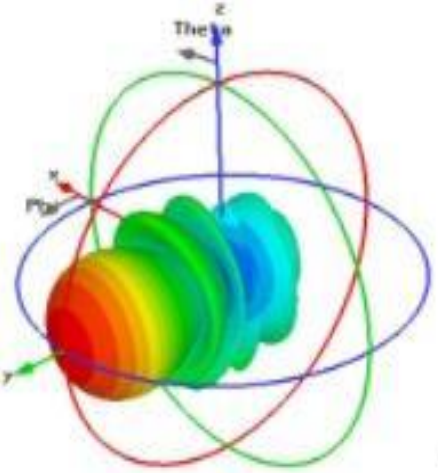


Dipole

Omni



Patch



Yagi

Parameter to maximize your omnidirectional antenna / vertical antenna

1. Lower VSWR (Voltage Standing Wave Radio)
2. Gain of antenna (in dB)
3. Radiation angle (in degree)
4. Return Loss (in dB)
5. Free Space / Line Of Sight

Parameter to maximize your Directional antenna / Yagi antenna

1. Lower VSWR (Voltage Standing Wave Radio)
2. Gain of antenna (in dB)
3. Front to Back Ratio (F/B)
4. Return Loss (in dB)
5. Free space / Line Of Sight

Low VSWR
Artinya impedansi transmitter sama dengan yang ada di feed point antenna

Gain
Semakin besar gain sebuah antenna maka akan menambah EIRP nya

Radiation Angle
Semakin rendah sudut radiasi sebuah antenna terhadap bumi , maka semakin jauh jarak pancarnya

Front to Back Ratio
Perbandingan Major lobe dan back lobenya artinya semakin besar major lobenya dibanding back lobenya antenna semakin kuat directional ke depannya

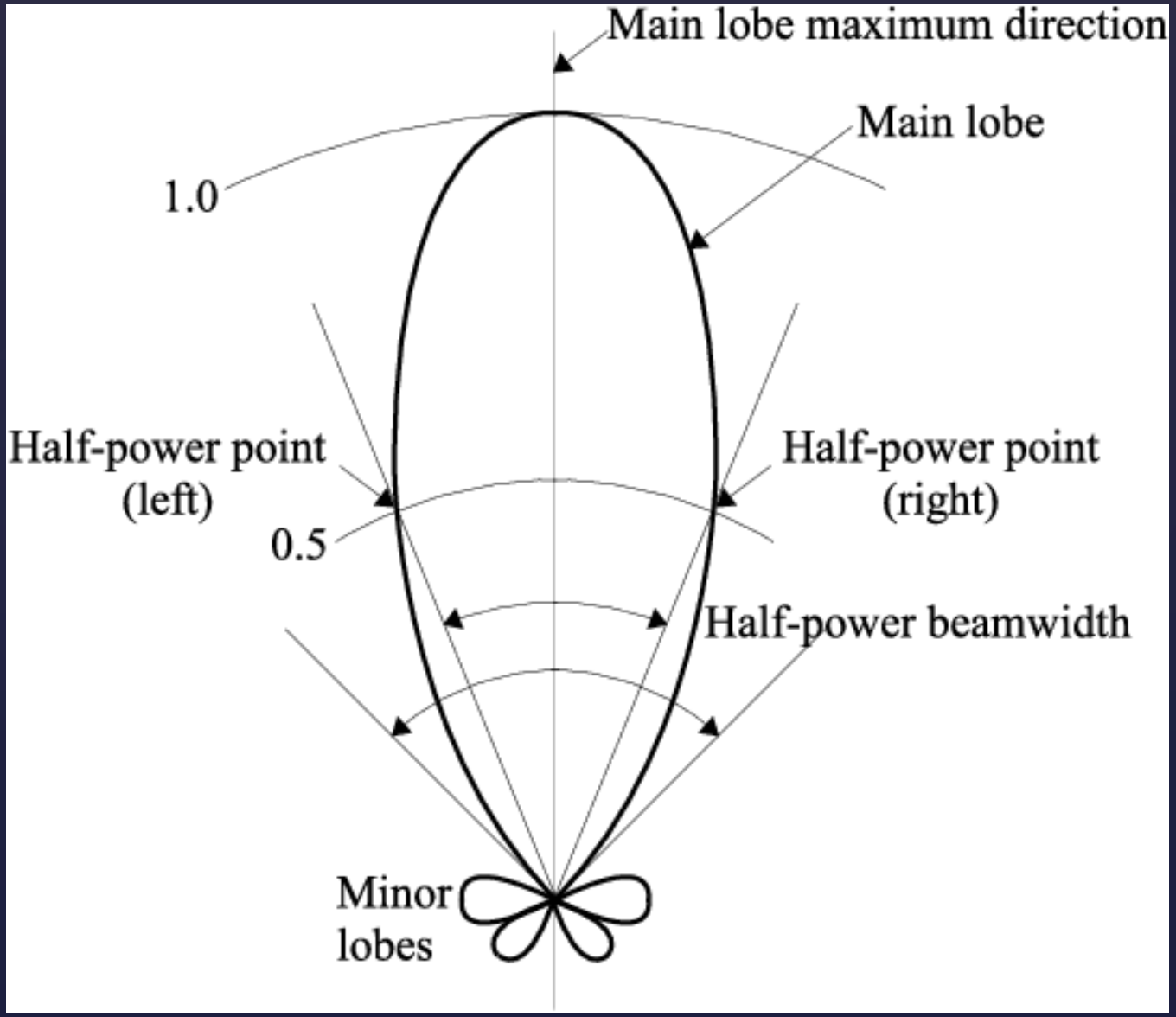
Return Loss
Adalah perbandingan antara power yang dipancarkan dan power yang kembali
0 dB Semua Power kembali , Sangat jelek matchingnya
-3 dB 50 % kembali , 50 % dipancarkan
-6 dB 25% kembali , 75% dipancarkan
-10 dB 10% kembali , 90% dipancarkan
-20 dB 1% kembali , 99% dipancarkan

Basic Parameter of Radiation Pattern

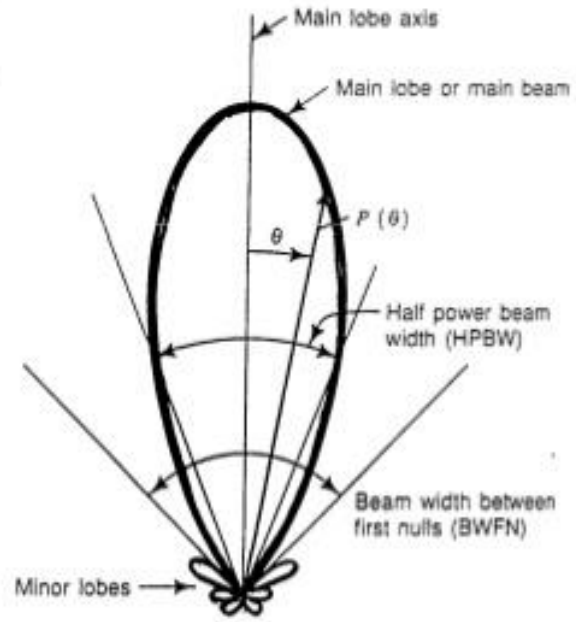
HPBW (Half Power Beam Width)
It is angular width of major lobe from maximun to 3 dB down

