Character Set Format

Character	External (ASCII)	Internal	Character	External (ASCII)	Internal
A	301	1	$	244	44
B	302	2	%	245	ignored
C	303	3	&	246	46
D	304	4	'	247	ignored
E	305	5	(	250	50
F	306	6	)	251	51
G	307	7	*	252	52
H	310	10	+	253	53
I	311	11	,	254	54
J	312	12	—	255	55
K	313	13	.	256	56
L	314	14	/	257	57
M	315	15	0	260	60
N	316	16	1	261	61
O	317	17	2	262	62
P	320	20	3	263	63
Q	321	21	4	264	64
R	322	22	5	265	65
S	323	23	6	266	66
T	324	24	7	267	67
U	325	25	8	270	70
V	326	26	9	271	71
W	327	27	:	272	72
X	330	30	;	273	73
Y	331	31	≤	274	74
Z	332	32	=	275	75
[	333	33	,	276	76
\	334	34	?	277	77
]	335	35	L/T	200	non-existent
↑	336	36	LINEFEED	212	45 (%)
←	337	ignored	CR	215	43 (#)
SPACE	240	40	Alt Mode	375	not stored
!	241	41	Rubout	377	not stored
"	242	42	Hor. Tab	211	47 (')
#	243	ignored	@	300	ignored
			Bell	207	ignored

START UP LAP6-DIAL

Put system tape on unit 0
Set CRT Display Channel Selector to 1 & 2
Turn A/D Knobs 3 & 7 to far right
Press Stop
Set Left Switches to 0701
Set Right Switches to 7300
Press I/O PRESET
Press DO
Press START 20 when tape stops

pdp12

INSTRUCTION LIST
LINC MODE

Mnemonic	Class	Code	Function	Time (µsec.)
			ADD	
ADD	D*	2000	add Y to contents of AC	3.2
ADA	β	1100	add Y to contents of AC	3.2
ADM	β	1140	add AC to memory	3.2
LAM	β	1200	add link and AC to memory	3.2
			MULTIPLY	
MUL	β	1240	signed multiply of AC by Y	8-9.6
QAC		0005	MQ(0-10)→AC(1-11); 0→AC(0)	1.6
			LOAD	
LDA	β	1000	load AC with Y	3.2
LDH	β	1300	load AC with half word from Y	3.2
			STORE	
STC	D	4000	store and clear AC	3.2
STA	β	1040	store AC in Y	3.2
STH	β	1340	store half word from AC in Y	3.2
			SHIFT/ROTATE	
ROLn		024n	rotate left n places	1.6-6.4
RORn		030n	rotate right n places	1.6-6.4
SCRn		034n	scale right n places	1.6-6.4

*D = Direct Address Format
β = Beta Class Indirect Address Format
α = Alpha Class Address Format

Mne-monic	Class	Code	Function	Time (μsec.)
			OPERATE	
HLT		0000	halt	1.6
CLR		0011	clear AC, link, and MQ	1.6
NOP		0016	no operation	1.6
SET	α	0040	set α register = contents of Y	4.8
JMP	D	6000	jump unconditionally	3.2
DJR		0006	disable JMP return save	1.6
ESF		0004	$AC(2\text{-}6) \rightarrow$ Special Function register; $AC(7) = 1$ gives I/O preset pulse	1.6
SFA		0024	Special Functions $\rightarrow AC(2\text{-}6)$; $0 \rightarrow AC(7\text{-}11)$	1.6


```
AC  0  1  2  3  4  5  6  7  8  9  10  11
```
INSTRUCTION TRAP
TAPE TRAP
DISPLAY CHARACTER SIZE
0 = HALF SIZE
1 = FULL SIZE
I/O PRESET PULSE
DISABLE TELETYPE INTERRUPT
FAST SAMPLE A/D CHANNELS
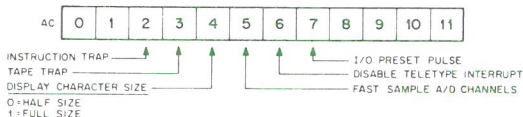
			LOGICAL OPERATIONS	
COM		0017	Compliment AC	1.6
BCL	β	1540	for each bit of Y = 1, clear that AC bit	3.2
BSE	β	1600	for each bit of Y = 1, set that AC bit	3.2
BCO	β	1640	for each bit of Y = 1, compliment that AC bit	3.2
			SKIPS	
XSK	α	0200	skip if Y = 1777; if I = 1, increment Y before test	3.2
SXLn		040n	skip if external level n = 1	1.6
KST		0415	skip if key struck (i.e. keyboard flag = 1)	1.6
SNSn		044n	skip if sense switch n = 1	1.6
AZE		0450	skip if AC = ±0	1.6
APO		0451	skip if AC(0) = 0	1.6
LZE		0452	skip if link bit = 0	1.6
FLO		0454	skip if FLOW flip flop = 1	1.6
QLZ		0455	skip if MQ(11) = 0	1.6
SKP		0456	skip unconditionally	1.6
		(0466	skip unconditionally) alternate codes not	
		(0467	skip unconditionally) generated by assembler	
SHD	β	1400	skip if half Y differs from right half AC	3.2
SAE	β	1440	skip if C(AC) = C(Y)	3.2
SRO	β	1500	skip if bit 11 of Y = 0; and rotate Y regardless	3.2

