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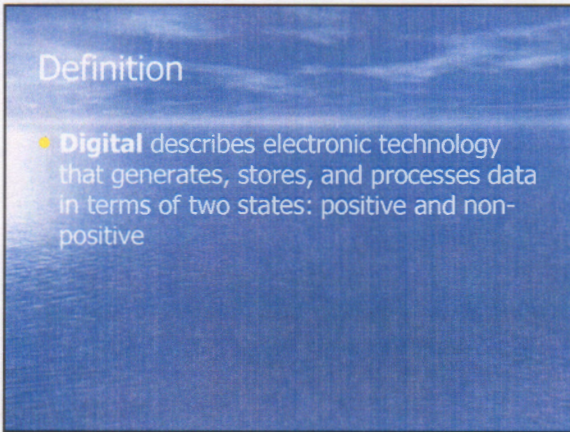
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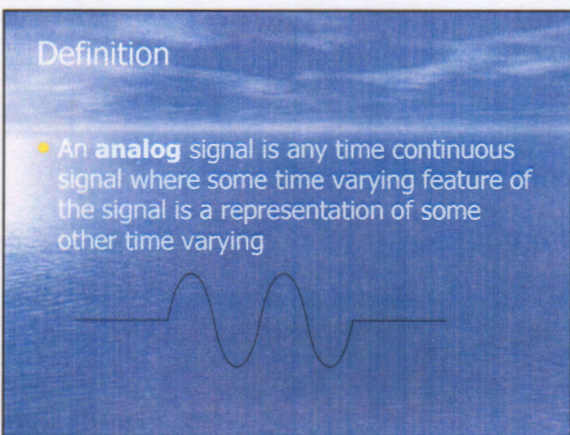
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Things that are Digital

- Light Switch
- Computer
- CW

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Things That are Analog

- Sound from speaker
- AM/SSB Signal
- Human Voice

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Decimal and Binary Numbers

- Base 10 Number 125
- $(1 \cdot 10^{**2}) + (2 \cdot 10^{**1}) + (5 \cdot 10^{**0})$
- Base 2 (Binary) Number 101
- $(1 \cdot 2^{**2}) + (0 \cdot 2^{**1}) + (1 \cdot 2^{**0})$
- $125_{10} = 1111101_2$
- $101_2 = 5_{10}$

