

[illegible][illegible]

05/31/72

01,58,43

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*****
**                                **
**      PDP-9 MINI TIME-SHARING SYSTEM      **
**                                **
**      NON-SWAPPING TSS DEBUGGER            **
**                                **
**                                **
**      TP2:DDT                                **
**                                **
**      DK01B07                                **
**                                **
*****

```

DDT INITIALIZATION

	100		.STITL	DDT INITIALIZATION
	110		.NAME	TSSDDT
	120	ENTER	.DEFIN	
	130	#1	HLT	
	140		.ENDM	
	150		.TITLE	PDP-9 TIME-SHARING SYSTEM DEBUGGER
	160		.PMC	ON
	170		.ABS	
000010	180	INDEX	.EQU	10
012000	190	BASE	.EQU	12000
000000	200	DEBUG	.EQU	0
	210		.INSRT	:DLIBRARY:PDP9LIB:LIBMACRO
	100		.INE	DEBUG,1

TELETYPE INPUT/OUTPUT MACROS

```
1940      ,LIST  ON
1950      ,END
220      ,INSRT  :DLIBRARY:PDP9LIB:GRODEFIN
100      ,INE    $DEBUG,1
1250     ,LIST  ON
1260     ,END
230     RET      ,OPDEF 620000
240     TERMINATE ,OPDEF 705001
250
260
013116 270      ,LOC    16000-2662      START SO AS TO PUT DDT AT THE END OF USER CORE
```

SUBROUTINES

	280		,STITL	SUBROUTINES	
	290		,HEAD		
	300	*	EXP --		
	310	*			
	320	*	EXP EVALUATES A SYMBOLIC EXPRESSION FROM THE TTY		
	330	*			
013116	700000	340	700000		
013117	705001	350	TERMINAT	'X' IS ALSO AN EXIT	
013120	000000	360	EXP	0	
013121	155206	370	DZM	EVAL	CLEAR CURRENT VALUE
013122	215074	380	LAC	(JMP PLU)	FAKE A 0* TO START WITH
013123	053174	390	DAC	OJMP	SAVE IN OPERATOR JMP
	400	*			
	410	*	LOOP TO EVALUATE EXPRESSIONS		
	420	*			
013124	115607	430	EVL	JMS	TSFGET
					GET A CHARACTER
013125	555075	440		SAD	(SPACE)
					CHECK FOR SPACE
013126	613124	450		JMP	EVL
					TRY AGAIN IF SO
013127	555076	460		SAD	(POINT)
					CHECK FOR .
013130	741000	470		SKP	
013131	613134	480		JMP	EVLO
013132	213671	490		LAC	LOC
					GET THE LOCATION COUNTER
013133	613173	500		JMP	EVX
					GO TO END
013134		510	EVLO	...	
013134	115633	520		JMS	TSCHRID
					CHECK FOR A NUMBER
013135	613175	530		JMP	EVD
					INSTANT DELIMITER
013136	613145	540		JMP	EVL1
					NO
013137	777777	550		LAW	-1
013140	355362	560		TAD	TSBPTR
					BACK UP POINTER
013141	055362	570		DAC	TSBPTR
					SAVE IT
013142		580		NUM	
					INPUT THE NUMBER
013142	115431			JMS	TSNUMIN
013143	741000	590		SKP	
					FORMAT ERROR ON NUMBER -- POSSIBLY A LETTER
013144	613173	600		JMP	EVX
					AND SKIP SYMBOLIC
013145	777777	610	EVL1	LAW	-1
					BACK UP CHARACTER POINTER
013146	355362	620		TAD	TSBPTR
013147	055362	630		DAC	TSBPTR
013150		640		WORD	
					GET A WORD
013150	115526			JMS	TSSIXIN
013151	740000	650		NOP	
013152		660		DELIM	
					GET THE DELIMITER
013152	215366			LAC	TSDLMTR
013153	055077	670		SAD	(44)
					CHECK FOR A S
013154	741000	680		SKP	
013155	613164	690		JMP	NHD
					NO EXTRANEIOUS HEAD SYMBOL
013156		700		WORD1	
					GET THE HEAD SYMBOL
013156	215237			LAC	TSWORDB
013157	055200	710		DAC	T1
					SAVE IT
013160		720		WORD	
					GET MORE WORDS
013160	115526			JMS	TSSIXIN
013161	740000	730		NOP	
					IGNORE VACUOUS
013162	215200	740		LAC	T1
					GET THE HEADSYMBOL

SUBROUTINES

013163	741000	750		SKP		
013164	215210	760	NHD	LAC	HEAD	GET THE CURRENT HEADSYMBOL
013165	055201	770		DAC	T2	SAVE IT
013166	113337	780		JMS	RJUS	RIGHT JUSTIFY
013167	215201	790		LAC	T2	RESTORE
013170	255237	800		XOR	TSWORDB	TRY IT
013171	055237	810		DAC	TSWORDB	RESTORE IT
013172	113271	820		JMS	SYMB	LOOK IT UP IN THE SYMBOL TABLE
013173	055207	830	EYX	DAC	TVAL	SAVE TEMP VALUE
013174	613174	840	OJMP	JMP	.	FILLED IN TO LAST OPERATER
013175	750000	850	EVD	CLA		VALUE IS ZERO FOR A VACUOUS WORD
013176	633174	860		JMP	OJMP,X	RETURN
		870	*			
		880	*	PLUS		
		890	*			
013177	355206	900	PLU	TAD	EVAL	
013200	613242	910		JMP	EVY	AND CONTINUE
		920	*			
		930	*	MINUS		
		940	*			
013201		950	MIN	NEG		NEGATE AC
013201	740001			CMA		
013202	355100			TAD	(1)	
013203	613177	960		JMP	PLU	HANDLE LIKE PLUS
		970	*			
		980	*	OR		
		990	*			
013204	740001	1000	OR	CMA		GET MASK
013205	515206	1010		AND	EVAL	MASK OUT BITS
013206	255207	1020		XOR	TVAL	FIND NEW VALUE
013207	613242	1030		JMP	EVY	EXIT
		1040	*			
		1050	*	XOR		
		1060	*			
013210	255206	1070	ERA	XOR	EVAL	DO THE XOR
013211	613242	1080		JMP	EVY	EXIT
		1090	*			
		1100	*	AND		
		1110	*			
013212	515206	1120	AND	AND	EVAL	GET NEW VALUE
013213	613242	1130		JMP	EVY	AND EXIT
		1140	*			
		1150	*	MPY		
		1160	*			
013214	000000	1170	OSET	O		ROUTINE TO SET UP FOR EAB
013215	741100	1180		SPA		
013216	355101	1190		TAD	(-1)	CONVERT TO UNARY
013217	664000	1200		OSH		
013220	053230	1210		DAC	OST+1	SAVE ONE OP
013221	233214	1220		LAC	OSET,X	GET OP
013222	053227	1230		DAC	OST	SAVE IT
013223	215206	1240		LAC	EVAL	GET THE VALUE

SUBROUTINES

013224	740102	1250		CMLISMA		CHECK
013225	353241	1260		TAD	ONE	ADJUST FOR 1'S COMPLEMENT
013226	355101	1270		TAD	(-1)	
013227	740040	1280	OST	XX		
013230	740040	1290		XX		
013231	641002	1300		LACQ		GET THE RESULT
013232	741100	1310		SPA		
013233	353241	1320		TAD	ONE	ADJUST FOR 1'S COMPLEMENT
013234	613242	1330		JMP	EVY	
		1340	*			
		1350	*	MPY		
		1360	*			
013235	113214	1370	MPY	JMS	OSET	
013236	657122	1380		MULS		INSTRUCTION
		1390	*			
		1400	*	DIV		
		1410	*			
013237	113214	1420	DIV	JMS	OSET	SET UP
013240	644323	1430		DIVS		INSTRUCTION
013241	000001	1440	ONE	1		
		1450	*			
		1460	*	GET NEXT OPERATOR		
		1470	*			
013242	055206	1480	EVY	DAC	EVAL	
	013243	1490		DELIM		GET THE CHARACTER THAT STOPPED US
013243	215366			LAC	TSDLMTR	
		1500	OPA	,DEFIN		
		1510		SAD	(#1) "CHECK FOR OPERATOR
		1520		LAW	#2	GET ADDRESS
		1530		,ENDM	OPA	
		1540	*			
	013244	1550		OPA	PLUS,PLU	
013244	555102			SAD	(PLUS)	CHECK FOR OPERATOR
013245	773177			LAW	PLU	GET ADDRESS
	013246	1560		OPA	MINUS,MIN	
013246	555103			SAD	(MINUS)	CHECK FOR OPERATOR
013247	773201			LAW	MIN	GET ADDRESS
	013250	1570		OPA	STAR,MPY	
013250	555104			SAD	(STAR)	CHECK FOR OPERATOR
013251	773235			LAW	MPY	GET ADDRESS
	013252	1580		OPA	SLASH,DIV	
013252	555105			SAD	(SLASH)	CHECK FOR OPERATOR
013253	773237			LAW	DIV	GET ADDRESS
	013254	1590		OPA	EXCLAM,OR	
013254	555106			SAD	(EXCLAM)	CHECK FOR OPERATOR
013255	773204			LAW	OR	GET ADDRESS
	013256	1600		OPA	BSLASH,ERA	
013256	555107			SAD	(BSLASH)	CHECK FOR OPERATOR
013257	773210			LAW	ERA	GET ADDRESS
	013260	1610		OPA	AMPRND,AND	
013260	555110			SAD	(AMPRND)	CHECK FOR OPERATOR
013261	773212			LAW	AND	GET ADDRESS

SUBROUTINES

013262	740100	1620		SMA		
013263	613267	1630		JMP	EVZ	EXIT IF DONE
013264	355111	1640		TAD	(JMP-LAW)	FORM POINTER
013265	053174	1650		DAC	OJMP	SAVE IT
013266	613124	1660		JMP	EVL	LOOP
013267		1670	EVZ	...		DONE
013267	215206	1680		LAC	EVAL	GET THE VALUE
013270	633120	1690		RET	EXP	RETURN
		1700	*			
015200		1710		.USE	STOR	
		1720	*			
015200	000000	1730	T1	0		
015201	000000	1740	T2	0		
015202	000000	1750	T3	0		
015203	000000	1760	T4	0		
015204	000000	1770	T5	0		
015205	000000	1780	T6	.DSA		
015206	000000	1790	EVAL	0		
015207	000000	1800	TVAL	0		
015210	000000	1810	HEAD	0		
013271		1820		.USE		
		1830	*			

SUBROUTINES

	1840		,EJECT	
	1850	*		
	1860	*	SYMBOL TABLE LOOKUP	
	1870	*		
000012	1880	SYMBX	,EQU 12	INDEX REGISTER FOR SYMBOL TABLE
	1890	*		
013271 000000	1900	SYMB	0	
013272 213336	1910	LAC	SPTR	GET THE SYMBOL TABLE POINTER
013273 040012	1920	DAC	SYMBX	
013274 777757	1930	SCOUNT	LAW -SYMN	GET THE NUMBER OF SYMBOLS
013275 055202	1940	DAC	T3	
013276	1950	SYML	WORD1	GET THE FIRST HALF
013276 215237		LAC	TSWORDB	
013277 560012	1960	SYML1	SAD SYMBX,X	CHECK A SYMBOL
013300 613306	1970	JMP	SYMB2	FOUND HALF
013301 440012	1980	ISZ	SYMBX	
013302 440012	1990	ISZ	SYMBX	
013303	2000	LOOP	T3,SYML1	
013303 455202		ISZ	T3	
013304 613277		JMP	SYML1	
013305 613314	2010	JMP	NQS	
013306	2020	SYMB2	WORD2	GET THE SECOND HALF
013306 215240		LAC	TSWORDB+1	
013307 560012	2030	SAD	SYMBX,X	CHECK IT
013310 613334	2040	JMP	SYMB3	TRY SOME MORE
013311 440012	2050	ISZ	SYMBX	
013312	2060	LOOP	T3,SYML	LOOK FOR COUNT
013312 455202		ISZ	T3	
013313 613276		JMP	SYML	
013314	2070	NQS	EMESS	<UNDEFINED SYMBOL>,16.
013314			,CRSM	SAVE,ON
013314 700312			MESS	<UNDEFINED SYMBOL WORD #>,16,-7
013315			KRB	
013315			MESSR	<UNDEFINED SYMBOL WORD #>,16,-7
013315 777747			,CRSM	SAVE,ON
013316 115561			LAW	-16,-7-2
			JMS	TSIXOT
			,PMC	RESTORE
			,CRSM	RESTORE
013330			COUNT	
013330 215367			LAC	TSCOUNT
013331			OCTZ	
013331 744002			STL	
013332 115502			JMS	TSOCTOT
			,CRSM	RESTORE
013333 614007	2080		JMP	IDLE
013334 220012	2090	SYMB3	LAC	SYMBX,X
013335 633271	2100		RET	SYMB
013336 011673	2110	SPTR	SYMBT-1	POINTER TO SYMBOL TABLE

SUBROUTINES

	2120			.EJECT	
	2130	*			
	2140	*		RJUS-	
	2150	*			
	2160	*		RJUS RIGHT JUSTIFIES THE CONTENTS OF TSWORDB	
013337	000000	2170	RJUS	0	
013340	155202	2180		DZM T3	CLEAR WORD AREA
013341		2190		WORD2	GET THE SECOND WORD
013341	215240			LAC TSWORDB+1	
013342	741200	2200		SNA	CHECK FOR ALL ZEROS
013343	613353	2210		JMP RJ51	HANDLE IT
013344		2220	RJS2	...	
013344	652000	2230		LMQ	MOVE CURRENT WORD TO MQ
013345	515112	2240		AND (77)	EXTRACT LOW ORDER CHARACTER
013346	740200	2250		SZA	
013347	613361	2260		JMP RJ53	EXIT IF DONE
013350	660614	2270		LLSS 18,-6,	
013351	455202	2280		ISZ T3	INCREMENT COUNT
013352	613344	2290		JMP RJ52	
013353	215113	2300	RJS1	LAC (3)	SET COUNT
013354	055202	2310		DAC T3	
013355		2320		WORD1	GET FIRST HALF
013355	215237			LAC TSWORDB	
013356	741200	2330		SNA	CHECK FOR 2 ZEROS
013357	633337	2340		RET RJUS	OK IF SO
013360	613344	2350		JMP RJ52	ENTER LOOP
013361	215202	2360	RJS3	LAC T3	GET COUNTER
013362	744010	2370		CLL,RAL	NOW 2X
013363	355202	2380		TAD T3	NOW 3X
013364	740010	2390		RAL	NOW 6X
013365	355114	2400		TAD (LRS 0)	MAKE LRS INSTRUCTION
013366	053372	2410		DAC RJ54	SAVE IT
013367		2420		WORD2	GET THE BUFFER WORD
013367	215240			LAC TSWORDB+1	
013370	652000	2430		LMQ	
013371		2440		WORD1	
013371	215237			LAC TSWORDB	
013372	000000	2450	RJS4	0	
013373	055237	2460		DAC TSWORDB	
013374	641002	2470		LACQ	GET BACK TO AC
013375	055240	2480		DAC TSWORDB+1	
013376	633337	2490		RET RJUS	RETURN

SUBROUTINES

	2500		.EJECT	
	2510	*		
	2520	*	DUMP ADDRESS FORMATTING	
	2530	*		
013377	000000	2540	DUMA	0
013400	613401	2550	AFORM	JMP OCTF
	2560	*		
	2570	*	OCTAL FORMAT	
	2580	*		
	2590	OCTF	...	
013401		2600	OCT	PRINT IN OCTAL
013401			CLL	
013401	744000		JMS	TSOCTOT
013402	115502		RET	DUMA
013403	633377	2610		RETURN
013404	661606	2620	EAECLA:LLSS 6	MOVE IN NEXT CHARACTER
	2630	*		
013405	113514	2640	JMS	PDEC
013406	633377	2650	RET	DUMA
	2660	*		
	2670	*	SYMBOLIC	
	2680	*		
013407	055201	2690	SYMF	DAC T2
013410	515115	2700		AND (400000)
013411	059200	2710		DAC T1
013412	775200	2720		LAW T1
013413	059203	2730		DAC T4
013414	213336	2740		LAC SPTR
013415	355116	2750		TAD (2)
013416	040012	2760		DAC SYMBX
013417	213274	2770		LAC SCOUNT
013420	059204	2780		DAC T5
013421	220012	2790	SFL	LAC SYMBX,X
013422		2800		NEG
013422	740001			CMA
013423	355100			TAD (1)
013424	059202	2810		DAC T3
013425	355201	2820		TAD T2
013426	741100	2830		SPA
013427	613436	2840		JMP SFX
013430	213202	2850		LAC T3
013431	375203	2860		TAD T4,X
013432	740300	2870		SMA:SZ
013433	613436	2880		JMP SFX
013434	200012	2890		LAC SYMBX
013435	055203	2900		DAC T4
013436	440012	2910	SFX	ISZ SYMBX
013437	440012	2920		ISZ SYMBX
013440		2930		LOOP T5,SFL
013440	455204			ISZ T5
013441	613421			JMP SFL
013442	235203	2940		LAC T4,X
013443	741200	2950		SNA
				GET VALUE
				CHECK FOR NOTHING THERE

SUBROUTINES

013444	613503	2960	JMP	SFD6	YES
013445		2970	NEG		
013445	740001		CMA		
013446	355100		TAD	(1)	
013447	355201	2980	TAD	T2	DECREMENT ORRIGNAL POINTER
013450	055201	2990	DAC	T2	
013451	777775	3000	LAW	-3	BACK UP POINTER
013452	355203	3010	TAD	T4	ADD POINTER
013453	040012	3020	DAC	SYMBX	SAVE
013454	777776	3030	LAW	-2	GET COUNT OF WORDS
013455	055200	3040	DAC	T1	
013456	155203	3050	DZM	T4	CLEAR FLAG
013457	777775	3060	LAW	-3	GET CHARACTER COUNT
013460	055202	3070	DAC	T3	SAVE IT
013461	220012	3080	LAC	SYMBX,X	
013462	652000	3090	LMQ		LOAD THE MQ REG
013463		3100	...		
013463	750000	3110	CLA		
013464	660606	3120	LLSS	6	SHIFT IN
013465	741200	3130	SNA		CHECK FOR A ZERO
013466	613506	3140	JMP	SFD3	CHECK IT
013467	455203	3150	ISZ	T4	SET FLAG
013470		3160	...		
013470	355117	3170	TAD	(40)	FORM ASCII
013471	115665	3180	JMS	TSTTYOT	PRINT IT
013472		3190	...		
013472		3200	LOOP	T3,SFD5	
013472	455202		ISZ	T3	
013473	613463		JMP	SFD5	
013474		3210	LOOP	T1,SFD1	
013474	455200		ISZ	T1	
013475	613457		JMP	SFD1	
013476	215201	3220	LAC	T2	GET VALUE
013477	741200	3230	SNA		CHECK FOR NOTHING
013500	633377	3240	RET	DUMA	IF SO, DONE
013501	215120	3250	LAC	(53)	GET A +
013502	115665	3260	JMS	TSTTYOT	PRINT IT
013503	215201	3270	LAC	T2	GET VALUE
013504	113711	3280	JMS	P6Z	PRINT IT
013505	633377	3290	RET	DUMA	AT LAST!
		3300	*		
013506	215203	3310	LAC	T4	CHECK FLAG
013507	741200	3320	SNA		SKIP IF WE SHOULD PRINT
013510	613472	3330	JMP	SFD4A	
013511	155203	3340	DZM	T4	SET FLAG AGAIN
013512	215121	3350	LAC	(4)	PRINT 'S'
013513	613470	3360	JMP	SFD4	PRINT IT

SUBROUTINES

		3370		,EJECT	
		3380	*		
		3390	*	PDEC -	
		3400	*		
		3410	*	PRINT A NUMBER IN DECIMAL	
		3420	*		
013514	000000	3430	PDEC	0	
013515	055200	3440		DAC T1	SAVE
013516	740100	3450		SMA	
013517	613525	3460		JMP PDE1	
013520		3470		NEG	MAKE PLUS
013520	740001			CMA	
013521	355100			TAD (1)	
013522	055200	3480		DAC T1	SAVE FOR NOW
013523	215122	3490		LAC (55)	GET A -
013524	115665	3500		JMS TSTTYOT	PRINT CHARACTER
013525	775210	3510	PDE1	LAW DECB-1	POINT TO DECIMAL OUTPUT BUFFER
013526	040012	3520		DAC SYMBX	SAVE POINTER
013527	215200	3530		LAC T1	GET THE OLD CHARACTER
013530	744000	3540	DECL	CLL	
013531	653323	3550		IDIV	DIVIDE
013532	000012	3560		12	BY 10
013533	060012	3570		DAC SYMBX,X	SAVE A DIGIT
013534	641002	3580		LACQ	GET THE QUOTIENT
013535	740200	3590		SZA	
013536	613530	3600		JMP DECL	LOOP
013537	440012	3610		ISZ SYMBX	ADVANCE POINTER
013540		3620	DECL1	...	
013540	777776	3630		LAW -2	GET AMOUNT TO BACKSPACE
013541	340012	3640		TAD SYMBX	GET IT
013542	555123	3650		SAD (LAW DECB-2	CHECK FOR DONE
013543	613551	3660		JMP PDX	EXIT IF SO
013544	040012	3670		DAC SYMBX	SAVE POINTER
013545	220012	3680		LAC SYMBX,X	GET NEXT WORD
013546	355124	3690		TAD (60)	MAKE NUMERIC
013547	115665	3700		JMS TSTTYOT	PRINT IT
013550	613540	3710		JMP DECL1	LOOP
013551	215076	3720	PDX	LAC (POINT)	GET A DECIMAL POINT
013552	115665	3730		JMS TSTTYOT	PRINT A CHARACTER
013553	633514	3740		RET PDEC	RETURN
		3750	*		
015211		3760		,USE STOR	
015211		3770	DECB	,BLOCK 6,	
013554		3780		,USE	

SUBROUTINES