NOTE: If I bit = 1 for above (excluding XSK) skip on negation of condition.

PIP INPUT DEVICES

C) —card reader, colums 1-110$_8$ using IBM 029 keypunch codes

Caa; THRU, bb) —card reader columns aa$_8$ -bb$_8$ using 029 codes

H(F)(;MODE,ADDR)) —high speed reader to field F in LINC(L) or PDP-8(P) mode with starting ADDR

Ln; NAME) —LINCtape unit n, file NAME

Rn; NAME) — RF08, RK8 disk unit n, file NAME

T(F)(;MODE,ADDR)) Teletype reader, same as H.

PIP OUTPUT DEVICES

H)   —high speed punch

Ln; NAME) —LINCtape unit n, file NAME

Rn; NAME) —disk unit n, file NAME

T)   —Teletype

P)   —Line printer

NOTE: Paper tapes must be in reader before) is typed.

For source paper tapes CTRL/Z terminates input; if not punched in tape, type it on keyboard when tape has been read (PIP adds it on output); PIP then asks MORE TAPES? Type A to read another tape into same file; N if no more tapes for this file.

PIP CONTROL COMMANDS

CTRL/P   Return to PIP option display

CTRL/D   Return to LAP6-DIAL

CTRL/U‡ Rewind all REMOTE LINCtape transports & put unit 0 at block 0

CTRL/T‡ Rewind all REMOTE LINCtape transports & put unit 0 at block 300

‡ LAP6-DIAL-MS only

Legend

( ) = this item may be omitted

L1,L2 = from line L1 thru line L2; if omitted use entire file

N = file name, if omitted use work area

U = LINCtape (0-7), or disk‡ (10-17), unit number; if omitted use 0 (or 10)

TBLK = LINCtape block number

M = Starting mode, L(LINC) or P(PDP-8)

F = Memory Field

ADDR = 4 digit starting address

XY = user's arguments to what he has in free blocks (270-277)

TTY = Teletype printer

LPT = Line printer

PIP COMMANDS

→ PI = → LO PIP,0(10 if LAP6-DIAL-MS) PIP commands are nated by)

PIP OPTIONS   A) B) or S)

A—auxiliary operations
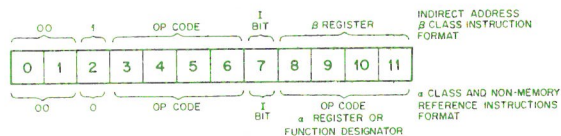
    C(#) copy specified blocks
    D(#) duplicate unit 0 onto unit 1
    S(#) copy entire system (blocks 300-345 & 350-370) except index
    U(#) copy entire unit

B—copy binary file

S—copy source file

=the number of consecutive units to copy to

Mnemonic	Code	Function	Time (μsec.)
		MEMORY	
LDFn	064n	set LINC data field to segment n (0≤N≤37)	1.6
LIFn	060n	set LINC instruction field to segment n (0≤N≤37)	1.6
(IOB)RIF	6224	LINC Instruction Field Register → AC(6-10)	5.9 (including IOB)
(IOB)RDF	6214	LINC Data Field Register → AC(6-10)	5.9 (including IOB)

DIRECT ADDRESS INSTRUCTION FORMAT

INDIRECT ADDRESS β CLASS INSTRUCTION FORMAT

α CLASS AND NON-MEMORY REFERENCE INSTRUCTIONS FORMAT

β CLASS ADDRESSING

I=0	β=0	operand address is in next location
I=1	β=0	operand is in next location
I=0	β≠0	operand address is in β register
I=1	β≠0	operand address − 1 in β register, β register is incremented by 1 before being used as operand address.

