Lec-4, CT303, 24-25, Sec A

Both optimality & scalability have enabled internet.

Ac :- link perfor. depends on message prop.
Successive links incur noise accumulation & this limits no. of links that can be cascaded. (seperate optimization for channel cannot be done)

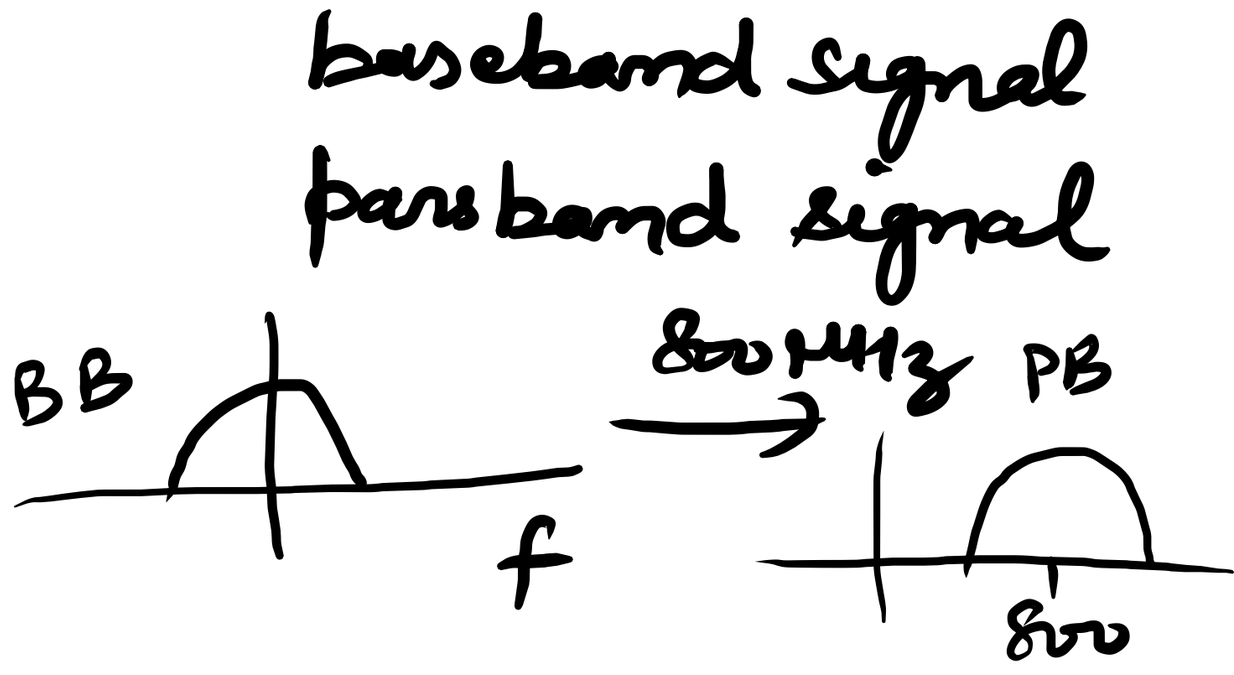
'bit pipes' makes the internet possible.

Then why AC still persists? - Analog circuit design because the physical link over which these bits are sent (after being converted to waveforms)

is analog. Analog design of antennas, mixers and A-D converters is required in order to translate the physical xxd waveform to digital.

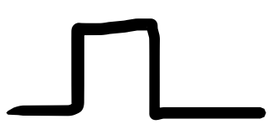
Continuous-Wave modulation (CWM):- some parameter of sinusoidal carrier wave is varied according to message signal. ex- AM, PM & FM.

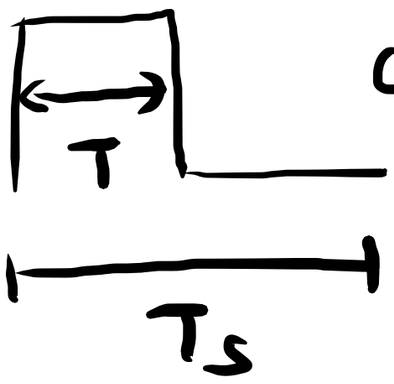
what happens if going to PB is not required.



Pulse modulation :- Some parameter of a periodic pulse train is varied in accordance with the message signal.
(PuM)

Analog PuM





Analog PuM :- inform. is txd in analog form but at discrete times.

Digital PuM :- Message signal is discrete in time

Digital PuM

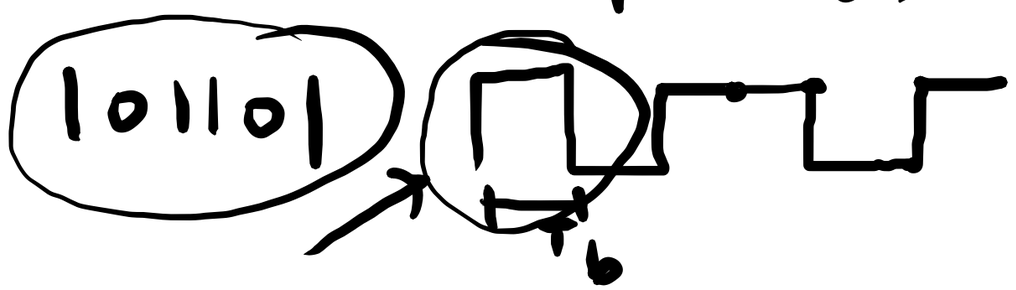
can vary A, T & position in Ts.

PAM, PWM, PPM

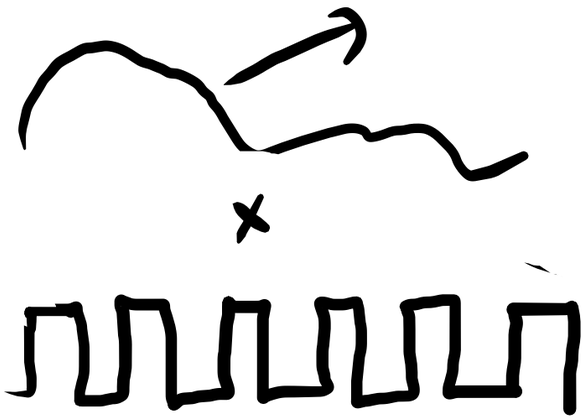
PAM – Pulse amp. mod.

PWM – Pulse width "

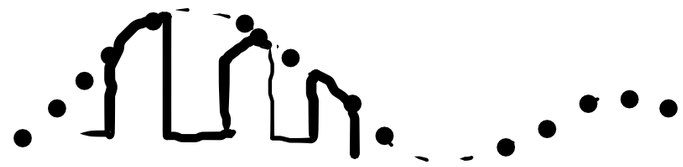
PPM – Pulse position ".



and amplitude both, hence can be Txd as a seq. of coded pulses.



Digital comm:- the base seq. is use of coded pulses for Tx. of analog information bearing signals.



Sampling process :-

Analog signal → seq. of samples that are 'usually' spaced uniformly in time

Q. rate or procedure s.t. seq. of samples 'uniquely' defines the original

analog signal. (sampling process should have a mechanism for distortion less regeneration)

→ Let us take an arbitrary signal g(t) of 'finite energy' & 'specified at all time'.

→ Sample the signal g(t) instantaneously & at a uniform rate, once every T_s seconds

$\{g(nT_s)\}$, $n \in \mathbb{Z}$ (integers)

T_s:- sampling period - you get inf. seq. of samples spaced T_s seconds apart.

f_s:- $1/T_s$ · sampling rate - no. of samples every second.