



**DATA
COMMUNICATION**

**COMPUTER
AWARENESS**

EPIISODE-9



Computer Awareness

Part 7

- Funsta Team

Lets Start





Computer Awareness



- Part 1 Intro/Generation/ Classification of Computers
- Part 2 Computer Architecture & Memory
- Part 3 Computer Hardware
- Part 4 Computer Software and System Utilities
- Part 5 Number System
- Part 6 Computer Codes & Logic Gates





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Computer Awareness

Part 7 Introduction to Operating System

Part 8 Operating System



Lets move on to
Next Part



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Sl. No	Topic	Page Number
1	Data Communication	<u>4</u>
2	Communication channel	<u>8</u>
3	Communication Media	<u>12</u>





Data Communication



Data transmission is the transfer of data over a **point-to-point** or **point-to-multipoint** communication channel.



Examples of such channels are copper wires, optical fibers, wireless communication channels, storage media and computer buses.



There are 3 types



Digital signal



Analog Signal



Hybrid Signal

[Back to Index](#)

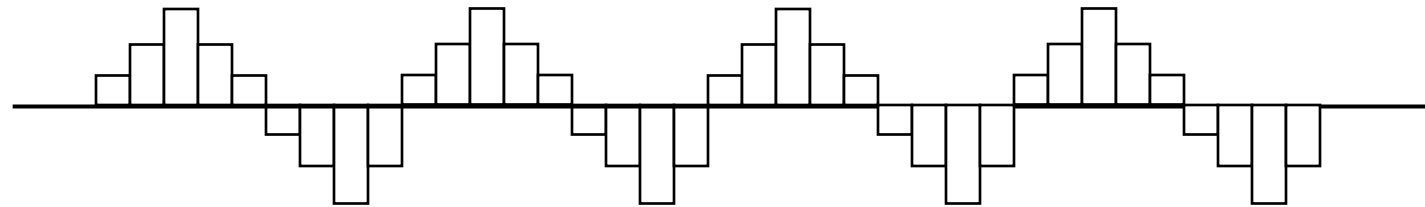
Digital signal



A **digital signal** is a **signal** that is being used to represent **data** as a sequence of discrete values; at any given time it can only take on one of a finite number of values.



Examples of digital **signals** are Computers, Digital Phones, Digital pens, etc.



[Back to Data Communication](#)



Analog Signal



An **analog** or **analogue signal** is any continuous **signal** for which the time varying feature (variable) of the **signal** is a representation of s one other time varying quantity, i.e., analogous to another time varying **signal**.

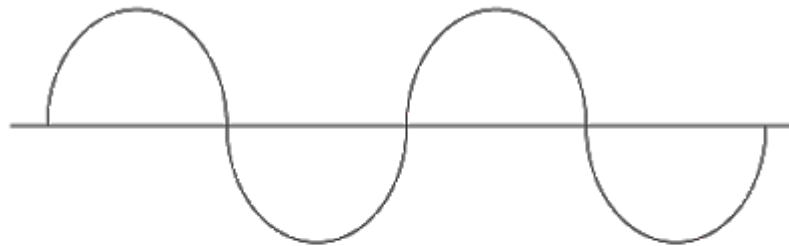


It differs from a digital **signal** in terms of small fluctuations in the **signal** which are meaningful.



Examples of analog signals are Human voice, Thermometer, **Analog** phones etc.

Analog



Back to
Data Communication

Hybrid Signal



- ⟨...⟩ This method uses a synthesis **signal** (hereafter, called as **Hybrid-signal**) for the **data communication** system.
- ⟨...⟩ The **Hybrid-signal** is electrically generated from an analog and digital **signal** by using a **signal** addition circuit.
- ⟨...⟩ Each **signal** (analog and digital) contains the respective information.



[Back to
Data Communication](#)



Communication channel



A **communication channel** refers either to a physical **transmission** medium such as a wire, or to a logical connection over a multiplexed medium such as a radio **channel** in telecommunications and computer networking



Communicating data from one location to another requires some form of **pathway or medium**.



There are 3 types



Simplex channel



Half Duplex Channel



Full Duplex Channel

[Back to Index](#)



Simplex channel



Simplex communication is a **communication channel** that sends information in one direction only.



The International **Telecommunication** Union definition is a **communications channel** that operates in one direction at a time, but that may be reversible;
broadcasting



Examples of simplex include radio broadcasting, television , computer to printer **communication**, and keyboard to computer connections



Back to
Communication channel



Half Duplex Channel



In **half-duplex** mode, each station can **both transmit and receive**, but **not at the same time**. When one device is sending, the other can only receive, and vice versa.