The operand address for β class instructions is computed as follows: Bits 2-11 of the operand address specify the memory location of the operand; if bit 1 of the operand address = 1, the operand is in the data field, if 0 it is in the instruction field.

HALF-WORD ADDRESSING

I=0	β=0	operand address is in next location
I=1	β=0	operand is in left half of next location
I=0	β≠0	operand address is in β register
I=1	β≠0	operand address − 4000 in β register, β register incremented by 4000 before being used as operand address.

The operand address for half-word operations is computed the same as described above under β Class Addressing, but with the following exception:

    If Bit 0 of the operand address =0, the left half of operand is used
    If Bit 0 of the operand address =1, the right half of operand is used

Mne-monic	Class	Code	Function	Time (μsec.)
			INPUT-OUTPUT	
ÅTR		0014	AC(6-11) → relay buffer	1.6
RTA		0015	relay buffer → AC(6-11)	1.6
SAMn		010n	sample analog channel n	1.6;18.2
DIS	a	0140	display point on scope	3.2-23**
DSC	β	1740	display character on scope (6 x 2 matrix)	4.8-56°
RSW		0516	right switches → AC	1.6
LSW		0517	left switches → AC	1.6
IOB		0500	execute following PDP-8 I/O Operation (including IOT)	5.9
(IOB)ION		6001	enable Interrupt facility (including IOB)	5.9
(IOB)IOF		6002	disable Interrupt facility (including IOB)	5.9
(IOB)RIB		6234	contents of Interrupt Buffer (Save Field Reg) ORed into AC bits 0-1 and 4-11 (including IOB)	5.9
(IOB)RMF		6244	Restore Data Field and In-struction Field from Save Field Register (including IOB)	5.9
PDP		0002	Transfer to 8 mode	1.6
			LINC TAPE	
RDE		0702	read 1 tape block into memory	
RDC		0700	read 1 tape block into memory and check it	
RCG‡		0701	read n tape blocks into memory and check each	3.2 and pause (Actual times depend upon tape position. Pause is optional, and program may continue after 3.2 μsec. instruction time.)
WRI		0706	write 1 tape block from memory	
WRC		0704	write 1 tape block from memory and check it	
WCG‡		0705	write n tape blocks from memory and check each	
CHK		0707	check 1 tape block	
MTB		0703	move tape toward specified block	
AXO		0001	AC → Extended Tape Operations Buffer	1.6
XOA		0021	Extended Tape Operations Buffer → AC	1.6
TAC		0003	Tape Accumulator Buffer → AC	1.6
TMA		0023	AC → Tape Memory Address Setup Register	1.6
STD		0416	skip if tape idle (no operation in progress)	1.6
TWC		0417	skip if tape word complete	1.6

$+$ Times shown are for $I = 1$ $B = 00$. Other cases add 1.6 μsec.
* Program can continue after 4.8 μsec.
** Program can continue after 3.2 μsec.
‡ Group tape transfers cannot be used with Extended Addres-sing.

LAP6-DIAL COMMANDS

→ CL⟩ — Clear source work area (unit 0)

→ ZE ⟩ ‡ — Fill BIN work area (unit 1) with zeros

→ AP(L1,L2,) N,U⟩
→ AP TBLK,U⟩ ⟩ — Add source file to source work area

→ AS(N,U)⟩ — Assemble; no listing; BIN output to BIN work area

→ LI(L1,L2,)(N,U)⟩ — Assemble and list on TTY (or LPT if 8K)

→ QL(L1,L2,)(N,U)⟩ — Assemble and list; omit line nos. & comments

→ SP N,U⟩ — Save source program from source work area. If source by that name on tape, REPLACE? displayed; type R if yes, ⟩ if no.

→ SB N,U(,M[FADDR])⟩ — Save BIN program from BIN work area. If L mode & start address omitted 04020 assumed; if P mode & no addr, 00200 assumed. If mode & addr omitted halt at 7774. Replace same as for SP.