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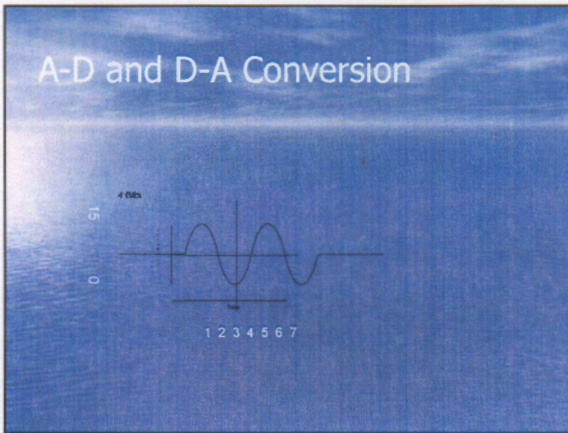
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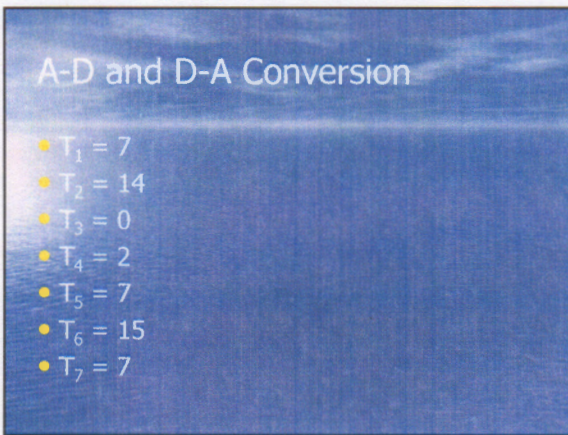
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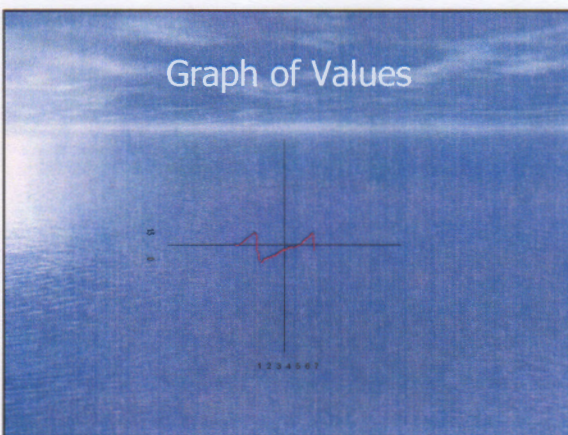
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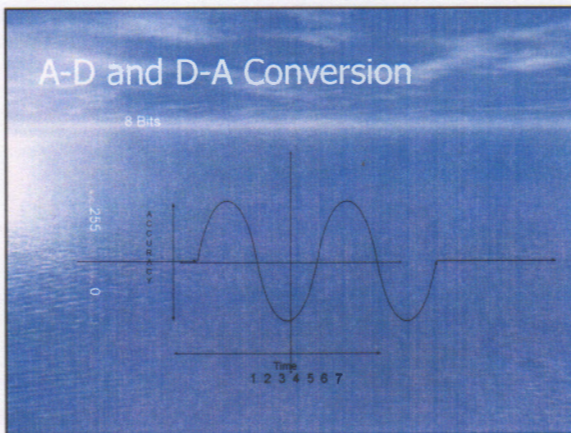
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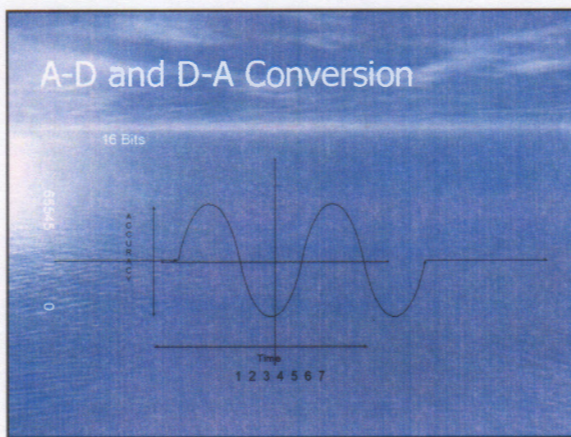
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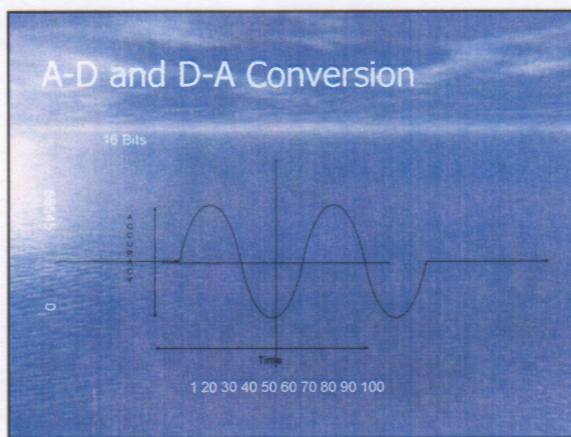
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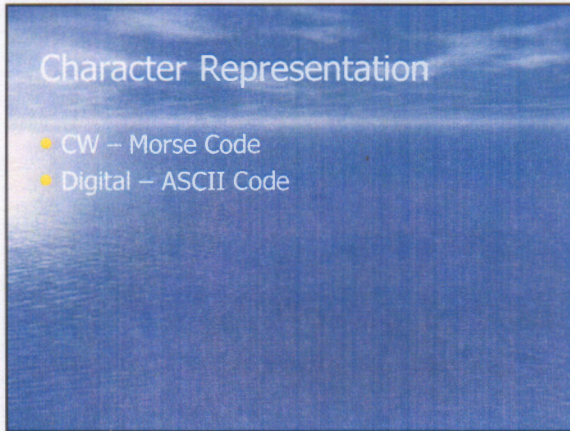
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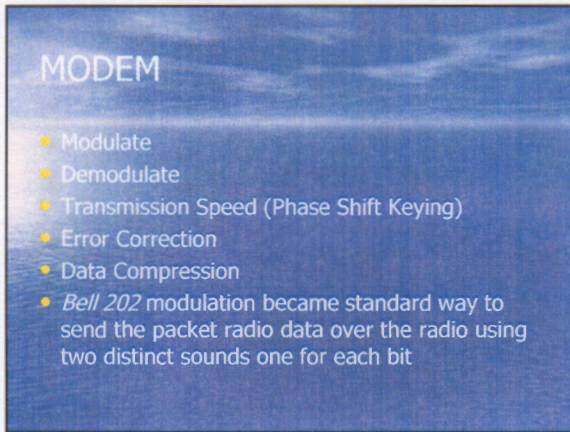
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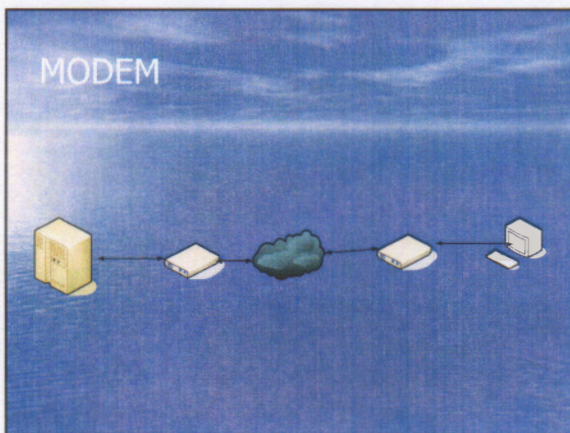
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### Ethernet

