

Peripherals/Computer Connections

- ▶ The CPU performs **arithmetic** and **logic** operations and controls the operation of the entire system.
- ▶ Some tasks are completely **controlled** by CPU, but for some others, it merely initiates a sequence of events which are controlled elsewhere, such as in a peripheral device.
- ▶ The peripheral devices **permit** communication of **information** and **storage** of information.

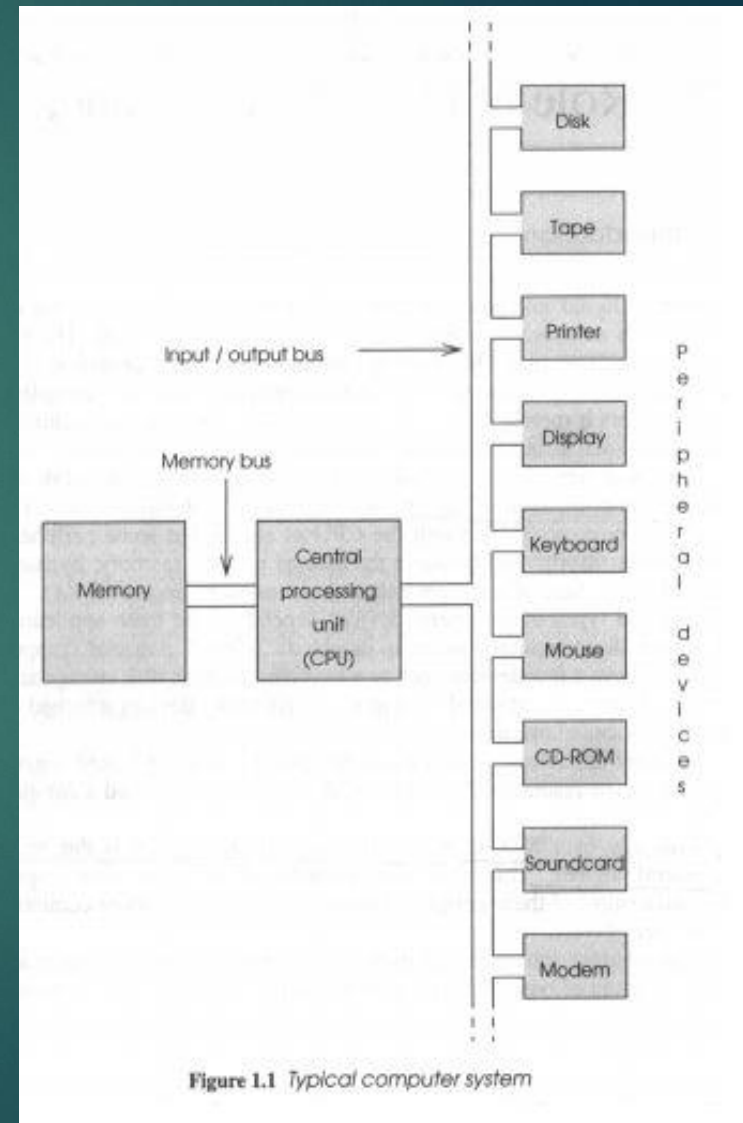
Peripherals/Computer Connections(Cont..)

- ▶ Peripherals normally **communicate** through the **CPU**.
- ▶ Some may communicate themselves and memory **bypassing** CPU
- ▶ The **number** and types of peripheral devices **depend** on the main applications for which the computer system is intended.

Typical Computer System

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Excluding CPU and Memory
all other Input Output
connected with the
computer systems altogether
referred to as peripheral
devices



