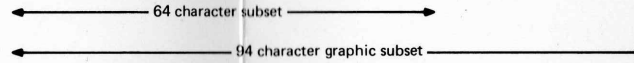


ASCII CHARACTER SET
ASCII-1968 (ANSI X3.4-1968)

To obtain octal ASCII, decimal ASCII, or DECsystem-10 SIXBIT representation of a character, add the row value to the column value.

Column Value	000	008	016	024	032	040	048	056	064	072	080	088	096	104	112	120	
Row Value	000	010	020	030	040	050	060	070	100	110	120	130	140	150	160	170	
0	NUL	BS	DLE	CAN	space	(	0	8	@	H	P	X	grave	h	p	x	
1	SOH	HT	DC1	EM	!	)	1	9	A	I	Q	Y	a	i	q	y	
2	STX	LF	DC2	SUB	"	*	2	:	B	J	R	Z	b	j	r	z	
3	EXT	VT	DC3	ESC	#	+	3	;	C	K	S	[	c	k	s	{	
4	EOT	FF	DC4	FS	\$	,	4	<	D	L	T	\	d	l	t	|	
5	ENQ	CR	NAK	GS	%	-	5	=	E	M	U	]	e	m	u	}	
6	ACK	SO	SYN	RS	&	.	6	>	F	N	V	(^)	f	n	v	(ESC)	
7	BEL	SI	ETB	US	apos	/	7	?	G	O	W	(-)	g	o	w	DEL	



Differences in the ASCII Standard

Octal	ASCII 1963	ASCII 1968
136	↑	^ (circumflex)
137	←	~ (underline)
176	ESC	~

NUL	NULL	DLE	DATA LINK ESCAPE (↑P)
SOH	START OF HEADING (↑A)	DC1	DEVICE CONTROL 1 (↑Q)
STX	START OF TEXT (↑B)	DC2	DEVICE CONTROL 2 (↑R)
ETX	END OF TEXT (↑C)	DC3	DEVICE CONTROL 3 (↑S)
EOT	END OF TRANSMISSION (↑D)	DC4	DEVICE CONTROL 4 (STOP) (↑T)
ENQ	ENQUIRY (↑E)	NAK	NEGATIVE ACKNOWLEDGE (↑U)
ACK	ACKNOWLEDGE (↑F)	SYN	SYNCHRONOUS IDLE (↑V)
BEL	BELL (↑G)	ETB	END OF TRANSMISSION BLOCK (↑W)
BS	BACKSPACE (↑H)	CAN	CANCEL (↑X)
HT	HORIZONTAL TABULATION (↑I)	EM	END OF MEDIUM (↑Y)
LF	LINE FEED (↑J)	SUB	SUBSTITUTE (↑Z)
VT	VERTICAL TABULATION (↑K)	ESC	ESCAPE (↑[)
FF	FORM FEED (↑L)	FS	FILE SEPARATOR (↑\)
CR	CARRIAGE RETURN (↑M)	GS	GROUP SEPARATOR (↑])
SO	SHIFT OUT (↑N)	RS	RECORD SEPARATOR (↑^)
SI	SHIFT IN (↑O)	US	UNIT SEPARATOR (↑-)
		DEL	DELETE (RUBOUT)

On most teleprinters, the ↑x character is produced by depressing the CTRL key and at the same time depressing the x character key.

NOTES

- SIXBIT is not part of any ASCII standard. It is used by DECsystem-10 programs as a code compression technique for the 64 character graphic subset of ASCII.
- Teleprinters manufactured by Teletype Corporation, Skokie, Illinois, have used codes 175 (ALT) and 176 for ESC. Programs may forgo the use of } (175) and ~ (176) in order to use these codes as ESC on older teleprinters.
- ASCII is a seven bit character code with an optional odd parity bit (200) added for many devices. Programs normally use just seven bits internally; the 200 bit is either stripped or added so the program will operate with either parity or non-parity generating devices.
- ISO Recommendation R646 and CCITT Recommendation V.3 (International Alphabet No. 5) is identical to ASCII except that number sign (043) is represented as £ instead of # and certain characters are reserved for national use.

7-- INPUT-OUTPUT INSTRUCTIONS

70000	³ BLKI	70204	⁶ RDCSB
	¹ APRID		⁵ RDTIME
70004	⁴ DATAI	70210	⁶ RDPUR
	⁴ DATAI APR,		⁵ WRPAE
	⁴ RSW	70214	⁶ RDCSTM
70010	⁵ BLKO	70220	⁶ RDTIM
	⁵ WRFIL		⁵ CONO TIM,
70014	³ DATAO	70224	⁶ RDINT
	³ DATAO APR,		⁵ CONI TIM,
70020	³ CONO	70230	⁶ RDHSB
	⁶ WRAPR	70240	⁶ WRSPB
	³ CONO APR,		⁵ RDMACT
70024	³ CONI	70244	⁶ WRCSB
	⁶ RDAPR		⁵ RDEACT
	³ CONI APR,	70250	⁶ WRPUR
70030	³ CONSZ	70254	⁶ WRCTM
70034	³ CONSO	70260	⁶ WRTIM
70040	⁵ RDERA		⁵ CONO MTR,
70050	⁵ SBDIAG	70264	⁶ WRINT
70054	⁴ DATAO PI,		⁵ CONI MTR,
70060	⁶ WRPI	70270	⁶ WRHSB
	³ CONO PI,	704	⁶ UMOVE
70064	⁶ RDPI	705	⁶ UMOVEM
	³ CONI PI,	710	⁶ TIOE
70104	⁶ RDUBR	71054	⁷ DATAO PTR,
	^{1,3} DATAI PAG,	711	⁶ TION
70110	¹ CLRPT	712	⁶ RDIO
70114	⁶ WRUBR	713	⁶ WRIO
	^{1,3} DATAO PAG,	714	⁶ BSIO
70120	⁶ WRBR	715	⁶ BCIO
	^{1,3} CONO PAG,	720	⁶ TIOEB
70124	⁶ RDEBR	721	⁶ TIONB
	^{1,3} CONI PAG,	722	⁶ RDIQB
70144	⁵ SWPIA	723	⁶ WRIOB
70150	⁵ SWPVA	724	⁶ BSIOB
70154	⁵ SWPVA	725	⁶ BCIOB
70164	⁵ SWPIO		
70170	⁵ SWPVO		
70174	⁵ SWPUO		
70200	⁶ RDSPB		
	⁵ RDPRF		

(x000x	³ APR)
(x004x	³ PI)
(x010x	^{1,3} PAG)
(x014x	⁵ CCA)
(x020x	⁵ TIM)
(x024x	⁵ MTR)

KEY

- Not available in KA10.
- No longer used in KS10 and future machines.
- Used only in KA10 and K110.
- Used only in KL10.
- Used only in KS10.
- Used only in K110.
- Used only in K110.

