of data between various Peripheral devices and memory.

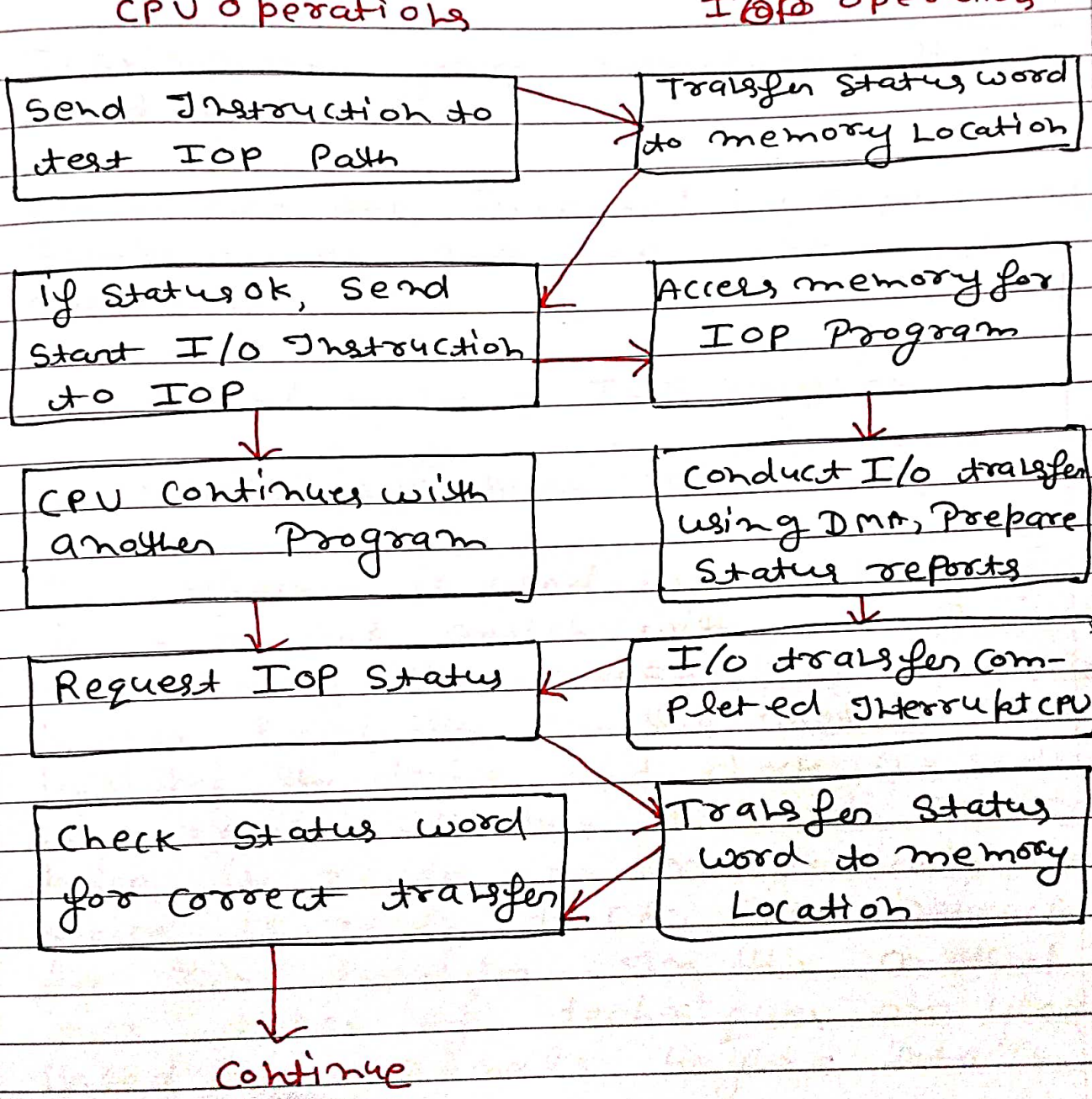
⇒ Data format of Peripherals differs from CPU and memory IOP maintain such Problems.

⇒ Data are transfer from IOP to memory by stealing one-memory cycle.

⇒ Instructions that are read from memory by IOP are called commands.

CPU-IOP communication:

CPU - IOP Communication:-



(Control Processing unit and Input/output Processor) Communication:-

Instruction that are read from memory by an IOP (Input/output Processor) :-

Distinguish from instructions that are read by CPU.

Commands are Prepared by experienced programmers and are stored in memory

Command word = IOP Program.

ASYNCHRONOUS DATA TRANSFER :-

This scheme is used when speed of I/O devices do not match with micro Processor and timing characteristics of I/O devices is not Predable. In this method Process initiates the device and check its status. As a result CPU has to wait Still I/O device is ready to transfer data when device is ready to CPU issues instruction for I/O transfer. In this method two types of techniques are used Based on signals before Data Transfer.

