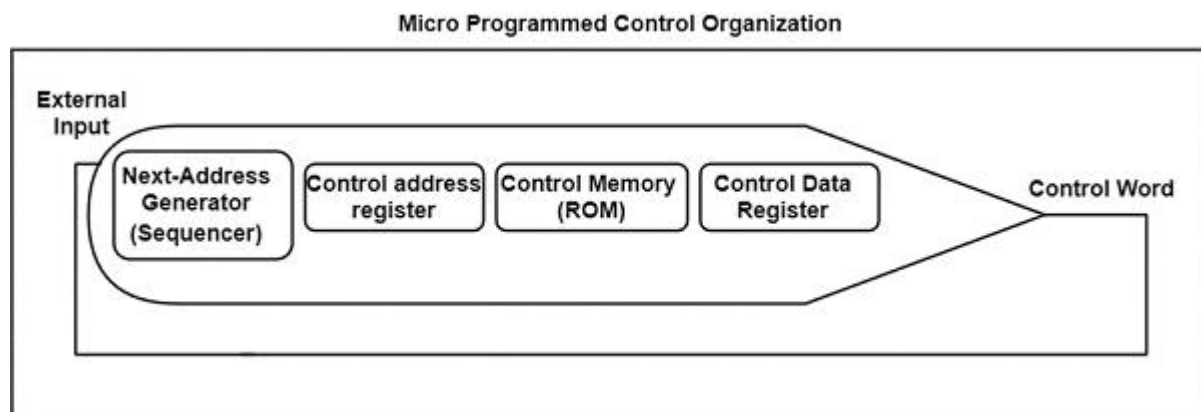# Micro programmed control

A control unit whose binary control values are saved as words in memory is called a microprogrammed control unit.

A controller results in the instructions to be implemented by constructing a definite collection of signals at each system clock beat. Each of these output signals generates one micro-operation including register transfer. Thus, the sets of control signals are generated definite micro-operations that can be saved in the memory.

Each bit that forms the microinstruction is linked to one control signal. When the bit is set, the control signal is active. When it is cleared the control signal turns inactive. These microinstructions in a sequence can be saved in the internal 'control' memory. The control unit of a microprogram-controlled computer is a computer inside a computer.

The following image shows the block diagram of a Microprogrammed Control organization.

Micro Programmed Control Organization

There are the following steps followed by the microprogrammed control are −

- It can execute any instruction. The CPU should divide it down into a set of sequential operations. This set of operations are called microinstruction. The sequential micro-operations need the control signals to execute.
- Control signals saved in the ROM are created to execute the instructions on the data direction. These control signals can control the micro-operations concerned with a microinstruction that is to be performed at any time step.
- The address of the microinstruction is executed next is generated.

- The previous 2 steps are copied until all the microinstructions associated with the instruction in the set are executed.

The address that is supported to the control ROM originates from the micro counter register. The micro counter received its inputs from a multiplexer that chooses the output of an address ROM, a current address incrementer, and an address that is saved in the next address field of the current microinstruction.

Advantages of Microprogrammed Control Unit

There are the following advantages of microprogrammed control are as follows −

- It can more systematic design of the control unit.
- It is simpler to debug and change.
- It can retain the underlying structure of the control function.
- It can make the design of the control unit much simpler. Hence, it is inexpensive and less error-prone.
- It can orderly and systematic design process.
- It is used to control functions implemented in software and not hardware.
- It is more flexible.
- It is used to complex function is carried out easily.

Disadvantages of Microprogrammed Control Unit

There are the following disadvantages of microprogrammed control are as follows −

- Adaptability is obtained at more cost.
- It is slower than a hardwired control unit.