STUDY MATERIAL – 5
TOPIC – NETWORKING

SUBJECT: COMPUTER APPLICATION **CLASS: XII**
F.M.:15 **DATE: 10.07.2020**

Un-guided Media(Wireless Communication)

Apart from communication by means of physical media using cables, communication can also take place through free space by means of radio, micro or infrared waves. This type is called **wireless communication** or communication through **un-guided media**. The types are:

- **Infrared Communication**
  - ✓ **Direct Mode**
  - ✓ **Diffused Mode**
- **Radio Communication**
  - ✓ **Ground Waves**
  - ✓ **Sky Waves**
- **Microwave Communication**
  - ✓ **Terrestrial**
  - ✓ **Satellite**

❖ Infrared(IR) Communication

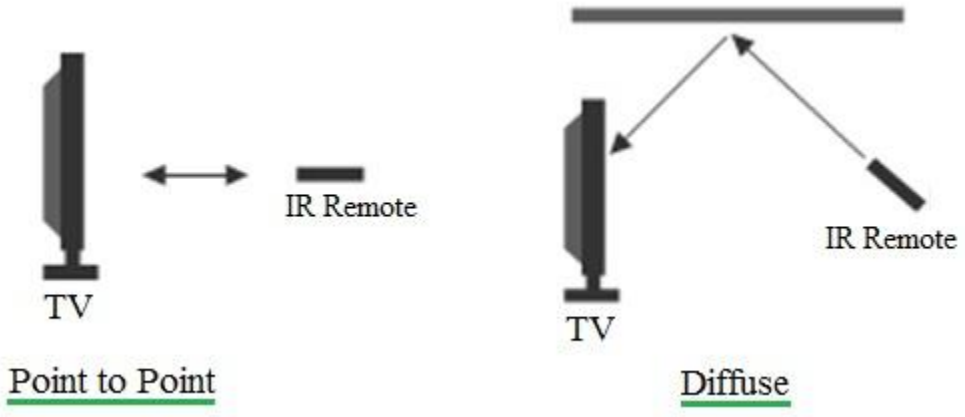
The infrared signals cannot go through opaque walls and are used for short distance communication in computer networks.

➢ Direct Mode Communication:

It is a point-to-point type communication where a clear line of sight is required between the transmitter and the receiver.

➢ Diffused Mode Communication:

It is a multipoint type communication where the IR light is bounced off the ceilings & the walls to reach a group of end users in the same room.



❖ Radio Communication

- ❑ Radio waves are ideal for communication systems where cable installation is difficult or costly or where the users are mobile.
- ❑ Bandwidth is limited and communication can be affected by the presence of other radio sources.
- ❑ A radio system consists of a transmitter and receiver. The transmitter produces radio waves that are emitted from an antenna and are received by antennas at the receiving end.

❑ Two types of Radio systems:

➢ Ground Waves:

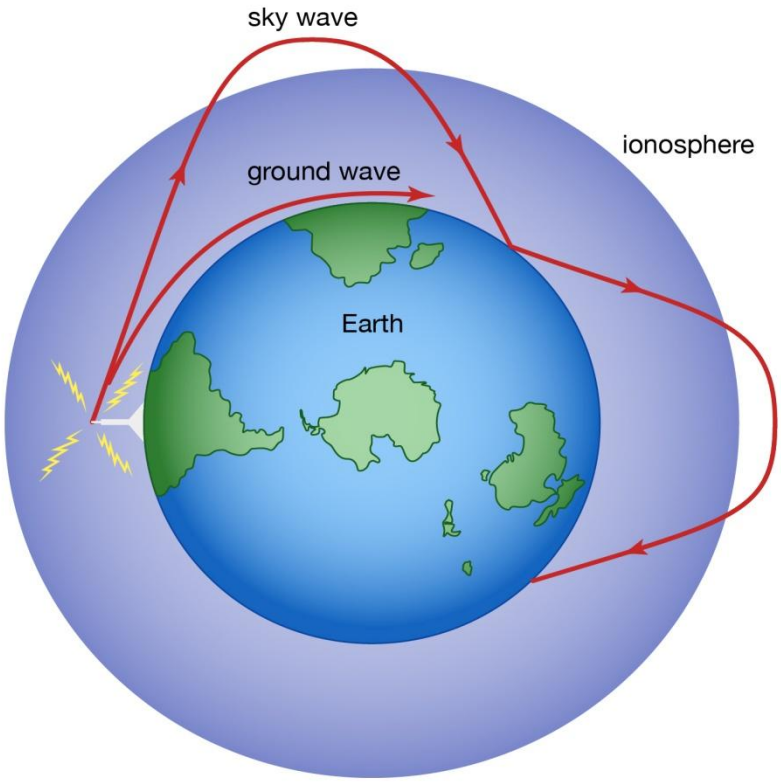
✓ Radio waves below 3Mhz tend to follow the ground.

✓ Used for public radio stations.

➢ Sky Waves:

✓ Radio waves above 3Mhz tend to be absorbed by the ground.