→ AB(ADDR, [F,])N,U⟩ ‡ — Copy BIN file to BIN work area, omit zeros

→LO (N,U)⟩ — Load binary file; if name omitted, load from BIN work area and halt at 7774

→ DX(,U)⟩ — Display index; Q,W,1&2 move back-ward & forward thru index; rubout to delete files, colon to finalize

→ PX(,U)⟩ — print index on TTY; ⟩ to stop print-ing

→ PS(L1,[L2,])(N,U)⟩ — print source from named file; ⟩ to stop printing

→ MC X(Y),U⟩ — reads block 270 into loc 4000-4377, puts X & Y into AC and starts at 04020

→ EX — save pointers and halt (press CONT to restart LAP 6-DIAL)

‡ LAP6-DIAL-MS only

PDP-12 MEMORY ORGANIZATION

LINC-MODE

15 BIT ABSOLUTE
OCTAL ADDRESS

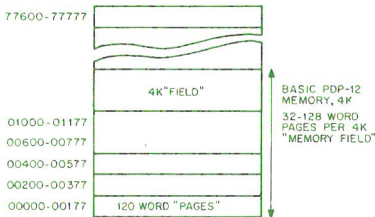| 76000-77777 | |
EXTRA MEMORY (UP TO 32K)	BASIC PDP-12 MEMORY, 4K
06000-07777	4-256 WORD "MEMORY BLOCKS" PER 1K SEGMENT
04000-05777	
02000-03777	
00000-01777	1K SEGMENT
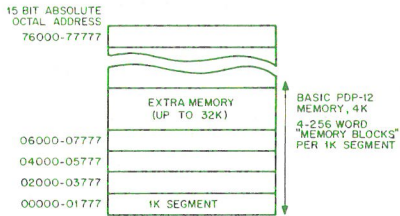
(each field contains 15 auto-index registers)
"Trap" is location 0140 (C(PC) → 0140)
Interrupt is location 0040 (C(PC) → 0040)

8-MODE

77600-77777	
4K "FIELD"	BASIC PDP-12 MEMORY, 4K
01000-01177	32-128 WORD PAGES PER 4K "MEMORY FIELD"
00600-00777	
00400-00577	
00200-00377	
00000-00177	120 WORD "PAGES"

(each field contains 8 auto-index registers)
Interrupt is location 0000 (C(PC) → 0000)

Mnemonic	Class	Code	Function	Time (μsec.)
IBZ		0453	skip if tape in inter block zone	1.6
STB		0414	skip if 8 tape block flag set	4.25
SWD		0457	skip if 8 tape word done flag set	4.25
(IOB)LMR		6151	with AC(5)=1; skip if tape done flag =1 (operation performed and completed)	5.9 (including IOB)
(IOB)LMR		6151	with AC(4) =1; clear tape done flag	5.9 (including IOB)

NOTE: Due to other functions of LMR other bits of AC **must** be =0 when executing the two instructions above.

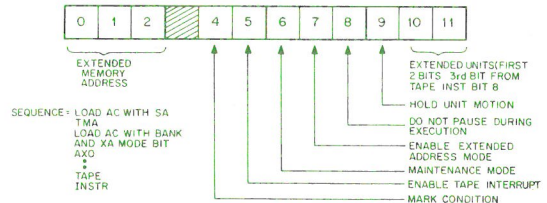### TRAPPED INSTRUCTIONS

501 to 515	operate 01 - 15	3.2
521 to 535	operate 01 - 15 (with I bit set)	3.2
700 to 737	LINCtape operations (these instructions are trapped if the tape trap bit is set)	3.2
740 to 747	execute	3.2
540 to 577	undefined	
1700 to 1737	undefined	

LINCTAPE INSTRUCTION FORMAT
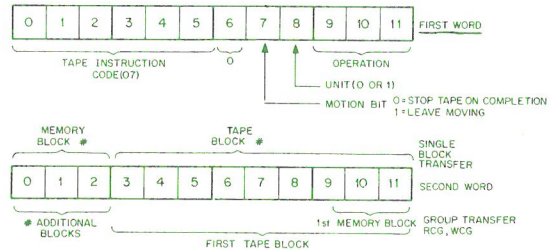
LINC TAPE EXTENDED OPERATIONS

8-MODE INSTRUCTIONS

Mnemonic	Code	Function	Time (μsec.)