¹ Indicates a NOW-standard instruction code that is available in the KL10 and KS10 (and can be expected to be available in all future processors) but is unassigned in the earlier processors.

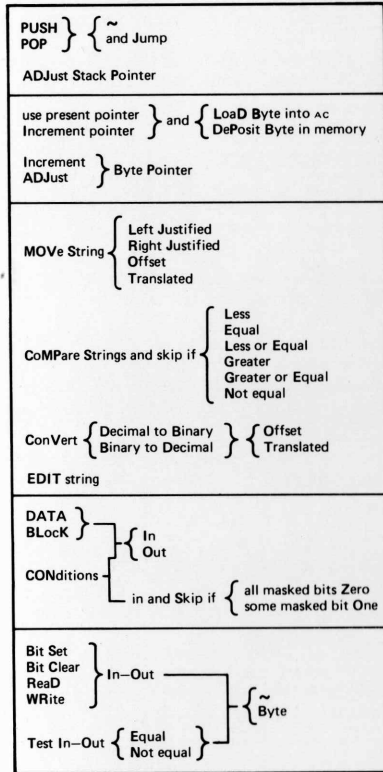
MR-6495

DECsystem-10 and DECSYSTEM-20

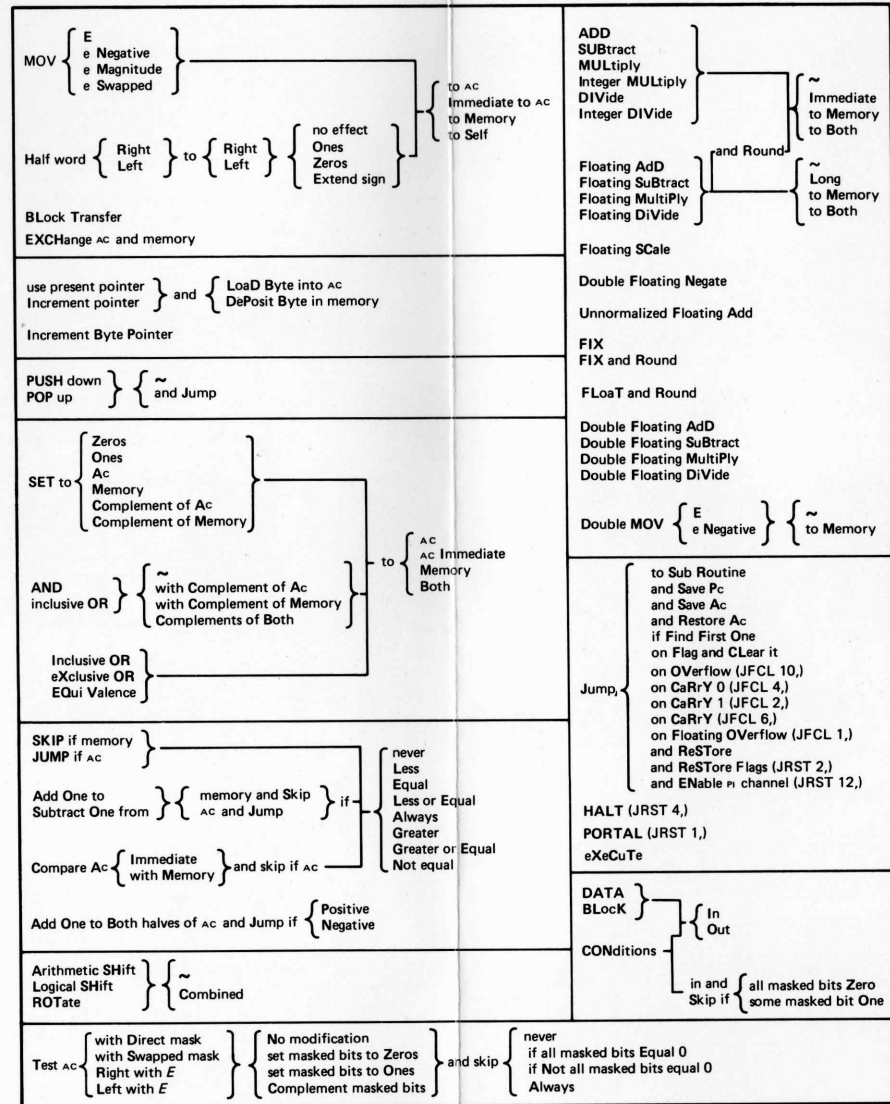
KL SYSTEM REFERENCE CARD

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digital



MR-6499



MR-6498

		INSTRUCTION CODES							
		--0	--1	--2	--3	--4	--5	--6	--7
00	ILLEGAL	CMPSL	CMPSE	CMPSL	EDIT	CMPST	CMPST	CMPST	CMPST
01	CVTDBD	CVTDBT	CVTBDO	CVTBDT	MOVSO	MOVST	MOVSLJ	MOVSRJ	MOVSRJ
02	XBLT								
03									
04	CALL	INIT	RESERVED MUJO's				CALLI		
05	OPEN	TTCAL				RENAME	IN	OUT	
06	SETSTS	STATO	GETSTS	STATZ	INBUF	OUTBUF	INPUT	OUTPUT	
07	CLOSE	RELEAS	MTAPE	UGETF	USETI	USETO	LOOKUP	ENTER	
10	UJEN				JSYS	ADJSP			
11	DFAD	DFSB	DFMP	DEDV					
12	DFOVI	DFOVN	FIX	IBP	DMOVEM	DMOVNM	FIXR	FLTR	
13	UFA	DFN	FSC		ILDB	LDB	IDPB	DPB	
14	FAD	-L	-M	-B	FADR	-I	-M	-B	
15	FSB	-L	-M	-B	FASB	-I	-M	-B	
16	FMP	-L	-M	-B	FMPR	-I	-M	-B	
17	FDV	-L	-M	-B	FDVR	-I	-M	-B	
20	MOV	-I	-M	-S	MOVS	-I	-M	-S	
21	MOVN	-I	-M	-S	MOVNM	-I	-M	-S	
22	IMUL	-I	-M	-B	MUL	-I	-M	-B	
23	IDIV	-I	-M	-B	DIV	-I	-M	-B	
24	ASH	ROT	LSH	JFFO	ASHC	ROTC	LSHC		
25	EXCH	BLT	AOBJP	AOBJN	JRST	JFCL	XCT	MAP	
26	PUSHJ	PUSH	POPJ	POPJ	JSR	JSA	JRA	JRA	
27	ADD	-I	-M	-B	SUB	-I	-M	-B	
30	CAI	-L	-E	-LE	-A	-GE	-N	-G	
31	CAM	-L	-E	-LE	-A	-GE	-N	-G	
32	JUMP	-L	-E	-LE	-A	-GE	-N	-G	
33	SKIP	-L	-E	-LE	-A	-GE	-N	-G	
34	AQJ	-L	-E	-LE	-A	-GE	-N	-G	
35	AOS	-L	-E	-LE	-A	-GE	-N	-G	
36	SOJ	-L	-E	-LE	-A	-GE	-N	-G	
37	SOS	-L	-E	-LE	-A	-GE	-N	-G	
40	SETZ	-I	-M	-B	AND	-I	-M	-B	
41	ANDCA	-I	-M	-B	SETM	-I	-M	-B	
42	ANDCM	-I	-M	-B	SETA	-I	-M	-B	
43	XOR	-I	-M	-B	IOR	-I	-M	-B	
44	ANDCB	-I	-M	-B	EOV	-I	-M	-B	
45	SETCA	-I	-M	-B	ORCA	-I	-M	-B	
46	SETCM	-I	-M	-B	ORCM	-I	-M	-B	
47	ORCB	-I	-M	-B	SETO	-I	-M	-B	
50	HLL	-I	-M	-S	HRL	-I	-M	-S	
51	HLLZ	-I	-M	-S	HRLZ	-I	-M	-S	
