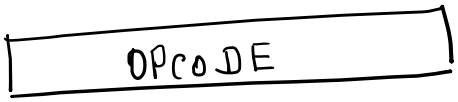
SIC/XE MACHINE ARCHITECTURE

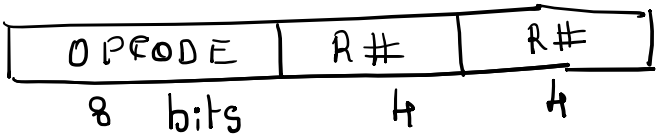
- Instruction formats
  - 4 formats
    - Format 1 : 1 Byte.



FIX

FLOAT

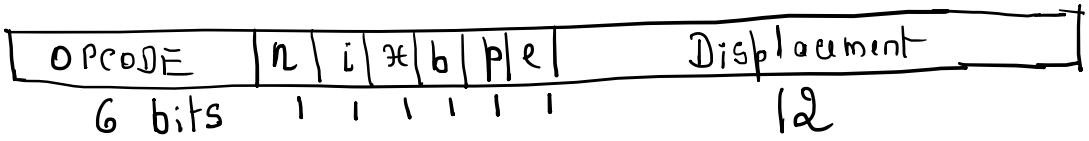
- Format 2: 2 Bytes



ADDR

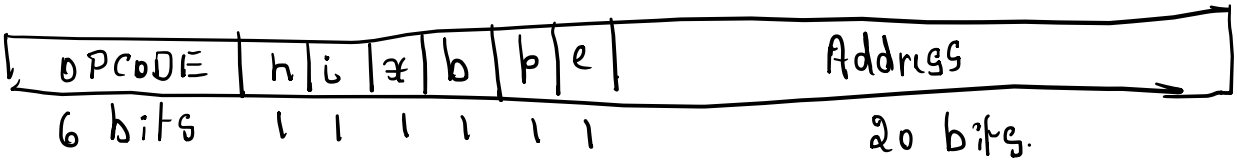
COMPR

- Format 3: 3 bytes



20 bits

- Format 4: 4 Bytes



+ JSUB SUBROUTINE

x : Indexed

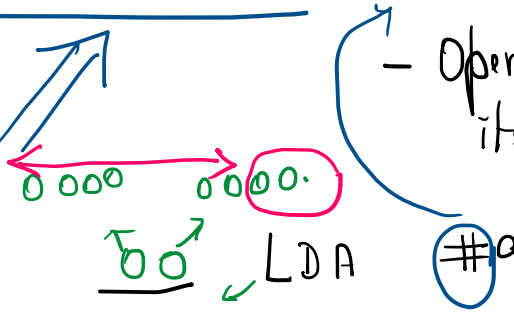
e : Extended → F3|F4

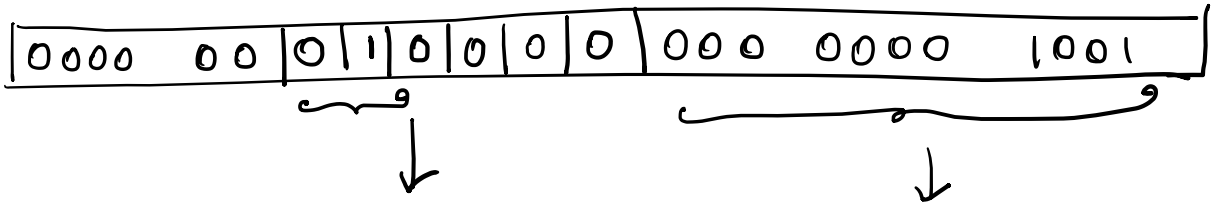
b, p :

n, i

i=1, n=0 : Immediate addressing

- Operand is directly given in the instruction itself





A ← 9.

