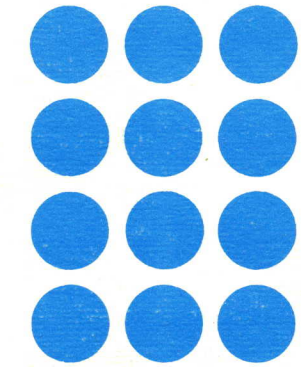
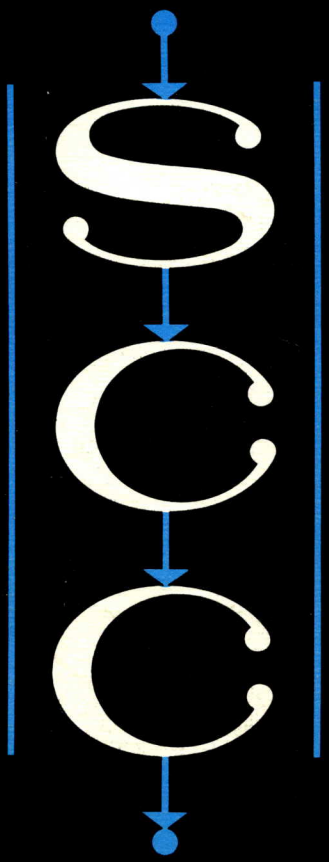
Scientific Control Corporation





INTRODUCTION TO THE SCC-6700

* POWERFUL REPERTOIRE
* FAST EXECUTION
* ADEQUATE MEMORY
* HIGH MEMORY BANDWIDTH
* FAST SWAP RATE
* LARGE FILES
* VERSATILE MAPPING

INSTRUCTION REPERTOIRE

- 48 BIT FLOATING POINT
- 24 BIT FIXED POINT
- 1-24 BIT CHARACTER
- REGISTER MANIPULATION
- REENTRANT LINKAGE
- EXPANDED POP FACILITY
- COMPLETE COMPARISONS
- GENERAL SHIFTS
- TRACE FACILITY

EXECUTION SPEED

1. INSTRUCTION "LOOK-AHEAD"
2. ADVANCE OPERAND FETCH
3. MULTIPLE SIMULTANEOUS MEMORY ACCESS
4. TYPICAL EXECUTION TIMES

FIXED ADD	.300μs
FLOATING ADD	2.0μs
SHIFTS	.3-.7μs
LOAD FIELD	1.0μs

MEMORY

* 64 K - 256 K words
  (24 bits + parity)

* Independently accessable
  in 8K modules

* Transfer rates up
  to 8×10^6 words/sec

* Independent access by

CPU
DRUM
OTHER I/O

SWAP FACILITY

1,000,000 word drum

2K word records

1.1×10^6 words/sec transfer rate

35 ms. max access time

17 ms. average access time

Up to 8 drums available per system

MASS FILES

140,000,000 WORD DISK

39×10^3 WORD/SEC.
AV. TRANSFER RATE

170 MS MAX ACCESS

25 MS AVERAGE ACCESS
(no head movement)

UP to 8 DISK FILES
PER DISK CONTROLLER

MEMORY MAPPING

* User memory is 8 2K pages (all mapped)

* System memory is 6 mapped 2K pages, 8 mapped 256 word pages, and 1 unmapped 2K page

* Protection for each page against:

  READING
  WRITING
  EXECUTION
  PRIVILEGED EXECUTION

* Map notes memory access and modification

AND

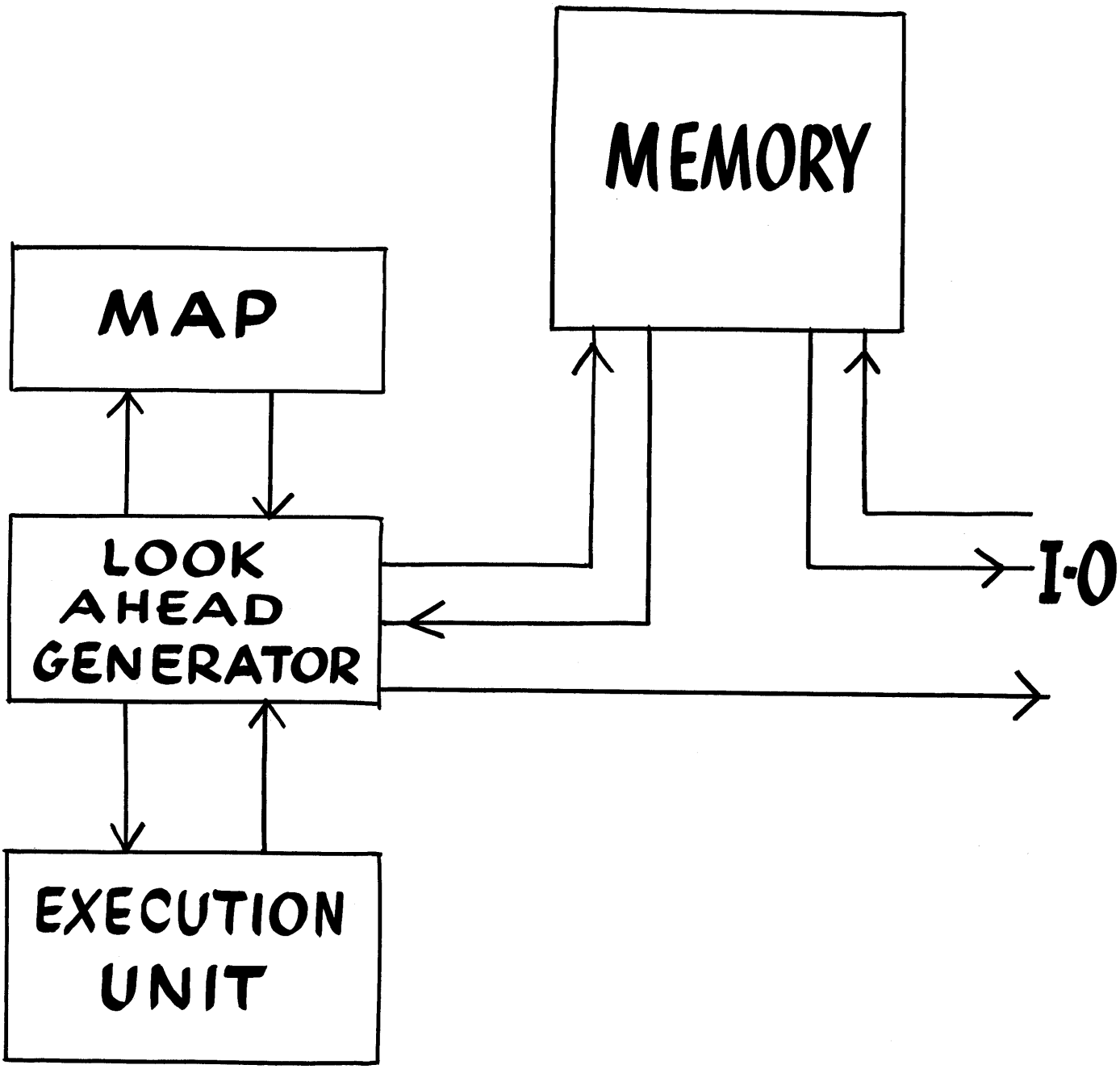
EACH TELETYPE CONTROLLER HANDLES 32 FULL-DUPLEX LINES

UP TO 8TTY CONTROLLERS MAY BE USED (256 TTY'S)