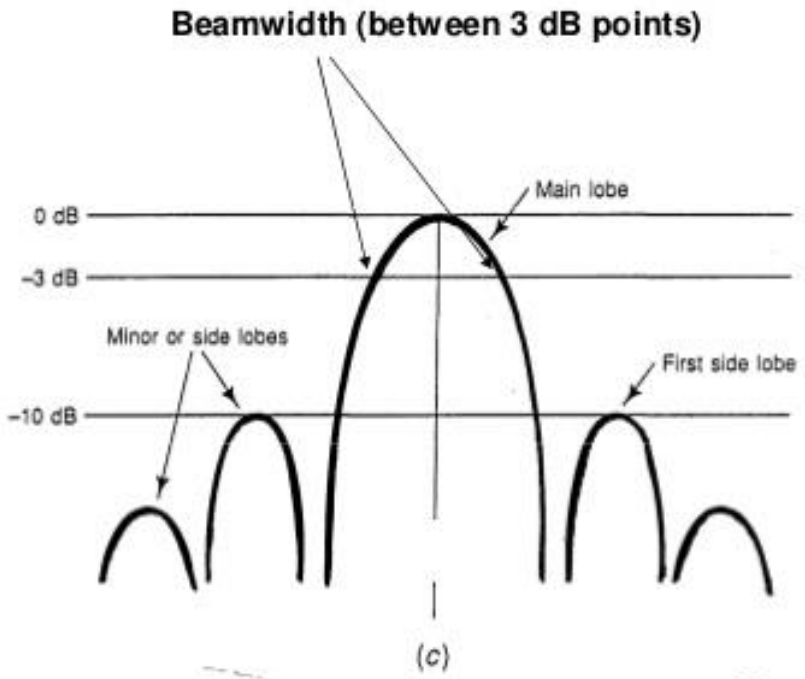
FNBW (First Null Beam Width)
It is a width of major lobe

Front to Back Ratio / F/B
Is ratio of gain from major lobe to back lobe

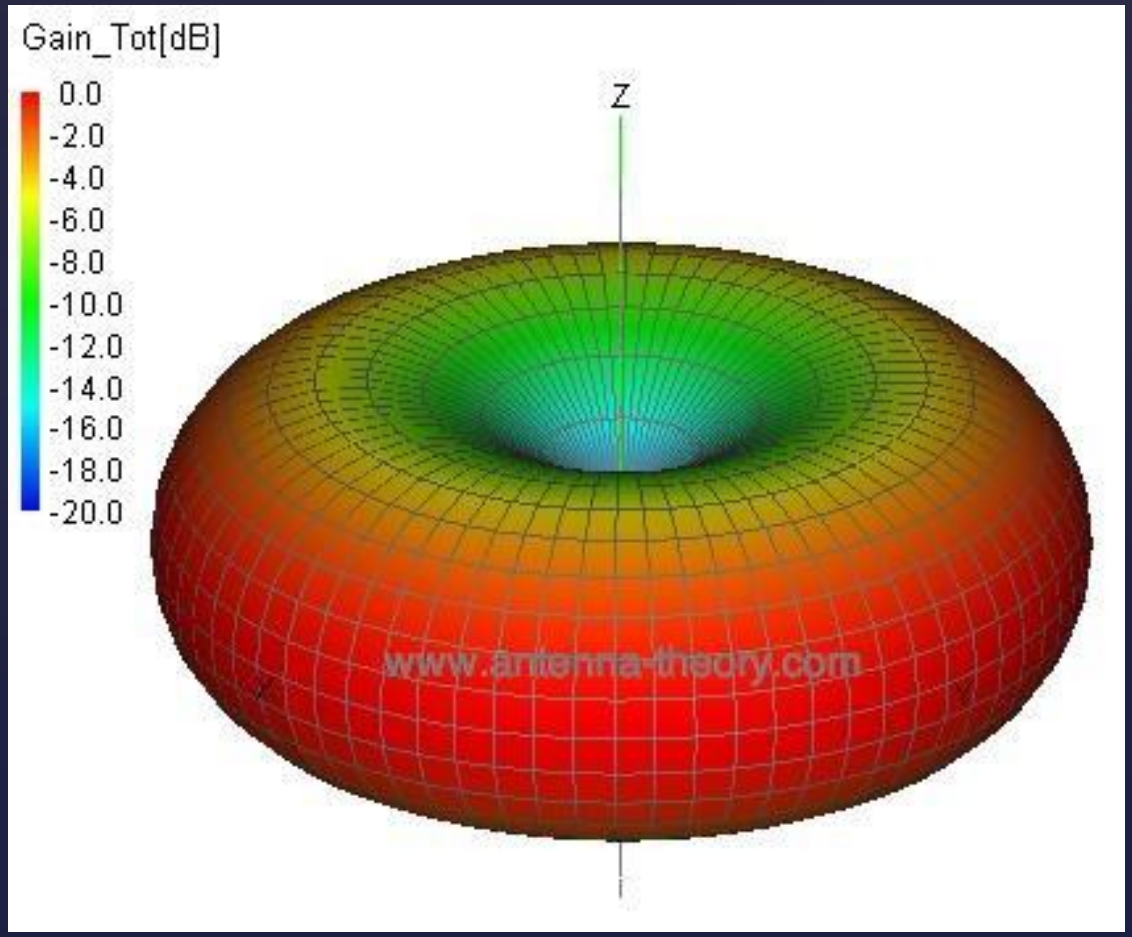

Main lobe maximum direction
Main lobe
1.0
Half-power point
(left)
Half-power point
(right)
0.5
Half-power beamwidth
Minor
lobes