```

3790      .EJECT
3800      *
3810      *      DUMP SUBROUTINE
3820      *
3830      *      DUMPS FROM LOC LOC TO LOC  -N IN THE FORMAT DETERMINED
3840      *      BY FORMSW
3850      *
013554 000000 3860      DUMP      0
013555 113605 3870      JMS      EOLP      PRINT EOL
013556 213671 3880      LAC      LOC
013557 015125 3890      AND      (17777)    WRAP CORE IF NECESSARY
013560 113377 3900      JMS      DUMA      DUMP IT
013561 113614 3910      JMS      SPCOL      I
013562 233671 3920      LAC      LOC,X    GET WORD
013563 613566 3930      FORMSW  JMP      FORMO    OCTAL TO START
013564 113600 3940      DUMX    JMS      NEXT      END OF LINE
013565 613555 3950      JMP      DUMP+1    LOBP
3960      *
3970      *      OCTAL
3980      *
3990
013566 4000      FORMO    ...
013566 4010      OCT          PRINT IT OCTAL
013566 744000 4020      CLL
013567 115502 4030      JMS      TSOCTOT
013570 113600 4040      JMS      NEXT      GET THE NEXT LOC
013571 213671 4050      LAC      LOC      GET THE LOCATION COUNTER
013572 015126 4060      AND      (7)      LOOK FOR NEEDING ANOTHER ADDRESS
013573 741200 4070      SNA
013574 613555 4080      JMP      DUMP+1    SKIP IF ON THE SAME LINE
013575 113610 4090      JMS      SPAC      NO REPRINT ADD
013576 233671 4100      LAC      LOC,X    PRINT SPACE
013577 613566 4110      JMP      FORMO    GET WORD
4120      *
4130      *      NEXT
4140      *
013600 000000 4150      NEXT    0      GET THE NEXT WORD
013601 453671 4160      ISZ      LOC      BUMP LOC
013602 453672 4170      ISZ      N      COUNT
013603 633600 4180      RET      NEXT    RETURN IF OK
013604 633554 4190      RET      DUMP    RETURN FROM DUMP IF NOT
4200      *
4210      *      EOLP
4220      *
013605 000000 4230      EOLP    0
013606 115673 4240      CRLF      PRINT A NULL MESSAGE
013607 633605 4250      JMS      TSCRLF
4260      *
4270      *      SPACE
4280      *
013610 000000 4290      SPAC    0

```

SUBROUTINES

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3790      .EJECT
3800      *
3810      *      DUMP SUBROUTINE
3820      *
3830      *      DUMPS FROM LOC LOC TO LOC  -N IN THE FORMAT DETERMINED
3840      *      BY FORMSW
3850      *
013554 000000 3860      DUMP      0
013555 113605 3870      JMS      EOLP      PRINT EOL
013556 213671 3880      LAC      LOC
013557 015125 3890      AND      (17777)    WRAP CORE IF NECESSARY
013560 113377 3900      JMS      DUMA      DUMP IT
013561 113614 3910      JMS      SPCOL      I
013562 233671 3920      LAC      LOC,X    GET WORD
013563 013566 3930      FORMSW  JMP      FORMO    OCTAL TO START
013564 113600 3940      DUMX    JMS      NEXT      END OF LINE
013565 013555 3950      JMP      DUMP+1    LOOP
3960      *
3970      *      OCTAL
3980      *
3990      *
013566 4000      FORMO      ...
013566 4010      OCT          PRINT IT OCTAL
013566 744000      CLL
013567 115502      JMS      TSOC TOT
013570 113600 4020      JMS      NEXT      GET THE NEXT LOC
013571 213671 4030      LAC      LOC      GET THE LOCATION COUNTER
013572 015126 4040      AND      (7)      LOOK FOR NEEDING ANOTHER ADDRESS
013573 741200 4050      SNA          SKIP IF ON THE SAME LINE
013574 013555 4060      JMP      DUMP+1    NO REPRINT ADD
013575 113610 4070      JMS      SPAC      PRINT SPACE
013576 233671 4080      LAC      LOC,X    GET WORD
013577 013566 4090      JMP      FORMO    LOOP
4100      *
4110      *      NEXT
4120      *
013600 000000 4130      NEXT      0      GET THE NEXT WORD
013601 053671 4140      ISZ      LOC      BUMP LOC
013602 053672 4150      ISZ      N      COUNT
013603 033600 4160      RET      NEXT    RETURN IF OK
013604 033554 4170      RET      DUMP    RETURN FROM DUMP IF NOT
4180      *
4190      *      EOLP
4200      *
013605 000000 4210      EOLP      0
013606 4220      CRLF          PRINT A NULL MESSAGE
013606 115673      JMS      TSCRLF
013607 033605      RET      EOLP
4230      *
4240      *      SPACE
4250      *
4260      *
013610 000000 4270      SPAC      0

