

XX
XX

0 0 000 000 0 0000 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
00000 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

0 0 000 000 0 0000 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
00000 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

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05/31/72

02304132

**
** PDP-9 MINI TIME-SHARING SYSTEM **
** MTSS SYSTEM MONITOR **
** MTSS SYSTEM MESSAGES **
** GROWTH SYSTEM DISK BOOTSTRAP **
** DTSS:XMTR **
** MTSS:B05 **
** *****

```
100      ,TITLE PDP9 TIME-SHARING SYSTEM MONITOR AND MESSAGE ROUTINES
000001   110      PURCOD ,EQU 1
           120      ,NAME MTR--805
           130      *
           140      *
           150      * PASSED PARAMETERS:
           160      * $UTEM5: NAME OF THE CALLING PROGRAM
           170      * $UTEM5: OCTAL VALUE TO PRINT (OPTIONAL)
           180      * $UTEM6: MESSAGE NUMBER
           190      *
           200
           210      ,HEAD M
           220      ,PMC ON
           230
           240      ,INSRT DEFIN$  
100      ,IPUND DEFIN$
```

DEFINS 05/31/72 01F03123 PDP9 TIME-SHARING SYSTEM MONITOR AND MESSAGE ROUTINES

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```
5720      ,LIST ON
5730      ,END
000000  250      DEBUG ,EQU 0
260      ,INSRT :DLIBRARY:PDP9LIB:GRODEFIN
100      ,INE $DEBUG,1
1250      ,LIST ON
1260      ,END
270      ,INSRT :DLIBRARY:PDP9LIB:LIBMACRO
100      ,INE DEBUG,1
```

LIBMACRO

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PDP9 TIME-SHARING SYSTEM MONITOR AND MESSAGE ROUTINES

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TELETYPE INPUT/OUTPUT MACROS

1940
1950

,LIST ON
,END

MONITOR MACRO DEFINITIONS