52	HLLO	-I	-M	-S	HLRO	-I	-M	-S	
53	HLLE	-I	-M	-S	HLRE	-I	-M	-S	
54	HRR	-I	-M	-S	HLR	-I	-M	-S	
55	HRRZ	-I	-M	-S	HLRZ	-I	-M	-S	
56	HRRD	-I	-M	-S	HLRD	-I	-M	-S	
57	HRRR	-I	-M	-S	HLRR	-I	-M	-S	
60	TRN	TLN	TRNE	TLNE	TRNA	TLNA	TRNN	TLNN	
61	TDN	TDN	TDNE	TDNE	TDNA	TDNA	TDNN	TDNN	
62	TRZ	TLZ	TRZE	TLZE	TRZA	TLZA	TRZN	TLZN	
63	TDZ	TSZ	TDZE	TSZE	TDZA	TSZA	TDZN	TSZN	
64	TRC	TLC	TRCE	TLCE	TRCA	TLCA	TRCN	TLCN	
65	TDC	TSC	TDCE	TSCE	TDCA	TSCA	TDON	TSCN	
66	TRO	TLO	TROE	TLOE	TROA	TLOA	TRON	TLON	
67	TDO	TSO	TDOE	TSOE	TDOA	TSOA	TDON	TSON	

7 -- INPUT-OUTPUT INSTRUCTIONS

001-037 LUUO's, 001-020 codes under EXTEND, all others unassigned.

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EXECUTIVE PROCESS TABLE
(ADDRESSED FROM EBR)

0	EIGHT CHANNEL LOGOUT AREAS
	EACH: 0 INITIAL CHANNEL COMMAND
	1 GETS CHANNEL STATUS WORD
	2 GETS LAST UPDATED COMMAND
	3 RESERVED
37	RESERVED
40	RESERVED
41	RESERVED
42	STANDARD PRIORITY INTERRUPT INSTRUCTIONS
57	RESERVED
60	FOUR CHANNEL BLOCK FILL WORDS
63	RESERVED
64	RESERVED
137	RESERVED
140	FOUR DTE20 CONTROL BLOCKS
	EACH: 0 TO11 BYTE POINTER
	1 TO10 BYTE POINTER
	2 DTE INTERRUPT INSTRUCTION
	3 RESERVED
	4 EXAMINE PROTECT
	5 EXAMINE RELOCATION
	6 DEPOSIT PROTECT
	7 DEPOSIT RELOCATION
177	RESERVED
200	RESERVED
420	EXECUTIVE ARITHMETIC OVERFLOW TRAP INSTRUCTION
421	EXECUTIVE STACK OVERFLOW TRAP INSTRUCTION
422	EXECUTIVE TRAP 3 TRAP INSTRUCTION
423	EXECUTIVE TRAP 3 TRAP INSTRUCTION
424	RESERVED
477	RESERVED
500	PAGE FAIL WORD
501	PAGE FAIL FLAGS
502	PAGE FAIL OLD PC
503	PAGE FAIL NEW PC
504	USER PROCESS EXECUTION TIME
505	USER MEMORY REFERENCE COUNT
506	USER MEMORY REFERENCE COUNT
507	RESERVED
510	RESERVED
513	PERFORMANCE ANALYSIS COUNT
514	INTERVAL COUNTER INTERRUPT INSTRUCTION
515	RESERVED
537	EXECUTIVE SECTION 0 POINTER
540	EXECUTIVE SECTION 0 POINTER
577	EXECUTIVE SECTION 37 POINTER
600	RESERVED
777	RESERVED

EXTENDED TOPS - 20 PROCESS TABLE
CONFIGURATION

USER PROCESS TABLE
(ADDRESSED FROM UBR)

