



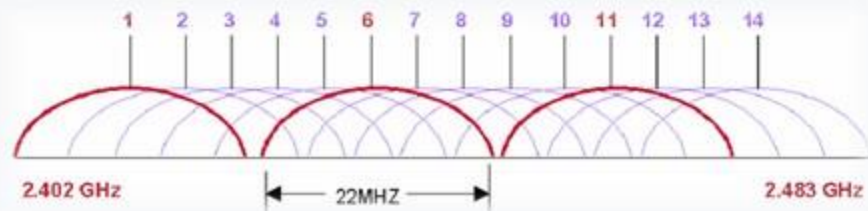
WIRELESS COMMUNICATIONS

DRONESVIP

CAPACITATION

RADIO FREQUENCIES

- Wifi, we refer to "Wireless Fidelity" of wireless communication technologies using waves
- RADIO LINK, is a connection between different telecommunications equipment using electromagnetic waves. A radio link consists of a small radio transmitter (TX) that sends the signal from the studios to a receiver (RX) located in the plant, both with their respective antennas.
- LINE OF SIGHT, the success of a Wi-Fi type link is to ensure that there is adequate visibility between the two ends of it.
- Fresnel Ellipsoid, Fresnel zones are concentric ellipsoids that surround the direct beam of a radio link and are defined from the positions of the transmitting and receiving antennas



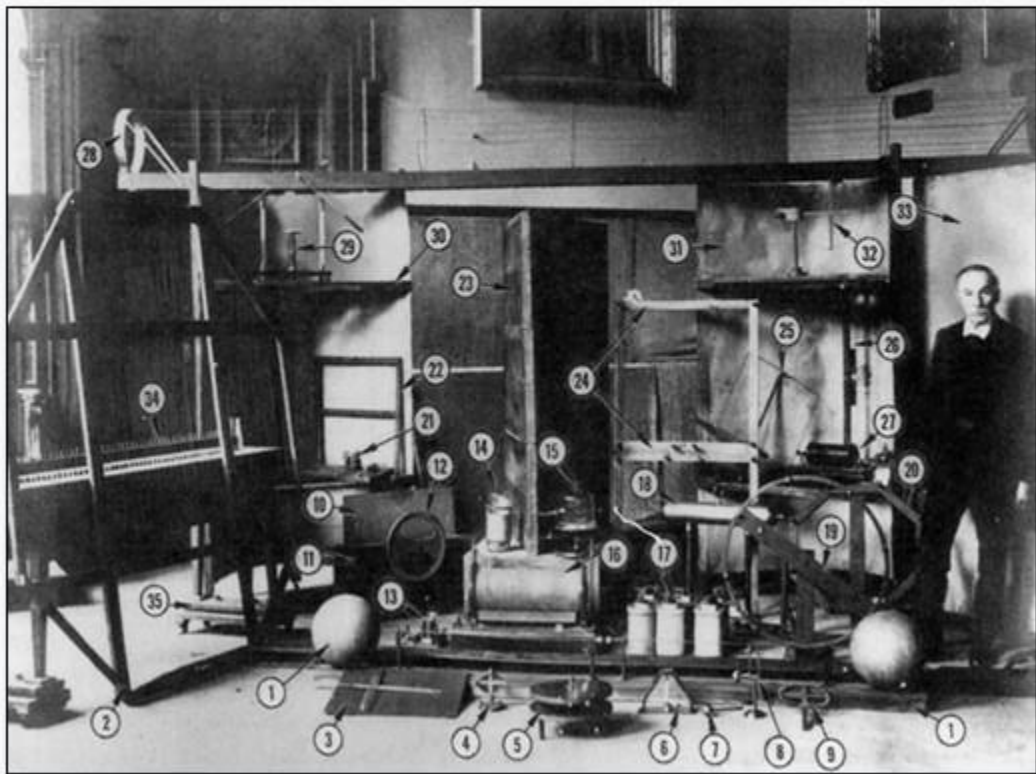
ELECTROMAGNETIC WAVES

In 1893 Nikola Tesla managed to transmit electromagnetic energy without wires, building the first radio transmitter (ahead of Guglielmo Marconi). That same year in Chicago, AC (alternating current) was publicly displayed, demonstrating its superiority over Edison's direct current (DC). In the late 19th century, Tesla demonstrated that by using a resonant electrical grid, and using what was then known as "high-frequency alternating current" (today it is considered low-frequency), Only one conductor was needed to power an electrical system, without the need for another metal or a ground conductor. Tesla called this phenomenon the "transmission of electrical energy through a single wire with no return."



