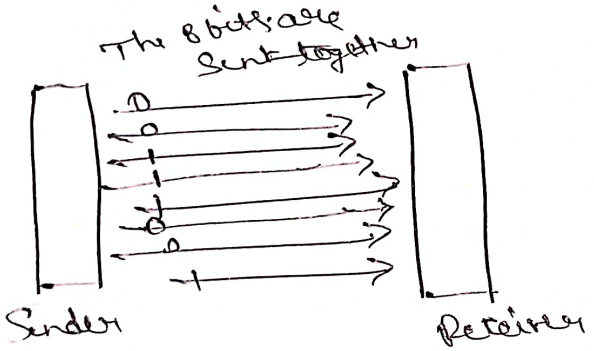
Internals - 02

DC (18CS46)

Shahul Hameed S
1KN18CS097
CSE 'A' Sec

10. Parallel transmission:

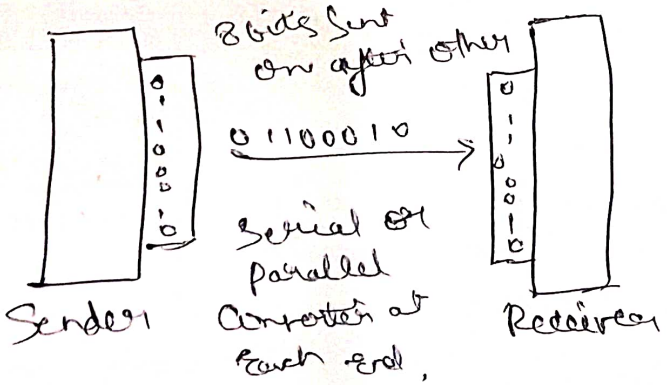
Multiple bits are sent with each clock tick. 'n' bits in a group are sent simultaneously, 'n' wires are used to send n bits at one time. Each bit has its own wire.



Parallel transmission.

Serial transmission:

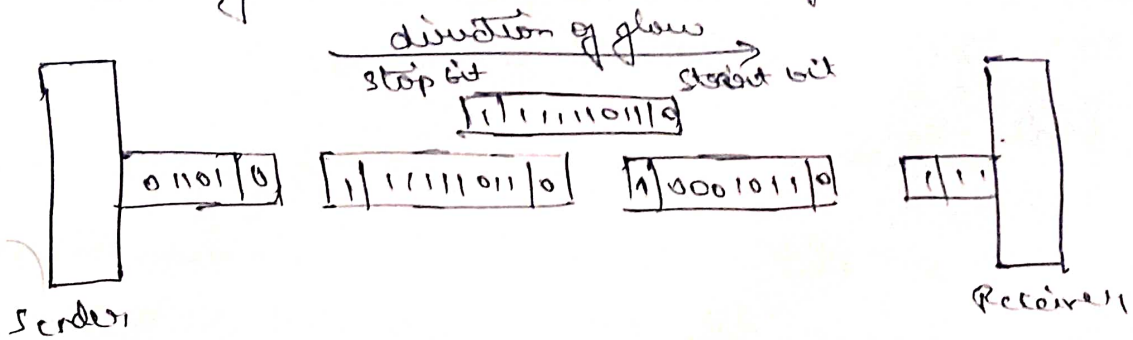
One bit is sent with each clock tick using only a single link.



Asynchronous transmission:

Prior to data transfer, both Sender & receiver agree on pattern of information to be exchanged. patterns are based on grouping bit into bytes.

