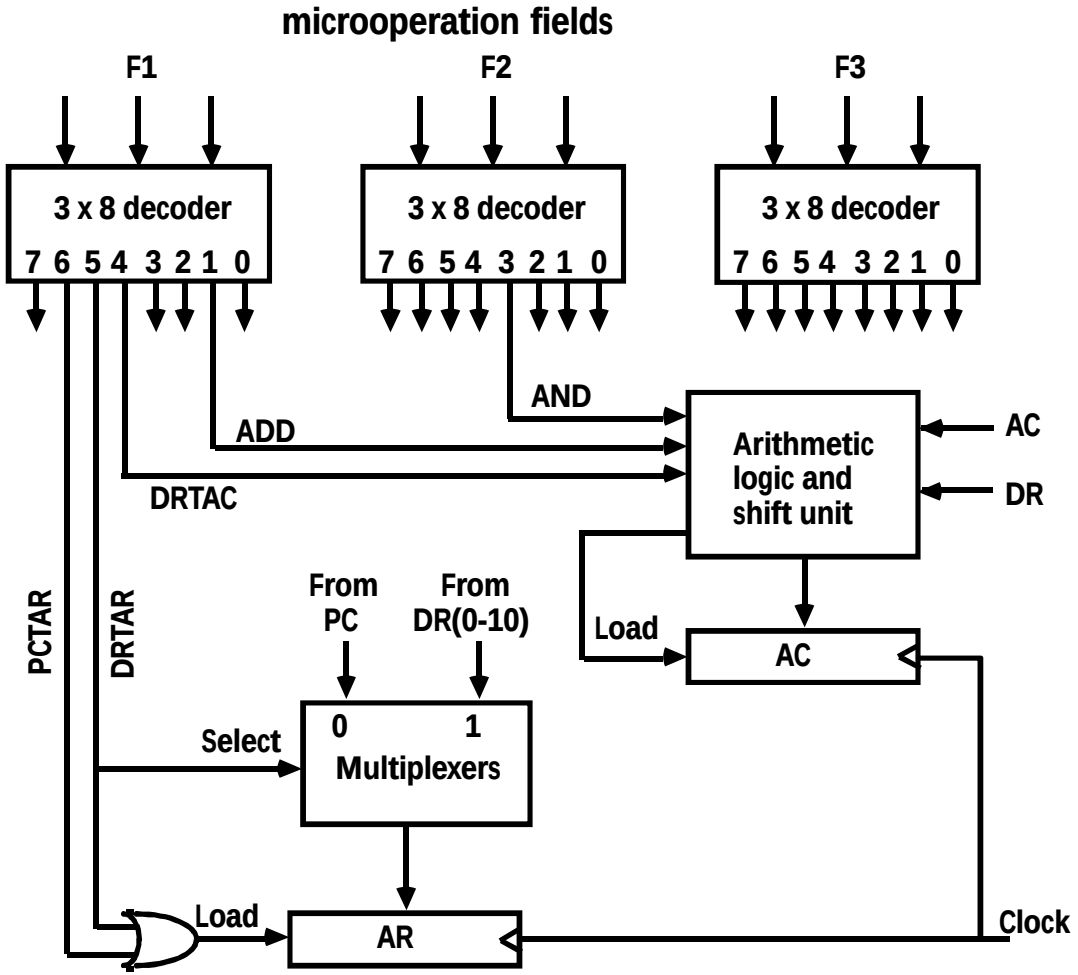
DESIGN OF CONTROL UNIT

Design of Control Unit



Design of Control Unit

- The bits of microinstruction are usually divided into fields, with each field defining a distinct separate function.
- The various fields in instruction format provide control bits to initiate microoperation in the system.
- Each field requires a decoder to produce the corresponding control signals.
- The nine bits of microoperation field are divided into 3 subfields of 3 bits each.
- The control memory output of each subfield must be decoded to provide distinct microoperation.

Design of Control Unit

- The output of the decoder are connected to the appropriate input in the processor.
- In the above diagram, each of the output of 3 fields are decoded with 3x8 decoder to provide 8 outputs.
- Each of these outputs must be connected to proper circuit to initiate corresponding microoperation as specified.
- Ex: When F1=101, it transfers the content of DR(0-10) to AR. Similarly when F1=110, it transfers the content from PC to AR.
- As shown in above diagram, the o/p's 5 and 6 of decoder F1 are connected to the load i/p of AR. So that either one of these o/p is transferred to AR.

Design of Control Unit

- The multiplexer selects the information from DR when o/p 5 is active and from PC when o/p 6 is active.
- The other o/p's of decoder that initiate the transfer between register must be connected in a similar fashion.
- The ALU can be designed as shown in above diagram. In the above diagram the i/p's of ALU will come from the o/p of the decoder associated with the symbols AND, ADD and DRTAC respectively.
- The other o/p of the decoder that are associated with an AC operation must also be connected to ALU unit in a similar fashion.