
Modulation Techniques and Bandwidth Est.

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Introduction

- Communication systems
 - Data transmission
 - Larger distance transfer
 - Accurate data transfer
 - Low Noise
-

What is Modulation ?

Modulation is a **process** of changing the characteristics of the wave to be **transmitted** by **superimposing the message signal on the high-frequency signal**. In this process video, voice and other data signals modify high-frequency signals – also known as the carrier wave. This carrier wave can be DC or AC or pulse chain depending on the application used. Usually, a high-frequency sine wave is used as a carrier wave signal.

Important Terms

- Modulating Signal
 - Carrier Signal
 - Modulated Signal
-

Why Modulation is Used in Communication?

- To make it more powerful for transmission
 - No Interference between different signals
 - Practical Antenna Size
 - Larger Distance Transfer
-

Types

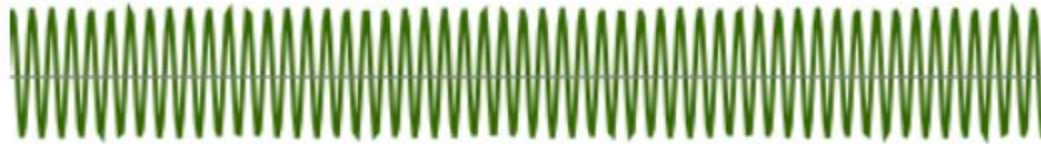
- Analog
 - Digital
-

Analog

Types

- Amplitude modulation (AM)
 - Frequency modulation (FM)
 - Phase modulation (PM)
-

Carrier

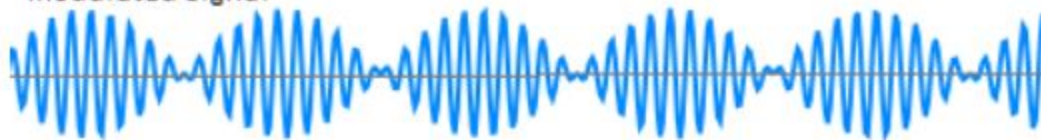


Modulating Signal



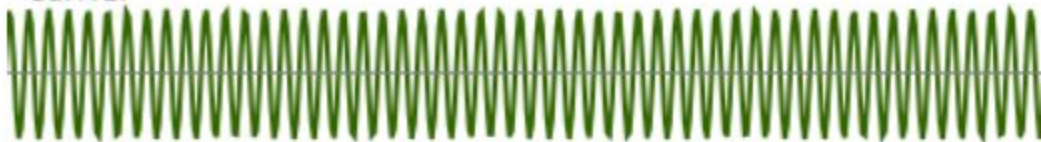
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Modulated Signal



Amplitude Modulation

Carrier

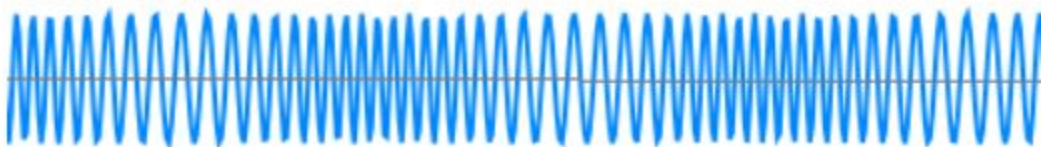


Modulating Signal



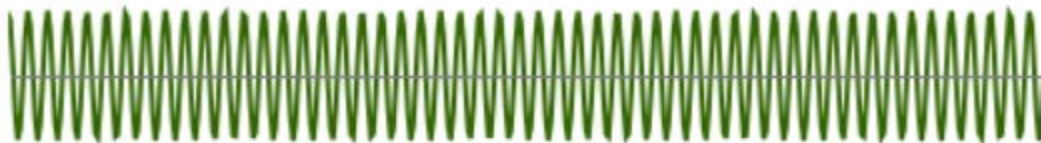
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Modulated Signal



Frequency Modulation

Carrier

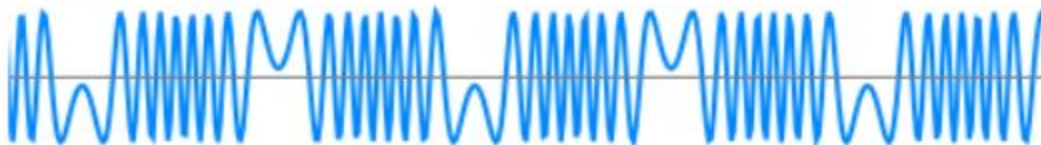


Modulating Signal



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Modulated Signal

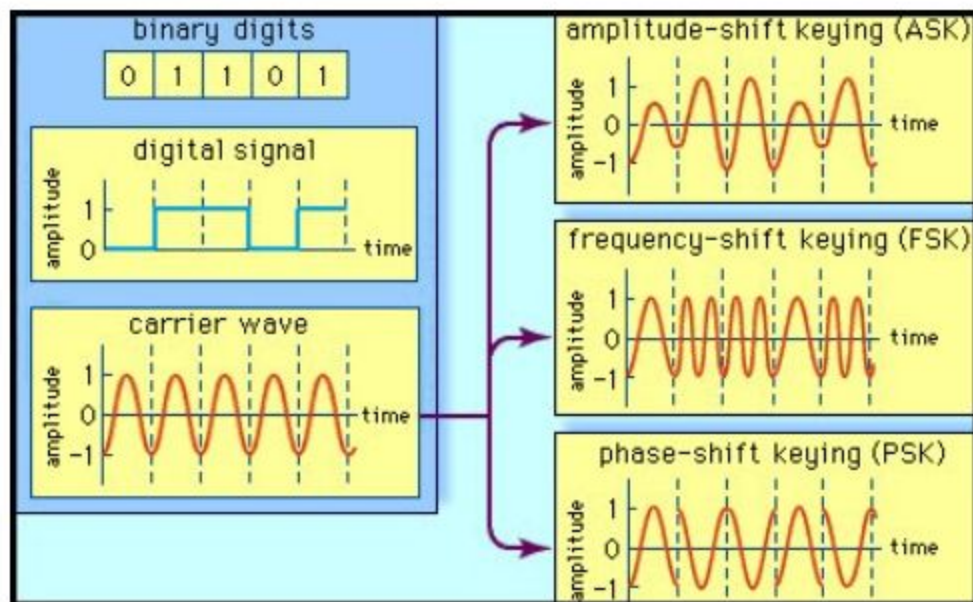


Phase Modulation

Digital

Types

- Amplitude Shift Key(ASK) Modulation
 - Frequency Shift Key (FSK) Modulation
 - Phase Shift Key (PSK) Modulation
-



Digital Modulation

Advantages

- It reduces the size of the antenna.
 - It reduces the cost of wires.
 - It prohibits the mixing of signals.
 - It increases the range of communication.
 - It improves the reception quality.
 - It easily multiplexes the signals.
 - It also allows the adjustment of the bandwidth.
-

Disadvantages

- The cost of the equipment is higher.
 - The receiver and the transmitter are very complicated.
 - For better communication, the antennas for the FM system must be kept closed.
 - It is not efficient for large bandwidth.
 - Power wastage takes place.
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Thankyou