The **half-duplex** mode is used in cases where there is no need for **communication** in both direction at the same time



An **example** of a **half-duplex** system is a two-party system such as a walkie-talkie



Back to
Communication channel



Full Duplex Channel



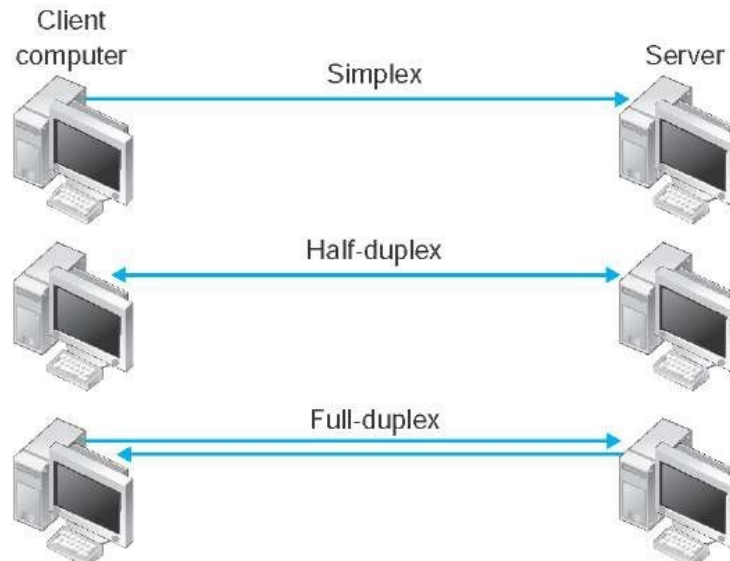
The term **full-duplex** describes simultaneous **data transmission** and receptions over one channel.



A **full-duplex** device is capable of bi-directional network **data** transmissions at the same time.



Example of full duplex mode is: Telephone.



Back to
Communication channel

Communication Media



Communication media refers to the means of delivering and receiving **data** or information.



In telecommunication, these means are **transmission** and storage tools or channels for **data** storage and **transmission**.



There are 2 types



Guided Media or Wired Technologies



Unguided Media or Wireless Technologies

[Back to Index](#)

Guided Media or Wired Technologies



Guided – In **guided media**, transmitted **data** travels through cabling system that has a fixed path.



For Example, Copper wires, fibre optic wires, etc.



It has 3 types



Ethernet Cable or Twisted Pair Cable



Co-Axial Cable



Fibre Optic Cable

[Back to
Communication Media](#)

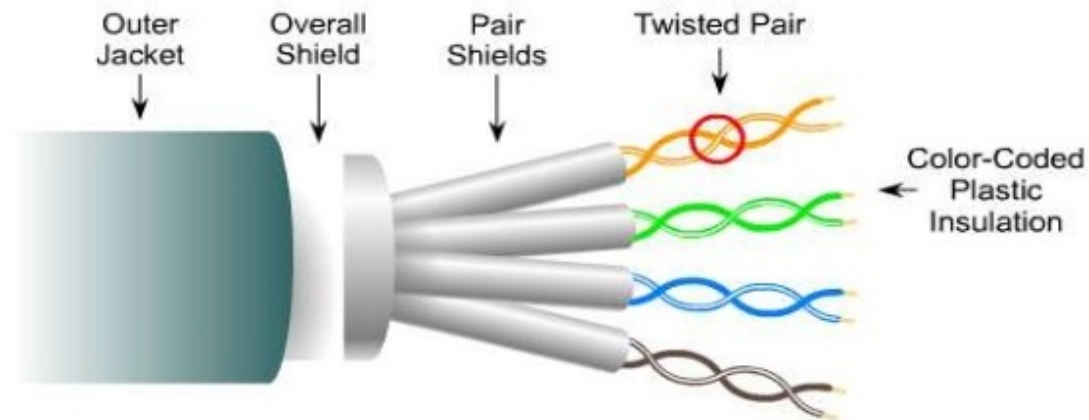
Ethernet Cable or Twisted Pair Cable



Inside an **ethernet cable** **are various copper wires** that are used to transmit **data** and information between the two devices by using analog/digital signals.



These **cables** are used to connect multiple devices and creating or connecting devices to both Local Area Networks (**LAN**) and Wide Area Networks (**WAN**)



Back to
Wired Technologies



Co-Axial Cable



Coaxial cables, commonly called **coax**, are copper **cables** with **metal shielding** designed to provide immunity against noise and greater bandwidth.

