# Communication Engineering Notes on Noise

"In common use, the word noise means any unwanted sound". Unwanted signal are called noise.

Classification of Noise:

There are several way to classify Noise, but conveniently Noise is classified as

1) External Noise

2) Internal Noise

External Noise:

External noise is defined as the type of Noise which is general externally due to communication system. External Noise are analysed qualitatively. Now, External Noise may be classified as

a) Atmospheric Noise : Atmospheric Noise is also known as static noise which is the natural source of disturbance caused by lightning, discharge in thunderstorm and the natural disturbances occurring in the nature.

b) Industrial Noise : Sources of Industrial noise are auto-mobiles, aircraft, ignition of electric motors and switching gear. The main cause of Industrial noise is High voltage wires. These noises is generally produced by the discharge present in the operations.

c) Extraterrestrial Noise : Extraterrestrial Noise exist on the basis of their originating source. They are subdivided into

i) Solar Noise

ii) Cosmic Noise



Internal Noise:

Internal Noise are the type of Noise which are generated internally or within the Communication System or in the receiver. They may be treated qualitatively and can also be reduced or minimized by the proper designing of the system. Internal Noises are classified as

1) Shot Noise : These Noise are generally arises in the active devices due to the random behaviour of Charge particles or carries. In case of electron tube, shot Noise is produces due to the random emission of electron form cathodes.

2) Partition Noise : When a circuit is to divide in between two or more paths then the noise generated is known as Partition noise. The reason for the generation is random fluctuation in the division.

3) Low- Frequency Noise : They are also known as FLICKER NOISE. These type of noise are generally observed at a frequency range below few kHz.  Power spectral density of these noise increases with the decrease in frequency. That why the name is given Low- Frequency Noise.

4) High- Frequency Noise : These noises are also known TRANSIT- TIME Noise. They are observed in the semi-conductor devices when the transit time of a charge carrier while crossing a junction is compared with the time period of that signal.

5) Thermal Noise : Thermal Noise are random and often referred as White Noise or Johnson Noise. Thermal noise are generally observed in the resistor or the sensitive resistive components of a complex impedance due to the random and rapid movement of molecules or atoms or electrons.