```

SUBROUTINES

013611	215117	4280	LAC	(40)	GET A SPACE
013612	115665	4290	JMS	TSTTYOT	PRINT IT
013613	633610	4300	RET	SPAC	
		4310	*		
		4320	*	PCOL	
		4330	*		
013614	000000	4340	SPCOL	0	
013615	215127	4350	LAC	(72)	COLON
013616	115665	4360	JMS	TSTTYOT	
013617	113610	4370	JMS	SPAC	SPACE IT OUT
013620	633614	4380	RET	SPCOL	
		4390	*		
		4400	*	P6	
		4410	*		
013621	000000	4420	P6	0	
013622	652000	4430	LMQ		LOAD WORD INTO MQ
		4440	,DUP	3,3	
013623	641606	4450	EAECLA:LLS	6	SHIFT IN TO AC
013624	355117	4460	TAD	(40)	MAKE ASCII
013625	115665	4470	JMS	TSTTYOT	
013626	641606		EAECLA:LLS	6	SHIFT IN TO AC
013627	355117		TAD	(40)	MAKE ASCII
013630	115665		JMS	TSTTYOT	
013631	641606		EAECLA:LLS	6	SHIFT IN TO AC
013632	355117		TAD	(40)	MAKE ASCII
013633	115665		JMS	TSTTYOT	
013634	633621	4480	RET	P6	RETURN
		4490	*		
		4500	*	SYMBOLIC FORMAT	
		4510	*		
013635		4520	FORMS	...	
013635	515130	4530	AND	(20000)	EXTRACT INDIRECT FLAG
013636	053673	4540	DAC	INDB	SAVE IT
013637	233671	4550	LAC	LOC,X	GET WORD AGAIN
013640	744000	4560	CLL		CLEAR LINK
013641	640516	4570	LRS	18.-4,	MOVE OVER
013642	355131	4580	TAD	(-15)	CHECK FOR NOT EAE OR OPR
013643	740100	4590	SMA		NO
013644	613655	4600	JMP	FORMS1	YES -- TROUBLE
013645	355132	4610	TAD	(OPTB+15)	POINT INTO TABLE
013646	055200	4620	DAC	T1	SAVE IT
013647	235200	4630	LAC	T1,X	GET OPCODE
013650	113621	4640	JMS	P6	PRINT IT
013651	113610	4650	JMS	SPAC	
013652	233671	4660	LAC	LOC,X	GET THE WORD
013653	515125	4670	AND	(17777)	EXTRACT GOOD BITS
013654	613657	4680	JMP	FORMS2	SKIP OTHER CODE
013655	153673	4690	FORMS1	INDB	CLEAR INDIRECT FLAG
013656	233671	4700	LAC	LOC,X	GET THE WORD
013657	113377	4710	FORMS2	JMS	PRINT IT
013660	213673	4720	LAC	INDB	GET INDIRECT FLAG
013661	741200	4730	SNA		SKIP IF IT NEED BE PRINTED

SUBROUTINES

013662	613564	4740	JMP	DUMX	
013663	215133	4750	LAC	(54)	GET A .
013664	115665	4760	JMS	TSTTYOT	
013665	215134	4770	LAC	(130)	GET A X
013666	115665	4780	JMS	TSTTYOT	PRINT IT
013667	613564	4790	JMP	DUMX	
013670	613635	4800	JMP	FORMS	CONTINUE
		4810	*		
		4820	*		
013671	000000	4830	LQC	0	
013672	000000	4840	N	0	
013673	000000	4850	INDB	0	
	013674	4860	OPTB		
013674	434154	4870	.DATA	434154,444143,525563,447255,544143,705762	
013675	444143				
013676	525563				
013677	447255				
013700	544143				
013701	705762				
013702	414444	4880	.AC16	/ADDTADXCTISZANDSADJMP/	
013703	644144				
013704	704364				
013705	516372				
013706	415644				
013707	634144				
013710	525560				

SUBROUTINES

	4890		.EJECT	
	4900	*		
	4910	*	PRINT IN OCTAL WITH ZERO SUPPRESSION	
	4920	*		
013711	000000	4930	P6Z	0
	013712	4940	OCTZ	PRINT THE AC WITH LEADING ZEROES SUPPRESSED
013712	744002		STL	
013713	115502		JMS	T\$OCTOT
013714	633711	4950	RET	P6Z,X
		4960		
	013715	4970	P6OCT	ENTER
013715	740040		XX	
	013716	4980	OCT	PRINT THE AC AS A SIX DIGIT OCTAL NUMBER
013716	744000		CLL	
013717	115502		JMS	T\$OCTOT
013720	633715	4990	RET	P6OCT,X
	5000		.EOT	TSSDDT1

COMMANDS

.STTL COMMANDS

*
*
* COMMAND TABLE*
*
* CQMTB

	100		
	110	*	
	120	*	
	130	*	
013721	140	CQMTB	...
013721	446555		446555
013722	614076	JMP	DUM
013723	604164		604164
013724	614155	JMP	PAT
013725	414444		414444
013726	614205	JMP	ADD
013727	637155		637155
013730	614171	JMP	SYM
013731	574364		574364
013732	614173	JMP	OCT
013733	444543		444543
013734	614175	JMP	DEC
013735	635170		635170
013736	614177	JMP	SIX
013737	634166		634166
013740	614232	JMP	SAVE
013741	457051		457051
013742	705001	TERMINAT	
013743	700000		700000
013744	705001	TERMINAT	
013745	624547		624547
013746	614271	JMP	REG
013747	415464		415464
013750	614310	JMP	ALT
013751	544463		544463
013752	614365	JMP	LDS
013753	414463		414463
013754	614371	JMP	ADS
013755	504541		504541
013756	614417	JMP	HEA
013757	426245		426245
013760	614440	JMP	BRE
013761	655642		655642
013762	614470	JMP	UNB
013763	525560		525560
013764	614617	JMP	TRA
013765	435756		435756
013766	614623	JMP	CQN
013767	545741		545741
013770	614734	JMP	LOAD
013771	554163		554163
013772	615025	JMP	MAS
013773	634541		634541
013774	615030	JMP	SEA
013775	590	CQME	...
000014	600	CMDX	.EQU 14
	610	*	

TSS DDT EXIT IS A HLT, WHICH RETURNS TO THE MONITOR

IX* ALSO EXITS

COMMAND REGISTER

COMMANDS

	620	*	STARTUP		
	630	*			
013775	703302	640	START	CAF	CLEAR Up
013776	700002	650		IOF	
013777	700416	660		TLS+10	PRINT A GRITCH
	014000	670		MESS	<DDT HERE>,.8,
014000	700312			KRB	
	014001			MESSR	<DDT HERE>,.8,
				,CRSM	SAVE.ON
014001	777766			LAW	-8,-2
014002	115561			JMS	TSSIXOT
				,PMC	RESTORE
				,CRSM	RESTORE
	680	*			
	690	*	IDLE LOOP		
	700	*			
	014007	710	IDLE	...	
	014007	720		MESS	<?>,.1
014007	700312			KRB	
	014010			MESSR	<?>,.1
				,CRSM	SAVE.ON
014010	777775			LAW	-1-2
014011	115561			JMS	TSSIXOT
				,PMC	RESTORE
				,CRSM	RESTORE
	014013	730		LINE	READ A LINE
014013	115370			JMS	TSINLIN
	014014	740	COMA	...	
014014	215135	750		LAC	(JMP COMTB-1) GET POINTER
014015	040014	760		DAC	CMDX SAVE IN REGISTER
014016	777724	770		LAW	COMTB-COME GET COUNT
014017	055200	780		DAC	T1 SAVE IT
	014020	790		WORD	GET A WORD OF INPUT
014020	115526			JMS	TSSIXIN
014021	614007	800		JMP	IDLE INPUT LINE WAS VACUOUS
014022	660014	810	COMO	SAD	CMDX,X CHECK FOR A COMMAND
014023	620014	820		JMP	CMDX,X GO TO IT
	014024	830		LOOP	T1,COMO LOOP ON COUNTER
014024	455200			ISZ	T1
014025	614022			JMP	COMO
	014026	840	COM1	EMESS	<COMMAND ERROR>,.13.
				,CRSM	SAVE.ON
	014026			MESS	<COMMAND ERROR WORD #>13.-7
014026	700312			KRB	
	014027			MESSR	<COMMAND ERROR WORD #>13.-7
				,CRSM	SAVE.ON
014027	777752			LAW	-13,-7-2
014030	115561			JMS	TSSIXOT
				,PMC	RESTORE
				,CRSM	RESTORE
	014041			COUNT	
014041	215367			LAC	TSCOUNT

COMMANDS

014042			OCTZ	
014042	744002		STL	
014043	115502		JMS	T\$OCTOT
			,CRSM	RESTORE
014044	614007	850	JMP	IDLE
		860	*	
		870	*	FORMAT ERROR
		880	*	
014045		890	FORMAT	EMESS <FORMAT ERROR>,12.
			,CRSM	SAVE,ON
014045	700312		MESS	<FORMAT ERROR WORD #>,12,-7
014046			KRB	
			MESSR	<FORMAT ERROR WORD #>,12,-7
			,CRSM	SAVE,ON
014046	777753		LAW	-12,-7-2
014047	115561		JMS	T\$IXOT
			,PMC	RESTORE
			,CRSM	RESTORE
014057			COUNT	
014057	215367		LAC	T\$COUNT
014060			OCTZ	
014060	744002		STL	
014061	115502		JMS	T\$OCTOT
			,CRSM	RESTORE
014062	614007	900	JMP	IDLE
		910	*	
014063		920	COMX	DELIM GET THE LAST DELIMITER
014063	215366		LAC	T\$DLMTR
014064	555136	930	SAD	(\$COLON) CHECK FOR A SEMI-COLON
014065	614074	940	JMP	COMY YES -- TROUBLE
014066	555137	950	SAD	(CR) CHECK FOR A CARRIAGE RETURN
014067	614007	960	JMP	IDLE YES
014070	555140	970	SAD	(NUMSGN) CHECK FOR #
014071	741000	980	SKP	
014072		990	FORMAT	FORMAT ERROR IF NOT
014072	614045		JMP	FORMAT
014073	614014	1000	JMP	COMA ENTER COMMAND SCAN
014074	400014	1010	XCT	CMDX GET THE POINTER
014075	000000	1020	CHDN	0 COMMAND NUMBER