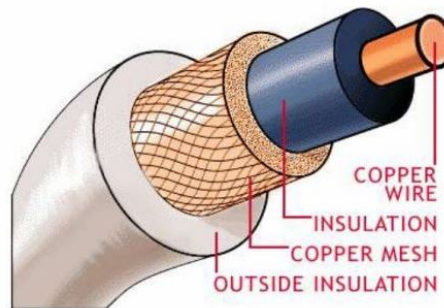


Coax can transmit signals over larger distances at a higher speed as compared to twisted pair **cables**.



Eg: Cable TV Network

A diagram of a coaxial cable



Back to
Wired Technologies



Fibre Optic Cable



A **fiber optic cable** is a network **cable** that contains **strands of glass fibers** inside an insulated casing.



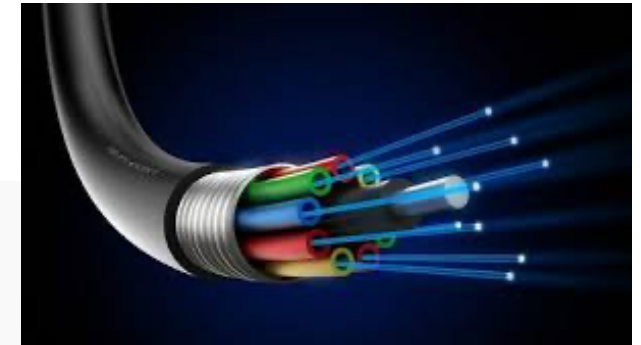
They're designed for long-distance, high-performance **data** networking, and telecommunications.



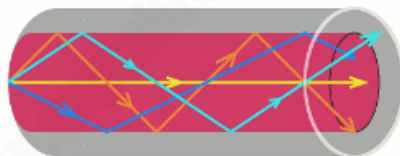
Compared to wired **cables**, **fiber optic cables** provide **higher bandwidth** and transmit **data** over longer distances.



There are three types of fiber optic cable commonly used: **single mode**, **multimode** and plastic optical fiber (POF)

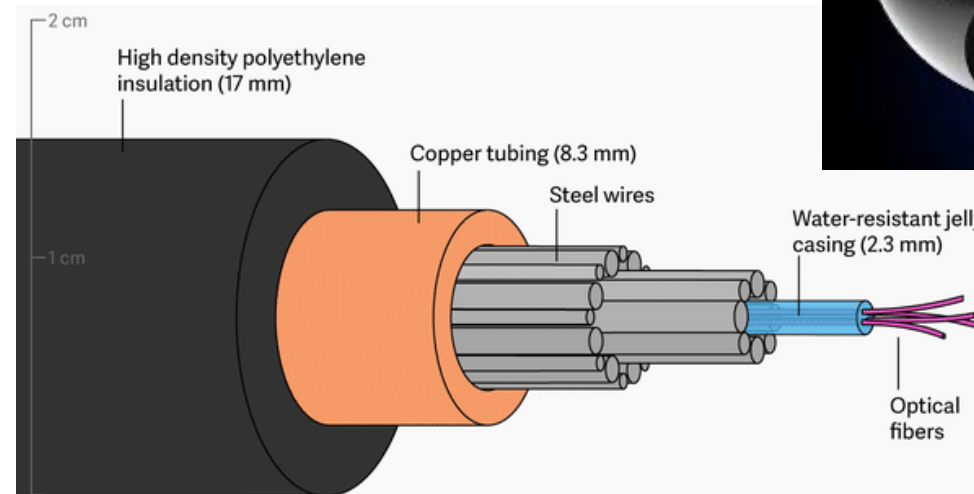


Single-mode fiber



Multi-mode fiber

www.explainthatstuff.com



Back to
Wired Technologies

Unguided Media or Wireless Technologies



An **unguided transmission** transmits the electromagnetic waves **without** using any physical **medium**.



Therefore it is also known as **wireless transmission**.



In **unguided media**, air is the **media** through which the electromagnetic energy can flow easily.



Examples are propagation through air, vacuum and seawater.