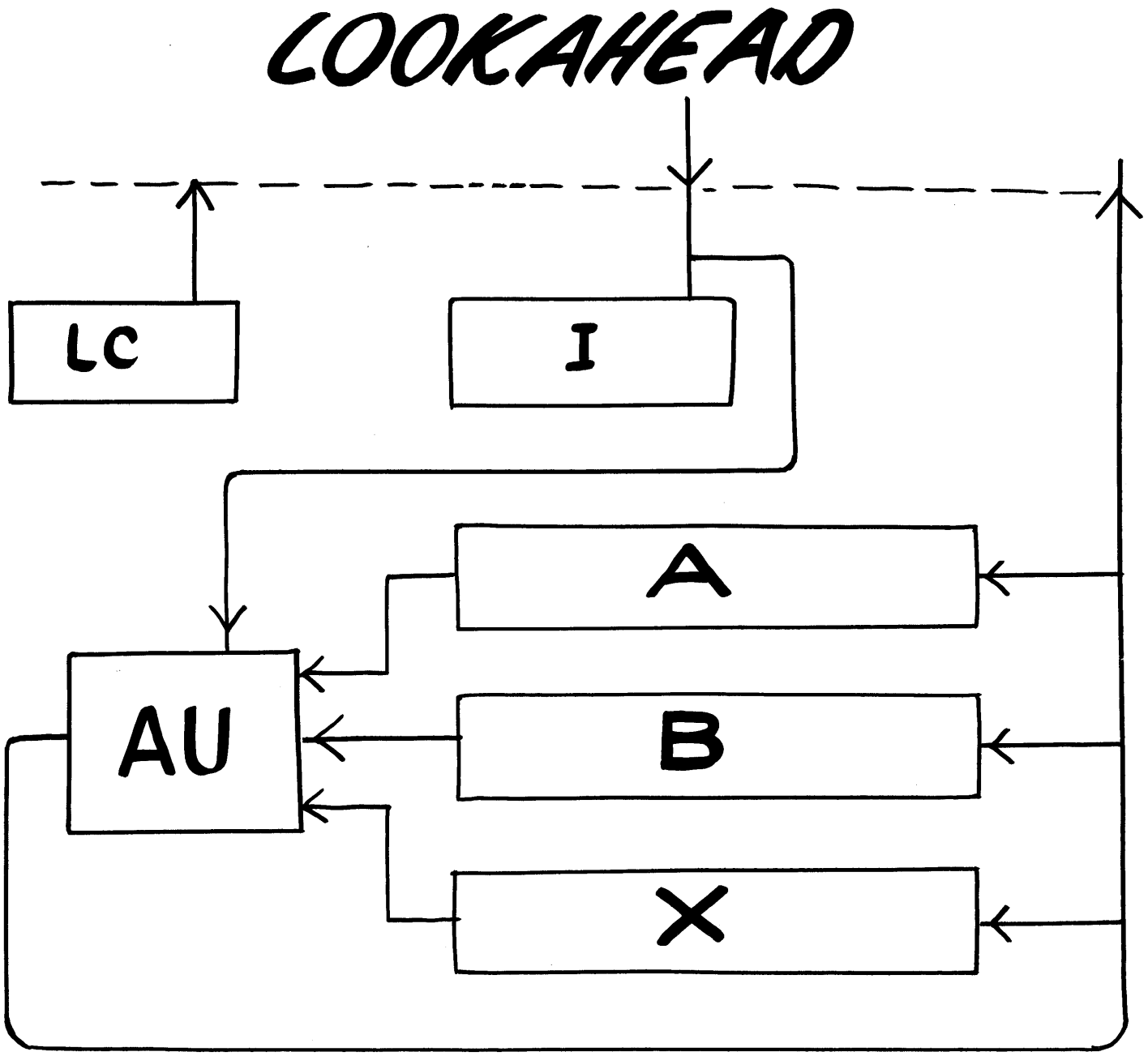
the Usual

400 CPM CARD READER
120 CPM CARD PUNCH
600 LPM PRINTER
75 IPS MAG TAPES
7 or 9 TRACK

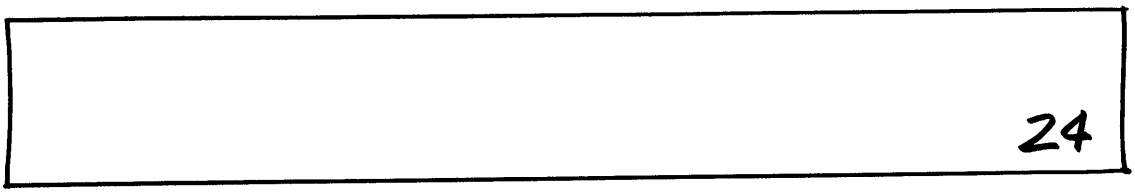
ORGANIZATION OF THE SCC-6700



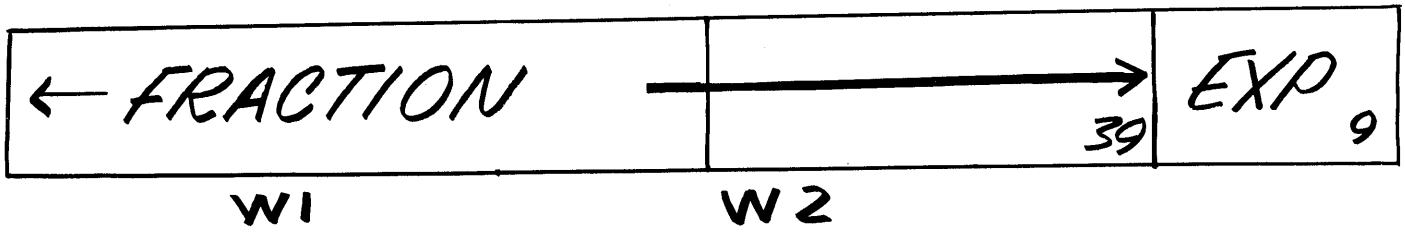
OVERALL ORGANIZATION



EXECUTION UNIT

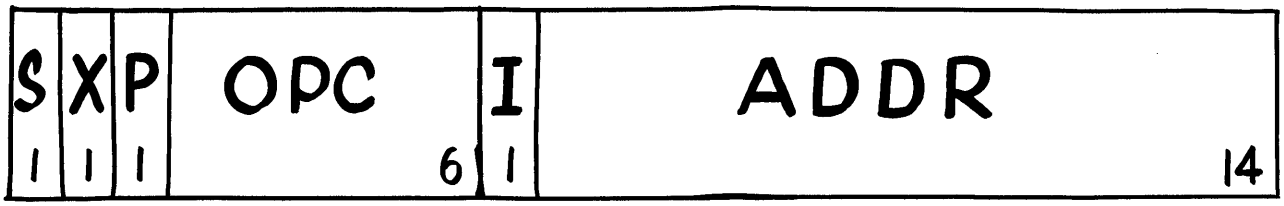


FIXED-POINT-2'S COMPLEMENT
FRACTION MULTIPLY & DIVIDE



FLOATING POINT - (2 WORDS)
2'S COMPLEMENT 39 BIT
FRACTION
2'S COMPLEMENT 9 BIT
EXPONENT
MAY BEGIN IN EVEN or ODD
LOCATION!

NUMERIC DATA



14 *bit address field*

6 *bit op code*

X *is index bit*

I *is indirect address bit*

P *for programmed operator*

S *for system call*

INSTRUCTION FORMAT

LNG *is length of field (≤24)*

OFF *is first bit of field (≤23)*

ADDR *is address of start of field*

Fields may over-lap word boundaries

FIELD DESCRIPTOR

LDA - LOAD A REGISTER
STA - STORE A REGISTER
XMA - EXCHANGE MEMORY & A
LDB - LOAD B REGISTER
STB - STORE B REGISTER
LDX - LOAD INDEX REGISTER
STX - STORE INDEX REGISTER
XMX - EXCHANGE MEMORY & X
STM - STORE UNDER MASK
LDD - LOAD DOUBLE
STD - STORE DOUBLE

LOADS/STORES

LDF - LOAD FIELD

STF - STORE FIELD

LDFX - LOAD FIELD INDEXED

STFX - STORE FIELD INDEXED

LDFI - LOAD FIELD & INCREMENT

STFI - STORE FIELD & INCREMENT

FIELD LOADS/STORES

1. $(Q)_{0-4} \rightarrow LNG$

2. $(Q)_{5-9} \rightarrow OFF$

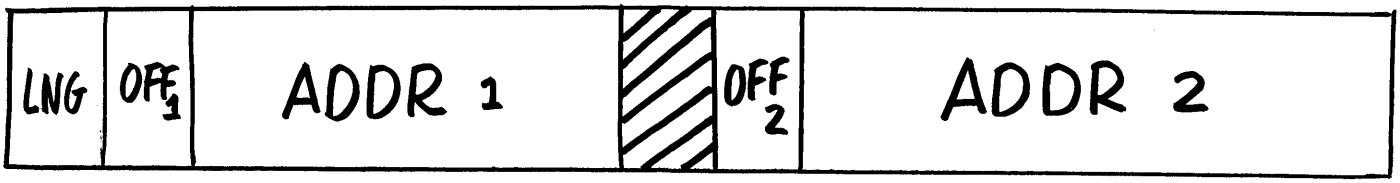
3. IF $LNG = 37_8$, $X_{0-4} \rightarrow LNG$