More Details about Radiation Patterns

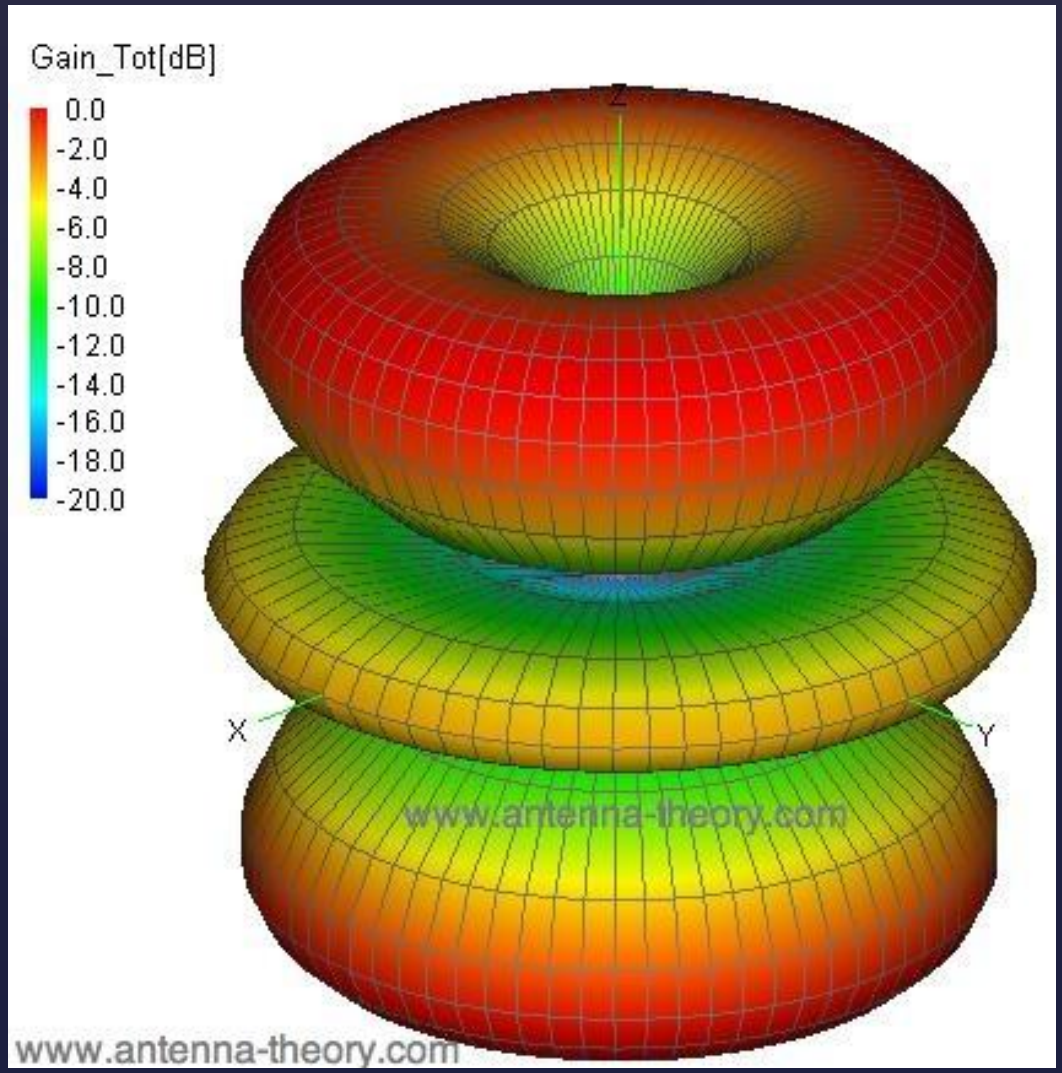




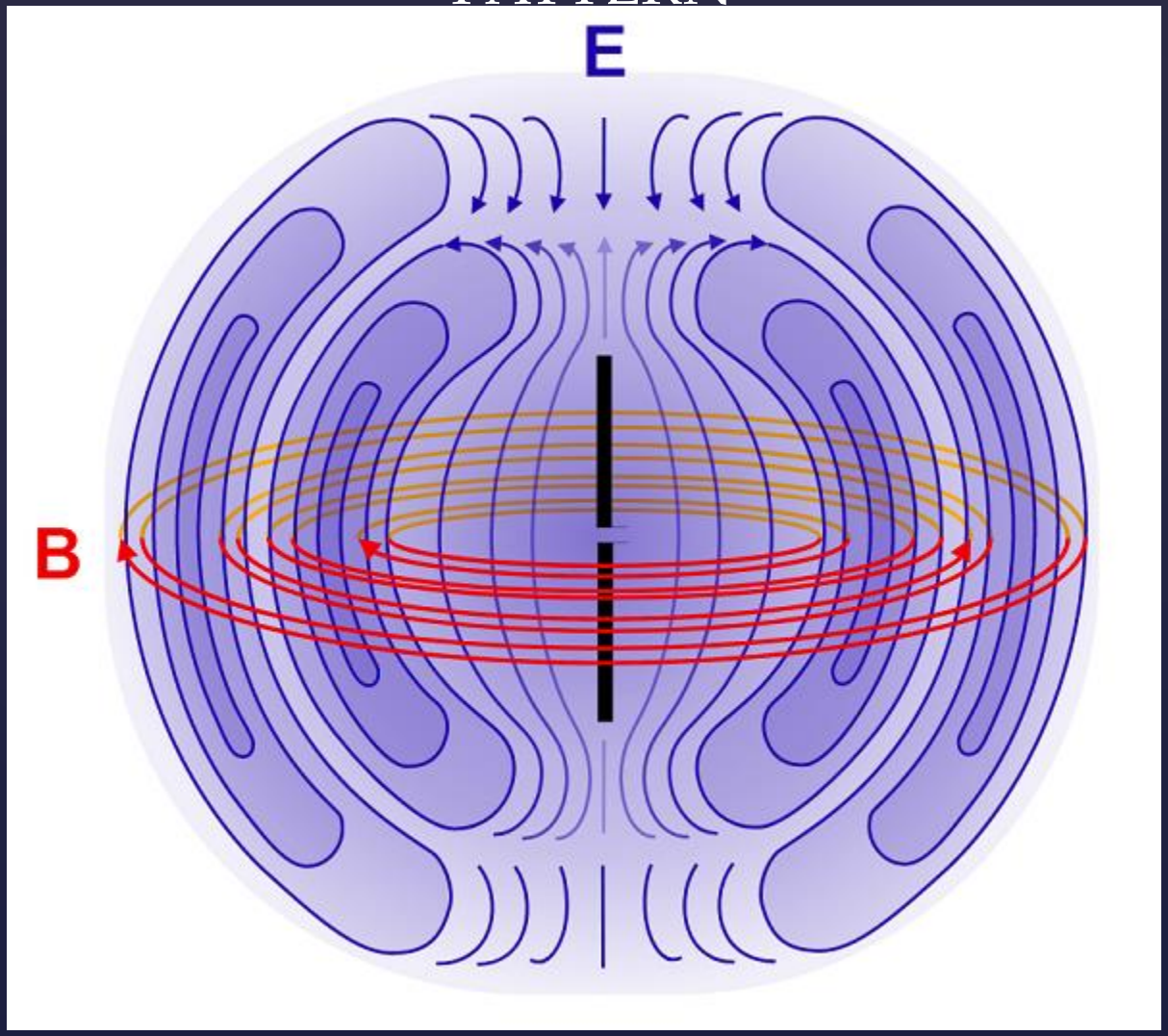
VERTICAL ANTENNA ¼ WAVE LENGTH 145 MHZ PATTERN