```
280      * ,STITL MONITOR MACRO DEFINITIONS
290      *
300      *
310      * MACRO TO SET UP PURE-CODED SUBROUTINE ENTRANCES
320      *
330      ENTER ,DEFIN
340          ,PMC    SAVE,OFF
350      9MAPBUG ,EQU
360          ,USE    IMPURE      SUBROUTINE ENTRANCES CANNOT BE PURE CODE
370          ,PMC    SAVE,ON
380      #1      ...
390          ,PMC    RESTORE
400          HLT
410          JMP    9MAPBUG
420          ,USE    PREVIOUS
430          ,PMC    RESTORE
440          ,ENDM
450      *
460      *
470      * THE FOLLOWING MACROS ARE USED TO BUILD THE TABLES WHICH CONTROL THE MONITOR
480      *
490      *
500      * REGISTER PUTS AN ELEMENT IN THE TABLE OF AVAILABLE SOFTWARE REGISTERS
510      *
520      REGISTER ,DEFIN
530          ,ACI6   S#1$      REGISTER NAME: #1
540          JMP     R#1      DUMP REGISTER #1
550          ,CRSM   SAVE,OFF
560          ,INE    'A#2','A',2
570          ,ACI6   S#2$      ALTERNATE REGISTER NAME: #2
580          JMP     R#1      DUMP REGISTER #1
590          ,CRSM   RESTORE
600          ,ENDM
610      *
620      * COMMAND PUTS AN ELEMENT IN THE TABLE OF AVAILABLE SOFTWARE REGISTERS
630      *
640      COMMAND ,DEFIN
650          ,ACI6   S#1$      COMMAND IS #1
660          JMP     #1      EXECUTE THE COMMAND
670          ,CRSM   SAVE,OFF
680          ,IDRP   #2
690          ,INE    'A#2','A',2
700          ,ACI6   S#2$      ALTERNATE COMMAND IS #2
710          JMP     #1      EXECUTE THE COMMAND #1
720          ,IDRP
730          ,CRSM   RESTORE
740          ,ENDM
750      *
760      * DMODE PUTS ELEMENTS IN THE DDT MODE TABLE
770      *
780      DMODE ,DEFIN
790          ,ACI6   S#1$      DUMP MODE NAME
```

MONITOR MACRO DEFINITIONS

800 JMP M#1
810 ,AC16 SA#1\$ ADDRESS MODE NAME
820 JMP AM#1
830 ,AC16 SR#1\$ REGISTER MODE NAME
840 JMP RM#1
850 ,CRSM SAVE,OFF
860 ,IDRP #2
870 ,INE '@#2',@#1.6
880 ,AC16 \$#2\$ ALTERNATE DUMP FORMAT NAME
890 JMP M#1
900 ,AC16 SA#2\$ ALTERNATE ADDRESS MODE NAME
910 JMP AM#1
920 ,AC16 SR#2\$ ALTERNATE REGISTERS MODE NAME
930 JMP RM#1
940 ,IDRP
950 ,CRSM RESTORE
960 ,ENDM

970 * RESOURCE PUTS AN ELEMENT IN THE TABLE OF AVAILABLE ALLOCATABLE RESOURCES
980 *
990 *
1000 RESOURCE ,DEFIN
1010 ,AC16 \$#1\$ RESOURCE NAME
1020 LAW SR#1 LOAD A POINTER TO THE RECORD OF RESOURCE #1
1030 JMP #10N TRY TO ALLOCATE THE #1
1040 JMP #1OFF TRY TO DE-ALLOCATE THE #1
1050 ,ENDM

1060 *
1070 * WHAT JUMPS TO THE ERROR MESSAGE "WHAT: WORD #N"
1080 *
1090 WHAT ,DEFIN
1100 ,PMC SAVE,OFF
1110 JMP MSG50
1120 ,PMC RESTORE
1130 ,ENDM

1140 *
1150 * FORMAT JUMPS TO THE ERROR MESSAGE "FORMAT ERROR: WORD #N"
1160 *
1170 FORMAT ,DEFIN
1180 ,PMC SAVE,OFF
1190 JMP MSG56
1200 ,PMC RESTORE
1210 ,ENDM

1220 *
1230 * CMDERR PRINTS THE "WORD #N" IN THE ABOVE MESSAGES
1240 *
1250 CMDERR ,DEFIN
1260 ,PMC SAVE,OFF
1270 JMP MSG57
1280 ,PMC RESTORE
1290 ,ENDM

MONITOR CONVENTIONS AND TEMPORARY STORAGE

1300 .STITL MONITOR CONVENTIONS AND TEMPORARY STORAGE
1310
1320
1330
1340 * TEMP0 -- CALLING PROGRAM'S NAME
1350 * TEMP1 -- CALLING PROGRAM'S EXTENDED PROGRAM COUNTER
1360 * TEMP2 -- CALLING PROGRAM'S INSTRUCTION AT THAT LOCATION
1370 * TEMP3 -- CALLING PROGRAM'S OVERLAY NAME
1380 * TEMP4 -- UNUSED
1390 * TEMP5 -- UNUSED
1400 * TEMP6 -- PASSED PARAMETER #1 (DESIRED MESSAGE NUMBER)
1410 * TEMP7 -- PASSED PARAMETER #2 (PROGRAM COUNTER FOR THE ERROR MESSAGE)
1420 * TEMP8 -- PASSED PARAMETER #3 (ILLEGAL INSTRUCTION FOR THE ERROR MESSAGE)

MONITOR INITIALIZATION

1430	,STITLE	MONITOR INITIALIZATION		
1440	,PMC	OFF		
1450	*			
1460	*			
1470	*	ARRANGE THE USE COUNTERS IN ORDER -- IMPURE CANNOT EXCEED SPURSTR		
1480	*			
000000	1490	,USE	IMPURE	PHANTOM'S SAVED IMPURE CODE
003170	1500	,LOC	IMPSTR	START IMPURE CODE AT THE END OF COMMON STORAGE
003700	1510	,USE	PURE	ALL CODE ABOVE SPUNSTR MUST BE PURE
1520	*			
1530	*	CHECK FOR OVERLENGTH IMPURE CODE		
1540	*			
1550	,IFG	CHECK,3600		
1570	*			
1580	*			
1590	*	ENTER THE MONITOR/MESSAGES/DDT HERE WITH MEMORY PROTECTION OFF		
1600	*	TURN OFF ALL INTERRUPTS; SAVE THE USER OR PHANTOM REGISTERS;		
1610	*	TURN THE INTERRUPTS BACK ON.		
1620	*			
003700 602025	1630	PMTR		NAME OF PURE CODE PORTION
003701	1640	START	...	ALL EXTERNAL ENTRANCES TO THIS PROGRAM START HERE
003701	1650	HPOFF		
003701	705000	,PMC	SAVE,ON	
003702	700002	,SPECIAL+0		
003703	200702	1660	10F	TURN OFF MEMORY PROTECT
003704	041776	1670	LAC	DISABLE ALL INTERRUPTS UNTIL WE DECIDE WHAT TO DO
003705	042011	1680	DAC	LOAD THE CALLER'S PC
003706	202150	1690	DAC	AND SET IT FOR THE REGISTERS SAVES TO PICK UP
003707	740200	1700	DAC	SAVE THE AC UNTIL WE DECIDE WHOSE IT IS
003710	603731	1710	LAC	LOAD THE PHANTOM PROGRAM FLAG
003711	202011	1720	JMP	SKIP IF WE ARE COMING FROM A USER PROGRAM
003712	042015	1730	LAC	ELSE DON'T DESTROY THE REAL USER'S REGISTERS
003713	641002	1740	DAC	LOAD THE USER'S AC
003714	042016	1750	LADQ	SAVE THE USER'S AC
003715	641001	1760	DAC	SAVE THE USER'S MQ REGISTER
003716	042021	1770	LACS	
003717	201776	1780	DAC	SAVE THE USER'S STEP COUNTER REGISTER
003720	042017	1800	LAC	SCSAVE
003721	201760	1810	DAC	SR8TRT
003722	042020	1820	LAC	PCSAVE
003723	200010	1830	DAC	SAVE THE USER PROGRAM'S EXTENDED PROGRAM COUNTER
003724	042023	1840	LAC	S10RS
003725	200011	1850	DAC	SAVE THE USER PROGRAM'S PROGRAM INTERRUPT STATUS
003726	042024	1860	LAC	STSOLVE
003727	442150	1870	DAC	SAVE THE USER'S AUTO-INDEX REGISTER 10
003730	603747	1880	INX	10SAVE
			JMP	SAVE THE USER'S AUTO-INDEX REGISTER 11
				RAISE THE PHANTOM FLAG TO PROTECT USER REGISTERS
				SKIP TO THE COMMON INITIALIZATION
	1890	*		
	1900	*		
	1910	*	THE INTERRUPT WAS FROM A PHANTOM PROGRAM -- SAVE THE REGISTERS	
	1920	*		
003731	1930	STRT1	...	

MONITOR INITIALIZATION

003731	202011	1940	LAC	TEMP9	
003732	042025	1950	DAC	PACSAV	SAVE THE PHANTOM AC
003733	641002	1960	LACQ		
003734	042026	1970	DAC	PMQSAV	SAVE THE PHANTOM MQ
003735	641001	1980	LACS		
003736	042031	1990	DAC	PSC\$AV	SAVE THE PHANTOM STEP COUNTER
003737	201776	2000	LAC	SRSTRT	
003740	042027	2010	DAC	PPCSAV	SAVE THE PHANTOM PROGRAM COUNTER
003741	201760	2020	LAC	SJORS	
003742	042030	2030	DAC	PSTS\$AV	SAVE THE PHANTOM PROGRAM INTERRUPT STATUS
003743	200010	2040	LAC	10	
003744	042033	2050	DAC	P10SAV	SAVE THE PHANTOM AUTO-INDEX REGISTERS 10
003745	200011	2060	LAC	11	
003746	042034	2070	DAC	P11SAV	SAVE THE PHANTOM AUTO-INDEX REGISTER 11
	2080	*			
	2090	*			
	2100	*			THE INITIALIZATION IS COMPLETED AS FAR AS SYSTEM PROBLEMS GO.
	2110	*			SO RE-ENABLE INTERRUPTS AND START THE PROGRAM INITIALIZATION.
	2120	*			

003747	2130	STRT2	...		
003747	201704	2140	LAC	SUTEM0	
003750	042000	2150	DAC	TEMPO	SAVE THE ERROR LOCATION
003751	201705	2160	LAC	SUTEM1	
003752	042001	2170	DAC	TEMPI	SAVE THE ERROR OP CODE
003753	201706	2180	LAC	SUTEM2	
003754	042002	2190	DAC	TEMP2	SAVE THE MESSAGE NUMBER
003755	700042	2200	ION		RE-ENABLE ALL INTERRUPTS
003756	701742	2210	MPEU		GO INTO USER MODE
003757	142156	2220	DZM	D\$BAL\$T	FLAG THE BUFFER NOT YET ALTERED
003760	703302	2230	CAP		CLEAR ALL FLAGS
003761	700002	2240	TOF		TURN OFF THE USER PROGRAM INTERRUPT SYSTEM
003762	700416	2250	TLS+10		INITIALIZE THE TELETYPE
	2260	*			
	2270	*			
	2280	*			THERE ARE SEVERAL REASONS TO CALL THIS MODULE. DETERMINE WHICH IT
	2290	*			IS THIS TIME. THE DISTINCTIONS ARE:
	2300	*			DDT BREAKPOINT -- THE ILLEGAL INSTRUCTION IS SPECIAL+BRK
	2310	*			MONITOR REQUEST -- MESSAGE NUMBER IS ZERO
	2320	*			ERROR MESSAGE REQUEST -- MESSAGE NUMBER IS NON-ZERO
	2330	*			

003763	202001	2340	LAC	TEMP1	LOAD THE USER'S LAST INSTRUCTION
003764	553273	2350	SAD	(SPECIAL+BRK)	CHECK FOR A DDT BREAKPOINT
003765	740040	2360	HLT		BREAKPOINTS NOT YET ENABLED
003766	553274	2370	SAD	(SPECIAL+TRCON)	
003767	740040	2380	HLT		TRACE ON NOT YET ENABLED
003770	553275	2390	SAD	(SPECIAL+TRCOFF)	
003771	740040	2400	HLT		TRACE OFF NOT YET ENABLED
003772	202002	2410	LAC	TEMP2	LOAD THE NUMBER OF THE POTENTIAL MESSAGE
003773	513276	2420	AND	(17777)	NO MESSAGE NUMBER EXCEEDS THIS!
003774	042002	2430	DAC	TEMP2	SET THE MESSAGE NUMBER
003775	353277	2440	TAD	(MSGMAX)	SUBTRACT THE LARGEST LEGAL MESSAGE NUMBER
003776	740100	2450	SMA		SKIP UNLESS MESSAGE NUMBER IS TOO LARGE

MONITOR INITIALIZATION

003777	611573	2460	JMP	MSG53	IN WHICH CASE PRINT A WARNING MESSAGE
		2470	*		
		2480	*		SYSTEM MESSAGE OUTPUT CONTROL, TRANSFER TO REQUESTED MESSAGE OUTPUT.
		2490	*		
004000	202002	2500	LAC	TEMP2	LOAD THE MESSAGE NUMBER
004001	353300	2510	TAD	(MSGPTR)	
004002	042002	2520	DAC	TEMP2	SET THE ENTRY TO THE TRANSFER VECTOR
004003	622002	2530	JMP	TEMP2,X	AND MAKE THE TRANSFER

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PDP9 TIME-SHARING SYSTEM MONITOR AND MESSAGE ROUTINES

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MAIN MONITOR ROUTINES

2540		.STITL	MAIN MONITOR ROUTINES	
2550		,HEAD	M	
2560	*			
2570	*		START OF SYSTEM MONITOR	
2580	*			
004004	2590	MQNMSG	MESS <TSSMON>,7.	
004012	2600	MONSYM	...	
004012 142002	2610	DZM TEMP2	KILL ANY RECORD OF THE ERROR MESSAGE JUST PRINTED	
004013	2620	MESS <#>,1		
004017	2630	LINE	GET A LINE OF TELETYPE INPUT	
004020	2640	MPOFF		
		,PMC SAVE,ON		
004020 705000		SPECIAL+0	TURN OFF MEMORY PROTECT	
004021 140006	2650	DZM SCNTRL	DE-ALLOCATE CONTROL AT THE END OF EACH LINE	
004022 701742	2660	MPEU		
004023 103172	2670	MONXT JMS EOL	WAS THE PREVIOUS WORD THE LAST ONE ON THIS LINE? RETURN IF NOT,	
004024	2680	WORD	GET THE NEXT WORD -- HOPEFULLY A COMMAND	
004025 604023	2690	JMP MONXT	IGNORE VACUOUS COMMANDS	
	2700	*		
	2710	*	IDENTIFY THE MONITOR COMMAND	
	2720	*		
004026 764752	2730	MONX2 LAW CLIST=1	LOAD A POINTER TO THE COMMAND LIST	
004027 103174	2740	JMS SEARCH	AND FIND THE COMMAND	
004030	2750	WHAT	COULD'NT FIND THE COMMAND	
004031 620010	2760	JMP 10,X	ELSE EXECUTE THE COMMAND	

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MAIN MONITOR ROUTINES

2770		,B9CT		
2780	*			
2790	*			
2800	*	TRY TO ALLOCATE AN AVAILABLE SYSTEM RESOURCE		
2810	*			
004032	2820	ON	...	
004032 213301	2830	LAC (NOP)	THIS PERMITS "ON" AND "OFF" TO USE A COMMON ROUTINE	
004033 741000	2840	SKP		
2850	*			
2860	*	TRY TO DE-ALLOCATE AN AVAILABLE SYSTEM RESOURCE		
004034	2870	*		
004034 213302	2880	OFF	...	
004035 042001	2890	LAC (INX 10)	THIS PERMITS "ON" AND "OFF" TO USE A COMMON ROUTINE	
	2900	DAC TEMP1	SET WHETHER THE COMMAND IS "ON" OR "OFF"	
2910	*			
2920	*	COMMON ROUTINE TO ALLOCATE OR TO DE-ALLOCATE AN AVAILABLE SYSTEM RESOURCE		
2930	*			
004036	2940	WORD	GET THE RESOURCE NAME	
004037	2950	WHAT	NO NAME -- DON'T BELIEVE IT	
004040 765051	2960	LAW RSRCS-1	LOAD A POINTER TO THE RESOURCES LIST	
004041 103174	2970	JMS SEARCH	FIND THE RESOURCE	
004042 604047	2980	JMP RSRCS	COME -- NOT A STANDARD RESOURCE -- IS IT A NUMBERED ONE?	
004043 420010	2990	XCT 10,X	LOAD A POINTER TO THE RESOURCE ALLOCATION TABLE	
004044 042000	3000	DAC TEMPO	AND PASS IT TO THE ALLOCATION/DE-ALLOCATION ROUTINES	
004045 402001	3010	XCT TEMP1	MAKE THE ON/OFF DISTINCTION	
004046 620010	3020	JMP 10,X	EXECUTE THE REQUEST	
3030				
004047	3040	RSRCS	...	
004047	3050	HORD1	LOAD THE RESOURCE NAME	
004050 042000	3060	DAC TEMPO	SAVE IT	
904051 513303	3070	SND (777700)	STRIP OFF THE DIGIT	
004052 043326	3080	DAC TSWORDB	REPLACE IT	
004053 200010	3090	LAC 10	LOAD A POINTER TO THE NUMBERED RESOURCES LIST	
004054 103174	3100	JMS SEARCH	LOCATE THE NUMBERED RESOURCE NAME	
004055 604061	3110	JMP RSRCS	COME -- NOT A LEGAL RESOURCE	
004056 440010	3120	INX 10	SKIP THIS NONSENSE ENTRY	
004057 402001	3130	XCT TEMP1	MAKE THE ON/OFF DISTINCTION	
004060 620010	3140	JMP 10,X	EXECUTE THE REQUEST	
3150				
004061	3160	RSRCS	...	
004061 802000	3170	LAC TEMPO	RELOAD THE ORIGINAL WORD	
004062 043326	3180	DAC TSWORDB	REPLACE IT	
004063 604026	3190	JMP MQN2	NOT A LEGAL RESOURCE -- WAS IT A COMMAND?	
3200				
004064	3210	RON	MPOFF	TURN OFF MEMORY PROTECT
			PMC	SAVE,ON
			SPECIAL+0	
904064 705000		LAC TEMPO,X	TURN OFF MEMORY PROTECT	
904065 222000	3220	SAD SNUMBR		
904066 541771	3230	JMP RON1		
904067 604074	3240	SZA	IGNORE THE COMMAND IF THE RESOURCE ALREADY BELONGS TO THIS USER	
904070 740200	3250	JMP MSG51	SKIP IF THE RESOURCE IS FREE	
904071 611540	3260		ELSE ERROR MESSAGE	

M				MAIN MONITOR ROUTINES		
004072	201771	3270		LAC	SNUMBR	LOAD THE USER #
004073	062000	3280		DAC	TEMPO,X	RESERVE THE RESOURCE FOR THIS USER
004074	701742	3290	RON1	MPEU		
004075	604023	3300		JMP	MONXT	GET THE NEXT MONITOR COMMAND
		3310				
004076		3320	ROFF	MPOFF		TURN OFF MEMORY PROTECT
				,PMC	SAVE,ON	
				SPECIAL+0		
004076	705000			LAC	SCNTRL	TURN OFF MEMORY PROTECT
004077	200006	3330		SAD	SNUMBR	
004100	541771	3340		JMP	ROK	DOES THIS USER HAVE THE CONTROL LINE?
004101	604110	3350		LAC	TEMPO,X	IF SO, ALLOW THE DE-ALLOCATION WITHOUT FURTHER CHECKS
004102	222000	3360		SNA		
004103	741200	3370		JMP	ROK	SKIP IF THE RESOURCE IS ALLOCATED
004104	604110	3380		SAD	SNUMBR	ELSE CONSIDER IT SUCCESSFULLY DE-ALLOCATED
004105	541771	3390		SKP		SKIP IF ALLOCATED TO ANOTHER USER
004106	741000	3400		JMP	MSG52	ELSE ERROR MESSAGE
004107	611557	3410		DZM	TEMPO,X	DE-ALLOCATE THE RESOURCE
004110	162000	3420	ROK	MPEU		
004111	701742	3430		JMP	MONXT	GET THE NEXT MONITOR COMMAND
004112	604023	3440				

M

MTSS CATALOG MODULE

			,STITL	MTSS CATALOG MODULE
003170	3450		,USE	IMPURE
	3460			
	3470			
	3480			
003170 000000	3490	CNAM	,DSA	
003171 000000	3500	NHED	,DSA	
004113	3510		,USE	PURE
004113 565045	3520	NHE	,ACI6	*NHE*
002170	3530	CATLOG	,EQU	BUFFER
002170	3540	CFREEB	,EQU	CATLOG
002172	3550	CNUM	,EQU	CATLOG+2
002173	3560	CMAX	,EQU	CATLOG+3
	3570			DEVICE ADDRESS OF THE FIRST FREE BLOCK
004114	3580			MINUS THE NUMBER OF ENTRIES IN THIS CATLOG
004114	3590	CAT	,USE	MAXIMUM NUMBER OF BLOCKS ON THE DEVICE
004114	3600			
004121 103171	3610		JMS	<CAT>,3
004122	3620	CNLX	FORCE	PRINT THE HEADER MESSAGE
004122	3630			AND FORCE THE OLD BUFFER BEFORE OVER-WRITING IT
004123	3640			
004127 143170	3650		MESS	<?>,1
004130 143171	3660		DZM	CNAM
004131	3670		DZM	NHED
004132	3680	CAT2	LINE	INITIALIZE THE FILE NAME REQUEST
004132	3690			GET THE NEXT LINE OF INPUT -- PRESUMABLY A CATALOG COMMAND
004133	3700			
004134 544113	3710		SAD	NHE
004135 604372	3720		JMP	NHEAD
004136	3730		CRLF	
004137 764143	3740		LAW	CAT4
004140 043532	3750		DAC	CSDEVCV
004141	3760		WORD1	
004142 611121	3770		JMP	CSDEVC3
004143 604263	3780	CAT4	JMP	CAT8
004144 103510	3790		JMS	CSRCAT
004145	3800		DELIM	
004146 553304	3810		SAD	(SCOLON)
004147 741000	3820		SKP	
004150 604154	3830		JMP	CAT6
004151	3840		WORD	
004152 740000	3850		NOP	
004153 043170	3860		DAC	CNAM
004154	3870	CAT6		SET THE FILENAME
004154	3880			
004155 202172	3890		CRLF	
004156 040011	3900		LAC	CNUM
004157 762173	3910		DAC	11
004160 040010	3920		LAW	CMAX
	3930		DAC	10
	3940	*		INITIALIZE THE NUMBER OF ENTRIES IN THE CATALOG
	3950	*		INITIALIZE THE POINTER TO THE FILES IN THE CATALOG
004161 203171	3960		LAC	NHED
				LOAD THE NO-HEADER FLAG

M

MTSS CATALOG MODULE

004245	103316	4430	JMS	D\$SPACE	START IT IN ITS OWN FIELD
004246	220010	4440	LAC	10,X	LOAD THE STARTING CORE ADDRESS
004247		4450	OCT		AND PRINT IT
		4460	*		
		4470	*	PRINT THE FILE'S LENGTH	
		4480	*		
004251	103316	4490	JMS	D\$SPACE	START IT IN ITS OWN FIELD
004252	103316	4500	JMS	D\$SPACE	LOAD THE LENGTH
004253	220010	4510	LAC	10,X	AND PRINT IT
004254		4520	OCT		
		4530	*		
		4540	*	PRINT THE TRANSFER CARD	
		4550	*		
004256	103316	4560	JMS	D\$SPACE	START IT IN ITS OWN FIELD
004257	220010	4570	LAC	10,X	LOAD THE TRANSFER
004260		4580	OCT		AND PRINT IT
004262		4590	CRLF		
		4600	*		
		4610	*	CHECK FOR DONE -- IF SO, PRINT THE TRAILER	
		4620	*		
004263	440011	4630	CAT8	ISZ	11 COUNT THE FILE
004264	604204	4640		JMP	CNEXT NOT YET DONE -- DO THE NEXT ENTRY
004265		4650		CRLF	
004266	203171	4660		LAC	NHED LOAD THE NO-HEADER FLAG
004267	740200	4670		SZA	SKIP UNLESS SET
004270	604122	4680		JMP	CNXL IF SET, DON'T PRINT A TRAILER, EITHER
004271		4690		CRLF	ELSE SPACE DOWN
004272	202170	4700		LAC	CFREE LOAD THE FIRST FREE BLOCK POINTER
004273	513306	4710		AND	(037777)
004274		4720		OCTZ	
004276		4730		NMESS	< IS THE NEXT FREE BLOCK>,23.
004310		4740		MESS	<CATALOG LAST MODIFIED ON >,25.
004324	202170	4750		LAC	CATLOG GET THE DEVICE ADDRESS
004325	513307	4760		AND	(040000) KEEP THE DEVICE BIT
004326	741200	4770		SNA	
004327	604335	4780		JMP	C4
004330		4790		NMESS	<DISK >,5
004334	604342	4800		JMP	C2
004335		4810	C4	NMESS	<DECTAPE >,8,
004342	202170	4820	C2	LAC	CATLOG RELOAD THE DEVICE ADDRESS
004343	744000	4830		CLL	PROTECT THE ROTATE
004344	640517	4840		LR9	18.-3
004345	353305	4850		TAD	(260) MAKE THE DIGIT INTO ASCII
004346	103503	4860		JMS	TSTTYOT AND PRINT IT
004347		4870		CRLF	
004350		4880		MESS	< ***END OF CATALOG***>,26.
004365	604122	4890		JMP	CNXL SEE IF THERE IS ANOTHER COMMAND
		4900			
004366		4910	CAT9	..,	TELL BY THE DELIMITER WHICH IT IS
004366		4920		DELIM	
004367	553310	4930		SAD	(SUPARR)
004370	604012	4940		JMP	MONSYM EXIT ON UP-ARROW

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MTSS CATALOG MODULE

004371	604023	4950	JMP	MONXT	SEE IF IT IS A MONITOR COMMAND
		4960	*		
		4970	*		
		4980	*	CATALOG MODULE OPTIONAL COMMANDS	
		4990	*		
004372		5000	NHEAD	...	
004372	443171	5010	INX	NHED	FLAG THE REQUEST
004373	604132	5020	JMP	CAT2	RETURN FOR ANOTHER COMMAND

M

MISCELLANEOUS SUBROUTINES AND STORAGE

	5030	,STITL MISCELLANEOUS SUBROUTINES AND STORAGE	
004374	5040	,USE PURE	
	5050 *		
	5060 *		
	5070 *	CHECK TO SEE WHETHER THE DELIMITER OF THE LAST WORD WAS A	
	5080 *	CARRIAGE RETURN, IF SO, RETURN TO PRINT THE MONITOR SYMBOL	
	5090 *	AND GET THE NEXT LINE OF INPUT; ELSE RETURN TO THE CALLER.	
	5100 *		
004374	5110	ENTER EOL ,PMC SAVE,ON	
	EOL	***	
003172		DELIM	GET THE DELIMITER OF THE PREVIOUS WORD
004374	5120	SAD (\$SCR)	CHECK FOR A CARRIAGE RETURN
004375 553311	5130	JMP MONSYM	YES -- SO GO GET THE NEXT LINE
004376 604012	5140	RET EOL,X	NO -- SO RETURN TO THE CALLER
004377 623172	5150		
	5160 *		
	5170 *		
	5180 *	SEARCH THE TABLE INDICATED BY THE POINTER PASSED IN THE	
	5190 *	ACCUMULATOR FOR A MATCH TO THE WORD IN T\$WORDB. THE END OF THE	
	5200 *	TABLE IS THE FIRST LOCATION CONTAINING MINUS 1. RETURN TO THE	
	5210 *	CALLER +1 IF NO MATCH IS FOUND; +2 IF A MATCH IS FOUND.	
	5220 *		
004400	5230	ENTER SEARCH ,PMC SAVE,ON	
	SEARCH	***	
003174		DAC 10 SET THE PASSED TABLE POINTER	
004400 040010	5240	SRCH2 LAC 10,X LOAD THE NEXT TABLE ENTRY	
004401 220010	5250	SAD M1 CHECK FOR DONE	
004402 545051	5260	RET SEARCH,X YES -- NO MATCH -- RETURN +1	
004403 623174	5270	SAD T\$WORDB ELSE CHECK FOR A MATCH	
004404 543326	5280	SKP	
004405 741000	5290	JMP SRCH2 NO MATCH FOUND -- TRY THE NEXT ENTRY	
004406 604401	5300	INX SEARCH MATCH FOUND -- BUMP THE RETURN	
004407 443174	5310	RET SEARCH,X SUCCESSFUL RETURN +2	
004410 623174	5320		

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M REQUESTS FOR OTHER PROGRAMS

004411 5330 ,STITL REQUESTS FOR OTHER PROGRAMS
 5340 ,USE PURE
 5350 *
 5360 *
 5370 *
 5380 *
 5390
 004411 213312 5400 DEB LAC (\$DDT)
 004412 042000 5410 DAC TEMPO
 004413 604421 5420 JMP MX1
 5430
 5440
 004414 213313 5450 LDR LAC (\$LDTR)
 004415 042000 5460 DAC TEMPO
 004416 604425 5470 JMP MX2
 5480
 004417 213314 5490 BAS LAC (\$BAS)
 004420 042000 5500 DAC TEMPO PASS THE PROGRAM NAME
 5510
 5520 *
 5530 *
 5540 * THIS IS THE ONLY NORMAL EXIT FROM THE MONITOR, BEFORE EXIT ALL
 5550 * USER REGISTERS MUST BE RESET AND THE SWAPPER PARAMETER WORDS
 5560 * MUST BE SET.
 5570 *
 5580 *
 5590 *
 004421 5600 MX1 ***
 004421 142150 5610 DZM PHFLAG SET THE NEXT PROGRAM TO BE A USER PROGRAM
 004422 5620 MPOFF
 ,PMC SAVE,ON
 004422 705000 SPECIAL+0 TURN OFF MEMORY PROTECT
 004423 213315 5630 LAC (506000) S-USER SWAP CONTROL WORD
 004424 604427 5640 JMP MX3
 004425 5650 ***
 004425 5660 MPOFF
 ,PMC SAVE,ON
 004425 705000 SPECIAL+0 TURN OFF MEMORY PROTECT
 004426 213316 5670 LAC (512000) PHANTOM SWAP CONTROL WORD
 004427 5680 MX3 ***
 004427 042001 5690 DAC TEMP1 SET THE SWAPPER CONTROL WORD
 004428 202000 5700 LAC TEMPO
 004429 042000 5710 MX5 DAC TEMP0
 004432 701742 5720 MPSU SET THE NAME TO SWAP
 004433 103314 5730 JMS FORCE ENABLE MEMORY PROTECTION FOR THE FORCE ROUTINE
 004434 5740 MPOFF FLUSH ANY PATCHES BEFORE LEAVING THIS MODULE
 ,PMC SAVE,ON
 004434 705000 SPECIAL+0 TURN OFF MEMORY PROTECT
 5750 *
 5760 * NOW THE SPECIALS ARE DONE WE CAN SET THE CONTROL WORDS SAFELY
 5770 *
 004435 202001 5780 LAC TEMP1

		M	REQUESTS FOR OTHER PROGRAMS		
004436	040702	5790	DAC	\$OC0	SET THE SWAPPER CONTROL WORD
004437	202000	5800	LAC	TEMPO	
004440	040703	5810	DAC	\$OC1	SET THE FILENAME
004441	202002	5820	LAC	TEMP2	
004442	040704	5830	DAC	\$OC2	SET THE RESTART ADDRESS
004443	700002	5840	MX4	IOP	
		5850	*		
		5860	*		SET THE USER'S REGISTERS
		5870	*		
004444	202022	5880	LAC	ACSW	
004445	041756	5890	DAC	\$ACS	RESTORE THE SER'S SOFTWARE AC SWITCHES REGISTER
004446	202020	5900	LAC	STSAVE	
004447	041760	5910	DAC	\$IORS	RESTORE THE USER'S PROGRAM INTERRUPT STATUS
		5920	*		
		5930	*		RESTORE THE USER'S STEP COUNTER
		5940	*		
004450	202021	5950	LAC	SCSAVE	RELOAD THE OLD STEP COUNT
004451	253317	5960	XOR	(77)	COMPLEMENT THE STEP COUNT
004452	353320	5970	TAD	(640402)	DEVELOP A PSEUDO-NORMALIZE INSTRUCTION
004453	513321	5980	AND	(640477)	DELETE A POSSIBLE STEP COUNT OVERFLOW
004454	043176	5990	DAC	MST2	SET THE NORMALIZE INSTRUCTION
	003176	6000	,USE	IMPURE	
003176	740040	6010	MST2	XX	
004455		6020	,USE	PURE	
004455	403176	6030	XCT	MST2	STEP COUNT TO THE SC REGISTER
		6040			
004456	202016	6050	LAC	MQSAVE	
004457	652000	6060	LMO		RESTORE THE USER'S MQ
004460	202015	6070	LAC	ACSAVE	
004461	040005	6080	DAC	\$3AC	RESTORE THE USER'S AC
004462	202023	6090	LAC	10SAVE	
004463	040026	6100	DAC	\$,310	RESTORE THE USER'S AUTO-INDEX REGISTER 10
004464	202024	6110	LAC	11SAVE	
004465	040027	6120	DAC	\$,311	RESTORE THE USER'S AUTO-INDEX REGISTER 11
004466	201771	6130	LAC	SNUMBR	
004467	040055	6140	DAC	\$3TEM4	
004470	761001	6150	LAW	SSWPPR	SET THE CURRENT USER TO ALSO BE THE NEXT USER
004471	600335	6160	JMP	SSWAP	GET THE SWAPPER

M DECTAPE ALLOCATION/DE-ALLOCATION

004472 6170 .STL DECTAPE ALLOCATION/DE-ALLOCATION
 6180 .USE PURE
 6190 *
 6200 *
 6210 *
 6220

004472 6230 DT0N *** TRY TO ALLOCATE THE DECTAPE UNIT
 004472 6240 MPOFF ,PMC SAVE,ON SPECIAL+0
 004472 705000 JMS DTNUM TURN OFF MEMORY PROTECT
 004473 103203 6250 CLL SET UP THE ALLOCATION TAG AND CHECK FOR A FORMAT ERROR
 004474 744000 6260 LAC INITAILIZE FREE HANDLER FLAG
 004475 200032 6270 LAC SRDT0 LOAD THE CURRENT STATUS OF ONE HANDLER
 004476 103177 6280 JMS DT0N6 CHECK ITS ALLOCATION
 004477 200033 6290 LAC SRDT1 LOAD THE CURRENT STATUS OF THE OTHER HANDLER
 004500 103177 6300 JMS DT0N6 AND CHECK ITS ALLOCATION
 6310
 6320 * NO ONE HAS ALREADY BEEN ALLOCATED THE DECTAPE TRANSPORT REQUESTED
 6330

004501 740400 6340 SNL SKIP IF THERE IS A FREE HANDLER
 004502 611624 6350 JMP MSG54 BOTH HANDLERS HAVE BEEN ALLOCATED
 004503 200032 6360 LAC SRDT0
 004504 740200 6370 S2A SKIP IF THE FIRST HANDLER IS FREE
 004505 604511 6380 JMP DT0N1 ELSE USE THE OTHER
 004506 202000 6390 LAC TEMPO LOAD THE TAG
 004507 040032 6400 DAG SRDT0 AND ALLOCATE THE HANDLER
 004510 604513 6410 JMP DT0N9 EXIT
 004511 202000 6420 LAC TEMPO LOAD THE TAG
 004512 040033 6430 DAG SRDT1 ALLOCATE THE OTHER HANDLER
 004513 701742 6440 DT0N9 MPSU
 004514 604023 6450 JMP MONXT
 6460
 004515 6470 ENTER DT0N6 ROUTINE TO SEE WHETHER OR NOT A DECTAPE HANDLER CAN BE ALLOCATED
 ,PMC SAVE,ON
 003177 DT0N6 ***
 004515 740200 6480 S2A SKIP IF THE HANDLER IS FREE
 004516 604521 6490 JMP DT0N7 ELSE CHECK WHO HAS WHAT
 004517 744002 6500 STL FLAG THERE IS A FREE HANDLER
 004520 623177 6510 RET DT0N6,X
 004521 542000 6520 DT0N7 SAD TEMPO
 004522 604513 6530 JMP DT0N9 EXIT -- IT ALREADY BELONGS TO THIS USER
 004523 513322 6540 AND (770000)
 004524 542001 6550 SAD TEMP1
 004525 611540 6560 JMP MSG51 RESOURCE ALREADY ALLOCATED TO ANOTHER USER
 004526 623177 6570 RET DT0N6,X
 6580
 004527 6590 DTOFF *** TRY TO DE-ALLOCATE THE DECTAPE UNIT
 004527 6600 MPOFF ,PMC SAVE,ON SPECIAL+0
 004527 705000 LAC SCNTRL TURN OFF MEMORY PROTECT
 004530 200006 6610 SAD SNUMBR SEE IF THE CURRENT USER HAS A CONTROL LINE
 004531 541771 6620

M

DECTAPE ALLOCATION/DE-ALLOCATION

004532	741000	6630	SKP		
004533	604536	6640	JMP	DT0F4	NO -- CONTINUE NORMALLY
004534	770000	6650	LAW	10000	LOAD UNIT NUMBER MASK
004535	741000	6660	SKP		
004536	777777	6670	DT0F4	LAW	-1 LOAD WHOLE WORD ALLOCATION MASK
004537	043326	6680	DAC	T\$WORDB	
004540	103203	6690	JMS	DTNUM	SET UP THE ALLOCATION TAG AND CHECK FOR A FORMAT ERROR
004541	202000	6700	LAC	TEMPO	RECOVER THE DEVICE NAME
004542	503326	6710	AND	T\$WORDB	MODIFY IT BY THE MASK
004543	042000	6720	DAC	TEMPO	
004544	760032	6730	LAW	SRDT0	LOAD A POINTER TO ONE OF THE HANDLERS
004545	103201	6740	JMS	DT0F6	AND CHECK ON IT
004546	760033	6750	DT0F8	LAW	LOAD A POINTER TO THE OTHER HANDLER
004547	103201	6760	JMS	DT0F6	AND CHECK ON IT
004550	701742	6770	DT0F9	MPEU	
004551	604023	6780	JMP	MONXT	
		6790			
004552		6800	ENTER	DT0F6	ROUTINE TO SEE WHETHER OR NOT A DECTAPE HANDLER CAN BE DE-ALLOCATED
			,PMC	SAVE,ON	
003201			DT0F6	...	
004552	043177	6810	DAC	DT0N6	SET THE POINTER
004553	223177	6820	LAC	DT0N6,X	LOAD THE ALLOCATION
004554	741200	6830	SNA		SKIP IF IT IS SOMEONE'S RESOURCE
004555	623201	6840	RET	DT0F6,X	ELSE EXIT NOW
004556	503326	6850	AND	T\$WORDB	RECOVER JUST THAT PART OF THE TAG WE ARE INTERESTED IN
004557	542000	6860	SAD	TEMPO	
004560	604565	6870	JMP	DT0F7	FOUND THIS USER'S ALLOCATION -- REMOVE IT
004561	513322	6880	AND	(770000)	
004562	542001	6890	SAD	TEMP1	
004563	611557	6900	JMP	MSG52	NOT THIS USER'S RESOURCE
004564	623201	6910	RET	DT0F6,X	
		6920			
004565	163177	6930	DT0F7	DZM	RELEASE THE DECTAPE HANDLER
004566	604546	6940		JMP	AND EXIT
		6950	*		
		6960	*		
		6970	*		DTNUM IS A SUBROUTINE USED BY THE DECTAPE ALLOCATION AND DE-ALLOCATION
		6980	*		ROUTINES TO SET UP THE ALLOCATION TAG AND TO CHECK FOR INPUT
		6990	*		OF A NON-OCTAL DIGIT.
		7000	*		
004567		7010	ENTER	DTNUM	
			,PMC	SAVE,ON	
003203			DTNUM	...	
004567	202000	7020	LAC	TEMPO	RECOVER THE DEVICE NAME
004570	650614	7030	GLBILLS	12,	RETAIN JUST THE THIRD SIXBIT CHARACTER
004571	513323	7040	AND	(570000)	RETAIN JUST THE DIGIT (PLUS A FLAG FOR NON-OCTAL DIGIT)
004572	042001	7050	DAC	TEMP1	SAVE THE DIGIT
004573	341771	7060	TAD	SNUMBR	FORM THE ALLOCATION TAG
004574	042000	7070	DAC	TEMPO	SET THE ALLOCATION TAG
004575	513324	7080	AND	(700000)	
004576	741200	7090	SNA		
004577	623203	7100	RET	DTNUM,X	GOOD EXIT -- THE DIGIT WAS OCTAL

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DECTAPE ALLOCATION/DE-ALLOCATION

004600 701742 7110
004601 7120

MPEU
FORMAT

ELSE RE-ENABLE USER MODE BEFORE TRYING TO PRINT
AND GO PRINT AN ERROR MESSAGE

M
 CONSOLE SWITCHES TYPE SERVICES

	7130		,STITL	CONSOLE SWITCHES TYPE SERVICES	
004602	7140		,USE	PURE	
	7150	*			
	7160	*		REQUESTS FOR CONSOLE-SWITCH TYPE SERVICES	
	7170	*			
004602	703302	7180	BYE	CAF	CLEAR ALL OF THE USER'S FLAGS
004603	103207	7190		JMS ZCORE	ZERO ALL OF THE USER'S CORE
004604	103211	7200		JMS ZCOR1	ZERO THE FIRST 40 LOCATIONS
004605	103213	7210		JMS ZDISK	ZERO ALL OF THE USER'S "PHYSICAL DISK"
004606	7220			MPOFF	
				,PMC SAVE,ON	
004606	705000			SPECIAL+0	TURN OFF MEMORY PROTECT
004607	760034	7230		LAW SRACS	
004610	103205	7240		JMS B5	DE-ALLOCATE AC SWITCHES
004611	760230	7250		LAW SRPTR	
004612	103205	7260		JMS B5	DE-ALLOCATE PAPER TAPE PUNCH
004613	760235	7270		LAW SRPTR	
004614	103205	7280		JMS B5	DE-ALLOCATE PAPER TAPE READER
004615	760242	7290		LAW SRSCO	
004616	103205	7300		JMS B5	DE-ALLOCATE THE GRAPHICS II PERIPHERALS
004617	760032	7310		LAW SRDIO	
004620	103205	7320		JMS B5	DE-ALLOCATE THE FIRST DECTAPE HANDLER
004621	760033	7330		LAW SRDT1	
004622	103205	7340		JMS B5	DE-ALLOCATE THE SECOND DECTAPE HANDLER
004623	701742	7350		MPEU	
004624	604004	7360		JMP MONMSG	ALL DONE -- PRINT & FRESH MONITOR MESSAGE
	7370	*			
	7380	*			
	7390	*			ENTER WITH A POINTER TO A RESOURCE ALLOCATION WORD IN THE AC.
	7400	*			DE-ALLOCATE THE RESOURCE IF IT BELONGS TO THE CURRENT USER.
	7410	*			OTHERWISE LEAVE IT ALONE.
	7420	*			
004625	7430		ENTER	B5	
			,PMC	SAVE,ON	
003205		85		...	
004625	042000	7440	DAC	TEMPO	SAVE THE POINTER TO THE RESOURCE ALLOCATION WORD
004626	222000	7450	LAC	TEMPO,X	LOAD THE CURRENT ALLOCATION BITS
004627	513325	7460	AND	(777)	KEEP JUST THE USER NUMBER PORTION
004630	541771	7470	SAD	SNUMBR	COMPARE TO THIS USER'S ID
004631	162000	7480	DZM	TEMPO,X	IT IS HIS -- DE-ALLOCATE IT
004632	623205	7490	RET	B5,X	EXIT
	7500	*			
	7510	*			
004633	703302	7520	CAF	CAF	CLEAR ALL OF THE USER'S FLAGS
004634	142020	7530	DZM	STSAVE	ALSO CLEAR ALL SOFTWARE FLAGS
004635	604023	7540	JMP	MONXT	GET THE NEXT COMMAND
	7550	*			
	7560	*			
	7570	*			REQUEST TO ZERO A USER FILE -- DETERMINE WHICH ONE
	7580	*			
	7590	*			
004636	435762	7600	CORE	.AC16 *COR*	

M CONSOLE SWITCHES TYPE SERVICES

004637	445163	7610	DISK	,AC16	*DIS*	
		7620				
004640		7630	ZER	...		
004640	103314	7640		JMS	DSFORCE	
004641		7650		WORD		GET THE NAME OF THE FILE TO ZERO
004642		7660		WHAT		NULL FILE NAME IS ILLEGAL
004643	544637	7670		SAD	DISK	
004644	604653	7680		JMP	ZDIS	ZERO THE USER DISK
004645	544636	7690		SAD	CORE	
004646	604650	7700		JMP	ZCOR	ZERO USER CORE
004647		7710		WHAT		NO OTHER LEGAL FILERAMES EXIST
		7720	*			
004650	103207	7730	ZCOR	JMS	ZCORE	ZERO MOST OF USER CORE
004651	103211	7740		JMS	ZCOR1	ZERO LOCATIONS 0-37
004652	604023	7750		JMP	MONXT	GET THE NEXT COMMAND
		7760	*			
004653	103213	7770	ZDIS	JMS	ZDISK	ZERO THE USER "PHYSICAL DISK"
004654	604023	7780		JMP	MONXT	GET THE NEXT COMMAND
		7790	*			
		7800	*			
		7810	*			ZERO ALL USER CORE, EXCEPT THE 40 LOCATIONS IN THE USER JOB TABLE
		7820	*			
004655		7830		ENTER	ZCORE	
				,PMC	SAVE,ON	
003207			ZCORE	LAW	BOUNDARY-CORMAX TWO'S COMPLEMENT NUMBER OF LOCATIONS TO ZERO	
004655	764000	7840		DAC	TEMP11	
004656	042013	7850		LAW	BOUNDARY	
004657	762000	7860		DAC	TEMP12	SET THE STARTING LOCATION TO ZERO
004660	042014	7870		JMS	DSBINIT	INITIALIZE THE BUFFER
004661	103324	7880		JMS	DSUCORE	OPEN USER CORE
004662	103306	7890		JMP	ZER2	DO THE ZEROING OPERATION
004663	604705	7900				
		7910	*			
		7920	*			
		7930	*			ZERO THE FIRST 40 LOCATIONS
		7940	*			
004664		7950		ENTER	ZCOR1	
				,PMC	SAVE,ON	
003211			ZCOR1	...		
004664	203211	7960		LAC	ZCOR1	