4. IF $OFF = 37_8$, $X_{5-9} \rightarrow OFF$

5. IF $LNG > 24_{10}$, TRAP

6. IF $OFF > 23_{10}$, TRAP

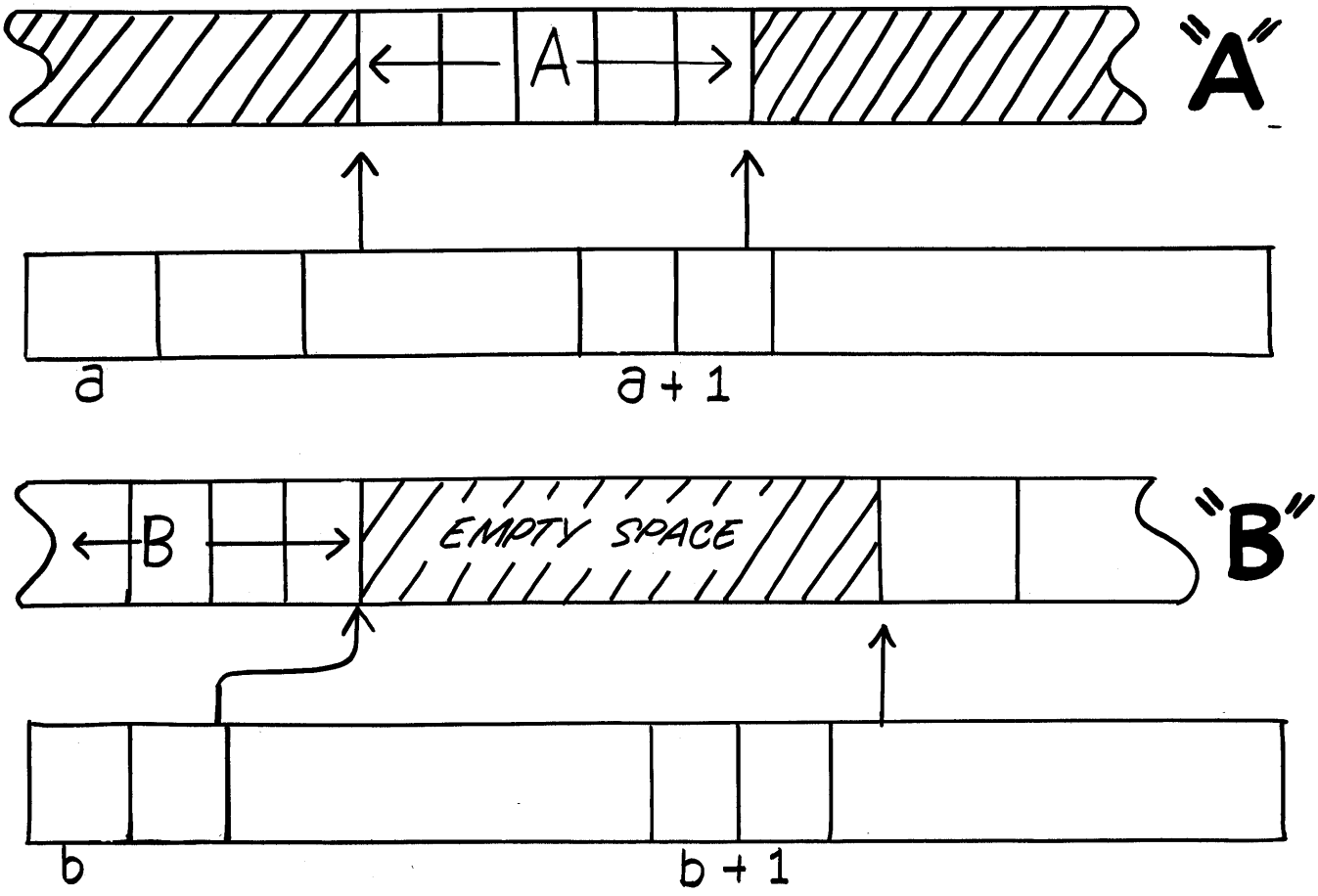
FIELD SPECIFICATION PREPARATION



1. IF $OFF_1 = OFF_2$ and
   $ADDR_1 = ADDR_2$, NOP

2. LOAD *(or store)* FIELD

3. $OFF_1 + LNG \rightarrow OFF_1$
   if ≤ 23, else
   $OFF_1 + LNG - 24 \rightarrow OFF_1$
   $ADDR_1 + 1 \rightarrow ADDR_1$




```
LDFI    a
BRU     done
STFI    b
BSL     overflow
BRU     * - 4
```

APPEND STRING A to B

ADD - ADD TO A

SUB - SUBTRACT FROM A

MPY - MULTIPLY

DIV - DIVIDE

ADM - ADD A to MEMORY

MIN - MEMORY INCREMENT

MDS - MEMORY DECREMENT & SKIP

ADX - ADD TO INDEX REGISTER