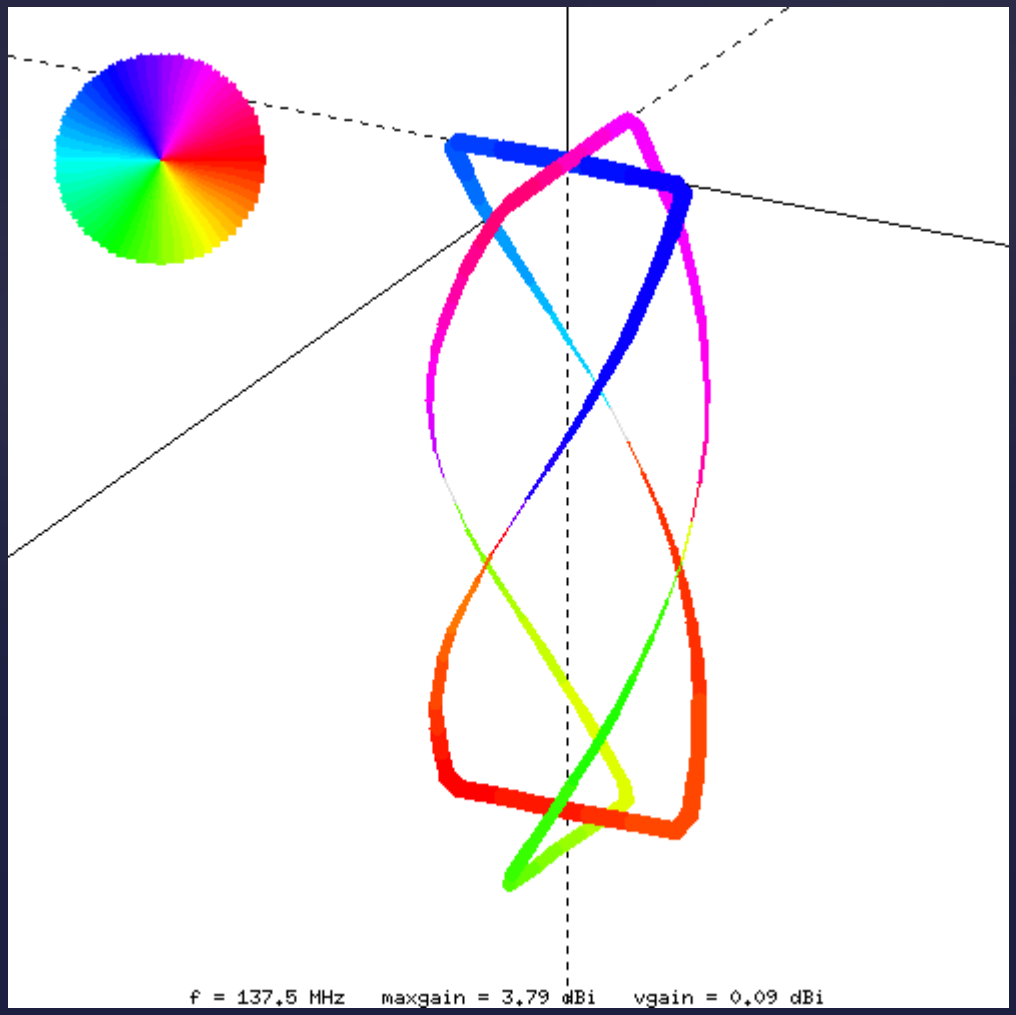
VERTICAL ANTENNA DIPOLE ½ WAVE LENGTH PATTERN



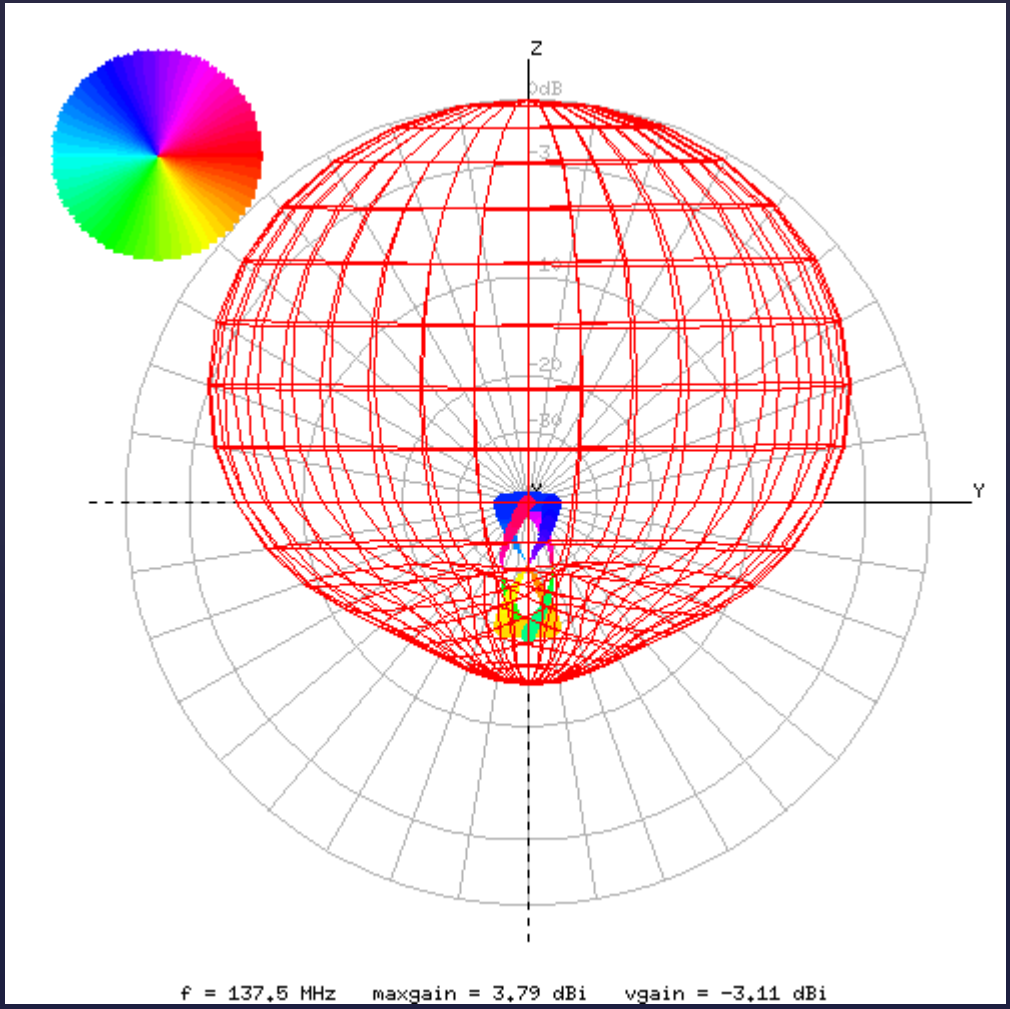
DIPOLE ELECTROMAGNETIC FIELD PATTERN



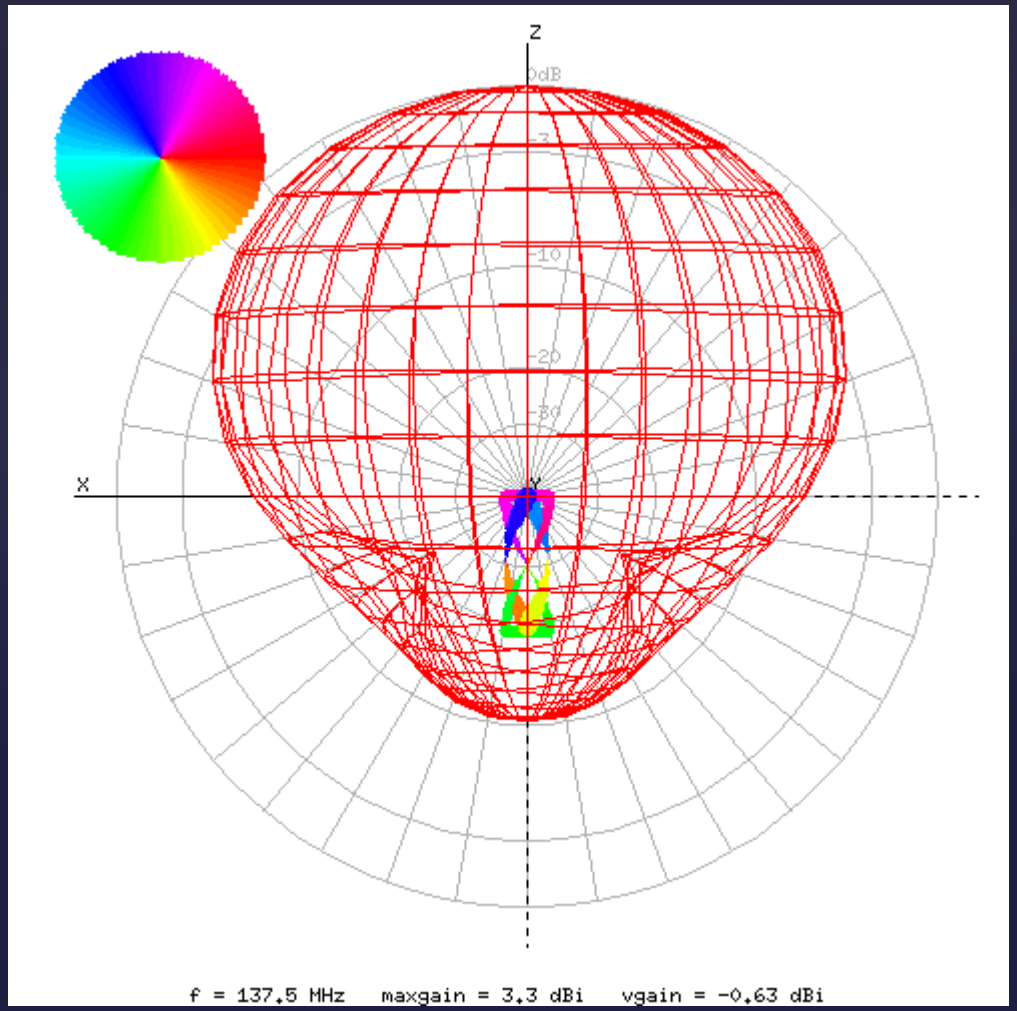
QFH
(Quadrifilar Helicoidal)