It has 4 types



Radio Wave Transmission



Micro Wave Transmission



Infrared Wave Transmission



Satellite Communication

[Back to
Communication Media](#)



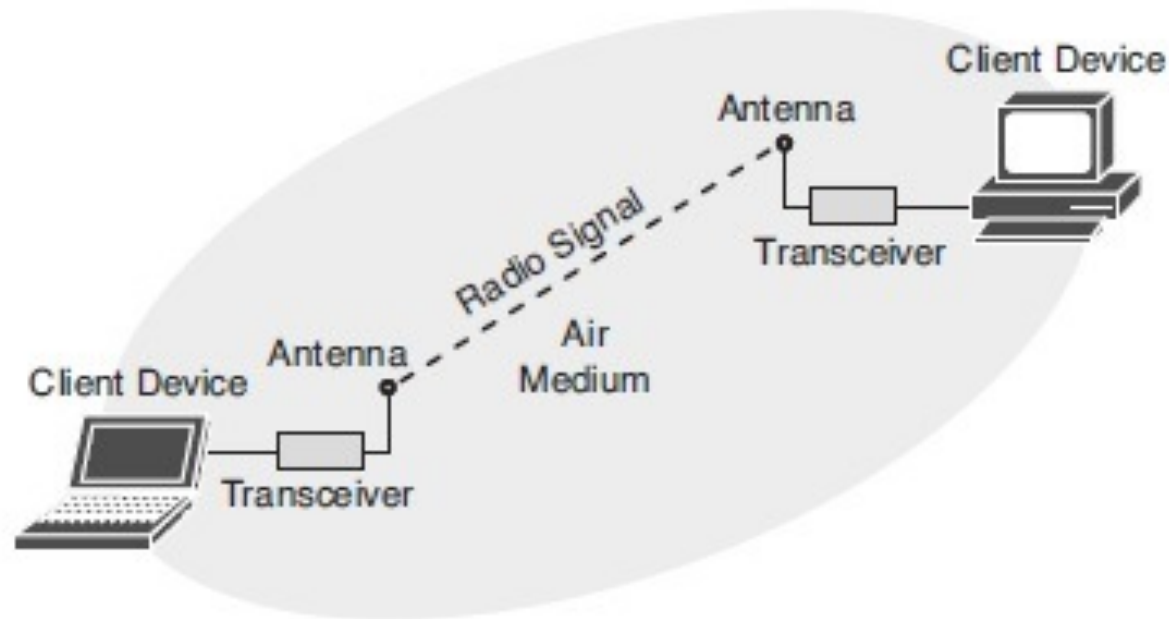
Radio Wave Transmission



When two devices communicate by using radio frequencies is called **Radio Wave Transmission**



It also called as Radio Frequency Transmission



Back to
Wireless Technologies



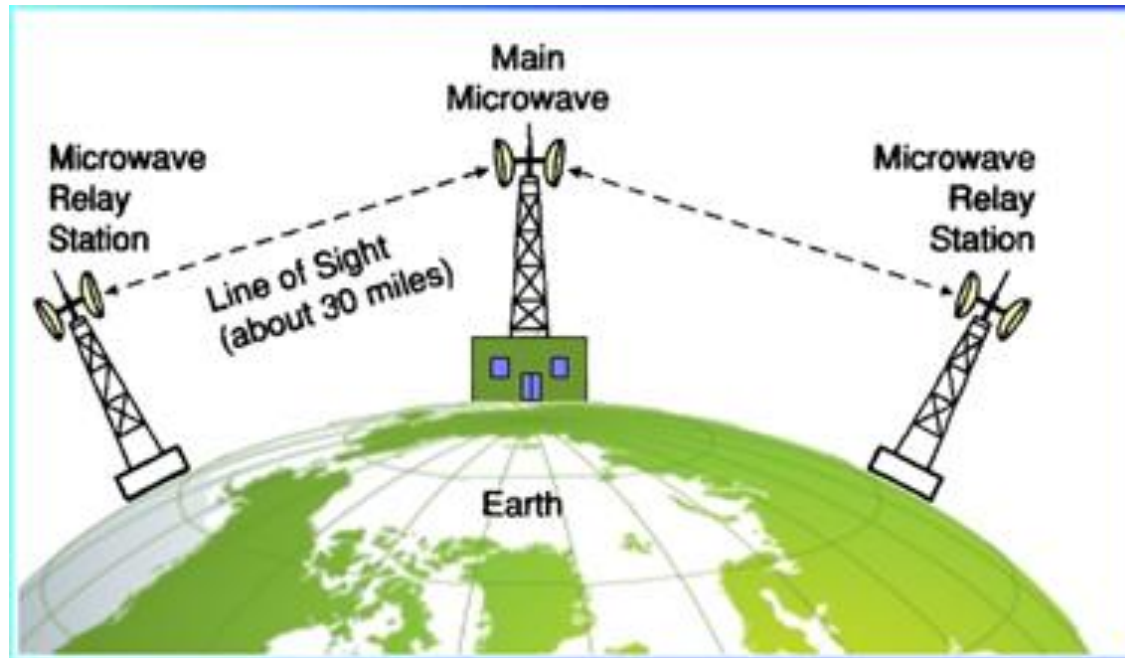
Micro Wave Transmission



When two devices communicate by using Electromagnetic frequencies is called **Micro Wave Transmission**