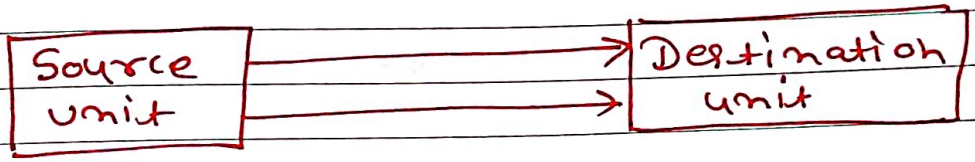
(1) Strobe control
(2) Hand Shaking

(1) Strobe control :- The Strobe control method of Asynchronous data transfer employes a signal control line to time each transfers.

The strobe may be activated by either the source or the destination unit.

Data transfer Initiated by source unit :-

(a) block diagram :

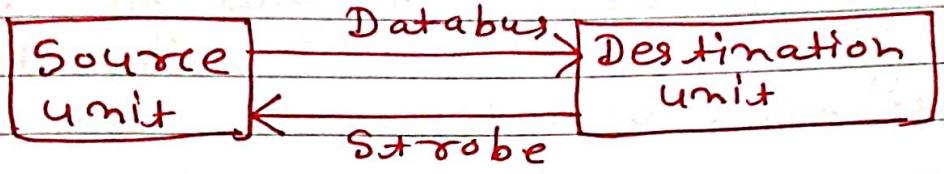


(b) Timing Diagram :-

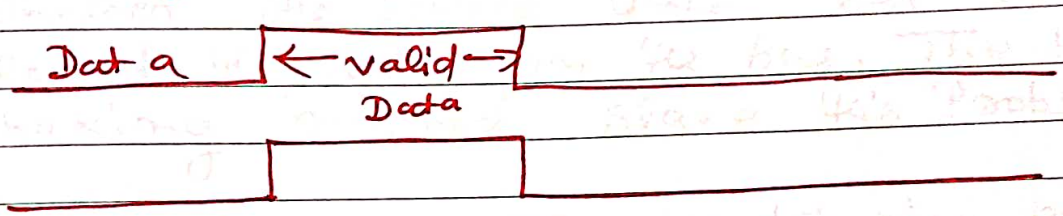
In this block Diagram the Data bus, the information from source to Destination unit.

In this diagram the source-unit first Places the data on the data bus.

The information on the data bus and strobe signal remain in the active state to allow the destination unit to receive the data.



(Block-Diagram of data transfer initiated by destination unit)



(Timing Diagram)

In this method the destination unit activates the Strobe Pulse. to informing the source to Provide the data. The source will Respond by Placing the requested binary information on the data bus.

The Data must be valid and remain in the bus long enough until the destination unit accept it when data is accepted by destination unit. then it

disorders the strobe and the source unit remove the data from the bus.

Disadvantage of strobe signal :-

The disadvantage of strobe method is that the source unit intiates the transfer has no way of knowing whether the destination unit has actually received the data item, that was places in the bus.

Similarly a destination unit that intiates the transfer has no way of knowing whether the source unit has actually placed the data on the bus. The Hand-shaking method slave this problem.

Handshaking :-

The Handshaking method solves the problem of strobe method by introducing a second control signal that provides a reply to the unit that initiates the data transfer.

Principle of Handshaking :-

One control line in the same Direction as the Data flows in the bus from source to Destination unit whether there is a valid Data in the bus. The other control

disorders the strobe and the source unit remove the data from the bus.

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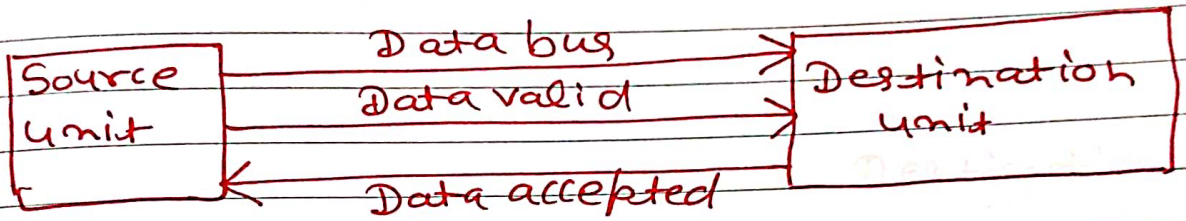
Principle of Handshaking :- One control line in the same Direction as the Data flows in the bus from Source to Destination unit whether there is a valid Data in the bus. The other control

Line is in the other direction from the destination to the source. It is used by the destination unit to inform the source whether it can accept the Data. The sequence of control during the transfer depends on the unit that intiates the transfer.