0	RESERVED
	NOTE: ASTERISKS INDICATE LOCATIONS WHOSE USE DIFFERS FROM THOSE IN THE SINGLE SECTION PROCESS TABLE LISTED ON THE NEXT PAGE
417	RESERVED
420	ADDRESS OF LUUO BLOCK *
421	USER ARITHMETIC OVERFLOW TRAP INSTRUCTION *
422	USER STACK OVERFLOW TRAP INSTRUCTION *
423	USER TRAP 3 TRAP INSTRUCTION *
424	MUO0 FLAGS MUO0 OP CODE, A *
425	MUO0 OLD PC *
426	E OF MUO0 *
427	MUO0 PROCESS CONTEXT WORD *
430	KERNEL NO TRAP MUO0 NEW PC *
431	KERNEL TRAP MUO0 NEW PC *
432	SUPERVISOR NO TRAP MUO0 NEW PC *
433	SUPERVISOR TRAP MUO0 NEW PC *
434	CONCEALED NO TRAP MUO0 NEW PC *
435	CONCEALED TRAP MUO0 NEW PC *
436	PUBLIC NO TRAP MUO0 NEW PC *
437	PUBLIC TRAP MUO0 NEW PC *
440	RESERVED
477	RESERVED
500	PAGE FAIL WORD *
501	PAGE FAIL FLAGS *
502	PAGE FAIL OLD PC *
503	PAGE FAIL NEW PC *
504	USER PROCESS EXECUTION TIME
505	USER MEMORY REFERENCE COUNT
506	USER MEMORY REFERENCE COUNT
507	RESERVED
510	RESERVED
513	PERFORMANCE ANALYSIS COUNT
514	INTERVAL COUNTER INTERRUPT INSTRUCTION
515	RESERVED
537	EXECUTIVE SECTION 0 POINTER
540	EXECUTIVE SECTION 0 POINTER
577	EXECUTIVE SECTION 37 POINTER
600	RESERVED
777	RESERVED

EXTENDED TOPS - 20 PROCESS TABLE
CONFIGURATION (CONT)

EXECUTIVE PROCESS TABLE
(ADDRESSED FROM EBR)

0	EIGHT CHANNEL LOGOUT AREAS
	EACH: 0 INITIAL CHANNEL COMMAND
	1 GETS CHANNEL STATUS WORD
	2 GETS LAST UPDATED COMMAND
	3 RESERVED
37	RESERVED
40	RESERVED
41	RESERVED
42	STANDARD PRIORITY INTERRUPT INSTRUCTIONS
57	RESERVED
60	FOUR CHANNEL BLOCK FILL WORDS
63	RESERVED
64	RESERVED
137	RESERVED
140	FOUR DTE20 CONTROL BLOCKS
	EACH: 0 TO11 BYTE POINTER
	1 TO10 BYTE POINTER
	2 DTE INTERRUPT INSTRUCTION
	3 RESERVED
	4 EXAMINE PROTECT
	5 EXAMINE RELOCATION
	6 DEPOSIT PROTECT
	7 DEPOSIT RELOCATION
177	RESERVED
200	RESERVED
420	EXECUTIVE ARITHMETIC OVERFLOW TRAP INSTRUCTION
421	EXECUTIVE STACK OVERFLOW TRAP INSTRUCTION
422	EXECUTIVE TRAP 3 TRAP INSTRUCTION
423	EXECUTIVE TRAP 3 TRAP INSTRUCTION
424	RESERVED
477	RESERVED
500	PAGE FAIL WORD *
501	PAGE FAIL FLAGS *
502	PAGE FAIL OLD PC *
503	PAGE FAIL NEW PC *
504	USER PROCESS EXECUTION TIME
505	USER MEMORY REFERENCE COUNT
506	USER MEMORY REFERENCE COUNT
507	RESERVED
510	RESERVED
513	PERFORMANCE ANALYSIS COUNT
514	INTERVAL COUNTER INTERRUPT INSTRUCTION
515	RESERVED
537	EXECUTIVE SECTION 0 POINTER
540	EXECUTIVE SECTION 0 POINTER
577	EXECUTIVE SECTION 37 POINTER
600	RESERVED
777	RESERVED

SINGLE-SECTION TOPS-20 PROCESS
TABLE CONFIGURATION

USER PROCESS TABLE
(ADDRESSED FROM UBR)

0	RESERVED
	NOTE: ASTERISKS INDICATE LOCATIONS WHOSE USE DIFFERS FROM THOSE IN THE EXTENDED PROCESS TABLE LISTED ON THE PRECEDING PAGE.
420	RESERVED
421	USER ARITHMETIC OVERFLOW TRAP INSTRUCTION *
422	USER STACK OVERFLOW TRAP INSTRUCTION *
423	USER TRAP 3 TRAP INSTRUCTION *
424	RESERVED *
425	MUO0 STORED HERE *
426	MUO0 OLD PC WORD *
427	MUO0 PROCESS CONTEXT WORD *
430	KERNEL NO TRAP MUO0 NEW PC WORD *
431	KERNEL TRAP MUO0 NEW PC WORD *
432	SUPERVISOR NO TRAP MUO0 NEW PC WORD *
433	SUPERVISOR TRAP MUO0 NEW PC WORD *
434	CONCEALED NO TRAP MUO0 NEW PC WORD *
435	CONCEALED TRAP MUO0 NEW PC WORD *
436	PUBLIC NO TRAP MUO0 NEW PC WORD *
437	PUBLIC TRAP MUO0 NEW PC WORD *
440	RESERVED
477	RESERVED
500	PAGE FAIL WORD *
501	PAGE FAIL FLAGS *
502	PAGE FAIL OLD PC WORD *
503	PAGE FAIL NEW PC WORD *
504	USER PROCESS EXECUTION TIME
505	USER MEMORY REFERENCE COUNT
506	USER MEMORY REFERENCE COUNT
507	RESERVED
510	RESERVED
513	PERFORMANCE ANALYSIS COUNT
514	INTERVAL COUNTER INTERRUPT INSTRUCTION
515	RESERVED
537	EXECUTIVE SECTION 0 POINTER
540	EXECUTIVE SECTION 0 POINTER
577	EXECUTIVE SECTION 37 POINTER
600	RESERVED
777	RESERVED

SINGLE-SECTION TOPS-20 PROCESS
TABLE CONFIGURATION (CONT)

USER PROCESS TABLE
(ADDRESSED FROM UBR)