Tesla stated in 1901: **"About ten years ago, I recognized the fact that in order to transport electric currents over long distances it was not at all necessary to use a return wire, but that any amount of energy could be transmitted using a single wire. I illustrated this principle by numerous experiments which, at the time, generated considerable attention among men of science."**

ELECTROMAGNETIC WAVES



This is Hertz's laboratory with which he carried out electromagnetism experiments. It was here that, in 1887, he demonstrated the existence of electromagnetic waves, waves that at the time were known as Hertzian waves.

The demonstration was carried out using as a generator the spheres that are marked with the number 1, which are zinc spheres each connected to a one-meter copper cable. While to receive the 50 MHz wave it has the antenna marked with the number 19, a spiral antenna.

TYPES OF ANTENNAS



Directional
Satellite Dish



Two-way antenna



Omnidirectional
Collinear Antenna



Directional Yagui
Antenna

01 Collinear - Omnidirectional

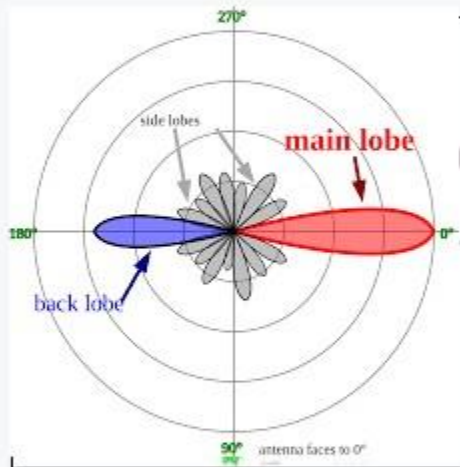
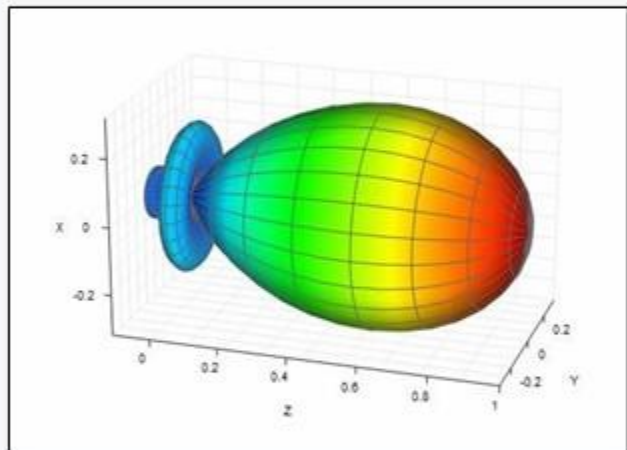
2. Bidirectional

3. Directional - Sectoral

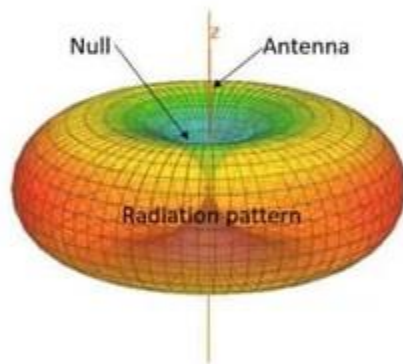
An antenna is a normally metallic conductive device, designed with the aim of emitting and/or receiving electromagnetic waves into free space.

A transmitting antenna transforms electrical energy into electromagnetic waves, and a receiver performs the reverse function.