004665	043207	7970		DAC	ZCORE	SAVE THE RETURN ADDRESS
004666	777740	7980		LAW	-40	
004667	042013	7990		DAC	TEMP11	SET THE LENGTH TO ZERO
004670	750000	8000		CLA		
004671	042014	8010		DAC	TEMP12	SET THE START ADDRESS TO ZERO
004672	604705	8020		JMP	ZER2	DO IT -- ZERO THE FIRST 40 CORE LOCATIONS (IN THE JOB TABLE)
		8030	*			
		8040	*			
		8050	*			ZERO THE USERIS "PHYSICAL DISK"
		8060	*			
004673		8070		ENTER	ZDISK	
				,PMC	SAVE,ON	

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CONSOLE SWITCHES TYPE SERVICES

003213	ZDISK	...	
004673 203213 8080	LAC	ZDISK	
004674 043207 8090	DAC	ZCORE	SAVE THE RETURN ADDRESS
004675 762000 8100	LAW	-\$DKLEN	
004676 042013 8110	DAC	TEMP11	SET THE DISK LENGTH
004677 142014 8120	DZM	TEMP12	SET THE START ADDRESS
004700 103324 8130	JMS	D\$BINIT	INITIALIZE THE BUFFER AREA
004701 103310 8140	JMS	DSUDISK	OPEN THE USER DISK FILE
004702 142151 8150	DZM	D\$FTYPE	SET THE FILE TYPE
004703 750001 8160	CLC		
004704 042051 8170	DAC	D\$PCM\$K	SET A FULL WORD MASK FOR THE DISK
8180			
004705 8190	ZER2	...	
004705 103304 8200	JMS	D\$NCOP	FINISH OPENING THE FILE
8210			
004706 8220	ZER4	...	
004706 202014 8230	LAC	TEMP12	LOAD THE NEXT LOCATION TO CLEAR
004707 103312 8240	JMS	DSLOCAT	LOCATE IT IN THE BUFFER
004710 162162 8250	DZM	D\$B\$PTR,X	ZERO IT
004711 442156 8260	INX	D\$BALY	SET THE ALTERS FLAG
004712 442014 8270	INX	TEMP12	INCREMENT THE POINTER
004713 442013 8280	ISZ	TEMP11	TEST FOR DONE
004714 604706 8290	JMP	ZER4	NO -- LOOP
004715 103314 8300	JMS	D\$FORCE	YES -- FORCE THE LAST BUFFER FULL OUT
004716 623207 8310	RET	ZCORE,X	EXIT
8320	*		
8330	*		
8340	*	EXPLAIN SYSTEM COMMANDS	
8350	*		
8360	*	LIST OF AVAILABLE EXPLAIN FUNCTIONS	
8370	*		
004717 435755 8380	COMND	,AC16	*COM*
004720 624563 8390	RESRC	,AC16	*RES*
004721 8400	EXP	...	
004721 8410	WORD		GET THE ITEM TO EXPLAIN
004722 611762 8420	JMP	MSG63	NO NULL COMMAND FOR NOW
004723 544717 8430	SAD	COMND	
004724 612043 8440	JMP	MSG64	COMMAND LIST
004725 544720 8450	SAD	RESRC	
004726 612676 8460	JMP	MSG65	RESOURCE LIST
004727 611762 8470	JMP	MSG63	ELSE GENERAL MESSAGE

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MTSS DEBUGGER -- X-RATED COMMANDS

8480 .STITL MTSS DEBUGGER -- X-RATED COMMANDS
8490 *
8500 *
8510 * COMMANDS WHICH WORK ON ACTUAL CORE FIRST SET THE FILE TYPE
8520 * TO ACTUAL CORE IF IT IS NOT ALREADY SET, AND SAVE THE OLD FILE TYPE.
8530 *
8540 * USE EXIT (EXI,X) TO GET BACK TO THE PREVIOUSLY OPEN FILE.
8550 *
004730 8560 XDU ... DUMP ACTUAL CORE
004730 8570 NUM
004731 8580 WHAT
004732 042001 8590 DAC TEMP1
004733 8600 CRLF
004734 8610 MPOFF
004734 705000 ,PMC SAVE,ON
004735 222001 8620 SPECIAL+0 TURN OFF MEMORY PROTECT
004736 701742 8630 LAC TEMP1,X
004737 8640 MPEU
004741 604023 8650 OCT
8660 JMP MONXT
8670
004742 8680 XPA ... PATCH ACTUAL CORE
004742 8690 NUM
004743 8700 WHAT
004744 042001 8710 DAC TEMP1
004745 8720 NUM
004746 8730 WHAT
004747 8740 MPOFF
004747 705000 ,PMC SAVE,ON
004750 062001 8750 SPECIAL+0 TURN OFF MEMORY PROTECT
004751 701742 8760 DAC TEMP1,X
004752 604023 8770 MPEU
JMP MONXT

M

TABLE OF COMMANDS, RESOURCES, AND REGISTERS

	8780	.STITLE TABLE OF COMMANDS, RESOURCES, AND REGISTERS		
	8790	*		
	8800	*	DEFINITIONS TO ALLOW FOR UN-IMPLEMENTED FEATURES AND OTHER ANOMALIES	
	8810	*		
004064	8820	SCOON	,EQU	RQN
004076	8830	SCOOFF	,EQU	RQFF
004064	8840	PTRON	,EQU	RQN
004076	8850	PTROFF	,EQU	RQFF
004064	8860	PTPON	,EQU	RQN
004076	8870	PTPOFF	,EQU	RQFF
004064	8880	ACSON	,EQU	RQN
004076	8890	ACSOFF	,EQU	RQFF
004064	8900	CNTON	,EQU	RQN
004076	8910	CNTOFF	,EQU	RQFF
004472	8920	TPDN	,EQU	DTDN
004587	8930	TPOFF	,EQU	DTOFF
	8940	,HEAD		
000032	8950	RDT	,EQU	SRDTON
000032	8960	RTP	,EQU	SRDTON
	8970	,HEAD M		
	8980	*		
	8990	*		
	9000	*	MONITOR COMMAND TABLE	
	9010	*		
004753	9020	,USE	PURE	
	9030	,PMC	SAVE, OFF	
004753	9040	CLIST	...	
004753	9050	COMMAND DEB		
004755	9060	COMMAND LDR,L		
004761	9070	COMMAND CAT		
004763	9080	COMMAND BAS		
004765	9090	COMMAND GRO		
004767	9100	COMMAND ON		
004771	9110	COMMAND OFF		
004773	9120	COMMAND BYE,<GOO,HEL>		
005001	9130	COMMAND EXP,E		
005005	9140	COMMAND CAF		
005007	9150	COMMAND ZER,Z		
005013	9160	COMMAND VAL,V		
005017	9170	COMMAND XDU,XD		
005023	9180	COMMAND XPA,XP		
	9190	,HEAD D		
005027	9200	COMMAND TRA,<T,JMP,J>		
005037	9210	COMMAND DDT		
005041	9220	COMMAND CON,C		
005045	9230	COMMAND EXI,X		
	9240	,HEAD M		
005051 777777	9250	M1	*1	END OF MONITOR COMMAND TABLE
	9260	*		
	9270	*	MONITOR RESOURCE TABLE	
	9280	*		
005052	9290	RSRCS	RESOURCE PTR	

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TABLE OF COMMANDS, RESOURCES, AND REGISTERS

005056	9300	RESOURCE PTP
005062	9310	RESOURCE ACS
005066	9320	RESOURCE CNT
005072	9330	RESOURCE SCO
005076 777777	9340	-1 END OF STANDARD RESOURCE NAMES
005077	9350	RESOURCE DT
005103	9360	RESOURCE TP
005107 777777	9370	-1 END OF NUMBERED RESOURCES
	9380	*
	9390	*
	9400	*
	9410	,HEAD D
005110	9420	REGLIS REGISTER AC
005112	9430	REGISTER MQ
005114	9440	REGISTER PC
005116	9450	REGISTER LK
005120	9460	REGISTER STS
005122	9470	REGISTER ACS
005124	9480	REGISTER SC
005126	9490	REGISTER ALL
005130	9500	REGISTER VAL
	9510	*
	9520	*
	9530	*
005132	9540	DDT.COM ...
005132	9550	COMMAND PAT,P
005136	9560	COMMAND DUM
005140	9570	COMMAND REG
005142	9580	COMMAND ALT
005144	9590	COMMAND TRA,<T,JMP,J>
005154	9600	COMMAND NSU,<N,NON>
005162	9610	COMMAND EXI,X
005166	9620	COMMAND CON,C
005172	9630	COMMAND CLO
005174	9640	COMMAND PRE
005176	9650	COMMAND LIM
005200	9660	COMMAND MAS
005202	9670	COMMAND SEA
005204	9680	COMMAND BAS
005206	9690	COMMAND VAL,V
	9700	*
	9710	*
	9720	*
005212	9730	DDTMOD ...
005212	9740	D MODE 0
005220	9750	D MODE A
005226	9760	D MODE 6
005234	9770	D MODE H
005242	9780	D MODE 7
005250	9790	D MODE 8
005256	9800	D MODE D
005264	9810	D MODE S

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TABLE OF COMMANDS, RESOURCES, AND REGISTERS

005272	777777	9820	-1	END OF DDT TABLES
		9830	*	
		9840	*	FILES THAT CAN BE "OPEN"ED
		9850	*	
005273		9860	FILES	COMMAND COR,C
005277		9870		COMMAND DIS,D
005303		9880		COMMAND SYS,S
005307		9890		COMMAND VSA,V
005313		9900		COMMAND XCO,X
005317		9910		COMMAND BLO,B
005323	777777	9920	-1	
		9930	,PMC	RESTORE
		9940	,HEAD	M
		9950	,INSRT	DEBUG

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MTSS MONITOR DEBUGGING PACKAGE

100 ,STITL MTSS MONITOR DEBUGGING PACKAGE
110 ,HEAD D
120 * 9120-9130
130 *
140 * THIS PACKAGE SHOULD EVENTUALLY PROBABLY BE EXPANDED ENOUGH TO
150 * ELIMINATE THE REQUIREMENT FOR A SEPARATE DDT.
160 *
170 * ADVANTAGES OF HAVING THE DEBUGGING DONE FROM THE MONITOR:
180 * 1) NO USER CORE IS OVERLAID (AS IT MUST BE WITH AN 8-USER DDT)
190 * 2) BECAUSE IT IS A PHANTOM PROGRAM THE DEBUGGER CAN HAVE MORE PRIVILEGES
200 * 3) CERTAIN THINGS, SUCH AS LOW-CORE MAPPING AND SAVING OF REGISTERS
210 * ARE AUTOMATICALLY DONE FOR THE DEBUGGER BY THE SYSTEM
220 *
230 * DISADVANTAGES OF HAVING A PHANTOM DEBUGGER
240 * 1) SOME REDUCTION IN SPEED -- NOT VERY NOTICEABLE TO THE USER, HOWEVER
250 * 2) ADDED SYSTEM OVERHEAD IN THE FORM OF MEMORY PROTECTION
260 * RELEASES AND ALL PATCHES, DUMPS, ETC REQUIRE DISK OPERATIONS.
270 *
280 *
290 * DEFINITIONS:
300 * 1) A LETTER IS ANY UPPER-CASE OR LOWER-CASE LETTER
310 * 2) OCTAL DIGITS ARE THE DIGITS 0-7
320 * 3) DECIMAL DIGITS ARE THE DIGITS 0-9
330 * 4) ANY OTHER CHARACTER IS A DELIMITER
340 * 5) A WORD IS ANY SEQUENCE OF LETTERS AND/OR DIGITS AND IS
350 * TERMINATED BY A DELIMITER
360 * 6) AN OCTAL NUMBER IS ANY SEQUENCE OF OCTAL DIGITS AND IS
370 * TERMINATED BY A DELIMITER OTHER THAN A PERIOD (.)
380 * 7) A DECIMAL NUMBER IS ANY SEQUENCE OF DIGITS WHICH IS TERMINATED
390 * BY A PERIOD FOLLOWED BY ANY DELIMITER
400 * 8) LEGAL PHYSICAL DEVICE NAMES AND THEIR DEVICES:
410 * PTR -- PAPER TAPE READER
420 * PTP -- PAPER TAPE PUNCH
430 * PPT -- PAPER TAPE (EITHER READER OR PUNCH, ACCORDING TO CONTEXT)
440 * TPN -- DECTAPE HANDLER #N
450 * DTN -- DECTAPE HANDLER #N (IDENTICAL TO TPN)
460 * DKN -- PHYSICAL DISK #N
470 * 9) LEGAL LOGICAL DEVICE NAMES AND THEIR MEANINGS:
480 * CQR -- THE USER'S CORE FILE ON THE DISK
490 * DIS -- THE USER'S "PHYSICAL DISK" FILE ON THE DISK
500 * SYS -- THE SYSTEM LOGICAL DISK
510 * VSA 0 -- DEC VSA LOGICAL DISK #0
520 * VSA 1 -- DEC LOGICAL DISK #1
530 * 9) A LEGAL FILENAME IS OF THE FORM <DEVICE NAME>:<WORD>
540 * WHERE <WORD> WILL BE TRUNCATED TO THREE CHARACTERS.
550 * <FILENAME> REFERS TO A SYSTEM FORMAT FILE ON EITHER THE SYSTEM
560 * DISK OR ON DECTAPE,
570 * 10) RANGE IS A SPECIFICATION OF THE ADDRESSES TO BE AFFECTED
580 * BY A COMMAND. RANGE IS OF THE FORM:
590 * <NUMBER> -- THE SINGLE LOCATION GIVEN BY THE NUMBER
600 * <NUM1>,<NUM2> -- THE LOCATIONS FROM NUM1 TO NUM2, INCLUSIVE
610 * <NUM1> <NUM2> -- STARTING FROM NUM1 FOR NUM2 LOCATIONS

D

MTSS MONITOR DEBUGGING PACKAGE

620 *
630 * 11) FIELD IS <RANGE> OR <FIELD>|<RANGE>
640 *
650 *
660 *
670 * DEBUGGER COMMANDS ARE OF THE FORMAT
680 * <COMMAND><ARG1><ARG2>...<ARGN><FIELD>
690 * WHERE EACH ITEM IS SEPARATED FROM THE NEXT BY ANY DELIMITER
700 *
710 * IN THE FOLLOWING COMMAND DESCRIPTIONS, FIRST THE COMMAND
720 * IS NAMED, THEN ANY LEGAL ABBREVIATIONS ARE GIVEN, THEN A DESCRIPTION
730 * OF THE COMMAND IS GIVEN. LEGAL DEBUGGER COMMANDS AS OF THIS
740 * ASSEMBLY ARE:
750 *
760 * VALIDATE (VAL,V) PROVIDES AN UNDERPRINTED AREA ON WHICH THE
770 * USER CAN TYPE HIS PASSWORD. IF THE PASSWORD IS CORRECT, THE NEXT
780 * COMMAND IS REQUESTED, OTHERWISE A "VALIDATION ERROR" MESSAGE IS
790 * PRINTED AND THEN THE NEXT COMMAND IS REQUESTED.
800 *
810 * OPEN (OPE,O) <DEVICE NAME> OR OPEN <FILENAME> OPENS THE
820 * REQUESTED DEVICE OR FILE. ALL SUBSEQUENT SENSE AND ALTER MEMORY
830 * COMMANDS REFER TO THIS FILE. AN ATTEMPT TO REFERENCE BELOW THE
840 * MINIMUM ADDRESS IN THE FILE OR TO REFERENCE ABOVE THE MAXIMUM
850 * ADDRESS IN THE FILE GENERATES AN "OUT OF BOUNDS" ERROR MESSAGE.
860 * OPEN DOES CLOSE WHATEVER FILE WAS OPEN BEFORE IT OPENS THE REQUESTED
870 * FILE, OTHERWISE THE USER HAS NO WAY OF KNOWING WHAT CHANGES
880 * HAVE BEEN MADE AND WHICH ONES HAVE NOT BEEN.
890 *
900 * CLOSE (CLO,C) CLOSES WHICHEVER FILE IS CURRENTLY OPEN,
910 * WRITING OUT THE LATEST CHANGES IN IT, THEN AN "OPEN CORE" IS DONE.
920 *
930 * READ (REA,R) <NUMBER> CLOSES THE CURRENT FILE AND OPENS
940 * ON THE CURRENT DEVICE A FILE WHICH IS THE BLOCK WHOSE <NUMBER>
950 * WAS GIVEN,
960 *

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PDP9 TIME-SHARING SYSTEM MONITOR AND MESSAGE ROUTINES

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D MTSS DEBUGGER -- NEXT SYNTACTIC UNIT

005324 970 ,STITL MTSS DEBUGGER -- NEXT SYNTACTIC UNIT
980 ,USE PURE
990 *
1000 *
1010 * ENTER THE DEBUGGER HERE, ABANDONING ANY UNPROCESSED MONITOR INPUT
1020 *
005324 1030 DDT ***
005324 1040 MESS <XDDT HERE>,9,
1050 *
1060 * INITIALIZE THE FILE TO BE USER CORE
1070 *
005333 103324 1080 JMS BINIT
005334 103306 1090 JMS UCORE SET MFDA,FDA,FMIN,MFMIN,FMAX,FTYPE,PCMSK FOR THE USER CORE FILE
005335 103304 1100 JMS SNCOP SET BMAX,BMIN,MBMIN,BDA FOR THE USER CORE FILE
1110 *
1120 * INITIALIZE MODE SWITCHES
1130 *
005336 763221 1140 LAW OMOD INITIALIZE TO OCTAL MODE
005337 042036 1150 DAC ADRSW SET THE ADDRESS MODE
005340 042035 1160 DAC REGSW SET THE REGISTERS MODE
005341 763241 1170 LAW SMOD INITIALIZE DUMP TO BE SYMBOLIC
005342 042037 1180 DAC DUMBSW SET THE DUMP MODE
005343 213326 1190 LAC (20,) *
005344 042041 1200 DAC LIMIT INITIALIZE THE LIMITS FOR SYMBOLIC DUMP
1210 *
1220 *
1230 * INITIALIZATION NOW COMPLETE -- GET THE COMMAND
1240 *
1250 ,HEAD D,M
005345 1260 NEXTL ***
1270 ,HEAD D
005345 1280 NXLIN ***
005345 1290 MESS <?>,1
005351 1300 NXLN1 LINE GET THE NEXT LINE OF INPUT
005352 605357 1310 JMP NSU2 WE ARE GUARANTEED TO BE STARTING A SYNTACTIC UNIT
1320 *
1330 * START TOPARSE THE NEXT SYNTACTIC UNIT, AFTER GETTING A NEW LINE IF NECESSARY
1340 *
005353 1350 NSU *** PARSE THE NEXT SYNTACTIC UNIT
005353 1360 DELIM FUDGE FOR THE ASSEMBLER -- GET THE DELIMITER WHICH SENT US HERE
005354 550324 1370 SAD ENDSN CHECK FOR A LEGAL ARRIVAL
005355 741000 1380 SKP OK
005356 605671 1390 JMP DONE DIDN'T BELONG HERE IN THE FIRST PLACE
005357 1400 NSU2 ***
005357 142053 1410 DZM COMFLG SET NO COMMAND YET COMPLETED
005360 213327 1420 LAC (\$KP)
005361 042052 1430 DAC REGBR SET UP THE REGISTERS/ALTERS BRANCH
005362 142007 1440 DZM TEMP7 SET THAT OP CODES ARE NOT ALLOWED
005363 103251 1450 JMS INVAL GET THE FIRST WORD
005364 741000 1460 SKP NULL WORD IS AMBIGUOUS -- DO FURTHER CHECKS
005365 605506 1470 JMP FLD08 NON-NULL WORD HAS TO BE A FIELD SPECIFIER
005366 1480 DELIM GET THE NULL WORD DELIMITER

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MTSS DEBUGGER -- NEXT SYNTACTIC UNIT

005367	553311	1490	SAD	(SCR)	
005370	606227	1500	JMP	DNXT	CARRIAGE RETURN -- DUMP THE NEXT LOCATION
005371	550324	1510	SAD	ENDSN	
005372	606227	1520	JMP	DNXT	END SIGN -- DUMP THE NEXT LOCATION
005373	550317	1530	SAD	FDEL	CHECK IT FOR A FILE NAME DELIMITER
005374	741000	1540	SKP		YES
005375	605537	1550	JMP	FLD05	ELSE IT MIGHT BE A FIELD AFTER ALL

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 MTSS DEBUGGER -- OPEN A FILE/DEVICE

005376 1560 ,STITL MTSS DEBUGGER -- OPEN A FILE/DEVICE
 1570 ,USE PURE
 1580 *
 1590 *
 1600 *
 1610 *
 1620 *
 OPEN SETS UP THE FILE AND BUFFER PARAMETERS FOR THE DEVICE OR
 FILE SPECIFIED.

005376 1630 OPEN JMS FORCE FORCE OUT ANY CHANGES THAT ARE IN THE BUFFER CURRENTLY
 005376 1640 WORD GET THE NAME OF THE FILE TO OPEN
 005377 1650 JMP MSG81 NO NAME -- DON'T BELIEVE IT
 005400 613063 1660 LAW DSFILES-1 LOAD A POINTER TO THE DSFILES LIST
 005401 765272 1670 JMS SEARCH LOCATE THE CURRENT REQUEST
 005402 103174 1680 SKPICLL NOT FOUND
 005403 745000 1690 JMP 10,X FOUND -- GO OPEN IT
 005404 620010 1700 *
 1710 *
 1720 *
 1730 *
 THE REQUEST WAS NOT FOR A LOGICAL DEVICE -- PERHAPS IT WAS FOR A SYSTEM FILE?
 005405 1740 DELIM GET THE DELIMITER
 005406 553304 1750 BAD (SCOLON) IT MUST BE A COLON (:) TO BE A SYSTEM FILE
 005407 741000 1760 SKP YES -- TRY TO OPEN A SYSTEM FILE
 005410 605451 1770 JMP OPE2 NOT A SYSTEM FILE -- MAYBE A PHYSICAL DEVICE
 1780 *
 1790 *
 1800 *
 1810 *
 NOW GET THE CATALOG OF THE REQUESTED DEVICE AND FIND THE FILENAME
 IN IT.
 905411 765414 1820 LAW OPE1
 905412 043527 1830 DAC CSGNAME SET THE RESTART ADDRESS
 905413 611061 1840 JMP CSGNAM2 READ IN THE CATALOG IF NOT ALREADY IN CORE AND RETURN FILENAME IN THE AC
 905414 613063 1850 OPE1 JMP MSG81 ATTEMPT TO OPEN A PAPER TAPE
 905415 103515 1860 JMP CSCATL NOW LOOK UP THE FILENAME IN THE CATALOG
 905416 613077 1870 JMP MSG82 FILE NOT FOUND
 1880 *
 1890 *
 THE FILE HAS BEEN LOCATED -- NOW SET ITS PARAMETERS
 905417 220011 1900 LAC SCATX,X
 905420 103322 1910 JMS TDVAL CHECK ON THE USER'S VALIDATION IF APPROPRIATE
 905421 042163 1920 DAC FDA SAVE THE DEVICE ADDRESS
 905422 513307 1930 AND (040000) SAVE THE DISK/DECTAPE BIT
 905423 740200 1940 SZA (\$SYSBAS) SKIP FOR DECTAPE, WHICH BEGINS AT BLOCK ZERO
 905424 213330 1950 LAC (\$SYSBAS) ELSE LOAD THE SYSTEM DISK BASE ADDRESS
 905425 342163 1960 TAD FDA ADD THE DEVICE ADDRESS YIELDS THE CORRECT DEVICE ADDRESS OF THE FILE
 905426 042163 1970 DAC FDA SET ITS DEVICE ADDRESS
 905427 740001 1980 GMA
 905430 042164 1990 DAC MFDA
 905431 442164 2000 INX MFDA SET MINUS THE FILE DEVICE ADDRESS
 905432 220011 2010 LAC SCATX,X
 905433 042165 2020 DAC FMIN SET THE FILES MINIMUM CORE ADDRESS
 905434 740001 2030 GMA
 905435 042166 2040 DAC MFMIN
 905436 442166 2050 INX MFMIN SET MINUM THE FILE MINIMUM CORE ADDRESS
 905437 777777 2060 LAW -1
 905440 342165 2070 TAD FMIN RELOAD THE MINIMUM CORE ADDRESS

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MTSS DEBUGGER -- OPEN A FILE/DEVICE

005441	360011	2080	TAD	SCATX,X	ADD THE FILE LENGTH
005442	740001	2090	CMA		
005443	042167	2100	DAC	FMAX	SET MINUS THE FILE'S MAXIMUM CORE ADDRESS
005444	210334	2110	LAC	LOGF	LOAD THE LOGICAL FILE FLAG
005445	042151	2120	DAC	FTYPE	AND SET IT
005446	213276	2130	LAC	(17777)	LOAD THE COREMAX MASK
005447	042051	2140	DAC	PCMSK	AND SET IT
005450	605475	2150	JMP	NCOP	SET UP THE CORE BUFFER PARAMETERS
		2160	*		
		2170	*	THE REQUEST IS FOR NO SORT OF FILE -- COULD IT BE FOR A PHYSICAL	
		2180	*	DISK OR DECTAPE? IF NOT, PRINT A FORMAT ERROR MESSAGE.	
		2190	*		
005451		2200	OPE2	...	
005451	765456	2210	LAW	OPE4	
005452	043532	2220	DAC	C\$DEVCV	SET THE RETURN ADDRESS
005453		2230	WORD1		RELOAD THE DEVICE MNEMONIC
005454	611121	2240	JMP	C\$DEVC3	EITHER SET UP THE DEVICE ADDRESS OR PRINT A "FORMAT ERROR" MESSAGE
005455	613063	2250	JMP	MSG81	IT IS A PAPER TAPE
005456		2260	OPE4	...	
005456	103322	2270	JHS	TDVAL	CHECK ON THE USER'S VALIDATION IF APPROPRIATE
005457	042163	2280	DAC	FDA	SET THE FILE DEVICE ADDRESS
005460	740001	2290	CHA		
005461	042164	2300	DAC	MFDA	
005462	442164	2310	INX	MFDA	SET MINUS THE FILE DEVICE ADDRESS
005463	142165	2320	DZM	FMIN	ALL PHYSICAL DEVICES BEGIN WITH WORD 0
005464	142166	2330	DZM	MFMIN	
005465	202163	2340	LAC	FDA	RELOAD THE FILE DEVICE ADDRESS
005466	640703	2350	ALS	3	MOVE THE DEVICE TYPE BIT TO AC(0)
005467	750,00	2360	SMAICLA		SKIP FOR THE DISK
005470	210331	2370	LAC	DTCT	ELSE LOAD THE DECTAPE MAX
005471	042167	2380	DAC	FMAX	SET MINUS THE MAXIMUM ADDRESS ON THE DEVICE
		2390	*		
		2400	*		
		2410	*		
005472		2420	BOPEN	...	
005472	142151	2430	DZM	FTYPE	CLEAR THE SPECIAL FILE TYPE FLAG
005473	750001	2440	GLC		SET THE FULL-WORD MASK FOR ALL PHYSICAL DEVICES
005474	042051	2450	DAC	PCMSK	
005475		2460	NCOP	...	ENTER HERE TO LEAVE THE FLAG ALONE
005475	103304	2470	JHS	SNCOP	SET UP BMAX, BMIN, MBMIN, BDA FOR THE USER CORE FILE
		2480	*		
005476		2510	OPDON	...	OPEN FILE FIELD MUST END IN THE DELIMITER FDEL
005476		2520	DELIM		
005477	350317	2530	SAD	FDEL	GET THE LAST DELIMITER
005500	605504	2540	JMP	FIELD	CHECK FOR THE CORRECT END-DELIMITER
005501		2550	WORD		IF SO, EXIT -- NOW SET UP THE FIELD
005502	605476	2560	JMP	OPDON	ELSE SEE IF THERE IS ANOTHER DELIMITER NEXT
005503	613111	2570	JMP	MSG83	YES -- SEE IF IT IS THE CORRECT END OF THE OPEN
					ELSE IS AN ERROR

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D MTSS DEBUGGER -- FIELD SPECIFICATION SETUP

005504 2580 ,STITL MTSS DEBUGGER -- FIELD SPECIFICATION SETUP
 2590 ,USE PURE

2600 *
 2610 *
 2620 * FIELD PICKS UP THE NEXT FIELD TO BE OPERATED ON, STORES THE LOWER BOUNDARY
 2630 * IN LOCOR AND STORES THE UPPER BOUNDARY IN HICOR.
 2640 *
 2650 * 1) IF THE FIELD CONTAINS A SINGLE VALUE, HICOR := LOCOR := <VALUE>
 2660 *
 2670 * 2) IF VAL1 < VAL2 THEN LOCOR := VAL1 AND HICOR := VAL2
 2680 *
 2690 * 3) IF VAL1 > VAL2 THEN HICOR := LOCOR := VAL1
 2700 *
 2710 *
 005504 2720 FIELD ... FIND OUT WHETHER WE REALLY HAVE A FIELD
 005504 103251 2730 JMS INVAL GET THE FIRST VALUE
 005505 605537 2740 FLD06 JMP FLD05 EVALUATE A NULL INPUT
 005506 2750 FLD08 ...
 005506 202000 2760 LAC TEMPO LOAD THE VALUE FOUND
 005507 042044 2770 DAC LOCOR SET IT AS THE LOW END OF THE FIELD
 005510 2780 DELIM BYSGN GET THE DELIMITER
 005511 550322 2790 SAD FLD20 COMMA DENOTES SETTING THE FIELD BY BOUNDARIES
 005512 605520 2800 JMP LNSGN
 005513 550321 2810 SAD FLD30 SPACE DENOTES TO SET THE FIELD BY LENGTH
 005514 605531 2820 JMP ...
 2830 *
 2840 * SET THE FIELD TO JUST ONE WORD
 2850 *
 005515 202044 2860 FLD10 LAC LOCOR LOAD THE LOW END
 005516 042045 2870 FLD11 DAC HICOR SET IT IN THE HIGH END
 005517 605560 2880 JMP MODE FIELD SPECIFICATION IS DONE
 2890 *
 2900 * SET THE FIELD BY BOUNDARIES
 2910 *
 005520 2920 FLD20 ...
 005520 103251 2930 JMS INVAL GET THE END VALUE
 005521 605515 2940 JMP FLD10 WASN'T ONE -- SET UP JUST ONE LOCATION AND EXIT
 005522 042045 2950 DAC HICOR SET THE HIGH END BOUNDARY
 005523 2960 NEG ...
 005525 342044 2970 TAD LOCOR ADD IN THE LOW END
 005526 741300 2980 SPA;SNA SKIP IF THE LOW END IS THE GREATER
 005527 605560 2990 JMP MODE FIELD SPECIFICATION IS DONE
 005530 605515 3000 JMP FLD10 THE LOW END IS GREATER, SO SET UP JUST ONE LOCATION
 3010 *
 3020 * SET THE FIELD BY LENGTH
 3030 *
 005531 3040 FLD30 ...
 005531 103251 3050 JMS INVAL GET THE LENGTH
 005532 605515 3060 JMP FLD10 NO LENGTH SPECIFIED -- SET UP JUST ONE LOCATION
 005533 513276 3070 AND (17777) CAN'T BE LONGER THAN 8K
 005534 342044 3080 TAD LOCOR ADD THE START ADDRESS
 005535 353332 3090 TAD (-1)

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MTSS DEBUGGER -- FIELD SPECIFICATION SETUP

005536	605516	3100	JMP	FLD11	SET THE END ADDRESS AND EXIT
		3110	*		
		3120	*	EVALUATE AN ORIGINAL NULL INPUT -- INDIRECT, CURRENT PC, OR NO FIELD	
		3130	*		
005537		3140	FLD05	...	
005537		3150	DELIM		GET THE NULL FIELD DELIMITER
005540	550316	3160	SAD	INDSN	CHECK FOR THE INDIRECT ADDRESSING SIGN
005541	605547	3170	JMP	FIND	SET THE INDIRECT WORD ON
005542	550325	3180	SAD	PCSGN	CHECK FOR THE CURRENT PROGRAM COUNTER VALUE
005543	605551	3190	JMP	FPC	YES -- INSERT THE CURRENT VALUE
		3200	*		
		3210	*	NO NEW FIELD SPECIFICATION, SO LOCOR := HICOR := PC, WHERE PC	
		3220	*	IS THE ADDRESS OF THE LAST CONTENTS TYPED IN OR OUT.	
		3230	*		
005544		3240	FLD07	...	
005544	202043	3250	LAC	PC	LOAD THE PC
005545	042044	3260	DAC	LOCOR	RESET LOCOR
005546	605515	3270	JMP	FLD10	GO DO THE REST
		3280	*		
		3290	*	ALREADY HAVE THE FIRST WORD, SO INITIALIZE INVAL AND TRANSFER INTO IT	
		3300	*		
		3310	*		
		3320	*	AN INDIRECT ADDRESS HAS BEEN REQUESTED, SET THE PROPER FLAG FOR IT.	
		3330	*		
005547		3340	FIND	...	
005547	442050	3350	INX	INDIR	SET THE FLAG
005550	605504	3360	JMP	FIELD	GO GET THE NEXT VALUE
		3370	*		
		3380	*		
		3390	*	USE OF THE CURRENT PROGRAM COUNTER VALUE HAS BEEN REQUESTED	
		3400	*		
005551		3410	FPC	...	
005551	765505	3420	LAC	FLD06	LOAD THE DESIRED RESTART ADDRESS
005552	043251	3430	DAC	INVAL	SET IT FOR THE SUBROUTINE
005553	142000	3440	DZM	TEMPO	INITIALIZE THE SUBROUTINE'S ACCUMULATED VALUE
005554	767456	3450	LAC	INPLU	
005555	042002	3460	DAC	TEMP2	INITIALIZE THE DEFAULT OPERATOR TO BE PLUS
005556	142006	3470	DZM	TEMP6	INITIALIZE THE VALUE-RECEIVED FLAG
005557	607443	3480	JMP	INPC	ACCUMULATE A VALUE, STARTING WITH THE CURRENT PROGRAM COUNTER

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PDP9 TIME-SHARING SYSTEM MONITOR AND MESSAGE ROUTINES

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MTSS DEBUGGER -- MODE SETTING COMMANDS

.STITL MTSS DEBUGGER -- MODE SETTING COMMANDS

	3490			
	3500	*		
	3510	*		
005560	3520	MODE	...	FIND OUT WHETHER OR NOT WE REALLY HAVE A MODE
005560	3530		DELIM	GET THE DELIMITER WHICH BROUGHT US HERE
005561 550323	3540		SAD MCSGN	
005562 605575	3550		JMP MOD10	MODE/COMMAND SIGN -- HANDLE IT
	3560	*		
	3570	*		CERTAIN DELIMITERS ARE ALSO DDT COMMANDS -- CHECK THEM NOW
	3580	*		
011531	3590	BRE	.EQU MSG50	
005563 550326	3600		SAD PATSN	
005564 606174	3610		JMP PAT	PATCH COMMAND
005565 550327	3620		SAD BKSN	
005566 611531	3630		JMP BRE	BREAKPOINT
005567 550330	3640		SAD JSGN	
005570 606577	3650		JMP TRA	JUMP/TRANSFER
005571 550324	3660		SAD ENDSN	
005572 606234	3670		JMP DUM	END OF SYNTACTIC UNIT -- DUMP IS DEFAULT
005573 553311	3680		SAD (SCR)	
005574 606234	3690		JMP DUM	END OF SYNTACTIC UNIT -- DUMP IS DEFAULT
	3700	*		
005575	3710	MOD10	...	
005575	3720		WORD	GET THE MODE/COMMAND
005576 605560	3730		JMP MODE	IGNORE VACUOUS WORDS HERE
005577 765107	3740		LAW REGLIS-1	LOAD A POINTER TO THE DDT TABLE
005600 103174	3750		JMS SEARCH	AND TRY FOR A MATCH
005601 613122	3760		JMP MSG84	FORMAT ERROR -- COULDN'T FIND IT
005602 620010	3770		JMP 10,X	ELSE GO DO THE COMMAND
	3780	*		
	3790	*		ACTUAL MODE-SETTING COMMANDS
	3800	*		
	3810	*		
	3820	MODSET	,DEFIN	
	3830	M#1	LAW #1MOD	LOAD A POINTER TO MODE #1
	3840		JMP S9	
	3850	AM#1	LAW #1MOD	LOAD A POINTER TO MODE #1
	3860		JMP AS9	
	3870	RM#1	LAW #1MOD	LOAD A POINTER TO MODE #1
	3880		JMP RS9	
	3890		,ENDM	
	3900	*		
	3910	*		
	3920	*		
005603	3930	MODSET	O	OCTAL
005611	3940	MODSET	A	AC16 SIXBIT
005617	3950	MODSET	6	TRIMMED SIXBIT
005625	3960	MODSET	H	BITS 0-8, 9-17
005633	3970	MODSET	7	STEXT: BITS 4-10, 11-17
005641	3980	MODSET	8	SINGLE ASCII CHARACTER IN AC(10-17)
005647	3990	MODSET	D	DECIMAL
005655	4000	MODSET	S	SYMBOLIC

D

MTSS DEBUGGER -- MODE SETTING COMMANDS

		4010				
		4020				
005663	042037	4030	S9	DAC	DUMSW	SET THE DUMP FORMAT
005664	605560	4040		JMP	MODE	
		4050				
005665	042036	4060	AS9	DAC	ADRSW	SET THE ADDRESS FORMAT
005666	605560	4070		JMP	MODE	
		4080				
005667	042035	4090	RS9	DAC	REGSW	SET THE REGISTER FORMAT
005670	605560	4100		JMP	MODE	
		4110	*			
		4120	*			DONE -- NOW WAIT FOR END OF THE SYNTACTIC UNIT, AND THEN PROCESS NEXT ONE
		4130	*			
005671		4140	DONE	...		
005671		4150		CRLF		
005672		4160	DON1	DELIM		GET THE LAST DELIMITER
005673	553311	4170		SAD	(SCR)	CHECK FOR END OF LINE
005674	605345	4180		JMP	NXLIN	IF SO, GET NEXT LINE
005675	550324	4190		SAD	ENDSN	CHECK FOR END OF SYNTACTIC UNIT
005676	605353	4200		JMP	NSU	IF SO, GET THE NEXT ONE
005677		4210		WORD		ELSE THROW AWAY ANOTHER WORD
005700	740000	4220		NOP		NULL INPUT IS IGNORED
005701	605672	4230		JMP	DON1	AND LOOP

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OPEN FILE/DEVICE ROUTINES

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4240 .STL OPEN FILE/DEVICE ROUTINES
4250 *
4260 *
4270 * THE USER WANTS TO OPEN HIS USER CORE FILE ON THE DISK
4280 *
4290 * FILL IN THE FILE PARAMETERS FOR HIM
4300 *
005702 005702 4310 COR ***
005702 103306 4320 JMS UCORE SET UP THE FILE PARAMETERS FOR THE USER CORE FILE
005703 605475 4330 JMP NCOP SET UP THE CORE BUFFER PARAMETERS AND EXIT
4340 *
4350 *
4360 * OPEN ACTUAL CORE, BUT DO NOT LOSE THE ORIGINAL
4370 * FILE PARAMETERS -- THUS AFTER THE COMMAND, THE PARAMETERS CAN
4380 * BE SET BACK TO THE FILE WHICH WAS PREVIOUSLY OPEN.
4390 *

005704 4400 XCD ***
005704 103215 4410 JMS VALCHK MUST BE VALIDATED FOR THIS ACTIVITY
005705 202151 4420 LAC FTYPE LOAD THE TYPE OF FILE CURRENTLY OPEN
005706 550333 4430 SAD ACF SKIP IF NOT ACTUAL CORE
005707 605504 4440 JMP FIELD JOB DONE -- NOW SET UP THE FIELD SPECIFICATIONS
005710 042152 4450 DAC OFTYP SAVE THE OLD FILE TYPE SO WE DON'T HAVE TO FORCE THE BUFFER
005711 210333 4460 LAC ACF LOAD THE ACTUAL CORE FLAG
005712 042151 4470 DAC FTYPE AND USE IT TO RESET THE TYPE OF FILE
005713 213276 4480 LAC (17777) LOAD A STANDARD ADDRESS MASK
005714 042051 4490 DAC PCMSK AND SET IT
005715 605476 4500 JMP OPDON NOW SET UP THE OPDON SPECIFICATIONS
4510 *
4520 *
4530 *
005716 4540 DIS ***
905716 103310 4550 JMS UDISK SET UP THE USER DISK INITIALIZATION
005717 605472 4560 JMP BOPEN SET UP THE CORE BUFFER PARAMETERS AND EXIT
905720 762000 4570 DISCT -SDKLEN
4580 *
4590 *
005721 4600 SYS ***
005721 103215 4610 JMS VALCHK WE MUST BE PROPERLY VALIDATED TO DO SO
005722 213333 4620 LAC (SSYSDA)
005723 042163 4630 DAC FDA SET THE DEVICE ADDRESS OF THE SYSTEM LOGICAL DISK
005724 740001 4640 CMA
005725 042164 4650 DAC MFDA
005726 442164 4660 INX MFDA SET MINUS THE FILE DEVICE ADDRESS
005727 142165 4670 DZM FMIN SYSTEM DISK STARTS FROM WORD ZERO
005730 142166 4680 DZM MFMIN
005731 205734 4690 LAC SYSC
005732 042167 4700 DAC FMAX SET MINUS THE MAXIMUM ADDRESS ON THE SYSTEM DEVICE
005733 605472 4720 JMP BOPEN SET UP THE CORE BUFFER PARAMETERS AND EXIT
905734 000401 4730 SYSCT -SSYSMAX*400+1
4740 *
4750 * THE USER WANTS TO OPEN ONE OF THE VSA LOGICAL DISKS

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D

OPEN FILE/DEVICE ROUTINES

005735	4760	*			
005735	4770	V5A	...		
005735	4780	JMS	VALCHK	HE MUST BE VALIDATED TO DO THIS	
005736	4790	LAC	(040000)	SET THE PHYSICAL DISK DEVICE ADDRESS	
005737	4800	DAC	FDA	GET THE NUMBER OF THE LOGICAL DISK	
005740	4810	NUM		NO NUMBER -- FORMAT ERROR	
005741	4820	JMP	MSG83	PUT ANY LEGAL DISK NUMBER IN THE LINK	
005742	4830	CLL RAR		SKIP IF THE DISK NUMBER WAS LEGAL	
005743	4840	9ZA			
005744	4850	JMP	MSG85		
005745	4860	SZL		SKIP FOR DISK ZERO	
005746	4870	LAC	(1000)	ELSE LOAD THE START OF DISK #1 (BLOCK 1000)	
005747	4880	TAD	FDA		
005750	4890	DAC	FDA	SET THE LOGICAL DISK'S DEVICE ADDRESS	
005751	4900	CMA			
005752	4910	DAC	MFDA		
005753	4920	INX	MFDA	SET MINUS THE FILE DEVICE ADDRESS	
005754	4930	DZM	FMIN	LOGICAL DISK STARTS WITH WORD ZERO	
005755	4940	DZM	MFMIN		
005756	4950	LAC	(-400000+1)		
005757	4960	DAC	FMAX	SET THE FILE MAXIMUM ADDRESS	
005760	4970	JMP	BOPEN	SET UP THE CORE BUFFER PARAMETERS AND EXIT	
	4980	*			
	4990	*	THE USER WANTS TO OPEN HIS PREVIOUS FILE -- VALID ONLY WHEN XCORE IS OPEN		
	5000	*			
005761	5010	PRE	...		
005761	5020	LAC	FTYPE	LOAD THE CURRENTLY OPEN FILE TYPE	
005762	5030	SAD	ACF	SKIP IF AN ACTUAL CORE FILE WAS NOT PREVIOUSLY OPEN	
005763	5040	SKP			
005764	5050	JMP	DONE	OTHERWISE IGNORE	
005765	5060	LAC	OFTYP	ELSE LOAD THE PREVIOUS FILE TYPE	
005766	5070	DAC	FTYPE	RESTORE IT	
005767	5080	SZA		CHECK FOR A CORE LENGTH FILE	
005770	5090	JMP	DONE	IN WHICH CASE THE MASK IS STILL OK	
005771	5100	CLC		ELSE GET THE FULL-WORD MASK	
005772	5110	DAC	PCMSK	AND SET IT	
005773	5120	JMP	DONE	EXIT	
	5130	*			
	5140	*			
	5150	*	BLOCK FORCES THE BUFFER AND OPENS THE SPECIFIED BLOCK ON THE		
	5160	*	CURRENT DEVICE AS A NEW FILE		
	5170	*			
005774	5180	BLD	...		
005774	5190	NUM		GET THE BLOCK NUMBER	
005775	5200	JMP	MSG83	SOME SORT OF FORMAT ERROR	
005776	5210	AND	(1777)	MASK TO JUST THE BLOCK NUMBER	
005777	5220	DAC	TEMP1		
006000	5230	LAW	0	LOAD A DEVICE NUMBER/TYPE MASK	
006001	5240	AND	FDA	RECOVER THE CURRENT DEVICE NUMBER/TYPE	
006002	5250	TAD	TEMP1	ADD IN THE REQUESTED BLOCK NUMBER	
006003	5260	DAC	FDA	SET THE NEW FILE DEVICE ADDRESS	
006004	5270	CMA			

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OPEN FILE/DEVICE ROUTINES

006005	042164	5280	DAC	MFDA	
006006	442164	5290	INX	MFDA	SET MINUS THE FILE DEVICE ADDRESS
006007	142165	5300	DZM	FMIN	BLOCK STARTS WITH WORD ZERO
006010	142166	5310	DZM	MFMIN	
006011	777401	5320	LAW	-377	
006012	042167	5330	DAC	FMAX	SET MINUS THE MAXIMUM BLOCK ADDRESS
006013	605472	5340	JMP	BOPEN	SET THE CORE PARAMETERS AND EXIT

D

MTSS DEBUGGER -- VALIDATE COMMAND

006014	5350	,STITL	MTSS DEBUGGER -- VALIDATE COMMAND	
006014 525252	5360	,USE	PURE	
006015 442125	5370	VALWD	525252	CONSTANT TO VALIDATE A USER
006016 262426	5380	VAL1	,AC16 \$D15\$	
006017 444555	5390	VAL2	,AC16 \$646\$	
	5400	VAL3	,AC16 \$DEMS	
	5410		,HEAD D,M	
006020	5420	VAL	'.'	
	5430		,HEAD D	
006020	5440		NMESS <(XXXXXXXXXXXX WWWWWWWW BBBBBBBB >,28.	