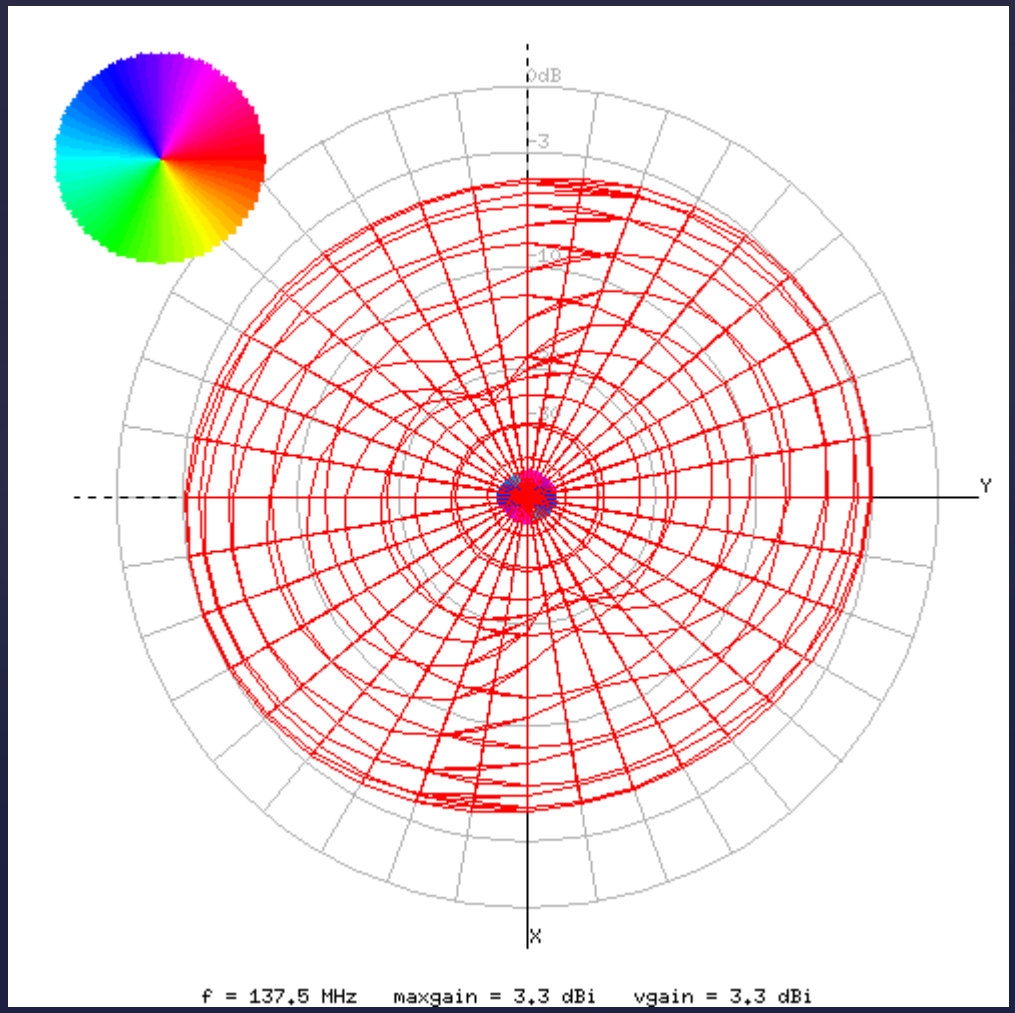
Radiation diagram (X-axis)



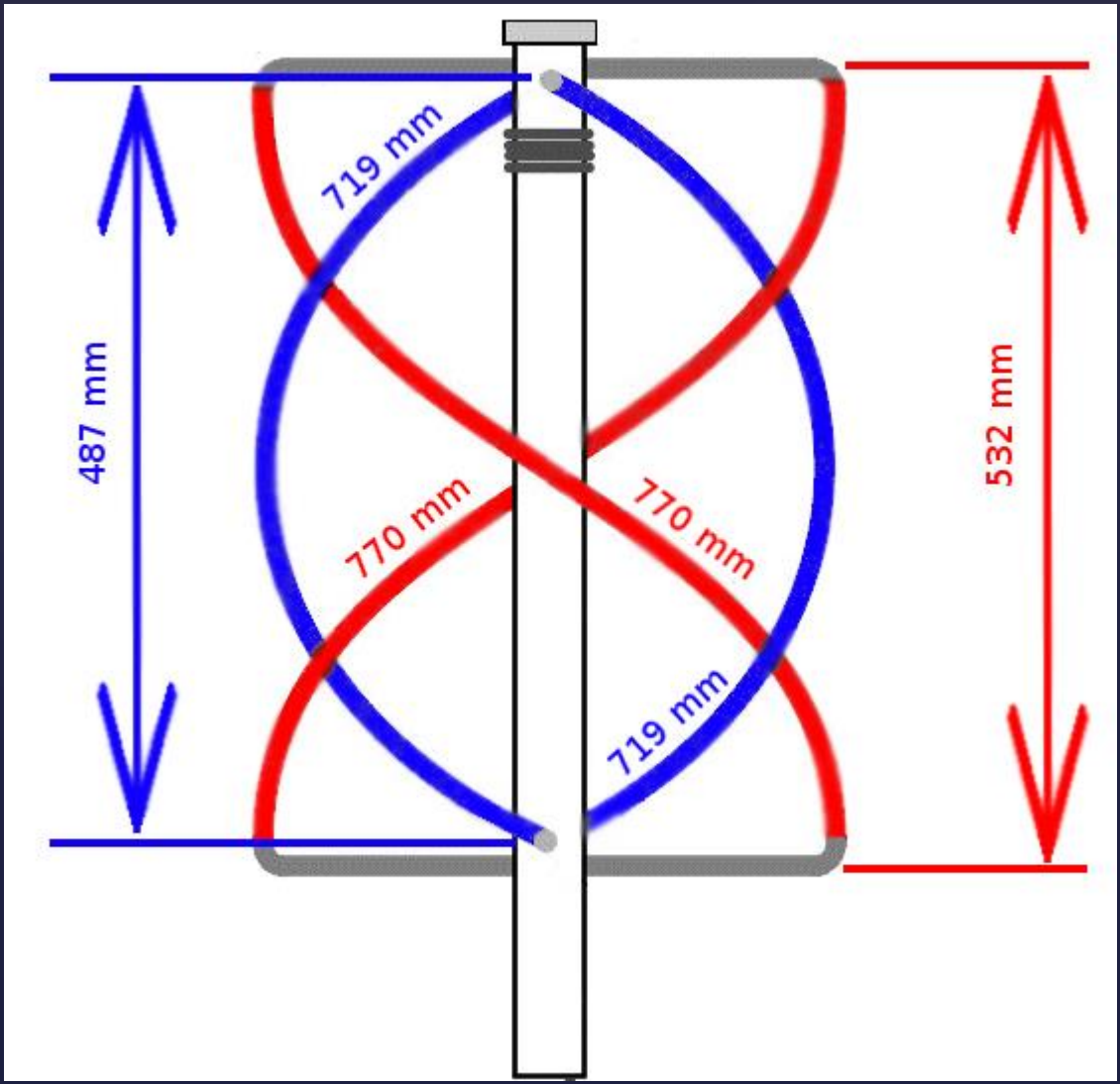
Radiation diagram (Y-axis)

