SIC ARCHITECTURE

① Memory
- Byte addressable
- There are 2^{15} bytes in mem.
  3 consec. bytes = 1 word (24 bits)

② Registers
5. Each has a reg. number.

A - Accumulator - 0 - mathem. operations
X - Index - 1 - addressing
L - Linkage - 2 - stores the return addr. in case of subroutines

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PC - Program Counter - 8 - addr. of the next instr.

SW - Status word - 9 - contains a variety of info

mode	state	id	cc	mask	x	icode

③ Data Format

- Integers - 24 bit
- -ve no's - 2's complement
- char. - ASCII value (8 bit)
- No floating pt. representation.

④ Instruction Format

opcode	x	Address
8	1	15

x = 0, direct addr. mode

x = 1, indexed " "

⑤ Instr. Set

- Load & Store - LDA, STA, LDCH, STCH
- Comparison - comp.(mem) w/ accum. COMP data
- Arithmetic - ADD, SUB, DIV
- Jump cond. - JLT, JEQ
- Subroutine linkage - JSUB.

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⑥ Input & Output

Perf. by tranferring 1 byte at a time from or to 8 rightmost bits of accumulator.

3 I/O Instr:

- Test Device (TD) - ready or not. cc in status word is used for this. if cc is < then device is ready.
- Read Data (RD) - Reads a byte from device & stores it in acc.
- Write Data (WD) - writes a byte from acc. to the device.

SIC / XE ARCHITECTURE

① memory

- mem. size is 2^{20} bytes
- 3 consec. bytes → 1 word

② Registers

9 → 5 (SIC) + 4 addⁿ :

B - Base reg.

S, T } General

F - Floating pt. acc.

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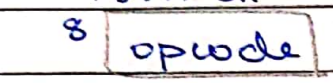
③ Data Format

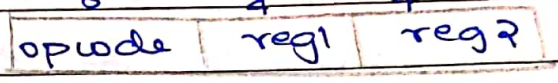
- Integer – repr. by Binary no's.
- Char. – " " ASCII codes
- Floating pt. – 48 bits

④ Instruction Format

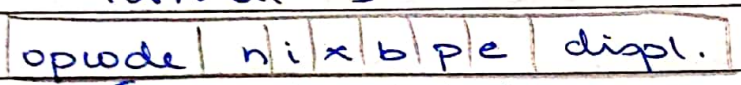
- Format 1



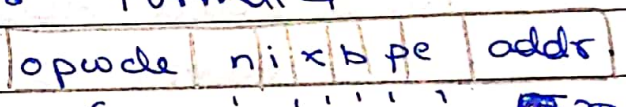
- Format 2



- Format 3



- Format 4



n - indirect x - index p - progr. counter
i - immediate b - base e - exponential

⑤ Addressing modes

Base Relative b=1, p=0 TA = (B) + displ.
Program. c. rel b=0, p=1 TA = (PC) + displ.

⑥ Instr. ~~Format~~ Set

(same as SIC)

but extra for Floating pt with op's:
ADDF, SUBF, MULF, DIVF

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(5) i/p & o/p

- includes i/o channels that allow to perform I/O operations while CPU is executing other tasks.
- Allows overlapping of computing & I/O.

SIO - start op.
TIO - Test op.
HIO - Halt op.
} I/O channels