Source initiated Transfer using Handshaking

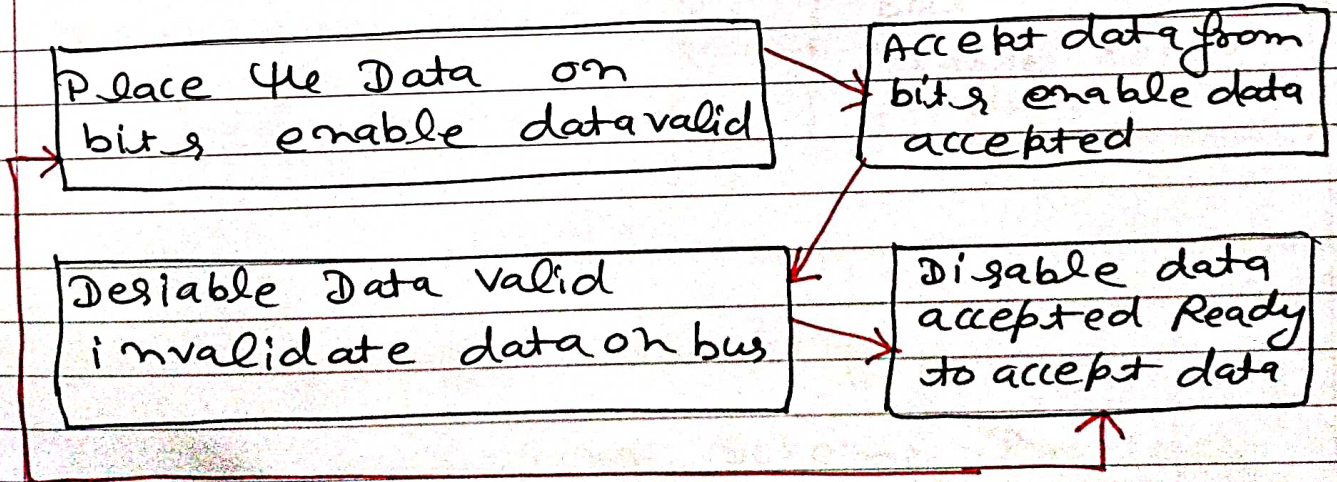


(Block Diagram)