BASIC INSTRUCTIONS

Mnemonic	Code	Function	Time
AND	0000	Logical AND	3.2
TAD	1000	2's complement add	3.2
ISZ	2000	increment and skip if zero	3.2
DCA	3000	deposit and clear AC	3.2
JMS	4000	jump to subroutine	3.2
JMP	5000	jump	1.6
IOT	6000	in/out transfer	4.25
OPR	7000	operate	1.6

GROUP 1 OPERATE MICROINSTRUCTIONS

Mnemonic	Code	Function	Time
NOP	7000	no operation	1.6
IAC	7001	increment AC	1.6
RAL	7004	rotate AC and link left one	1.6
RTL	7006	rotate AC and link left two	1.6
RAR	7010	rotate AC and link right one	1.6
RTR	7012	rotate AC and link right two	1.6
CML	7020	complement link	1.6
CMA	7040	complement AC	1.6
CLL	7100	clear link	1.6
CLA	7200	clear AC	1.6

GROUP 2 OPERATE MICROINSTRUCTIONS

Mnemonic	Code	Function	Time
HLT	7402	halts the program	1.6
OSR	7404	Inclusive OR, switch register with AC	1.6
SKP	7410	skip unconditionally	1.6
SNL	7420	skip on non-zero link	1.6
SZL	7430	skip on zero link	1.6
SZA	7440	skip on zero AC	1.6
SNA	7450	skip on non-zero AC	1.6
SMA	7500	skip on minus AC	1.6
SPA	7510	skip on plus AC	1.6
CLA	7600	clear AC	1.6

COMBINED OPERATE MICROINSTRUCTIONS

Mnemonic		Code	Function	
CIA		7041	complement and increment AC	
LAS		7604	load AC with switch register	
STL		7120	set link (to 1)	
GLK		7204	get link (put link in AC bit 11)	
CLA	CLL	7300	clear AC and link	
CLA	IAC	7201	Set AC $= 1$	
CLA	CMA	7240	set AC $= -1$	
CLL	RAR	7110	shift positive number one right	
CLL	RTL	7106	clear link, rotate 2 left	
CLL	RTR	7112	clear link, rotate 2 right	1.6
SZA	CLA	7640	skip if AC $= 0$, then clear AC	
SZA	SNL	7460	skip if AC $= 0$ or link is 1, or both	
SMA	SZA	7540	skip if AC ≤ 0	
SMA	SNL	7520	skip if AC < 0 or link is 1, or both	
SPA	SNA	7550	skip if AC > 0	
SPA	SZL	7530	skip if AC ≥ 0, and if the link is 0	
SPA	CLA	7710	skip if AC ≥ 0, then clear AC	
SNA	SZL	7470	skip if AC $\neq 0$ and link $= 0$	

RK8/RK01 DISK CARTRIDGE MEMORY

Mnemonic	Code	Function
DLDC	6732	Load Command register from AC, clear AC
DLDR	6733	Load disk address from AC and read
DLDW	6735	Load disk address from AC and write
DCHP	6737	Load disk address from AC, read and check parity
DRDA	6734	Clear AC and read disk address into AC
DRDC	6736	Clear AC and read Command register into AC
DRDS	6741	Clear AC and read Status register into AC
DCLS	6742	Clear Status register
DMNT	6743	Load Maintenance register from AC
DLDA	6731	Load disk address from AC (Maintenance only)
DSKD	6745	Skip on Transfer Done flag
DSKE	6747	Skip on Error flag
DCLA	6751	Clear all control registers and flags except disk select; set Transfer Done flag when disk at Track 000
DRWC	6752	Clear AC and read Word Count register into AC
DLWC	6753	Load Word Count from AC; Clear AC
DRCA	6757	Clear AC and read Current Address register into AC
DLCA	6755	Load Current Address from AC, Clear AC

LINE PRINTER and CONTROL TYPE LP12

Mnemonic	Code	Function
LSE	6651	Skip on Line Printer Error flag
LCF	6652	Clear Printer Error and Done flags
LLB	6654	Load Printer Buffer
LSD	6661	Skip on Printer Done flag
LCB	6662	Clear Printer Buffer
LPR	6664	Load Printer Format register and print

LINE PRINTER and CONTROL TYPE LP08

Mnemonic	Code	Function
LSF	6661	Skip on Demand Character flag
LCF	6662	Clear Character flag
LSR	6663	Skip on Error Status line
LLC	6664	Load Printer Buffer from AC and print if buffer full
LSP	6665	Set Interrupt Enable
LPC	6666	Load Buffer from AC and clear flag
LCP	6667	Clear Interrupt Enable