0	USER PAGE 0	USER PAGE 1
377	USER PAGE 776	USER PAGE 777
400	EXECUTIVE PAGE 340	EXECUTIVE PAGE 341
417	EXECUTIVE PAGE 376	EXECUTIVE PAGE 377
420	RESERVED	
421	USER ARITHMETIC OVERFLOW TRAP INSTRUCTION	
422	USER STACK OVERFLOW TRAP INSTRUCTION	
423	USER TRAP 3 TRAP INSTRUCTION	
424	MUUO STORED HERE	
425	MUUO OLD PC WORD	
426	MUUO PROCESS CONTEXT WORD	
427	RESERVED	
430	KERNEL NO TRAP MUUO NEW PC WORD	
431	KERNEL TRAP MUUO NEW PC WORD	
432	SUPERVISOR NO TRAP MUUO NEW PC WORD	
433	SUPERVISOR TRAP MUUO NEW PC WORD	
434	CONCEALED NO TRAP MUUO NEW PC WORD	
435	CONCEALED TRAP MUUO NEW PC WORD	
436	PUBLIC NO TRAP MUUO NEW PC WORD	
437	PUBLIC TRAP MUUO NEW PC WORD	
440	RESERVED	
477	RESERVED	
500	PAGE FAIL WORD	
501	PAGE FAIL OLD PC WORD	
502	PAGE FAIL NEW PC WORD	
503	RESERVED	
504	USER PROCESS EXECUTION TIME	
506	USER MEMORY REFERENCE COUNT	
507	RESERVED	
510	RESERVED	
777	RESERVED	

TOPS - 10 PROCESS TABLE
CONFIGURATION

MR-3698

EXECUTIVE PROCESS TABLE
(ADDRESSED FROM EBR)

0	EIGHT CHANNEL LOGOUT AREAS	
	EACH: 0 INITIAL CHANNEL COMMAND	
	1 GETS CHANNEL STATUS WORD	
	2 GETS LAST UPDATED COMMAND	
	3 RESERVED	
37	RESERVED	
40	RESERVED	
41	RESERVED	
42	STANDARD PRIORITY INTERRUPT INSTRUCTIONS	
57	RESERVED	
60	FOUR CHANNEL BLOCK FILL WORDS	
63	RESERVED	
64	RESERVED	
137	RESERVED	
140	FOUR DTE20 CONTROL BLOCKS	
	EACH: 0 TO11 BYTE POINTER	
	1 TO10 BYTE POINTER	
	2 DTE INTERRUPT INSTRUCTION	
	3 RESERVED	
	4 EXAMINE PROTECT	
	5 EXAMINE RELOCATION	
	6 DEPOSIT PROTECT	
	7 DEPOSIT RELOCATION	
177	RESERVED	
200	EXECUTIVE PAGE 400	EXECUTIVE PAGE 401
377	EXECUTIVE PAGE 776	EXECUTIVE PAGE 777
400	RESERVED	
420	RESERVED	
421	EXECUTIVE ARITHMETIC OVERFLOW TRAP INSTRUCTION	
422	EXECUTIVE STACK OVERFLOW TRAP INSTRUCTION	
423	EXECUTIVE TRAP 3 TRAP INSTRUCTION	
424	RESERVED	
507	RESERVED	
510	TIME BASE	
511	RESERVED	
512	PERFORMANCE ANALYSIS COUNT	
513	RESERVED	
514	INTERVAL COUNTER INTERRUPT INSTRUCTION	
515	RESERVED	
577	RESERVED	
600	EXECUTIVE PAGE 0	EXECUTIVE PAGE 1
757	EXECUTIVE PAGE 336	EXECUTIVE PAGE 337
760	RESERVED	
777	RESERVED	

TOPS - 10 PROCESS TABLE
CONFIGURATION (CONT)

MR-3699

DEVICE CODE AND MNEMONICS

SECOND AND THIRD OCTAL DIGITS
FIRST OCTAL DIGIT

	00	04	10	14	20	24	30	34	40	44	50	54	60	64	70	74	
0	APR CPA CENTRAL PROCESSOR	PI PRIORITY INTERRUPT	PAG K110 PAGING	CCA CACHE	MCA20 TIM KL10 ACCOUNTING LOGIC	MTR LPT LINE PRINTER	AD10 ADC2 ANALOG- DIGITAL CONVERTER	DK10 PDC3 MAGNETIC TAPE						DLB PDP-11 DATA LINK	DLC DL10 DATA LINK	CLK DK10 REAL TIME CLOCK	CLK2 DK10 REAL TIME CLOCK
1	PTP PAPER TAPE PUNCH	PTR PAPER TAPE READER	CP10 CDP CARD PUNCH		626 TTY CONSOLE TELETYPE	LP10 LPT LINE PRINTER	VP10 DIS DISPLAY	VP10 DIS2 DISPLAY	XY10 PLT PLOTTER	XY10 PLT2 PLOTTER	CR10 CR CARD READER	CR10 CR2 CARD READER		DLB2 PDP-11 DATA LINK	DLC2 DL10 DATA LINK	RC10 DSK DISK/DRUM	RC10 DSK2 DISK/DRUM
2	DTE20 10/11 INTERFACE	DTE20 DTE2 10/11 INTERFACE	DTE20 DTE3 10/11 INTERFACE	DTE20 DTE4 10/11 INTERFACE	DX10 PDC MAGNETIC TAPE	DX10 PDC2 MAGNETIC TAPE		LP10 LPT2 LINE PRINTER	DC10 DLS DATA LINE SCANNER	DC10 DLS2 DATA LINE SCANNER	RP10 DPC DISK PACK SYSTEM	RP10 DPC2 DISK PACK SYSTEM	RP10 DPC3 DISK PACK SYSTEM	RP10 DPC4 DISK PACK SYSTEM	RH10 RMC DATA CONTROL	RH10 RMC2 DATA CONTROL	
3		PDC4 MAGNETIC TAPE			TD10 DTC DECTAPE	TD10 DTS DECTAPE	TD10 DTC2 DECTAPE	TD10 DTS2	TM10 TMC MAGNETIC TAPE	TM10 TMS	TM10 TMC2 MAGNETIC TAPE	TM10 TMS2		RH10 RMC3 DATA CONTROL	RH10 RMC4 DATA CONTROL	RH10 RMC5 DATA CONTROL	RH10 RMC6 DATA CONTROL
4														DS10 DSS SINGLE SYNCHRONOUS LINE UNIT	DS10 DSI SINGLE SYNCHRONOUS LINE UNIT	DS10 DSS2 SINGLE SYNCHRONOUS LINE UNIT	DS10 DSI2 SINGLE SYNCHRONOUS LINE UNIT
5	CODES IN THIS SECTION RESERVED FOR USER SPECIAL DEVICES								RH20 MBC MASSBUS CONTROL	RH20 MBC2 MASSBUS CONTROL	RH20 MBC3 MASSBUS CONTROL	RH20 MBC4 MASSBUS CONTROL	RH20 MBC5 MASSBUS CONTROL	RH20 MBC6 MASSBUS CONTROL	RH20 MBC7 MASSBUS CONTROL	RH20 MBC8 MASSBUS CONTROL	
6																	
7									K110 UNRESTRICTED CODES RESERVED FOR USERS				K110 UNRESTRICTED CODES RESERVED FOR DEC				

