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(UNIT-V) Fundamentals of Communication Engineering.

Introduction :-

Communication is the process of establishing connection or link between two points for information exchange.

OR

Communication is simply the basic process of exchanging information.

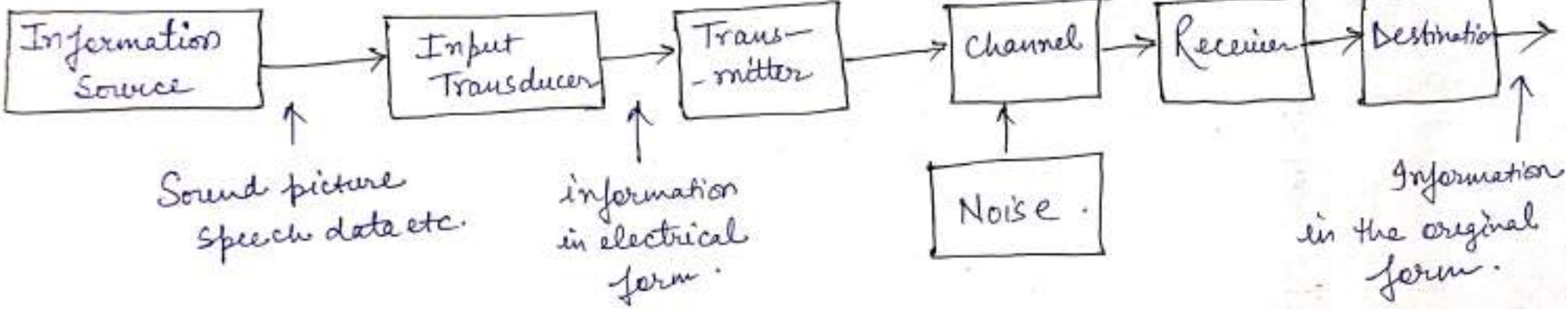
The electronic equipments which are used for Communication purpose are Called Communication equipments. Different Communication equipments when assembled together form a Communication system.

Typical examples of Communication system are line telephony and line telegraphy, radio telephony and radio telegraphy radiobroadcasting, point-to-point Communication, radar communication, television broadcasting, radio telemetry, radio aids to navigation, radio aids to aircraft landing etc.

Elements of a Communication system.

The essential components of a communication system are information source, input transducer, transmitter,

Communication channel, receiver & destination.



Block diagram of a Communication system.

1. Information Source:

We know that a Communication system serves to Communicate a message or information. This message or information originates in the information source. In general, there can be various messages in the form of words, group of words, code, symbols, sound signal etc. However, out of these messages, only the desired message is selected & conveyed or communicated.

In short, we can say that function of information source is to produce required message which has to be transmitted.

2. Input Transducer:

A Transducer is a device which converts one from of energy into another form. The message form the information source may or may not be electrical in nature. In a case when the message produced by the information source is not electrical in nature, an input transducer is used to convert it into a time varying electrical Signal.

For example, in case of radio broadcasting, a microphone converts the information or message which is in the form of sound waves into corresponding electrical signal.

3) Transmitter

The function of the transmitter is to process the electrical signal from different aspects.

For example in radio broadcasting the electrical signal obtained from sound signal is processed to restrict its range of audio frequencies (up to 5 KHz) in amplitude modulation radio broadcast) and is often amplified. In wire telephony, no real processing is needed. However in long distance radio communication or broadcast, signal amplification is necessary before modulation. Modulation is the main function of transmitter. In modulation, the message signal is superimposed upon the high frequency carrier signal. In short, we can say that inside the transmitter the signals processings such as restriction of range of audio frequencies, amplification & modulation are achieved.

The Channel and the Noise.

The term channel mean the medium through which the message travels form the transmitter to receiver. In other words, we can say that the function of the channel is to provide as physical connection between the transmitter & receiver.

There are two types of channels, namely point to point channels & broadcast channels. Examples of point to point channels are wire lines, microwave links & optical fibres. the broadcast channels provide a capability where several receiving stations can be reached simultaneously from a single transmitter.

An example of a broadcast channel is a ~~No~~ satellite in geostationary orbit, which covers about one third of the earth's surface. During the process of transmission & reception the signal gets distorted due to noise introduced in the system. Noise is an unwanted signal which tend to interfere with the required signal. Noise signal is always random in character. Noise may interfere with signal at any point in a communication system. However, the noise has its greatest effect on the signal in the channel.

5) Receiver

The main function of the receiver is to reproduce the message signal in electrical form from the distorted receive signal. This reproduction of the original signal is accomplished by a process known as the demodulation or detection. Demodulation is the reverse process of modulation, carried out in transmitter.

6. Destination

Destination is the final stage which is used to convert an electrical message signal into its original form. For example in radio broadcasting, the destination is a loud speaker which works as a transducer ie. it converts the electrical signal in the form of original sound signal.