Modulation in communication system

Group 10 Sec B

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Outlines

- Introduction to modulation in communication system.
- Types of modulation
- Modulation schemes
- Modulation and Demodulation
- Interface
- Types of modulation
- Real-life Applications
- Hardware Components
- Conclusion
- Acknowledgement
- References

Introduction to modulation in communication system

What is modulation?

Modulation is the process of converting data into radio waves by adding information to an electronic or optical carrier signal.
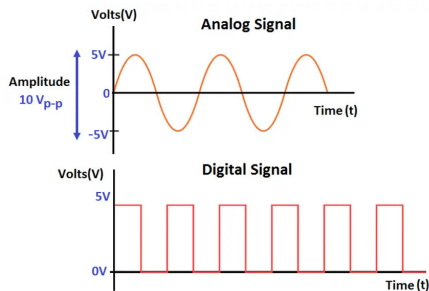
A carrier signal is one with a steady waveform – constant height, or amplitude, and frequency.
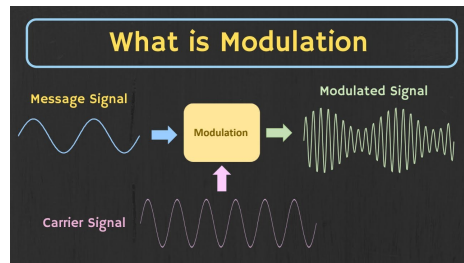
Modulation schemes

Analog and digital

- Modulation schemes can be analog or digital

- An analog scheme has an input
  wave that varies continuously like a sine wave.

- In digital modulation
  scheme, voice is sampled at some rate and
  then compressed and turned into a bit stream

Modulation and Demodulation

Modulation vs demodulation

- Modulation is the process of encoding information in a transmitted signal

- Demodulation
  is the process of extracting
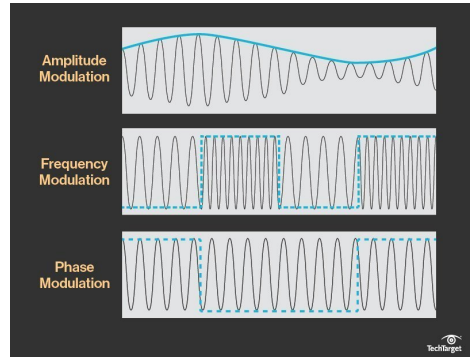 information from the transmitted signal

AM Modulation/Demodulation
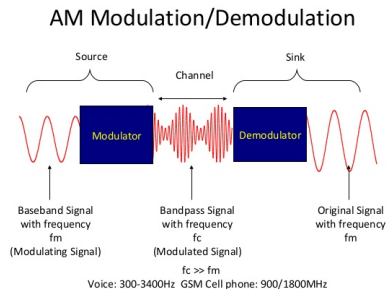
Types of modulation

What are the types of modulation?

- Amplitude modulation (AM)

- Frequency modulation (FM)

- Phase modulation (PM)

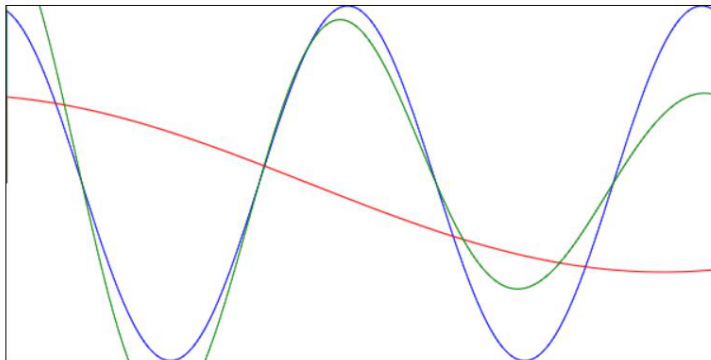- Polarization modulation

- Pulse-code modulation

Interface

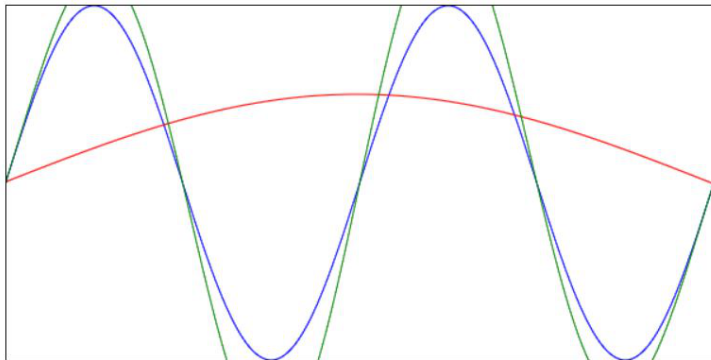Carrier Signal

Modulation Signal

Amplitude-Modulated Signal

Interface

Real-life Applications

Amplitude Modulation

- Broadcast radio, Two-way radio communication, Air traffic control

Frequency Modulation

- FM radio broadcasting, Television broadcasting, Wireless communication

Phase modulation

- Digital communication, Radar systems

Polarization modulation

- Optical Communication, Liquid Crystal Displays (LCDs).

Pulse Coded Modulation(PCM)

- Digital audio transmission, Voice over Internet Protocol (VoIP)

Hardware Components

- Oscillator
- Operational amplifier / Power amplifier
- Mixer Circuit (using transistor)
- Modulation Circuitry
- Filters
- Stable power supply

Conclusion

- The project focused on studying modulation in communication systems and developed an interface to generate modulated waveform
- It provide insights into modulation techniques and practical experience in waveform generation and analysis
- The interface has made with HTML CSS and we further more working on it to serves as a valuable tool for research, experimentation, and education in communication technology

Acknowledgement

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References

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THANK YOU!!!