

8.2.5 DIGITAL COMMUNICATION

Electromagnetic waves have potential for future communication technologies and data storage technologies

5.1 Identify types of **communication data** that are stored or transmitted in **digital form**

- Digital communication changes **analog signals** to **binary** (1 or 0)
- **Amplitude** is measured by the binary – in 8-bit processing, amplitude is broken into 8 sections (0 to 7)
- **Frequency** is automatically included – **more often oscillation of amplitude = higher frequency** of signal
- Data superimposed on carrier wave then decoded by **digital-to-analog converter (DAC)**
- **Advantage:** if **interference** occurs, easier to distinguish a pulse or not – easily removed
 - Analog interference more difficult to remove, and retransmission causes degradation

CDS AND DVDS

- **CD** (Compact Disc): Plastic, metal coated disc with data stored in **pits** – lack of pit is 0
 - Light reflected off surface and intensity of reflected light is translated into electrical signal
- **DVD** (Digital Versatile Disc): increased storage capacity – **pits are smaller** and closer

TELECOMMUNICATIONS

- **Telecommunications** – use of computers for communication
- **Modems** (**MO**ulate and **DE**Modulate) convert digital output from computers into analog, to be sent over a telephone line

GLOBAL POSITIONING SYSTEM

- 24 satellites orbiting Earth, emitting microwave signals
 - Receiver must be in direct line of sight, and measures distance from satellite (by checking time)
- In the diagram:
 - First satellite positions receiver to a circumference of a circle
 - Second satellite positions **receiver to two points**
 - Third satellite positions the **receiver to one point**