COMMANDS

	1030		,EJECT	
	1040	*		
	1050	*	DUMP	
	1060	*		
	1070	*	DUM ADD1;ADD2;ADD3	OR
	1080	*	DUM ADD1 L;ADD2 L;ADD3 L	OR
	1090	*	DUM ADD1L,ADD1U;ADD2L,ADD2U	
	1100	*		
	1110	DUM	...	
014076	1120	JMS	EXP	GET AN EXPRESSION
014076 113120	1130	DAC	LOC	SAVE IT
014077 053671	1140	DELIM		GET THE DELIMITER
014100		LAC	TSDLMTR	
014100 215366		SAD	(SPACE)	CHECK FOR A SPACE
014101 555075	1150	JMP	DUM1	
014102 614107	1160	SAD	(COMMA)	CHECK FOR A COMMA
014103 555141	1170	JMP	DUM2	
014104 614117	1180	LAW	-1	ELSE DUMP ONLY ONE WORD
014105 777777	1190	JMP	DUM3	
014106 614114	1200	JMS	EXP	GET ANOTHER EXPRESSION
014107 113120	1210	NEG		FORM 2'S COMPLEMENT
014110	1220	CMA		
014110 740001		TAD	(1)	
014111 355100		SMA		CHECK FOR PROPER LENGTH
014112 740100	1230	FORMAT		
014113	1240	JMP	FORMAT	
014113 614045		DAC	N	SAVE FOR DUMP ROUTINE
014114 053672	1250	JMS	DUMP	DUMP IT
014115 113554	1260	JMP	COMX	
014116 614063	1270	JMS	EXP	GET ANOTHER EXPRESSION
014117 113120	1280	CMA		NEGATE
014120 740001	1290	TAD	LOC	FORM DIFFERENCE
014121 353671	1300	SMA		CHECK FOR OK
014122 740100	1310	LAW	-1	GET -1 IF NOT
014123 777777	1320	JMP	DUM3	CONTINUE
014124 614114	1330			

COMMANDS

	1340		.EJECT	
	1350	*		
	1360	*		
	1370	*	GET WORD ROUTINE	
	1380	*		
	1390	GWORD	0	
014125	000000		JMS EXP	GET AN EXPRESSION
014126	113120		DAC T5	SAVE FOR NOW
014127	055204		LAC TSCHAR	GET THE CHARACTER THAT STOPPED US
014130	215365		SAD (SPACE)	CHECK FOR SPACE
014131	555075		JMP GWD1	
014132	614135			
	014133	GWD0	...	
014133	215204		LAC T5	GET THE VALUE
014134	634125		JMP GWORD,X	RETURN
	1480	*		
	1490	*	INSTRUCTION FOUND	
	1500	*		
014135	113120	GWD1	JMS EXP	GET ANOTHER EXPRESSION
014136	515125		AND (ADDRS)	EXTRACT ADDRESS FIELD
014137	355204		TAD T5	ADD TO CURRENT ONE
014140	055204		DAC T5	SAVE IT
014141	215365		LAC TSCHAR	GET THE CHARACTER
014142	555141		SAD (COMMA)	CHECK FOR ,
014143	741000		SKP	
014144	614133		JMP GWD0	NO
014145	115607		JMS TSFGET	GET A CHARACTER
014146	555134		SAD (130)	CHECK FOR 'X'
014147	741000		SKP	
	014150	FORMAT	FORMAT	FORMAT ERROR IF NOT
014150	614045		JMP FORMAT	
014151	215204		LAC T5	GET VALUE
014152	515142		AND (757777)	TRIM
014153	355130		TAD (20000)	MAKE INDIRECT
014154	634125		RET GWORD	

COMMANDS

	1670		.EJECT	
	1680	*		
	1690	*	PATCH	
	1700	*		
	1710	*	PATCH ADD;LOC LOC LOC;LOC LCO LOC	
	1720	*		
014155	1730	PAT	...	
014155 113120	1740	JMS	EXP	GET THE ADDRESS
014156 053671	1750	DAC	LOC	SAVE IT
014157	1760	PATO	DELIM	GET A CHARACTER
014157 215366		LAC	TSDLMTR	
014160 555075	1770	SAD	(SPACE)	CHECK FOR SPACE
014161 614165	1780	JMP	PAT1	
014162 555136	1790	SAD	(SCOLON)	CHECK FOR ;
014163 741000	1800	SKP		
014164 614063	1810	JMP	COMX	DONE IF NOT
014165 114125	1820	JMS	GWORD	GET A WORD
014166 073671	1830	DAC	LOC,X	SAVE IT
014167 453671	1840	ISZ	LOC	INDEX
014170 614157	1850	JMP	PATO	LOOP
	1860	*		
	1870	*	SYM	
	1880	*		
014171 215143	1890	SYM	LAC (JMP FORMS)	GET THE PROPER JUMP
014172 614200	1900	JMP	FORM	
	1910	*		
	1920	*	OCT	
	1930	*		
014173 215144	1940	OCT	LAC (JMP FORMO)	GET THE PROPER JUMP
014174 614200	1950	JMP	FORM	DO IT
	1960	*		
	1970	*	DEC	
	1980	*		
014175 215145	1990	DEC	LAC (JMS PDEC)	DECIMAL FORMAT
014176 614200	2000	JMP	FORM	DO IT
	2010	*		
	2020	*	SIX	
	2030	*		
014177 215146	2040	SIX	LAC (JMS P6	GET FORMAT
014200 053563	2050	FORM	FORMSW	SAVE IT
014201 215365	2060	LAC	TSCHAR	
014202 555075	2070	SAD	(SPACE)	CHECK FOR SPACE
014203 614014	2080	JMP	COMA	ANOTHER COMMAND IF SO
014204 614063	2090	JMP	COMX	TRY IF NOT
	2100	*		
	2110	*	ADD	
	2120	*		
014205 774223	2130	ADD	LAW ADDTB-1	GET TABLE START
014206 040010	2140	DAC	INDEX	SAVE IT
014207 777775	2150	LAW	-ADDTL/2	
014210 055200	2160	DAC	T1	
014211	2170	WORD		GET A WORD

COMMANDS

014211	115526		JMS	TSSIXIN	
014212	740000	2180	NOP		
014213	560010	2190	ADDL	INDEX,X	CHECK IT
014214	614221	2200	JMP	ADD1	
014215	440010	2210	ISZ	INDEX	
014216		2220	LOOP	T1,ADDL	LODP
014216	455200		ISZ	T1	
014217	614213		JMP	ADDL	
014220		2230	FORMAT		FORMAT ERROR
014220	614045		JMP	FORMAT	
014221	220010	2240	ADD1	INDEX,X	GET FORMAT
014222	053400	2250	DAC	AFORM	SAVE IT
014223	614063	2260	JMP	COMX	RETURN
		2270	*		
		2280	*	ADDRESS FORMAT TABLE	
		2290	*		
014224		2300	ADDTB	...	
014224	574364	2310		574364	
014225	613401	2320	JMP	OCTF	
014226	444543	2330		444543	
014227	613405	2340	JMP	DECF	
014230	637155	2350		637155	
014231	613407	2360	JMP	SYMF	
000006		2370	ADDTL	.EQ	.-ADDTB

COMMANDS

		2380		,EJECT	
014232	215121	2390	SAVE	LAC (DSWRITE)	LOAD THE WRITE COMMAND
014233	115707	2400		JMS DSDO	GO DO THE DISK WRITE
014234	774236	2410		LAW SAV4	POINTER TO THE DISK FILE PARAMETERS
014235	614063	2420		JMP COMX	NEXT??
		2430			
014236	000000	2440	SAV4	0	STARTING IN DISK BLOCK ZERO
014237	002000	2450		BOUNDARY	CORE STARTING ADDRESS
014240	010000	2460		\$BASE-BOUNDARY	LENGTH

COMMANDS

	2470		,EJECT	
	2480	*		
	2490	*	REGF	
	2500	*		
	2510	*	FIND A REGISTER	
	2520	*		
014241	000000	2530	REGF	0
014242	774317	2540	LAW	REGT-1
014243	040010	2550	DAC	INDEX
014244	777772	2560	LAW	-REGN/3
014245	055200	2570	DAC	T1
014246		2580	WORD	
014246	115526		JMS	TSSIXIN
014247	740000	2590	NOP	
014250	515147	2600	AND	(770000)
014251	555150	2610	SAD	(700000)
014252	614263	2620	JMP	REG2
014253	215237	2630	LAC	TSWORDB
014254	560010	2640	SAD	INDEX,X
014255	634241	2650	RET	REGF
014256	440010	2660	ISZ	INDEX
014257	440010	2670	ISZ	INDEX
014260		2680	LOOP	T1,REGL
014260	455200		ISZ	T1
014261	614254		JMP	REGL
014262		2690	FORMAT	
014262	614045		JMP	FORMAT
014263		2700	REG2	...
014263	215237	2710	LAC	TSWORDB
014264	640506	2720	LRS	6
014265	515126	2730	AND	(7)
014266	355151	2740	TAD	(REGS-1)
014267	040010	2750	DAC	INDEX
014270	634241	2760	RET	REGF
	2770	*		
	2780	*	REGISTER COMMAND	
	2790	*		
014271	114241	2800	REG	JMS
014272	113605	2810	JMS	REGF
014273	215237	2820	LAC	EOLP
014274	113621	2830	JMS	TSWORDB
014275	113614	2840	JMS	P6
014276	215237	2850	LAC	SPCOL
014277	515147	2860	AND	TSWORDB
014300	555150	2870	SAD	(770000)
014301	614305	2880	JMP	(700000)
014302	220010	2890	LAC	REG1
014303	420010	2900	XCT	INDEX,X
014304	614063	2910	JMP	INDEX,X
014305		2920	REG1	COMX
014305	220010	2930	LAC	DO SOMETHING
014306	113377	2940	JMS	EXIT
			JMS	INDEX,X
			JMS	DUMA
				GET THE REGISTER
				DUMP IT

COMMANDS

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014307 614063 2950      JMP      COMX      EXIT
                2960      *
                2970      *      ALTER
                2980      *
014310 114241 2990      ALT      JMS      REGF      FIND THE REGISTER
014311 440010 3000      ISZ      INDEX      FORM POINTER
014312 200010 3010      LAC      INDEX
014313 054317 3020      DAC      REGI      SAVE IT
014314 114125 3030      JMS      GWORD     GET A WORD FOR IT
014315 074317 3040      DAC      REGI,X    SAVE IT
014316 614063 3050      JMP      COMX      EXIT
014317 000000 3060      REGI      0
                3070      *
                3080      *      REGISTER TABLE
                3090      *
                014320      REGT      ...
014320 414300 3110      414300
014321 000000 3120      AC      0
014322 113377 3130      JMS      DUMA      DUMP
014323 556100 3140      556100
014324 000000 3150      MQ      0
014325 113377 3160      JMS      DUMA      DUMP IT
014326 604300 3170      604300
014327 000000 3180      PC      0
014330 113377 3190      JMS      DUMA
014331 545300 3200      545300
014332 000000 3210      LK      0
014333 113711 3220      JMS      P6Z
014334 634300 3230      634300
014335 000000 3240      SC      0
014336 113711 3250      JMS      P6Z
014337 636463 3260      636463
014340 000000 3270      STS      0
                014341      OCT      IN OCTAL ALWAYS
014341 744000 3280      CLL
014342 115502 3290      JMS      TSOCOT
                000023      REGN      ,EQU      .-REGT      NUMBER OF REGISTERS

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COMMANDS

	3300		.EJECT	
	3310	*		
	3320	*	TAPE READER ROUTINES	
	3330	*		
014343	000000	3340	GETW	0
014344	154363	3350	DZM	TIME
014345	700144	3360	RSB	CLEAR TIMER
014346		3370	GW1	START THE READER
014346	700101	3380	RSF	...
014347	741000	3390	SKP	CHECK FOR CHARACTER IN
014350	614354	3400	JMP	WIN
014351	454363	3410	ISZ	TIME
014352	614346	3420	JMP	GW1
014353	634343	3430	RET	GETW
014354	700112	3440	WIN	RRB
014355	054363	3450	DAC	WT
014356	254364	3460	XOR	CKSUM
014357	054364	3470	DAC	CKSUM
014360	214363	3480	LAC	WT
014361	454343	3490	ISZ	GETW
014362	634343	3500	RET	GETW
014363		3510	WT	...
014363	000000	3520	TIME	0
014364	000000	3530	CKSUM	0
		3540	*	
		3550	*	LOAD SYMBOLTABLE
		3560	*	
014365		3570	LDS	...
014365	771673	3580	LAW	SYMST-1
014366	053336	3590	DAC	SPTR
014367	777757	3600	LAW	-SYMN
014370	053274	3610	DAC	SCOUNT
		3620	*	
		3630	*	ADD SYMBOLTABLE
		3640	*	
014371		3650	ADS	...
014371	777775	3660	LAW	-3
014372	055200	3670	DAC	T1
014373	353336	3680	TAD	SPTR
014374	053336	3690	DAC	SPTR
014375	040012	3700	DAC	SYMBX
014376	777777	3710	LAW	-1
014377	353274	3720	TAD	SCOUNT
014400	053274	3730	DAC	SCOUNT
014401	114343	3740	ADSL	JMS
014402	614411	3750	JMP	GETW
014403	060012	3760	DAC	ADSL
014404		3770	LOOP	SYMBX,X
014404	455200		ISZ	T1,ADSL
014405	614401		JMP	T1
014406	114343	3780	JMS	ADSL
014407	614411	3790	JMP	GETW
				ADSL
				IGNORE EXTRA WORD
				EXIT IF NONE