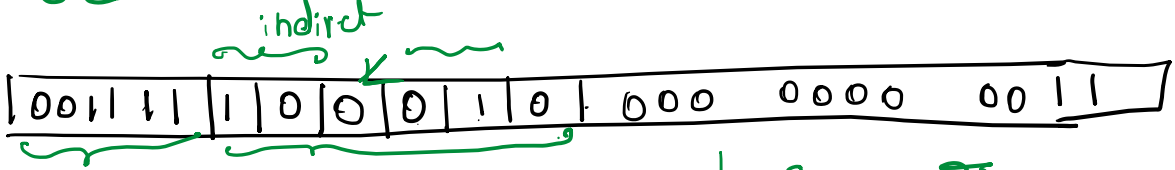
n=1, i=0 : Indirect Addressing

J @RETADR

3C

A - 10
B - 11
C - 12

1100



PC Relative: b=0, p=1

[PC] ⇒ 002D

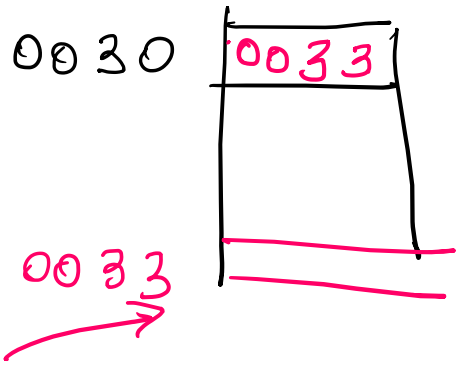
RETADR → 0030

3C → J

EA → 002D
0003
0030

002D
0004
0031

0030
0021
0003



$n=0$ $i=0$ } Simple addressing : Target Address is taken as the location of the operand.
$n=1$ $i=1$ }

$n=0$ $i=1$: Immediate addressing } Indexing cannot be used.
$n=1$ $i=0$ Indirect addressing }

$b=0$ $p=0$: Direct addressing
↳ No Relative addressing

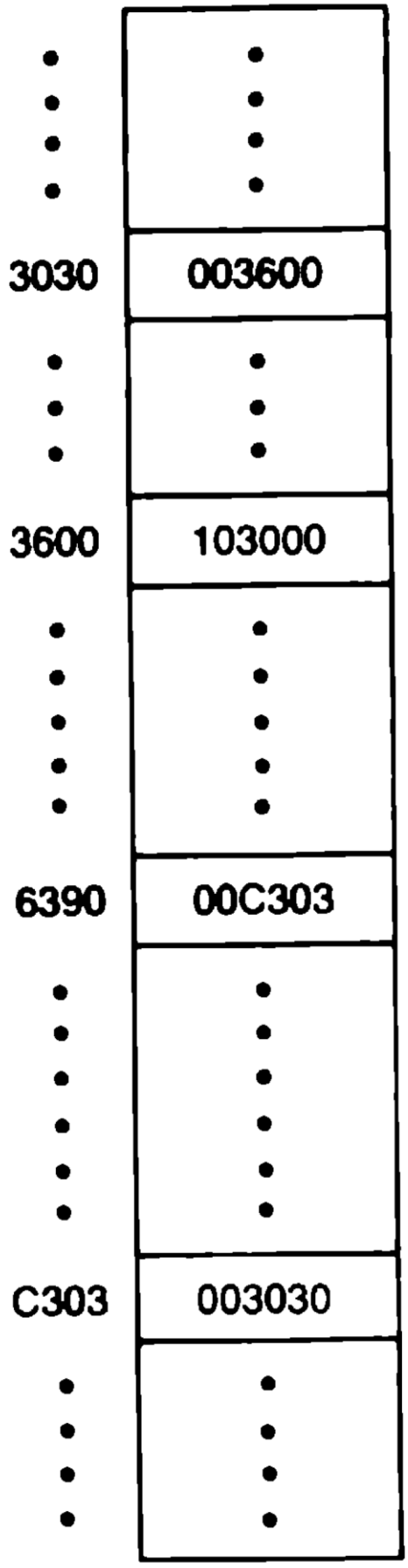
F3 → Operand address → 12 bit → Displacement → Operand address TA

F4 → $b=0, p=0$ / $b=1, p=1$ }

b = 1 p = 0 Base relative.

b = 0 p = 1 PC Relative.

} Indexing



(B) = 006000

(PC) = 003000

(X) = 000090

1) 03 2600

n=1 i=1 : Simple addressing

x=0 : Direct

b=0 p=1 : PC Relative.

e=0 : F=3

TA = [PC] + Disp

003000
000600
3600

A ← 103000

2) 03C300

3) 022030