006034	5450		LINE GET THE VALIDATION LINE ON INPUT	
006035	5460		WORD GET THE FIRST THREE CHARACTERS OF THE PASSWORD	
006036	5470		FORMAT FORMAT ERROR IF NONE	
006037 546017	5480	SAD	VAL3 CHECK THE PUBLIC VALIDATION WORD	
006040 606050	5490	JMP	VAL9	
006041 546015	5500	SAD	VAL1 CHECK THEM	
006042 741000	5510	SKP	OK -- CHECK NEXT THREE	
006043 611667	5520	JMP	MSG58 ELSE VALIDATION ERROR	
006044	5530	WORD2	GET THE NEXT THREE CHARACTERS	
006045 546016	5540	SAD	VAL2 CHECK THEM	
006046 741000	5550	SKP	VALIDATION SUCCESSFUL	
006047 611667	5560	JMP	MSG58 ELSE VALIDATION ERROR	
006050	5570	VAL9	MPOFF	
			,PMC SAVE,ON	
006050 705000			SPECIAL+0 TURN OFF MEMORY PROTECT	
006051 206014	5580	LAC	VALWD	
006052 041770	5590	DAC	SVALID VALIDATE THIS USER	
006053 701742	5600	MPEU		
006054 604023	5610	JMP	M\$MONXT GET THE NEXT COMMAND	
	5620	*		
	5630	*		
	5640	*		
	5650	*	SEE IF THE CURRENT USER HAS BEEN VALIDATED; IF SO, RETURN TO THE	
	5660	*	CALLER. OTHERWISE PRINT A "WHAT" ERROR MESSAGE.	
	5670	*		
006055	5680	ENTER	VALCHK	
		,PMC	SAVE,ON	
003215		VALCHK	'.'	
006055	5690	MPOFF		
		,PMC	SAVE,ON	
006055 705000		SPECIAL+0 TURN OFF MEMORY PROTECT		
006056 201770	5700	LAC	SVALID LOAD THE VALIDATION WORD	
006057 701742	5710	MPEU		
006060 546014	5720	SAD	VALWD IS THIS USER VALIDATED	
006061 623215	5730	RET	VALCHK,X YES -- RETURN	
006062	5740	FORMAT	NO -- PRETEND WE DON'T KNOW FORMAT HE IS TALKING ABOUT	

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D MTSS DEBUGGER -- CLOSE -- LIMIT -- MASK -- BASE COMMANDS

5750 * .STITL MTSS DEBUGGER -- CLOSE -- LIMIT -- MASK -- BASE COMMANDS

5760 *
5770 *
5780 * CLOSE THE CURRENTLY OPEN FILE
5790 *
006063 5800 CL0 ***
006063 103314 5810 JMS FORCE COPY OUT THE CURRENT BUFFER IF IT HAS BEEN ALTERED
006064 103306 5820 JMS UCORE SET UP THE USER CORE FILE PARAMETERS
006065 103304 5830 JMS SNCOP SET UP THE BUFFER PARAMETERS
006066 605671 5840 JMP DONE EXIT
5850 *
5860 *
5870 *
006067 5880 LIM ***
006067 202044 5890 LAC LOCOR
006070 042041 5900 DAC LIMIT
006071 605671 5910 JMP DONE
5920 *
5930 *
5940 *
006072 5950 MAS ***
006072 202044 5960 LAC LOCOR
006073 042046 5970 DAC MASK
006074 605671 5980 JMP DONE
5990 *
6000 *
6010 *
006075 6020 BAS ***
006075 202044 6030 LAC LOCOR
006076 042047 6040 DAC RELOC
006077 605671 6050 JMP DONE

D MTSS DEBUGGER -- SEARCH COMMAND

6060 * .STITL MTSS DEBUGGER -- SEARCH COMMAND
 6070 *
 6080 * SEARCH FOR WORDS IDENTICAL TO THE SEARCH VALUE WHEN BOTH ARE MASKED
 6090 *
 006100 6100 SEA ...
 006100 6110 CRLF LOCOR PUT THE OUTPUT ON A FRESH LINE
 006101 202044 6120 LAC LOC
 006102 042042 6130 DAC LOC INITIALIZE THE WORKING LOCATION TO THE LOW END OF THE RANGE
 006103 750001 6140 CLC
 006104 042007 6150 DAC TEMP7 SET THAT OP CODES ARE LEGAL
 6160
 006105 6170 SEA1 ...
 006105 103251 6180 JMS INVAL GET THE VALUE TO SEARCH FOR
 006106 606136 6190 JMP SEAS DONE IF A FORMAT ERROR OR NULL INPUT
 006107 502046 6200 AND MASK MODIFY BY THE SPECIFIED MASK
 006110 042014 6210 DAC TEMP12 SAVE THE ADJUSTED VALUE FOR THE SEARCH
 006111 6220 SEA2 ...
 006111 202042 6230 LAC LOC LOAD THE ADDRESS OF THE NEXT LOCATION TO BE EXAMINED
 006112 103312 6240 JMS LOCAT LOCATE IT
 006113 222162 6250 LAC BPTR,X LOAD THE VALUE TO BE EXAMINED
 006114 502046 6260 AND MASK MODIFY BY THE SPECIFIED MASK
 006115 542014 6270 SAD TEMP12 CHECK FOR A GOOD FIND
 006116 606125 6280 JMP SEA4 GOOD FIND -- OUTPUT IT
 6290
 006117 6300 SEA3 ...
 006117 202042 6310 LAC LOC LOAD THE LOCATION POINTER
 006120 542045 6320 SAD HICOR SEE IF DONE
 006121 606136 6330 JMP SEAS YES
 006122 442042 6340 INX LOC NOT YET DONE -- ADVANCE THE POINTER
 006123 740000 6350 NOP SKIP INSURANCE
 006124 606111 6360 JMP SEA2 LOOP TO DO THE NEXT VALUE
 6370
 006125 6380 SEA4 ...
 006125 202042 6390 LAC LOC OUTPUT THE GOOD LOCATION AND CONTENTS
 006126 502051 6400 AND PCMSK LOAD THE SUCCESSFUL ADDRESS
 006127 042043 6410 DAC PC MASK TO THE ADDRESS FIELD
 006130 122036 6420 JMS ADRSW,X UPDATE THE PC TO THE LATEST LOCATION OUTPUT
 006131 103320 6430 JMS COLSP PRINT THE ADDRESS IN THE CORRECT FORMAT
 006132 222162 6440 LAC BPTR,X FOLLOWED BY A COLON AND SPACE
 006133 122037 6450 JMS DUMSW,X LOAD THE CONTENTS
 006134 6460 CRLF PRINT THE CONTENTS IN THE CORRECT FORMAT
 006135 606117 6470 JMP SEA END THE LINE
 6480
 006136 6490 SEA5 ...
 006136 6500 DELIM (SCR) DONE
 006137 553311 6510 SAD DONE
 006140 605671 6520 JMP ENDSN CARRIAGE RETURN ENDS THE COMMAND
 006141 550324 6530 SAD
 006142 605671 6540 JMP DONE SYNTACTIC UNIT SEPARATOR ENDS THE COMMAND
 006143 606100 6550 JMP SEA ELSE DO THE NEXT SEARCH

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D MTSS DEBUGGER -- HARDWARE READ-IN PAPER TAPE PUNCH COMMAND

6560 .STITL MTSS DEBUGGER -- HARDWARE READ-IN PAPER TAPE PUNCH COMMAND

6570
6580
6590

006144 6600 HRI1 .
006144 777777 6610 LAC -1
006145 342044 6620 TAD LOCOR
006146 040010 6630 DAC 10 SET THE AUTO-INDEX REGISTER TO THE FIRST LOCATION TO BE PUNCHED
006147 213337 6640 LAC (200) 8-HOLE PUNCH FOR BINARY TAPE
006150 042001 6650 DAC TEMP1 SAVE IT FOR THE SUBROUTINE

006151 6660 HRI2 .
006151 220010 6670 LAC 10,X LOAD THE NEXT WORD TO PUNCH
006152 652000 6680 LMQ SAVE IT
006153 103217 6690 JMS OUTPUT PUNCH THE FIRST SIX BITS
006154 103217 6700 JMS OUTPUT PUNCH THE SECOND SIX BITS
006155 200010 6710 LAC 10 LOAD THE ADDRESS OF THE WORD
006156 542045 6720 SAD HICOR DONE??
006157 606162 6730 JMP HRI6 YES
006160 103217 6740 JMS OUTPUT NO -- OUTPUT THE THIRD SIX BITS
006161 606151 6750 JMP HRI2 PUNCH THE NEXT WORD

006162 6760 HRI6 .
006162 213340 6770 LAC (300) LOAD BITS 7&8 FOR THE LAST LINE ON A HARDWARE READ-IN TAPE
006163 042001 6780 DAC TEMP1 SAVE FOR THE SUBROUTINE
006164 103217 6790 JMS OUTPUT PUNCH THE LAST SIX BITS OF THE TAPE

006165 740040 6800 HLT
6810

006166 6820 ENTER OUTPUT SHIFT AND PUNCH THE NEXT SIX BITS
,PMC SAVE,ON

003217 OUTPUT .
006166 641606 6830 EABCLA!LLS 6 GET THE NEXT SIX BITS
006167 342001 6840 TAD TEMP1 INCLUDE THE HIGH-ORDER BIT(S)
006170 700204 6850 PBA PUNCH IT
006171 700201 6860 PSF WAIT FOR IT TO SETTLE
006172 606171 6870 JMP -.1
006173 623217 6880 RET OUTPUT,X EXIT

D

MTSS DEBUGGER -- PATCH COMMAND

	6890		.STITL	MTSS DEBUGGER -- PATCH COMMAND		
	6900	*				
	6910	*				
006174	6920	PAT	...			
006174	750001	6930	CLC			
006175	103312	6940	JMS	LOCAT	GET A POINTER TO IT	
006176	042007	6950	DAC	TEMP7	FLAG THAT OPCODES ARE LEGAL	
006177	202044	6960	LAC	LOCOR	LOAD THE ADDRESS AT WHICH TO DO THE PATCH	
006200	103251	6970	JMS	INVAL	GET THE VALUE TO PATCH THERE	
006201	606216	6980	JMP	PAT2	DONE IF A FORMAT ERROR OR NO MORE INPUT	
006202	062162	6990	PAT1	DAC	BPTR,X	ELSE DO THE PATCHING
006203	442156	7000		INX	BALT	SET THE BUFFER ALTERED FLAG
006204	202044	7010		LAC	LOCOR	
006205	042043	7020		DAC	PC	UPDATE THE PC TO THIS LAST LOCATION
	7030	*				
	7040	*	CHECK FOR A BLOCK PATCH			
	7050	*				
006206	542045	7060	SAD	HICOR	SEE IF THE BLOCK IS DONE	
006207	606216	7070	JMP	PAT2	IF SO, RESUME NORMAL PATCHING	
006210	442044	7080	INX	LOCOR	ELSE MOVE THE POINTER TO THE NEXT WORD OF THE BLOCK	
006211	740000	7090	NOP		SKIP INSURANCE	
006212	202044	7100	LAC	LOCOR	LOAD THE NEXT LOCATION TO PATCH	
006213	103312	7110	JMS	LOCAT	LOCATE IT	
006214	202000	7120	LAC	TEMPO	RELOAD THE SAME CONTENTS	
006215	606202	7130	JMP	PAT1	AND PATCH IT	
006216		7140	PAT2	...		
006216		7150		DELIM	GET THE LAST DELIMITER	
006217	553311	7160	SAD	(SCR)		
006220	605671	7170	JMP	DQNE	CARRIAGE RETURN ENDS THE COMMAND	
006221	550324	7180	SAD	END\$N		
006222	605671	7190	JMP	DONE	SYNTACTIC UNIT DELIMITER ENDS THE COMMAND	
006223	442044	7200	INX	LOCOR	ADVANCE THE POINTER IN CASE OF ANOTHER PATCH	
006224	442045	7210	INX	HICOR	MAKE HICOR KEEP UP WITH LOCOR OR ELSE WE RUN WILD	
006225	740000	7220	NOP		IN CASE OF A SKIP	
006226	606174	7230	JMP	PAT	LOOP FOR ANOTHER CONTENTS TO PATCH	

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D MTSS DEBUGGER -- DUMP COMMAND

7240 .STITL MTSS DEBUGGER -- DUMP COMMAND

7250 *

7260 *

7270 * DUMP PRINTS ON THE TELETYPE IN THE CURRENT FORMAT THE FIELD SPECIFIED
7280 * FROM THE CURRENTLY OPEN FILE. DUMPING CONTINUES UNTIL A NEW COMMAND IS GIVEN.
7290 * A NULL FIELD WILL DUMP THE NEXT LOCATION, DUMP RESETS THE PC AS IT DUMPS,
7300 * ON EXIT FROM DUMP, THE PC WILL BE SET TO THE LAST LOCATION DUMPED,
7310 * (E.G. THE COMMAND (DUM .) WILL DUMP THE CURRENT LOCATION AGAIN,
7320 * WHILE THE COMMAND DUM ;) WOULD DUMP THE NEXT LOCATION.

7330 *

7340 *

7350 * SET TO DUMP THE NEXT LOCATION -- GET HERE ON A VACUOUS SYNTACTIC UNIT

7360 *

006227 7370 DNXT ...
006227 442043 7380 INX PC ADVANCE THE COUNTER FOR THE DUMP
006230 740000 7390 NOP PROTECT FROM A POSSIBLE SKIP
006231 202043 7400 LAC PC
006232 042045 7410 DAC HICOR SET TO DUMP ONLY THE ONE LOCATION
006233 606241 7420 JMP TTD50

7430 *

7440 *

006234 7450 DUM ...
006234 202053 7460 LAC COMFLG GENERAL TELETYPE DUMP DRIVER
006235 740200 7470 SZA LOAD THE COMMAND-ALREADY-PROCESSED FLAG
006236 605671 7480 JMP DONE SKIP IF NONE
7490 *

7500 * SET UP THE PC TO FOLLOW THE DUMP

7510 *

006237 202044 7520 LAC LOCOR
006240 042043 7530 DAC PC PC ORIGINATES AT THE LOW END OF THE FIELD

7540 *

7550 *

7560 * TTDUM PRINTS ON THE TELETYPE THE CONTENTS OF THE OPEN FILE, IN THE
7570 * CURRENT FORMAT, FROM LOCOR THROUGH HICOR. THE LOCOR IS EQUAL TO THE LATEST LOCATION
7580 * PRINTED AT ALL TIMES, A SYMBOLIC DUMP IS PRINTED FOUR LOCATIONS PER LINE;
7590 * ALL OTHER FORMATS ARE PRINTED EIGHT LOCATIONS PER LINE, OUTPUT IS DOUBLE-
7600 * SPACED BEFORE EACH LINE WHOSE STARTING ADDRESS IS AN OCTAL HUNDRED.
7610 *

006241 202037 7620 TTD50 LAC DUMSW LOAD THE DUMP FORMAT SWITCH
006242 553341 7630 SAD (LAW SMOD) SKIP UNLESS A SYMBOLIC DUMP IS REQUESTED
006243 606277 7640 JMP TTD10 SPECIAL SET-UP FOR A SYMBOLIC DUMP
006244 142001 7650 DZM TEMP1 NO OTHER FORMAT HAS A HALF LINE MASK

7660 *

006245 7670 TTD20 ...
006245 7680 CRLF START OF A NEW LINE
GET A FRESH LINE

006246 202043 7690 LAC PC LOAD THE NEXT ADDRESS TO PRINT
006247 502051 7700 AND PCMSK MASK TO THE ADDRESS FIELD IF NEEDED
006250 122036 7710 JHS ADRSH,X PRINT THE ADDRESS IN THE PROPER FORMAT
006251 103320 7720 JMS COLSP PRINT A COLON AND SPACE AFTER THE ADDRESS
7730 *

006252 7740 TTD30 ...
006252 202043 7750 LAC PC PRINT THE NEXT CONTENTS ON THE SAME LINE
LOAD THE NEXT ADDRESS

D

MTSS DEBUGGER -- DUMP COMMAND

006253	103312	7760	JMS	LOCAT	GET A POINTER TO THIS CONTENTS
006254	222162	7770	LAC	BPTR,X	LOAD THE CONTENTS TO PRINT
006255	122037	7780	JMS	DUMSW,X	PRINT THE CONTENTS IN THE REQUESTED FORMAT
		7790			
006256	202043	7800	TTD40	...	DECIDE WHICH THING TO DO NEXT
006256	202043	7810	LAC	PC	LOAD THE LOCATION JUST OUTPUT
006257	542045	7820	SAD	HICOR	CHECK FOR DONE
006260	605671	7830	JMP	DONE	DONE -- EXIT
006261	442043	7840	INX	PC	NOT DONE YET -- MOVE THE POINTER TO THE NEXT WORD
006262	740000	7850	NOP		SKIP INSURANCE
006263	202043	7860	LAC	PC	NOW LOAD THE UPDATED PC
006264	513317	7870	AND	(77)	AC = 0 IF A BLOCK OF OUTPUT HAS JUST ENDED
006265	741200	7880	SNA		HAS IT??
006266		7890	CRLF		YES -- DOUBLE SPACE
006267	202043	7900	LAC	PC	RELOAD THE LOCATION
006270	513342	7910	AND	(7)	AC = 0 IF A LINE OF OUTPUT HAS JUST ENDED
006271	542001	7920	SAD	TEMP1	CHECK FOR THE END OF A HALF-LINE
006272	606245	7930	JMP	TTD20	YES
006273	741200	7940	SNA		CHECK FOR END OF A FULL LINE
006274	606245	7950	JMP	TTD20	YES
006275	103316	7960	JMS	SPACE	PRINT A SPACE AFTER THE WORD
006276	606252	7970	JMP	TTD30	NO -- CONTINUE ON THE SAME LINE
		7980			
006277		7990	TTD10	...	SET 4 LOCATION PER LINE FOR A SYMBOLIC DUMP
006277	213343	8000	LAC	(4)	
006300	042001	8010	DAC	TEMP1	SET THE HALF-LINE FLAG
006301	606245	8020	JMP	TTD20	RESUME THE DUMP

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D SENSE USER REGISTERS

006302	8030	.STITL	SENSE USER REGISTERS	
	8040	.USE	PURE	
	8050	*		
	8060	*		
006302	8070	REG	...	
006302 213327	8080	LAC	(SKP)	LOAD THE REGISTERS BRANCH SWITCH
006303 042052	8090	DAC	REGBR	AND SET IT
006304 606575	8100	JMP	ADONE	NOW FIND OUT WHICH REGISTERS TO DUMP
	8110	*		
	8120	*		
	8130	*	GET, AND PRINT, THE REQUESTED REGISTER	
	8140	*		
006305	8150	RSTS	...	
006305 402052	8160	XCT	REGBR	
006306 606553	8170	JMP	ASTS	BRANCH TO ALTER THE REGISTER
006307	8180	MESS	<STS1 >,5	PRINT THE REGISTER NAME
006315 202020	8190	LAC	STSAVE	LOAD THE USER'S PROGRAM INTERRUPT STATUS REGISTER
006316 606515	8200	JMP	FREG	PRINT IT IN OCTAL
006317	8210	RAC	...	
006317 402052	8220	XCT	REGBR	
006320 606522	8230	JMP	AAC	BRANCH TO ALTER THE ACCUMULATOR
006321	8240	MESS	<AC1 >,4	PRINT THE REGISTER NAME
006326 202015	8250	LAC	ACSAVE	LOAD THE USER'S ACCUMULATOR REGISTER
006327 606515	8260	JMP	FREG	PRINT IT IN OCTAL
006330	8270	RMO	...	
006330 402052	8280	XCT	REGBR	
006331 606526	8290	JMP	AMO	BRANCH TO ALTER THE MO REGISTER
006332	8300	MESS	<MO1 >,4	
006337 202016	8310	LAC	MQSAVE	
006340 606515	8320	JMP	FREG	
006341	8330	RACS	...	
006341 402052	8340	XCT	REGBR	
006342 606570	8350	JMP	AACS	BRANCH TO ALTER THE ACCUMULATOR SWITCHES REGISTER
006343	8360	MESS	<ACS1 >,5	
006351 202022	8370	LAC	ACSW	LOAD THE USER'S ACCUMULATOR SWITCHES SOFTWARE REGISTER
006352 606515	8380	JMP	FREG	PRINT IT IN OCTAL
006353	8390	RSC	...	
006353 402052	8400	XCT	REGBR	
006354 606532	8410	JMP	ASC	BRANCH TO ALTER THE STEP COUNTER REGISTER
006355	8420	MESS	<SC1 >,4	
006362 202021	8430	LAC	SCSAVE	
006363 606512	8440	JMP	SREG	
006364	8450	RSC2	...	
006364 402052	8460	XCT	REGBR	
006365	8470	FORMAT		CAN'T ALTER THE VALIDATION REGISTER
006366	8480	MESS	<VALIDATION: >,12,	
006376	8490	MPOFF		
	8500	,PMC	SAVE,ON	

D SENSE USER REGISTERS

006376	705000		SPECIAL+0	TURN OFF MEMORY PROTECT
006377	201770	8540	LAC SVALID	
006400	701742	8550	MPEU	
006401	606512	8560	JMP SREG	
		8570		
006402	8580	RPC	...	
006402	402052	8590	XCT REGBR	
006403	606557	8600	JMP APC	BRANCH TO ALTER THE PROGRAM COUNTER REGISTER
006404	8610	MESS <PC1>,4	PRINT THE REGISTER NAME	
006411	202017	8620	LAC PCSAVE	LOAD THE USER'S PROGRAM COUNTER AND MACHINE STATE
006412	513276	8630	AND (17777)	RECOVER JUST THE PROGRAM COUNTER
006413	606512	8640	JMP SREG	PRINT IT IN LEADING-ZEROES-SUPPRESSED OCTAL
		8650		
006414	8660	RLK	...	
006414	402052	8670	XCT REGBR	
006415	606537	8680	JMP ALK	BRANCH TO ALTER THE LINK REGISTER
006416	8690	MESS <LK1>,4	PRINT THE REGISTER NAME	
006423	202017	8700	LAC PCSAVE	LOAD THE USER'S PC AND MACHINE STATE
006424	740010	8710	RAL	MOVE THE LINK BIT (AC (0)) TO THE LINK
006425	750010	8720	GLK	RECOVER JUST THE LINK
006426	606512	8730	JMP SREG	
		8740		
		8750		
006427	8760	RALL	...	DO ALL OF THE REGISTERS
006427	402052	8770	XCT REGBR	
006430	8780	FORMAT		CANNOT ALTER ALL REGISTERS
006431	8790	MESS <AC1>,4		
006436	202015	8800	LAC ACSAVE	
006437	122035	8810	JMS REGSW,X	PRINT THE REGISTER IN THE DESIRED FORMAT
006440	8820	MESS <MQ1>,4		
006443	202016	8830	LAC MQSAVE	
006446	122035	8840	JMS REGSW,X	PRINT THE REGISTER IN THE DESIRED FORMAT
006447	8850	MESS <PC1>,4		
006454	202017	8860	LAC PCSAVE	
006455	513276	8870	AND (17777)	
006456	122035	8880	JMS REGSW,X	PRINT THE REGISTER IN THE DESIRED FORMAT
006457	8890	MESS <LK1>,4		
006464	202017	8900	LAC PCSAVE	
006465	740010	8910	RAL	
006466	750010	8920	GLK	
006467	8930	OCTZ		
006471	8940	MESS <STS1>,5		
006477	202020	8950	LAC STSAVE	
006500	122035	8960	JMS REGSW,X	PRINT THE REGISTER IN THE DESIRED FORMAT
006501	8970	MESS <ACSI>,5		
006507	202022	8980	LAC ACSW	
006510	122035	8990	JMS REGSW,X	PRINT THE REGISTER IN THE DESIRED FORMAT
006511	606353	9000	JMP RSC2	PRINT THE SC REGISTER
		9010		
006512	9020	SREG	...	
006512	9030	OCTZ		PRINT THE AC IN LEADING-ZEROES-SUPPRESSED OCTAL
006514	606575	9040	JMP ADONE	IS THERE ANOTHER REGISTER REQUEST?

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SENSE USER REGISTERS

	9050					
006515	9060	FREG	..	REGSW,X	PRINT THE FULL AC IN OCTAL	
006515	122035	9070	JMS		PRINT THE AC IN THE DESIRED FORMAT	
006516	606575	9080	JMP	ADONE	IS THERE ANOTHER REGISTER REQUEST?	

D ALTER THE USER REGISTERS

006517	9090	.STITL	ALTER THE USER REGISTERS	
	9100	.USE	PURE	
	9110	*		
	9120	*		
006517	9130	ALT	...	
006517 213301	9140	LAC	(NOP)	LOAD THE ALTERS BRANCH SWITCH
006520 042052	9150	DAC	REGBR	AND SET IT
006521 606575	9160	JMP	ADONE	NOW FIND OUT WHICH REGISTER TO ALTER
	9170	*		
	9180	*	NOW ALTER THE REQUESTED REGISTER	
	9190	*		
006522	9200	AAC	...	
006522	9210	NUM		
006523	9220	WHAT	GET THE NEW VALUE FOR THE USER'S AC	
006524 042015	9230	DAC	ACSAVE	FORMAT ERROR
006525 606575	9240	JMP	ADONE	SET THE NEW USER'S AC VALUE
	9250			
006526	9260	AMQ	...	ANOTHER REGISTER???
006526	9270	NUM		
006527	9280	WHAT	GET THE NEW VALUE FOR THE USER'S MQ	
006530 042016	9290	DAC	MQSAVE	FORMAT ERROR
006531 606575	9300	JMP	ADONE	SET THE USER'S NEW MQ VALUE
	9310			
006532	9320	ASC	...	ANOTHER REGISTER???
006532	9330	NUM		
006533	9340	WHAT	GET THE NEW VALUE FOR THE USER'S STEP COUNTER	
006534 513317	9350	AND	(77)	FORMAT ERROR
006535 042021	9360	DAC	SCSAVE	SC IS A SIXBIT REGISTER
006536 606575	9370	JMP	ADONE	SET THE USER'S NEW STEP COOUNT VALUE
	9380			
006537	9390	ALK	...	ANOTHER REGISTER???
006537	9400	NUM		
006540	9410	WHAT	GET THE NEW VALUE FOR THE USER'S LINK	
006541 744020	9420	CLLRAR	FORMAT ERROR	
006542 740200	9430	SZA	MOVE THE VALUE INTO THE LINK	
006543	9440	WHAT	SKIP IF A VALUE OF ZERO OR ONE WAS TYPED -- GOOD VALUE	
006544 740020	9450	RAR	ANY OTHER VALUE IS AN ERROR	
006545 042000	9460	DAC	TEMPO	MOVE THE VALUE INTO AC (0)
006546 202017	9470	LAC	PCSAVE	SAVE IT
006547 513344	9480	AND	(377777)	LOAD THE USER'S PC AND MACHINE STATE
006550 842000	9490	XOR	TEMPO	GET RID OF THE OLD LINK
006551 042017	9500	DAC	PCSAVE	INSERT THE NEW LINK
006552 606575	9510	JMP	ADONE	SAVE THE UPDATED PC AND MACHINE STATE
	9520			
006553	9530	ASTS	...	ANOTHER REGISTER???
006553	9540	NUM		
006554	9550	WHAT	GET THE NEW VALUE FOR THE USER'S PROGRAM INTERRUPT STATUS NUM	
006555 042020	9560	DAC	STSAVE	FORMAT ERROR
006556 606575	9570	JMP	ADONE	SET THE USER'S NEW PROGRAM INTERRUPT STATUS REGISTER
	9580			
006557	9590	APC	...	ANOTHER REGISTER???
006557	9600	NUM	GET THE NEW VALUE FOR THE USER'S PC	

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ALTER THE USER REGISTERS

006560	9610		WHAT	FORMAT ERROR
006561	513276	9620	AND (17777)	REDUCE IT TO JUST PC
006562	042000	9630	DAC TEMPO	
006563	202017	9640	LAC PCSAVE	LOAD THE USER'S OLD PC AND MACHINE STATE
006564	513324	9650	AND (700000)	GET RID OF THE OLD PC
006565	242000	9660	XOR TEMPO	PUT IN THE NEW PC
006566	042017	9670	DAC PCSAVE	SAVE THE UPDATED PC AND MACHINE STATUS
006567	606575	9680	JMP ADONE	ANOTHER REGISTER???
		9690		
006570	9700	AACS	...	
006570	9710		NUM	GET THE NEW VALUE FOR THE USER'S AC SWITCHES
006571	9720		WHAT	FORMAT ERROR
006572	042022	9730	DAC ACSW	SET THE NEW VALUE OF THE USER'S AC SWITCHES
006573	606575	9740	JMP ADONE	ANOTHER REGISTER???
		9750		
006574	9760	AVAL	...	
006574	9770		WHAT	CAN'T ALTER VALIDATION REGISTER
	9780	*		
	9790	*		
	9800	*	ALMOST DONE -- FLAG THE COMMAND AND LOOK FOR THE NEXT	
	9810	*		
006575	9820	ADONE	...	
006575 442053	9830		INX COMFLG	FLAG THE COMMAND
006576 605560	9840		JMP MODE	TRY TO PICK UP ANOTHER ONE

D

USER JUMP/TRANSFER/CONTINUE COMMANDS

	9850		,STITL	USER JUMP/TRANSFER/CONTINUE COMMANDS	
	9860	*			
	9870	*			
006577	9880	TRA	...		
006577 142150	9890		DZM	PHFLAG	SET THE NEXT PROGRAM TO BE A USER PROGRAM
006600	9900		NUM		GET THE ADDRESS
006601 613111	9910		JMP	MSG83	DON'T ACCEPT A NULL ADDRESS
006602 513345	9920	J1	AND	(417777)	
006603 253346	9930		XOR	(100000)	
006604 042002	9940		DAC	TEMP2	SET THE RESTART ADDRESS
006605 213347	9950		LAC	(507000)	LOAD THE SWAPPER CONTROL WORD
006606 042001	9960		DAC	TEMP1	
006607	9970		MPOFF		
			,PMC	SAVE,ON	
006607 705000			SPECIAL+0		TURN OFF MEMORY PROTECT
006610 201771	9980		LAC	\$NUMBR	LOAD THE USER CORE PROGRAM NAME
006611 604431	9990		JMP	M\$MX5	SWAP TO IT
	10000				
006612 202017	10010	CQN	LAC	PCSAVE	LOAD THE USER'S RESTART ADDRESS
006613 606602	10020		JMP	J1	AND RESTART HIM THERE
	10030				
	10040				
006614	10050	EXI	...		GET OUT OF ACTUAL CORE MODE
006614 202151	10060		LAC	FTYPE	LOAD THE CURRENTLY OPEN FILE TYPE
006615 550333	10070		SAD	ACF	SKIP UNLESS WE REALLY DO HAVE THE ACTUAL CORE FILE OPEN
006616 741000	10080		SKP		
006617 606622	10090		JMP	EXI2	ELSE JOB IS DONE -- EXIT
006620 202152	10100		LAC	OFTYP	LOAD THE PREVIOUS FILE TYPE
006621 042151	10110		DAC	FTYPE	AND RESTOR IT TO ITS RIGHTFUL PLACE
006622 103314	10120	EXI2	JMS	FORCE	FORCE THE BUFFER BEFORE QUITTING
006623 604023	10130		JMP	M\$MONXT	NEKT COMMAND

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MTSS DEBUGGER -- OUTPUT SUBROUTINES

.STITL MTSS DEBUGGER -- OUTPUT SUBROUTINES

	10140				
	10150	*			
	10160	*			
	10170	*			
	10180	*			
	10190	*			
	10200	*			
006624	10210		ENTER ,PMC OMOD SAVE,ON		PRINT THE AC, INCLUDING LEADING ZEROES, IN OCTAL
003221		DMOD	...		
006624	10220		OCT		
006626 623221	10230		RET	OMOD,X	EXIT
006627	10240				
006627	10250				
003223	10260	AMOD	ENTER ,PMC AMOD SAVE,ON		PRINT THE AC IN AC&6 SIXBIT ASCII
006627 652000	10270		...		
006630	10280		LMQ		SET UP THE WORD TO PRINT
006630 641606	10290		,DUP 3,3		ONCE FOR EACH CHARACTER
006631	353350		EAECLA!LLS 6		RECOVER THE NEXT CHARACTER
006632	103503		TAD (240)		RECONSTITUTE THE ASCII
006633	641606		JMS TSTTYOT		PRINT THE CHARACTER
006634	353350		EAECLA!LLS 6		RECOVER THE NEXT CHARACTER
006635	103503		TAD (240)		RECONSTITUTE THE ASCII
006636	641606		JMS TSTTYOT		PRINT THE CHARACTER
006637	353350		EAECLA!LLS 6		RECOVER THE NEXT CHARACTER
006640	103503		TAD (240)		RECONSTITUTE THE ASCII
006641 623223	10320		JMS TSTTYOT		PRINT THE CHARACTER
006641 623223	10330		RET AMOD,X		EXIT
006642	10340				
006642	10350		ENTER ,PMC 6MOD SAVE,ON		PRINT THE AC IN TRIMMED SIXBIT
003225		6MOD	...		
006642 652000	10360		LMQ		SAVE THE VALUE
006643 103227	10370		JMS SIX		PRINT THE FIRST CHARACTER
006644 103227	10380		JMS SIX		PRINT THE SECOND CHARACTER
006645 103227	10390		JMS SIX		PRINT THE THIRD CHARACTER
006646 623225	10400		RET 6MOD,X		EXIT
006647	10410				
006647	10420				
006647	10430		ENTER ,PMC SIX SAVE,ON		PRINT THE NEXT CHARACTER FROM THE MQ AS TRIMMED SIXBIT ASCII
003227		SIX	...		
006647 641606	10440		EAECLA!LLS 6		RECOVER THE CHARACTER
006650 353351	10450		TAD (-40)		300'S GO NEGATIVE; 200'S GO POSITIVE
006651 741100	10460		SPA		CHECK WHICH IT WAS
006652 353352	10470		TAD (100)		IT WAS A 300
006653 353350	10480		TAD (240)		IT WAS A 200
006654 103503	10490		JMS TSTTYOT		PRINT THE CHARACTER
006655 623227	10500		RET SIX,X		EXIT
	10510				

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MTSS DEBUGGER -- OUTPUT SUBROUTINES

		10520				
006656		10530	ENTER ,PMC	HMOD SAVE,ON	PRINT THE AC AS ONE ASCII CHARACTER IN EACH HALF-WORD	
003231			... LRS	9,	KEEP THE UPPER CHARACTER	
006656	640511	10540	JMS	T\$TTYOT	PRINT IT	
006657	103503	10550	LLS	9,	RECOVER THE LOWER CHARACTER	
006660	640611	10560	JMS	T\$TTYOT	PRINT IT	
006661	103503	10570	RET	HMOD,X	EXIT	
006662	623231	10580				
		10590				
		10600				
006663		10610	ENTER ,PMC	8MOD SAVE,ON	PRINT THE AC AS ONE ASCII CHARACTER IN AC(10-17)	
003233			... AND	(377)	MASK TO THE CHARACTER	
006663	513353	10620	JMS	T\$TTYOT	PRINT THE CHARACTER	
006664	103503	10630	RET	8MOD,X		
006665	623233	10640				
		10650				
		10660				
006666		10670	ENTER ,PMC	7MOD SAVE,ON	PRINT THE AC AS STEXT FORMAT (CHARS IN BITS 4-10 11-17)	
003235			... LRS	7	KEEP THE UPPER CHARACTER	
006666	640507	10680	AND	(177)	MASK TO SEVEN BIT CODE	
006667	513354	10690	JMS	T\$TTYOT	PRINT IT	
006670	103503	10700	LLS	7	RECOVER THE LOWER CHARACTER	
006671	640607	10710	AND	(177)	MASK TO SEVEN BIT CODE	
006672	513354	10720	JMS	T\$TTYOT	PRINT IT	
006673	103503	10730	RET	7MOD,X	EXIT	
006674	623235	10740				
		10750				
		10760				
006675		10770	ENTER ,PMC	DMOD SAVE,ON	PRINT THE AC AS A SIGNED DECIMAL VALUE	
003237			... GSM		GET THE SIGN AND MAGNITUDE OF THE AC	
006675	664000	10780	DAC	TEMPO	SAVE THE MAGNITUDE -- IT IS CORRECT FOR POSITIVE QUANTITIES	
006676	042000	10790	BNL;CLL		SKIP IF THE NUMBER WAS NEGATIVE	
006677	744400	10800	JMP	DEC2	ELSE PREPARATIONS ARE DONE	
006700	606704	10810	INX	TEMPO	ALLOW FOR GSM IS ONE'S COMPLEMENT CONVERSION	
006701	442000	10820	LAW	SMINUS	LOAD A MINUS SIGN	
006702	760255	10830	JMS	T\$TTYOT	AND PRINT IT	
006703	103503	10840				
		10850				
		10860				
006704		10870	DEC2	...		
006704	762001	10880	LAH	TEMP2-1	LOAD A POINTER TO THE OUTPUT BUFFER	
006705	040010	10890	DAC	10	AND SET IT	
006706	202000	10900	LAC	TEMPO	LOAD THE VALUE TO PRINT	
006707	653323	10910	DEC4	IDIV	DIVIDE BY 10	
006710	000012	10920		10,		
006711	060010	10930	DAC	10.X	STORE THE NEXT DIGIT -- NOTE THERE CANNOT BE MORE THAN 5	
006712	641002	10940	LACQ		LOAD THE QUOTIENT	
006713	744200	10950		\$ZALICLL	SKIP IF DONE	

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MTSS DEBUGGER -- OUTPUT SUBROUTINES

006714	606707	10960	JMP	DEC4	ELSE LOOP
006715	777777	10970	LAW	-1	AMOUNT TO BACK UP THE POINTER FOR OUTPUT
		10980			
006716	340010	10990	DEC6	TAD	BACK UP THE POINTER
006717	553355	11000		SAD	(LAW TEMP2-2) SKIP UNLESS DONE
006720	606727	11010	JMP	DEC8	DONE -- EXIT
006721	040010	11020	DAC	10	ELSE RESET THE POINTER
006722	220010	11030	LAC	10,X	LOAD THE NEXT CHARACTER TO PRINT
006723	353305	11040	TAD	(260)	MAKE IT ASCII
006724	103503	11050	JMS	TSTTYOT	PRINT IT
006725	777776	11060	LAW	-2	AMOUNT TO BACK UP THE POINTER
006726	606716	11070	JMP	DEC6	TRY FOR ANOTHER CHARACTER
		11080			
006727		11090	DEC8	...	
006727	760256	11100	LAW	SPERIOD	LOAD A PERIOD (.)
006730	103503	11110	JMS	TSTTYOT	AND PRINT IT TO SIGNIFY DECIMAL OUTPUT
006731	623237	11120	RET	DMOD,X	EXIT
		11130	*		
		11140	*		
		11150	*	SMOD PRINTS THE AC AS A SYMBOLIC VALUE UNDER THE FOLLOWING RULES:	
		11160	*	1) IF THE OP CODE FIELD IS A MEMORY REFERENCE INSTRUCTION OR	
		11170	*	A LAW INSTRUCTION, IT IS SO PRINTED. IN THIS CASE THE PRESENCE	
		11180	*	OF A 1 IN BIT 4 CAUSES A "p,X" TO BE PRINTED AFTER THE ADDRESS	
		11190	*	TO SIGNIFY INDIRECTION. THE ADDRESS FIELD WILL BE PRINTED	
		11200	*	AS THE USER SYMBOL IT IS CLOSEST TO PLUS OR MINUS THE DIFFERENCE.	
		11210	*	IF THE ABSOLUTE VALUE OF THE DIFFERENCE EXCEEDS THE PRE-ASSIGNED	
		11220	*	LIMIT, THEN THE ADDRESS IS PRINTED ENTIRE.	
		11230	*		
		11240	*	2) IF THE OPCODE FIELD IS AN EAE, THE EAE INSTRUCTION WHICH IS	
		11250	*	CLOSEST TO THE VALUE WILL BE PRINTED, ALONG WITH PLUS OR MINUS	
		11260	*	THE DIFFERENCE.	
		11270	*		
		11280	*	3) IF THE VALUE IS AN IOT INSTRUCTION OR AN OPERATE INSTRUCTION	
		11290	*	IT WILL BE PRINTED AS A SEQUENCE OF MICROCODED INSTRUCTIONS.	
		11300	*		
		11310	*		
		11320	*	TEMPORARY VARIABLE USAGE IS:	
		11330	*	TEMPO -- STORE THE VALUE TO BE OUTPUT	
		11340	*	TEMP1 -- STORE THE INDIRECT BIT IF NECESSARY	
		11350	*	TEMP2 -- SCRATCH	
		11360	*	TEMP3 -- POINTER TO THE CLOSEST SYMBOL VALUE LOCATED	
		11370	*	TEMP4 -- ABSOLUTE VALUE OF THE DIFFERENCE BETWEEN VALUE SOUGHT AND SYMBOL VALUE FOUND	
		11380	*		
006732		11390	ENTER	SMOD	PRINT THE AC AS A SYMBOLIC VALUE
			,PMC	SAVE,ON	
003241			SMOD	...	
006732	042000	11400	DAC	TEMPO	SAVE THE VALUE
006733	744000	11410	CLL		PROTECT THE SHIFT
006734	640516	11420	LRS	18,-4	RETAIN JUST THE OP CODE
006735	353356	11430	TAD	(OPTAB)	FORM A POINTER TO THE OPCODE TABLE
006736	042001	11440	DAC	TEMP1	SET THE POINTER
006737	353357	11450	TAD	(-OPTAB-15)	EAE, IOT, AND OPR INSTRUCTIONS STAY POSITIVE

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MTSS DEBUGGER -- OUTPUT SUBROUTINES

006740	740100	11460	SMA	SKIP IF IT WAS A MEMORY REFERENCE INSTRUCTION
006741	622001	11470	JMP	TEMP1,X ELSE BRANCH TO A SPECIAL HANDLING ROUTINE
006742	222001	11480	LAC	TEMP1,X LOAD THE OPCODE
006743	103223	11490	JMS	AMOD PRINT IT
006744	103316	11500	JMS	SPACE FOLLOWED BY A SPACE
006745	202000	11510	LAC	TEMPO RELOAD THE VALUE
006746	513360	11520	AND	(020000) RECOVER THE INDIRECT BIT
006747	042001	11530	DAC	TEMP1 SAVE IT
006750	202000	11540	LAC	TEMPO RELOAD THE FULL VALUE
006751	513276	11550	AND	(17777) RETAIN JUST THE ADDRESS FIELD
006752	042000	11560	DAC	TEMPO REPLACE THE VALUE -- THE REST OF IT IS ALREADY PRINTED
006753	103276	11570	JMS	UVSCH SEARCH THE USER TABLE FOR A SYMBOL FOR THE ADDRESS
006754	202004	11580	LAC	TEMP4 LOAD THE ABSOLUTE VALUE OF THE DIFFERENCE BETWEEN SOUGHT AND FOUND
006755		11590	NEG	NEGATE IT
006757	342041	11600	TAD	LIMIT ADD THE ALLOWED MARGIN
006760	740100	11610	SMA	SKIP IF WE ARE OUTSIDE THE ALLOWED MARGIN
006761	607040	11620	JMP	SYM2 ELSE PRINT THE SYMBOL AND DIFFERENCE
		11630	*	
		11640	*	NO SUITABLE SYMBOL, SO PRINT THE ADDRESS IN OCTAL
		11650	*	
006762	202000	11660	LAC	TEMPO RELOAD THE ADDRESS
006763		11670	OCTZ	PRINT IT IN OCTAL
006765	202001	11680	LAC	TEMP1 LOAD THE INDIRECT BIT FLAG
006766	741200	11690	SNA	SKIP IF THERE IS ONE
006767	623241	11700	RET	SMOD,X ELSE DONE
006770	206773	11710	LAC	IND LOAD THE COMMA X
006771	103245	11720	JMS	SAMOD PRINT IT
006772	623241	11730	RET	SMOD,X DONE
		11740		
006773	001470	11750	IND	,ACI6 + .X+
006774	623241	11760	RET	SMOD,X EXIT
		11770	*	
		11780	*	THE VALUE IS A LAW INSTRUCTION
		11790	*	
006775	544167	11800	SLAW2	,ACI6 +LAW+
006776		11810	SLAW	...
006776	206773	11820	LAC	SLAW2 LOAD THE MNEMONIC
006777	103223	11830	JMS	AMOD PRINT THE LAW SYMBOL
007000	103316	11840	JMS	SPACE
007001	142001	11850	DZM	TEMP1 LAW INSTRUCTION HAS NO INDIRECT BIT
007002	606750	11860	JMP	SMOD2 PRINT THE ADDRESS
		11870		
		11880		
007003	454145	11890	SEAE	,ACI6 +EAE+
007004		11900	SEAE	...
007004	213361	11910	LAC	(640000) EAE INSTRUCTION -- DO A BIT MATCH FOR BEST AND PRINT NUMERICAL RESIDUE
007005	042007	11920	DAC	TEMP7 SET THE OP CODE
007006	213301	11930	LAC	(740000) SET THE OP CODE MASK
007007	042010	11940	DAC	TEMP8
007010	202000	11950	LAC	TEMPO
007011	513306	11960	AND	(037777) GET RID OF THE OP CODE FROM THE OLD VALUE
007012	042000	11970	DAC	TEMPO

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MTSS DEBUGGER -- OUTPUT SUBROUTINES

007013	103302	11980		JMS	PBSCH	SEARCH FOR THE CODE WITH THE LARGEST NUMBER OF COMMON BITS
007014	202004	11990		LAC	TEMP4	LOAD THE NUMBER OF COMMON BITS
007015	740200	12000		SZA		SKIP IF THERE WERE NONE
007016	607024	12010		JMP	SEAE2	ELSE CHECK THE FIT
007017	202000	12020	SEAE3	LAC	TEMPO	RELOAD THE VALUE
007020	253361	12030		XOR	(640000)	PUT THE OPCODE BACK
007021	007021	12040		OCT		PRINT IT
