signal's properties Basics of Modulation A con (wt + 0) 1 amplitude (3) What is deta Modulation: commen stand . 9 a briequency Modulation is the process of changing the characteristics of an carrier signal W.r.t a message modulating signal. Modulation 2 2st respect signal Pace asses aspo A The mark and 1) carrier Signal Properties ii) mog I modulating -> Amplitude > briequency - Phase Torright and D signals involved in the process of modulation. (Main data Total transmit i. Message | Modulating Signal! It is an audio on video signal containing the necessary

data on intormation to be transmitted.

- range: 20 HZ - 20 KHZ

- It is a low tree quency signed.

with

to

## 11. Conrien Signal!

This a high brequency signal with trequency

range broom (10k Hz to 3000 MHz whose
characteristics such as amplitude brequency on

phase is altered with the message modulating

Signal.

Basically massage signal writers over carrier signal by the process of modulation.

word ou -

## Marriagor objurnadulation

- 1) Amplitude Modulation, 2) Frequency Modulation
- 3) Phanel Modulation. and he persupond only

the fire was the life on and frompand

and the majorest of the subject in all

completely was at horis

# Why do we need modulation? There are 4 reasons 2) Frequency range and Energy,
2) Antenna Tength, Wiredens scommunication, south of south 4) Intenterence. Sanal. reidus ... suited sono and 1) Frequency range and Energy tig sire process or modellation. we know,

1 stable Energy 21 Frequency

- bon, mennage, pignal is mitaliball shilling it

the briequency is low. Since we have low briequency, then we will get low energy content. It is not helpful able to transmit the mensage signal in long distance.

## 2) Antenna Length

- mentally raining a thing have been - For effective radiation of energy into space,
- . the length of the antenna should be equal to the

Wavelength of the wave

A. Elizado et Janes Ragina

wave'n speed = light's speed TENEV ON SUNT C=62 tobmin = 20 Hz C A brown = 20kHz Cramina = 12000 Eme

Reamon n of modulation

- 3. Wireless Communication
- 4. Ebbech of Intentace intentience.
- (3. Wirelens Communication Audion Frequency signals on message signals material, medium bon transmission. For this reason their transmission range in Low.

twinted cable copper cable @ carrier signal on radio signal brequency signals do not need any material medium bon transmission. Since carrier signal has high brequency, so they have high energy components As a result their transmission range is vast.

were the same of the same willing to the same of

4. Ebbects of Interstence

=> From electro magnetic wave theory, we can nay

mutual intersperence is higher when the brequency ob a signal is low and meetual interspersence is

Lower when the brequency of a signal is higher.

mespage inignal Comput out up

Q' mutual an high 200 Por Fa pb 2551 Face onto

School Reference

Same Barrier Solution Hundal mar ado modulation Lis earrier signal Ls brequency - high Ly It will no low intentenence - That should be Ac Danve & a fell record our goal 1 Moran Les & A Maria Q: Reasons of modulation - 23 201 technique # Amplitude modulation. 1 ("112 51) 418 - 4/ 41, - 11/ 400 } 100 + + 4 30 ain 24 = It is the process in amplitude of carrier signal charges W.R. t. mesnage (modulating) signal. principal (- (A) (A) 3 flor director to " or " or thinks for -> messages, mce) = Am Sincomt ->+ -> carrier rignal c(t) = presumer + > modulated signal, &CH = A' PinWet

MCL) = A' since t = (Ae+m(x), sin wet = (Ac + Am sin wmt) sin wet = Ac (1+ (Am) sin wmt), sin wet Hair = Ac (1+ M sin Wmt). sin wet Ac Ninwet + AeM. nin wet. sinumt = Acrin wet + AcM. 2 (sin wet . nin w t) of modulation - 20 pt dechnque 2 SinA SinB = con (A-B) - con (A+B) = Ae sin wet + AcM { con(we-wm) t - con (we + wm) t} complified of courier organi S(x) -> having 3 brequencies we, we-would we toom Ac - amplitude