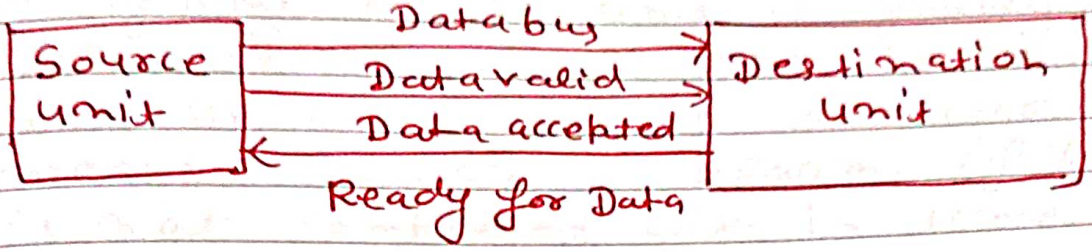
Sequence of events:-

Source - unit

Destination unit

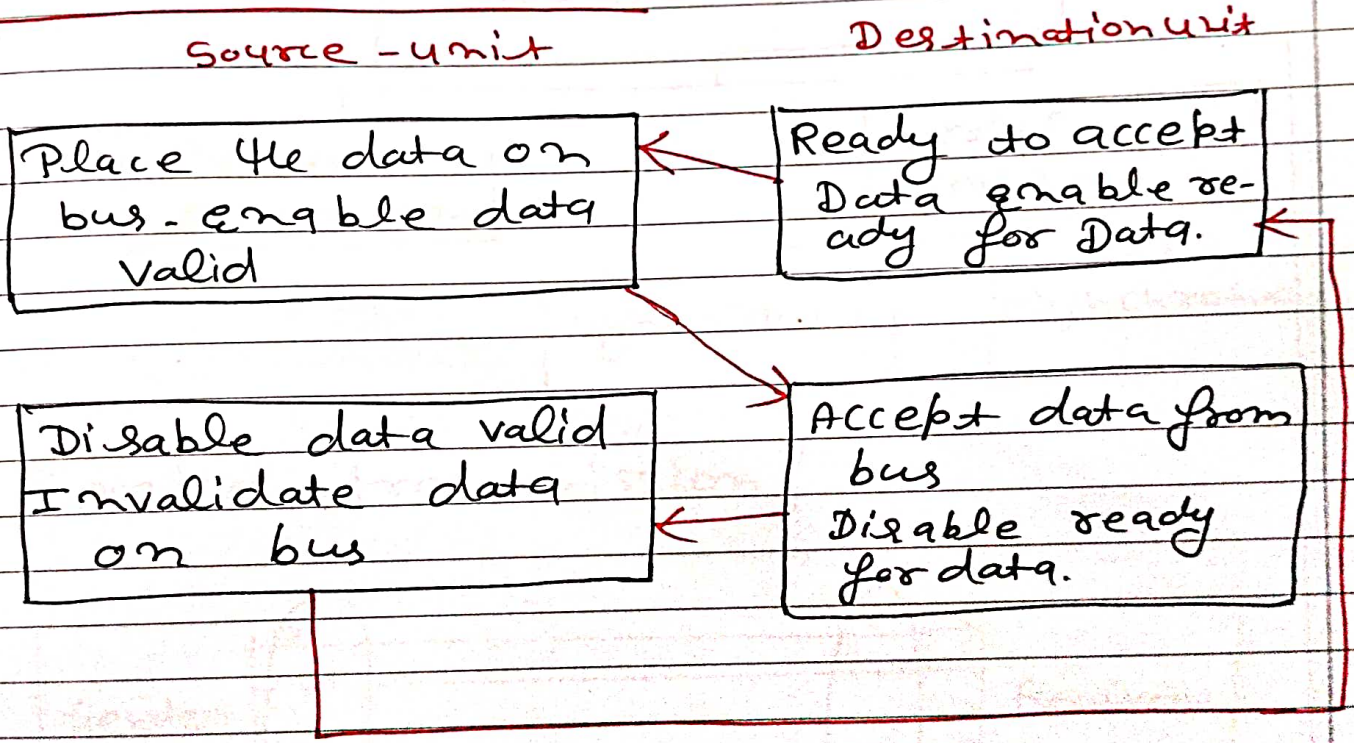


Destination Initiated Transfer using Hand-Shaking:-



(Block- Diagram)

Sequence of events:-



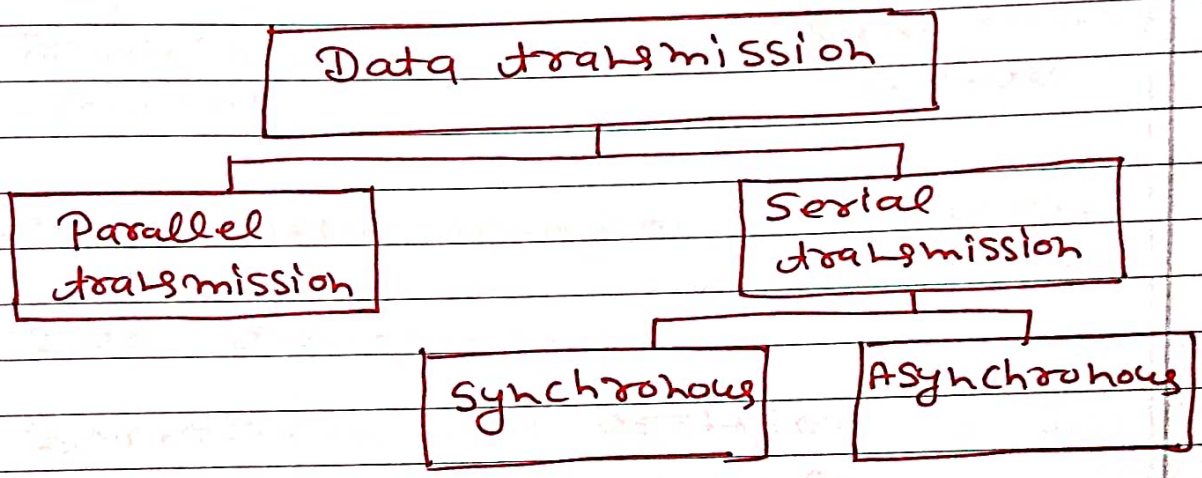
Advantages of Handshaking:-

(1) The Handshaking Scheme Provides degree of flexibility and reliability

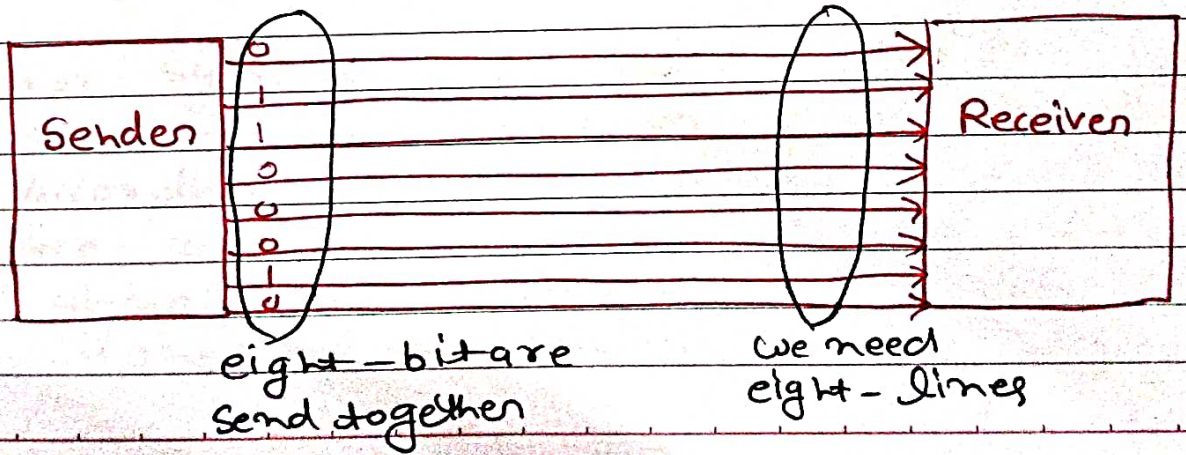
because the successful completion of Data relies on active participation by both units.