(NOTE: CARRY & OVERFLOW ARE SET WHEN SUMS ARE PLACED in A)

FIXED ARITHMETIC

AND-LOGICAL AND TO A
ORA-LOGICAL OR TO A
EOR-LOGICAL EXCLUSIVE OR to A

LOGICAL OPERATIONS

FAD-FLOATING ADD
UFA-UNNORMALIZED FLOATING ADD
FSB-FLOATING SUBTRACT
UFS-UNNORMALIZED FLOATING SUBTRACT
FMP-FLOATING MULTIPLY
FDV-FLOATING DIVIDE

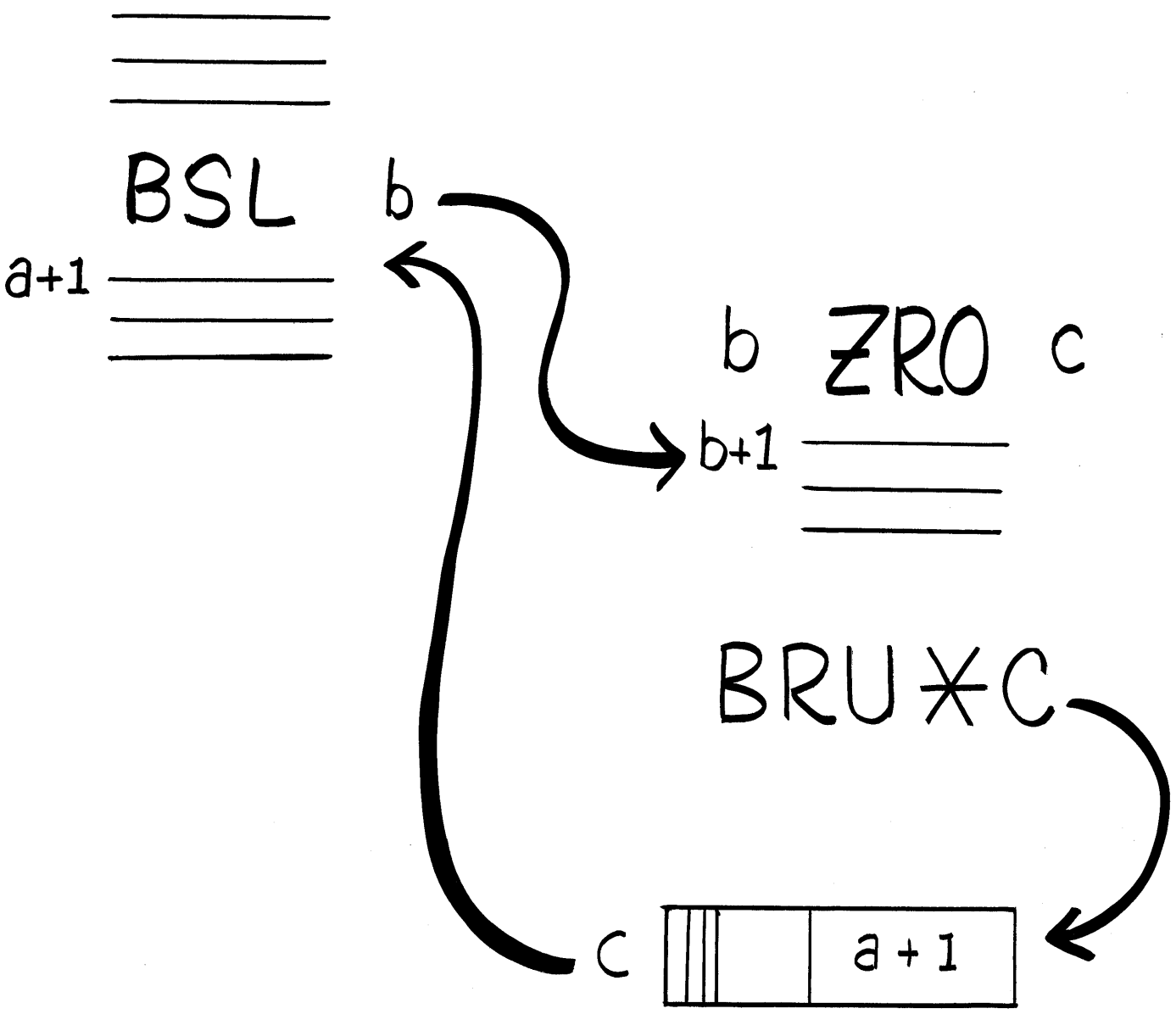
FLOATING POINT

SKE - SKIP ON A EQUAL to MEMORY
SKU - SKIP UNEQUAL
SKG - SKIP ON A GREATER
SKL - SKIP ON A LESS or EQUAL
SKEM - SKIP ON MASKED EQUALITY
SKUM - SKIP ON MASKED UNEQUAL
SKN - SKIP IF MEMORY NEGATIVE
SKP - SKIP IF MEMORY POSITIVE
SKA - SKIP ON A & MEMORY ZERO
SKB - SKIP ON B & MEMORY ZERO
SKC - SKIP & CLEAR FLAG