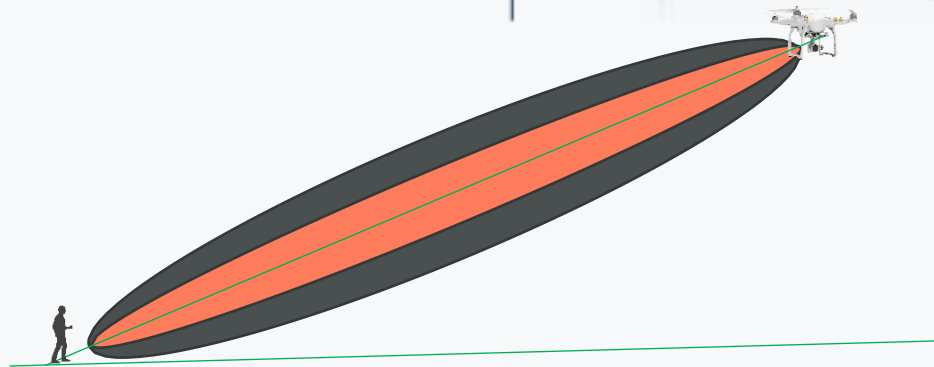
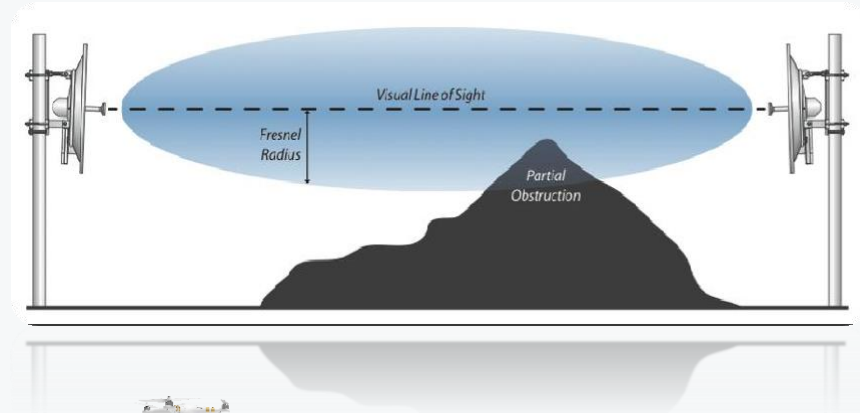
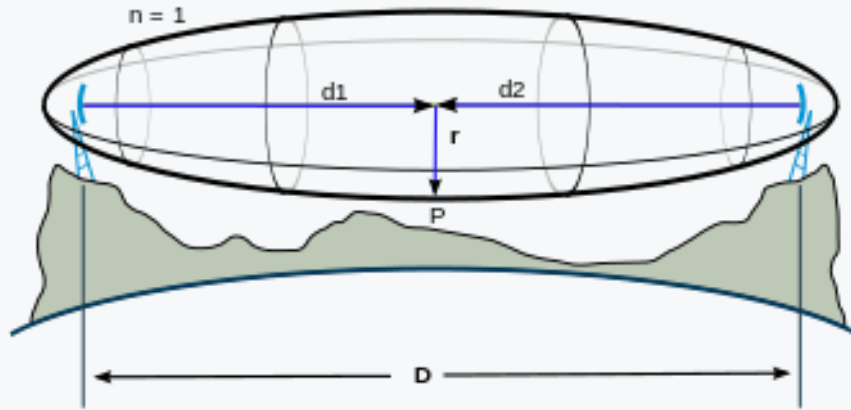
RADIATION LOBES



RADIATION PATTERN



ELIPSOIDE DE FRESNEL



OTHER BONDING TECHNOLOGIES



4G/5G CELLULAR NETWORKS

SATELLITE COMMUNICATION



LINK LOSS (DATALINK LOSS)



- 01 RTH - RETURN TO HOME
RPO - RETURN TO THE POINT OF ORIGIN
- 02 LAND
- 03 HOVER
- 04 DYNAMIC RETURN
RETURN TO RC

QUESTION TIME!