- Developed in the early 1970's, Ethernet has proven to be one of the most simple, reliable, and long-lived networking protocols ever designed
- Ethernet is like a bunch of loud people in an unmoderated meeting room.
- Only one person can talk at a time, because communication consists of standing up and yelling at the top of your lungs.
- People are allowed to start communicating whenever there is silence in the room.
- If two people stand up and start yelling at the same time, they wind up garbling each others' attempt at communication, an event known as a "collision."
- In the event of a collision, the two offending parties sit back down for a semi-random period of time, then one of them stands up and starts yelling again

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### TCP/IP

- Rules of Unmoderated meeting
- Allows connection of multiple computers
- Key to Ethernet

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### Packet Radio

- A form of digital data transmission used to link computers using wireless computer networks
- The use of packet switching between network nodes, which allows multiple virtual circuits to coexist on a single radio channel

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### Packet Radio Station Components

- Station consists of a **computer**, a **modem**, and a **transceiver** with an **antenna**
- Traditionally, the computer and modem are combined in one unit, the **terminal node controller (TNC)**, with a **dumb terminal**
- Modern computers use software and a soundcard to replace the TNC

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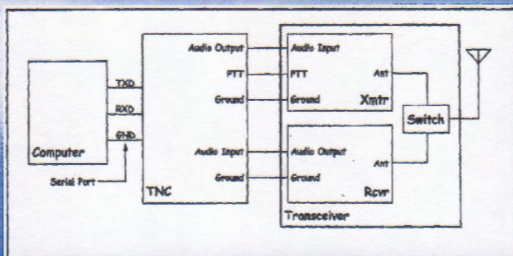
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### TNC Connection




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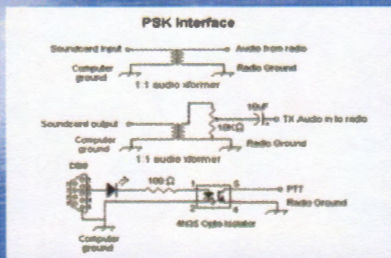
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### Soundcard Connection




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### Popular Digital Modes

- RTTY
- PSK 31
- APRS
- Pactor
- MFSK16
- PSK 64
- WSJT (FT8, JT65)

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### Radioteletype (RTTY)

- A RTTY transmitter sends out a continuous carrier that shifts frequency back and forth between two distinct frequencies
- The lower RF frequency is known as the SPACE frequency and the upper RF frequency is known as the MARK frequency
- FSK means Frequency Shift Keying and AFSK means Audio Frequency Shift Keying.
- To operate with AFSK, you put your transmitter in the SSB mode

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### PSK31

- Designed by Peter G3PLX
- Based on the RTTY mode of operation,
- Useful for live keyboard to keyboard QSO
- Works at 31.25 bauds,
- Uses varicode character coding what gives 50wpm,
- Easy to use and monitor,
- Gives very good copy under low Eb/No numbers and is thus suitable for QRP.
- Instead of using FSK or on/off keying uses BPSK or QPSK with a Viterbi decoder,
- Available for free for many platforms, including Windows (c) with SoundBlaster type Soundcard,
- Uses advanced DSP and narrow band (31 Hz!!) techniques.

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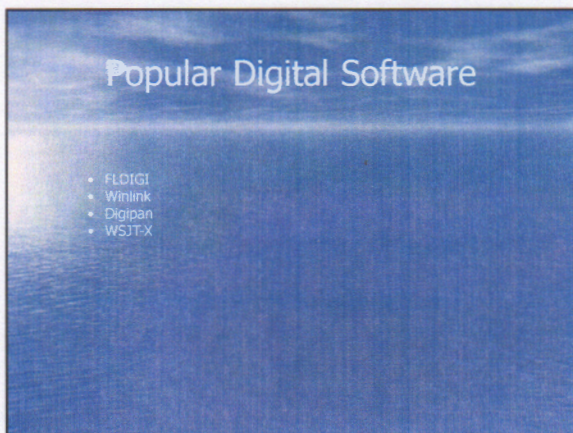
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