INTERRUPT CONTROL

ION	6001	turn interrupt on
IOF	6002	turn interrupt off

MODE CHANGE

| LINC | 6141 | change to LINC mode |

RANDOM ACCESS DISC FILE TYPE DF32

| DCMA | 6601 | clear disk Memory Address register, & disc flags |
DMAR	6603	load disk Memory Address register & read
DMAW	6605	load disk Memory Address register and write
DCEA	6611	clear disk Extended Address register and Memory Address Extension
DSAC	6612	skip on address confirmed flag
DEAL	6615	load disk Extended Address and Memory Address Extension
DEAC	6616	read disk Extended Address register
DFSE	6621	skip on zero error flag
DFSC	6622	skip on data completion flag
DMAC	6626	read disk Memory Address register

4.25 if executed from 8-mode.
5.9 if executed from LINC-mode.

DISK MEMORY SYSTEM TYPE RF/RS08

DCMA	6601	Clear disk Memory Address register and all disk flags except interrupt enable
DMAR	6603	Load disk Memory Address register and read
DMAW	6605	Load disk Memory Address register and write
DCIM	6611	Clear disk interrupt enable and Memory Address Extension register
DSAC	6612	Skip on Address Confirmed flag
DIML	6615	Clear interrupt enable and Memory Address Extension register and load them from AC
DIMA	6616	Clear AC and load status into AC
DFSE	6621	Skip on zero error flag
DFSC	6622	Skip on Data Completion flag
DISK	6623	Skip on Error or Completion flag
DMAC	6626	Clear AC, load disk Memory Address register into AC
DCXA	6641	Clear disk address register
DXAL	6643	Clear disk address register and load it from AC, then clear AC
DXAC	6645	Clear AC, load disk address register into AC
DMMT	6646	Maintenance Instruction

8-MODE INSTRUCTION FORMATS
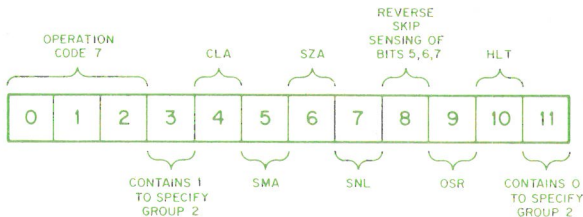
Memory Reference Instruction Bit Assignments
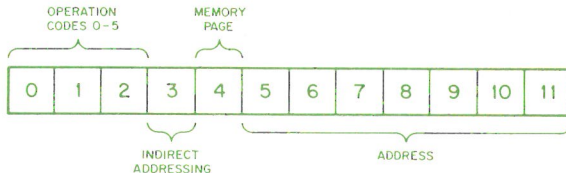
Group 1 Operate Instruction Bit Assignments
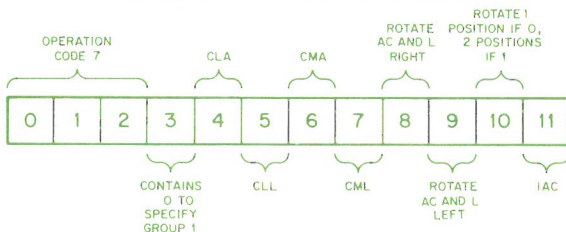
Logical Sequences:
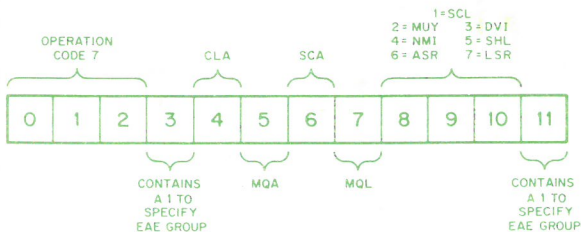1—CLA, CLL
2—CMA, CML
3—IAC
4—RAR, RAL, RTR, RTL

Group 2 Operate Instruction Bit Assignments

Logical Sequences:
1 (Bit 8 is Zero) — Either SMA or SZA or SNL
1 (Bit 8 is One) — Both SPA and SNA and SZL
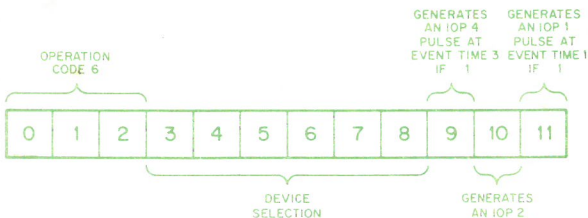2 — CLA
3 — OSR, HLT