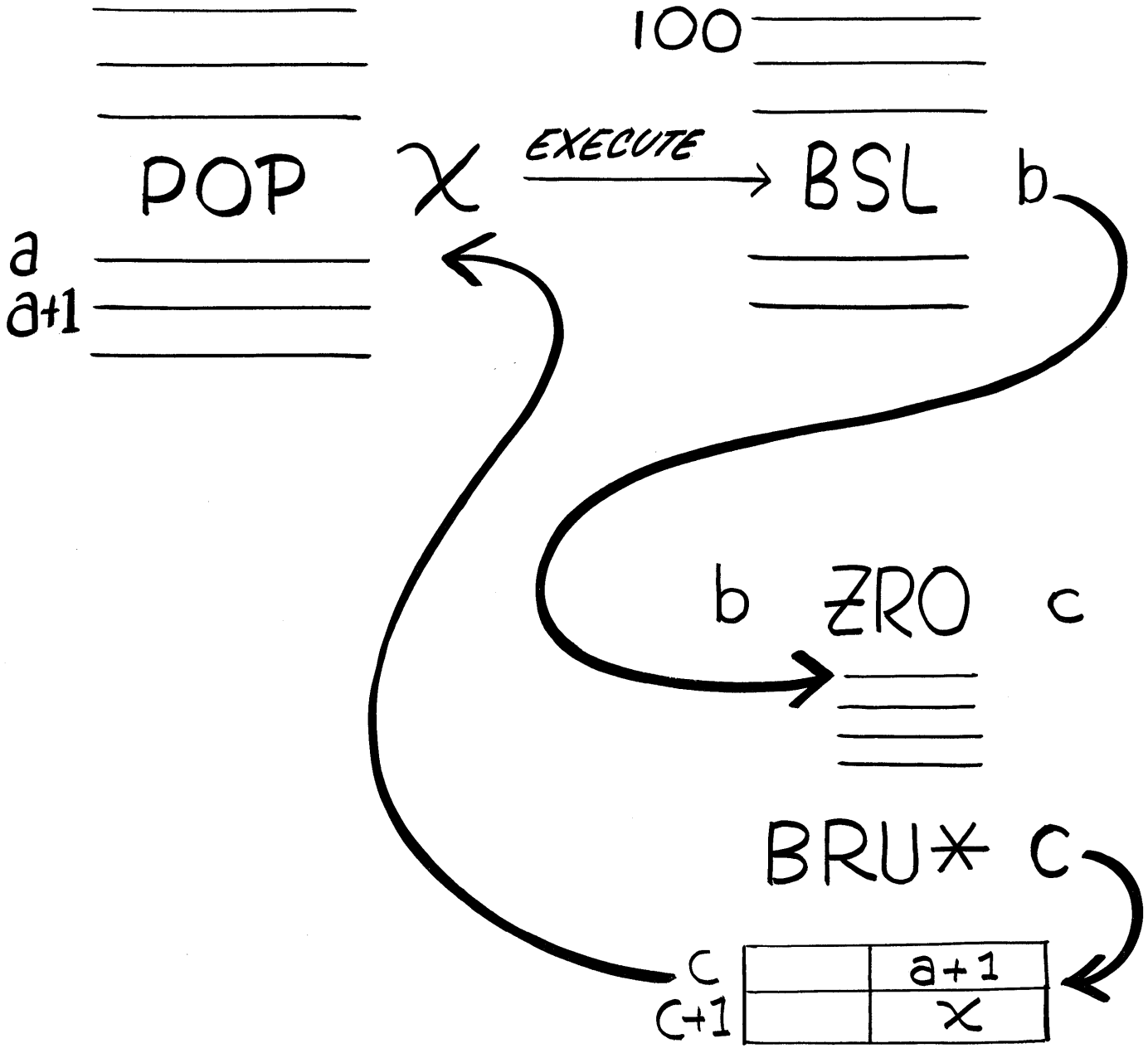
SKIP TESTS

BRU - BRANCH UNCONDITIONAL
BSL - BRANCH & SAVE LOCATION
BIX - BRANCH - INCREMENT X
BDX - BRANCH - DECREMENT X
BRI - BRANCH & RESTORE INTERRUPTS

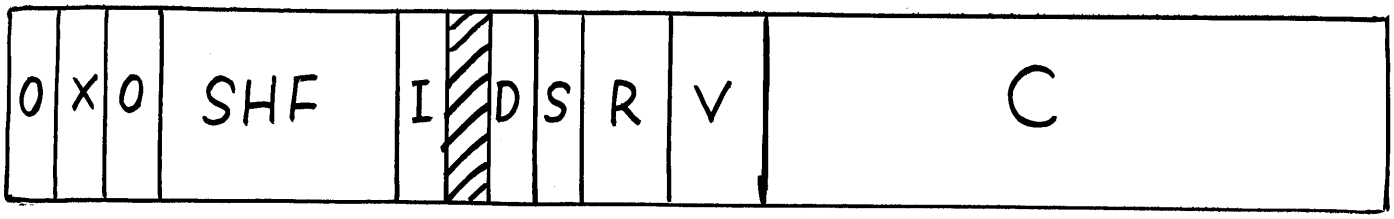
BRANCHING



BSL



POP'S



C = *shift count ± 0-63 positions*

V = *vacated position values*
0's, 1's, sign, sign comp

R = *Registers shifted*
A, B, AB, A *and* B

S = *Shift Type*
logical - Arithmetic

D = *Direction*
Left - Right
(C is a signed shift)