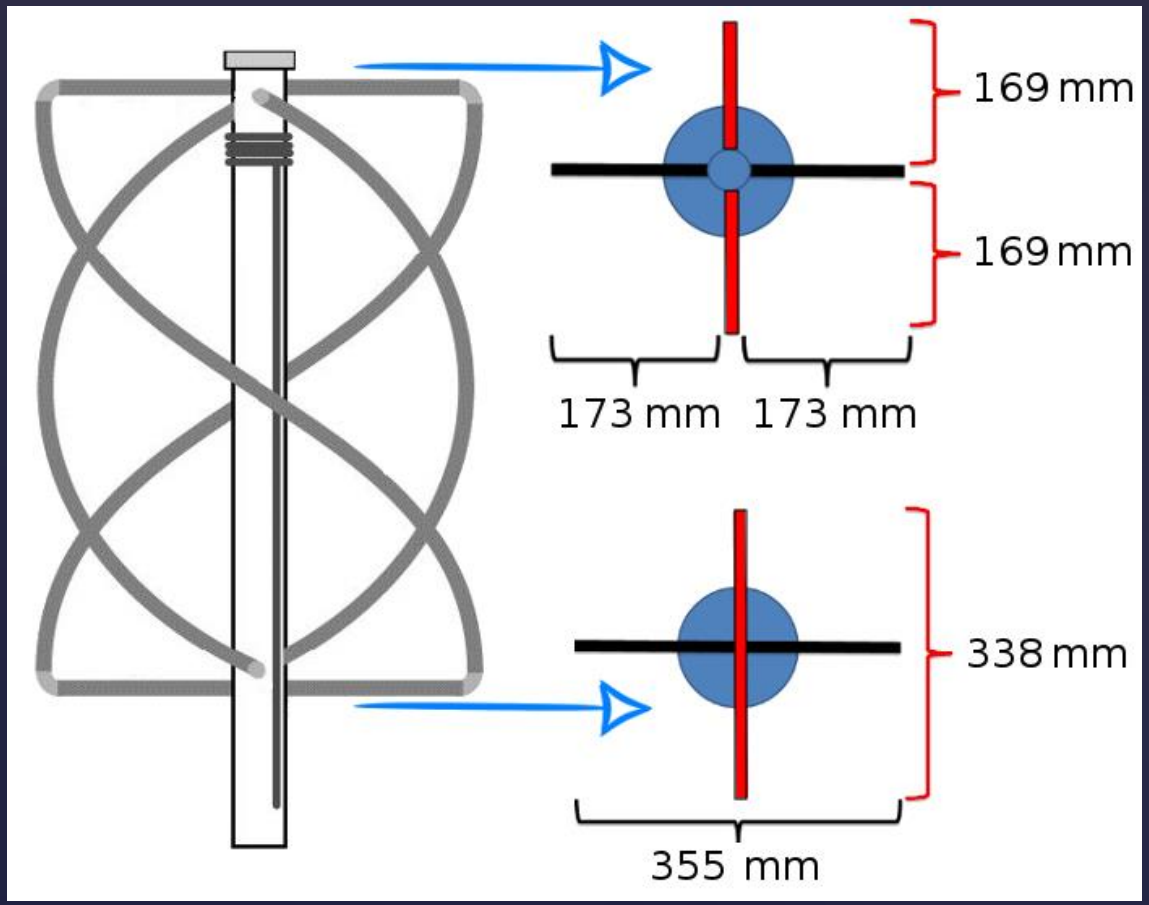


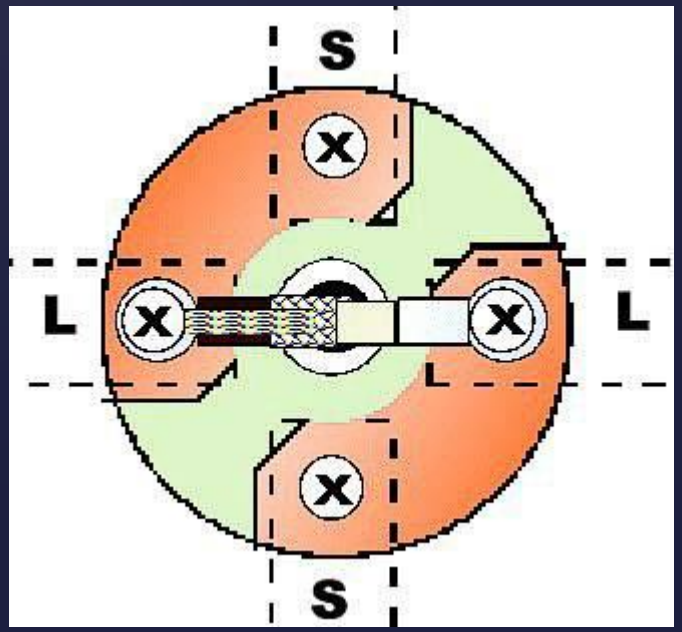
Radiation diagram (Z-axis)