Electromagnetic Frequency Range - 0.3 to 300 GHz



Back to
Wireless Technologies



Infrared Wave Transmission



Infrared transmission technology refers to energy in the region of the electromagnetic **radiation** spectrum at wavelength longer than those of **visible light** but shorter than those of radio **waves**. **Infrared** technology allows computing devices to **communicate** via short range wireless signals.



It uses TV remote and wireless Speakers



Wireless Technologies



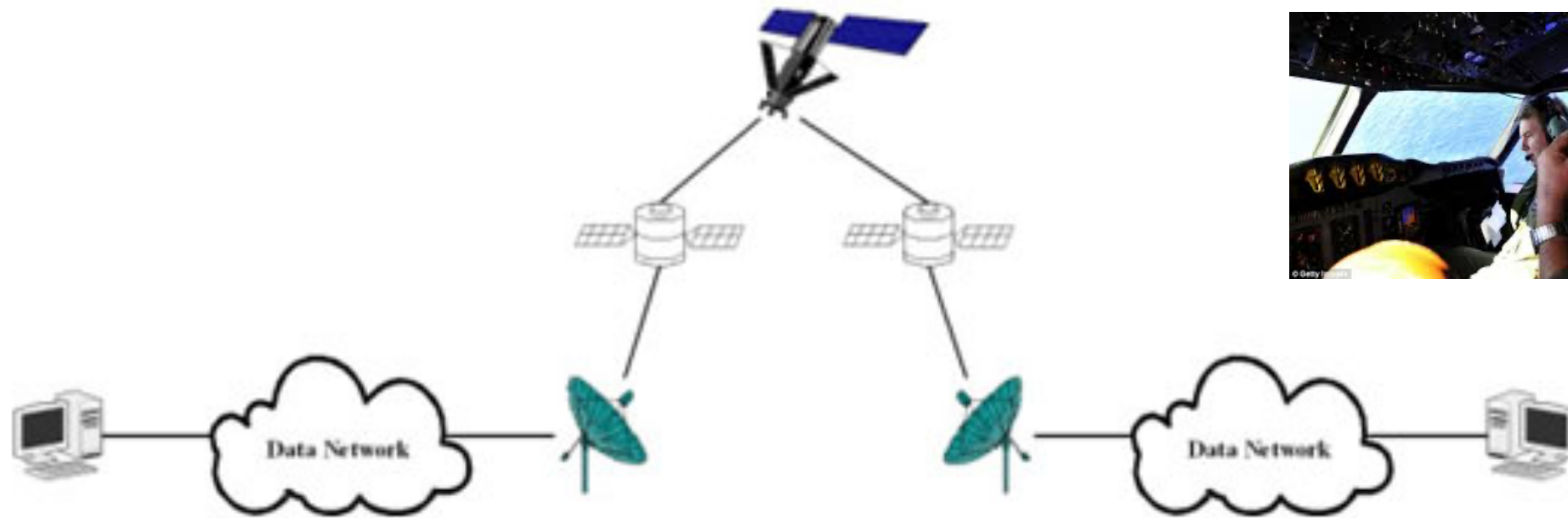
Satellite Communication



This communication is interact with satellites using Radio Frequency Transmission



It is used to ships, Planes, vehicles, Handheld Terminals for communication



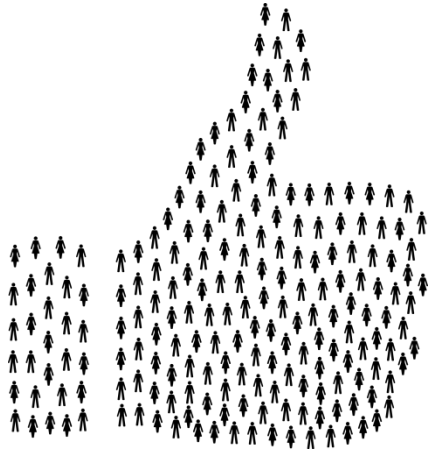
Back to
Wireless Technologies



'Hurrah!'

Next session is

Types of Operating System



Coming
Soon...