EAE Microinstruction Bit Assignments

Bit assignment diagram:

```
                                        1 = SCL
                                    2 = MUY    3 = DVI
   OPERATION                        4 = NMI    5 = SHL
   CODE 7        CLA       SCA      6 = ASR    7 = LSR

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |

         CONTAINS      MQA      MQL           CONTAINS
         A 1 TO                               A 1 TO
         SPECIFY                              SPECIFY
         EAE GROUP                            EAE GROUP
```

Logical Sequence:

1 — CLA

2 — MQA, MQL, SCA

3 — SCL, MUY, DVI, NMI, SHL, ASR, LSR

8-MODE MULTIPLY/DIVIDE KE12

SCL	7403	load the step counter	3.2	
MUY	7405	multiply	9.0	
DVI	7407	divide	4.0-10.0	
NMI	7411	normalize	$1.6 + 0.40$/step	
SHL	7413	shift left	$3.2 + 0.40$/step	
ASR	7415	arithmetic shift right	$3.2 + 0.40$/step	
LSR	7417	logical shift right	$3.2 + 0.40$/step	
MQL	7421	load AC into MQ, clear AC	1.6	
SCA	7441	read SC into AC	1.6	
MQA	7501	Inclusive OR, MQ with AC	1.6	
CLA	7601	clear AC	1.6	
CAM	7621	clear AC and MQ	1.6	

IOT Instruction Bit Assignments


```
                              GENERATES       GENERATES
                              AN IOP 4        AN IOP 1
                              PULSE AT        PULSE AT
   OPERATION                  EVENT TIME 3    EVENT TIME 1
   CODE 6                     IF  1           IF  1

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |

              DEVICE                    GENERATES
              SELECTION                 AN IOP 2
                                        PULSE AT
                                        EVENT TIME 2
                                        IF  1
```

POWER FAILURE/RESTART KP12

SPL   6102   skip on power too low

Mnemonic	Code	Function	Time (μsec.)

EXTENDED MEMORY MC12

CDFn0	62n1	change to data field n	
CIFn0	62n2	change to instruction field n	
RDF	6214	read data field into AC	
RIF	6224	read instruction field into AC	
RMF	6244	restore memory field	
RIB	6234	read interrupt buffer	

REAL TIME CLOCK KW12-A

CLSK	6131	skip on clock interrupt	
CLLR	6132	AC → Clock Control register	
CLAB	6133	AC → Buffer Preset register	
CLEN	6134	AC → Clock Enable register	
CLSA	6135	clock status → AC	
CLBA	6136	Buffer Preset register → AC	
CLCA	6137	Clock Counter → AC	

FIXED INTERVAL CLOCKS KW12-B AND KW12-C

CSOF	6131	Skip if Clock Flag = 1	
CTOC	6132	Turn off clock, clear flag, disable interrupt	
CTON	6134	Turn on clock, clear flag	
CRUN	6135	Turn on clock, enable Interrupt, skip if Clock Flag = 1, and clear flag	4.25 if executed from 8-mode. 5.9 if executed from LINC-mode.

TTY KYBD/READER

KSF	6031	skip if flag is set	
KCC	6032	clear AC and flag	
KRS	6034	KYBD/reader buffer → AC	
KRB	6036	clear AC, KYBD/reader buffer→AC clear flag	

TTY PRINTER/PUNCH

TSF	6041	skip if flag is set	
TCF	6042	clear flag	
TPC	6044	AC → printer/punch buffer, print	
TLS	6046	AC → printer/punch buffer, print, clear flag	

HIGH SPEED PERFORATED TAPE READER TYPE PR8/I

RSF	6011	skip if reader flag = 1	
RRB	6012	read reader buffer, and clear flag	
RFC	6014	clear flag and buffer and fetch character	

HIGH SPEED PERFORATED TAPE PUNCH TYPE PP8/I

PSF	6021	skip if punch flag = 1	
PCF	6022	clear flag and buffer	
PPC	6024	load buffer and punch character	
PLS	6026	clear flag and buffer; load and punch	