SNS COLLEGE OF TECHNOLOGY

An Autonomous Institution
Coimbatore-35

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A++' Grade(III Cycle)
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

19ECB301-ANALOG AND DIGITAL COMMUNICATION

III YEAR/ V SEMESTER

UNIT 1 – ANALOG COMMUNICATION

TOPIC – Pulse Communication-PPM

PULSE POSITION MODULATION

•Pulse position modulation is a modulation technique in which the position of pulse varies according to instantaneous value of amplitude of sampled modulating signal.

• The width of pulses remains constant only there position changes. Hence transmitted power remains same.

ACTIVITY

What is the role of channel in communication system?

a) acts as a medium to send message signals from transmitter to receiver
b) converts one form of signal to other
c) allows mixing of signals
d) helps to extract original signal from incoming signal

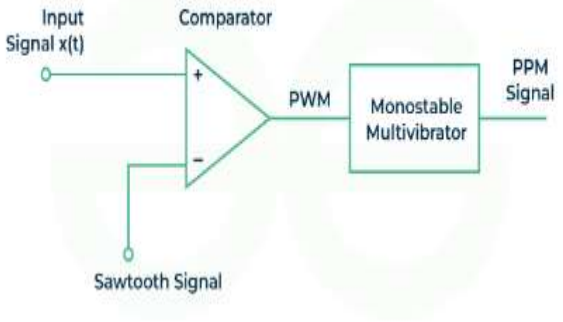
GENERATION OF PPM SIGNAL

•In this block diagram, Firstly a PAM(pulse amplitude modulated) signal is produced which is processed at comparator to generate a PWM (pulse width modulated signal) .

•After processing, the output of comparator is fed as an input to monostable vibrator.

•Being negative edge-triggered, the output of vibrator goes high with trailing edge of PWM signal.

•The trailing edge of PWM shifts with modulating signal creating PPM pulses.



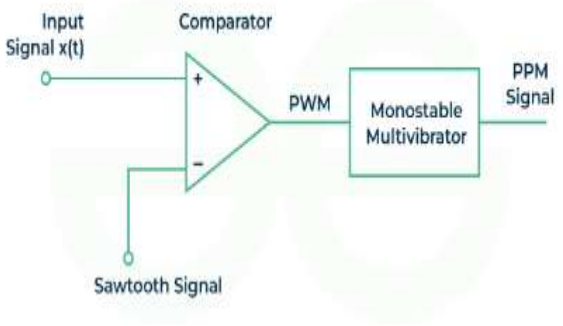
DETECTION OF PPM SIGNAL

•In this block diagram, Firstly a PAM(pulse amplitude modulated) signal is produced which is processed at comparator to generate a PWM (pulse width modulated signal) .

•After processing, the output of comparator is fed as an input to monostable vibrator.

•Being negative edge-triggered, the output of vibrator goes high with trailing edge of PWM signal.

•The trailing edge of PWM shifts with modulating signal creating PPM pulses.



ADVANTAGES OF PPM

- Due to constant width of pulse , the transmission power remains constant and displays no variations.
- PPM shows better noise immunity as compared to an amplitude modulated signal. This is because information in PPM is stored in position rather than amplitude.
- The recovery process of PPM signal from its distorted form is easy and simple.
- The PPM system has very low system requirements so it is frequently used in lightweight appliances with simple accessories.
- The all-over power required for such system is low as compared to PAM making it a power-efficient modulation technique.

DRAWBACKS OF PPM

- The major limitation of this technique is that it requires large bandwidth as compared to other methods increasing the bandwidth consumption.

- In order to perform detection of this signal at receiver, it is necessary that transmitter and receiver are synchronized. This is not possible every time.

- It is really sensitive to phenomena like interference which can disturb a transmission by changing the difference in arrival times of every signal.

APPLICATIONS OF PPM

•This modulation technique finds its application in air traffic control systems, in radio control and in military applications.

•Since PPM is used in non-coherent detection when we don't require a receiver having a PLL(Phase lock loop) for tracking carrier phase.

•Since this modulation technique helps in compression of data, it is often used for storage purpose.

•We can employ PPM in optimal communication. This is done to minimize the dispersion effect and efficiently use the laser power.

•PPM is employed in remote control systems, in which a stream of pulses is used to encode the information in bits.

ASSESSMENT

1.What is PPM?

2. List the applications of PPM.

THANK YOU