007023	623241	12050		RET	SMOD,X	AND EXIT
		12060				
007024		12070	SEAE2	...		
007024	777777	12080	M1	LAW	-1	
007025	362003	12090		TAD	TEMP3,X	LOAD THE TABLE VALUE
007026	740001	12100		CMA		NEGATE IT
007027	342000	12110		TAD	TEMPO	ADD THE ORIGINAL MICROCODE
007030	353361	12120		TAD	(640000)	ADD THE OPCODE
007031	042004	12130		DAC	TEMP4	SAVE THE SIGNED DIFFERENCE BETWEEN THEM
007032	664000	12140		GSM		GET SIGN AND MAGNITUDE
007033	347024	12150		TAD	M1	
007034	740001	12160		CMA		NEGATE THE MAGNITUDE OF THE DIFFERENCE
007035	342041	12170		TAD	LIMIT	ADD THE ALLOWABLE DIFFERENCE
007036	741100	12180		SPA		SKIP IF IT IS OK
007037	607017	12190		JMP	SEAE3	ELSE PRINT IT IN OCTAL
		12200				
007040	103243	12220	SYM2	JMS	SYM4	PRINT THE BEST SYMBOL FOUND
007041	202004	12230		LAC	TEMP4	LOAD THE DIFFERENCE IN VALUES
007042	741200	12240		SNA		SKIP IF THERE IS ANY
007043	623241	12250		RET	SMOD,X	DON'T BOTHER TO PRINT A ZERO
007044	760253	12260		LAW	SPLUS	LOAD A PLUS SIGN
007045	103503	12270		JMS	TSTTYOT	AND PRINT IT
007046	202004	12280		LAC	TEMPO	RELOAD THE VALUES DIFFERENCE
007047	103237	12290		JMS	DMOD	PRINT IT IN DECIMAL
007050	623241	12300		RET	SMOD,X	EXIT
		12310				
007051		12320		ENTER	SYM4	PRINT THE BEST SYMBOL FOUND
				,PMC	SAVE,ON	
007051			SYM4	...		
007051	142002	12330		DZM	TEMP2	INITIALIZE THE FIRST-CHARACTER-PRINTED FLAG
007052	777775	12340		LAW	-3	AMOUNT TO BACK UP THE POINTER
007053	342003	12350		TAD	TEMP3	MOVE THE POINTER BACK TO THE SYMBOL
007054	040010	12360		DAC	10	SAVE THE POINTER
007055	220010	12370		LAC	10,X	LOAD THE FIRST HALF-SYMBOL
007056	103245	12380		JMS	SAMOD	PRINT IT
007057	220010	12390		LAC	10,X	LOAD THE SECOND HALF-SYMBOL
007060	103245	12400		JMS	SAMOD	PRINT IT
007061	623243	12410		RET	SYM4,X	
		12420	*			
		12430	*			
		12440	*			
		12450	*			
007062		12460		ENTER	SAMOD	
				,PMC	SAVE,ON	
						PRINT THE AC IN SIXBIT (AC16) ASCII, DELETING LEADING BLANKS AND CHANGING OTHER BLANKS TO DOLLAR SIGNS (\$).

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MTSS DEBUGGER -- OUTPUT SUBROUTINES

003245		SAM0D	...	
007062	652000	12470	LMO	SAVE THE VALUE TO BE PRINTED
007063	777775	12480	LAW	-3 LOAD THE CHARACTER COUNT
007064	042001	12490	DAC	TEMP1 AND SET IT
007065	12500	SAM2	...	
007065	641606	12510	EAECIA!LLS	6 GET THE NEXT CHARACTER
007066	741200	12520	SNA	SKIP IF NON-BLANK
007067	607076	12530	JMP	SAM4 ELSE TAKE APPROPRIATE ACTION
007070	353350	12540	TAD	(240) MAKE INTO ASCII
007071	442002	12550	INX	TEMP2 COUNT THE PRINTED CHARACTERS
007072	12560	SAM6	...	
007072	103503	12570	JMS	TSTTYOT PRINT THE CHARACTER
007073	12580	SAM8	...	
007073	442001	12590	ISZ	TEMP1 COUNT THE CHARACTERS IN THIS WORD
007074	607065	12600	JMP	SAM2 LOOP TO PRINT THE NEXT CHARACTER
007075	623245	12610	RET	SAM0D,X ELSE DONE -- EXIT
	12620			
007076	12630	SAM4	...	
007076	202002	12640	LAC	TEMP2 LOAD THE FIRST-CHARACTER-PRINTED FLAG
007077	741200	12650	SNA	SKIP IF THERE HAS BEEN A CHARACTER PRINTED
007100	607073	12660	JMP	SAM8 ELSE DON'T PRINT THIS ONE
007101	773362	12670	LAW	(\$DOLLAR) YES -- REPLACE THE BLANK WITH A DOLLAR SIGN (\$)
007102	142002	12680	DZM	TEMP2 AND SUPPRESS PRINTING FURTHER BLANKS
007103	607072	12690	JMP	SAM6 PRINT THE DOLLAR SIGN
	12700			
007104	565760	12720	OPR8	,AC16 +NOP+
007105	12730	SOPR	...	
007105	202000	12740	LAC	TEMP0 PRINT A STRING OF OPERATE INSTRUCTION MICROCODES
007106	513363	12750	AND	(LAW) LOAD THE VALUE
007107	553363	12760	SAD	(LAW) RETAIN THE OPCODE PLUS THE LAW BIT IF PRESENT
007110	606776	12770	JMP	SLAW CHECK THE LAW BIT
	12780			YES -- LAW INSTRUCTIONS ARE DIFFERENT FROM THE REST OF THE OPERATE GROUP
007111	213301	12790	LAC	(740000) SET THE OP CODE
007112	042007	12800	DAC	TEMP7 SET THE MASK FOR THE OP CODE TABLE SEARCH
007113	042010	12810	DAC	TEMP8 LOAD THE VALUE TO BATCH
007114	202000	12820	LAC	TEMP0 GET RID OF THE OP CODE
007115	513306	12830	AND	(037777) SET JUST THE MICROCODE
007116	042000	12840	DAC	TEMP0 RECOVER THE INVERTED SKIP BIT
007117	513334	12850	AND	(001000) AND SAVE IT
007120	042011	12860	DAC	TEMP9
	12870			
007121	12880	OPR2	...	
007121	103302	12890	JMS	PBSCH SEARCH THE PERMANENT SYMBOL TABLE FOR THE OPR INST W/LGST # OF COMMON BITS
007122	202004	12900	LAC	TEMP4 LOAD THE NUMBER OF COMMON BITS
007123	741200	12910	SNA	SKIP IF THERE ARE ANY
007124	607146	12920	JMP	OPR6 ELSE PRINT THE NUMERICAL DIFFERENCE
007125	103243	12930	JMS	SYM4 PRINT THE BEST MATCH FOUND
007126	222003	12940	LAC	TEMP3,X LOAD THE TABLE VALUE OF THE "MATCH"
007127	242000	12950	XOR	TEMP0 GET RID OF THE MICROCODE JUST PRINTED
007130	242007	12960	XOR	TEMP7 GET RID OF THE OPCODE
007131	741200	12970	SNA	SKIP UNLESS DONE

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MTSS DEBUGGER -- OUTPUT SUBROUTINES

007132	623241	12980	RET	SMOD,X	IN WHICH CASE EXIT
007133	042000	12990	DAC	TEMPO	SET THE REDUCED MICROCODE
007134	513364	13000	AND	(000700)	RECOVER ANY REMAINING SKIP BITS
007135	741200	13010	SNA		SKIP UNLESS THERE ARE NONE
007136	607143	13020	JMP	OPR1	IN WHICH CASE THE MICROCODE IS CORRECT
007137	202000	13030	LAC	TEMPO	STILL HAVE SKIP BITS, SO RELOAD THE MICROCODE
007140	513365	13040	AND	(776777)	GET RID OF ANY INVERTED SKIP BIT
007141	242011	13050	XOR	TEMP9	PUT THE PROPER INVERTED SKIP BIT IN
007142	042000	13060	DAC	TEMPO	RESTORE THE MICROCODE
		13070			
007143		13080	OPR1	...	
007143	760241	13090	LAH	SEXCLAM	LOAD AN EXCLAMATION MARK FOR THE MICROCODING INDICATION
007144	103503	13100	JMS	TSTTYOT	AND PRINT IT
007145	607121	13110	JMP	OPR2	DO THE REMAINDER OF THE CODE
		13120			
		13130			
007146	207104	13140	OPR6	LAC	LOAD THE MNEMONIC
007147	103223	13150	JMS	AMOD	PRINT IT
007150	623241	13160	RET	SMOD,X	EXIT
		13170	*		
		13180	*		
		13190	*		DECODE THE IOT INSTRUCTION AND PRINT IT AS A STRING OF MICROCODES
		13200	*		PLUS ANY OCTAL OFFSET. UNRECOGNIZED DEVICES WILL BE PRINTED AS
		13210	*		IOT-<OFFSET>.
		13220	*		
007151	515764	13230	SIOT8	.AC16	*IOT*
007152		13240	SIOT	...	
007152	142011	13250	DZM	TEMP9	CLEAR THE CODE PRINTED FLAG
007153	213366	13260	LAC	(777760)	
007154	042010	13270	DAC	TEMP8	SET THE OP CODE RETAINING MASK
007155	502000	13280	AND	TEMPO	
007156	042007	13290	DAC	TEMP7	SET THE OP CODE FOR THE TABLE SEARCH
007157	202000	13300	LAC	TEMPO	LOAD THE VALUE
007160	513306	13310	AND	(037777)	GET RID OF THE OP AND DEVICE CODES
007161	042000	13320	DAC	TEMPO	SAVE THE MICROCODE
007162	103247	13330	JMS	SIOT2	PRINT THE INSTRUCTION AS A MICRO-CODED STRING
007163		13340	SIOT4	...	NO MATCH FOUND FOR THE REMAINING CODE
007163	202011	13350	LAC	TEMP9	LOAD THE CODE PRINTED FLAG
007164	740200	13360	SZA		SKIP IF NO CODE HAS YET BEEN PRINTED
007165	607176	13370	JMP	SIOT6	ELSE PRINT THE OFFSET
007166	202000	13380	LAC	TEMPO	LOAD THE UNACCOUNTED FOR BITS
007167	741200	13390	SNA		SKIP IF THERE ARE ANY
007170	607173	13400	JMP	SIOT3	ELSE PRINT THE IOT MNEMONIC
007171	253324	13410	XOR	(700000)	RESTORE THE OP CODE
007172	607201	13420	JMP	SIOT7	PRINT IT
007173		13430	SIOT3	...	
007173	207151	13440	LAC	SIOT8	LOAD THE IOT MNEMONIC
007174	103223	13450	JMS	AMOD	PRINT THE OP CODE
007175	623241	13460	RET	SMOD,X	EXIT
		13470			
007176		13480	SIOT6	...	PRINT ANY REMAINING OFFSET
007176	760253	13490	LAH	\$PLUS	LOAD A PLUS SIGN

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MTSS DEBUGGER -- OUTPUT SUBROUTINES

007177	103503	13500		JMS	T\$TTYOT	PRINT IT
007200	202000	13510		LAC	TEMPO	LOAD THE REMAINING UNMATCHED CODE
007201		13520	SLOT7	OCTZ		PRINT IT IS ZERO=SWPPRESSED OCTAL
007203	623241	13530		RET	SMOD,X	EXIT
		13540				
		13550				
007204		13560		ENTER	SLOT2	PRINT A STRING OF MICROCODES AND EXIT WHEN NO MORE MATCH CAN BE FOUND
003247			SLOT2	,PMC	SAVE,ON	
007204	103302	13570		JMS	PBSCH	SEARCH THE PERMANENT SYMBOL TABLE FOR THE INST W/LGST # OF COMMON BITS
007205	202004	13580		LAC	TEMP4	LOAD THE NUMBER OF MATCHING BITS
007206	741200	13590		SNA		SKIP IF THERE ARE SOME
007207	623247	13600		RET	SLOT2,X	ELSE EXIT
007210	202011	13610		LAC	TEMP9	SEE IF THERE HAS ALREADY BEEN A PIECE OF CODE PRINTED
007211	741200	13620		SNA		SKIP IF SO
007212	607215	13630		JMP	SLOT5	ELSE DON'T PRINT AN EXCLAMATION POINT
007213	760241	13640		LAW	SEXCLAM	LOAD AN EXCLAMATION POINT FOR THE MICROCODING INDICATOR
007214	103503	13650		JMS	T\$TTYOT	PRINT IT
007215	442011	13660	SLOT5	INX	TEMP9	COUNT THE PRINTED CODE
007216	103243	13670		JMS	SYM4	PRINT THE BEST MATCH FOUND
007217	202007	13680		LAC	TEMP7	LOAD THE OLD OPCODE & DEVICE NUMBER
007220	513301	13690		AND	(740000)	RECOVER JUST THE OP CODE
007221	242000	13700		XOR	TEMP0	INCLUDE THE LATEST SEARCHED-FOR BITS
007222	262003	13710		XOR	TEMP3,X	GET RID OF THE MICROCODE JUST PRINTED
007223	741200	13720		SNA		SKIP UNLESS DONE
007224	623241	13730		RET	SMOD,X	IN WHICH CASE, EXIT
		13740				
007225	042000	13750		DAC	TEMPO	SET THE REDUCED MICROCODE
007226	003250	13760		JMP	SLOT2+1	ITERATE
		13770				
		13780				
007227	434154	13790	OPTAB	,AC16	*CAL*	TABLE OF PDP-9 OPCODES
007230	444143	13800		,AC16	*DAC*	
007231	525563	13810		,AC16	*JMS*	
007232	447255	13820		,AC16	*DZM*	
007233	544143	13830		,AC16	*LAC*	
007234	705762	13840		,AC16	*XOR*	
007235	414444	13850		,AC16	*ADD*	
007236	644144	13860		,AC16	*TAD*	
007237	704364	13870		,AC16	*XCT*	
007240	516372	13880		,AC16	*ISZ*	
007241	415644	13890		,AC16	*AND*	
007242	634144	13900		,AC16	*SAD*	
007243	525560	13910		,AC16	*JMP*	
007244	607004	13920		JMP	SEAE	
007245	607152	13930		JMP	SLOT	
007246	607105	13940		JMP	SOPR	

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MTSS DEBUGGER -- INVAL SUBROUTINE

,STITL MTSS DEBUGGER -- INVAL SUBROUTINE

13950 *
 13960 *
 13970 *
 13980 * INVAL EVALUATES THE NEXT EXPRESSION THE USER HAS TYPED.
 13990 * RETURN IS +1 IF THERE IS NONE
 14000 * +2 IF THE EXPRESSION IS SUCCESSFULLY EVALUATED
 14010 * FORMAT ERROR MESSAGE OTHERWISE

14020 *
 14030 * TEMPORARY VARIABLE USAGE IS:
 14040 * TEMPO -- ACCMULATED VALUE
 14050 * TEMP1 -- LATEST TERM VALUE OR HEAD SYMBOL
 14060 * TEMP2 -- OPERATOR SWITCH
 14070 * TEMP3 -- TELETYPE BUFFER POINTER TO START OF CURRENT WORD
 14080 * TEMP4 -- WORD COUNT AT THE START OF THE CURRENT WORD
 14090 * TEMP5 -- DELIMITER AT THE START OF THE CURRENT WORD
 14100 * TEMP6 -- FLAG FOR VALUE HAS BEEN RECEIVED (NEED FOR PC SIGN)
 14110 * TEMP7 -- #1 FOR OP CODE INPUT ALLOWED (PERMANENT SYMBOL TABLE WILL BE CHECKED)
 14120 * #0 FOR OP CODE INPUT NOT ALLOWED (PERMANENT SYMBOL TABLE WILL NOT BE CHECKED)
 14130 * TEMP8 -- FLAG THAT A PREVIOUS VALUE WAS FROM THE PERMANENT SYMBOL TABLE
 14140 * TEMP9 -- USED BY THE SYMBOL PICK-UP ROUTINE
 14150 * TEMP10 -- USED BY THE SYMBOL PICK-UP ROUTINE

14160 *
 14170 * A SPACE IS A DELIMITER FOR THE VALUE UNLESS THE WORD IT IS DELIMITING IS AN
 14180 * OP CODE AND THE NEXT WORD IS NOT AN OP CODE, IN THAT CASE IT IS AN
 14190 * IMPLIED PLUS.

14200 *
 14210 * A COMMA IS A DELIMITER FOR THE VALUE UNLESS IT IS FOLLOWED BY EITHER
 14220 * X<DELIMITER> OR I<DELIMITER>, IN THAT CASE THE COMMA X OR COMMA I IS
 14230 * REPLACED BY <EXCLAMATION PT>020000.

007247

14250 ENTER INVAL
,PMC SAVE,ON

INVAL

003251					
007247	142000	14260	DZM	TEMPO	INITIALIZE THE ACCMULATED VALUE
007250	142006	14270	DZM	TEMP6	INITIALIZE THE VALUE RECEIVED FLAG
007251	767456	14280	LAW	INPLU	
007252	042002	14290	DAC	TEMP2	INITIALIZE THE OPERATOR SWITCH TO PLUS
007253	142010	14300	DZM	TEMP8	INITIALIZE THE PREVIOUS VALUE FLAG
007254	103260	14310	JMS	SYMBOL	BUILD THE ASSUMED SYMBOLIC INPUT
007255	607432	14320	JMP	INULL	NO INPUT AVAILABLE -- REQUIRES FURTHER CHECKS
007256	442006	14330	INX	TEMP6	FLAG A NON-NULL SYMBOL
007257	202007	14340	LAC	TEMP7	LOAD THE OP CODES FLAG
007260	741200	14350	SNA		SKIP IF THEY ARE ALLOWED
007261	607264	14360	JMP	INV3	ELSE DO NOT CHECK THE PERMANENT SYMBOL TABLE
		14370			
		14380			SEARCH ONE OR BOTH SYMBOL TABLES FOR THE SYMBOL WE HAVE BUILT. RETURN
		14390			WITH THE SYMBOL VALUE IN TEMP1.
		14400			
007262	103266	14410	JMS	PSRCH	SEARCH THE PERMANENT SYMBOL TABLE
007263	607302	14420	JMP	INV6	SUCCESS -- FURTHER CHECKS NEEDED
		14430			
		14440			THE SYMBOL IS NOT FROM THE PERMANENT SYMBOL TABLE

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MTSS DEBUGGER -- INVAL SUBROUTINE

007264	14450	*				
007264	14460	INV3	...			
007264	14470		LAC	TEMP8	LOAD THE PREVIOUS SYMBOL TYPE	
007265	14480		SZA		SKIP IF IT WAS NOT FROM THE PERMANENT SYMBOL TABLE	
007266	14490		JMP	INV4	ELSE WE ARE O.K.	
007267	14500		LAC	TEMP2	IF SO, LOAD THE OLD DELIMITER	
007270	14510		SAD	(LAW INSPA)	OLD DELIMITER WAS A SPACE -- BACK THE POINTERS AND EXIT	
007271	14520		JMP	INV62	OLD DELIMITER WAS A COMMA -- BACK THE POINTERS AND EXIT	
007272	14530		SAD	(LAW INCOM)		
007273	14540		JMP	INV62		
007274	14550	INV4	...			
007274	14560		JMS	USRCH	NOW SEARCH THE USER SYMBOL TABLE (IF ANY)	
007275	14570		JMP	TEMP2,X	SUCCESS -- DO THE INDICATED OPERATION	
007276	14580		LAC	TEMP2	FAILURE -- LOAD THE BRANCH CONTROL	
007277	14590		SAD	(LAW INCOM)	CHECK FOR A PREVIOUS COMMA	
007300	14600		JMP	INCOM	IF SO, HANDLE IT	
007301	14610		JMP	INV30	ELSE SEE IF IT WAS A NUMBER	
	14620					
007302	14630	INV6	...			
007302	14640		DZM	TEMP7	FLAG NO MORE OP CODES ALLOWED	
007303	14650		DAC	TEMP1	SAVE THE VALUE	
007304	14660		LAC	TEMP8	LOAD THE PREVIOUS VALUE FLAG	
007305	14670		SNA;CLA;CMA		SKIP IF THE PREVIOUS VALUE WAS A PERMANENT SYMBOL	
007306	14680		JMP	INV61	ELSE WE ARE O.K.	
007307	14690		LAC	TEMP2	LOAD THE BRANCH CONTROL	
007310	14700		SAD	(LAW INSPA)	SEE IF THE PREVIOUS DELIMITER WAS A SPACE	
007311	14710		SKP		IF SO, FORGET THIS SYMBOL AND EXIT	
007312	14720		JMP	INV61	IF NOTI THIS SYMBOL IS O.K.	
007313	14730	INV62	LAC	TEMP3		
007314	14740		DAC	TSBPTR	RESTORE THE TELETYPE BUFFER POINTER	
007315	14750		LAC	TEMP4		
007316	14760		DAC	T\$COUNT	RESTORE THE PREVIOUS WORD COUNT	
007317	14770		LAC	TEMP5		
007320	14780		DAC	TSDELMTR	RESTORE THE PREVIOUS DELIMITER	
007321	14790		JMP	INV49	EXIT THIS ROUTINE	
007322	14800	INV61	DAC	TEMP8	SET THE FLAG THAT THIS VALUE IS FROM THE PERMANENT SYMBOL TABLE	
007323	14810		LAC	TEMP1	RELOAD THE VALUE FOUND	
007324	14820		JMP	TEMP2,X	DO THE OPERATION	
	14830	*				
	14840	*			THE SYMBOL IS UNRECOGNIZABLE -- MAYBE IT IS A NUMBER	
	14850	*				
007325	14860	INV30	...			
007325	14870		LAC	TEMP3		
007326	14880		DAC	TSBPTR	BACK UP TO THE START OF THE LAST WORD	
007327	14890		LAC	TEMP4	RELOAD THE LATEST COUNT	
007330	14900		DAC	T\$COUNT	AND BACK IT UP TO THE PREVIOUS WORD	
007331	14910		LAC	TEMP5		
007332	14920		DAC	TSDELMTR	RESTORE THE PREVIOUS DELIMITER	
007333	14930		NUM		AND TRY READING THE INPUT AS A NUMBER	
007334	14940		SKP		FAILURE -- INPUT IS NOT RECOGNIZABLE	
007335	14950		JMP	TEMP2,X	DO THE OPERATION	
007336	14960		LAC	TEMP8		

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007337	741200	14970	SNA				
007340	613165	14980	JMP	MSG87	TRULY AN ILLEGAL SYMBOL		
007341	607313	14990	JMP	INV62	ELSE EXIT NORMALLY AFTER BACKING THE POINTERS		
		15000	*				
		15010	*				
		15020	*	NOW THE OPERATION IS DONE -- CHECK WHETHER OR			
		15030	*	NOT THERE ARE MORE TERMS TO COME			
		15040	*				
007342		15050	INV45	...			
007342		15060	DELIM		LOAD THE DELIMITER		
007343	553371	15070	SAD	(SEXCLAM)	(!)		
007344	607405	15080	JMP	INV31			
007345	553372	15090	SAD	(SAMPRSN)	(@)		
007346	607407	15100	JMP	INV32			
007347	553373	15110	SAD	(\$STAR)	(*)		
007348	607411	15120	JMP	INV33			
007349	553374	15130	SAD	(\$PLUS)	(+)		
007352	607413	15140	JMP	INV34			
007353	553375	15150	SAD	(\$MINUS)	(-)		
007354	607415	15160	JMP	INV35			
007355	553376	15170	SAD	(\$BLASH)	(/)		
007356	607421	15180	JMP	INV36			
007357	553377	15190	SAD	(\$BSLASH)	(\)		
007360	607423	15200	JMP	INV37			
007361	553390	15210	SAD	(\$SPACE)	()		
007362	607425	15220	JMP	INV38			
007363	553400	15230	SAD	(SCOMMA)	(,)		
007364	607427	15240	JMP	INV381			
		15250	*				
		15260	*	THE DELIMITER IS NOT AN OPERATOR, RELOAD THE VALUE AND EXIT			
		15270	*				
007365	202050	15280	INV49	LAC	INDIR	LOAD THE INDIRECT FLAG	
007366	740200	15290	SZA			SKIP IF NO INDIRECT HAS BEEN INDICATED	
007367	607375	15300	JMP	INV48			
007370	202006	15310	LAC	TEMP6		LOAD THE VALUE RECEIVED FLAG	
007371	740200	15320	SZA			SKIP IF NONE HAS BEEN RECEIVED	
007372	443251	15330	INX	INVAL		ELSE BUMP THE RETURN TO INDICATE SUCCESS	
007373	202000	15340	LAC	TEMPO		RELOAD THE ACCUMULATED VALUE	
007374	623251	15350	RET	INVAL,X		AND EXIT	
		15360					
007375		15370	INV48	...			
007375	777777	15380	LAW	-1		COUNT THE INDIRECT LEVEL DOWN	
007376	342050	15390	TAD	INDIR			
007377	042050	15400	DAC	INDIR			
007400	202000	15410	LAC	TEMPO		LOAD THE ADDRESS FOR THE INDIRECTION	
007401	103312	15420	JMS	LOCAT		FIND IT IN THE OPEN FILE	
007402	222162	15430	LAC	BPTR,X		LOAD THE INDIRECT WORD	
007403	042000	15440	DAC	TEMPO		SET THE NEW VALUE	
007404	607365	15450	JMP	INV49		FINISH UP AND EXIT	
		15460					
007405	767522	15470	INV31	LAW	INIOR		LOGICAL OR
007406	607430	15480	JMP	INV39			

D MTSS DEBUGGER -- INVAL SUBROUTINE

007407	767516	15490	INV32	LAW	INAND	LOGICAL AND
007410	607430	15500		JMP	INV39	
007411	767465	15510	INV33	LAW	INMUL	MULTIPLICATION
007412	607430	15520		JMP	INV39	
007413	767456	15530	INV34	LAW	INPLU	ADDITION
007414	607430	15540		JMP	INV39	
007415	767462	15550	INV35	LAW	INMIN	LOAD THE SUBTRACT SWITCH
007416	542002	15560		SAD	TEMP2	CHECK THE OLD SWITCH FOR ALSO SUBTRACTION
007417	607413	15570		JMP	INV34	YES, AND TWO MINUSES MAKE A PLUS
007420	607430	15580		JMP	INV39	NO, SO SET UP THE SUBTRACTION
007421	767471	15590	INV36	LAW	INDIV	DIVISION
007422	607430	15600		JMP	INV39	
007423	767520	15610	INV37	LAW	INXOR	LOGICAL EXCLUSIVE OR
007424	607430	15620		JMP	INV39	
007425	767461	15630	INV38	LAW	INSPA	SPACE MAY TERMINATE THE VALUE OR MAY BE <OPCODE> <ADDRESS>
007426	607430	15640		JMP	INV39	
007427	767531	15650	INV381	LAW	INCOM	COMMA MAY TERMINATE THE VALUE OR INDICATE INDIRECT ADDRESSING
		15660				
007430	042002	15670	INV39	DAC	TEMP2	SET THE NEW OPERATOR SWITCH
007431	607254	15680		JMP	INV2	GET THE NEXT TERM
		15690	*			
		15700	*			
		15710	*	THE FIRST WORD OF INPUT IS A NULL, IF THE DELIMITER IS A DOLLAR SIGN (\$)		
		15720	*	THEN A SYMBOL FOLLOWS, IF IT IS AN INDIRECT SIGN, THEN INDIRECT		
		15730	*	ADDRESSING IS BEING REQUESTED, OTHERWISE IT IS TRUE NULL INPUT.		
		15740	*			
007432		15750	INULL	...		
007432	202005	15760		LAC	TEMP5	GET THE DELIMITER
007433	550325	15770		SAD	PCSGN	CHECK FOR THE CURRENT PROGRAM COUNTER SIGN
007434	607443	15780		JMP	INPC	YES -- GO SET IT UP
007435		15790	DELIM			GET THE LAST DELIMITER
007436	550316	15800		SAD	INDSN	CHECK FOR AN INDIRECT ADDRESS REQUEST
007437	741000	15810		SKP		
007440	607342	15820		JMP	INV45	NOW CHECK FOR A LOGICAL OR ARITHMETIC OPERATOR
		15830	*			
		15840	*	INDIRECT ADDRESSING HAS BEEN REQUESTED		
		15850	*			
007441	442050	15860	ININD	INX	INDIR	FLAG THE REQUEST FOR INDIRECTION
007442	607254	15870		JMP	INV2	AND GET THE NEXT WORD
		15880	*			
		15890	*	USE THE CURRENT VALUE OF THE PC, TERMINATED BY AN IMPLIED PLUS SIGN		
		15900	*			
007443		15910	INPC	...		
007443	442006	15920		INX	TEMP6	FLAG THERE HAS BEEN AT LEAST ONE COMMAND COMPLETED
007444	202002	15930		LAC	TEMP2	LOAD THE BRANCH CONTROL
007445	553367	15940		SAD	(LAW INSPA)	CHECK FOR PREVIOUS DELIMITER WAS A SPACE
007446	607453	15950		JMP	INPC1	YES -- BACK UP THE POINTERS AND EXIT
007447	553370	15960		SAD	(LAW INCOM)	CHECK FOR A COMMA
007450	607453	15970		JMP	INPC1	YES -- BACK UP THE POINTERS AND EXIT
007451	202043	15980		LAC	PC	LOAD THE PC TO USE AS THE VALUE
007452	622002	15990		JMP	TEMP2,X	AND INCLUDE IT IN THE CALCULATIONS
		16000				

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007453	16010	INPC1	DELIM	GET THE REAL DELIMITER
007454	042005	16020	DAC	AND SET IT FOR RESTORATION
007455	607313	16030	JMP	BACK UP THE POINTERS AND EXIT

D

MTSS DEBUGGER -- INVAL SUBROUTINE

	16040	.EJECT		
	16050	*		
	16060	*		
	16070	*	LOGICAL AND ARITHMETIC OPERATIONS SECTION	
	16080	*	COMBINE THE AC WITH TEMPO, STORE THE RESULT IN TEMPO, AND RETURN TO THE MAIN ROUTINE	
	16090	*		
007456	16100	INPLU	...	TEMPO := TEMPO + AC
007456 342000	16110	TAD	TEMPO	
007457 042000	16120	DAC	TEMPO	
007460 607342	16130	JMP	INV45	
	16140			
	16150			
007461	16160	INSPA	...	SPACE == TEMPO := TEMPO + AC
007461 607456	16170	JMP	INPLU	
	16180			
	16190			
007462	16200	INMIN	..,	TEMPO := TEMPO - AC
007462	16210	NEG		NEGATE THE AC
007464 607456	16220	JMP	INPLU	THEN IS SAME AS ADDITION
	16230			
	16240			
007465	16250	INMUL	...	TEMPO := TEMPO * AC
007465 652000	16260	LMO		SET THE MULTIPLICAND
007466 213401	16270	LAC	(MULS)	LOAD A MULTIPLY INSTRUCTION
007467 103253	16280	JMS	MULDIV	DO THE MULTIPLICATION
007470 741400	16290	SZL		MULTIPLY TEST FOR A NEED TO ADJUST THE ONE'S COMPLEMENT ANSWER
	16300			
	16310			
007471	16320	INDIV	...	TEMPO := TEMPO/AC
007471 652000	16330	LMO		SET THE DIVISOR
007472 213402	16340	LAC	(IDIVS)	LOAD A DIVIDE INSTRUCTION
007473 103253	16350	JMS	MULDIV	DO THE DIVISION
007474 741100	16360	SPA		DIVIDE TEST FOR A NEED TO ADJUST THE ONE'S COMPLEMENT ANSWER
	16370			
	16380			
007475	16390	ENTER	MULDIV	
		,PMC	SAVE,ON	
003253		MULDIV	..,	
007475 043255	16400	DAC	MD1	SET THE INSTRUCTION
007476 202000	16410	LAC	TEMPO	LOAD THE MULTIPLIER/DIVIDEND
007477 741100	16420	SPA		
007500 353332	16430	TAD	(-1)	NEED TO ADJUST NEGATIVE NUMBERS TO BE ONE'S COMPLEMENT
007501 042000	16440	DAC	TEMPO	RESTORE THE MULTIPLIER/DIVIDEND
007502 641002	16450	LACQ		LOAD THE MULTIPLICAND/DIVISOR
007503 741100	16460	SPA		
007504 353332	16470	TAD	(-1)	NEED TO ADJUST NEGATIVE NUMBERS TO BE ONE'S COMPLEMENT
007505 664000	16480	BSM		SET UP FOR THE OPERATION
007506 043256	16490	DAC	MD2	SET THE OPERAND
007507 202000	16500	LAC	TEMPO	
007510 603255	16510	JMP	MD1	DO THE OPERATION
003255	16520	,USE	IMPURE	
003255 740040	16530	MD1	XX	SET THE MULTIPLY/DIVIDE INSTRUCTION HERE

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		D		MTSS DEBUGGER -- INVAL SUBROUTINE			
003256	740040	16540	MD2	XX			SET THE MULTIPLICAND/DIVISOR HERE
003257	607511	16550		JMP	MD4		RETURN TO PURE CODE
007511		16560		,USE	PURE		
007511		16570	MD4	...			
007511	740010	16580		RAL			MOVE THE SIGN OF THE PRODUCT TO THE LINK
007512	641002	16590		LACQ			LOAD THE RESULT
007513	423253	16600		XCT	MULDIV,X		TEST THE NEED TO ADJUST TO BE ONE'S COMPLEMENT
007514	353331	16610		TAD	(1)		IF YES, MAKE THE ADJUSTMENT
007515	607457	16620		JMP	INPL2		SAVE THE RESULT AND EXIT
		16630					
		16640					
007516		16650	INAND	...			TEMPO != TEMPO (AND) AC
007516	502000	16660		AND	TEMPO		DO THE AND
007517	607457	16670		JMP	INPL2		SAVE THE RESULT AND EXIT
		16680					
007520		16690					
007520		16700	INXOR	...			TEMPO != TEMPO (EXCLUSIVE OR) AC
007520	242000	16710		XOR	TEMPO		
007521	607457	16720		JMP	INPL2		SAVE THE RESULT AND EXIT
		16730					
007522		16740					
007522	042001	16750	INIOR	...			TEMPO != TEMPO (INCLUSIVE OR) AC
007523	740001	16760		DAC	TEMP1		
007524	502000	16770		CMA			
007525	242001	16780		AND	TEMPO		
007526	607457	16790		XOR	TEMP1		
		16800		JMP	INPL2		SAVE THE RESULT AND EXIT
		16810					
		16820					
007527	000070	16830	COMX	,AC16	♦ X♦		
007530	000051	16840	COMI	,AC16	♦ I♦		
007531		16850	INCOM	...			PREVIOUS DELIMITER WAS COMMA -- TERMINATOR OR INDIRECT ADDRESSING?
007531	203326	16860		LAC	TSWORDB		LOAD THE UPPER HALF OF THE SYMBOL
007532	740200	16870		SZA			SKIP IF THERE IS NONE
007533	607313	16880		JMP	INV62		OOPS -- NOT INDIRECT -- BACK UP THE POINTERS AND EXIT
007534	203327	16890		LAC	TSWORDB+1		LOAD THE LOWER HALF OF THE SYMBOL
007535	547527	16900		SAD	COMX		
007536	607542	16910		JMP	INC M2		INDIRECT ADDRESSING
007537	547530	16920		SAD	COMI		
007540	607542	16930		JMP	INC M2		INDIRECT ADDRESSING
007541	607313	16940		JMP	INV62		NO INDIRECT ADDRESSING -- BACK UP AND EXIT
		16950					
007542	213360	16960	INC M2	LAC	(020000)		LOAD THE INDIRECT ADDRESS BIT
007543	607522	16970		JMP	INIOR		AND PUT IT IN THE VALUE

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MTSS DEBUGGER -- SYMBOL PICKUP SUBROUTINE

16980 * ,STITL MTSS DEBUGGER -- SYMBOL PICKUP SUBROUTINE

16990 *

17000 *

17010 * THIS SUBROUTINE EXAMINES THE INPUT STRING CHARACTER BY CHARACTER TO BUILD
17020 * A LEGAL SYMBOL IN TSWORDB AND TSWORDB+1 IF POSSIBLE. EXITS ARE:
17030 * *1 -- NULL INPUT -- FIRST CHARACTER IS A NON-SPACE DELIMITER
17040 * *2 -- SYMBOL SUCCESSFULLY BUILT AND STORED IN TSWORDB & TSWORDB+1
17050 * ELSE -- ILLEGAL SYMBOL ERROR MESSAGE

17060 *

17070 * TEMPORARY VARIABLE USAGE:
17080 * TEMP3 -- SAVE TTY BUFFER POINTER IN CASE RESTORATION IS LATER NEEDED
17090 * TEMP4 -- SAVE WORD COUNT IN CASE LATER RESTORATION IS NEEDED
17100 * TEMP9 -- NUMBER OF CHARACTERS IN THE MAIN PART OF THIS SYMBOL
17110 * TEMP10 -- HEAD SYMBOL

17120 *

17130 *

17140 007544 MQOR ,OPDEF 642000 OR THE AC TO THE MO

17150 17160 ENTER SYMBOL
,PMC SAVE,ON

003260 SYMBOL ...

17170 *

17180 * FIRST SAVE THE TELETYPE BUFFER POINTERS SO WE CAN BACK UP LATER IF NECESSARY

17190 *

007544 203451 17200 LAC TSBPTR

007545 042003 17210 DAC TEMP3 SET THE CHARACTER POINTER

007546 203456 17220 LAC TSCOUNT

007547 042004 17230 DAC TEMP4 SAVE THE COUNT

007550 17240 DELIM

007551 042005 17250 DAC TEMP5 SAVE THE DELIMITER

17260 *

17270 * INITIALIZE THE INPUT, THROWING AWAY LEADING BLANKS

17280 *

007552 777771 17290 LAW -7

007553 042011 17300 DAC TEMP9 INITIALIZE THE CHARACTER COUNT

007554 142012 17310 DZM TEMP10 INITIALIZE TO NO HEAD SYMBOL

007555 103477 17320 JMS TSINTIN RETURN +1 WITH A DELIMITER; ELSE +2

007556 607640 17330 JMP SYMB1 INITIAL DELIMITER SPECIAL -- PERIOD AMBIGUOUS; DOLLAR SIGN HEAD SYMBOL

17340 *

17350 * FIRST CHARACTER

17360 *

007557 443260 17370 SYMB3 INX SYMBOL BUMP THE RETURN FOR A NON-VACUOUS SYMBOL

007560 103475 17380 JMS TSFGET GET THE FIRST CHARACTER

007561 103501 17390 JMS TSCHRID IDENTIFY IT

007562 103262 17400 JMS SYMB4 ROUTINELY ANALYZE THE DELIMITER

007563 740000 17410 NOP LETTERS ARE NOT SPECIAL

007564 353403 17420 SYMB31 TAD (-240) MAKE IT SIXBIT

007565 650614 17430 CLO1LLS 12, MOVE IT TO THE FIRST CHARACTER POSITION

007566 043326 17440 DAC TSWORDB SAVE IT

007567 442011 17450 INX TEMP9 COUNT THE FIRST ELEMENT OF THE SYMBOL

17460 *

17470 * THE SECOND CHARACTER IS ALSO SPECIAL -- IF IT IS A DOLLAR SIGN (\$)

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		17480	*	THE FIRST CHARACTER WAS A HEAD SYMBOL -- OTHERWISE THE FIRST CHARACTER
		17490	*	WAS THE TRUE FIRST CHARACTER OF THE MAIN SYMBOL.
		17500	*	
007570	103475	17510	JMS	TSFGET GET THE SECOND CHARACTER
007571	103501	17520	JMS	TSCHR1D IDENTIFY IT
007572	607671	17530	JMP	SYMB2 DELIMITERS HERE REQUIRE SPECIAL ANALYSIS
007573	740000	17540	NOP	LETTERS ARE NOT SPECIAL
		17550	*	
		17560	*	THE SECOND CHARACTER IS EITHER A LETTER OR A DIGIT. THEREFORE THE
		17570	*	PREVIOUS CHARACTER WAS NOT A HEAD SYMBOL.
		17580	*	
007574	442011	17590	SYMB25	INX TEMP9 COUNT THE SYMBOL ELEMENT
007575	353403	17600		TAD (-240) CONVERT TO SIXBIT
007576	660706	17610	ALSS	6 MOVE THE CHARACTER TO THE SECOND CHARACTER POSITION
007577	243326	17620	XOR	TSWORDB CONCATENATE WITH THE FIRST CHARACTER
007600	043326	17630	DAC	TSWORDB SAVE THEM
		17640	*	
		17650	*	GET THE THIRD CHARCTER AND STORE IT; THEN STORE THE FIRST HALF OF THE SYMBOL
		17660	*	
007601	103475	17670	JMS	TSFGET GET THE THIRD CHARCTER
007602	103501	17680	JMS	TSCHR1D IDENTIFY IT
007603	103262	17690	JMS	SYMB4 DO THE STANDARD DELIMITER ANALYSIS ON IT
007604	740000	17700	NOP	LETTERS ARE NOT SPECIAL
007605	442011	17710	INX	TEMP9 COUNT THE THIRD CHARACTER
007606	353403	17720	TAD	(-240) MAKE ASCII
007607	243326	17730	XOR	TSWORDB ACCUMULATE IN THE AC WITH THE FIRST TWO CHARACTERS
007610	043326	17740	DAC	TSWORDB SAVE THE FIRST HALF OF THE SYMBOL
		17750	*	
		17760	*	GET THE LOWER HALF OF THE SYMBOL
		17770	*	
007611	651000	17780	EAECLA!CLQ	INITIALIZE THE SECOND HALF ACCUMULATION
007612	103264	17790	JMS	SYMB5 GET THE FOURTH SIXBIT CHARACTER IIN AC(12-17)
007613	660714	17800	ALSS	12. MOVE IT TO THE FOURTH CHARACTER POSITION
007614	103264	17810	JMS	SYMB5 SAVE IT AND GET THE NEXT CHARACTER
007615	660706	17820	ALSS	6 MOVE IT TO THE FIFTH CHARCTER POSITION
007616	103264	17830	JMS	SYMB5 SAVE IT AND GET THE NEXT CHARACTER
007617	642000	17840	MQDR	SAVE THE SIXTH CHARACTER
007620	142012	17850	DZM	TEMP10 THE HEAD SYMBOL IS CANCELLED DUE TO SIX OR MORE CHARS IN MAIN SYMBOL
		17860	*	
		17870	*	
007621	103475	17880	SYMB6	JMS TSFGET GET THE NEXT SYMBOL
007622	103501	17890	JMS	TSCHR1D IDENTIFY IT
007623	103262	17900	JMS	SYMB4 DO THE STANDARD DELIMITER ANALYSIS
007624	607621	17910	JMP	SYMB6 ELSE LOOP TO THROW AWAY THE CHARACTER
		17920	*	
		17930	*	THE SYMBOL IS COMPLETE -- RIGHT JUSTIFY IT AND RESTORE THE HEAD SYMBOL
		17940	*	
007625	203326	17950	SYMB7	LAC TSWORDB LOAD THE HIGH-ORDER HALF OF THE SYMBOL
007626	442011	17960	SYMB71	ISZ TEMP9 CHECK FOR JUSTIFICATION COMPLETE
007627	745000	17970	SKPICLL	NO -- PROTECT THE SHIFT AND JUSTIFY BY ONE MORE CHARACTER
007630	607633	17980	JMP	SYMB8 SYMBOL IS JUSTIFIED
007631	640506	17990	LRS	6 JUSTIFY BY ONE MORE CHARACTER

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MTSS DEBUGGER -- SYMBOL PICKUP SUBROUTINE

007632	607626	18000		JMP	SYMB71	SEE IF MORE JUSTIFICATION IS NEEDED
		18010				
007633	242012	18020	SYMB88	XOR	TEMP10	PUT ANY HEAD SYMBOL INTO THE SYMBOL
007634	043326	18030		DAC	T\$WORDB	STORE THE UPPER HALF SYMBOL
007635	641002	18040		LACQ		
007636	043327	18050		DAC	T\$WORDB+1	STORE THE LOWER HALF OF THE SYMBOL
007637	623260	18060		RET	SYMBOL,X	EXIT
		18070				
		18080				
007640	553404	18090	SYMB1	SAD	(\$PERIOD)	
007641	607647	18100		JMP	SYMB11	FURTHER CHECKS NEEDED IF PERIOD WAS THE FIRST CHARACTER
007642	553362	18110		SAD	(\$DOLLAR)	
007643	607557	18120		JMP	SYMB3	DOLLAR SIGN FOR THE FIRST SYMBOL MERELY DENOTES NO HEAD SYMBOL
007644	553405	18130		SAD	(\$SHARP)	
007645	607660	18140		JMP	SYMB13	SHARP SIGN IS A NORMAL CHARACTER IN THE SYMBOL
007646	623260	18150		RET	SYMBOL,X	IMMEDIATE RETURN FOR NULL INPUT
		18160				
007647		18170	SYMB11	...		
007647	042005	18180		DAC	TEMP5	SAVE THE PERIOD
007650	103475	18190		JMS	T\$FGET	GET THE CHARACTER AFTER THE PERIOD
007651	103501	18200		JMS	T\$CHR1D	IDENTIFY IT
007652	623260	18210		RET	SYMBOL,X	EXIT -- MEANS TO USE THE PC
007653	740000	18220		NOP		LETTERS ARE NOT SPECIAL
007654	777776	18230		LAW	-2	LOAD THE AMOUNT TO BACK UP TO INCLUDE THE PERIOD IN THE SYMBOL
