AAYOUSHEE

1EC2020033

LAB-2 WRITE-UP

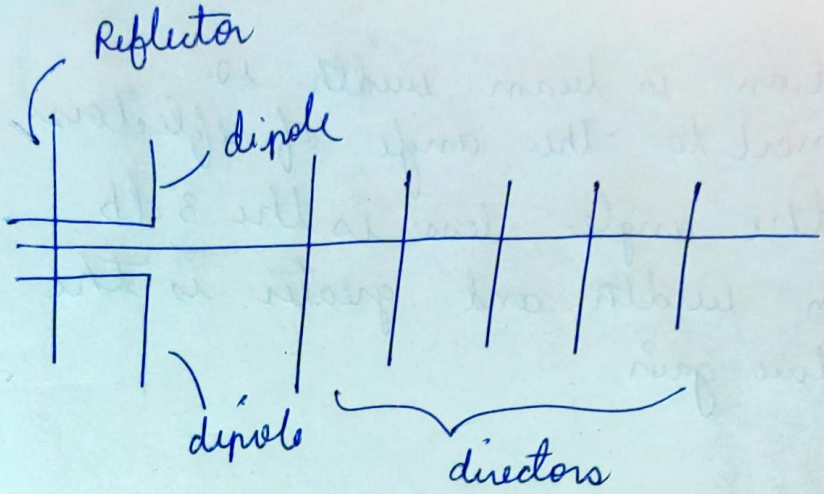
Measure parameters of Yagi Antenna, Stacked yagi & ground plane with Reflector & director.

Aim:

1. To plot the radiation pattern of yagi antenna in Azimuth & elevation planes on log & linear scales.
2. To measure the beam width, front to back ratio, side lobe level & its angular position, plane of polarisation, directivity & gain.
3. To measure antenna resonance and measure VSWR, impedance and impedance bandwidth.
4. To measure the significance of parasitic elements on Yagi.
5. To find the gain bandwidth of yagi antenna using a log periodic antenna.

Equipment required:

Antenna transmitter, receiver and stepper motor, dipole antenna, Yagi antenna, log-periodic antenna, Stacked YAGI & ground plane with Reflector/ director, Antenna Tripod and stepper pod.



Understanding

Dipole –
Two conductors of length ≈ 1/4
One connected to signal, the other to ground
The only driven element in the system, no electrical connection to directors or reflectors

Directors –
length smaller than dipole, continously decreasing
Excited by the field of the dipole
Makes antenna directional

Reflectors –
Larger than dipole
Prevents antenna from sending backwards.

The reduction in beam width is proportional to the angle of reflectors more the angle, less is the 3 db beam width and greater is the directive gain.

Advantages :

→ It is simple to build
→ It is compact size and also it is must in lightweight
→ High gain is achieved about to 7dB.
→ less amount of power is wasted.
→ frequency coverage is broad.
→ It offers a unidirectional radiation pattern which is reasonably good.

Disadvantages:

→ It is sensative to frequency.
→ it does not offer very high gain limited around 20dB.
→ Need a large number of elements to be used.
→ It is prone to noise.
→ It is also prone to atmospheric effect.
→ Bandwidth is reduced if a number of director element is used in the array.