COMMANDS

014410	614371	3800		JMP	ADS	ADD SOME MORE
014411	213336	3810	AD SX	LAC	SPTR	GET POINTER
014412	355113	3820		TAD	(3)	ADD 3
014413	053336	3830		DAC	SPTR	BACK UP TO LAST SYMBOL
014414	453274	3840		ISZ	SCOUNT	AND UNCOUNT IT
014415	700112	3850		RRB		CLEAR FLAG IN STUBORN READER
014416	614063	3860		JMP	COMX	CONTINUE
		3870	*			
		3880	*	HEAD		
		3890	*			
014417		3900	HEA	WORD		GET THE SYMBOL
014417	115526			JMS	TSSIXIN	
014420	055210	3910		DAC	HEAD	SAVE IT
014421	614063	3920		JMP	COMX	EXIT
		3930	*			
		3940	*	BREAK		
		3950	*			
		3960	*	SUBROUTINE TO SEARCH BREAK POINT TABLE		
		3970	*			
014422	000000	3980	BLOOK	0		
014423	055200	3990		DAC	T1	SAVE THING TO LOOK FOR
014424	215152	4000		LAC	(DAC BTBL-1)	GET POINTER
014425	040010	4010		DAC	INDEX	SAVE IT
014426	777770	4020		LAW	-10	GET THE NUMBER OF BREAK POINTES
014427	055201	4030		DAC	T2	
014430	215200	4040		LAC	T1	RESTORE PATTERN
014431	560010	4050	BRL	SAD	INDEX,X	CHECK FOR ONE
014432	634422	4060		RET	BLOOK	RETURN IF WE FIND IT
014433	440010	4070		ISZ	INDEX	
014434		4080		LOOP	T2,BRL	LOOP ON COUNTER
014434	455201			ISZ	T2	
014435	614431			JMP	BRL	
014436	454422	4090		ISZ	BLOOK	INCREMENT RETURN
014437	634422	4100		RET	BLOOK	
		4110	*			
		4120	*	BREAK TABLE		
		4130	*			
015217		4140		,USE	STOR	
		4150		,DUP	1,10	
015217	000000	4160	BTBL	,DATA	0,0	
015220	000000					
015221	000000			,DATA	0,0	
015222	000000					
015223	000000			,DATA	0,0	
015224	000000					
015225	000000			,DATA	0,0	
015226	000000					
015227	000000			,DATA	0,0	
015230	000000					
015231	000000			,DATA	0,0	
015232	000000					
015233	000000			,DATA	0,0	

COMMANDS

015234	000000		
015235	000000	,DATA	0,0
015236	000000		
014440	4170	,USE	

COMMANDS

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4180      ,EJECT
4190      *
4200      *
4210      *      BREAK
4220      *
014440    4230      BRE
014440 113120 4240      JMS      EXP      GET THE LOCATION
014441 055202 4250      DAC      T3      SAVE IT
014442 114422 4260      JMS      BLOOK    IS IT ALREADY THERE
014443 614063 4270      JMP      COMX     YES -- DO NOTHING
014444 750000 4280      CLA
014445 114422 4290      JMS      BLOOK    LOOK FOR A HOLE
014446 614465 4300      JMP      BR1
014447      4310      EMESS    <TABLE FULL>,.10.
      ,CRSM    SAVE,ON
014447 700312 4320      MESS    <TABLE FULL WORD #>,.10,-7
014450      4330      KRB
014450 777755 4340      MESSR   <TABLE FULL WORD #>,.10,-7
014451 115561 4350      ,CRSM    SAVE,ON
      LAW      -10,-7-2
      JMS      TSSIXOT
      ,PMC     RESTORE
      ,CRSM    RESTORE
014461      4360      COUNT
014461 215367 4370      LAC      TSCOUNT
014462      4380      OCTZ
014462 744002 4390      STL
014463 115502 4400      JMS      TSOCTOT
      ,CRSM    RESTORE
014464 614063 4410      JMP      COMX     EXIT
014465 215202 4420      LAC      T3      GET THE LOCATION
014466 400010 4430      XCT      INDEX    SAVE IT
014467 614063 4440      JMP      COMX     EXIT
      4450      *
      4460      *      UNBREAK
      4470      *
014470      4480      UNB
014470 113120 4490      ...
014471 114422 4500      JMS      EXP      GET THE EXPRESSION
014472 614510 4510      JMS      BLOOK    LOOK FOR IT
014473      4520      JMP      UN1      FOUND IT
      EMESS    <NO BREAK>,.8.
      ,CRSM    SAVE,ON
014473 700312 4530      MESS    <NO BREAK WORD #>,.8,-7
014474      4540      KRB
014474      4550      MESSR   <NO BREAK WORD #>,.8,-7
      ,CRSM    SAVE,ON
014474 777757 4560      LAW      -8,-7-2
014475 115561 4570      JMS      TSSIXOT
      ,PMC     RESTORE
      ,CRSM    RESTORE
014504      4580      COUNT
014504 215367 4590      LAC      TSCOUNT

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COMMANDS

014505			OCTZ		
014505	744002		STL		
014506	115502		JMS	T\$OCTOT	
			.CRSM	RESTORE	
014507	614063	4440	JMP	COMX	EXIT
014510	750000	4450	UN1	CLA	
014511	400010	4460	XCT	INDEX	CLEAR BREAK POINT
014512	614063	4470	JMP	COMX	EXIT
		4480	*		
		4490	*	RSAVE	"REGISTER SAVE AND RESTORE ROUTINE
		4500	*		
014513	000000	4510	RSAVE	0	
014514	055201	4520	DAC	T2	SAVE
014515	777770	4530	LAW	-10	GET COUNT
014516	055202	4540	DAC	T3	SAVE IT
	014517	4550	RS1	...	
014517	235200	4560	LAC	T1,X	GET WORD
014520	075201	4570	DAC	T2,X	
014521	455200	4580	ISZ	T1	
014522	455201	4590	ISZ	T2	
	014523	4600	LOOP	T3,RS1	
014523	455202		ISZ	T3	
014524	614517		JMP	RS1	
014525	634513	4610	RET	RSAVE	
		4620	*		
		4630	*	ENTRY	FROM INTERRUPT
		4640	*		
014526	000000	4650	INT0	0	
014527	054321	4660	DAC	AC	SAVE ACCUMULATOR
014530	214526	4670	LAC	INT0	GET THE PC
014531	054327	4680	DAC	PC	SAVE AS PC
014532	154616	4690	DZM	WF	CLEAR FLAG
014533	641002	4700	INT1	LACQ	GET THE MQ
014534	054324	4710	DAC	MQ	
014535	750010	4720	CLAIRAL		GET THE LINK
014536	054332	4730	DAC	LK	SAVE IT
014537	641001	4740	LACS		GET THE SC
014540	054335	4750	DAC	SC	SAVE IT
014541	154363	4760	DZM	TIME	WAIT FOR SLOW INTERRUPTS
014542	454363	4770	ISZ	TIME	
014543	614542	4780	JMP	.-1	
014544	700314	4790	IORS		GET THE STATUS
014545	054340	4800	DAC	STS	SAVE IT
014546	700002	4810	IOF		TURN PI OFF
		4820	*	RPL	"GET THE API STATUS
		4830	*	DAC	API "SAVE IT
014547	700416	4840		TLS+10	SEND
		4850	*	LAC	(700010) "SET LEVEL 4
		4860	*	ISA	
014550	700312	4870	KRB		
014551	760010	4880	LAW	10	POINT TO X REGISTERS
014552	055200	4890	DAC	T1	SAVE IT

COMMANDS

014553	774724	4900		LAW	REGS	POINT TO SAVE AREA
014554	114513	4910		JMS	RSAVE	SAVE THEM
		4920	*			
		4930	*			
		4940	*			
014555	775216	4950		LAW	BTBL-1	POINT TO TABLE
014556	040014	4960		DAC	CMDX	SAVE POINTER
014557	777770	4970		LAW	-10	NUMBER OF BREAKPOINTS
014560	055200	4980		DAC	T1	SAVE IT
014561	200000	4990		LAC	0	PRESERVE LOCATION ZERO
014562	055202	5000		DAC	T3	
014563	220014	5010	INT2	LAC	CMDX,X	GET A POINTER
014564	055201	5020		DAC	T2	SAVE IT
014565	220014	5030		LAC	CMDX,X	GET THE INSTRUCTION
014566	075201	5040		DAC	T2,X	RESTORE IT
014567		5050		LOOP	T1,INT2	LOOP ON COUNTER
014567	455200			ISZ	T1	
014570	614563			JMP	INT2	
014571	215202	5060		LAC	T3	
014572	040000	5070		DAC	0	
014573		5080		MESS	<BREAK - >8.	
014573	700312			KRB		
014574				MESSH	<BREAK - >8.	
				,CRSM	SAVE,ON	
014574	777766			LAW	-8,-2	
014575	115561			JMS	TSSIXOT	
				,PMC	RESTORE	
				,CRSM	RESTORE	
014602	777777	5090		LAW	-1	PRINT PROPPER PC
014603	354327	5100		TAD	PC	
014604	055200	5110		DAC	T1	SAVE
014605	214616	5120		LAC	WF	CHECK FOR WAT
014606	740200	5130		SZA		
014607	614612	5140		JMP	INT3	YES -- DONAT CHANGE INSTRUCTION
014610	235200	5150		LAC	T1,X	GET INSTRUCTION
014611	054711	5160		DAC	UINST	SAVE IT
014612	215200	5170	INT3	LAC	T1	RESTORE PC
014613	015125	5180		AND	(ADRSS)	TRIM
014614	113377	5190		JMS	DUMA	DUMP
014615	614007	5200		JMP	IDLE	AND LOOP IDLEY
014616	000000	5210	WF	0		

COMMANDS

	5220		,EJECT	
	5230	*		
	5240	*	TRANSFER	
	5250	*		
014617	113120	5260	TRA	JMS EXP GET THE EXPRESSION
014620	515125	5270		AND (ADRS) TRIM
014621	355153	5280		TAD (JMP) MAKE A JMP X INSTRUCTION
014622	054711	5290		DAC UINST SAVE IT
	5300	*		
	5310	*	CONTINUE	
	5320	*		
	5330	CON	CRLF	
014623	115673		JMS	TSCRLF
014624	215154	5340	LAC	(BTBL-1) GET INITIAL POINTER
014625	040014	5350	DAC	CMDX SAVE IT
014626	777770	5360	LAW	-10 GET COUNT
014627	055200	5370	DAC	T1 SAVE IT
014630	220014	5380	CON1	LAC CMDX,X GET A POINTER
014631	741200	5390		SNA CHECK FOR SOMETHING
014632	614641	5400		JMP CON2
014633	055201	5410	DAC	T2 SAVE IT
014634	235201	5420	LAC	T2,X GET THE WORD
014635	060014	5430	DAC	CMDX,X SAVE IT
014636	215155	5440	LAC	(JMS INTO
014637	075201	5450	DAC	T2,X MAKE A CAL
014640	741000	5460		SKP
014641	440014	5470	CON2	ISZ CMDX SKIP POINTER
014642	5480		LOOP	T1,CON1 LOOP COUNTER
014642	455200		ISZ	T1
014643	614630		JMP	CON1
014644	774724	5490	LAW	REGS POINTER TO X REGISTER 1
014645	055200	5500	DAC	T1 SAVE IT
014646	760010	5510	LAW	10 POINT TO REGISTERS
014647	114513	5520	JMS	RSVE RESTORE REGISTERS
014650	214335	5530	LAC	SC GET THE STEP COUNTER
014651	255112	5540	XOR	(77) COMPLEMENT
014652	355156	5550	TAD	(640402) FORM RANDOM EAE
014653	515157	5560	AND	(640477)
014654	054655	5570	DAC	.+1 SAVE IT
014655	740040	5580	XX	
014656	214324	5590	LAC	MQ RESTORE MQ
014657	652000	5600	LMQ	
014660	214332	5610	LAC	LK GET THE LINK
014661	740020	5620	RAR	RESTORE IT
014662	700401	5630	TSP	WAIT FOR LAST CHARACTER TO PRINT
014663	614662	5640	JMP	.-1
014664	214340	5650	LAC	STS GET THE STATUS
014665	515130	5660	AND	(20000) FIND TTY FLAG
014666	741200	5670	SNA	SKIP IF SO
014667	700402	5680	TCF	CLEAR FLAG
014670	703304	5690	DBK	DEBREAK API
014671	214340	5700	LAC	STS GET THE STATUS REGISTER