007655	343451	18240	SYMB14	TAD	T\$BPTR	ADD THE TELETYPE BUFFER POINTER
007656	043451	18250		DAC	T\$BPTR	STORE THE BACKED-UP POINTER
007657	607557	18260		JMP	SYMB3	PERIOD IS A LEGAL COMPONENT OF THE SYMBOL
007660	777777	18270	SYMB13	LAW	-1	LOAD THE AMOUNT TO BACK UP FOR A SHARP SIGN
007661	607655	18280		JMP	SYMB14	DO IT
		18290				
		18300				
007662		18310		ENTER	SYMB4	STANDARD DELIMITER ANALYSIS
				,PMC	SAVE,ON	
003262			SYMB4	...		
007662	553362	18320		SAD	(\$DOLLAR)	
007663	613177	18330		JMP	MSG88	ILLEGAL HEAD SYMBOL ATTEMPT
007664	553405	18340		SAD	(\$SHARP)	
007665	623262	18350		RET	SYMB4,X	SHARP SIGN IS A LEGAL SYMBOL COMPONENT
007666	553404	18360		SAD	(\$PERIOD)	
007667	623262	18370		RET	SYMB4,X	PERIOD IS A LEGAL SYMBOL COMPONENT
007670	607625	18380		JMP	SYMB7	ELSE THE SYMBOL HAS BEEN COMPLETED
		18390				
007671	553362	18400	SYMB2	SAD	(\$DOLLAR)	
007672	607675	18410		JMP	SYMB21	DOLLAR SIGN MEAN THE FIRST CHARACTER WAS A HEAD SYMBOL
007673	103262	18420		JMS	SYMB4	ELSE DO NORMAL DELIMITER ANALYSIS
007674	607574	18430		JMP	SYMB25	RETURN
		18440				
007675	202012	18450	SYMB21	LAC	TEMP10	LOAD THE PREVIOUS HEAD SYMBOL
007676	740200	18460		SZA		SKIP IF NONE
007677	613177	18470		JMP	MSG88	ELSE A SECOND DOLLAR SIGN IS AN ILLEGAL HEAD SYMBOL CONSTRUCTION
007700	641002	18480		LACQ		
007701	042012	18490		DAC	TEMP10	SET THE VALID HEAD SYMBOL

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		D	MTSS DEBUGGER -- SYMBOL PICKUP SUBROUTINE		
007702	777771	18500	LAW	-7	RELOAD THE CHARCTER COUNT
007703	042011	18510	DAC	TEMP9	AND RESET IT
007704	607557	18520	JMP	SYMB3	GET A NEW FIRST CHARACTER
		18530			
		18540			
007705		18550	ENTER	SYMB5	STORE THE PREVIOUS CHARACTER AND GET A NEW SIXBIT CHAR IN AC(12-17)
			,PMC	SAVE,ON	
003264		SYMB5	...		
007705	642000	18560	MQOR		ACCUMULATE THE NEW CHARACTER IN THE MQ WITH THE PREVIOUS ONES
007706	103475	18570	JMS	TSFGET	GET THE NEXT CHARACTER
007707	103501	18580	JMS	TSCHRID	IDENTIFY IT
007710	103262	18590	JMS	SYMB4	ANALYZE A DELIMITER
007711	740000	18600	NOP		LETTERS ARE NOT SPECIAL
007712	442011	18610	INX	TEMP9	COUNT THE CHARACTER
007713	353403	18620	TAD	(=240)	MAKE IT ASCII
007714	623264	18630	RET	SYMB5,X	

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MTSS DEBUGGER -- SYMBOL TABLE LABEL SEARCH SUBROUTINES

	18640		.STITL MTSS DEBUGGER -- SYMBOL TABLE LABEL SEARCH SUBROUTINES
	18650	*	
	18660	*	
	18670	*	SEARCH THE INDICATED SYMBOL TABLE FOR THE LABEL PASSED IN TSWORD8 AND
	18680	*	T\$WORD8+1, RETURN TO THE CALLER +2 IF THE LABEL CANNOT BE FOUND;
	18690	*	+1 WITH THE VALUE IN THE AC IF IT IS FOUND
	18700	*	TEMP1 IS USED AS A COUNTER
	18710	*	
007715	18720	ENTER ,PMC	SEARCH THE PERMANENT SYMBOL TABLE FOR A LABEL MATCH
		PSRCH SAVE,ON	
003266		...	
007715	773447	18730	LAW SYMO-1 LOAD A POINTER TO THE PERMANENT SYMBOL TABLE
007716	103272	18740	JMS SRCH SEARCH IT
007717	443266	18750	INX PSRCH BUMP THE RETURN IF WE FAILED TO FIND A MATCH
007720	623266	18760	RET PSRCH,X EXIT
	18770		
	18780		
007721	18790	ENTER ,PMC	SEARCH THE USER SYMBOL TABLE FOR A LABEL MATCH
		USRCH SAVE,ON	
003270		...	
007721	774564	18800	LAW SYM1-1 LOAD A POINTER TO THE USER SYMBOL TABLE
007722	103272	18810	JMS SRCH AND SEARCH IT
007723	443270	18820	INX USRCH BUMP THE RETURN IF WE FAILED TO FIND A MATCH
007724	623270	18830	RET USRCH,X EXIT
	18840	*	
	18850	*	
	18860	*	SEARCH THE SYMBOL TABLE BEGINNING AT THE POINTER PASSED IN THE AC
	18870	*	+1 WITH THE VALUE IN THE AC IF IT IS FOUND
	18880	*	FOR FAILURE, RETURN +2 WITH THE VALUE IN THE AC FOR SUCCESS.
	18890	*	
007725	18900	ENTER ,PMC	SET THE SYMBOL TABLE POINTER
		SRCH SAVE,ON	
003272		...	
007725	040010	18910	DAC 10 SET MINUS THE NUMBER OF SYMBOLS IN THIS TABLE
007726	220010	18920	LAC 10,X
007727	042001	18930	DAC TEMP1
007730	18940	SRCH1	...
007730	442001	18950	ISZ TEMP1 DONE??
007731	741000	18960	SKP NO
007732	623272	18970	RET SRCH,X YES -- RETURN +1 FOR FAILURE
007733	220010	18980	LAC 10,X LOAD THE FIRST HALF OF THE NEXT SYMBOL
007734	543326	18990	SAD TSWORD8 NO -- TEST AGAINST THE GIVEN SYMBOL
007735	741000	19000	SKP GOOD MATCH -- KEEP ON TRYING
007736	607743	19010	JMP SRCH2 NO MATCH -- TRY THE NEXT SYMBOL
007737	220010	19020	LAC 10,X LOAD THE SECOND HALF OF THE SYMBOL
007740	543327	19030	SAD TSWORD8+1 AND TEST IT
007741	607746	19040	JMP SRCH4 EUREKA...
007742	741000	19050	SKP
	19060		
007743	440010	19070	SRCH2 INX 10 MOVE THE POINTER BY THE SECOND HALF OF THE SYMBOL
007744	440010	19080	INX 10 MOVE THE POINTER BY THE VALUE
007745	607730	19090	JMP SRCH1 LOOP

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MTSS DEBUGGER -- SYMBOL TABLE LABEL SEARCH SUBROUTINES

007746	19100	SRCH4	...	
007746	220010	19110	LAD	10,X
007747	443272	19120	INX	SRCH
007750	623272	19130	RET	SRCH,X

LOAD THE VALUE OF THE FOUND SYMBOL
BUMP THE RETURN FOR SUCCESS

D

MTSS DEBUGGER -- SYMBOL TABLE VALUE SEARCH SUBROUTINES

	19140		,STITL	MTSS DEBUGGER -- SYMBOL TABLE VALUE SEARCH SUBROUTINES
	19150	*		
	19160	*		
007751	19170		ENTER ,PMC	PVSCH SAVE,ON
			...	SEARCH THE PERMANENT SYMBOL TABLE FOR THE CLOSEST MATCH TO VALUE IN TEMPO
003274		PVSCH	LAW	SYMO-1
007751 773447	19180		JMS	VSRCH
007752 103300	19190		RET	PVSCH,X
007753 623274	19200			
	19210			
	19220			
007754	19230		ENTER ,PMC	UVSCH SAVE,ON
			...	SEARCH THE USER SYMBOL TABLE FOR THE CLOSEST MATCH TO THE VALUE IN TEMPO
003276		UVSCH	LAW	SYM1-1
007754 774564	19240		JMS	VSRCH
007755 103300	19250		RET	UVSCH,X
007756 623276	19260			
	19270	*		
	19280	*		
	19290	*		
	19300	*		
	19310	*		
	19320	*		
	19330	*		
	19340	*		
	19350	*		
	19360	*		
	19370	*		
	19380	*		
	19390	*		
007757	19400		ENTER ,PMC	VSRCH SAVE,ON
003300		VSRCH	...	
007757 040010	19410		DAC	10
007760 220010	19420		LAC	10,X
007761 042002	19430		DAC	TEMP2
007762 213344	19440		LAC	(377777)
007763 042004	19450		DAC	TEMP4
007764	19460	VSR2	...	
007764 442002	19470		ISZ	TEMP2
007765 741000	19480		SKP	
007766 623300	19490		RET	VSRCH,X
007767 440010	19500		INX	10
007770 440010	19510		INX	10
007771 220010	19520		LAC	10,X
007772	19530		NEG	
007774 342000	19540		TAD	TEMPO
007775 664000	19550		OSM	
007776 652000	19560		LMQ	
007777	19570		NEG	
010001 342004	19580		TAD	TEMP4
010002 741100	19590		SPA	

SEARCH THE SYMBOL TABLE WHOSE POINTER IS PASSED IN THE AC FOR THE CLOSEST MATCH TO THE VALUE PASSED IN TEMPO. RETURN WITH AUTOINDEX REGISTER 10 POINTING TO THE VALUE FOUND.

TEMPORARY VARIABLE USAGE:

- 19340 * TEMP0 -- THE VALUE TO BE MATCHED AS CLOSELY AS POSSIBLE
- 19350 * TEMP2 -- SYMBOL TABLE LENGTH COUNTER
- 19360 * TEMP3 -- POINTER TO THE BEST VALUE FOUND SO FAR
- 19370 * TEMP4 -- ABSOLUTE VALUE OF THE DIFFERENCE BETWEEN THE VALUE SOUGHT AND THE VALUE FOUND

SET THE POINTER TO THE SYMBOL TABLE TO SEARCH

LOAD THE SYMBOL TABLE COUNT

SET THE SYMBOL TABLE LENGTH

LOAD A RIDICULOUS OFFSET

SET IT

CHECK FOR DONE

NOT YET

DONE -- EXIT

MOVE THE POINTER PAST THE FIRST HALF SYMBOL

MOVE THE POINTER PAST THE SECOND HALF-SYMBOL

LOAD THE NEXT VALUE TO BE COMPARED

NEGATE IT

SUBTRACT IT FROM THE DESIRED VALUE

GET SIGN AND MAGNITUDE OF THE DIFFERENCE BETWEEN THE VALUES

SAVE THE MAGNITUDE

NEGATE THE MAGNITUDE

ADD THE OLD BEST MAGNITUDE

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MTSS DEBUGGER -- SYMBOL TABLE VALUE SEARCH SUBROUTINES

010003	607764	19600	JMP	VSR2	THE OLD ONE WAS BETTER -- KEEP IT AND LOOP
010004	200010	19610	LAC	10	
010005	042003	19620	DAC	TEMP3	THE NEW ONE IS BETTER -- RECORD ITS POINTER
010006	641002	19630	LACQ		
010007	042004	19640	DAC	TEMP4	RECORD ITS MAGNITUDE
010010	607764	19650	JMP	VSR2	LOOP

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MTSS DEBUGGER -- SYMBOL TABLE BIT SEARCH SUBROUTINE

19660 *
 19670 *
 19680 *
 19690 * SEARCH THE PERMANENT SYMBOL TABLE FOR THE VALUE WHOSE BITS
 19700 * ARE THE LARGEST SUBSET OF THE BITS IN TEMPO.
 19710 * AND WHOSE MASKED AREA IS IDENTICAL.
 19720 *
 19730 * TEMPORARY VARIABLE USAGE:
 19740 * TEMPO -- THE VALUE WHOSE BITS ARE TO BE MATCHED AS CLOSELY AS POSSIBLE
 19750 * TEMP1 -- SCRATCH
 19760 * TEMP2 -- TABLE LENGTH
 19770 * TEMP3 -- POINTER TO THE BEST VALUE FOUND SO FAR
 19780 * TEMP4 -- NUMBER OF MATCHING BITS IN THE BEST VALUE
 19790 * TEMP5 -- CURRENT VALUE BEING COMPARED
 19800 * TEMP6 -- SCRATCH
 19810 * TEMP7 -- OP CODE FOR THE VALUE
 19820 * TEMP8 -- RETAINING MASK FOR THE OP CODE FIELD
 19830 *

010011	19840	ENTER PBSCH		
		,PMC	SAVE,ON	
003302	PBSCH	...		
010011	773447	19850	LAH SYMO-1	
010012	040010	19860	DAC 10	SET THE TABLE POINTER
010013	220010	19870	LAC 10,X	
010014	042002	19880	DAC TEMP2	
010015	142004	19890	DZM TEMP4	INITIALIZE TO NO BITS MATCHED
010016		19900	ISZ TEMP2	CHECK THE NEXT LIST ELEMENT FOR A BETTER MATCH
010016	442002	19910	SKP	
010017	741000	19920	RET PBSCH,X	CHECK FOR BONE
010020	623302	19930	INX 10	NO
010021	440010	19940	INX 10	YES -- EXIT
010022	440010	19950	LAC 10,X	
010023	220010	19960	DAC TEMP5	MOVE THE POINTER TO THE NEXT VALUE
010024	042005	19970	AND TEMP8	
010025	202010	19980	SAD TEMP7	SET THE NEW VALUE TO COMPARE
010026	542007	19990	SKP	APPLY THE MASK
010027	741000	20000	JMP PBS2	COMPARE THE MASKED AREAS
010030	610016	20010	LAC TEMP7	THEY ARE IDENTICAL, SO CONTINUE
010031	202007	20020	AND (740000)	THEY ARE DIFFERENT; SO TRY THE NEXT ONE
010032	513301	20030	XOR TEMPO	LOAD THE OLD EXTENDED OP CODE
010033	242000	20040	CMA	RECOVER THE OP CODE
010034	740001	20050	AND TEMP5	ADD IN THE VALUE WE ARE TRYING TO MATCH
010035	502005	20060	SZA	FORM THE SUBSET MASK
010036	740200	20070	JMP PBS2	KEEP THOSE BITS NOT IN THE ORIGINAL VALUE
010037	610016	20080	20090	SKIP IF THERE ARE NONE (I.E. SKIP IF NEW IS A SUBSET OF THE OLD)
		20100	*	ELSE LOOP ON THE NEXT SYMBOL
		20110	*	COUNT THE NUMBER OF BITS THE OLD VALUE (TEMPO) AND THE VALUE BEING
		20120	*	TESTED (TEMP5) HAVE IN COMMON, REPLACE THE BEST-VALUE POINTER
		20130	*	IF THIS IS BETTER THAN THE PREVIOUS NUMBER OF COMMON BITS,
010040	142001	20140	DZM TEMP1	ZERO THE COMMON BITS COUNT
010041	777767	20150	LAH -9.	LOAD THE NUMBER OF BIT PAIRS

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010042	042006	20160		DAC TEMP6 SET THE LOOP CONTROL
010043	202000	20170		LAC TEMP0 RELOAD THE OLD VALUE
010044	502005	20180		AND TEMP5 KEEP THOSE BITS THE TWO WORDS HAVE IN COMMON
010045	745010	20190		CLLIRAL!SKP
010046		20200	RBS4	...
010046	742010	20210		RTL MOVE THE NEXT BIT PAIR TO THE LINK AND AC(0)
010047	741400	20220		SZL SKIP UNLESS THE NEXT BIT WAS ON
010050	442001	20230		INX TEMP1 YES -- COUNT IT
010051	741100	20240		SPA SKIP UNLESS THE NEXT BIT WAS ON
010052	442001	20250		INX TEMP1 YES -- COUNT IT
010053	442006	20260		ISZ TEMP6 SEE IF DONE LOOPING
010054	610046	20270		JMP PBS4 NO -- LOOP AGAIN
		20280		
010055	777777	20290		LAW -1
010056	342001	20300		TAD TEMP1
010057	740001	20310		CMA AC = MINUS NUMBER OF COMMON BITS
010060	342004	20320		TAD TEMP4 ADD THE PREVIOUS BEST NUMBER
010061	740100	20330		SMA SKIP IF THE NEW ONE IS BETTER
010062	610016	20340		JMP PBS2 ELSE LOOP -- CHECK THE NEXT VALUE
010063	202001	20350		LAC TEMP1
010064	042004	20360		DAC TEMP4 REPLACE THE BIT COUNT
010065	200010	20370		LAC 10
010066	042003	20380		DAC TEMP3 REPLACE THE POINTER TO THE BEST VALUE
010067	610016	20390		JMP PBS2 LOOP

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STSS DEBUGGER -- MISCELLANEOUS SUBROUTINES

20400		.STITLE STSS DEBUGGER -- MISCELLANEOUS SUBROUTINES		
20410	*			
20420	*			
20430	*	THE FILE PARAMETERS HAVE ALREADY BEEN FILLED IN AND NOTHING OF IMPORTANCE IS LEFT IN THE BUFFER, NOW SET UP THE BUFFER PARAMETERS WITH THE MINIMUM CORE ADDRESS PRESENT IN THE BUFFER SET TO BE GREATER THAN THE MAXIMUM, THIS WILL FORCE A PAGE OPERATION THE FIRST TIME THE BUFFER IS REFERENCED.		
20440	*			
20450	*			
20460	*			
20470	*			
20480	*			
20490	*			
20500	*			
010070	20510	ENTER	SNCOP	
		,PMC	SAVE,ON	
003304	SNCOP	...		
010070	142161	20520	DZM	BMAX SET THE MAXIMUM ADDRESS IS 0
010071	142157	20530	DZM	BMIN
010072	442157	20540	INX	BMIN SET THE MINIMUM ADDRESS IS +1
010073	750001	20550	CLC	
010074	042160	20560	DAC	MBMIN SET MINUS THE MINIMUM BUFFER ADDRESS
010075	202163	20570	LAC	FDA
010076	042153	20580	DAC	BDA SET THE BUFFER ADDRESS TO CANCEL OUT ANY TROUBLESONE OLD ONE
010077	623304	20590	RET	SNCOP,X
	20600	*		
	20610	*		
	20620	*		
010100	20630	ENTER	UCORE	
		,PMC	SAVE,ON	
003306	UCORE	...		
010100	20640	MPOFF		
		,PMC	SAVE,ON	
010100	705000	20650	SPECIAL+0	TURN OFF MEMORY PROTECT
010101	201766	20660	LAC	SUCORE
010102	701742	20670	MPEU	
010103	744000	20680	CLL	PROTECT THE SHIFT
010104	640510	20690	LRS	8, DIVIDE BY 400 TO GET THE BLOCK NUMBER
010105	253307	20700	XOR	(040000) ADD IN THE DISK 0 DEVICE ADDRESS
010106	042163	20710	DAC	FDA SET THE FILE DEVICE ADDRESS
010107	740001	20720	CHA	
010110	042164	20730	DAC	MFDA
010111	442164	20740	INX	MFDA SET MINUS THE FILE DEVICE ADDRESS
010112	213406	20750	LAC	(\$BOUNDARY)
010113	042165	20760	DAC	FMIN SET THE MINIMUM FILE CORE ADDRESS
010114	776000	20770	LAC	-\$BOUNDARY
010115	042166	20780	DAC	MFMIN SET MINUS THE MINIMUM FILE CORE ADDRESS
010116	210125	20790	LAC	CORCT
010117	042167	20800	DAC	FMAX SET MINUS THE FILE MAXIMUM CORE ADDRESS
010120	210332	20810	LAC	UCF LOAD THE USER CORE FILE FLAG
010121	042151	20820	DAC	FTYPE AND SET THE CURRENT TYPE OF FILE
010122	213276	20830	LAC	(17777) LOAD A STANDARD ADDRESS MASK
010123	042051	20840	DAC	PCMSK AND SET IT
010124	623306	20850	RET	UCORE,X
010125	762000	20860	CORCT	-\$8K

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STSS DEBUGGER -- MISCELLANEOUS SUBROUTINES

	20860			
	20870			
	20880			
010126	20890	ENTER	UDISK	
		,PMC	SAVE,ON	
003310		...		
010126	20900	MPOFF		
		,PMC	SAVE,ON	
010126	705000	SPECIAL+0		TURN OFF MEMORY PROTECT
010127	201767	LAC	SUDISK	
010130	701742	MPEU		
010131	744000	CLL		PROTECT THE SHIFT
010132	640510	LRS	8,	DIVIDE BY 400 TO GET THE BLOCK COUNT
010133	353307	TAD	(040000)	ADD THE DISK DEVICE ADDRESS
010134	042163	DAC	FDA	SET THE FILE DEVICE ADDRESS
010135	740001	CMA		
010136	042164	DAC	MFDA	
010137	442164	INX	MFDA	SET MINUS THE FILE DEVICE ADDRESS
010140	142165	DZM	FMIN	USER DISK STARTS FROM ZERO
010141	142166	DZM	MFMIN	
010142	205720	LAC	DISCT	
010143	042167	DAC	FMAX	SET MINUS THE MAXIMUM ADDRESS
010144	623310	RET	UDISK,X	
	21050	*		
	21060	*		
	21070	*	LOCAT	IS ENTERED WITH THE DESIRED ADDRESS IN THE AC.
	21080	*		LOCAT EXITS WITH THE POINTER TO THE DESIREB ADDRESS IN THE AC AND IN BPTR
	21090	*		
010145	21100	ENTER	LOCAT	
		,PMC	SAVE,ON	
003312		...		
	21110	*		
	21120	*	SEE WHICH FILE WE ARE WORKING ON	
	21130	*		
010145	502051	AND	PCMSK	MASK TO JUST THE ADDRESS
010146	042162	DAC	BPTR	SAVE THE REQUIRED LOCATION
010147	202151	LAC	FTYPE	LOAD THE TYPE OF FILE WE HAVE OPEN
010150	950333	SAD	ACF	
010151	610210	JMP	PUCF4	IT IS AN ACTUAL CORE FILE; THE CALLERIS POINTER WAS CORRECT
	21140	*		
	21150			
	21160			
	21170			
	21180			
	21190	*		
	21200	*	CHECK	TO SEE THAT THE ADDRESS IS WITHIN THE CURRENT FILE
	21210	*		
010152	744002	STL		SET THE OVERFLOW FLAG
010153	202162	LAC	BPTR	RELOAD THE DESIRED LOCATION
010154	342167	TAD	FMAX	SUBTRACT THE MAXIMUM ADDRESS IN THE FILE
010155	740400	SNL		SKIP ON NO OVERFLOW -- SKIP IF REQUESTED LOCATION IS NOT PAST THE FILE END
010156	613232	JMP	MSG91	YES -- THE ADDRESS IS OUT OF BOUNDS
010157	202166	LAC	MFMIN	LOAD THE MINIMUM ADDRESS IN THE FILE
010160	741200	SNA		SKIP IF ALL IS CORRECT
010161	744000	CLL		ELSE CLEAR THE LINK TO MAKE THE CORRECT NUMBER
010162	342162	TAD	BPTR	AND ADD THE DESIREB LOCATION
010163	740400	SNL		SKIP IF REQUESTED ADDRESS IS BEFORE THE BUFFER START

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STSS DEBUGGER -- MISCELLANEOUS SUBROUTINES

010164	610171	21320	JMP	PAGE6	NO -- PAGE IT	
		21330	*			
		21340	*	O.K. -- NOW SEE WHAT KIND OF A FILE WE ARE WORKING WITH		
		21350	*			
010165	202151	21360	LAC	FTYPE		
010166	550332	21370	SAD	UCF		
010167	610204	21380	JMP	PUCF	IT IS A USER CORE FILE -- CHECK FOR 0-37	
010170	613232	21390	JMP	MSG91	ILLEGAL ADDRESS BEFORE THE BUFFER START	
		21400	*			
		21410	*	THE FILE IS A NORMAL DEVICE FILE -- IS THE DESIRED LOCATION IN CORE NOW?		
		21420	*			
010171		21430	PAGE6	...		
010171	202162	21440	LAC	BPTR	RELOAD THE DESIRED LOCATION	
010172	342161	21450	TAD	BMAX	SUBTRACT THE MAXIMUM LOCATION WHICH IS IN THE BUFFER	
010173	740300	21460	SMA;SZA		IS THE DESIRED LOCATION PAST THE BUFFER END?	
010174	610217	21470	JMP	PNEW	YES -- GET A NEW PAGE	
010175	202162	21480	LAC	BPTR	NO -- RELOAD THE DESIRED LOCATION	
010176	342160	21490	TAD	MBMIN	SUBTRACT THE MINIMUM ADDRESS WHICH IS IN THE BUFFER NOW	
010177	741100	21500	SPA		IS THE DESIRED LOCATION BEFORE THE BUFFER START?	
010200	610217	21510	JMP	PNEW	YES -- GET A NEW PAGE	
		21520	*			
		21530	*	THE DESIRED LOCATION IS IN CORE NOW -- SET UP THE POINTER, THE		
		21540	*	AC ALREADY CONTAINS THE ADDRESS RELATIVE TO THE START OF THE BUFFER,		
		21550	*			
010201	342154	21560	TAD	BCA	ADD IN THE BUFFER ADDRESS	
010202	042162	21570	PAGE6	DAC	SET THE POINTER TO THE BUFFER LOCATION	
010203	623312	21580		RET	LOCAT,X	
		21590	*			
		21600	*	THE FILE IS A USER CORE FILE -- LOCATIONS 0-37 ARE SPECIAL, SO CHECK FOR THEM		
		21610	*			
010204		21620	PUCF	...		
010204	777741	21630	LAW	-37	LOAD MINUS THE MAXIMUM LEGAL SPECIAL ADDRESS	
010205	342162	21640	TAD	BPTR	ADD THE REQUESTED ADDRESS	
010206	740300	21650	SMA;SZA		IS THE DESIRED LOCATION A LEGAL SPECIAL ADDRESS?	
010207	610212	21660	JMP	PUCF2	NO -- IS IT LEGAL AT ALL?	
010210	202162	21670	PUCF4	LAC	YES, THE ADDRESS IS LEGAL -- DON'T ALTER IT	
010211	623312	21680		RET	LOCAT,X	
		21690	*			
010212	776000	21700	PUCF2	LAW	-BOUNDARY	LOAD THE MINIMUM NORMAL LEGAL ADDRESS
010213	342162	21710		TAD	BPTR	ADD THE REQUESTED ADDRESS
010214	741100	21720		SPA		IS IT LEGAL?
010215	613232	21730		JMP	MSG91	ADDRESS OUT OF BOUNDS
010216	610171	21740		JMP	PAGE6	YES -- CARRY ON
		21750	*			
		21760	*			
		21770	*	PNEW GETS A NEW TWO-BLOCK PAGE SURROUNDING THE LOCATION GIVEN		
		21780	*	IN BPTR. THE NEW "PAGE" WILL BE THE BLOCK CONTAINING THE DESIRED		
		21790	*	LOCATION AND THE FOLLOWING BLOCK.		
		21800	*			
010217		21810	PNEW	...		
010217	103314	21820	JMS	FORCE	FIRST FORCE THE OLD PAGE	
010220	762170	21830		LAW	BUFFER	

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STSS DEBUGGER -- MISCELLANEOUS SUBROUTINES

			DAC	BQA	RESTORE THE BUFFER CORE ADDRESS
010221	042154	21840	LAC	(BUFLEN)	
010222	213334	21850	DAC	BLEN	RESTORE THE BUFFER LENGTH
010223	042155	21860	LAC	BPTR	NO -- RELOAD THE DESIRED ADDRESS
010224	202162	21870	TAD	MFMIN	SUBTRACT THE MINIMUM ADDRESS IN THE FILE
010225	342166	21880	CLL		PROTECT THE ROTATE
010226	744000	21890	LRS	B,	ELSE DIVIDE BY 400 TO GET THE BLOCK NUMBER IN THE FILE
010227	640510	21900	TAD	FDA	ADD TO THE FILE DEVICE ADDRESS
010230	342163	21910	DAC	BDA	SET THE NEW BUFFER DEVICE ADDRESS
010231	042153	21920	TAD	MFDA	SUBTRACT THE FILE DEVICE ADDRESS
010232	342164	21930	ALSS	B,	MULTIPLY BY 400 TO GET THE OFFSET FROM THE BEGINNING OF THE FILE (IN WORDS)
010233	660710	21940	TAD	FMIN	ADD THE MINIMUM CORE ADDRESS TO GET THE MINIMUM IN THE BUFFER
010234	342165	21950	DAC	BMIN	AND SET IT
010235	042157	21960	CMA		
010236	740001	21970	TAD	(1)	
010237	353331	21980	DAC	M\$MIN	SET MINUS THE MINIMUM ADDRESS
010240	042160	21990	LAC	BMIN	RELOAD THE ADDRESS
010241	202157	22000	TAD	(-1)	
010242	353332	22010	TAD	(BUFLEN)	ADD THE BUFFER LENGTH TO GET THE MAXIMUM ADDRESS IN THE BUFFER
010243	353334	22020	CMA		
010244	740001	22030	DAC	BMAX	
010245	042161	22040	INX	BMAX	SET MINUS THE MAXIMUM ADDRESS IN THE BUFFER
010246	442161	22050	LAW	PAGE6	
010247	770171	22060	LMO		SET THE RESTART ADDRESS
010250	652000	22070	LAW	BDA	LOAD A POINTER TO THE READ PARAMETERS
010251	762153	22080	PREAD		READ IN A NEW BUFFER
010252	705003	22090			
		22100	*		
		22110	*	HARDWARE ERROR RETURN IS HERE	
		22120	*		
U	010253	100000	22130	JMS	ERROR
	010254	610247	22140	JMP	PNEW2
		22150	*		
		22160	*		
		22170	*	FORCE IS A ROUTINE TO OUTPUT THE CORE BUFFER IF IT HAS BEEN	
		22180	*	ALTERED, AND TO ZERO THE ALTERS FLAG.	
		22190	*		
	010255	22200	ENTER	FORCE	
			,PMC	SAVE,ON	
	003314		FORCE	...	
	010255	202156	LAC	BALT	LOAD THE BUFFER ALTERS FLAG
	010256	142156	DZM	BALT	CLEAR IT IN ANY CASE
	010257	741200	SNA		SKIP IF THE BUFFER HAS BEEN ALTERED
	010260	623314	RET	FORCE,X	ELSE EXIT NOW
	010261	202151	LAC	FTYPE	LOAD THE CURRENT TYPE OF FILE
	010262	550333	SAD	ACF	SKIP IF IT CAN BE FORCED
	010263	623314	RET	FORCE,X	IT IS AN ACTUAL CORE FILE, AND CANNOT BE FORCED
	010264	203314	LAC	FORCE	LOAD THE RESTART ADDRESS
	010265	652000	LMO		AND PASS IT TO THE EXEC
	010266	762153	LAW	BDA	LOAD A POINTER TO THE PARAMETERS
	010267	705005	PWRITE		WRITE THE BUFFER OUT
		22320	*		
		22330	*	ERROR RETURN IS HERE	

D

STSS DEBUGGER -- MISCELLANEOUS SUBROUTINES

U	010270	100000	22340	*			
	010271	610264	22350		JMS	ERROR	
			22360		JMP	FORCE2	
			22370	*		RETRY THE OPERATION	
			22380	*			
			22390	*		PRINT A SPACE	
			22400	*			
	010272		22410		ENTER	SPACE	
					,PMC	SAVE,ON	
		003316	SPACE		...		
	010272	760240	22420		LAW	240	
	010273	103503	22430		JMS	TSTTYOT	
	010274	623316	22440		RET	SPACE,X	
			22450	*			
			22460	*		PRINT A COLON FOLLOWED BY A SPACE	
			22470	*			
	010275		22480		ENTER	COLSP	
					,PMC	SAVE,ON	
		003320	COLSP		...		
	010275	760272	22490		LAW	\$COLON	
	010276	103503	22500		JMS	TSTTYOT	
	010277	760240	22510		LAW	\$SPACE	
	010300	103503	22520		JMS	TSTTYOT	
	010301	623320	22530		RET	COLSP,X	
			22540	*			
			22550	*			
	010302		22560		ENTER	TDVAL	MAKE SURE THE USER IS VALIDATED IF HE IS TRYING TO DO A DISK OPERATION
					,PMC	SAVE,ON	
		003322	TDVAL		...		
	010302	042000	22570		DAC	TEMPO	SAVE THE DEVICE ADDRESS
	010303	640703	22580		ALS	3	MOVE THE DEVICE-TYPE BIT TO AC(0)
	010304	741100	22590		SPA		SKIP FOR DECTAPE
	010305	103215	22600		JMS	VALCHK	ELSE CHECK THE USERIS VALIDATION
	010306	802000	22610		LAC	TEMPO	RELOAD THE DEVICE ADDRESS
	010307	623322	22620		RET	TDVAL,X	
			22630				
			22640				
			22650				
	010310		22660		ENTER	BINIT	
					,PMC	SAVE,ON	
		003324	BINIT		...		
	010310	103314	22670		JMS	FORCE	FORCE ANY OLD BUFFER BEFORE MESSING AROUND WITH THE POINTERS
	010311	813407	22680		LAC	(BUFFER)	
	010312	042154	22690		DAC	BGA	SET THE BUFFER CORE ADDRESS
	010313	813334	22700		LAC	(BUFLEN)	
	010314	042155	22710		DAC	BLEN	SET THE BUFFER LENGTH
	010315	623324	22720		RET	BINIT,X	

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MTSS DEBUGGER -- MISCELLANEOUS STORAGE

22730

.STITL MTSS DEBUGGER -- MISCELLANEOUS STORAGE

22740 *

22750 *

DDT CONTROL SIGN DEFINITIONS

22760 *

010316	000336	22770	INDSN	SUPARR	UP ARROW INDICATES INDIRECT ADDRESSING
010317	000300	22780	FDEL	SAT	AT DELIMITS FILENAMES
010320	000243	22790	RSGN	SSHARP	SHARP SIGN DENOTES REGISTER NAMES
010321	000240	22800	LNSGN	SSPACE	SPACE IN FIELD DENOTES SPECIFICATION BY LENGTH
010322	000254	22810	BYSGN	SQCOMM	COMMMA DENOTE FIELD SPECIFICATION BY BOUNDARIES
010323	000272	22820	MCSGN	SCOLON	COMMERCIAL AT SIGN DENOTES MODE/COMMAND WHEN NEEDED
010324	000273	22830	ENDSN	SSCOLON	SEMI-COLON DENOTES END OF A SYNTACTIC UNIT
010325	000256	22840	PCSGN	SPERIOD	PERIOD IS SYMBOL FOR PROGRAM COUNTER
010326	000275	22850	PATSN	SEQUAL	(=) IS PATCH COMMAND
010327	000274	22860	BKSN	SLESS	(<) IS BREAKPOINT COMMAND
010330	000276	22870	JSGN	SGREAT	(>) IS JUMP/TRANSFER COMMAND
		22880	*		
		22890	*	MISCELLANEOUS CONSTANTS	
		22900	*		

010331	340000	22910	DTCT	-1100*400
010332	000001	22920	UCF	1
010333	000002	22930	ACF	2
010334	000003	22940	LOGF	3
		22950		USER CORE FILE FLAG
		22960	,END	ACTUAL CORE FLAG
				LOGICAL FILE FLAG

D

MTSS DEBUGGER -- PERMANENT SYMBOL TABLE

	9960	,STITL	MTSS DEBUGGER -- PERMANENT SYMBOL TABLE
013450	9970	,USE	SYMTAB
	9980	,PMC	SAVE,OFF
	9990	,INSRT	INSERT190PS
	100	,CRSM	SAVE,OFF
	110	OP	,DEFIN
	120		,AC16 /*#1/
	130		#1
	140		,ENDM OP
013450 777473	150	SYMO	,SYM1-1/3-1
013451	160		OP < ABS>
013454 614444	170		.AC16 *ADDROT*
013455 625764			
013456 742000	180		742000
013457	190		OP < ALS>
013462	200		OP < ALSS>
013465	210		OP < BEG>
013470	220		OP < CAF>
013473	230		OP < CCK>
013476	240		OP < CDF>
013501	250		OP < CLA>
013504	260		OP < CLC>
013507	270		OP < CLL>
013512	280		OP < CLOF>
013515	290		OP < CLON>
013520	300		OP < CLQ>
013523 435461	310		.AC16 *CLQLLS*
013524 545463			
013525 650600	320	CLQLLLS	
013526	330		OP < CLSF>
013531	340		OP < CMA>
013534	350		OP < CML>
013537	360		OP < CMQ>
013542	370		OP < CON>
013545	380		OP < CPB>
013550	390		OP < DBK>
013553	400		OP < DBR>
013556	410		OP < DCB>
013561	420		OP < DCHB>
013564	430		OP < DGSS>
013567	440		OP < DIV>
013572	450		OP < DIVS>
013575	460		OP < DLAH>
013600	470		OP < DLAL>
013603	480		OP < DLBR>
013606	490		OP < DLOK>
013611	500		OP < DLP>
013614	510		OP < DOV>
013617	520		OP < DPBS>
013622	530		OP < DPCF>
013625	540		OP < DPEP>
013630	550		OP < DPMK>

NUMBER OF SYMBOLS IN THE PERMANENT SYMBOL TABLE -1

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MTSS DEBUGGER -- PERMANENT SYMBOL TABLE

013633	560	OP	< DP0F>
013636	570	OP	< DP0N>
013641	580	OP	< DP0P>
013644	590	OP	< DP0T>
013647	600	OP	< DPRC>
013652	610	OP	< DPRS>
013655	620	OP	< DPgF>
013660	630	OP	< DPWC>
013663	640	OP	< DRAH>
013666	650	OP	< DRAL>
013671	660	OP	< DRBR>
013674	670	OP	< DSCC>
013677	680	OP	< DSCD>
013702	690	OP	< DSCF>
013705	700	OP	< DSCN>
013710	710	OP	< DSFX>
013713	720	OP	< DSRS>
013716	730	OP	< DSSC>
013721	740	OP	< DSSF>
013724	750	OP	< DTCA>
013727	760	OP	< DTDF>
013732	770	OP	< DTEF>
013735	780	OP	< DTLA>
013740	790	OP	< DTRA>
013743	800	OP	< DTRB>
013746	810	OP	< DTXA>
013751	820	OP	< EAECIA>
013754	830	OP	< ECR>
013757	840	OP	< ECB>
013762	850	OP	< EEM>
013765	860	OP	< EIS>
013770	870	OP	< ELP>
013773	880	OP	< EOF>
013776	890	OP	< ESS>
014001	900	OP	< FRDIV>
014004	910	OP	< FRDIVS>
014007	920	OP	< GLK>
014012	930	OP	< GEM>
014015	940	OP	< HLT>
014020	950	OP	< IDIV>
014023	960	OP	< IDIVS>
014026	970	OP	< IDX>
014031	980	OP	< INX>
014034	990	OP	< IOF>
014037	1000	OP	< ION>
014042	1010	OP	< IORE>
014045	1020	OP	< ISA>
014050	1030	OP	< KRB>
014053	1040	OP	< KRBLT1>
014056	1050	OP	< KRBLT2>
014061	1060	OP	< KSF>
014064	1070	OP	< KSFLT1>

D

MTSS DEBUGGER -- PERMANENT SYMBOL TABLE

014067	1080	OP	< KSFLT2>
014072	1090	OP	< LACQ>
014075	1100	OP	< LACS>
014100	1110	OP	< LAB>
014103	1120	OP	< LAW>
014106	1130	OP	< LBL>
014111	1140	OP	< LCK>
014114	1150	OP	< LDA>
014117	1160	OP	< LDB>
014122	1170	OP	< LD8>
014125	1180	OP	< LEM>
014130	1190	OP	< LL8>
014133	1200	OP	< LLSC>
014136	1210	OP	< LLSS>
014141	1220	OP	< LM8>
014144	1230	OP	< LPB>
014147	1240	OP	< LPM>
014152	1250	OP	< LR8>
014155	1260	OP	< LRSCLA>
014160	1270	OP	< LRSS>
014163	1280	OP	< LX>
014166	1290	OP	< LY>
014171	1300	OP	< MPCNE>
014174	1310	OP	< MPEU>
014177	1320	OP	< MPCV>
014202	1330	OP	< MPEV>
014205	1340	OP	< MPLD>
014210	1350	OP	< MPOFF>
		,PMC	SAVE,ON
014212	705000	SPECIAL+0	TURN OFF MEMORY PROTECT
014213	1360	OP	< MPSK>
014216	1370	OP	< MPSNE>
014281	0000055	1AC16	♦ MOOR♦
014282	615762		
014283	642000	642000	
014284	1400	OP	< MUL>
014287	1410	OP	< MULS>
014292	1420	OP	< NOP>
014295	1430	OP	< NORM>
014240	1440	OP	< NORMS>
014243	1450	OP	< OAB>
014246	1460	OP	< OCK>
014251	1470	OP	< OMQ>
014254	1480	OP	< OPB>
014257	1490	OP	< OSC>
014262	1500	OP	< PCF>
014265	1510	OP	< PLS>
014270	1520	OP	< PSA>
014273	1530	OP	< PSB>
014276	1540	OP	< PSF>
014301	1550	OP	< RAEF>
014304	1560	OP	< RAL>

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MTSS DEBUGGER -- PERMANENT SYMBOL TABLE

014307	1570	OP	< RAR>
014312	1580	OP	< RCF>
014315	1590	OP	< RCL>
014320	1600	OP	< RCR>
014323	1610	OP	< RET>
014326	1620	OP	< RLFD>
014331	1630	OP	< RPL>
014334	1640	OP	< RLPE>
014337	1650	OP	< RRB>
014342	1660	OP	< RSA>
014345	1670	OP	< RSB>
014350	1680	OP	< RSF>
014353	1690	OP	< RTL>
014356	1700	OP	< RTR>
014361	1710	OP	< SCK>
014364	1720	OP	< SEM>
014367	1730	OP	< SKP>
014372	1740	OP	< SKP7>
014375	1750	OP	< SMA>
014400	1760	OP	< SNA>
014403	1770	OP	< SNL>
014406	1780	OP	< SPA>
014411	1790	OP	< SPB>
014414	1800	OP	< SPI>
014417	1810	OP	< STL>
014422	1820	OP	< SZA>
014425	1830	OP	< SZL>
014430	1840	OP	< TCF>
014433	1850	OP	< TCFLT1>
014436	1860	OP	< TCFLT2>
014441	1870	OP	< TLS>
014444	1880	OP	< TLSLT1>
014447	1890	OP	< TLSLT2>
014452	1900	OP	< TSF>
014455	1910	OP	< TSFLT1>
014460	1920	OP	< TSFLT2>
014463	1930	OP	< TTS>
014466	1940	OP	< WBL>
014471	1950	OP	< WCGA>
014474	1960	OP	< WDA>
014477	1970	OP	< WDSC>
014502	1980	OP	< WDSS>
014505	1990	OP	< CAL>
014510	2000	OP	< DAC>
014513	2010	OP	< JMS>
014516	2020	OP	< DZM>
014521	2030	OP	< LAC>
014524	2040	OP	< XOR>
014527	2050	OP	< ADD>
014532	2060	OP	< TAD>
014535	2070	OP	< XCT>
014540	2080	OP	< ISZ>

D

MTSS DEBUGGER -- PERMANENT SYMBOL TABLE

014543	2090	OP	< AND>
014546	2100	OP	< SAD>
014551	2110	OP	< JMP>
014554	2120	OP	< EAE>
014557	2130	OP	< IOT>
014562	2140	OP	< OPR>
014565 777777	2150 SYM1	-1	NUMBER OF SYMBOLS IN THE USER SYMBOL TABLE -1
	2160	.CRSM	RESTORE
	2170	.END	
	10000	.PMC	RESTORE
003326	10010	.USE	IMPURE
	10020	.HEAD	
000001	10030 DEBUG	,EQU	1 TURN ON THE HANDLER INSERTS LISTINGS
	10040	,HEAD	D
	10050	.INSRT	:DLIBRARY:PDP9LIB:TTYNON
	100	.INE	SDEBUG,1
	120	,IPE	SDEBUG,1

TTYNON

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MTSS-PDP9 NON-INTERRUPTING TELETYPE HANDLER

130 * .STITL MTSS-PDP9 NON-INTERRUPTING TELETYPE HANDLER
140 * .HEAD T
150 *
160 *
170 * PROGRAMMED BY ROBERT W. BLEAN
180 *
190 *
200 * LAST REVISED 24 MARCH 1972
210 *
220 *
230 * THIS HANDLER PERMITS NON-INTERRUPT DRIVEN INPUT FROM AND OUTPUT
240 * TO THE CONSOLE TELETYPE ON THE PDP-9 COMPUTER.
250 *
260 * THIS HANDLER ALTERS THE AC, AND MQ, IT DOES NOT ALTER ANY CORE
270 * MEMORY OUTSIDE OF ITSELF, IN PARTICULAR IT DOES NOT ALTER ANY AUTO-INDEX REGISTER.
280 *
290 * DATA FORMATS:
300 *
310 * 1) OCTAL
320 *
330 * 2) SIXBIT -- SIXBIT IS 8-BIT ASCII MINUS 240. THIS MAPS THE PRINTING
340 * CHARACTERS ONTO THE SET 0-77. ASCII VALUE 333 () IS USED FOR
350 * CARRIAGE RETURN AND 335 () IS USED FOR LINEFEED. NOTE THAT NEITHER
360 * 333, 335, NOR ANY CONTROL CHARACTERS CAN BE RECOGNIZED IN SIXBIT.
370 *
380 * 3) ASCII -- ONE ASCII CHARACTER IS STORED PER WORD, LINE INPUT
390 * IS STORED IN THIS FORMAT, SINCE THERE IS ONLY ONE LINE-BUFFER
400 * THE EXTRA BUFFER LENGTH WASTES LESS SPACE THAN WOULD THE HANDLING
410 * ROUTINES NECESSARY FOR OTHER FORMS OF PACKING CHARACTERS.