MR-2300

BASIC INSTRUCTIONS

00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
INSTRUCTION CODE (INCLUDING MODE)											A,F	I	X	Y																					

KL10 IN-OUT INSTRUCTIONS

00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
1	1	1	DEVICE CODE										INSTR CODE	I	X	Y																			

INSTRUCTIONS EXECUTED UNDER EXTEND

00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
INSTRUCTION CODE										0	0	0	0	I	X	Y																			

LOCAL INDIRECT WORD

00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
1	0	RESERVED										I	X	Y																					

GLOBAL INDIRECT WORD

00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
0	I	X	Y																																

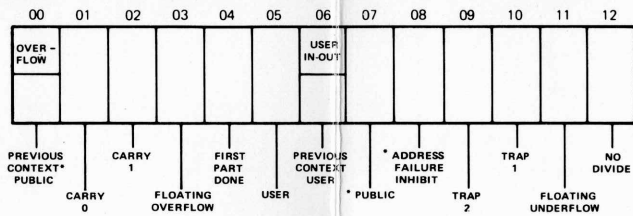
LOCAL INDEX REGISTER

00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
IN NONZERO SECTION MUST BE ≤ 0 OR BITS 6-17 = 0																LOCAL INDEX																			

GLOBAL INDEX REGISTER

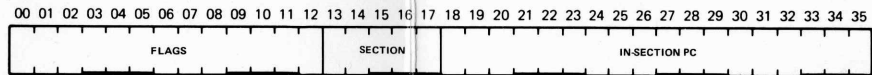
00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
0	0	0	0	0	0	GLOBAL INDEX WITH NONZERO SECTION NUMBER																													

SAVED FLAGS

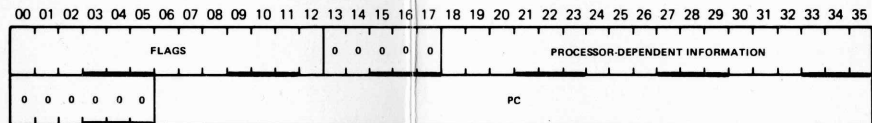


*KL10 ONLY

PC WORD

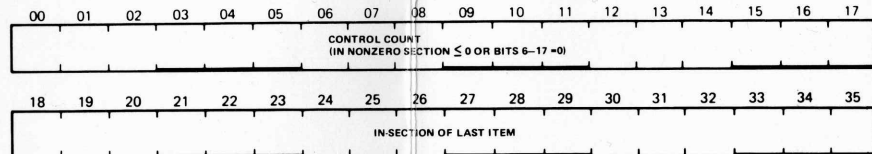


FLAG-PC DOUBLE WORD

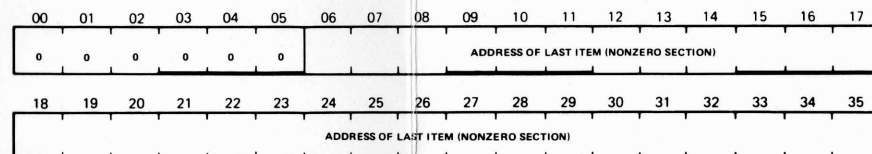


MR-6485

LOCAL STACK POINTER

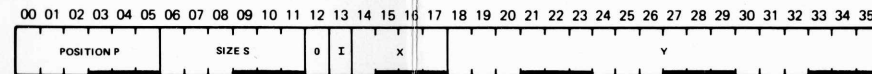


GLOBAL STACK POINTER

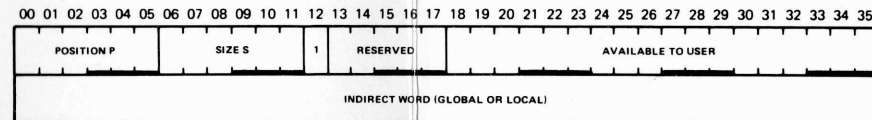


MR-6482

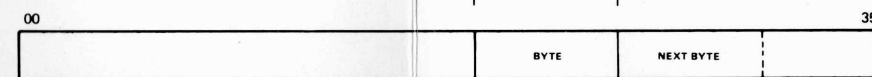
ONE-WORD BYTE POINTER



TWO-WORD BYTE POINTER



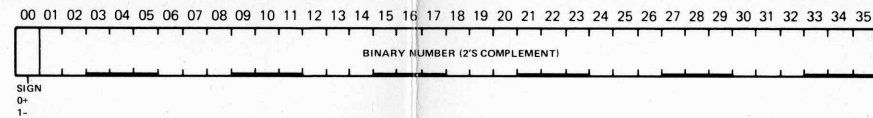
BYTE STORAGE



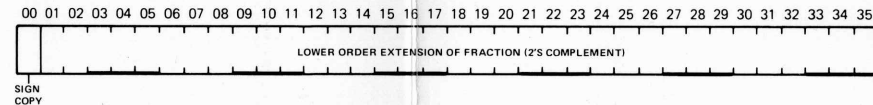
35-P-S+1 35-P 35-P+1

MR-6483

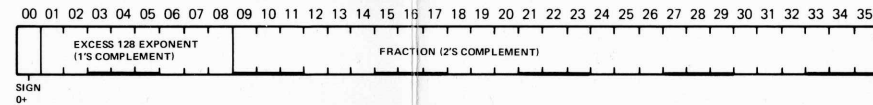
FIXED POINT OPERANDS (SINGLE PRECISION OR HIGH ORDER WORD)



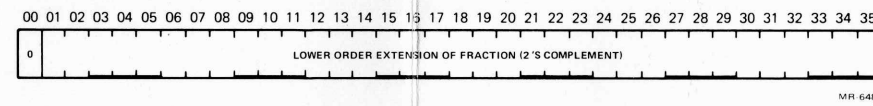
LOWER ORDER WORDS IN DOUBLE LENGTH FIXED POINT OPERANDS



FLOATING POINT OPERANDS (SINGLE PRECISION OR HIGH ORDER WORD)

