Com   8/5/2020.   Micro progrramed control

Microprogramming is a process of writing microcode for a microprocessor. Microcode is low-level code that defines how a microprocessor should function when it executes machine-language instructions. Typically, one machine language instruction translates into several microcode instruction, on some computers, the microcode is stored in ROM and can not be modified;

On some large computers, it is stored in EPRON and therefore can be replaced with newer versions.

Microprogrammed Control Unit:

1) A control unit with its binary control values stored as words in memory is called as microprogrammed control. Each word in the control memory contains microinstruction that specifies one or more microperations for the system. A sequence of microinstructions constitutes a micro program.

2) Microprogrammed implementation is a software approach in contrast to the hardwired approach.

3) It deals with various units of software but at the micro level i.e. micro-operation, micro-instruction, micro-program etc.

4) Different key elements used for implementation of a control unit using microprogrammed approach is shown in fig. below:

5) Control Memory:

The set of microinstruction is stored in control Memory (CM) also called as control store.

6) Control Address Register (CAR):

It contains the address of next microinstruction to be read. This is similar to the program counter(PC) which stores the address of the next instruction.

7) Control Buffer Register(CBR):

When microinstruction is read from the control memory, it is transferred to a control Buffer Register (CBR), which is similar to the instruction Register (IR) that stores the opcode of the instruction read from the memory.

8) Sequencing:

It loads the control Address register with the address of the next instruction to be read abd issues a read command to control memory.

Microprogrammed Control Unit Organization

The microroutines for all instruction in the instruction set of a computer are stored in a special memory called the control memory (CM). The control unit can generate the the control signals for

Any instructions by sequentially reading the control words of the corresponding micro-routine from the control store. To read the control words sequentially from the control memory, a microprogram counter (µPC) is used. Every time a new instruction is loaded into the IR the output of the block labeled 'starting Address Generator'. Is loaded into the µPC. The µPC then automatically incremented by one, by the clock. So that successive microinstructions are fetched from the control memory.