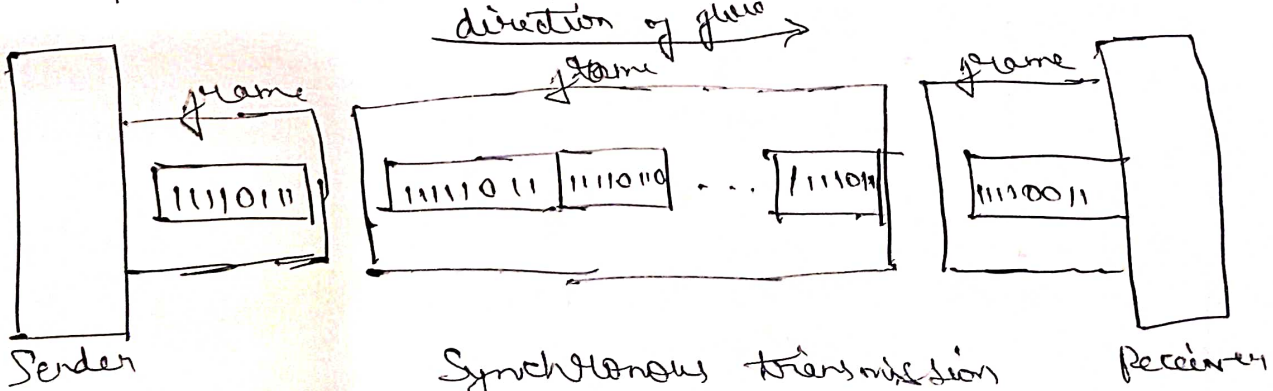
The sender transmits each group bit-by-bit without regard to timers.
As long as these patterns are followed, the receiver receives the info. without timer regard.



Asynchronous transmission

Synchronous transmission:

We send bits one after another without start or stop bits or gaps. The receiver is responsible for grouping the bits.
The bit-stream is combined into longer frames, which contain multiple bytes. If the sender wants to send data in separate bursts, the gaps b/w bursts must be filled with a special sequence of 0's & 1's.



Synchronous transmission

Isochronous:

The isochronous transmission guarantees that the data arrived at a fixed rate. In real time audio/video, jitter is not

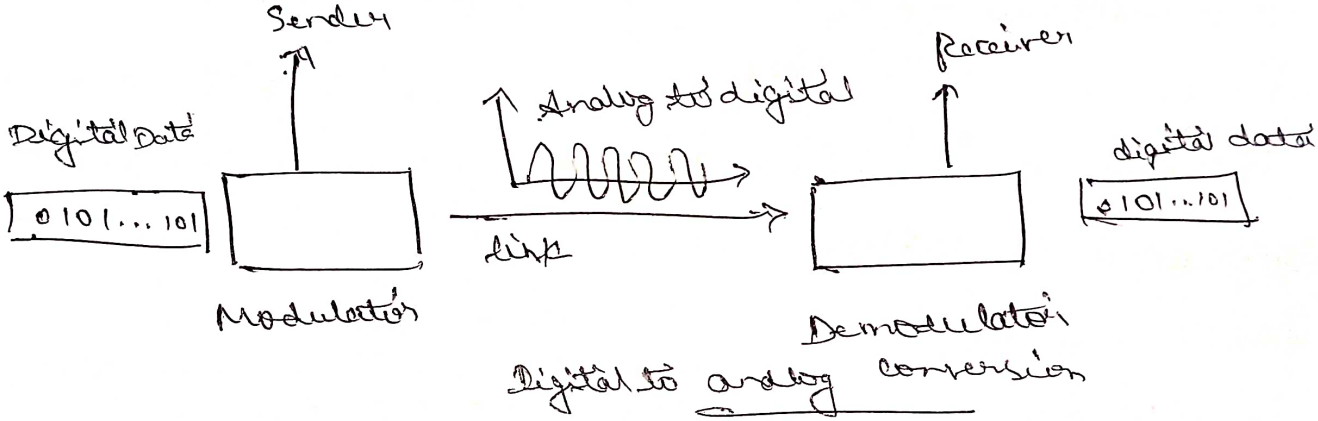
acceptable. Thereafter Synchronous Transmission fails.

1b. ~~Analog~~ Digital to analog :-

It is the process of changing one of the characteristics of an analog signal based on the information in digital signal.