144/430 Mhz Quadri Filar Helix antenna




169 mm
169 mm
173 mm
173 mm
338 mm
355 mm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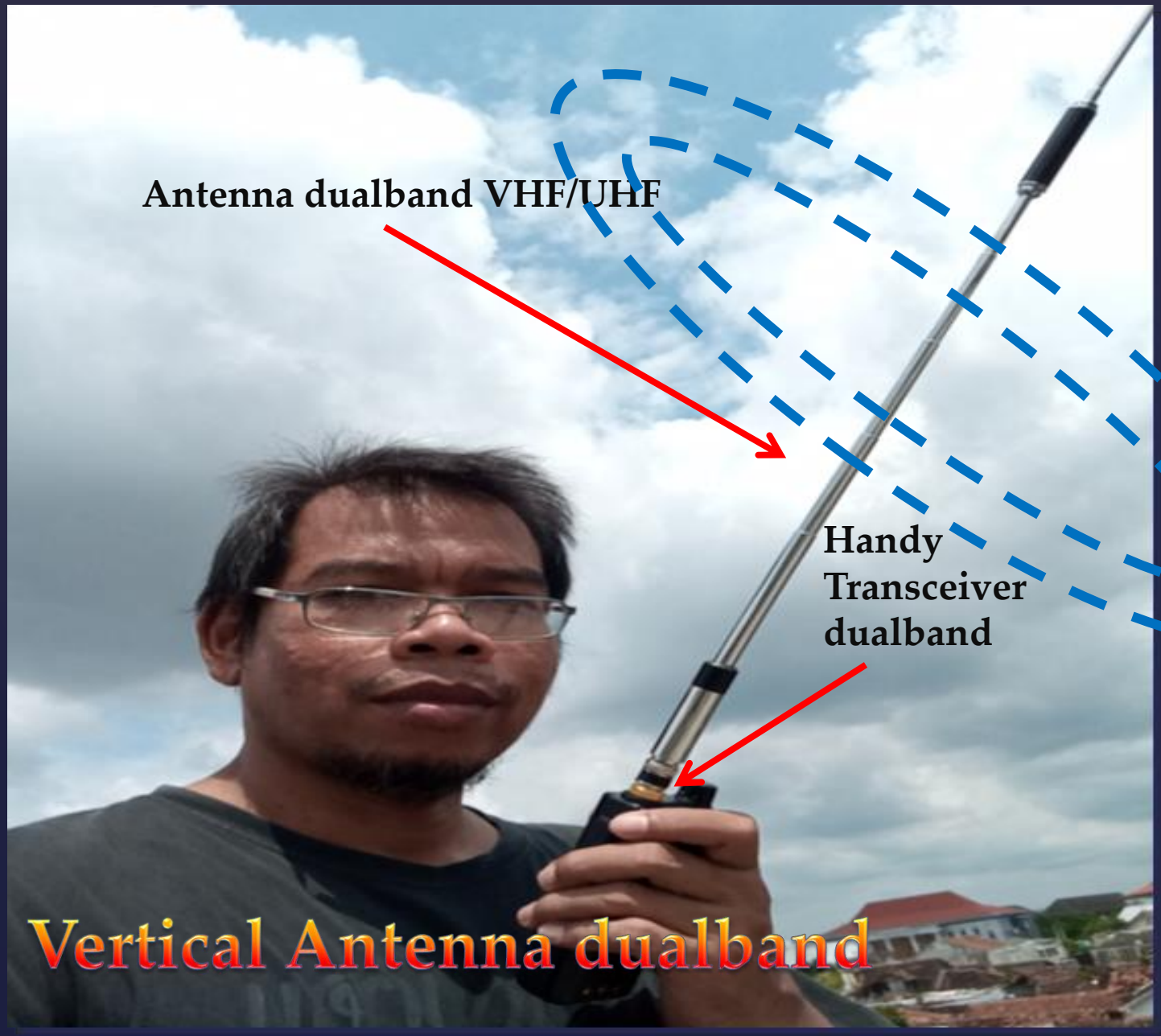
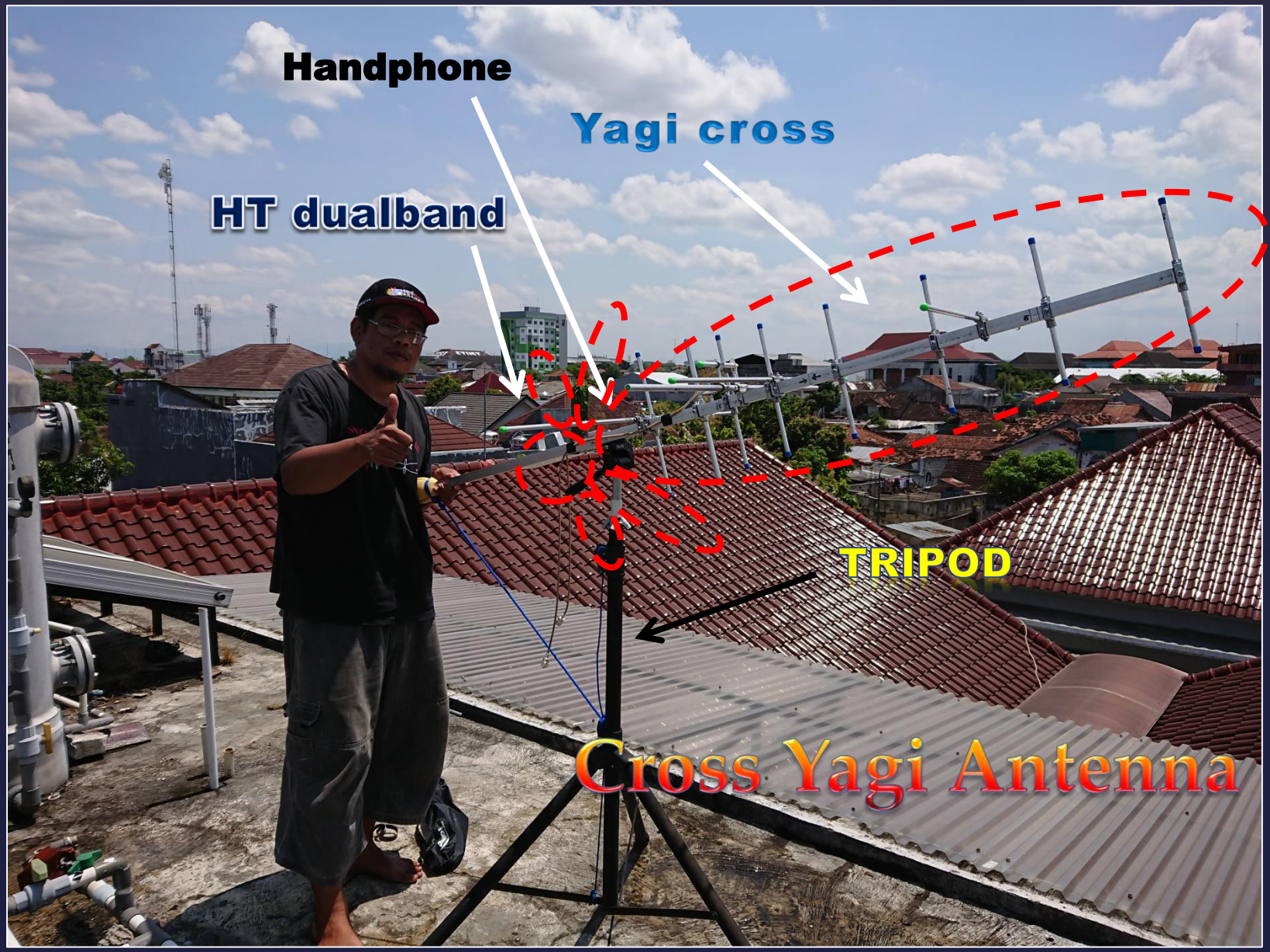
PERALATAN KOMUNIKASI PORTABLE SATELIT

1. Handy Transceiver Dualband (VHF / UHF)
2. Antenna Omni directional ex. vertical superstick dualband
3. Antenna Directional Ex. Moxon , Optibeam, Yagi cross ,etc
4. Compass atau Smartphone dengan aplikasi yang dapat melihat posisi satelit
5. Tripod jika memungkinkan


Antenna dualband VHF/UHF
Handy
Transceiver
dualband
Vertical Antenna dualband


Handphone
Yagi cross
HT dualband
TRIPOD
Cross Yagi Antenna

Inline Yagi antenna

Optibeam antenna
By YC2YIZ


TX antenna IO-86


RX antenna

Hal-Hal yang menentukan keberhasilan kita Melakukan Komunikasi Satelit

1. Lokasi harus pada posisi LOS atau terbuka mengarah ke Satelit
2. Antenna Matching pada frekuensinya
3. Posisikan arah pancaran antenna ke satelit dengan tepat sesuaikan polaradiasinya
4. Pastikan RX / TX HT kita baik , periksa koneksinya ke antenna dengan baik
5. Atur Doppler frekuensi satelit dengan benar sesuai posisi satelit melintas
6. Timing yang tepat saat berkomunikasi , jangan paksakan memanggil atau cq jika sedang ada yang berkomunikasi atau kalau kita ragu sebaiknya RX dahulu.
7. Kecepatan memori kita menentukan kualitas qso yang kita dapatkan
8. Pelajari radius pancaran anda sesuai footprint satelit yang melintas untuk memperoleh stasiun DX yang maksimal
9. Kesabaran dalam berkomunikasi.