(2) if any of one unit is faulty. The data transfer will not be complete such an error can be detected by means Provides an alarm. if the data is not completed with in time.

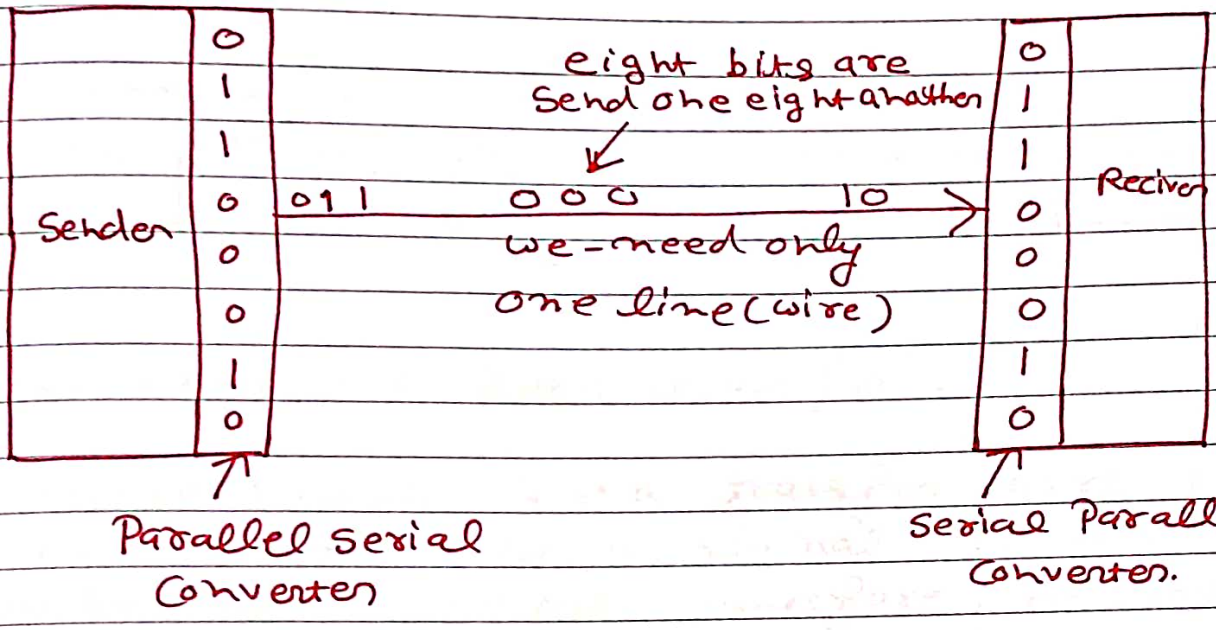
Data Transmission :-



Parallel transmission :-



Serial transmission :-



Types of Data transfer :-

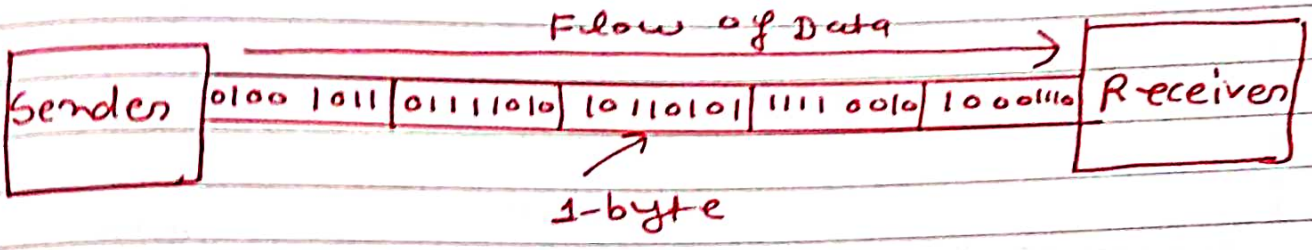
There are two types of Data transfer :

(1) Synchronous Data transfer
(2) Asynchronous Data transfer.

