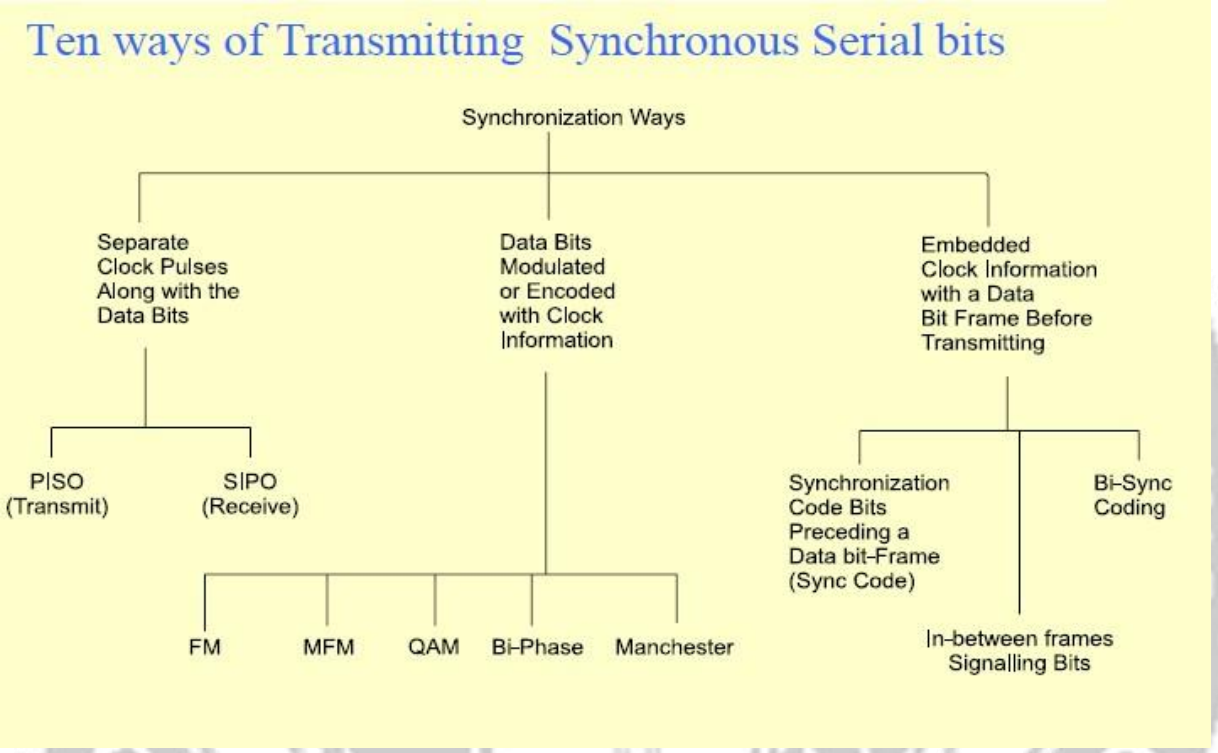
UNIT II

EMBEDDED NETWORKING

2.3 CHARACTERISTICS OF SYNCHRONOUS COMMUNICATIONS



First characteristics of synchronous communication

1. Bytes (or frames) maintain a constant phase difference, which means they are synchronous ,i.e. in synchronization. No permission of sending either the bytes or the frames at the random time intervals, this mode therefore does not provide for handshaking *during* the communication interval ─ *This facilitates fast data communication at pre-fixed bps.* Second characteristics of synchronous communication

2. A clock ticking at a certain rate has always to be there for transmitting serially the bits of all the bytes (or frames) *serially. Mostly, the clock is* ***not*** *always* ***implicit*** to the synchronous data receiver. The transmitter *generally* transmits the clock rate information

Asynchronous Communication from Serial Ports or Devices

Asynchronous Communication Clocks of the receiver and transmitter independent, un synchronized, but of same frequency and variable phase differences between bytes or bits of ware data frames, which may not be sent within any prefixed time interval.

Example of asynchronous communication

- UART Serial Telephone or modem communication.
- RS232C communication between the UART devices
- Each successive byte can have variable time - gap but have a minimum in- between

Two characteristics of a synchronous communication

1. Bytes (or frames) need not maintain a constant phase difference and are a synchronous i.e., not in synchronization. There is permission to send either bytes or frames at variable time intervals─ This *facilitates in-between hand shaking* between the serial transmitter port and serial receiver port

2. Though the *clock* must ticking at a certain rate always has to be there to transmit the bits of a single byte (or frame) serially, it is *always implicit* to the asynchronous data receiver and is independent of the transmitter

Clock Features

_ The transmitter *does not transmit* (neither separately nor by encoding using modulation) along with the serial stream of bits any *clock rate information* in the asynchronous communication and *receiver clock thus is notable to maintain identical frequency and constant phase difference* with transmitter clock

Example: IBM personal computer has two COM ports (communication ports)

- _COM1andCOM2atIOaddresses0x2F8-0xFFand0xx38-0x3FF
- _ Hand shaking signals─ RI,DCD, DSR, DTR,RTS, CTS,DTR
- _Data Bits─ R x D and T x D Example: COM port and Modem Hand shaking signals
- _ When a modem connects, modem sends *data carrier detect* DCD signal ataninstancet0.
- _ Communicates *data set ready* (DSR) signal at an instance t1when it receives the bytes on the line.
- _ Receiving computer (terminal) responds at an instance by data terminal ready (DTR) signal.

After DTR *request to send* (RTS) signal is sent at an instance t3

- _Receiving end responds by *clear to send* (CTS) signal at an instance t4. After the response CTS, the data bits are transmitted by modem from an instance t5 to the receiver terminal.
- Between two sets of bytes sent in a synchronous mode the hand shaking signals RTS and CTS can again be exchanged. This explains why the bytes do not remain synchronized during a synchronous transmission