* Sine wave can be defined by 3 attributes:
1. Amplitude 2. phase 3. frequency

When any one of the 3 attributes of a wave is varied, a different version of the wave will be produced.

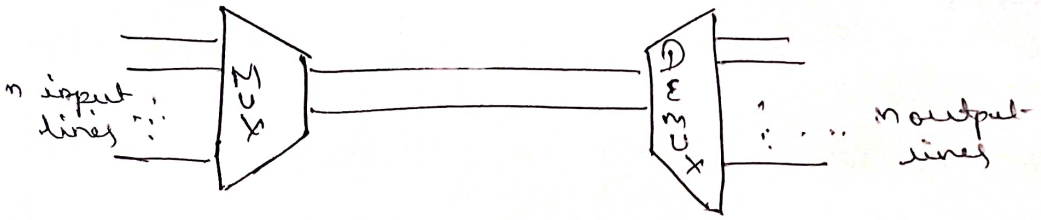


By changing one ~~one~~ attribute in ~~an~~ analog signal, we can use it to represent digital data.

Four methods used in digital to analog conversion.
1. Amplitude shift keying (ASK) 2. Frequency shift keying (FSK)
3. phase shift keying (PSK) 4. Quadrature amplitude modulation (QAM).

QAM is combination of ASK & PSK. it combines changing Amplitude & phase shift keying.

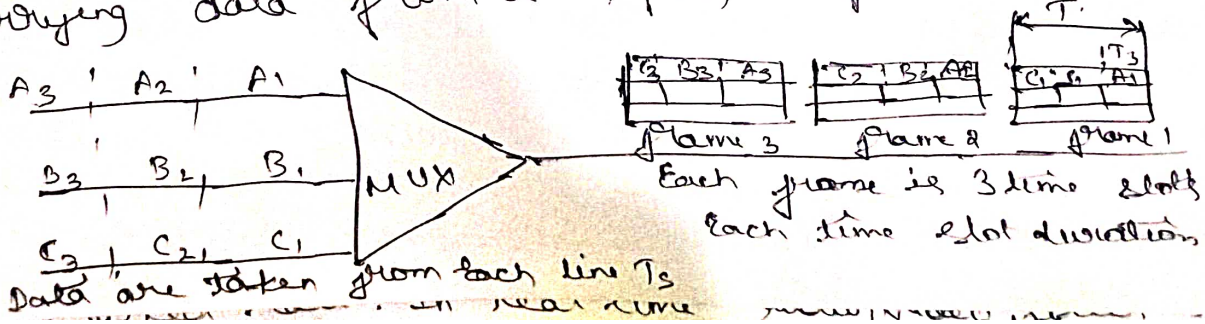
3a. Multiplexing is a set of techniques that allows the simultaneous transmission of multiple signals across a single data link.



~~Synchronous~~

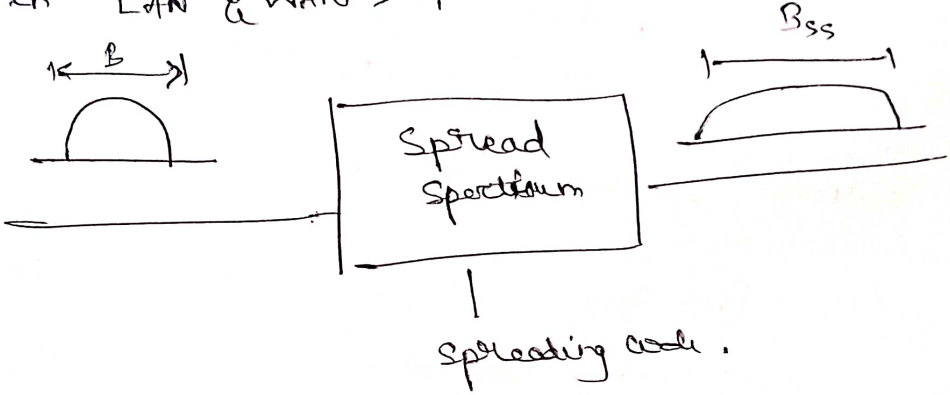
Synchronous TDM: The data flow of input connection is divided into units, where each input occupies one input time slot. The duration of an output time is n times shorter than the duration of an input time slot. A round of data units from each input is collected into a frame, ~~for n frames~~, for n connections, ~~we~~ frames divided into n time slots & one slot is allocated for each unit, one for each input line.