```

T                                (MTSS TELETYPE HANDLER) STORAGE AREA

003326   420      .STITL  (MTSS TELETYPE HANDLER) STORAGE AREA
          430      .IFE    PURCOD,1
          440      .USE    IMPURE
          450
          460
003326   470      WORDB  ,BLOCK  2           ROOM TO ACCUMULATE TWO VALID WORDS
000120   480      STD     ,EQU    80,           STANDARD IS AN 80-CHARACTER LINE BUFFER
003330   490      BUFFER ,BLOCK  STD
          500      *
          510      *
          520      *      VARIABLES
          530      *

03450  003447  540      BEND   .-1
03451  000000  550      BPTR   ,DSA
03452  000000  560      T1     ,DSA
03453  000000  570      T2     ,DSA
03454  000000  580      CHAR   ,DSA
03455  000000  590      DLMTTR ,DSA
03456  000000  600      COUNT  ,DSA
          610      .IFE    PURCOD,1
          620      .USE    PURE

```

TTYNQN

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T

(MTSS TELETYPE HANDLER) LINE BUFFER INPUT

,STITL (MTSS TELETYPE HANDLER) LINE BUFFER INPUT

630
640
650
660
670
680
690
700*
THE PROGRAM IS PROTECTED AGAINST OVERFLOW OR UNDERFLOW OF THE LINE
BUFFER. UNDERFLOW (EXCESS DELETIONS) IS IGNORED, AND OVERFLOW CHARACTERS
ARE LOST, EXCEPT FOR THE LAST CHARACTER TYPED.710
010335 720ENTER INLIN SUBROUTINE TO READ IN AND BUFFER A LINE FROM THE TELETYPE
,PMC SAVE,ON003457
010335 700312 730
010336 213410 740INLIN
INL
INLSUBROUTINE TO READ IN AND BUFFER A LINE FROM THE TELETYPE
KRB
LAG (BUFFER-1)
DAC BPTR
DZM COUNT
DZM DLMTR
KSF1KRB
JMP .-1
SAD (SBKARR)
JMP 1CHAR
SAD (SCONTX)
JMP 1LINE
LMQONCE, ON ENTRANCE, CLEAN UP ANY PRIOR INPUT
LOAD A POINTER TO START OF THE BUFFER MINUS ONE
INITIALIZE THE BUFFER POINTER
INITIALIZE THE WORD FETCHED COUNT
INITIALIZE THE LAST DELIMITTER STORAGE
GET THE NEXT INPUT CHARACTER010337 043451 750
010340 143456 760
010341 143455 770
010342 700313 780
010343 610342 790
010344 553411 800
010345 610367 810
010346 553412 820
010347 610365 830
010350 652000 840

IN1

DELETE ONE CHARACTER IF IT WAS A BACKARROW

010351 203451 850
010352 543450 860
010353 741000 870
010354 443451 880
010355 641002 890

IN4

DELETE THE ENTIRE LINE IF IT WAS A CONTROL X
SAVE THE CHARACTER
LOAD THE CURRENT BUFFER POINTER
SKIP IF NO OVERFLOW
AVOID DAMAGE DUE TO OVERFLOW
ADVANCE THE POINTER -- IT IS STILL WITHIN THE BUFFER
RELOAD THE CHARACTER
AND PUT IT IN THE BUFFER010356 063451 900
010357 553311 910
010360 741000 920
010361 610342 930
010362 763327 940
010363 043451 950
010364 623457 960EXIT WHEN A CARRIAGE RETURN IS FOUND
ELSE GET THE NEXT CHARACTER970
010365 103505 980
010366 610336 990
010367 203451 1000

1LINE

RESET THE BUFFER POINTER AT THE END OF THE LINE
AND RETURN TO THE CALLER1CHAR
DAC BPTR
JMP IN1,X

PRINT THE RESPONSE TO A LINE-DELETE

1LINE
JMP INL
LAG BPTR

REREAD THE LINE

SAD INL
JMP IN1

LOAD THE BUFFER POINTER

TAD (-1)
DAC BPTR
JMP IN1

SKIP IF NO UNDERFLOW

1010
010371 610342 1020
010372 353332 1030
010373 043451 1040
010374 610342 1050

ELSE IGNORE THE COMMAND

DECREMENT THE BUFFER POINTER

AND SAVE IT

GET THE NEXT CHARACTER

T

(MTSS TELETYPE HANDLER) OCTAL WORD INPUT/OUTPUT

1060		.STITL (MTSS TELETYPE HANDLER) OCTAL WORD INPUT/OUTPUT					
1070							
1080	*						
1090	*	OPERATION	RETURN	L	AC	MQ	MEANING
1100	*	-----				-----	
1110	*	INPUT	+1	0	X	X	FORMAT ERROR DISCOVERED
1120	*		+1	1	DELIM	X	FIRST NON-BLANK CHARACTER IS A DELIMITER
1130	*		+2	1	OCTAL	DELIM	SUCCESSFUL READ OF AN OCTAL NUMBER
1140	*	OUTPUT	+1	X	X	X	SUCCESSFUL WRITE OF AN OCTAL NUMBER
1150	*						
1160							
010375	1170	ENTER	NUMIN				
		,PMC	SAVE,ON				
003461		NUMIN	:				
010375	143453	1180	DZM	T2	INITIALIZE THE DECIMAL-DIGIT-RECEIVED FLAG		
010376	103477	1190	JMS	INTIN	INITIALIZE THE INPUT STRING, ETC		
010377	623461	1200	JMP	NUMIN,X	RETURN +1 FOR DELIMITER IS FIRST NON-BLANK CHARACTER		
010400	103475	1210	JMS	FGET	GET THE NEXT CHARACTER		
010401	103501	1220	JMS	CHRID	IDENTIFY IT		
010402	610424	1230	JMP	NUM26	IT IS A DELIMITER, SO EXIT		
010403	623461	1240	JMP	NUMIN,X	IT IS A LETTER, SO EXIT +1 FOR A FORMAT ERROR		
010404	741400	1250	SZL		SKIP IF THE CHARACTER IS AN OCTAL DIGIT		
010405	443453	1260	ISZ	T2	ELSE BE SURE THE DECIMAL-DIGIT-RECEIVED FLAG IS SET		
010406	513413	1270	AND	(17)	RETAIN JUST THE DIGIT		
010407	043452	1280	DAC	T1	AND SAVE IT FOR DECIMAL ACCUMULATION		
	1290						
010410	640503	1300	LRS	3	SAVE THE "OCTAL DIGIT"		
010411	203326	1310	LAC	WORDB	LOAD THE PREVIOUSLY GATHERED "OCTAL NUMBER"		
010412	640603	1320	LLS	3	CONCATENATE THE "OCTAL DIGITS"		
010413	043326	1330	DAC	WORDB	AND SAVE THE RESULT		
	1340						
010414	203327	1350	LAC	WORDB+1	LOAD THE PREVIOUSLY GATHERED "DECIMAL NUMBER"		
010415	744000	1360	CLL		SET THE LINK FOR THE MULTIPLY		
010416	653122	1370	MUL		MULTIPLY THE PREVIOUS "DECIMAL VALUE"		
010417	000012	1380	10,		BY 10 FOR DECIMAL		
010420	641002	1390	LACQ		LOAD THE RESULT		
010421	343452	1400	TAD	T1	ADD THE CURRENT "DECIMAL DIGIT"		
010422	043327	1410	DAC	WORDB+1	AND SAVE THE TOTAL "DECIMAL NUMBER"		
	1420						
010423	610400	1430	JMP	NUM20	LOOP		
	1440						
	1450						
010424	553404	1460	NUM26	SAD	CHECK FOR A PERIOD		
010425	610433	1470		JMP	IF SO, PICK UP THE DECIMAL VALUE		
010426	203453	1480		LAC	ELSE LOAD THE DECIMAL-DIGITS-RECEIVED FLAG		
010427	744200	1490		SZAICLL	AND SKIP IF THERE WERE NONE		
010430	623461	1500		JMP	RETURN +1, LK=0 FOR A FORMAT ERROR: DECIMAL DIGITS, BUT NO PERIOD		
010431	203326	1510		LAC	LOAD THE OCTAL VALUE		
010432	610442	1520		JMP			
010433	103475	1530		JMS	GET THE NEXT CHARACTER		
010434	103501	1540		JMS	AND IDENTIFY IT		
010435	610441	1550		JMP	A DELIMITER IS LEGAL, SO EXIT		

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(MTSS TELETYPE HANDLER) OCTAL WORD INPUT/OUTPUT

010436	623461	1560	JMP	NUMIN,X	A LETTER -- EXIT +1 FOR A FORMAT ERROR
010437	744000	1570	CLL		A NUMBER -- CLEAR THE LINK FOR A FORMAT ERROR
010440	623461	1580	JMP	NUMIN,X	AND EXIT +1
010441	203327	1590	LAC	WORDB+1	LOAD THE DECIMAL VALUE
010442	043326	1600	DAC	WORDB	SAVE THE CORRECT VALUE
010443	443461	1610	ISZ	NUMIN	BUMP TO A RETURN +2 FOR SUCCESSFUL
010444	623461	1620	JMP	NUMIN,X	
		1630			
		1640			
		1650			
010445		1660	ENTER	OCTOT	
			,PMC	SAVE,ON	
003463			OCTOT	'.'	
010445	652000	1670	OCT42	LMQ	SET THE VALUE TO BE OUTPUT
010446	741400	1680		SZL	SKIP IF NO LEADING ZEROES ARE TO BE SUPPRESSED
010447	750201	1690		SZA;CLC	SET A FLAG TO PRINT ONE CHARACTER, ANYWAY; IF THE AC IS ZERO
010450	777772	1700		LAW	ELSE SET THE COUNT FOR THE STANDARD SIX CHARACTERS
010451	043452	1710		DAC	SET THE NUMBER OF CHARACTERS TO BE OUTPUT
010452	641002	1720		LACQ	RELOAD THE USER'S VALUE
010453	741200	1730		SNA	SKIP FOR A NON-ZERO VALUE
010454	744000	1740		CLL	ELSE FORCE A SINGLE ZERO TO PRINT
010455	641603	1750	OCT44	LLSC	GET THE NEXT OCTAL DIGIT
010456	740200	1760		SZA	IF IT IS ZERO, DON'T CHANGE PRINT-SUPPRESSION STATE
010457	744000	1770		CLL	ELSE CLEAR THE PRINT INHIBIT AT THE FIRST NON-ZERO FOUND
010460	353305	1780		TAD	MAKE ASCII IN ANY CASE
010461	740400	1790		SNL	BUT SKIP IF PRINT IS INHIBITED
010462	103503	1800		JMS	ELSE PRINT THE DIGIT
010463	443452	1810		ISZ	DONE???
010464	610455	1820		JMP	NO -- LOOP
010465	700401	1830		TSF	
010466	610465	1840		JMP	WAIT FOR THE TELETYPE TO SETTLE
010467	623463	1850		JMP	YES -- EXIT

T

(MTSS TELETYPE HANDLER) SIXBIT WORD INPUT & SIXBIT BUFFER OUTPUT

1860		,STL (MTSS TELETYPE HANDLER) SIXBIT WORD INPUT & SIXBIT BUFFER OUTPUT							
1870									
1880									
1890	*								
1900	*	OPERATION	RETURN	L	AC	MQ	MEANING		
1910	*								
1920	*	INPUT	+1	L	DELIM	X	FIRST NON-BLANK CHARACTER IS A DELIMITER		
1930	*		+2	L	SIXBIT	DELIM	SUCCESSFUL READ OF A SIXBIT WORD		
1940	*	OUTPUT	+1	X	X	X	SUCCESSFUL WRITE OF A SIXBIT BUFFER		
1950	*								
1960									
010470	1970	ENTER	SIXIN						
		,PMC	SAVE,ON						
003465		SIXIN	...						
010470	763326	1980	LAW	WORDB					
010471	043452	1990	DAC	T1	INITIALIZE THE SIXBIT BUFFER POINTER				
010472	103477	2000	JMS	INTIN	INITIALIZE THE INPUT				
010473	623465	2010	JMP	SIXIN,X	RETURN +1 FOR DELIMITER IS FIRST NON-BLANK CHARACTER				
010474	443465	2020	ISZ	SIXIN	ELSE BUMP TO A GOOD RETURN				
010475	103467	2030	JMS	SIX5	GET THE FIRST GOOD CHARACTER				
010476	660714	2040	ALSS	12,	AND PUT IT IN THE FIRST CHARACTER POSITION				
010477	063452	2050	DAC	T1,X	AND SAVE IT				
010500	103467	2060	JMS	SIX5	GET THE SECOND CHARACTER				
010501	660706	2070	ALSS	6,	PUT IT IN THE SECOND CHARACTER POSITION				
010502	263452	2080	XOR	T1,X	CONCATENATE THE CHARACTERS				
010503	063452	2090	DAC	T1,X	AND SAVE THE RESULT				
010504	103467	2100	JMS	SIX5	GET THE THIRD CHARACTER				
010505	263452	2110	XOR	T1,X	CONCATENATE THE CHARACTERS				
010506	063452	2120	DAC	T1,X	AND SAVE THE RESULT				
010507	443452	2130	ISZ	T1	BUMP THE STORAGE BUFFER POINTER				
010510	610475	2140	JMP	SIX2	LOOP				
	2150								
010511	203326	2160	SIX9	LAC	WORDB	LOAD THE FIRST SIXBIT WORD			
010512	623465	2170	JMP	SIXIN,X	EXIT				
	2180								
010513		2190	ENTER	SIX5	SUBROUTINE TO GET THE NEXT CHARACTER, MAKE IT SIXBIT, EXIT IF A DELIMITER				
			,PMC	SAVE,ON					
003467		SIX5	...						
010513	103475	2200	JMS	FGET	GET THE NEXT CHARACTER				
010514	103501	2210	JMS	CHRID	IDENTIFY IT				
010515	610511	2220	JMP	SIX9	EXIT IF IT IS A DELIMITER				
010516	740000	2230	NOP		PERMIT LETTERS				
010517	353403	2240	TAD	(-240)	MAKE SIXBIT				
010520	623467	2250	JMP	SIX5,X					
	2260								
010521		2280	ENTER	SIXOT					
			,PMC	SAVE,ON					
003471		SIXOT	...						
010521	043452	2290	DAC	T1	SET THE NEGATIVE CHARACTER COUNT				
010522	223471	2300	LAC	SIXOT,X	LOAD THE NEXT WORD OF OUTPUT				
010523	652000	2310	LMO		SAVE IT FOR PRINTING				

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T (MTSS TELETYPE HANDLER) SIXBIT WORD INPUT & SIXBIT BUFFER OUTPUT

010524	443471	2320	ISZ	SIXOT	BUMP THE POINTER
010525	103473	2330	JMS	SIX26	OUTPUT THE FIRST CHARACTER
010526	103473	2340	JMS	SIX26	OUTPUT THE SECOND CHARACTER
010527	103473	2350	JMS	SIX26	OUTPUT THE THIRD CHARACTER
010530	610522	2360	JMP	SIX24	LOOP
		2370			
010531		2380	ENTER	SIX26	
			,PMC	SAVE,ON	
003473		SIX26	LLSC	6,	GET THE NEXT SIXBIT CHARACTER
010531	641606	2390	TAD	(240)	MAKE IT ASCII
010532	353350	2400	SAD	(333)	CHECK FOR CARRIAGE RETURN MAPPING
010533	553414	2410	LAW	SCR	
010534	760215	2420	SAD	(335)	CHECK FOR LINE FEED MAPPING
010535	553415	2430	LAW	SLF	
010536	760212	2440	JMS	TTYOT	PRINT THE CHARACTER
010537	103503	2450	ISZ	T1	ALL CHARACTERS PRINTED?
010540	443452	2460	JMP	SIX26,X	NO -- LOOP
010541	623473	2470	TSF	.	
010542	700401	2480	JMP	-1	WAIT FOR THE TELETYPE TO SETTLE
010543	610542	2490	JMP	SIXOT,X	YES -- EXIT
010544	623471	2500			
		2510	*		
		2520	*		

T

(MTSS TELETYPE HANDLER) MISCELLANEOUS LINE BUFFER ROUTINES

	2530		.STTL (MTSS TELETYPE HANDLER) MISCELLANEOUS LINE BUFFER ROUTINES		
	2540				
	2550				
	2560				
	2570				
010545	2580		ENTER ,PMC	FGET SAVE,ON	SUBROUTINE TO GET THE FIRST REMAINING CHARACTER FROM THE LINE BUFFER
003475		FGET	...		
010545	443451	2590	ISZ	BPTR	NO -- BUMP THE POINTER
010546	223451	2600	LAC	BPTR,X	LOAD THE NEXT CHARACTER
010547	043454	2610	DAC	CHAR	AND SAVE IT
010550	623475	2620	JMP	FGET,X	
010551		2630			
003477		2640	ENTER ,PMC	INTIN SAVE,ON	INITIALIZE INPUT WORD-GETTING
010551	443456	2650	...		
010552	143326	2660	ISZ	COUNT	COUNT THE WORD, SUCCESSFUL OR NOT
010553	143327	2670	DZM	WORDB	INITIALIZE THE TWO FIRST WORDS OF THE INPUT BUFFER
010554	103475	2680	DZM	WORDB+1	
010555	553350	2690	JMS	FGET	GET THE NEXT CHARACTER
010556	610554	2700	SAD	(SSPACE)	CHECK IT FOR A SPACE
010557	103501	2710	JMP	.-2	THROW AWAY SPACES
010560	623477	2720	JMS	CHRID	IDENTIFY THE NON-SPACE
010561	740000	2730	JMP	INTIN,X	RETURN +1 FOR A DELIMITER
010562	443477	2740	NOP		
010563	750001	2750	ISZ	INTIN	ELSE BUMP THE RETURN FOR A NUMBER OR A LETTER
010564	343451	2760	CLC		
010565	043451	2770	TAD	BPTR	
010566	623477	2780	DAC	BPTR	BACK UP THE POINTER TO POINT TO THE FIRST GOOD CHARACTER
			JMP	INTIN,X	

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PDP9 TIME-SHARING SYSTEM MONITOR AND MESSAGE ROUTINES

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T

(MTSS TELETYPE HANDLER) MISCELLANEOUS CHARACTER-HANDLING SUBROUTINES

,STITL (MTSS TELETYPE HANDLER) MISCELLANEOUS CHARACTER-HANDLING SUBROUTINES

2790
 2800 *
 2810 *
 2820 *
 2830 *
 2840 *
 2850 *
 2860 *
 2870 *
 2880 *
 2890 *
 2900 *
 2910 *
 2920 *

CHRID -- SUBROUTINE TO CLASSIFY EIGHT-BIT ASCII CHARACTERS.
 ENTER WITH THE CHARACTER IN THE AC, LEAVE WITH THE EIGHT-BIT CHARACTER
 IN AC(0-17) AND THE LINK AS FOLLOWS:

RETURN LINK MEANING

 2880 * *1 1 THE CHARACTER IS A DELIMITER (I.E., NEITHER A DIGIT NOR A LETTER
 2890 * *2 0 THE CHARACTER IS EITHER AN UPPER CASE OR A LOWER CASE LETTER
 2900 * *3 0 THE CHARACTER IS AN OCTAL DIGIT
 2910 * *3 1 THE CHARACTER IS A DECIMAL DIGIT (8 OR 9)

010567 2930

ENTER CHRID
,PMC SAVE,ON

CHRID

003501
 010567 513353 2940
 010570 043503 2950
 010571 353416 2960
 010572 745102 2970
 010573 610611 2980
 010574 353417 2990
 010575 745100 3000
 010576 610614 3010
 010577 353420 3020
 010600 745102 3030
 010601 610614 3040
 010602 353421 3050
 010603 745302 3060
 010604 610611 3070
 010605 513422 3080
 010606 353423 3090
 010607 741102 3100
 010610 610615 3110
 3120
 010611 203503 3130
 010612 043455 3140
 010613 623501 3150
 3160
 010614 443501 3170
 010615 443501 3180
 010616 203503 3190
 010617 623501 3200
 3210
 3220
 3230

DLMR LAC TTYOT
 DAC DLMTR
 JMP CHRID,X

DIGIT ISZ CHRID
 LETTR ISZ CHRID
 LAC TTYOT
 JMP CHRID,X

RELOAD THE CHARACTER

010620 3240

ENTER TTYOT
,PMC SAVE,ON

TTYOT

003503
 010620 700401 3250
 010621 610620 3260

...
 TSF
 JMP .-1

WAIT FOR THE TELEPRINTER TO BE FREE

T

(MTSS TELETYPE HANDLER) MISCELLANEOUS CHARACTER-HANDLING SUBROUTINES

010622	700301	3270	KSP	KILL-THE-OUTPUT FEATURE
010623	700406	3280	TLS	PRINT THE CHARACTER IN THE AC
010624	623503	3290	JMP	TTYOT,X
		3300		
		3310		
010625		3320	ENTER	CRLF
			,PMC	SAVE,ON
003505			...	
010625	760215	3330	LAW	215
010626	103503	3340	JMS	TTYOT
010627	760215	3350	LAW	215
010630	103503	3360	JMS	TTYOT
010631	760212	3370	LAW	212
010632	103503	3380	JMS	TTYOT
010633	700401	3390	TSF	
010634	610633	3400	JMP	.-1
010635	623505	3410	JMP	CRLF,X
		3420		WAIT FOR THE TTY TO SETTLE
		3430		
		3440	,HEAD	
		3450	,LIST	ON
		3460	,END	
004012	10060	NEXTL	,EQU	\$MONSYM
	10070		,HEAD	M
002170	10080	CATLOG	,EQU	BUFFER
003314	10090	FORCE	,EQU	D\$FORCE
	10100		,INSRT	MTSSCAT

M

DESCRIPTION OF THE GROWTH SYSTEM CATALOG STRUCTURE

100 ,STTL DESCRIPTION OF THE GROWTH SYSTEM CATALOG STRUCTURE
110 ,HEAD C

140 *

150 * MAJOR REVISION -- JAN 21, 1972 BY ROBERT W. BLEAN

160 *

170 * A GROWTH CATALOG FOR A FILE-ORIENTED DEVICE IS LOCATED IN THE 400 WORDS
180 * OF LOGICAL BLOCK 1 OF THE LOGICAL DEVICE; THIS PERMITS DISK AND DECTAPE
190 * TO BE USED INTERCHANGEABLY BY THE GROWTH SYSTEM PROGRAMS.

200 *

210 * THE DEVICE ADDRESS OF A HANDLER IS THE HANDLER NUMBER IN BITS 0-2
220 * AND THE TYPE (DISK (1) OR DECTAPE (0)) IN BIT 3.

230 *

240 * THE DEVICE ADDRESS OF A FILE IS THE DEVICE ADDRESS OF THE HANDLER IT
250 * IS ON PLUS IN BITS 8-17 ITS STARTING BLOCK NUMBER.

260 *

270 * ALL DEVICE ADDRESSES IN A DECTAPE CATALOG ARE CORRECT FOR THE HANDLER
280 * THE TAPE WAS MOUNTED ON THE LAST TIME IT WAS ALTERED.

290 *

300 * THE FIRST FOUR WORDS OF THE CATALOG BLOCK ARE A HEADER:
310 * 1) THE DEVICE ADDRESS OF THE FIRST FREE BLOCK ON THE DEVICE
320 * 2) POINTER TO THE FIRST FREE WORD IN THE CATALOG MINUS ONE PLUS THE CATALOG'S CORE ADDRESS
330 * 3) TWOS COMPLEMENT COUNT OF THE NUMBER OF FILES CATALOGED
340 * 4) TWOS COMPLEMENT MAXIMUM BLOCK NUMBER ON THE DEVICE

350 *

360 * THE REMAINDER OF THE CATALOG CONSISTS OF A SERIES OF FIVE WORD FILE-
370 * CONTROL BLOCKS, THE FIRST FILE CONTROL BLOCK IS FOR THE CATALOG ITSELF,
380 * THEN THERE IS ONE FILE CONTROL BLOCK FOR EACH FILE ON THE DEVICE.

390 *

400 * FORMAT OF THE FILE CONTROL BLOCKS:
410 * 1) THE FIRST WORD IS THE SIXBIT ASCII (EIGHTBIT ASCII - 240)
420 * FILENAME. THIS MEANS THE FILENAME IS RESTRICTED TO THREE
430 * CHARACTERS, WITH NO EXTENSION OR PASSWORD.
440 * 2) THE DEVICE ADDRESS OF THE FILE.
450 * 3) THE FILE'S CORE ADDRESS
460 * 4) THE FILE'S LENGTH (IN WORDS)
470 * 5) THE PROGRAM START

480 *

490 * THIS LEAVES TWO WORDS OF THE CATALOG BLOCK UNUSED, IT IS SUGGESTED THAT
500 * THE SECOND OF THESE CONTAIN THE BLOCK NUMBER OF A CONTINUATION OF THE
510 * CATALOG, SHOULD THIS EVER BE NECESSARY; IT WOULD BE ZERO IF THERE
520 * IS NO CONTINUED CATALOG BLOCK.

C

GROWTH SYSTEM STANDARD CATALOG ROUTINES

	530		,STITL	GROWTH SYSTEM STANDARD CATALOG ROUTINES	
003507	540		,USE	IMPURE	
	550				
003507 000000	560	CTEM1	,DSA	CATALOG ROUTINE'S PRIVATE TEMP	
010636	570		,USE	PURE	
	580				
	590				
	600	*			
	610	*	RCAT -- THE BASIC CATALOG ROUTINE, IT READS IN CATALOGS AND UPDATES THEM		
	620	*	FOR THE CURRENT DEVICE AND (POSSIBLY NON-STANDARD) CATALOG LOCATION.		
	630	*			
	640	*			
	650	*	A HANDLER DEVICE ADDRESS IS PASSED IN THE AC. THE REQUESTED		
	660	*	CATALOG IS READ IN AND ALL OF THE DEVICE ADDRESSES ARE UPDATED,		
	670	*	AS A RESULT, THE CATALOG IN CORE ALWAYS HAS THE PROPER DEVICE ADDRESSES		
	680	*	FOR THE DEVICE IT WAS READ FROM.		
	690	*			
	700	*	RETURN IS +1 WHEN THE DESIRED CATALOG IS IN CORE.		
	710	*			
	720	*	IN THE EVENT OF UNRECOVERABLE ERROR, EXIT IS TO AN ERROR ROUTINE.		
	730	*			
010636	740	ENTER	RCAT		
		,PMC	SAVE,ON		
003510		RCAT	...		
010636 043507	750	DAC	CTEM1	SAVE THE DEVICE ADDRESS OF THE DEVICE WHOSE CATALOG IS BEING REQUESTED	
010637 103314	760	JMS	M\$FORCE	FORCE THE OLD BUFFER BEFORE READING A NEW ONE	
	770				
010640	780	RCAT1	...		
010640 203507	790	LAC	CTEM1		
010641	800	AND	(DVCMSK)	GET THE NEW HANDLER'S DEVICE ADDRESS	
010642	810	DAC	D\$BDA	SET THE HANDLER DEVICE ADDRESS	
010643	820	AND	(040000)	RECOVER JUST THE D\$BK/DECTAPE BIT	
010644	830	SZA		SKIP FOR DECTAPE	
010645	840	LAC	(\$SYSBAS)	ELSE LOAD THE DISK SYSTEM BASE ADDRESS	
010646	850	XOR	D\$BDA	ADD THE BASE ADDRESS INTO THE HANDLER DEVICE ADDRESS	
010647	860	XOR	(SCATBLK)	ADD IN THE CATALOG BLOCK NUMBER	
010650	870	DAC	D\$BDA	SAVE THE NEW CATALOG'S DEVICE ADDRESS	
010651	880	LAH	BUFFER	LOAD A POINTER TO THE BUFFER	
010652	890	DAC	DSBCA	SET IT AS THE CORE ADDRESS	
010653	900	LAC	(400)	LOAD THE LENGTH	
010654	910	DAC	DSBLEN	SET IT AS THE BUFFER LENGTH	
010655	920	JMS	CSRCOVER	SET UP THE ERROR RECOVERY	
010656	930	LAW	RCAT3		
010657	940	LMO		LOAD THE RESTART ADDRESS	
010660	950	LAW	D\$BDA	GET A POINTER TO THE CATALOG PARAMETERS	
010661	960	PREAD		READ IN THE NEW CATALOG	
010662	970	JMP	RCVRA	IN CASE OF ERROR	
	980	*			
	990	*	NOW UPDATE THE DEVICE ADDRESSES		
	1000	*			
010663	203507 1010	RCAT3	LAC	CTEM1	
010664	513301 1020		AND	(DVCMSK)	

C				GROWTH SYSTEM STANDARD CATALOG ROUTINES	
010665	043507	1030	DAC	CTEM1	SET THE CURRENT DEVICE ADDRESS
		1040			
010666	202170	1050	LAC	CATLOG	
010667	513336	1060	AND	(BLKMSK)	
010670	243507	1070	XOR	CTEM1	
010671	042170	1080	DAC	CATLOG	UPDATE THE OLD DEVICE ADDRESS OF THE FIRST FREE BLOCK
		1090			
010672	762175	1100	LAW	CATLOG+5	
010673	043314	1110	DAC	MSFORCE	
010674	043515	1120	DAC	CATL	SET POINTERS TO THE FIRST OLD DEVICE ADDRESS
010675	202172	1130	LAC	CATLOG+2	
010676	043512	1140	DAC	RCOVR	SET THE COUNT OF FCB'S
		1150			
010677	223314	1160	RCAT4	LAC	MSFORCE,X
010700	513336	1170	AND	(BLKMSK)	LOAD THE NEXT OLD DEVICE ADDRESS
010701	243507	1180	XOR	CTEM1	RECOVER THE BLOCK NUMBER
010702	063515	1190	DAC	CATL,X	ADD IN THE CURRENT HANDLER DEVICE ADDRESS
		1200			SAVE THE UPDATED FILE DEVICE ADDRESS
010703	443512	1210	ISZ	RCOVR	COUNT THE FILES DONE
010704	741000	1220	SKP		
010705	623510	1230	JMP	RCAT,X	ALL DONE
		1240			
010706	203314	1250	LAC	MSFORCE	LOAD THE FCB POINTER
010707	353425	1260	TAD	(FCBLEN)	ADVANCE IT TO THE NEXT FCB
010710	043314	1270	DAC	MSFORCE	
010711	043515	1280	DAC	CATL	SAVE THE NEW POINTER
010712	610677	1290	JMP	RCAT4	LOOP

C

GROWTH SYSTEM STANDARD CATALOG ROUTINES

1300 .EJECT
1310
1320
1330
010713 1340 ENTER RCOVR SUBROUTINE TO SET UP RECOVERY FROM HARDWARE ERRORS
003512 RCOVR ,PMC SAVE,ON
010713 777776 1350 LAW -2 SET FOR FIVE RETRIES BEFORE GIVING UP
010714 043514 1360 DAC ERcnt
010715 623512 1370 JMP RCOVR,X
1380
010716 1390 RCVR4 MESS <DEVICE ERROR>,12,
010726 443514 1400 ISZ ERcnt COUNT THE ERROR
010727 623512 1410 JMP RCOVR,X
010730 1420 RCVR5 MESS <TYPE 'IGNORE' OR 'CONTINUE'>,29,
010746 1430 LINE GET THE USER'S ANSWER TO WHAT HE WANTS TO DO ABOUT IT
010747 1440 WORD READ HIS ANSWER
010750 610730 1450 JMP RCVR5 NO INPUT IS ILLEGAL
010751 550756 1460 SAD IGN
010752 604012 1470 JMP \$NEXTL IGNORE THE LAST COMMAND
010753 550757 1480 SAD CON
010754 603513 1490 JMP RCOVR+1 SET UP TO TRY AGAIN
010755 610730 1500 JMP RCVR5 ANY OTHER ANSWER IS ILLEGAL
003514 1510 USE IMPURE
003514 000000 1520 ERCNT ,DSA
010756 1530 USE PURE
010756 514756 1540 IGN ,AC16 *IGN*
010757 435756 1550 CON ,AC16 *CON*

C

GROWTH SYSTEM STANDARD CATALOG ROUTINES

1560 * .EJECT
 1570 *
 1580 * CATL
 1590 *
 1600 * CATL SEARCHES THE CATALOG IN CORE FOR THE FILENAME
 1610 * PASSED IN THE AC
 1620 *
 1630 * RETURN +2 WITH CATX POINTING TO THE FILE NAME IF SUCCESSFUL
 1640 *
 1650 * RETURN +1 WITH CATX POINTING TO THE FIRST FREE SPACE -1 IN THE
 1660 * CATALOG IF THE FILE NAME IS NOT FOUND
 1670 *
 010760 1680 ENTER CATL
 ,PMC SAVE,ON
 003515
 010760 043326 1690 CATL ;,
 1700 * DAC T\$WORDB SAVE CATALOG NAME
 1710 *
 1720 * FIRST CHECK WHETHER OR NOT THIS IS A SPECIAL FILE
 010761 203531 1730 LAC CDFLG LOAD THE CORE/DISK SPECIAL FILE FLAG
 010762 741200 1740 SNA SKIP IF IT IS SET
 010763 611005 1750 JMP CATL1 NO -- THEREFORE IT IS A NORMAL FILE
 1760 *
 1770 * FIND OUT WHICH KIND OF SPECIAL FILE WE ARE TALKING ABOUT
 1780 *
 010764 1790 WORD1
 010765 543517 1800 SAD CORE
 010766 611024 1810 JMP CORE1 IT IS THE USER CORE FILE
 010767 543523 1820 SAD DISK
 010770 611036 1830 JMP DISK1 IT IS THE USER DISK FILE
 010771 1840 MESS <ILLEGAL SPECIAL FILE>,20,
 011004 605345 1850 JMP MSNEXTL GET THE NEXT COMMAND
 1860 *
 1870 * NEXT CHECK FOR NORMAL FILES
 1880 *
 011005 762173 1890 CATL1 L\$W CATLOG+3
 011006 040011 1900 DAC SCATX SET A POINTER TO THE FIRST FCB IN THE CATALOG AUTO-INDEX REGISTER
 011007 202172 1910 LAC CATLOG+2 GET CATALOG COUNT
 011010 043507 1920 DAC CTEM1 SAVE IT
 011011 1930 CATL1 WORD1 RESTORE NAME TO SEARCH FOR
 011012 560011 1940 SAD SCATX,X CHECK IT
 011013 611022 1950 JMP CATL9 FOUND IT
 011014 200011 1960 LAC SCATX
 011015 353343 1970 YAD (FCBLEN-1) FAILED -- MOVE THE POINTER TO THE NEXT FILE CONTROL BLOCK
 011016 040011 1980 DAC SCATX
 011017 443507 1990 ISZ CTEM1 COUNT
 011020 611011 2000 JMP CATL1 LOOP
 011021 623515 2010 JMP CATL,X EXHAUSTED, NO FILE FOUND -- BAD RETURN
 011022 443515 2020 ISZ CATL GOOD RETURN
 011023 623515 2030 JMP CATL,X
 2040 *
 2050 * SPECIAL CATALOG AND ROUTINES FOR THE USER CORE IMAGE

C

GROWTH SYSTEM STANDARD CATALOG ROUTINES

	2060	*			
003517	2070		,USE IMPURE		
003517 435762	2080	CORE	,ACI6 *COR*		
003520 000000	2090	CORDA	,DSA	DISK ADDRESS OF THE USER CORE IMAGE	
003521 002000	2100	CQRCA	BOUNDARY	STARTING CORE ADDRESS OF THE USER CORE	
003522 014000	2110	CORLN	CORMAX-BOUNDARY	LENGTH OF USER CORE	
	2120				
011024	2130		,USE PURE		
011024	2140	CORE1	,,,	SET UP THE USER CORE IMAGE AS A FILE	
011024	2150		MPOFF		
			,PMC SAVE,ON		
011024 705000	2160		SPECIAL+0	TURN OFF MEMORY PROTECT	
011025 201766	2160	LAC	SUCORE	LOAD THE USER CORE IMAGE DISK ADDRESS	
011026 744000	2170	CLL		PROTECT THE SHIFT	
011027 640510	2180	LRS	8,	MAKE THE PHYSICAL ADDRESS INTO A BLOCK ADDRESS	
011030 253307	2190	XOR	(040000)	SET THE DISK BIT ON	
011031 043520	2200	DAC	CORDA	SET IT IN THE TEMPORARY CATALOG	
011032 701742	2210	MPEU		RE-ENABLE USER MODE	
011033 763517	2220	LAW	CORE	LOAD A POINTER TO THE CATALOG	
011034 040011	2230	DAC	SCATX	AND PASS IT TO THE CALLER	
011035 611022	2240	JMP	CATL9	EXIT	
	2250	*			
	2260	*	SPECIAL CATALOG AND ROUTINES FOR THE USER "PHYSICAL DISK"		
	2270	*			
003523	2280		,USE IMPURE		
003523 445163	2290	DISK	,ACI6 *DIS*		
003524 000000	2300	DISDA	,DSA	DISK ADDRESS OF THE USER "PHYSICAL DISK"	
003525 000000	2310	DISCA	0	MINIMUM USER "PHYSICAL DISK" ADDRESS	
003526 016000	2320	DISLN	SDKLEN	LENGTH OF THE USER "PHYSICAL DISK"	
	2330				
011036	2340		,USE PURE		
011036	2350	DISK1	,,,		
011036	2360		MPOFF		
			,PMC SAVE,ON		
011036 705000	2370		SPECIAL+0	TURN OFF MEMORY PROTECT	
011037 201767	2370	LAC	SUDISK	LOAD THE USER "PHYSICAL DISK" DISK ADDRESS	
011040 744000	2380	CLL		PROTECT THE SHIFT	
011041 640510	2390	LRS	8,	MAKE THE PHYSICAL ADDRESS INTO A DISK ADDRESS	
011042 253307	2400	XOR	(040000)	SET THE DISK BIT ON	
011043 043524	2410	DAC	DISDA	AND SET IT IN THE TEMPORARY CATALOG	
011044 701742	2420	MPEU		RE-ENABLE USER MODE	
011045 763523	2430	LAW	DISK	LOAD A POINTER TO THE CATALOG	
011046 040011	2440	DAC	SCATX	PASS IT TO THE CALLER	
011047 611022	2450	JMP	CATL9	EXIT	

MTSSCAT

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PDP9 TIME-SHARING SYSTEM MONITOR AND MESSAGE ROUTINES

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GROWTH SYSTEM STANDARD CATALOG ROUTINES

2460		,EJECT		
2470	*			
2480	*	GNAME		
2490	*			
2500	*	GNAME GETS A FILE NAME FROM THE TTY BUFFER		
2510	*	AND READS IN THE CATALOG IF NECESSARY		
2520	*			
2530	*	RETURN IS +1 FOR PAPER TAPE DESIRED		
2540	*	RETURN IS +2 FOR SUCCESS ON DISK OR DECTAPE		
2550	*	OTHERWISE EXIT IS TO FORMAT ERROR		
2560	*			
2570	*	THE FILE NAME IS RETURNED IN TSWORDB AND IN THE AC.		
2580	*			
011050	2590	ENTER GNAME		
		,PMC SAVE,ON		
003527		GNAME		
011050	143531	2600	DZM CDFLG	INITIALIZE THE SPECIAL FILE FLAG
011051		2610	WORD	GET A WORD OF SIX BIT ASCII
011052	611105	2620	JMP GNAM90	CHECK FOR A SPECIAL FILE IF A DELIMITER IS FIRST CHARACTER
011053		2630	DELIM	GET THE DELIMITER
011054	553304	2640	SAD (SCOLON)	CHECK FOR COLON
011055	611061	2650	JMP GNAM2	
011056	103534	2660	JMS PAPER	
011057	623527	2670	JMP GNAME,X	CHECK FOR PAPER TAPE
011060	611071	2680	JMP GNAM5	YES -- PAPER TAPE
		2690		NO -- SO USE CURRENT CATALOG
011061	771065	2700	GNAM2 LAW	GNAM3
011062	043532	2710	DAC DEVCV	
011063		2720	WORD1	RELOAD THE CATALOG NAME
011064	611121	2730	JMP DEVCO3	CONVERT IT TO A DEVICE ADDRESS
011065	623527	2740	GNAM3 JMP GNAME,X	
011066	103510	2750	JMS RCAT	READ IN THE CATALOG
011067		2760	WORD	GET ANOTHER WORD
011070	740000	2770	NOP	
011071		2780	GNAM5 DELIM	GET THE DELIMITER
011072	553376	2790	SAD (\$SLASH)	CHECK FOR SLASH
011073	611100	2800	JMP GNAME6	LOOK FOR OCTAL
011074		2810	WORD1	ELSE RECOVER THE SIXBIT NAME
011075	741200	2820	SNA	CHECK FOR ALL SPACES
011076		2830	FORMAT	FORMAT ERROR -- ALL SPACES IS AN ILLEGAL NAME
011077	611103	2840	JMP GNAM8	
011100		2850	GNAME6 NUM	GET THE NUMBER
011101		2860	FORMAT	
011102	043326	2870	DAC TSWORDB	TO BE COMPATABLE WITH SIXBIT INPUT
011103	443527	2880	GNAM8 ISZ GNAME	GOOD RETURN
011104	623527	2890	JMP GNAME,X	
		2900		
		2910		
		2920	*	CHECK FOR A SPECIAL FILE REQUEST (E.G. 'CORE' OR 'DISK')
		2930	*	
003531		2940	,USE IMPURE	
003531 000000		2950	CDFLG ,DSA	FLAG FOR PRESENCE OF SPECIAL FILE REQUEST

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GROWTH SYSTEM STANDARD CATALOG ROUTINES

011105	2960	.USE	PURE	
	2970			
011105	2980	GNAM90	...	
011105	2990	DELIM	-	RECOVER THE DELIMITER
011106	553304	3000	SAD	(SCOLON) CHECK FOR A VACUOUS COLON
011107	741000	3010	SKP	YES -- IT IS A SPECIAL FILE
011110	611056	3020	JMP	NO -- RETURN TO NORMAL PROCESSING
	3030			
011111	213426	3040	LAC	(SDK0) LOAD THE IMPLIED SYSTEM DISK MNEMONIC
011112	043326	3050	DAC	TSHWORDB FAKE THAT IT WAS TYPED
011113	443531	3060	INX	CDFLG FLAG THE SPECIAL FILE REQUEST
011114	611061	3070	JMP	GNAM2 RESUME NORMAL PROCESSING OF THE FADED INPUT

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GROWTH SYSTEM STANDARD CATALOG ROUTINES

	3080		.EJECT
	3090	*	
	3100	*	DEVCV -- READS THE NEXT WORD.
	3110	*	RETURN IS +1 WITH THE NAME IN THE AC IF IT IS A PAPER TAPE CALL
	3120	*	
	3130	*	OTHERWISE IT ATTEMPTS TO CONVERT THE NAME TO DEVICE ADDRESS FORMAT,
	3140	*	IF SUCCESSFUL, IT RETURNS +2 WITH THE HANDLER NUMBER IN AC(0-2) AND
	3150	*	THE DEVICE TYPE (DISK (1) OR DECTAPE (0)) IN AC(3), REMAINING BITS
	3160	*	ARE ZEROED.
	3170	*	
	3180	*	EXIT IS TO THE FORMAT ERROR MESSAGE IF THE DEVICE IS NEITHER PAPER TAPE
	3190	*	NOR DISK NOR DECTAPE.
	3200	*	
011115	3210		ENTER DEVCV ,PMC SAVE,ON
003532		DEVCV	...
011115	3220		WORD
011116	3230		FORMAT
011117	103534	3240	JMS PAPER
011120	623532	3250	JMP DEVCV,X
011121	513303	3260	AND (777700)
011122	553427	3270	SAD (STP.)
011123	611133	3280	JMP DEVCO1
011124	553430	3290	SAD (SDT.)
011125	611133	3300	JMP DEVCO1
011126	553431	3310	SAD (SDK.)
011127	611141	3320	JMP DEVCO4
011130	604026	3330	JMP MSMONX2
011131	650004	3340	DEVCO35 CLQ;CMQ
011132	741000	3350	SKP
011133	650000	3360	DEVCO1 CLQ
011134	3370		WORD1
011135	640617	3380	LLS 18,-3
011136	513301	3390	AND (DVCMISK)
011137	443532	3400	ISZ DEVCOV
011140	623532	3410	JMP DEVCV,X
	3420	*	
	3430	*	
	3440	*	DISK FILE OPERATIONS ARE PERMITTED ONLY FOR VALIDATED USERS
	3450	*	
011141	3460	DEVCO4	...
011141	3470		MPOFF ,PMC SAVE,ON
011141	705000		SPECIAL+0
011142	201770	3480	LAC SVALID
011143	701742	3490	MPBU
011144	740200	3500	SZA
011145	611131	3510	JMP DEVCO35
	3520	*	
	3530	*	CHECK FOR A SPECIAL FILE OPERATION -- IF SO, IT IS ALLOWED
	3540	*	
011146	203531	3550	LAC CDFLG
			LOAD THE SPECIAL FILE FLAG

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GROWTH SYSTEM STANDARD CATALOG ROUTINES

011147	740200	3560	SZA	SKIP IF NOT SET -- THEN THE OPERATION IS ILLEGAL
011150	611131	3570	JMP	DEVC35 IT IS A SPECIAL FILE OPERATION, SO ALLOW IT
		3580 *		
		3590 *		DISK OPERATION IS ILLEGAL
		3600 *		
011151		3610	MESS	<DISK OPERATION IS FORBIDDEN>,27,
011166	605345	3620	JMP	M\$NEXTL GET THE NEXT COMMAND LINE
		3630 *		
		3640 *		PAPER CHECKS THE AC FOR A PAPER TAPE MNEMONIC. IT RETURNS +1 IF IT
		3650 *		FINDS ONE, ELSE RETURNS +2. THE AC IS UNCHANGED.
		3660 *		
011167		3670	ENTER	PAPER
			,PMC	SAVE,ON
003534		PAPER	...	
011167	553432	3680	SAD	(\$PPT)
011170	623534	3690	JMP	PAPER,X
011171	553433	3700	SAD	(\$PTR)
011172	623534	3710	JMP	PAPER,X
011173	553434	3720	SAD	(\$PTP)
011174	623534	3730	JMP	PAPER,X
011175	443534	3740	ISZ	PAPER
011176	623534	3750	JMP	PAPER,X NO PAPER TAPE MNEMONIC

C

GROWTH SYSTEM STANDARD CATALOG ROUTINES

3760 *
 3770 *
 3780 *
 3790 *
 3800 *
 3810 *
 3820 *
 3830 *
 3840 *
 3850 *

011177 3860 ENTER SAVE
 ,PMC SAVE,ON

003536 SAVE JMS CATL LOOK UP NAME
 011177 103515 3870 SKP
 011200 741000 3880 JMP SAVE,X DON'T ALLOW DUPLICATES
 011201 623536 3890 LAC CATLOG+2 LOAD THE FCB COUNT
 011202 202172 3900 SAD (CATMAX) CHECK FOR CATALOG ALREADY FULL
 011203 553435 3910 JMP CFULL YES -- EXIT TO ERROR MESSAGE
 011204 611217 3920 TAD (-1) COUNT THE NEW FILE
 011205 353332 3930 DAC CATLOG+2 UPDATE THE FCB COUNT
 011206 042172 3940 LAC CATLOG+1 GET FREE POINTER
 011207 202171 3950 TAD (FCBLEN) ADD ONE FILE CONTROL BLOCK LENGTH FOR THE NEW ENTRY
 011210 353425 3960 DAC CATLOG+1
 011211 042171 3970 WORD1 RECOVER THE FILE NAME
 011212 3980 DAC \$CATX,X SAVE IT
 011213 060011 3990 ISZ D\$BALT FLAG THE CATALOG HAS BEEN ALTERED
 011214 442156 4000 ISZ SAVE
 011215 443536 4010 JMP SAVE,X
 011216 623536 4020 4030
 011217 4040 CFULL MESS <CATALOG FULL>,12.
 011227 604012 4050 JMP \$NEXTL
 4060 *
 4070 *
 4080 *
 4090 *
 4100 *
 4110 *
 4120 *
 4130 *
 4140 *
 011230 4150 ENTER ALC
 ,PMC SAVE,ON

003540 ALC TAD (377) ROUND UP TO A BLOCK
 011230 353353 4160 LRSS 8, AC = MINIMUM INTEGER NUMBER OF BLOCKS REQUIRED
 011231 660510 4170 DAC CTEM1 SAVE IN A GOOD RANDOM PLACE
 011232 043507 4180 LAC CATLOG GET THE POINTER TO THE FIRST FREE BLOCK
 011233 202170 4190 LMQ SAVE IT
 011234 652000 4200 TAD CTEM1 ADD THE REQUESTED NUMBER OF BLOCKS TO FORM A NEW POINTER
 011235 343507 4210 DAC CTEM1 SAVE THE NEW POINTER
 011236 043507 4220 AND (1777) EXTRACT BLOCK NUMBER

C

GROWTH SYSTEM STANDARD CATALOG ROUTINES

011240	342173	4240	TAD	CATLOG+3	SEE IF WE OVERFLOWED THE DEVICE
011241	740100	4250	JMP	_MA	NO IF SKP
011242	611247	4260	JMP	DFULL	FULL -- HELP=?!@
011243	203507	4270	LAC	CTEM1	
011244	042170	4280	DAC	CATLOG	SET THE FREE FCB POINTER NOW WE KNOW IT WILL BE OK
011245	641002	4290	LACQ		RESTORE THE DEVICE ADDRESS OF THE FIRST FREE BLOCK
011246	623540	4300	JMP	ALC,X	
		4310			
011247		4320	DFULL	MESS	<DEVICE FULL>,11.
011257	604012	4330	JMP		\$NEXTL
		4340		,END	

C SYSTEM MESSAGE OUTPUT ROUTINES

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011260      10110 .STITL SYSTEM MESSAGE OUTPUT ROUTINES
              10120 ,USE PURE
              10130 ,HEAD M
              10140 * MSG0: A CALL FOR MESSAGE #0 IS A MONITOR CALL
              10150 * MSG1-9: RESERVED FOR MEMORY PROTECTION OVERLAY #1 (MP1)
              10160 * MSG10-19: RESERVED FOR MEMORY PROTECTION OVERLAY #2 (MP2)
              10170 * MSG50-59: RESERVED FOR MONITOR MESSAGES. MONITOR TRANSFERS DIRECTLY
              10180 * TO ITS OWN MESSAGE ROUTINES, NOT GOING THROUGH THE SORTING PROCEDURE.
              10190 *

011260 604004 10200 MSGPTR JMP MONMSG
011261 611305 10210 JMP MSG1
011262 611321 10220 JMP MSG2
011263 611344 10230 JMP MSG4
011264 611332 10240 JMP MSG3
011265 611365 10250 JMP MSG5
011266 611377 10260 JMP MSG6
011267 611412 10270 JMP MSG7
011270 611466 10280 JMP MSG8
011271 611447 10290 JMP MSG9
011272 611424 10300 JMP MSG10
011273 611506 10310 JMP MSG11
011274 611522 10320 JMP MSG12
              10330
    777763 10340 MSGMAX ,EQU MSGPTR-. TWO'S COMP OF LENGTH OF TABLE FOR CHECKING MESSAGE REQUESTS
              10350
011275      10360 MSGOCT OCTZ          PRINT THE AC IN ZERO-SUPPRESSED OCTAL
011277 604012 10370 JMP MONSYM       GET THE NEXT LINE
              10380
011300 202000 10390 ADDOCT LAC  TEMPO
011301 744002 10400 STL   SUPPRESS LEADING ZEROES
011302      10410 OCTZ          PRINT THE ERROR ADDRESS IN OCTAL
011304 604004 10420 JMP MONMSG       PRINT THE MONITOR HEADER
              10430 *
              10440 * MP1 MESSAGES, GENERALLY PRINTING THE PC AS WELL
              10450 *
              10460
011305      10470 MSG1  MESS  <ILLEGAL TRANSFER TO >,20.
011320 611300 10480 JMP ADDOCT        PRINT THE LOCATION OF THE VIOLATION
              10490
011321      10500 MSG2  MESS  <BAD ADDRESS: >,13.
011331 611300 10510 JMP ADDOCT
              10520
011332      10530 MSG3  MESS  <CHAINED XCT'S: >,15.
011343 611300 10540 JMP ADDOCT
              10550
011344      10560 MSG4  MESS  <ILLEGAL OP CODE >,16.
011355 202001 10570 LAC   TEMP1 LOAD THE OP CODE
011356      10580 OCT
011360      10590 NMESS < AT >,4
011364 611300 10600 JMP ADDOCT
              10610
011365      10620 MSG5  MESS  <PROGRAM HALTED: >,16.

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M

SYSTEM MESSAGE OUTPUT ROUTINES

011376	611300	10630	JMP	ADDOCT
		10640		
011377		10650	MESS	<DEVICE OVERFLOW: >,17,
011411	611300	10660	JMP	ADDOCT
		10670		
011412		10680	MESS	<CORE OVERFLOW: >,15,
011423	611300	10690	JMP	ADDOCT
		10700		
011424		10710	MESS	<DEVICE TRANSFER TO/FROM PROTECTED MEMORY: >,42,
011446	611300	10720	JMP	ADDOCT
		10730		
011447		10740	MESS	<UNASSIGNED DEVICE REQUESTED: >,29,
011465	611300	10750	JMP	ADDOCT
		10760		
011466		10770	MESS	<NON-EXISTANT DISK REFERENCED: MESS>,30,
011505	611300	10780	JMP	ADDOCT
		10790		
011506		10800	MESS	<FILE NOT FOUND: MESS>,16,
011521	611300	10810	JMP	ADDOCT
		10820		
011522		10830	MESS	<CAL: >,5
011530	611300	10840	JMP	ADDOCT

M SYSTEM MESSAGE OUTPUT ROUTINES