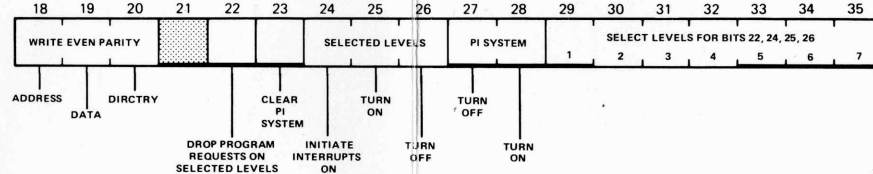


LOWER ORDER WORDS IN MULTIPLE LENGTH FLOATING POINT OPERANDS



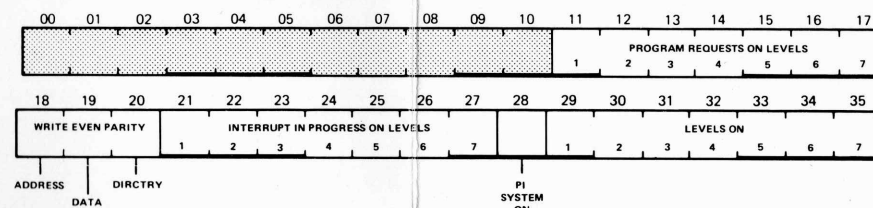
MR-6481

CONO PI - Conditions Out, Priority Interrupt



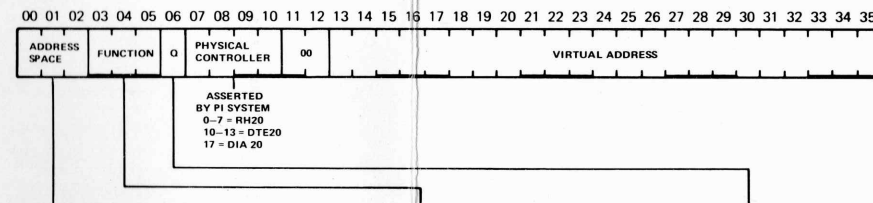
MR-6487

CONI PI - Conditions In, Priority Interrupt



MR-6488

API Word Format



ADDRESS SPACE* (AS SPECIFIED BELOW)

ADDRESS CODE	DEFINITION
0	EPT
1	EXEC VIRTUAL
2	PHYSICAL
4	UNDEFINED
2,3,5-7	

FUNCTION (AS SPECIFIED BELOW)

FUNCTION CODE	DEFINITION
0	STANDARD (40 + 2N) INTERRUPT
1	STANDARD INTERRUPT (40 + 2N)
2	VECTOR INTERRUPT (XCT (13-35))
3	INCREMENT (QUAL = >) DECREMENT)
4	DATAI (EXAMINE) (QUAL = > PROTECTED)
5	DATAI (DEPOSIT) (QUAL = > PROTECTED)
6	BYTE (QUAL = > TO -10)
7	STANDARD (40 + 2n) INTERRUPT

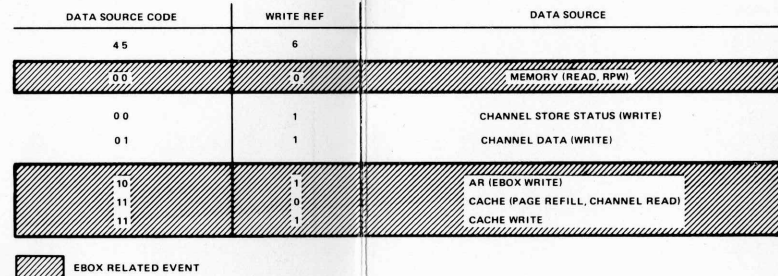
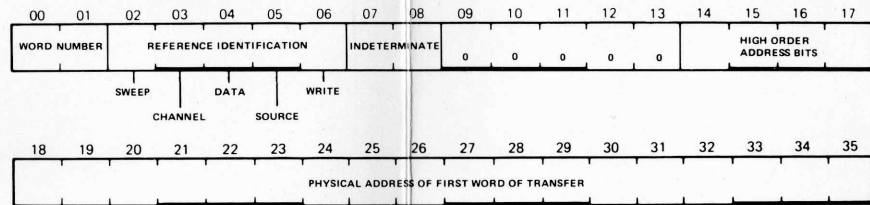
QUALIFIER (AS SPECIFIED BELOW)

FUNCTION CODE	Q BIT INTERPRETATION
0,1,2,7	IGNORED
3	0 = ADD + 1
	1 = SUBTRACT + 1
4,5	1 = APPLY PROTECTION AND RELOCATION
6	1 = TO 10 BYTE TRANSFER
	0 = TO 11 BYTE TRANSFER

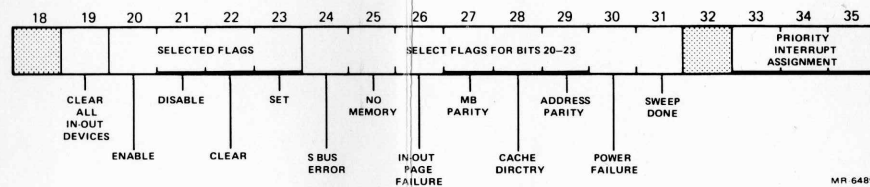
*THESE BITS ARE MICROCODE DEPENDENT. CHECK THE LATEST MICROCODE LISTING FOR POSSIBLE CHANGES.

MR-6500

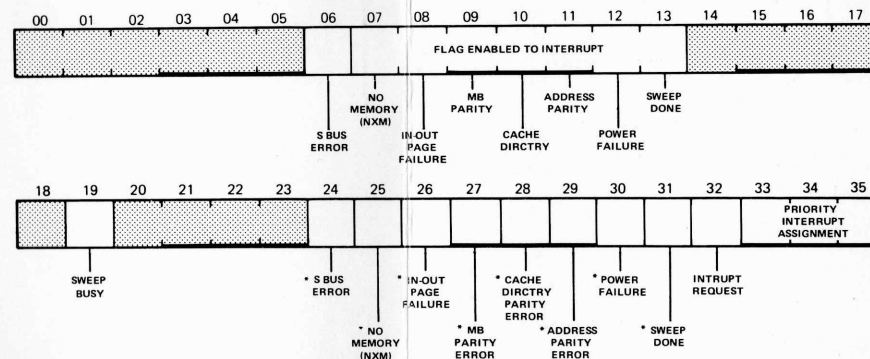
RDERA - Read Error Address Register (BLKI PI.)