Time slots are grouped into frames. A frame consists of one complete cycle of time slots, with one slot dedicated to each device, In a system with n input lines, each frame has n slots, with each slot allocated to carrying data from a specific input line.



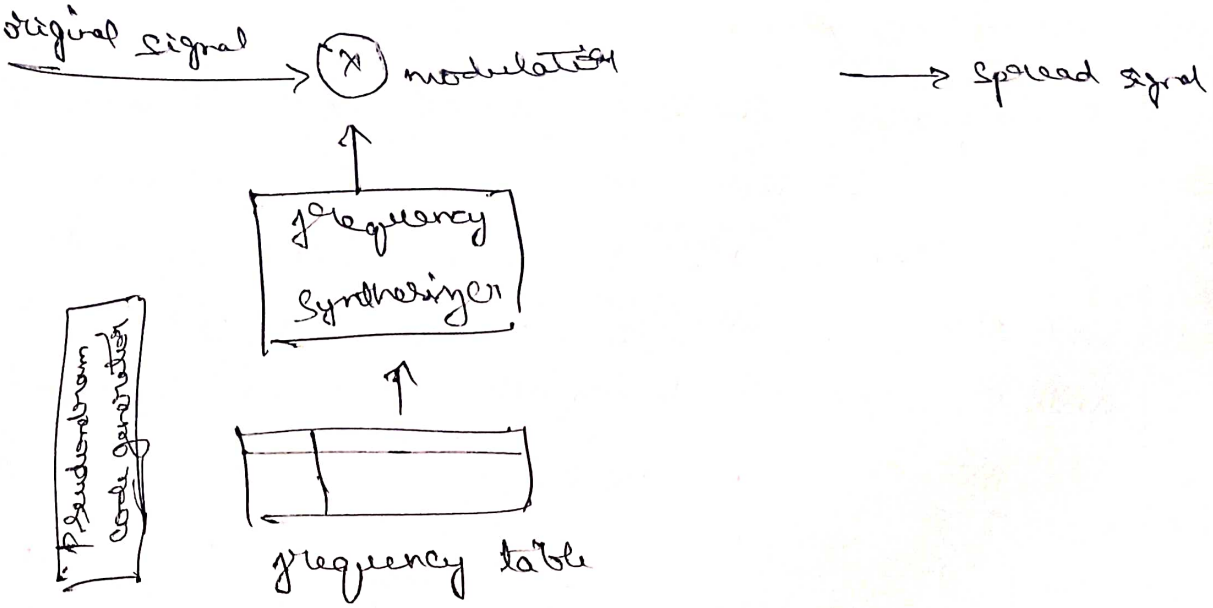
8b Spread Spectrum:

Multiplexing combines signals from several sources to achieve bandwidth efficiency. The available bandwidth of a link is divided b/w the sources. In spread spectrum, we also combine signals from different sources to fit into a larger bandwidth. Spread spectrum is divided to use in LAN & WAN's.



Frequency Hopping Spread Spectrum:

FHSS technique uses M different carrier frequencies that are modulated by the source signal at one moment, the signal modulates one carrier frequency, at the next moment, the signal modulates another frequency carrier. Modulation is done using one carrier frequency at a time. A pseudorandom code generator, called pseudorandom noise, creates a k bit pattern for every hopping period T_H. The frequency tables use the pattern to find the frequency to be used.



Direct Sequence Spread Spectrum:

It expands the bandwidth of the original signal, but the process is different. In DSSS, we replace each data bit with 11 bits using a spreading code. ~~Each~~ Each bit is assigned a code of 11 bits called chips.