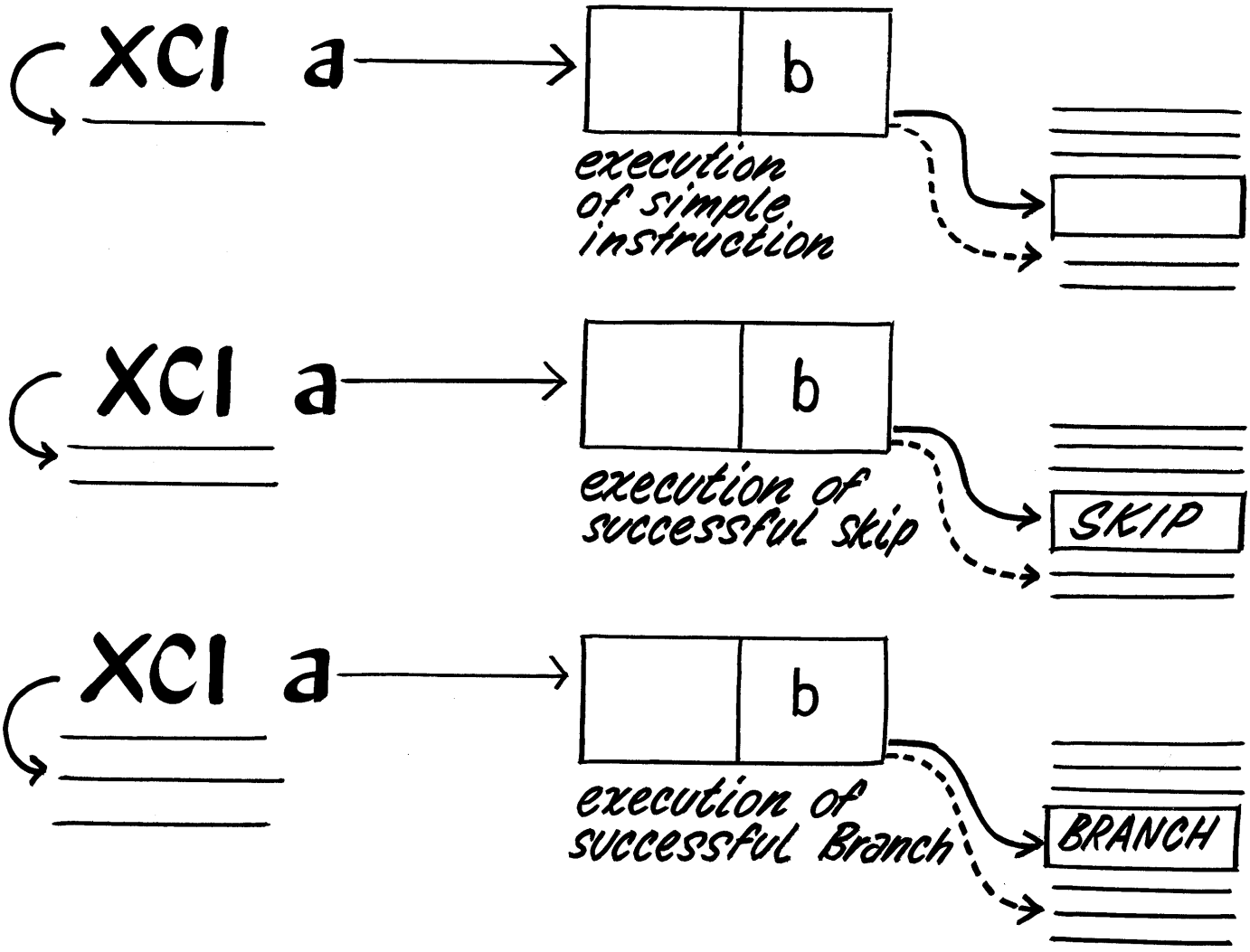
ANY LENGTH SHIFT IN 700 ns.

SHIFTS

EAX - EFFECTIVE ADDRESS TO X
SHF - SHIFT
XEC - EXECUTE
XCI - EXECUTE INDIRECT
OPR - OPERATE MICROINSTRUCTION
- A NORM - FD INTO BIT LENGTH
- B NORM - BIT LENGTH INTO FD
- NORM - NORMALIZE FD
- FIX - FLOAT TO FIX CONVERSION
- FLT - FIX TO FLOAT CONVERSION
- FNG - FLOATING NEGATE
- FRD - FLOATING ROUND
- SWP - GENERAL REGISTER SWAP
- AOP - ARITHMETIC OPS *on* REGISTERS
- LOP - LOGICAL OPS *on* REGISTERS
- RIN - REGISTER INCREMENTS & TEST

(and Many Others)