CONO APR - Conditions Out, Processor Flags

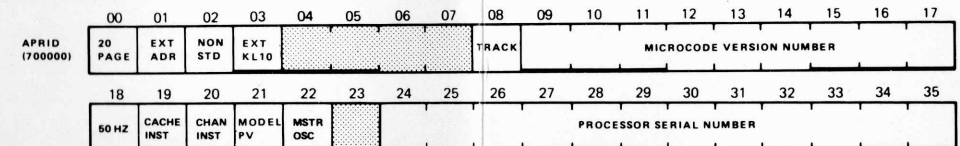


CONI APR - Conditions In, Processor Flags



NOTE: ASTERISKS INDICATE BITS THAT CAN CAUSE INTERRUPTS

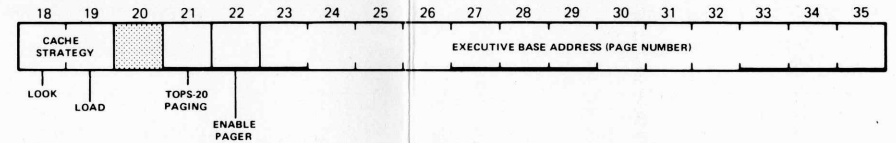
BLKI APR



NOTE: BITS <00-08> ARE MICROCODE OPTIONS BITS <18-23> ARE HARDWARE OPTIONS

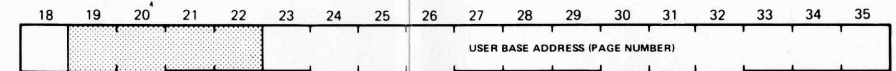
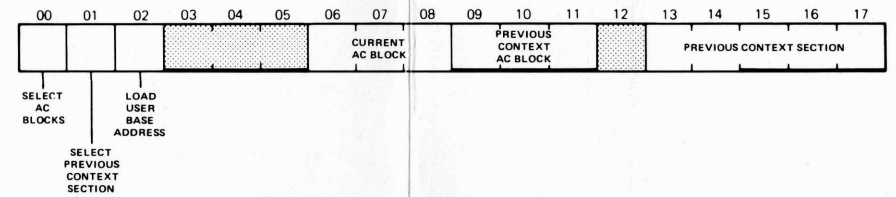
00	MICROCODE IS FOR TOPS-20 PAGING	08	MICROCODE VERSION SUPPORTS TRACKING	22	MASTER OSCILLATOR (KW20 OPTION)
01	MICROCODE HANDLES EXTENDED ADDRESSES	19	CACHE INSTALLED		
02	NON-STANDARD MICROCODE	20	CHANNELS INSTALLED		
03	MODEL PV TYPE PROCESSOR	21	CPU IS AN EXTENDED KL10		

CONO PAG - Conditions Out, Pager



CONI PAG - Conditions In, Pager (Same as CONO PAG)

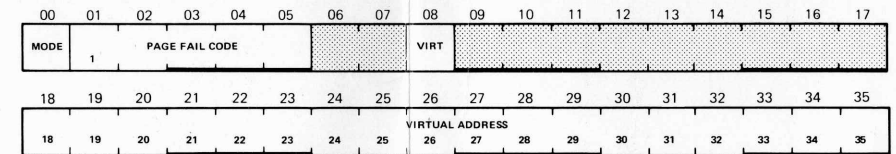
DATAO PAG - Data Out, Pager



DO NOT UPDATE ACCOUNTS

DATAI PAG - Data In, Pager (Same format as DATAO PAG, Bits 0-2 are 1's and Bit 18 is 0)

Page Fail Word (TOPS-10 Only)



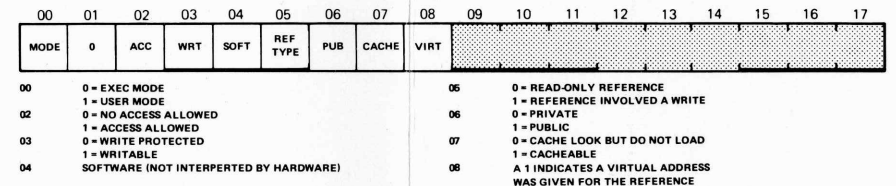
NOTE: REFER TO OTHER PAGE FAIL WORD FOR BIT DEFINITIONS.

0 = EXEC MODE
1 = USER MODE

<01:06>	PAGE FAIL CODES	21	PROPRIETARY VIOLATION	22	REFILL ERROR	23	ADDRESS FAILURE
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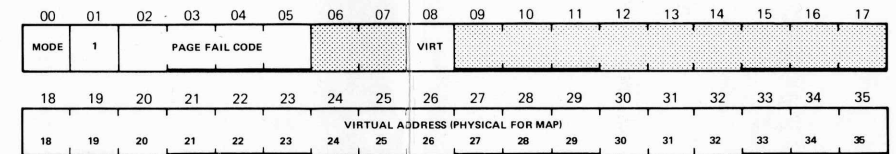
<01:05>	25	PAGE TABLE PARITY ERROR	26	CONT	27	AR DATA PARITY ERROR	28	ARX DATA PARITY ERROR
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Page Fail Word (TOPS-20 Only)



00	0 = EXEC MODE	06	0 = READ-ONLY REFERENCE
01	1 = USER MODE	07	1 = REFERENCE INVOLVED A WRITE
02	0 = NO ACCESS ALLOWED	08	0 = PRIVATE
03	1 = ACCESS ALLOWED	09	1 = PUBLIC
04	0 = WRITE PROTECTED	07	0 = CACHE LOOK BUT DO NOT LOAD
05	1 = WRITABLE	08	1 = CACHEABLE
06	SOFTWARE (NOT INTERPRETED BY HARDWARE)	08	A 1 INDICATES A VIRTUAL ADDRESS WAS GIVEN FOR THE REFERENCE

Page Fail Word (TOPS-20 Only)



NOTE: REFER TO OTHER PAGE FAIL WORD FOR BIT DEFINITIONS.

0 = EXEC MODE
1 = USER MODE

<01:05>	PAGE FAIL CODES	21	PROPRIETARY VIOLATION	23	ADDRESS FAILURE	24	ILLEGAL INDIRECT
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<01:05>	25	PAGE TABLE PARITY ERROR	26	CONT	27	ILLEGAL ADDRESS - SECTION > 37	28	AR DATA PARITY ERROR	29	ARX DATA PARITY ERROR
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