Frequency of operation

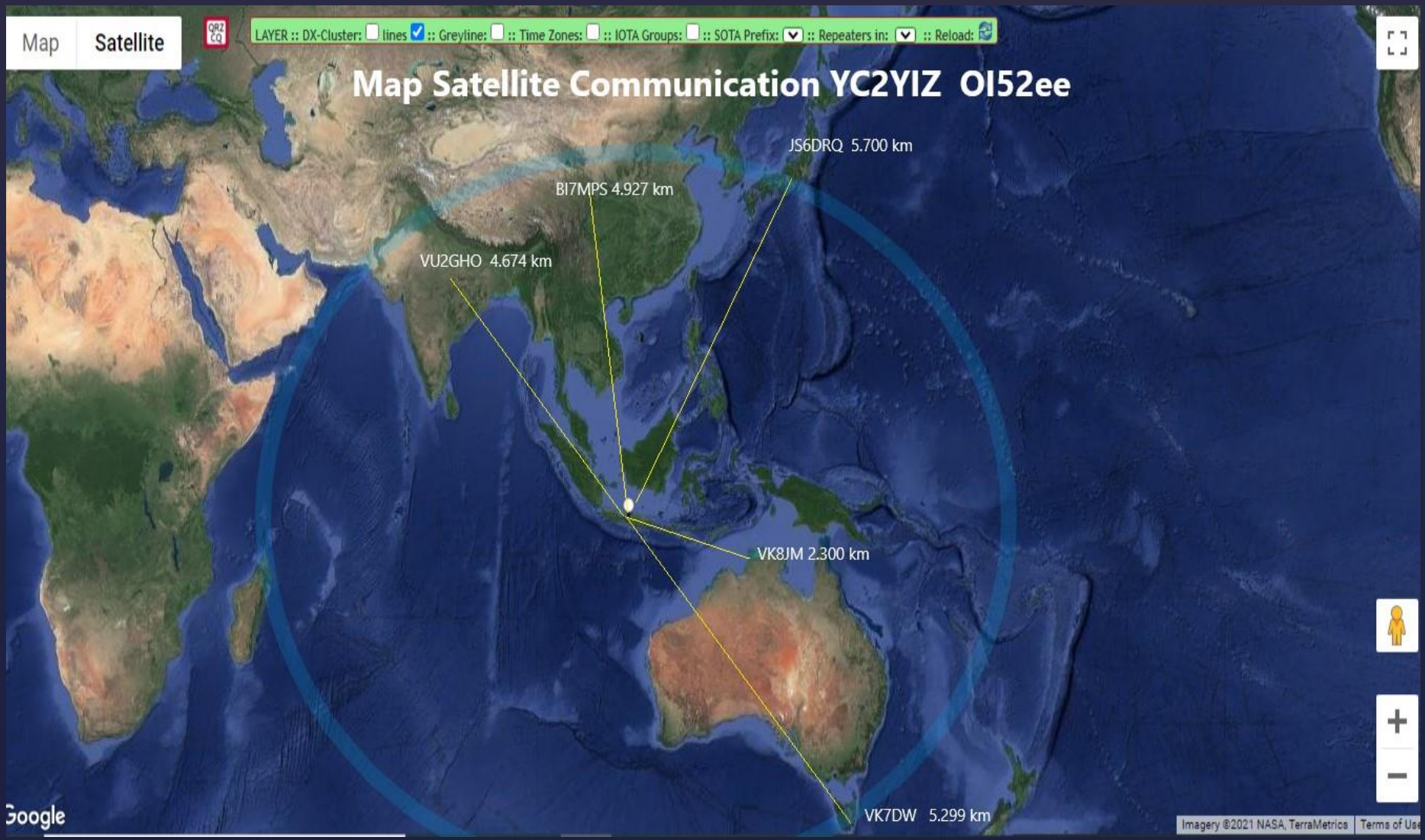
Following are the types of antennas according to the frequency of operation.

Very Low Frequency (VLF)
Low Frequency (LF)
Medium Frequency (MF)
High Frequency (HF)
Very High Frequency (VHF)
Ultra High Frequency (UHF)
Super High Frequency (SHF)
Micro wave
Radio wave

Mode of Applications

Following are the types of antennas according to the modes of applications

Point-to-point communications
Broadcasting applications
Radar communications
Satellite communications


Map
Satellite
LAYER :: DX-Cluster: lines :: Greyline: :: Time Zones: :: IOTA Groups: :: SOTA Prefix: :: Repeaters in: :: Reload:
Map Satellite Communication YC2YIZ OI52ee
JS6DRQ 5.700 km
BI7MPS 4.927 km
VU2GHO 4.674 km
VK8JM 2.300 km
VK7DW 5.299 km
Google
Imagery ©2021 NASA, TerraMetrics
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PENCAPAIAN QSO DX SATELLITE YC2YIZ OI52ee

start Juli 2020 - Januari 2021 (7 bulan)

NO	9W-9M	9V	HS	VU- 4S	E2-	DU-DV	BA-BH	JA	VK
1	9W2UPI	9V1SV	HS3ANP	VU2LBW	E21EJC	DU9JJY	BI7MPS	JS6DRQ	VK8JM
2	9W2XRE	9V1YP	HS6MYW	VUGV	E22FFJ	DW9ILX		JR6DI *	VK6KCC
3	9W2LAN		HS9JZL	VU2GHO	E29AHU	DU1GM			VK6RD
4	9W2NCS			VU2DGR		DU6DKL			VK6JJJ
5	9W2VIN			VU2PEP		DU1AV			VK6MIT
6	9W2EVR			4S5SN		DV8DIG			VK3ZL
7	9W2AXZ					DV1XWK			VK8AW
8	9W8DNX					DW5CD			VK3EJ
9	9M4LHJ					4I1DWE			VK4CW
10	9W2ZNL					DV2JB			VK6MK
11	9M2VMW								VK4JU
12	9M2DA								VK7DW
13	9M4CJM								VK6KFD
14	9W8VWW								VK6XQ
15	9W2AWA								VK3MTV
16	9W2IMN								VK6XL
17	9W6DLE								VK6ZIM
18	9W2RYF								VK6NT
19	9W2JPX								VK6LIN
20	9W2ABA								VK6MIL
21	9W2TKW								VK6FD
22	9W2XBS								VK4WDM
23	9W2VGE								VK6FR
24	9W2CKO								VK6GC
25	9W6JNR								VK6BMM

Long distance 5.700 km JS6DRQ

Terima kasih
De YC2YIZ