(1) Synchronous Data transfer :-

For synchronous Data transfer, both sender and receiver access the data according to the same clock. Therefore a special line for the clock signal is required. A master (or one of the senders) should Provide

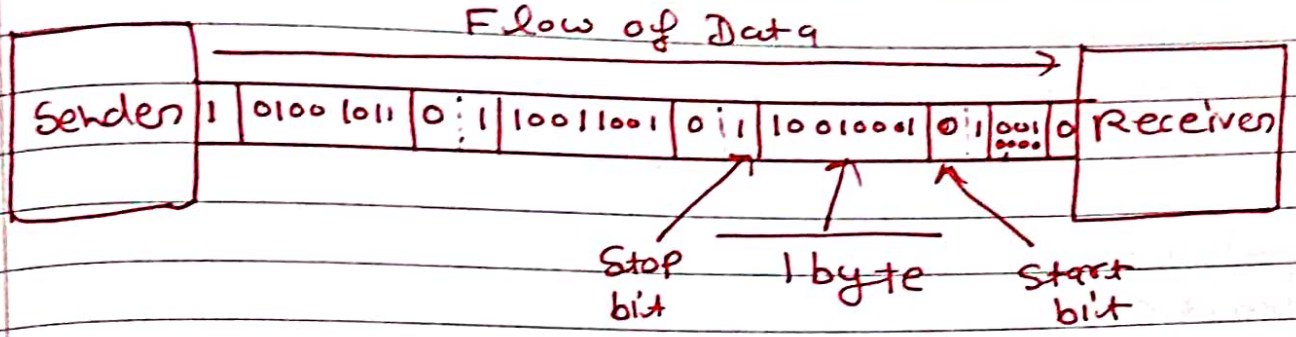
The signal to all the receivers in the synchronous data transfer.



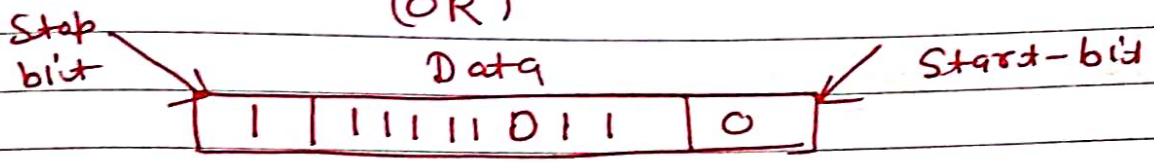
Asynchronous Data transfer :-

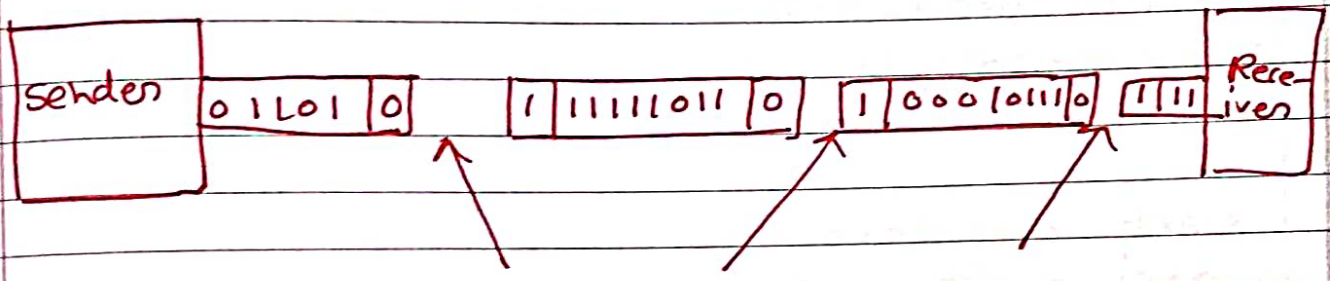
Asynchronous Data transfer there is no common clock signal between the sender and receivers. Therefore, the sender and the receive first need to agree on a data transfer speed. The speed usually does not change after the data transfer starts. Both the sender and receiver set-up their own internal circuits to make sure that the Data accessing is follows that agreement.

This Problem is solved by adding synchronization bits at the front, middle or end of the Data. Since the synchronization is done Periodically the receiver can correct the clock accumulation added to every byte of data or to every frame of Data.



(OR)





Gaps between data units

Direction of flow.

Comparision Between Synchronous and Asynchronous Transmission:-

Clock synchronization:- Synchronous transmission

Same clock signal used by sender and receiver.

Asynchronous transmission Different clock signal used by sender and receiver.

Definition:- Synchronous - transmits data in the form of chunks or frames.

Asynchronous Transmits 1 byte or character at a time.

Cost:- Synchronous transmission cost is expensive Asynchronous transmission cost is slow.

Time Interval:- Synchronous transmission time interval is constant. Asynchronous transmission time interval is Random.

Gaps between the Data:-

Synchronous transmission Gaps between the Data — yes.

Asynchronous transmission Gaps between the Data — No

Example: Sky Synchronous transmission Ex Chat Rooms, Telephonic Conversa-

tions, video conferencing.

Asynchronous transmission e.g email.

STANDARD COMMUNICATION INTERFACES:-

Interface Standards:- Interface standards are like a guide which must both know and follow the rules. They simplify coordination only as long as everyone follows the same rules.