✓ Radio waves are used as sky waves that reflect off the ionosphere and bend back to the surface.



❖ Microwave Communication

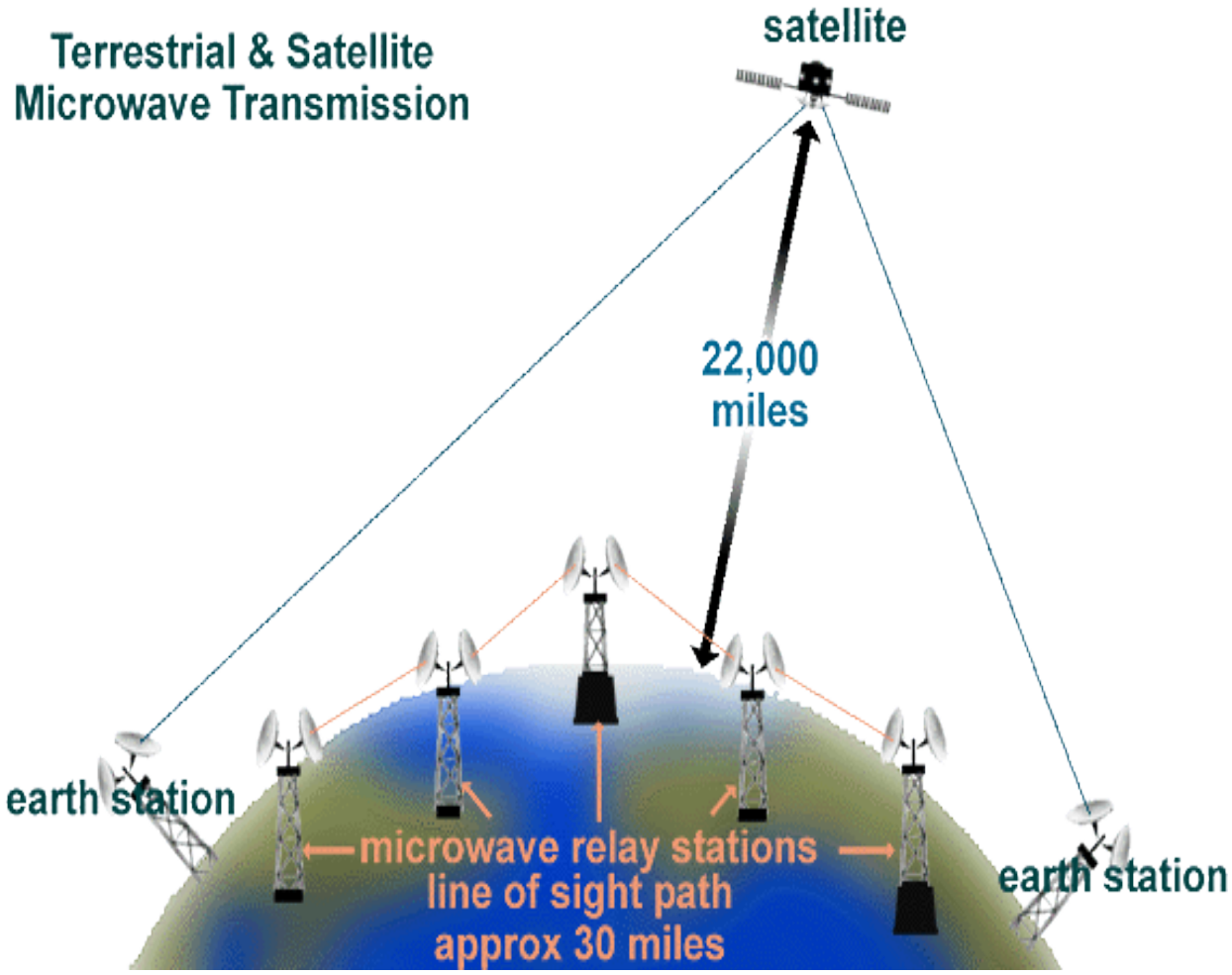
- ❑ Microwaves are high frequency electromagnetic signals used for long distance communication.
- ❑ They provide greater bandwidth and less affected by electromagnetic interference
- ❑ The system consists of a transmitter and receiver and requires a line of sight between the two
- ❑ Two types of microwave networks include:

➢ Terrestrial:

- ✓ Provides communication across short distances using parabolic antennas.
- ✓ The antennas transmit and receive signals up to 10 kilometre away. Higher the location of the antenna in a tower, longer is the distance possible

➢ Satellite:

- ✓ A special satellite dish serving as an antenna is used to transmit and receive signals from overhead.
- ✓ The satellites relay the microwave signals using special devices called transponders.