MISCELLANEOUS



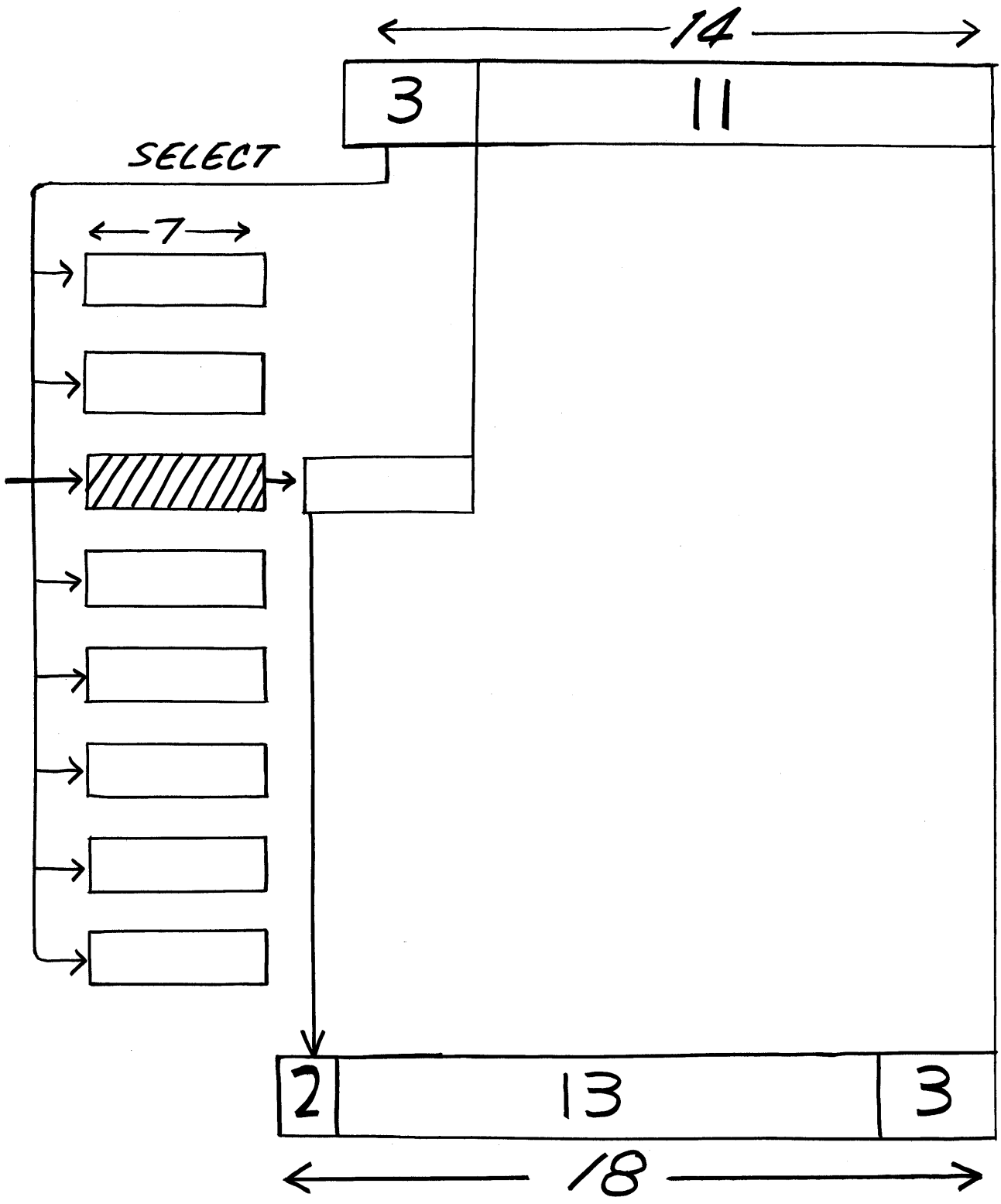
EXECUTE INDIRECT

SWP-SWAP
LRO-LOGICAL REGISTER OPS
ARO-ARITHMETIC REGISTER OPS
RIN-REGISTER INCREMENT
BTO-BIT TEST OP
PFM-PERFORM GROUP

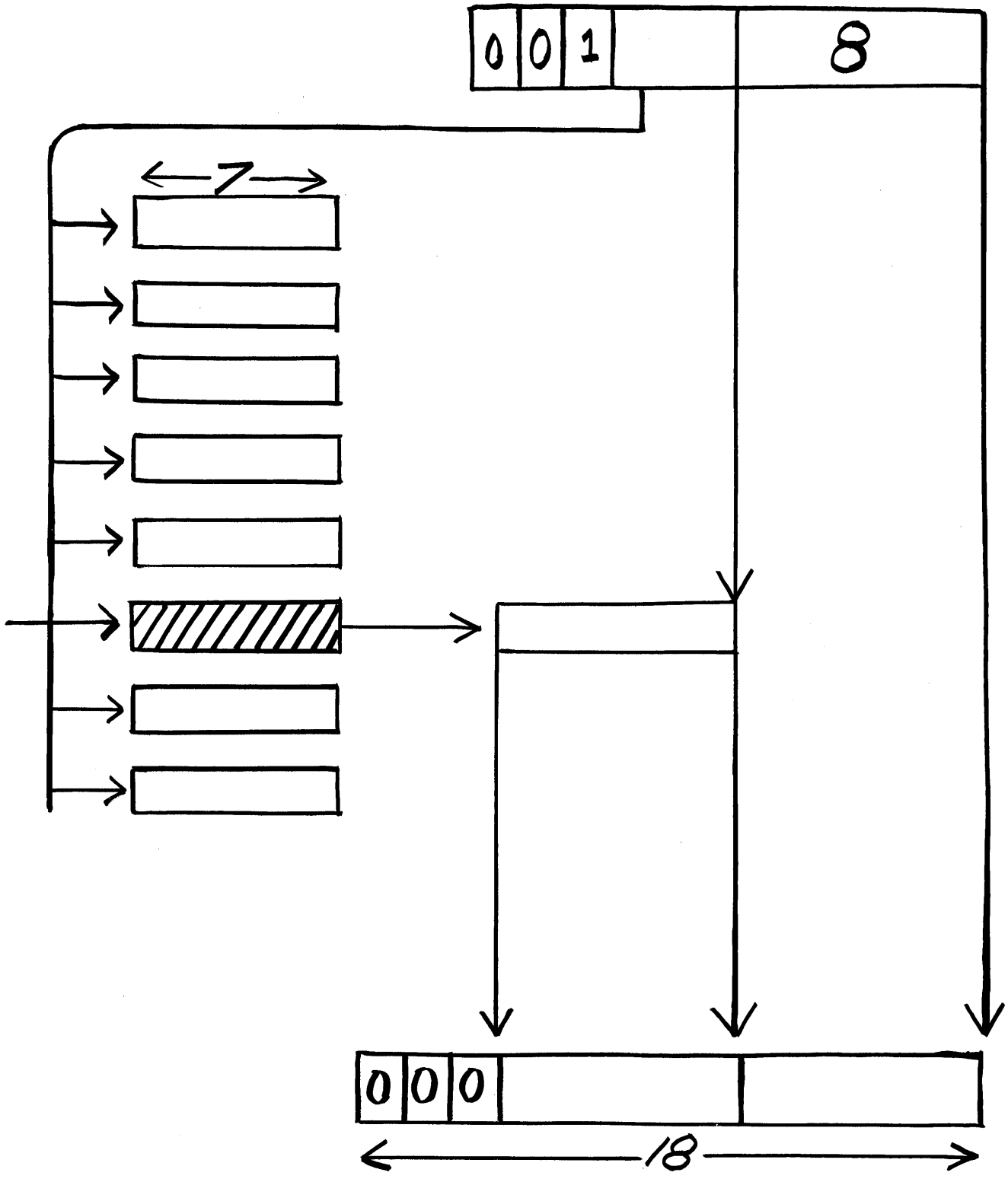
OPERATE GROUP

FLT - CONVERT TO FLOATING POINT
FIX - CONVERT TO FIXED POINT
FRND - FLOATING ROUND
FNEG - FLOATING NEGATE
A NRM - A NORMALIZE FO
B NRM - B NORMALIZE FO
NRM - NORMALIZE FO
LLO - LOCATE LEADING ONES
LLZ - LOCATE LEADING ZERO
LLT - LOCATE LEADING TRANSITION
CNT - COUNT BITS

