Insert Characters Under Mask

ICM R1,M3,D2(B2)   **RS**

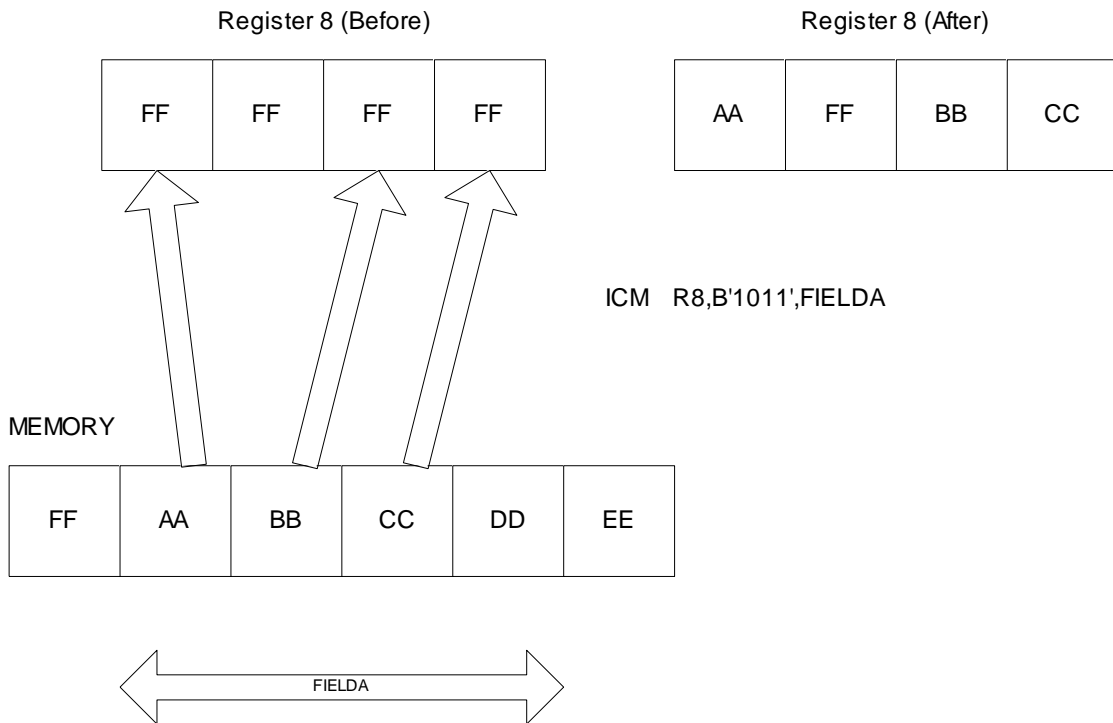| Op Code	R1M₃	B₂D₂	D₂D₂

ICM is used to copy consecutive bytes from memory into selected bytes of a register. Up to 4 bytes can be copied into the register which is specified by operand 1. The bytes that are copied, come from consecutive bytes in memory specified by operand 3. Additionally, the programmer supplies a mask (pattern), usually in binary, that indicates which bytes in the register should be changed. For example, a binary pattern of B'1010' indicates that bytes 1 and 3 (numbering from left to right) are targets of the copying operation. A binary mask of B'0011' indicates that two consecutive bytes from memory should be copied into the bytes 3 and 4 of the register. Consider the following example.

Register 8 (Before)   Register 8 (After)

FF	FF	FF	FF

AA	FF	BB	CC

ICM   R8,B'1011',FIELDA

MEMORY

FF	AA	BB	CC	DD	EE

FIELDA

Often, **ICM** is used instead of "LH" or "L" to load halfwords and fullwords when these fields are not properly aligned. The use of a load instruction for a 4-byte field that is not aligned on a fullword produces a warning from the assembler. Similar remarks apply to the load halfword instruction.
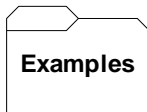
For the following examples, assume that R8 contains x'AABBCCDD'.

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FIELDA    DS    X'11223344'
FIELDB    DS    C'ABCD'
FIELDC    DC    HL2'20'   MAY NOT BE PROPERLY ALIGNED
                                     Result:
          ICM   R8,B'1100',FIELDA   R8 = x'1122CCDD'
          ICM   R8,B'0011',FIELDA   R8 = x'AABB1122'
          ICM   R8,B'1111',FIELDA   R8 = x'11223344'
          ICM   R8,B'1001',FIELDA   R8 = x'11BBCC22'
          ICM   R8,B'0101',FIELDB   R8 = x'AAC1CCC2'
          ICM   R8,B'0011',FIELDC   R8 = x'AABB0014'
                                     Binary 20 = x'0014'
          ICM   R8,3,FIELDC         R8 = x'AABB0014'
                Note - a decimal 3 = B'0011' and so the last
                    two instructions are equivalent. It would
                    be better, however, to use a binary mask.
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☞ Tips

1. Use ICM instead of load or load halfword when the field you are loading may not be properly aligned.

2. Remember that the mask applies to the bytes in the register and not the bytes in memory. Bytes in memory are consecutively loaded.

3. It is good documentation to always use a binary self-defining term when creating the mask.