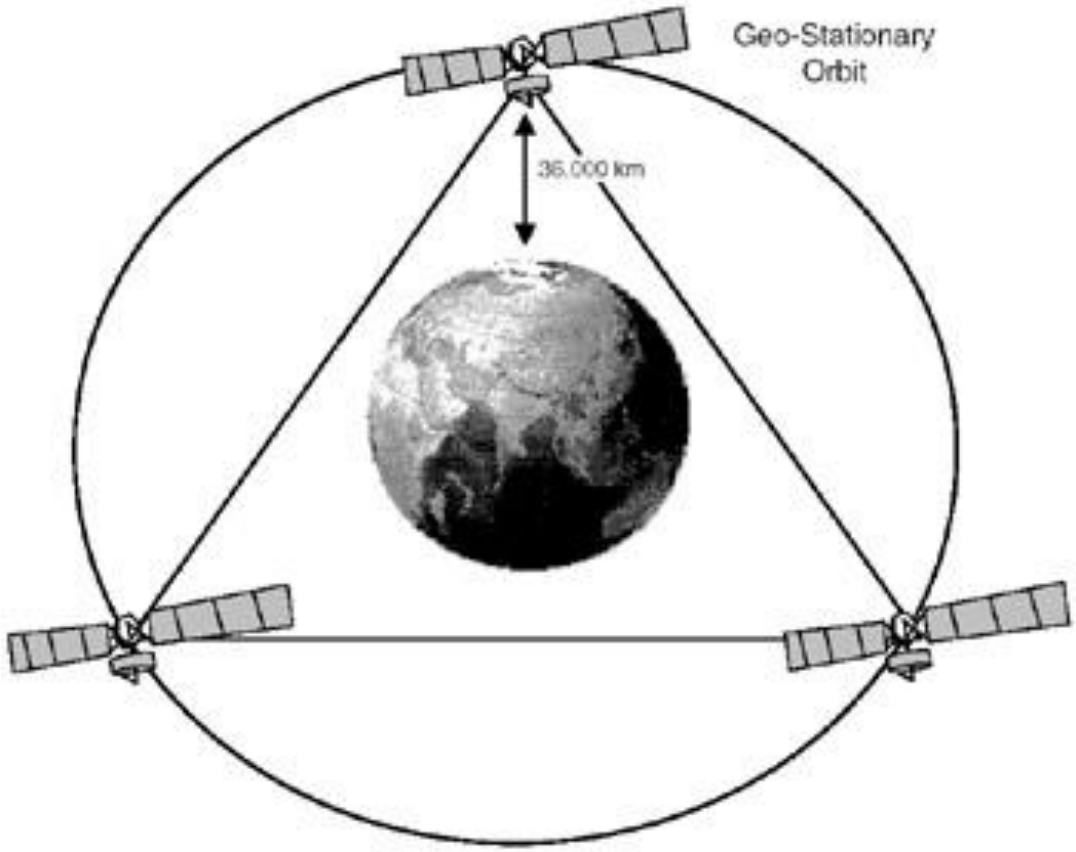


Microwave satellite communication uses satellites at different pre-defined altitudes for different purposes.

Orbit Name	Orbit Altitude	Used For	Remarks
Low Earth Orbit (**LEO**)	200 – 1,200 Km above Earth's surface	Used by communications satellites like the Iridium phone system	Orbit time can be as low as 90 minutes
Medium Earth Orbit (**MEO**)	1,200 – 35,790 Km above Earth's surface	Used by the Global Positioning System (GPS) satellites	Orbit time 6-12 hours
Geo Synchronous Orbit (**GSO**) and Geostationary Earth Orbit (**GEO**)	35,790 Km above Earth's surface	Used for weather forecasting, direct broadcast TV, and communications systems	GSO satellites stay in place over a single longitude, though may drift north to south. GEO satellites remain in the same position throughout the day and orbits once a day
High Earth Orbit (**HEO**)	Above 35,790 Km from Earth's surface	Used for scientific research	Have orbiting time of more than 24 hours

Geostationary Satellite

- A geostationary satellite is an earth-orbiting satellite, placed at an altitude of approximately 35,800 kilometres (22,300 miles) directly over the equator, that revolves in the same direction the earth rotates (west to east).
- It appears as stationary with respect to the surface of the earth.
- At least three satellites, placed at three corners resembling an equilateral triangle, are required to cover the entire surface of earth.
- The signal from the transmitting station to the satellite is called uplink & the one from the satellite back to the ground station is called downlink.



❖ Client Server Computation & Network Software

- ❑ A networked computer system uses the concept of distributed computing, which refers to any computation that involves two or more computers communicating over a network.
- ❑ Client Server computation refers to this distributed computing scheme.
- ❑ In Client Server computation model, an application is split into a front-end client component with which the user interacts, and a back-end server component processes the data.

❖ Network Operating System(NOS)

- ❑ The network operating system or NOS is the network software that allows multiple computers to communicate and share files and hardware devices with one another.
- ❑ The basic functions of a network operating system are:
  - ✓ Maintaining connectivity between network devices and co-ordinate their activities
  - ✓ Providing sharing of data and network resources such as printers and scanners
  - ✓ Implement data and device security on the network through centralised administration
- ❑ NOS that are used nowadays are – Windows Server, UNIX and OS X

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