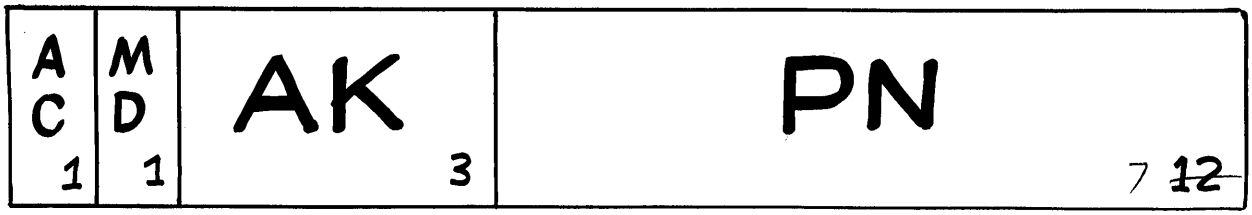
PERFORM GROUP



USER MEMORY MAPPING



MONITOR PG1 MAPPING



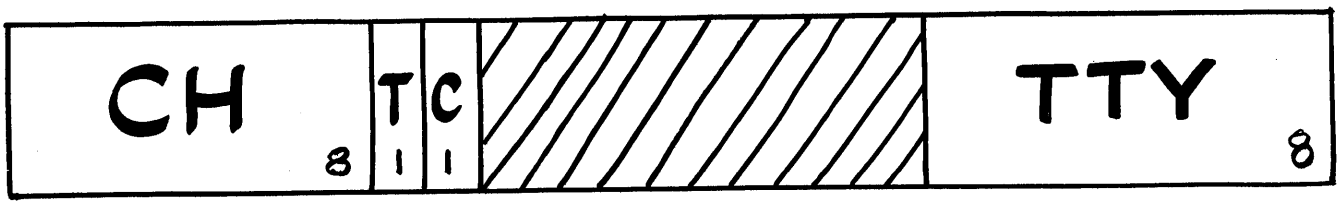
PN-ACTUAL PAGE NUMBER
AC-ACCESS MARK
MD-MODIFICATION MARK
AK-ACCESS KEY

no access
read, write
execute only
execute privileged
read, execute
read, execute privileged
read, write, execute
read, write, execute privileged

MEMORY MAP REGISTER

40 PRIVILEGE ERROR
41 UNDEFINED OP-CODE
42 WRITE ERROR
43 READ ERROR
44 EXECUTE ERROR
45 FLOATING OVERFLOW
46 INTERVAL TIMER
47 NON-EXISTENT MEMORY
50 RETURN TO USER MAP
51 PARITY ERROR
52 FD SPECIFICATION ERROR

TRAP LOCATIONS



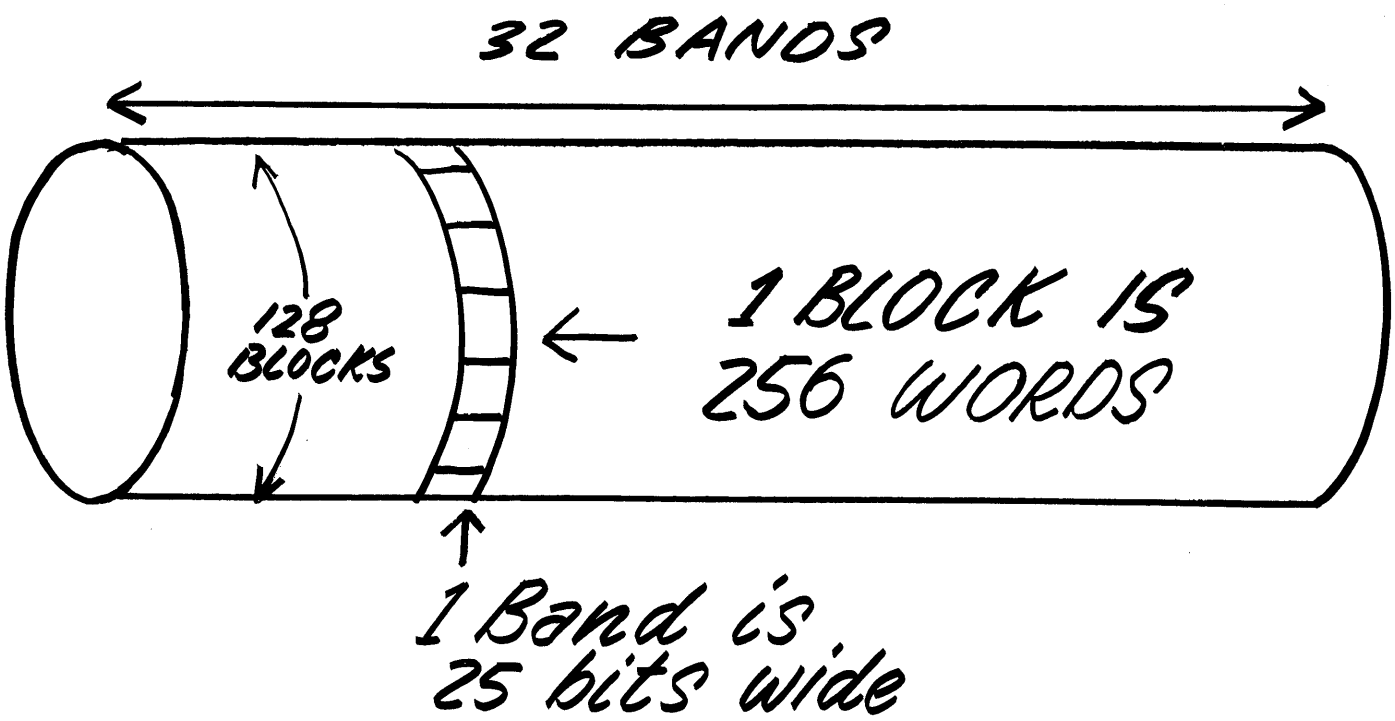
CH - *Character to be transmitted*

TTY - *Teletype Number*

T - =1 *do not transmit* CH

C - =1 *interrupt on transmission complete*

TELETYPE I-O FORMAT



WORDS PER BAND = 32,768
TOTAL WORD = 1,048,576
TRANSFER RATES = 1.1 MHz
INTERBLOCK GAP = 15 μsec
AVERAGE ACCESS = 17 MS
MAX ACCESS = 35 MS

DRUM FORMAT

SCC maintains complete support activities for its users. Installation and maintenance services are available through SCC offices strategically located throughout the United States. For pre-procurement demonstration of hardware and programs in Dallas, contact local sales office or the Marketing Department in Dallas.

Arlington, Massachusetts
30 Park Avenue
617 — 648-2922
(Boston)

Skokie, Illinois
125 Old Orchard Arcade
312 — 675-6700
(Chicago)

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713 — 782-9851

Seattle, Washington
1806 South Bush Place
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Midland Park, New Jersey
36 Central Avenue
201 — 652-6750
(New York)

Crofton, Maryland
Village Green
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Other SCC products include: telemetry systems and airborne signal conditioning equipment such as amplifiers, demodulators and converters.

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