```

10850 ,EJECT
10860 ,HEAD M,C,T,D,O
10870 *
10880 * MONITOR MESSAGES RETURN TO PRINT MONITOR-READY MESSAGE WHEN COMPLETED.
10890 *
10900
011531 10910 MSG50 MESS <WHAT: >,6
011537 10920 CMDERR
10930
011540 10940 MSG51 ...
011540 701742 10950 MPEU
011541 10960 MESS <RESOURCE ALREADY ALLOCATED>,26.
011556 10970 CMDERR
10980
011557 10990 MSG52 ...
011557 701742 11000 MPEU
011560 11010 MESS <NOT YOUR RESOURCE>,17,
011572 11020 CMDERR
11030
011573 11040 MSG53 MESS <{ }** WARNING -- ILLEGAL MESSAGE NUMBER GENERATED: >,50.
011620 202002 11050 LAC TEMP2 LOAD THE ILLEGAL MESSAGE NUMBER
011621 11060 OCTZ AND PRINT IT
011623 604004 11070 JMP MONMSG
11080
011624 11090 MSG54 ...
011624 701742 11100 MPEU
011625 11110 MESS <BOTH DECTAPE HANDLERS ALREADY ALLOCATED>,39.
011646 11120 CMDERR
11130
011647 11140
011660 11150 MSG56 MESS <FORMAT ERROR: >,14.
11160
011665 11170 MSG57 NMESS < WORD # >,8,
011666 611275 11180 COUNT GET THE NUMBER OF THE WORD PROVOKING THE ERROR MESSAGE
11190 JMP MSGOCT
11200
011667 11210 MSG58 MESS <VALIDATION ERROR>,16.
011700 705000 11220 MPOFF
011701 141770 11230 $PMC SAVE,ON
011702 701742 11240 $SPECIAL+0 TURN OFF MEMORY PROTECT
011703 604012 11250 DZM $VALID INSURE THE USER IS NOT VALIDATED
11260
011704 11270 MSG59 MESS <ADDRESS OUT OF BOUNDS>,21.
011717 11280 CMDERR
11290
011720 11300 ENTER MSG60 SAVE THE LOCATION OF THE SYSTEM ERROR HERE
,PMC SAVE,ON
003542 MSG60 ...
011720 11310 MESS <SYSTEM ERROR: >,14.
011731 777777 11320 LAW -1

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M C T D				SYSTEM MESSAGE OUTPUT ROUTINES	
011732	343542	11330	TAD	MSG60	RECOVER THE LOCATION OF THE SYSTEM ERROR
011733		11340	OCTZ		
011735	604012	11350	JMP	MONSYM	GET THE NEXT COMMAND
		11360			
011736		11370	MSG61	MESS	<FILE NOT FOUND>,16.
011747		11380	CMDERH		
		11390			
011750		11400	MSG62	MESS	<CAN'T CATALOG IT>,16.
011761		11410	CMDERH		
		11420			
011762		11430	MSG63	MESS	<FOR A LIST OF MONITOR COMMANDS TYPE 'EXPLAIN COMMANDS'>,54.
012010		11440	MESS	<FOR A LIST OF MTSS ALLOCATABLE RESOURCES TYPE 'EXPLAIN RESOURCES'>,65.	
012042	604023	11450	JMP	MONXT	PICK UP THE NEXT COMMAND
		11460			
012043		11470	MSG64	...	
012043		11480	CRLF		
012044		11490	MESS	<BAS -- CALLS S-USER PROGRAM 'BASIC INTERPRETER'>,47.	
012070		11500	MESSR	<BYE -- CLEARS USER FLAGS, DE-ALLOCATES USER RESOURCES>,54.	
012115		11510	MESSR	<ZEROES USER CORE AND USER DISK>,37.	
012134		11520	MESSR	<CAF -- CLEARS ALL USER HARDWARE FLAGS>,37.	
012153		11530	MESSR	<CAT -- CALLS PHANTOM PROGRAM 'CATALOG'>,38.	
012173		11540	MESSR	<CON -- CONTINUE BEGINS TO EXECUTE CURRENT USER CORE>,51.	
012217		11550	MESSR	<AT CURRENT REGISTER VALUES>,33.	
012235		11560	MESSR	<DEB -- CALLS S-USER PROGRAM 'DEBUGGER'>,38.	
012255		11570	MESSR	<DDT -- CALLS PHANTOM PROGRAM 'DDT'>,34.	
012273		11580	MESSR	<EXP -- LIST EXPLAINABLE TOPICS>,31.	
012310		11590	MESSR	<GOO -- GOODBYE IS THE SAME AS BYE>,34.	
012326		11600	MESSR	<GRO -- ABORTS MTSS AND BOOTSTRAPS GROWTH, REQUIRES CONTROL LINE>,64.	
012356		11610	MESSR	<HEL -- HELLO HAS THE SAME EFFECT AS BYE>,40.	
012376		11620	MESSR	<JMP -- JMP ADDRESS REPLACES USER PC WITH THE ADDRESS AND CONTINUES>,66.	
012427		11630	MESSR	<LDR -- CALLS PHANTOM PROGRAM 'LOADER'>,37.	
012446		11640	MESSR	<OFF -- 'OFF RESOURCE' DE-ALLOCATES THE NAMED RESOURCE>,53.	
012473		11650	MESSR	<ON -- 'ON RESOURCE' ATTEMPTS TO ALLOCATE THE NAMED RESOURCE>,60.	
012522		11660	MESSR	<TRA -- TRANSFER IS THE SAME AS JMP>,34.	
012540		11670	MESSR	<VAL -- REQUESTS UNDERPRINTING FOR A VALIDATION PASSWORD>,55.	
012565		11680	MESSR	<XDU -- SIMPLE OCTAL DUMP FOR SYSTEM DEBUGGING>,45.	
012607		11690	MESSR	<XPX -- SIMPLE OCTAL PATCH FOR SYSTEM DEBUGGING>,46.	
012631		11700	MESSR	<ZER -- 'ZERO CORE' ZEROES USER CORE>,35.	
012650		11710	MESSR	<'ZERO DISK' SETS THE ENTIRE USER DISK TO ZERO>,52.	
012674		11720	CRLF		
012675	604023	11730	JMP	MONXT	PICK UP THE NEXT COMMAND
		11740			
012676		11750	MSG65	...	
012676		11760	CRLF		
012677		11770	MESS	<PTR -- PAPER TAPE READER>,24.	
012713		11780	MESS	<PTP -- PAPER TAPE PUNCH>,23.	
012727		11790	MESS	<ACS -- HARDWARE ACCUMULATOR SWITCHES>,36.	
012747		11800	MESS	<CNT -- CONTROL LINE>,19.	
012761		11810	MESS	<SCO -- GRAPHICS II PERIPHERALS>,30.	
012777		11820	MESS	<DTN -- DECTAPE HANDLER #N>,25.	
013013		11830	MESS	<TPN -- DECTAPE HANDLER #N>,25.	
013027		11840	CRLF		

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M C T D SYSTEM MESSAGE OUTPUT ROUTINES

013030 604023 11850 JMP MONXT PICK UP THE NEXT COMMAND

M C T D

MTSS DEBUGGER MESSAGES

11860		,STITL	MTSS DEBUGGER MESSAGES
11870		.HEAD	D
11880			
11890			
11900			
013031	11910	MSGLOC	...
013031 042000	11920	DAC	TEMPO
013032	11930	NMESS	< AT >,4
013036 202000	11940	LAC	TEMPO
013037	11950	MSGCT	OCTZ
013041 605345	11960	JMP	DSNXLIN
	11970		
013042	11980	MSGWRD	...
013042	11990	NMESS	< WORD >,6
013046	12000	COUNT	
013047 613037	12010	JMP	MSGCT
	12020		
013050	12030	ENTER	MSG80
		,PMC	SAVE,ON
003544	12040	MSG80	...
013050	12040	MESS	<DDT SYSTEM ERROR>,16,
013061 203544	12050	LAC	MSG80
013062 613031	12060	JMP	MSGLOC
	12070		
013063	12080	MSG81	MESS
013076 613042	12090	JMP	<FILE CAN'T BE OPENED>,20.
	12100		
013077	12110	MSG82	MESS
013110 613042	12120	JMP	<FILE NOT FOUND>,14.
	12130		
013111	12140	MSG83	MESS
013121 613042	12150	JMP	<FORMAT ERROR>,12.
	12160		
013122	12170	MSG84	MESS
013136 613042	12180	JMP	<ILLEGAL MODE OR COMMAND>,23.
	12190		
013137	12200	MSG85	MESS
013152 613042	12210	JMP	<ILLEGAL DEVICE NUMBER>,21.
	12220		
013153	12230	MSG86	MESS
013164 613042	12240	JMP	<VALIDATION ERROR>,16.
	12250		
013165	12260	MSG87	MESS
013176 613042	12270	JMP	<UNDEFINED SYMBOL>,16.
	12280		
013177	12290	MSG88	MESS
013211 613042	12300	JMP	<ILLEGAL HEAD SYMBOL>,19.
	12310		
013212	12320	MSG89	MESS
013221 613042	12330	JMP	<TABLE FULL>,10.
	12340		
013222	12350	MSG90	MESS
			<NOT FOUND>,9.

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D MTSS DEBUGGER MESSAGES

013231	613042	12360	JMP	MSGWRD
		12370		
013232	12380	MSG91	MESS	<ADDRESS OUT OF BOUNDS>,21.
013245	613042	12390	JMP	MSGWRD

D GROWTH SYSTEM BOOTSTRAP

```

12400 .STITL GROWTH SYSTEM BOOTSTRAP
12410 ,HEAD M,C,T,D
12420 *
12430 *
12440 *
013246 12450 GRO MPOFF LEAVING TSS, SO TURN OFF MEMORY PROTECT
      ,PMC SAVE,ON
      SPECIAL+0 TURN OFF MEMORY PROTECT
      IOFLCLOF INSURE NO INTERRUPTS WHILE TRYING TO SHUT DOWN THE SYSTEM
013246 705000 12460 LAC SCNTRL
013247 700006 12470 SAD $NUMBR SEE IF THE CURRENT USER HAS A CONTROL LINE
013250 200006 12480 JMP .+4
013251 541771 12490 IONICLON
013252 613256 12500 MPEU
013253 700046 12500 WHAT NO -- SO DON'T LET HIM CRASH THE SYSTEM
013254 701742 12510
013255 12520
013256 703302 12530 CAF
013257 777377 12540 LAW -401 SET TO READ IN ONE BLOCK
013260 040036 12550 DAC 36
013261 040037 12560 DAC 37
013262 707074 12570 DLAH+10 SET PHYSICAL DISK 0
013263 213272 12580 LAC C1 SET THE DISK ADDRESS
013264 707024 12590 DLAL
013265 760002 12600 LAW 2 NON-INTERRUPTING DISK READ
013266 707047 12610 DSCF;DSFX;DSCN
013267 707001 12620 DSSF
013270 613267 12630 JMP .-1
013271 617740 12640 JMP 17740 DONE -- ENTER GROWTH SYSTEM
013272 540000 12650 C1 540000 START ADDRESS OF GROWTH SYSTEM
      12660
      12670
003546 12680 ,HEAD
003546 12690 CHECK ,USE IMPURE
      ,EQU .
      ,LOC PURSTR
      ,USE PURE
      ,END $START
013273 705377 12720
013274 705375
013275 705376
013276 017777
013277 777763
013300 011260
013301 740000
013302 440010
013303 777700
013304 000272
013305 000260
013306 037777
013307 040000
013310 000336
013311 000215
013312 422027
013313 422026
013314 422030

```

GROWTH SYSTEM BOOTSTRAP

013315 506000
013316 512000
013317 000077
013320 640402
013321 640477
013322 770000
013323 570000
013324 700000
013325 000777
013326 000024
013327 741000
013330 001300
013331 000001
013332 777777
013333 041300
013334 001000
013335 400001
013336 001777
013337 000200
013340 000300
013341 763241
013342 000007
013343 000004
013344 377777
013345 417777
013346 100000
013347 507000
013350 000240
013351 777740
013352 000100
013353 000377
013354 000177
013355 762000
013356 007227
013357 770534
013360 020000
013361 640000
013362 000244
013363 760000
013364 000700
013365 776777
013366 777760
013367 767461
013370 767531
013371 000241
013372 000246
013373 000252
013374 000253
013375 000255
013376 000257
013377 000334
013400 000254

GROWTH SYSTEM BOOTSTRAP

013401	657122
013402	657323
013403	777540
013404	000256
013405	000243
013406	002000
013407	002170
013410	003327
013411	000337
013412	000230
013413	000017
013414	000333
013415	000335
013416	777520
013417	777770
013420	777776
013421	777772
013422	777737
013423	777745
013424	000400
013425	000005
013426	445320
013427	646000
013430	446400
013431	445300
013432	606064
013433	606462
013434	606460
013435	777716
013436	000000
013437	000000
013440	000000
013441	000000

TRANSFER ADDRESS 603701

CROSS REFERENCE TABLE

1713	.0	4510	4520		
11534	.046.	10910			
11544	.047.	10960			
11563	.048.	11010			
11576	.049.	11040			
11630	.050.	11110			
11652	.051.	11150			
11662	.052.	11170			
11672	.053.	11210			
11707	.054.	11270			
11723	.055.	11310			
11741	.056.	11370			
11753	.057.	11400			
11765	.058.	11430			
12033	.059.	11440			
12047	.060.	11490			
12072	.061.	11500			
12137	.062.	11510			
12136	.063.	11520			
12155	.064.	11530			
12175	.065.	11540			
12221	.066.	11550			
12237	.067.	11560			
12257	.068.	11570			
12275	.069.	11580			
12312	.070.	11590			
12330	.071.	11600			
12360	.072.	11610			
12400	.073.	11620			
12431	.074.	11630			
12450	.075.	11640			
12475	.076.	11650			
12524	.077.	11660			
12542	.078.	11670			
12567	.079.	11680			
12611	.080.	11690			
12633	.081.	11700			
12652	.082.	11710			
12702	.083.	11770			
12716	.084.	11780			
12732	.085.	11790			
12752	.086.	11800			
12764	.087.	11810			
13002	.088.	11820			
13016	.089.	11830			
26	.310	3400	6100		
27	.311	3410	6120		
4453	.DK	770			
4464	.DT	750			
6460	.TP	760			
2023	10SAVE	1870	1880	1840	6090
2024	11SAVE	1880	1920	1860	6110

CROSS REFERENCE TABLE

CROSS REFERENCE TABLE

13272	C C1	12650
3540	C ALC	4150 4300
10757	C CON	1550 1480
13246	C GRO	12450
10796	C IGN	1540 1460
3515	C CATL	1680 1860 1120 1190 1280 2010 2020 2030 3870
3517	C CORE	2080 1800 2220
3523	C DISK	2290 1820 2430
3510	C RGAT	740 3790 1230 2750
3536	C SAVE	3860 3890 4010 4020
10721	C,027,	1390
10733	C,028,	1420
10774	C,029,	1840
11154	C,030,	3610
11222	C,031,	4040
11252	C,032,	4320
11534	C,046,	10910
11544	C,047,	10960
11563	C,048,	11010
11576	C,049,	11040
11630	C,050,	11110
11652	C,051,	11150
11662	C,052,	11170
11672	C,053,	11210
11707	C,054,	11270
11723	C,055,	11310
11741	C,056,	11370
11753	C,057,	11400
11765	C,058,	11430
12013	C,059,	11440
12047	C,060,	11490
12072	C,061,	11500
12137	C,062,	11510
12136	C,063,	11520
12155	C,064,	11530
12175	C,065,	11540
12221	C,066,	11550
12237	C,067,	11560
12257	C,068,	11570
12275	C,069,	11580
12312	C,070,	11590
12330	C,071,	11600
12360	C,072,	11610
12400	C,073,	11620
12431	C,074,	11630
12450	C,075,	11640
12475	C,076,	11650
12524	C,077,	11660
12542	C,078,	11670
12567	C,079,	11680
12611	C,080,	11690
12633	C,081,	11700

CROSS REFERENCE TABLE

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PDP9 TIME-SHARING SYSTEM MONITOR AND MESSAGE ROUTINES

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CROSS REFERENCE TABLE

45	CMP1	3490	3500						
46	CMP2	3500	3510						
11531	CMSG50	10910							
11540	CMSG51	10940							
11557	CMSG52	10990							
11573	CMSG53	11040							
11624	CMSG54	11090							
11647	CMSG56	11150	2830	2860	3230				
11660	CMSG57	11170							
11667	CMSG58	11210							
11704	CMSG59	11270							
3542	CMSG60	11300							
11736	CMSG61	11370							
11750	CMSG62	11400							
11762	CMSG63	11430							
12083	CMSG64	11470							
12676	CMSG65	11750							
4076	CNTOFF	8910	9320						
6	CNTRL	3380	3390	2650	3330	6610	12470		
272	COLON	370	3810	1750	22490	22820	2640	3000	
2053	CQFLG	2200	2210	1410	7460	9830			
254	COMMA	320	15230	22810					
2150	COMSTO	2270	2280						
230	CONTX	230	820						
435762	COR	880							
16090	CORMAX	910	980	7840	2110				
3534	CPAPER	3670	2660	3240	3690	3710	3730	3740	3750
17095	CPARAM	590							
215	CR	220	5130	1490	3680	4170	6510	7160	910
10640	CRCAT1	780							
10663	CRCAT3	1010	930						
10677	CRCAT4	1160	1290						
3512	CRCOVR	1340	920	1140	1210	1370	1410	1490	
10716	CRCVR4	1390	970						
10730	CRCVR5	1420	1450	1500					
87	CSPL	3510	3520						
44	CSWP	3480	3490						
60	CTBFR	3600	3630	3640					
100	CTBIN	3640	3650	3670	4250				
2000	CTEMPO	1630							
2001	CTEMP1	1640							
2002	CTEMP2	1650							
2003	CTEMP3	1660							
2004	CTEMP4	1670							
2005	CTEMP5	1680							
2006	CTEMP6	1690							
2007	CTEMP7	1700							
2010	CTEMP8	1710							
2011	CTEMP9	1720							
102	CTFLG	3650	3660						
436454	CTL	810							
104	CTNAM	3660							

CROSS REFERENCE TABLE

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CROSS REFERENCE TABLE

CROSS REFERENCE TABLE

CROSS REFERENCE TABLE

CROSS REFERENCE TABLE

CROSS REFERENCE TABLE

CROSS REFERENCE TABLE

7423	DINV37	15610	15200									
7425	DINV38	15630	15220									
7430	DINV39	15670	15480	15500	15520	15540	15580	15600	15620	15640		
7342	DINV45	15050	15820	16130								
7375	DINV48	15370	15300									
7365	DINV49	15280	14790	15450								
7322	DINV61	14800	14680	14720								
7313	DINV62	14730	14520	14540	14990	16030	16880	16940				
3251	DINVAL	14250	1450	2730	2930	3050	3430	6180	6970	15330	15350	
7520	DINXOR	16700	15610									
445300	DK.	740	3310									
445320	DK0	780	3040									
127	DK1	4310										
156	DK2	4350										
37	DKCA	2750										
675	DKDON	4170	4180									
16000	DKLEN	2650	2660	8100	4570	2320						
34	DKLENB	2660										
266	DKLOK	3830	3840									
777601	DKMAX	650										
672	DKOVR	4160	4170									
2	DKRD	2760										
36	DKWC	2740										
4	DKWRT	2770										
2041	DLIMIT	2100	2110	1200	5900	11600	12170					
10321	DLN6GN	22800	2810									
3312	DLOCAT	21100	8240	6240	6940	7110	7760	15420	21580	21680		
2044	DLOCOR	2130	2140	2770	2860	2970	3080	3260	5890	5960	6030	6120
			7010	7080	7100	7200	7520				6620	6960
2160	DMBMIN	2410	2420	20560	21490	21990						
10323	DMCSGN	22820	3540									
2166	DMFMIN	2470	2480	2040	2050	2330	4690	4940	5310	20770	21010	21270
5575	DMOD10	3710	3550									
11531	DMSG50	10910	3590	9220	9280	9340	9410	9440	9550	9610	9720	9770
11540	DMSG51	10940										
11557	DMSG52	10990										
11573	DMSG53	11040										
11624	DMSG54	11090										
11647	DMSG56	11150	5470	5740	8510	8780						
11650	DMSG57	11170										
11667	DMSG58	11210	5520	5560								
11704	DMSG59	11270										
3542	DMSG60	11300										
11736	DMSG61	11370										
11750	DMSG62	11400										
11762	DMSG63	11430										
12043	DMSG64	11470										
12676	DMSG65	11750										
3544	DMSG68	12030	12050									
13063	DMSG69	12080	1660	1850	2250							
13077	DMSG72	12110	1870									
13111	DMSG73	12140	2570	4820	5200	9910						

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CROSS REFERENCE TABLE

CROSS REFERENCE TABLE

CROSS REFERENCE TABLE

1702	FRLEN	4420	4430					
1703	FRSTA	4430	4440					
2	FUDGE	3190	3200					
11195	GNAM90	2980	2620					
11100	GNAME6	2850	2800					
276	GREAT	2930	22870					
476257	GRO	870						
4	HDRLEN	580						
1700	IMPLEN	990						
3170	IMPSTR	2550	1500					
10	INDEX	490						
422020	INT	320						
7427	INV381	15650	15240					
513	IO.IN	3910	3920					
525	IO.OT	3920	3930					
300000	IOBLK	2830						
1760	IORS	4570	4580	1810	2020	5910		
1002	IOTO	4900	4910					
652	JMP	4110	4120					
100	JTLEN	960						
1700	JTSTRT	950	940	960	1000	4400		
16	KBLEN	3610	3630	3640	3680	3690	3730	3740
10	KBNUM	3620	3670	3720				
76	LOLOK	3630						
107	L1BFR	3670	3680	3690				
127	L1BIN	3690	3700	3720	4290			
131	L1FLG	3700	3710					
125	L1LOK	3680						
163	L1NAM	3710						
136	L2BFR	3720	3730	3740				
156	L2BIN	3740	3750	4330				
160	L2FLG	3750	3760					
154	L2LOK	3730						
162	L2NAM	3760	3770					
422026	LDR	390	5450					
2000	LDRST	5040						
274	LESS	2920	22860					
212	LF	210	2440					
3205	M B5	7430	7240	7260	7280	7300	7320	7340
13272	M C1	12650	12580					
4342	M C2	4820	4800					
4335	M C4	4810	4780					
5051	M M1	9250	5260					
4032	M ON	2820	9100					
4417	M BAS	5490	9080					
4602	M BYE	7180	9120	9120	9120			
4633	M CAF	7520	9140					
4114	M CAT	3590	9070					
4411	M DEB	5400	9050					
3172	M EOL	5110	2670	5150				
4721	M EXP	8400	9130	9130				
13246	M GRO	12450	9090					

CROSS REFERENCE TABLE

4414	M LDR	5450	9060	9060			
4421	M MX1	5600	5420				
4425	M MX2	5650	5470				
4427	M MX3	5680	5640				
4443	M MX4	5840					
4451	M MX5	5710	9990				
4113	M NHE	3520	3710				
4034	M OFF	2880	9110				
4110	M ROK	3420	3350	3380			
4064	M RON	3210	8820	8840	8860	8880	8900
6020	M VAL	5420	9160	9160			
4730	M XDU	8560	9170	9170			
4742	M XPA	8680	9180	9180			
4640	M ZER	7630	9150	9150			
2022	M ACSW	1860	5880				
4132	M CAT2	3680	5020				
4143	M CAT4	3780	3740				
4215	M CAT5	4150	4080				
4154	M CAT6	3870	3830				
4223	M CAT7	4230	4140				
4263	M CAT8	4630	3780	4200			
4366	M CAT9	4910					
2173	M CMAX	3560	3910				
3170	M CNAM	3490	3650	3860	4100		
2172	M CNUM	3550	3890				
4122	M CNXL	3620	4680	4890			
4636	M CORE	7600	7690				
4637	M DISK	7610	7670				
4492	M DT0N	6230	8920	9350			
11305	M MSG1	10470	10210				
11321	M MSG2	10500	10220				
11322	M MSG3	10530	10240				
11344	M MSG4	10560	10230				
11365	M MSG5	10620	10250				
11377	M MSG6	10650	10260				
11412	M MSG7	10680	10270				
11466	M MSG8	10770	10280				
11447	M MSG9	10740	10290				
3176	M MST2	6010	5990	6030			
3171	M NHED	3500	3660	3960	4660	5310	
4076	M ROFF	3320	8830	8850	8870	8390	8910
4074	M RON1	3290	3240				
4472	M TPON	8920	9360				
4650	M ZCOR	7730	7700				
4653	M ZDIS	7770	7680				
4705	M ZER2	8190	7900	8020			
4706	M ZER4	8220	8290				
4007	M,000,	2590					
4036	M,001,	2620					
4117	M,002,	3600					
4126	M,003,	3640					
4167	M,004,	3990					

CROSS REFERENCE TABLE

4300	M,005,	4730
4313	M,006,	4740
4332	M,007,	4790
4337	M,008,	4810
4353	M,009,	4880
11310	M,033,	10470
11324	M,034,	10500
11335	M,035,	10530
11347	M,036,	10560
11362	M,037,	10590
11370	M,038,	10620
11402	M,039,	10650
11415	M,040,	10680
11427	M,041,	10710
11452	M,042,	10740
11471	M,043,	10770
11511	M,044,	10800
11525	M,045,	10830
11534	M,046,	10910
11544	M,047,	10960
11563	M,048,	11010
11576	M,049,	11040
11630	M,050,	11110
11652	M,051,	11150
11662	M,052,	11170
11672	M,053,	11210
11707	M,054,	11270
11723	M,055,	11310
11741	M,056,	11370
11753	M,057,	11400
11765	M,058,	11430
12013	M,059,	11440
12047	M,060,	11490
12072	M,061,	11500
12117	M,062,	11510
12136	M,063,	11520
12155	M,064,	11530
12175	M,065,	11540
12221	M,066,	11550
12237	M,067,	11560
12257	M,068,	11570
12275	M,069,	11580
12312	M,070,	11590
12330	M,071,	11600
12360	M,072,	11610
12400	M,073,	11620
12431	M,074,	11630
12450	M,075,	11640
12475	M,076,	11650
12524	M,077,	11660
12542	M,078,	11670
12567	M,079,	11680

CROSS REFERENCE TABLE

4300	M,005,	4730
4313	M,006,	4740
4332	M,007,	4790
4337	M,008,	4810
4353	M,009,	4880
11310	M,033,	10470
11324	M,034,	10500
11335	M,035,	10530
11347	M,036,	10560
11362	M,037,	10590
11370	M,038,	10620
11402	M,039,	10650
11415	M,040,	10680
11427	M,041,	10710
11452	M,042,	10740
11471	M,043,	10770
11511	M,044,	10800
11525	M,045,	10830
11534	M,046,	10910
11544	M,047,	10960
11563	M,048,	11010
11576	M,049,	11040
11630	M,050,	11110
11652	M,051,	11150
11662	M,052,	11170
11672	M,053,	11210
11707	M,054,	11270
11723	M,055,	11310
11741	M,056,	11370
11753	M,057,	11400
11765	M,058,	11430
12013	M,059,	11440
12047	M,060,	11490
12072	M,061,	11500
12117	M,062,	11510
12136	M,063,	11520
12155	M,064,	11530
12175	M,065,	11540
12221	M,066,	11550
12237	M,067,	11560
12257	M,068,	11570
12275	M,069,	11580
12312	M,070,	11590
12330	M,071,	11600
12360	M,072,	11610
12400	M,073,	11620
12431	M,074,	11630
12450	M,075,	11640
12475	M,076,	11650
12524	M,077,	11660
12542	M,078,	11670
12567	M,079,	11680

CROSS REFERENCE TABLE

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CROSS REFERENCE TABLE

CROSS REFERENCE TABLE

CROSS REFERENCE TABLE

4076	PTPOFF	8870	9300					
606462	PTR	700	3700					
4076	PTROFF	8850	9290					
1	PURCOD	110	5140	5270	430	610		
12100	PURLEN	1010						
1775	PURNM	4700	4710					
3700	PURSTR	2560	990	1010	2560	12700		
546	PUTIN	3940	3950					
34	RACS	3440	7230	9310				
6	RGNT	3390	9320					
35	RCORE	3450						
1003	RDBLK	4910	4920					
32	RDT	8950	9350					
32	RDT0	3420	6270	6360	6400	6730	7310	8950
33	RDT1	3430	6290	6430	6750	7330		8960
17505	RECOV	470						
5110	REGLIS	9420	3740					
422021	RES	330						
40	RESCAT	3470	3480					
1080	RESLEN	920						
234	RFLAG	3790	3800					
230	RPTP	3780	3790	7250	9300			
235	RPTR	3800	3810	7270	9290			
242	RSCO	3820	3830	7290	9330			
1776	RSTART	4710	1680	1790	2000			
32	RTP	8960	9360					
1755	SO	4540	4550					
273	SCOLON	380	22830					
4076	SCOOFF	8830	9330					
640000	SCRSTR	2670						
2021	SCSAVE	1850	1860	1780	5950	8460	9360	
3134	SEARCH	5230	2740	2970	3100	5270	5310	5320
243	SHARP	2890	18130	18340	22790			1680
257	SLASH	360	15170	2790				3750
240	SPACE	250	18210	22510	22800	2690		
377	SPCOD	5410						
422122	SPL	430						
1000	SPLST	4960						
777490	SPMBK	5390						
252	STAR	300	15110					
3701	START	1640	12720					
3731	STR1	1930	1720					
3747	STR2	2130	1880					
2020	STSAVE	1840	1850	1820	5900	7530	8190	8950
335	SWAP	3880	3890	6160				9560
336	SWAP1	3890	3900					
340	SWAP3	3900	3910					
1000	SWCAT	4750	4760					
1003	SWCLK	4780	4790					
1004	SWERR	4790	4800					
1007	SWMP1	4820	4830					
1010	SWMP2	4830	4840					

CROSS REFERENCE TABLE

CROSS REFERENCE TABLE

12043	T,059,	11440
12047	T,060,	11490
12072	T,061,	11500
12137	T,062,	11510
12136	T,063,	11520
12155	T,064,	11530
12175	T,065,	11540
12221	T,066,	11550
12237	T,067,	11560
12257	T,068,	11570
12275	T,069,	11580
12312	T,070,	11590
12330	T,071,	11600
12360	T,072,	11610
12400	T,073,	11620
12431	T,074,	11630
12450	T,075,	11640
12475	T,076,	11650
12524	T,077,	11660
12542	T,078,	11670
12567	T,079,	11680
12611	T,080,	11690
12633	T,081,	11700
12652	T,082,	11710
12702	T,083,	11770
12716	T,084,	11780
12732	T,085,	11790
12752	T,086,	11800
12764	T,087,	11810
13002	T,088,	11820
13016	T,089,	11830
10367	T1CHAR	1000 810
10365	T1LINE	980 830
190	TABLEN	2630 2640
17500	TAPIN	450
17502	TAPOT	460
3330	TBUFFER	490 740 940
3501	TCHRID	2930 17390 17520 17680 17890 18280 18580 1220 1540 2210 2710 3150 3170 3180 3200
3456	TCOUNT	600 14760 14900 17220 760 2650 11180 12000
10614	TDIGIT	3170 3010 3040
3455	TDLMTR	590 3800 4920 5120 1360 1480 1740 2520 2780 3150 3530 4160 6500 7150 14780 14920 15060 15790 16010 17240 770 3140 2630 2780 2990
2000	TEMP0	1630 1640 2150
2001	TEMP1	1640 1650 2170 2340
2012	TEMP10	1730 1740 17310 17850 18020 18450 18490
2013	TEMP11	1740 1750 7850 7990 8110 8280
2014	TEMP12	1750 1800 7870 8010 8120 8230 8270 6210 6270
2002	TEMP2	1650 1660 2190 2410 2430 2500 2520 2530
2003	TEMP3	1660 1670
2004	TEMP4	1670 1680
2005	TEMP5	1680 1690

CROSS REFERENCE TABLE

CROSS REFERENCE TABLE

UNDEFINED SYMBOLS

#1	5630
#2	5640
#3	5650
#4	5660
#5	5680
BAD	1560
D #1	130
DEFINS	100 100 120 120 580 580 2680 2680 3210 3210 5330 5330
DERROR	22130 22350
LINE	1210
MESS	1190 1200
OCTZ	1790

MACRO CROSS REFERENCE TABLE

CHAR	1380
CHRDT	1340
CMDERR	1250
COMMAND	640
	9050
	9060
	9070
	9080
	9090
	9100
	9110
	9120
	9130
	9140
	9150
	9160
COUNT	1460
CRLF	1300
	3630
	3730
	3880
	4000
	4010
	4590
	4650
	4690
	4870
	8600
	4150
	6110
DELIM	1420
	6460
	7680
	7890
	11480
	11720
	11760
	11840
	2520
	2780
	3150
	3530
	4160
	6500
D MODE	780
	7150
	15060
	15790
	16010
	17240
	2630
	2780
	2990
	9740
	9750
	9760
	9770
	9780
	9790
	9800
	9810
E MESS	1750
ENTER	330
	5110
	5230
	6470
	6800
	7010
	7430
	7830
	7950
	8070
	5680
	6820
	10210
	10260
	10350
	10430
	10530
	10610
	10670
	10770
	11390
	12320
	12460
	13560
	14250
	16390
	17160
	18310
	18550
	18720
	18790
	18900
	19170
	19230
	19400
	19840
	20510
	20630
	20890
	21100
	22200
	22410
	22480
	22560
	22660
	720
	1170
	1660
	1970
	2190
	2280
	2380
	2580
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	2930
	3240
	3320
	740
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	1680
	2590
	3210
	3670
	3860
	4150
	11380
	12030
	2830
	2860
	3230
FORMAT	1170
LINE	1100
LOOP	960
MESS	1620
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	3600
	3640
	3990
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	1040
	1290
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	11780
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	12350
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	3600
	3640
	3990
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	1290
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	11680
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	11770
	11780
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	11820
	11830
	12040
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	12110
	12140
	12170
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	12260
	12290
	12320
	12350
	12380
MODSET	3820
MPOFF	5430
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	3940
	3950
	3960
	3970
	3980
	3990
	4000
	11670
	1650
	2640
	3210
	3320
	5620
	5660
	5740
	6240
	6600
	7220
	8610
	8740
	5570
	5690
	8530
	9970
	20640
	20900
	1350
	2150
	2360
	3470
	11220
	12450
NEG	1010
NMESS	1670
NUM	1260
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	11590
	16210
	19530
	19570
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	5440
	10590
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	9400
	9540
	9600
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OCT	1890
OCTZ	1840
OP	110
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	4580
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	12040
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	720
	730
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	750
	760
	770
	780
	790

MACRO CROSS REFERENCE TABLE

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USE CROSS REFERENCE TABLE

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0 . . . .
0 REL.
0 IMPURE   1490    3460    5110    5230    6000    6470    6800    7010    7430    7830    7950    8070    5680
           6820   10210   10260   10350   10430   10530   10610   10670   10770   11390   12320   12460
           13560   14250   16390   16520   17160   18310   18550   18720   18790   18900   19170   19230
           19400   19840   20510   20630   20890   21100   22200   22410   22480   22560   22660   10010
               440      720     1170     1660     1970     2190     2280     2380     2580     2640     2930     3240
               3320      540     740     1340     1510     1680     2070     2280     2590     2940     3210     3670
           3860   4150   11300   12030   12680   5110     5280     5340     6020     6180     6470     6800    7010
3700  PURE    1510    3510    3580    5040    5110    5280    5340    6020    6180    6470    6800    7010    7140
               7430    7830    7950    8070    9020    980     1570     2590     5360     5680     6820     8040
               9100   10210   10260   10350   10430   10530   10610   10670   10770   11390   12320   12460
           13560   14250   16390   16560   17160   18310   18550   18720   18790   18900   19170   19230
           19400   19840   20510   20630   20890   21100   22200   22410   22480   22560   22660   620
               720      1170     1660     1970     2190     2280     2380     2580     2640     2930     3240     3320
               570      740     1340     1530     1680     2130     2340     2590     2960     3210     3670     3860
               4150   10120   11300   12030   12740
13450  SYMTAB   9970

```