To be effeciative coordination devices, interface standards must be binding on both the Platform owner and app developers and app developers must obey them and also expect others to obey them.

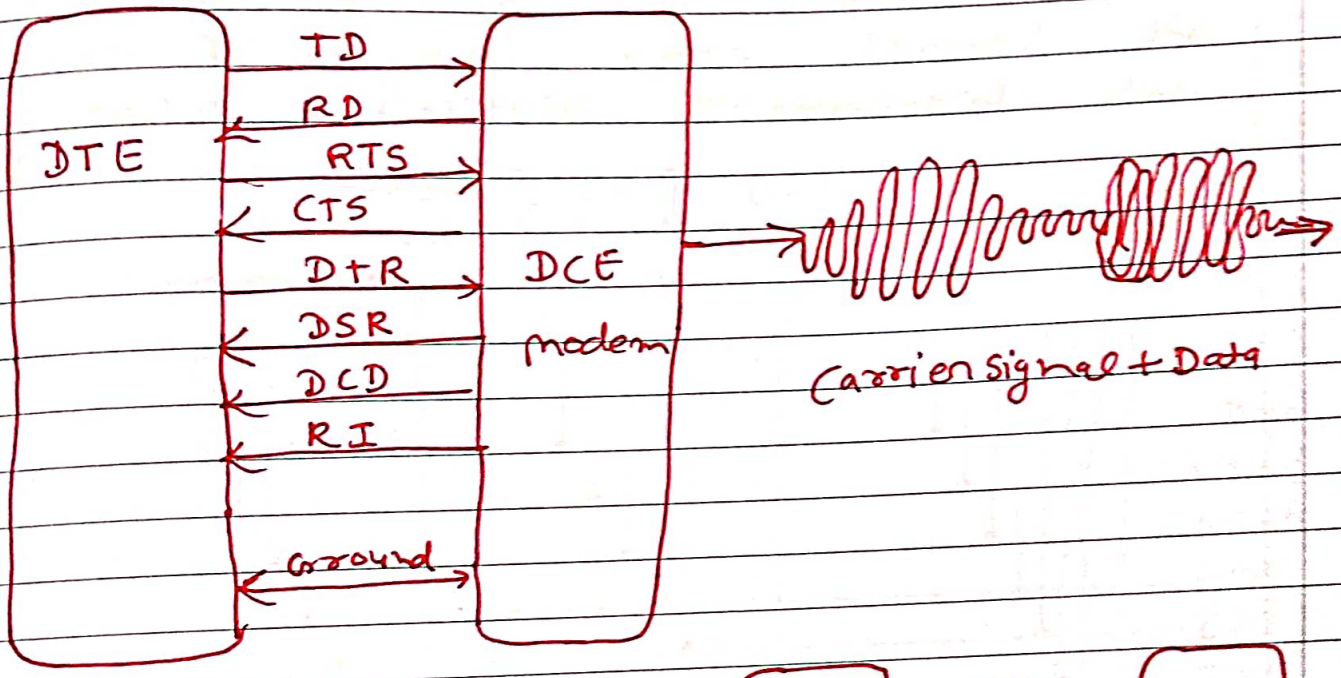
There are two types of ~~inter~~ interface standards:

(1) Serial
(2) Parallel

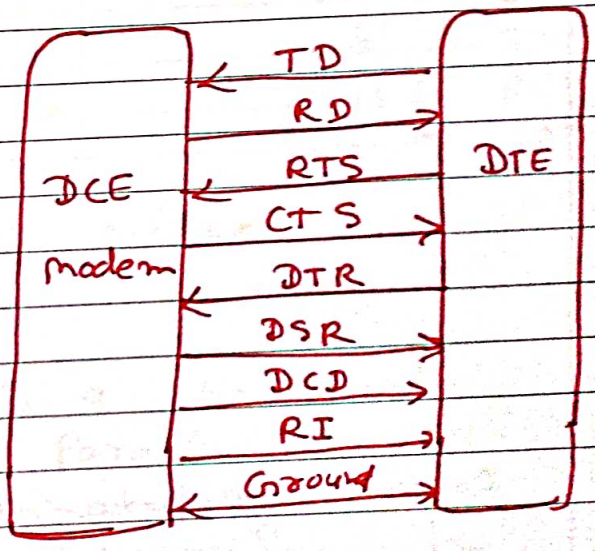
Serial:- RS232 interface (MAX 232 interface)

The RS232 interface standard defines the necessary control signals and data

data lines to enable information to be transmitted between computer equipment (or data terminal equipment DTE) and the modem (or data communication equipment DCE). The modulated carrier signal is transmitted over a two-wire telephone network by the connecting modems