COMMANDS

014672	741100	5710		SPA	CHECK FOR PI
014673	700042	5720		ION	
		5730	*	LAC	API "GET THE REGISTER
		5740	*	AND	(400000) "JUST THE ENABLE BIT
		5750	*	ISA	
014674	214711	5760		LAC	UINST SPECIAL CHECK FOR JMS
014675	515160	5770		AND	(740000)
014676	555161	5780		SAD	(JMS)
014677	614715	5790		JMP	CON7 OOPS
014700	214711	5800		LAC	UINST GET THE INSTRUCTION AGAIN
014701	515162	5810		AND	(740700) CHECK FOR WEIRD EAE
014702	555163	5820		SAD	(640100) MUL
014703	614722	5830		JMP	EA
014704	555164	5840		SAD	(640300) DIV
014705	614722	5850		JMP	EA
014706	215165	5860		LAC	(SKP) SET UP INSTRUCTION
014707	054712	5870	CON6	DAC	UINST+1 SAVE IT
014710	214321	5880		LAC	AC RESTORE THE ACC
014711	740040	5890	UINST	XX	
014712	741000	5900		SKP	
014713	454327	5910		ISZ	PC ESTORE THE PC
014714	634327	5920		RET	PC
014715	214327	5930	CON7	LAC	PC GET THE PC
014716	074711	5940		DAC	UINST,X SAVE IT
014717	454711	5950		ISZ	UINST INCREMENT INSTRUCTION
014720	214321	5960		LAC	AC RESTORE THE AC
014721	634711	5970		RET	UINST RETURN
014722	234327	5980	EA	LAC	PC,X GET MPY OR DIV CONSTANT
014723	614707	5990		JMP	CON6 GO TO IT
		6000	*		
014724	6010		REGS	.BLOCK	10

COMMANDS

	6020		.EJECT		
	6030				
014734	6040	LOAD	WORD		GET THE DEVICE NAME
014734	115526		JMS	TSSIXIN	
014735	614745	6050	JMP	DLOAD	VACUOUS ASSUMES LOAD FROM THE DISK
014736	555166	6060	SAD	(PPT)	
014737	614751	6070	JMP	PPR	
014740	555167	6080	SAD	(PTR)	
014741	614751	6090	JMP	PPR	
014742	555170	6100	SAD	(DK0)	
014743	741000	6110	SKP		
014744	6120		FORMAT		FORMAT ERROR
014744	614045		JMP	FORMAT	
014745	215116	6130	LAC	(DSREAD)	LOAD THE READ COMMAND
014746	115707	6140	JMS	DSDO	DO THE DISK READ
014747	774236	6150	LAW	SAV4	POINTER TO THE DISK READ PARAMETERS
014750	614063	6160	JMP	COMX	NEXT COMMAND??
	6170	*			
	6180	*	LOAD PAPER TAPE		
	6190	*			
014751	154364	6200	PPR	DZM	CKSUM
014752	114343	6210	JMS	GETW	CLEAR CHECKSUM
014753	6220		FORMAT		GET A WORD
014753	614045		JMP	FORMAT	
014754	515160	6230	AND	(740000)	CHECK FOR LOADER
014755	555171	6240	SAD	(DAC 0)	
014756	614774	6250	JMP	PPR4	GO USE IT
014757	700104	6260	RSA		
014760	700101	6270	RSP		
014761	614760	6280	JMP	.-1	
014762	700112	6290	RRB		
014763	740200	6300	SZA		
014764	614757	6310	JMP	.-5	
014765	614751	6320	JMP	PPR	LOOP
014766	114343	6330	PPR1	JMS	GETW
014767	6340		FORMAT		GET A WORD
014767	614045		JMP	FORMAT	FORMAT ERROR
014770	515160	6350	AND	(740000)	CHECK FOR DAC
014771	555171	6360	SAD	(DAC 0)	CHECK FOR DAC
014772	741000	6370	SKP		
014773	614063	6380	JMP	COMX	
014774	214363	6390	PPR4	LAC	WT
014775	053671	6400	DAC	LOC	GET WORD BACK
014776	114343	6410	JMS	GETW	SAVE IT
014777	6420		FORMAT		GET LENGTH
014777	614045		JMP	FORMAT	
015000	6430		NEG		FORM COUNT
015000	740001		CMA		
015001	355100		TAD	(1)	
015002	053672	6440	DAC	N	
015003	114343	6450	JMS	GETW	TRY FOR CHECKSUM
015004	6460		FORMAT		

COMMANDS

015004	614045		JMP	FORMAT	
015005	214364	6470	LAC	CKSUM	CHECK CHECKSUM
015006	740200	6480	SZA		
015007		6490	FORMAT		NOPE
015007	614045		JMP	FORMAT	
015010	114343	6500	JMS	GETW	GET A WORD
015011		6510	FORMAT		FORMAT ERROR
015011	614045		JMP	FORMAT	
015012	073671	6520	DAC	LOC,X	SAVE IT
015013	453671	6530	ISZ	LOC	INDEX LOCATION
015014		6540	LOOP	N,PPRL	LOOP
015014	453672		ISZ	N	
015015	615010		JMP	PPRL	
015016	614766	6550	JMP	PPR1	GET ANOTHER BLOCK
015017	000000	6560	TPR	.DATA	0,TSWORDB,2
015020	015237				
015021	000002				
015022	000000	6570	TPR1	.DATA	0,30,2
015023	000030				SPECIAL READ PARAMETER BLOCK
015024	000002				

COMMANDS

		6580		,EJECT	
		6590	*		
		6600	*	MASK	
		6610	*		
015025	114125	6620	MAS	JMS	GWORD GET THE MASK
015026	055072	6630		DAC	MASK SAVE IT
015027	614063	6640		JMP	COMX RETURN
015030	114125	6650	SEA	JMS	GWORD GET SEARCH PATTERN
015031	055073	6660		DAC	ST SAVE IT
	015032	6670		DELIM	GET THE DELIMITER
015032	215366			LAC	TSDLMTR
015033	555137	6680		SAD	(CR)
015034	615044	6690		JMP	SEA3 USE DEFAULT CONDITIONS WHEN NO ARGUMENT
015035	555140	6700		SAD	(NUMSGN)
015036	615044	6710		JMP	SEA3 USE DEFAULT CONDITIONS WHEN NO ARGUMENT
015037	113120	6720		JMS	EXP 2GET STARTING LOC
015040	053671	6730		DAC	LOC SAVE
015041	355172	6740		TAD	(-BOUNDARY)
015042	740100	6750		SMA	SKIP IF ATTEMPTING TO SEARCH PROTECTED MEMORY
015043	615050	6760		JMP	SEA1 ELSE CONTINUE
015044	762000	6770	SEA3	BOUNDARY	START SEARCH AT THE BOUNDARY
015045	053671	6780		DAC	LOC
015046	770000	6790		LAW	BOUNDARY-BASE
015047	615053	6800		JMP	SEA2
015050	113120	6810	SEA1	JMS	EXP GET ENDING LOC
015051	740001	6820		CMA	NEGATE
015052	353671	6830		TAD	LOC FORM LENGTH
015053	055071	6840	SEA2	DAC	N1 SAVE
015054	233671	6850	SEAL	LAC	LOC,X CHECK A LOC
015055	255073	6860		XOR	ST CHECK
015056	515072	6870		AND	MASK CHECK IT
015057	740200	6880		SZA	CHECK FOR MASK
015060	615065	6890		JMP	SEAX DONE
015061	777777	6900		LAW	-1 SET COUNT
015062	053672	6910		DAC	N SAVE IT
015063	113554	6920		JMS	DUMP DUMP
015064	741000	6930		SKP	ISZ SKIP ISZ
015065	453671	6940	SEAX	ISZ	LOC BUMP LOC
	015066	6950		LOOP	N1,SEAL LOOP
015066	455071			ISZ	N1
015067	615054			JMP	SEAL
015070	614063	6960		JMP	COMX
015071	000000	6970	N1	0	EXIT
015072	777777	6980	MASK	777777	INITIALIZED TO -1
015073	000000	6990	ST	0	

SYMBOL TABLE

		7000	,STITL SYMBOL TABLE	
		7010	*	
		7020	*	SYSTEM SYMBOLS
		7030	*	
000021		7040	SYMN	,EQU 21 NUMBER OF SYMBOLS
015074		7050	HERE	...
011674		7060		,LOC -4*SYMN+BASE
		7070	DEF	,DEFIN (OCTAL SYMBOL,VALUE
		7080		,DATA 0,#1,#2
		7090		,ENDM DEF
011674		7100	SYMST	...
011674		7110	DEF	0,0
011674	000000		,DATA	0,0,0
011675	000000			
011676	000000			
011677		7120	DEF	434154,0 CAL
011677	000000		,DATA	0,434154,0
011700	434154			
011701	000000			
011702		7130	DEF	444143,40000 DAC
011702	000000		,DATA	0,444143,40000
011703	444143			
011704	040000			
011705		7140	DEF	525563,100000 JMS
011705	000000		,DATA	0,525563,100000
011706	525563			
011707	100000			
011710		7150	DEF	447255,140000 DZM
011710	000000		,DATA	0,447255,140000
011711	447255			
011712	140000			
011713		7160	DEF	544143,200000 LAC
011713	000000		,DATA	0,544143,200000
011714	544143			
011715	200000			
011716		7170	DEF	705762,240000 XOR
011716	000000		,DATA	0,705762,240000
011717	705762			
011720	240000			
011721		7180	DEF	414444,300000 ADD
011721	000000		,DATA	0,414444,300000
011722	414444			
011723	300000			
011724		7190	DEF	644144,340000 TAB
011724	000000		,DATA	0,644144,340000
011725	644144			
011726	340000			
011727		7200	DEF	704364,400000 XCT
011727	000000		,DATA	0,704364,400000
011730	704364			
011731	400000			
011732		7210	DEF	516372,440000 ISZ

SYMBOL TABLE

011732	000000		,DATA	0,516372,440000	
011733	516372				
011734	440000				
011735		7220	DEF	415644,500000	AND
011735	000000		,DATA	0,415644,500000	
011736	415644				
011737	500000				
011740		7230	DEF	634144,540000	SAD
011740	000000		,DATA	0,634144,540000	
011741	634144				
011742	540000				
011743		7240	DEF	525560,600000	JMP
011743	000000		,DATA	0,525560,600000	
011744	525560				
011745	600000				
011746		7250	DEF	454145,640000	EAE
011746	000000		,DATA	0,454145,640000	
011747	454145				
011750	640000				
011751		7260	DEF	515764,700000	IOT
011751	000000		,DATA	0,515764,700000	
011752	515764				
011753	700000				
011754		7270	DEF	576062,740000	OPT
011754	000000		,DATA	0,576062,740000	
011755	576062				
011756	740000				
015074		7280	,LOC	HERE	
015074	613177	7290	,LIT		
015075	000240				
015076	000256				
015077	000044				
015100	000001				
015101	777777				
015102	000253				
015103	000255				
015104	000252				
015105	000257				
015106	000241				
015107	000334				
015110	000246				
015111	620000				
015112	000077				
015113	000003				
015114	640500				
015115	400000				
015116	000002				
015117	000040				
015120	000053				
015121	000004				
015122	000055				
015123	775207				

SYMBOL TABLE

015124 000060
 015125 017777
 015126 000007
 015127 000072
 015130 020000
 015131 777763
 015132 013711
 015133 000054
 015134 000130
 015135 613720
 015136 000273
 015137 000215
 015140 000243
 015141 000254
 015142 757777
 015143 613635
 015144 613566
 015145 113514
 015146 113621
 015147 770000
 015150 700000
 015151 014723
 015152 055216
 015153 600000
 015154 015216
 015155 114526
 015156 640402
 015157 640477
 015160 740000
 015161 100000
 015162 740700
 015163 640100
 015164 640300
 015165 741000
 015166 606064
 015167 606462
 015170 445320
 015171 040000
 015172 776000
 015173 000000
 015174 000000

