

Modulation techniques

Pulse amplitude modulation, Digital pulse modulation

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Analog Pulse Modulation techniques

- Sample \rightarrow Pulse
- Pulse properties: amplitude, width, phase/position
- Modulation technique for each property: PAM, PWM, PPM

Pulse Amplitude Modulation

- Sequence of finite-width τ pulses
- Signal level \rightarrow pulse height
- Analog signal sampled at pulse edge: $m_\delta = m(nT_s)\delta(t - nT_s)$
- Holding circuit: $h(t) = \text{rect}\left(\frac{t - \frac{1}{2}\tau}{\tau}\right)$

Delta Modulation

- Delta modulation technique in which the message signal is encoded into a sequence of binary symbols.
- It is an analog to digital and digital to analog conversion technique.
- It is the simplest form of DPCM cause the transmitted data are reduced to a 1-bit