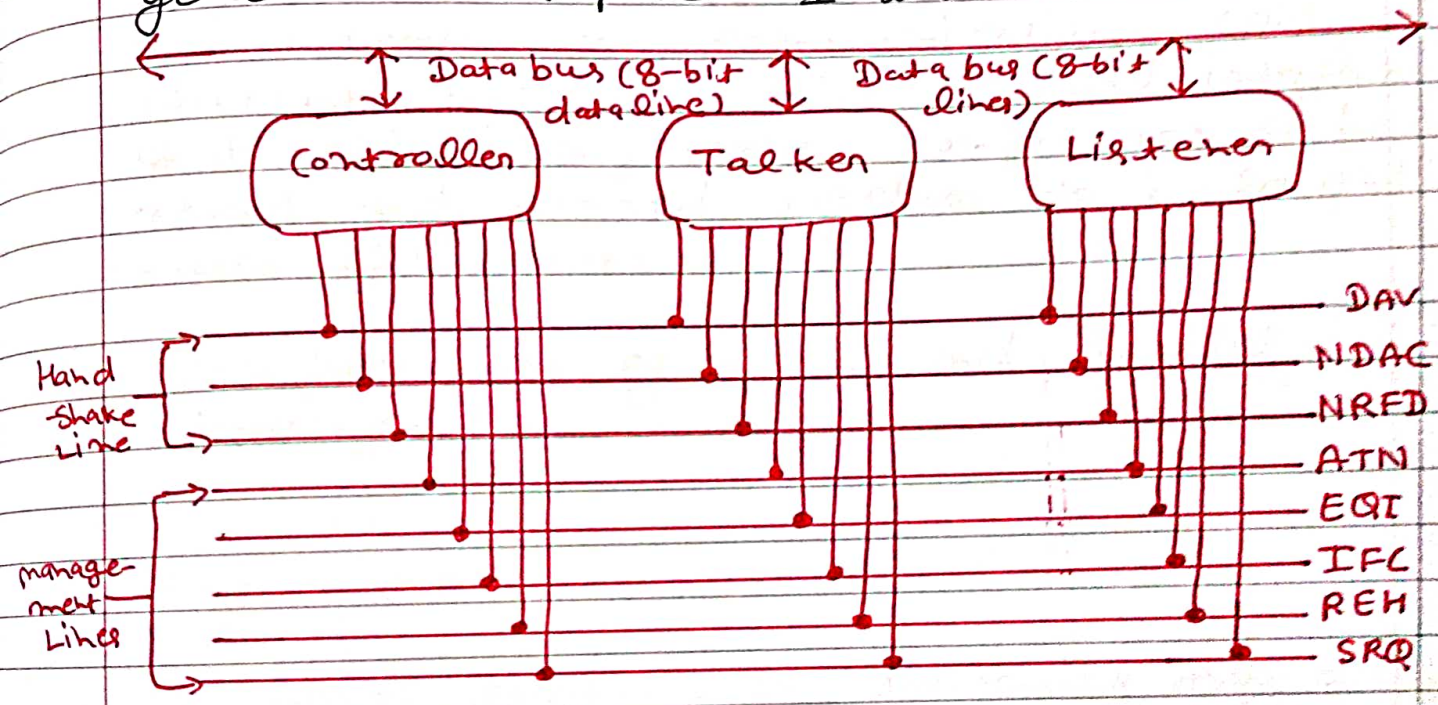
Transmitter



Receiver

Parallel Interface (IEEE-488):-

The standard interface most commonly used for Parallel communications is IEEE-488. This was orginally developed by Hewlett-Packard to link its computers and instruments and was known as the Hewlett-Packard Instrumentation Bus. It is now often termed the general-Purpose Instrument Bus.



Different Parallel Interfaces:-

OpenMP:- OpenMP is a standard interface for Parallel Programming based on annotating serial code so that certain constructs, in

Particular loops, can be reinterpreted as parallel constructs. The basic Patterns it supports directly as features are map and reduce, although other Patterns can also be implemented.

COM Automation:- component object model (COM) is a Binary interface Standard that allows objects to interact with each other via interprocesses communication. COM objects Specify well-defined interfaces that allow Software components to be reused and linked together to build end-user applications.

Comparison of serial and Parallel interfaces:-

Performance:-

The Serial transmission transmits only a Single bit Per clock, the overall performance is lower than that of Parallel transmission.

The Parallel transmission transmits about eight bits Per clock, the overall performance is much higher than that

of serial transmission.

Preference :- Serial transmission is only implements a single link due to the transmission of a single bit every clock. Thus we Prefer it for transmission between long distances.

Parallel transmission - It is capable of transferring as well as implementing multiple links simultaneously. Thus is preferable for short distance only.

Complexity :- The single link transmission makes the process of serial transmission very simple. and not very complex. even if it covers long distances.

Due to multiple link transmission, the process of parallel transmission becomes comparatively complex to Handle, thus, Paving the way to Short-distance data transfer.

Applications :- Chat Rooms, Telephonic conversations video conferencing.

~~Sex~~ Email, Forums, Letters.