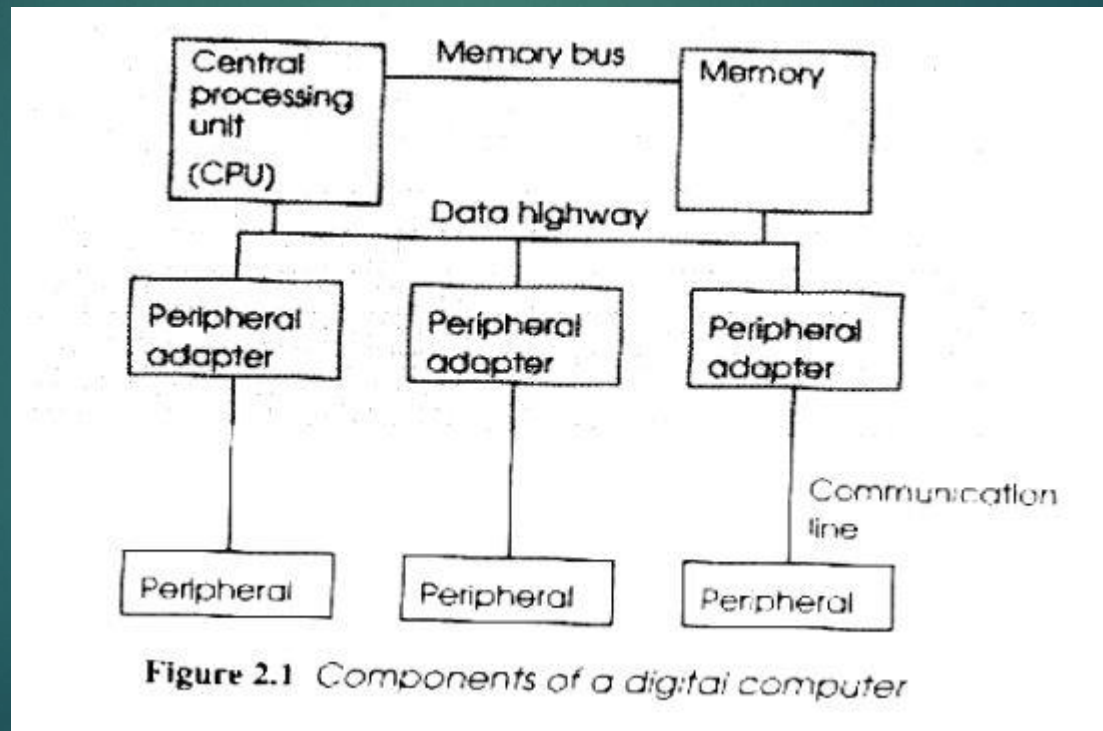
Peripheral Adapter

Modern computers perform operations very much **faster** than most peripherals can generate or accept data. Programs and data are moved between memory and the CPU at such a speed that it would be inappropriate to connect peripherals directly to the CPU. So some form of interface (Peripheral Adapter) is required to **convert** between the fast internal communications and the relatively slow external devices.



Peripheral Adapter (Cont..)

A peripheral adaptor works as an **interface** between CPU (very fast) and a peripheral device (relatively slow) for data communication.



PA Registers(Cont..)

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Peripheral adaptors are directly connected to the buses. PA contains: Control register, Status register, Data register, Control Logic, Address Comparator.

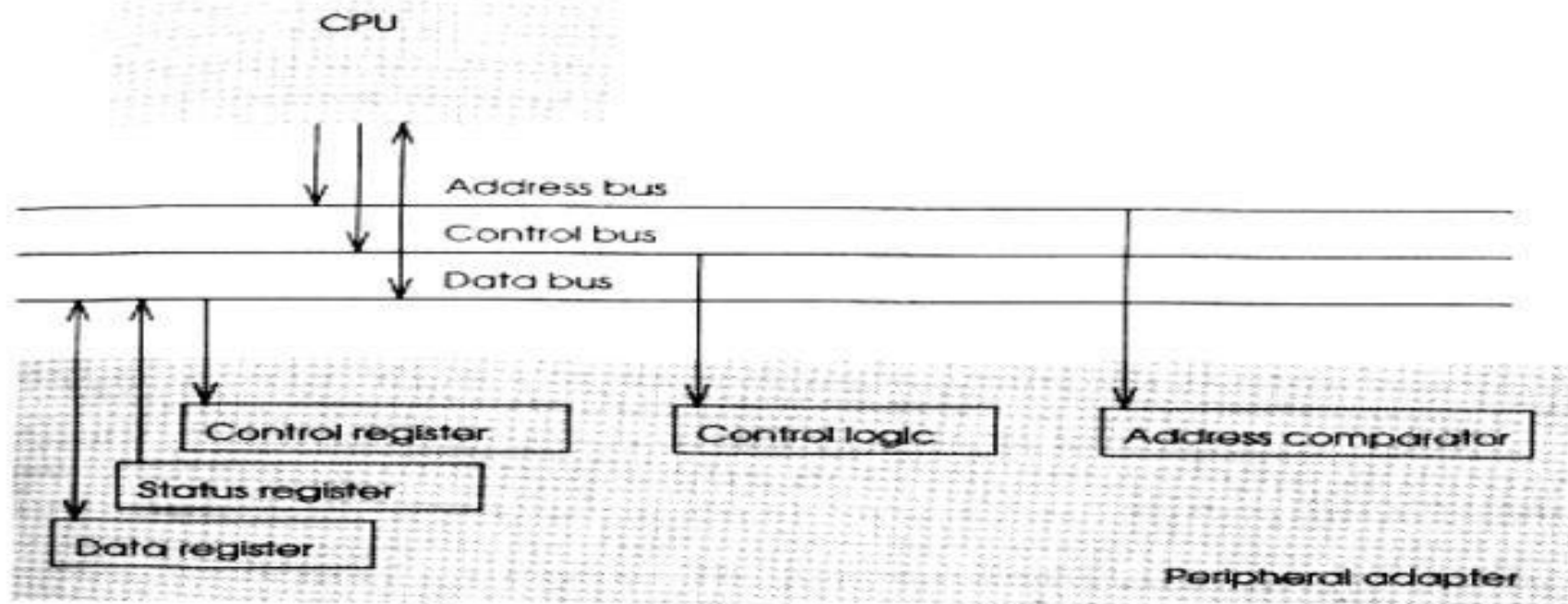


Figure 2.2 Connection of peripheral adapter to highway

PA Registers(Cont..)

► Address Comparator

- It is necessary to **distinguish** between adapters used for different peripherals. So a **value** is **allocated** to the adaptor (Often set with switches).
- An **adaptor** may **recognize** a **single** address or a small **group** of address.
- It **compares** the address on the address bus with the peripheral adapter's address.
- If the address on the bus **matches** that of the adapter then the control lines are interpreted by the **control logic** to perform the required function, typically to read from or write to a register (may be data register) connected to a data bus.

PA Registers(Cont..)

► Control Register

Stores values written to it to control the operation of the adaptor.

► Status Register

-Can be read by the CPU to determine the status of the device (e.g. whether it is ready for use, busy, switched on/off etc.)

-Each piece of information stored in the control and status registers usually needs only a single bit and several such bits are stored in each register, each bit is often known as a flag.

PA Registers(Cont..)

► Data Register

Used to hold **temporarily** a value to be transferred to or from the peripheral so that it is not necessary to **synchronize** the computer with the peripheral

END..