015237 7300

000001 7310

7320

100

120

DEBUG

.USE

.EQU

.INSRT

.INE

.IFE

STOR

1

:DLIBRARY:PDP9LIB:TTYNON

\$DEBUG,1

\$DEBUG,1

TURN ON THE TTY LISTING

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 (I) IS USED FOR
350      * CARRIAGE RETURN AND 335 (J) 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 CHHRACTERS.
```

```

      T
      (MTSS TELETYPE HANDLER) STORAGE AREA
      420 ,STITL (MTSS TELETYPE HANDLER) STORAGE AREA
      430 ,IFE PURCOD,1
      450
      460
      015237 470 WORDB ,BLOCK 2 ROOM TO ACCUMULATE TWO VALID WORDS
      000120 480 STD ,EQU 80. STANDARD IS AN 80-CHARACTER LINE BUFFER
      015241 490 BUFR ,BLOCK STD
      500 *
      510 *
      520 * VARIABLES
      530 *
      015361 015360 540 BEND , -1 END OF THE CHARACTER BUFFER
      015362 000000 550 BPTR ,DSA POINTER TO CURRENTLY ACTIVE WORD IN LINE BUFFER
      015363 000000 560 T1 ,DSA TEMPORARY VARIABLE
      015364 000000 570 T2 ,DSA TEMPORARY VARIABLE
      015365 000000 580 CHAR ,DSA STORES LATEST CHARACTER FROM FGET
      015366 000000 590 DLMTR ,DSA STORES LATEST DELIMITER THROUGH CHRID
      015367 000000 600 COUNT ,DSA
      610 ,IFE PURCOD,1

```

T

(MTSS TELETYPE HANDLER) LINE BUFFER INPUT

,STITL (MTSS TELETYPE HANDLER) LINE BUFFER INPUT

```

630
640
650
660 *
670 * THE PROGRAM IS PROTECTED AGAINST OVERFLOW OR UNDERFLOW OF THE LINE
680 * BUFFER, UNDERFLOW (EXCESS DELETIONS) IS IGNORED, AND OVERFLOW CHARACTERS
690 * ARE LOST, EXCEPT FOR THE LAST CHARACTER TYPED.
700 *
710
720 015370 ENTER INLIN SUBROUTINE TO READ IN AND BUFFER A LINE FROM THE TELETYPE
015370 740040 INLIN XX
015371 700312 730 KRB ONCE, ON ENTRANCE, CLEAN UP ANY PRIOR INPUT
015372 215743 740 INL LAC (BUFFER-1) LOAD A POINTER TO START OF THE BUFFER MINUS ONE
015373 055362 750 DAC BPTR INITIALIZE THE BUFFER POINTER
015374 155367 760 DZM COUNT INITIALIZE THE WORD FETCHED COUNT
015375 155366 770 DZM DLMTR INITIALIZE THE LAST DELIMITER STORAGE
015376 700313 780 IN1 KSP,KRB GET THE NEXT INPUT CHARACTER
015377 615376 790 JMP .-1
015400 555744 800 SAD ($BKARR)
015401 615423 810 JMP 1CHAR DELETE ONE CHARACTER IF IT WAS A BACKARROW
015402 555745 820 SAD ($CONTX)
015403 615421 830 JMP 1LINE DELETE THE ENTIRE LINE IF IT WAS A CONTROL X
015404 652000 840 IN4 LMQ SAVE THE CHARACTER
015405 215362 850 LAC BPTR LOAD THE CURRENT BUFFER POINTER
015406 555361 860 SAD BEND SKIP IF NO OVERFLOW
015407 741000 870 SKP AVOID DAMAGE DUE TO OVERFLOW
015410 455362 880 ISZ BPTR ADVANCE THE POINTER -- IT IS STILL WITHIN THE BUFFER
015411 641002 890 LACQ RELOAD THE CHARACTER
015412 075362 900 DAC BPTR,X AND PUT IT IN THE BUFFER
015413 555746 910 SAD ($CR)
015414 741000 920 SKP
015415 615376 930 JMP IN1 EXIT WHEN A CARRIAGE RETURN IS FOUND
015416 775240 940 LAW BUFFER-1 ELSE GET THE NEXT CHARACTER
015417 055362 950 DAC BPTR RESET THE BUFFER POINTER AT THE END OF THE LINE
015420 635370 960 JMP INLIN,X AND RETURN TO THE CALLER
970
015421 115673 980 1LINE JMS CRLF PRINT THE RESPONSE TO A LINE-DELETE
015422 615372 990 JMP INL REREAD THE LINE
015423 215362 1000 1CHAR LAC BPTR LOAD THE BUFFER POINTER
015424 555372 1010 SAD INL SKIP IF NO UNDERFLOW
015425 615376 1020 JMP IN1 ELSE IGNORE THE COMMAND
015426 355747 1030 TAD (-1) DECREMENT THE BUFFER POINTER
015427 055362 1040 DAC BPTR AND SAVE IT
015430 615376 1050 JMP IN1 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
	1100	*				MQ
	1110	*	INPUT	+1	0	X
	1120	*		+1	1	DELIM
	1130	*		+2	1	OCTAL
	1140	*	OUTPUT	+1	X	X
	1150	*				
	1160					
	1170		ENTER	NUMIN		
015431			NUMIN	XX		
015431	740040		DZM	T2		INITIALIZE THE DECIMAL-DIGIT-RECEIVED FLAG
015432	155364	1180	JMS	INTIN		INITIALIZE THE INPUT STRING, ETC
015433	115614	1190	JMP	NUMIN,X		RETURN +1 FOR DELIMITER IS FIRST NON-BLANK CHARACTER
015434	635431	1200	JMS	FGET		GET THE NEXT CHARACTER
015435	115607	1210	JMS	CHRID		IDENTIFY IT
015436	115633	1220	JMP	NUM26		IT IS A DELIMITER, SO EXIT
015437	615461	1230	JMP	NUMIN,X		IT IS A LETTER, SO EXIT +1 FOR A FORMAT ERROR
015440	635431	1240	SZL			SKIP IF THE CHARACTER IS AN OCTAL DIGIT
015441	741400	1250	ISZ	T2		ELSE BE SURE THE DECIMAL-DIGIT-RECEIVED FLAG IS SET
015442	455364	1260	AND	(17)		RETAIN JUST THE DIGIT
015443	515750	1270	DAC	T1		AND SAVE IT FOR DECIMAL ACCUMULATION
015444	055363	1280				
		1290	LRS	3		SAVE THE "OCTAL DIGIT"
015445	640503	1300	LAC	WORDB		LOAD THE PREVIOUSLY GATHERED "OCTAL NUMBER"
015446	215237	1310	LLS	3		CONCATENATE THE "OCTAL DIGITS"
015447	640603	1320	DAC	WORDB		AND SAVE THE RESULT
015450	055237	1330				
		1340	LAC	WORDB+1		LOAD THE PREVIOUSLY GATHERED "DECIMAL NUMBER"
015451	215240	1350	CLL			SET THE LINK FOR THE MULTIPLY
015452	744000	1360	MUL			MULTIPLY THE PREVIOUS "DECIMAL VALUE"
015453	653122	1370	10,			BY 10 FOR DECIMAL
015454	000012	1380	LACQ			LOAD THE RESULT
015455	641002	1390	TAD	T1		ADD THE CURRENT "DECIMAL DIGIT"
015456	355363	1400	DAC	WORDB+1		AND SAVE THE TOTAL "DECIMAL NUMBER"
015457	055240	1410				
		1420	JMP	NUM20		LOOP
015460	615435	1430				
		1440				
		1450	NUM26	SAD	(\$POINT)	CHECK FOR A PERIOD
015461	555751	1460	JMP	NUM27		IF SO, PICK UP THE DECIMAL VALUE
015462	615470	1470	LAC	T2		ELSE LOAD THE DECIMAL-DIGITS-RECEIVED FLAG
015463	215364	1480	SZA,CLL			AND SKIP IF THERE WERE NONE
015464	744200	1490	JMP	NUMIN,X		RETURN +1, LK=0 FOR A FORMAT ERROR; DECIMAL DIGITS, BUT NO PERIOD
015465	635431	1500	LAC	WORDB		LOAD THE OCTAL VALUE
015466	215237	1510	JMP	NUM29		
015467	615477	1520	JMS	FGET		GET THE NEXT CHARACTER
015470	115607	1530	JMS	CHRID		AND IDENTIFY IT
015471	115633	1540	JMP	NUM28		A DELIMITER IS LEGAL, SO EXIT
015472	615476	1550	JMP	NUMIN,X		A LETTER -- EXIT +1 FOR A FORMAT ERROR
015473	635431	1560				

```

      T                                     (MTSS TELETYPE HANDLER) OCTAL WORD INPUT/OUTPUT

015474 744000 1570      CLL                A NUMBER -- CLEAR THE LINK FOR A FORMAT ERROR
015475 635431 1580      JMP      NUMIN,X    AND EXIT +1
015476 215240 1590      NUM28 LAC      WORDB+1  LOAD THE DECIMAL VALUE
015477 055237 1600      NUM29 DAC      WORDB   SAVE THE CORRECT VALUE
015500 455431 1610      ISZ      NUMIN      BUMP TO A RETURN +2 FOR SUCCESSFUL
015501 635431 1620      JMP      NUMIN,X

      1630
      1640
      1650
      015502 1660      ENTER  OCTOT

015502 740040      OCTOT  XX
015503 652000 1670      OCT42 LMO
015504 741400 1680      SZL
015505 750201 1690      SZA!CLC
015506 777772 1700      LAW      -6
015507 055363 1710      DAC      T1
015510 641002 1720      LACQ
015511 741200 1730      SNA
015512 744000 1740      CLL
015513 641603 1750      OCT44 LLSC      3.
015514 740200 1760      SZA
015515 744000 1770      CLL
015516 355752 1780      TAD      (260)
015517 740400 1790      SNL
015520 115665 1800      JMS      TTYOT
015521 455363 1810      ISZ      T1
015522 615513 1820      JMP      OCT44
015523 700401 1830      TSP
015524 615523 1840      JMP      .-1
015525 635502 1850      JMP      OCTOT,X

      SET THE VALUE TO BE OUTPUT
      SKIP IF NO LEADING ZEROES ARE TO BE SUPPRESSED
      SET A FLAG TO PRINT ONE CHARACTER, ANYWAY; IF THE AC IS ZERO
      ELSE SET THE COUNT FOR THE STANDARD SIX CHARACTERS
      SET THE NUMBER OF CHARACTERS TO BE OUTPUT
      RELOAD THE USER'S VALUE
      SKIP FOR A NON-ZERO VALUE
      ELSE FORCE A SINGLE ZERO TO PRINT
      GET THE NEXT OCTAL DIGIT
      IF IT IS ZERO, DON'T CHANGE PRINT-SUPPRESSION STATE
      ELSE CLEAR THE PRINT INHIBIT AT THE FIRST NON-ZERO FOUND
      MAKE ASCII IN ANY CASE
      BUT SKIP IF PRINT IS INHIBITED
      ELSE PRINT THE DIGIT
      DONE???
      NO -- LOOP
      WAIT FOR THE TELETYPE TO SETTLE
      YES -- EXIT

```

T

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

.STI TL (MTSS TELETYPE HANDLER) SIXBIT WORD INPUT & SIXBIT BUFFER OUTPUT

1860				
1870				
1880				
1890	*			
1900	*	OPERATION	RETURN L	AC MQ MEANING
1910	*			
1920	*	INPUT	+1	1 DELIM X FIRST NON-BLANK CHARACTER IS A DELIMITER
1930	*		+2	1 SIXBIT DELIM SUCCESSFUL READ OF A SIXBIT WORD
1940	*	OUTPUT	+1	X X X SUCCESSFUL WRITE OF A SIXBIT BUFFER
1950	*			
1960				
1970		ENTER	SIXIN	
015526				
015526	740040	SIXIN	XX	
015527	775237	LAW	WORDB	
015530	055363	DAC	T1	INITIALIZE THE SIXBIT BUFFER POINTER
015531	115614	JMS	INTIN	INITIALIZE THE INPWT
015532	635526	JMP	SIXIN,X	RETURN +1 FOR DELIMITER IS FIRST NON-BLANK CHARACTER
015533	455526	ISZ	SIXIN	ELSE BUMP TO A GOOD RETURN
015534	115552	JMS	SIX5	GET THE FIRST GOOD CHARACTER
015535	660714	ALSS	12.	AND PUT IT IN THE FIRST CHARACTER POSITION
015536	075363	DAC	T1,X	AND SAVE IT
015537	115552	JMS	SIX5	GET THE SECOND CHARACTER
015540	660706	ALSS	6.	PUT IT IN THE SECOND CHARACTER POSITION
015541	275363	XOR	T1,X	CONCATENATE THE CHARACTERS
015542	075363	DAC	T1,X	AND SAVE THE RESULT
015543	115552	JMS	SIX5	GET THE THIRD CHARACTER
015544	275363	XOR	T1,X	CONCATENATE THE CHARACTERS
015545	075363	DAC	T1,X	AND SAVE THE RESULT
015546	455363	ISZ	T1	BUMP THE STORAGE BUFFER POINTER
015547	615534	JMP	SIX2	LOOP
015550	215237	SIX9	LAC	WORDB
015551	635526	JMP	SIXIN,X	LOAD THE FIRST SIXBIT WORD
				EXIT
015552		ENTER	SIX5	SUBROUTINE TO GET THE NEXT CHARACTER, MAKE IT SIXBIT, EXIT IF A DELIMITER
015552	740040	SIX5	XX	
015553	115607	JMS	FGET	GET THE NEXT CHARACTER
015554	115633	JMS	CHRID	IDENTIFY IT
015555	615550	JMP	SIX9	EXIT IF IT IS A DELIMITER
015556	740000	NOP		PERMIT LETTERS
015557	355753	TAD	(-240)	MAKE SIXBIT
015560	635552	JMP	SIX5,X	
015561		ENTER	SIXOT	
015561	740040	SIXOT	XX	
015562	055363	DAC	T1	SET THE NEGATIVE CHARACTER COUNT
015563	235561	LAC	SIXOT,X	LOAD THE NEXT WORD OF OUTPUT
015564	652000	LMQ		SAVE IT FOR PRINTING
015565	455561	ISZ	SIXOT	BUMP THE POINTER
015566	115572	JMS	SIX26	OUTPUT THE FIRST CHARACTER
015567	115572	JMS	SIX26	OUTPUT THE SECOND CHARACTER

```

      T                                     (MTSS TELETYPE HANDLER) SIXBIT WORD INPUT & SIXBIT BUFFER OUTPUT
015570 115572 2350      JMS      SIX26      OUTPUT THE THIRD CHARACTER
015571 615563 2360      JMP      SIX24      LOOP
      2370
015572      2380      ENTER   SIX26
015572 740040      SIX26  XX
015573 641606 2390      LLSC    6,          GET THE NEXT SIXBIT CHARACTER
015574 355754 2400      TAD     (240)      MAKE IT ASCII
015575 555755 2410      SAD     (333)      CHECK FOR CARRIAGE RETURN MAPPING
015576 760215 2420      LAW     SCR
015577 555756 2430      SAD     (335)      CHECK FOR LINE FEED MAPPING
015600 760212 2440      LAW     SLF
015601 115665 2450      JMS     TTYOT      PRINT THE CHARACTER
015602 455363 2460      ISZ     T1         ALL CHARACTERS PRINTED?
015603 635572 2470      JMP     SIX26,X    NO -- LOOP
015604 700401 2480      TSF
015605 615604 2490      JMP     .-1       WAIT FOR THE TELETYPE TO SETTLE
015606 635561 2500      JMP     SIXOT,X    YES -- EXIT
      2510      *
      2520      *

```


T

(MTSS TELETYPE HANDLER) MISCELLANEOUS LINE BUFFER ROUTINES

,STITL (MTSS TELETYPE HANDLER) MISCELLANEOUS LINE BUFFER ROUTINES

		2530			
		2540			
		2550			
		2560			
		2570			
		2580			
015607					
015607	740040		FGET	ENTER	FGET
				XX	
015610	455362	2590		ISZ	BPTR
015611	235362	2600		LAC	BPTR,X
015612	055365	2610		DAC	CHAR
015613	635607	2620	FGET9	JMP	FGET,X
		2630			
		2640			
015614				ENTER	INTIN
015614	740040		INTIN	XX	
015615	455367	2650		ISZ	COUNT
015616	155237	2660		DZM	WORDB
015617	155240	2670		DZM	WORDB+1
015620	115607	2680		JMS	FGET
015621	555754	2690		SAD	(SSPACE)
015622	615620	2700		JMP	.-2
015623	115633	2710		JMS	CHRID
015624	635614	2720		JMP	INTIN,X
015625	740000	2730		NOP	
015626	455614	2740		ISZ	INTIN
015627	750001	2750		CLC	
015630	355362	2760		TAD	BPTR
015631	055362	2770		DAC	BPTR
015632	635614	2780		JMP	INTIN,X

SUBROUTINE TO GET THE FIRST REMAINING CHARACTER FROM THE LINE BUFFER
 NO -- BUMP THE POINTER
 LOAD THE NEXT CHARACTER
 AND SAVE IT
 INITIALIZE INPUT WORD-GETTING
 COUNT THE WORD, SUCCESSFUL OR NOT
 INITIALIZE THE TWO FIRST WORDS OF THE INPUT BUFFER
 GET THE NEXT CHARACTER
 CHECK IT FOR A SPACE
 THROW AWAY SPACES
 IDENTIFY THE NON-SPACE
 RETURN +1 FOR A DELIMITER
 ELSE BUMP THE RETURN FOR A NUMBER OR A LETTER
 BACK UP THE POINTER TO POINT TO THE FIRST GOOD CHARACTER

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

2930

015633

015633 740040

015634 515757

015635 055665

015636 355760

015637 745102

015640 615656

015641 355761

015642 745100

015643 615661

015644 355762

015645 745102

015646 615661

015647 355763

015650 745302

015651 615656

015652 515764

015653 355765

015654 741102

015655 615662

015656 215665

015657 055366

015660 635633

015661 455633

015662 455633

015663 215665

015664 635633

015665

015665 740040

015666 700401

015667 615666

015670 700301

015671 700406

CHRID

ENTER CHRID

XX

AND (377)

DAC TTYOT

TAD (-260)

SPA:STL

JMP DLMR

TAD (-10)

SPA:CLL

JMP DIGIT

TAD (-2)

SPA:STL

JMP DIGIT

TAD (-6)

SNA:SPA:STL

JMP DLMR

AND (777737)

TAD (-33)

SPA:CHL

JMP LETTR

DLMR

LAC TTYOT

DAC DLMR

JMP CHRID,X

DIGIT

ISZ CHRID

LETTR

ISZ CHRID

LAC TTYOT

JMP CHRID,X

TTYOT

ENTER TTYOT

XX

TSF

JMP

KSP

TLS

.-1

SAVE THE EIGHT-BIT ASCII CHARACTER
AC < 0 FOR DELIMITERSCHARACTER IS A DELIMITER
AC < 0 FOR OCTAL DIGITSCHARACTER IS AN OCTAL DIGIT
AC < 0 FOR DECIMAL DIGITSCHARACTER IS A DECIMAL DIGIT
AC < 0 FOR DELIMITERSCHARACTER IS A DELIMITER
MAP LOWER CASE INTO UPPER CASE
AC < 0 FOR LETTERS -- L*1 FOR LETTERS; L=0 FOR DELIMITERS

THE CHARACTER IS A LETTER

LOAD THE DELIMITER
SAVE IT

RELOAD THE CHARACTER

WAIT FOR THE TELEPRINTER TO BE FREE
KILL-THE-OUTPUT FEATURE
PRINT THE CHARACTER IN THE AC

T

(MTSS TELETYPE HANDLER) MISCELLANEOUS CHARACTER-HANDLING SUBROUTINES

015672	635665	3290	JMP	TTYOT,X	
		3300			
		3310			
	015673	3320	ENTER	CRLF	
015673	740040		XX		
015674	760215	3330	LAW	215	
015675	115665	3340	JMS	TTYOT	
015676	760215	3350	LAW	215	
015677	115665	3360	JMS	TTYOT	
015700	760212	3370	LAW	212	
015701	115665	3380	JMS	TTYOT	
015702	700401	3390	TSP		
015703	615702	3400	JMP	.-1	WAIT FOR THE TTY TO SETTLE
015704	635673	3410	JMP	CRLF,X	
		3420			
		3430			
		3440	.HEAD		TURN OFF THE INSERT'S HEAD SYMBOL
		3450	.LIST	ON	
		3460	.END		

SHORT DISK ROUTINE

	7330		,STITL	SHORT DISK ROUTINE	
	7340		,HEAD	D	
000036	7350	DSKWC	,EQU	36	
000037	7360	DSKCA	,EQU	37	
000002	7370	READ	,EQU	2	
000004	7380	WRITE	,EQU	4	
015705 000000	7390	CMND	,DSA		
001777	7400	BLKMSK	,EQU	1777	
015706 000000	7410	PNTR	,DSA		
	7420				
	7430				
015707	7440	DQ	ENTER		
015707 740040			XX		
015710 055705	7450		DAC	CMND	SAVE THE DISK COMMAND
015711 235707	7460		LAC	DO,X	GET THE POINTER TO THE PARAMETERS
015712 055706	7470		DAC	PNTR	
015713 455707	7480		ISZ	DO	CORRECT THE RETURN
	7490	*			
015714 707074	7500		DLAH+10		ONLY DISK 0 AVAILABLE
	7510	*			
015715 235706	7520		LAC	PNTR,X	GET THE BLOCK NUMBER
015716 501777	7530		AND	BLKMSK	AND OUT THE DISK NUMBER
015717 660710	7540		ALSS	8.	MULTIPLY BY 400 TO MAKE IT A PHYSICAL DISK ADDRESS
015720 707024	7550		DLAL		PLACE THE PHYSICAL ADDRESS INTO THE DISK ADDRESS REGISTER
	7560	*			
015721 455706	7570		ISZ	PNTR	MOVE THE POINTER TO THE PARAMETERS
015722 777777	7580		LAW	-1	GET A MINUS 1 TO FORM THE CORE POINTER
015723 375706	7590		TAD	PNTR,X	
015724 040037	7600		DAC	DSKCA	PLACE THE CORRECTED POINTER INTO THE DATA CHANNEL CORE ADDRESS
	7610	*			
015725 455706	7620		ISZ	PNTR	MOVE THE POINTER TO THE LAST PARAMETER
015726 777777	7630	NCHK	LAW	-1	PREPARE TO COMPLEMENT A NUMBER
015727 375706	7640		TAD	PNTR,X	
015730 740001	7650		CMA		
015731 040036	7660		DAC	DSKWC	PLACE THE TWO'S COMPLEMENT WORD COUNT IN THE DATA CHANNEL WORD COUNT
	7670	*			
015732 215705	7680		LAC	CMND	GET THE COMMAND
015733 707047	7690		DSCF:DSFX:DSCH		ISSUE THE OPERATION
015734 707001	7700		DSSF		SEE IF THE OPERATION IS DONE
015735 615734	7710		JMP	.-1	NO -- WAIT
	7720	*			
	7730	*			
	7740	*			
015736 707272	7750		DSRS+10		LOAD THE AC WITH THE STATUS OF THE OPERATION
015737 707242	7760		DSCD		LOAD THE FLAGS
015740 741100	7770		BPA		SKIP IF OK
015741 740040	7780	ERROR	HLT		BAD STATUS
015742 635707	7790		RET	DO	EXIT
	7800	*			
015743 015240	7810		.LIT		
015744 000337					
015745 000230					

D

SHORT DISK ROUTINE

015746	000215		
015747	777777		
015750	000017		
015751	000256		
015752	000260		
015753	777540		
015754	000240		
015755	000333		
015756	000335		
015757	000377		
015760	777520		
015761	777770		
015762	777776		
015763	777772		
015764	777737		
015765	777745		
015770	7820	.USE	END
	7830	.DUP	1,10
015770	613775	7840	JMP S\$START
015771	613775	JMP	S\$START
015772	613775	JMP	S\$START
015773	613775	JMP	S\$START
015774	613775	JMP	S\$START
015775	613775	JMP	S\$START
015776	613775	JMP	S\$START
015777	613775	JMP	S\$START
016000	7850	.END	S\$START

TRANSFER ADDRESS 613775

CROSS REFERENCE TABLE

[illegible]

D

CROSS REFERENCE TABLE

254	COMMA	320	1170	1560											
15721	COMTB	140	750	770											
14063	COMX	920	1270	1810	2090	2260	2420	2910	2950	3050	3860	3920	4270	4320	
			4350	4440	4470	6160	6380	6640	6960						
14074	COMY	1010	940												
14623	CON	5330	520												
14630	CON1	5380	5480												
14641	CON2	5470	5400												
14707	CON6	5870	5990												
14715	CON7	5930	5790												
230	CONTX	230	820												
435762	COR	880													
17005	CPARAM	590													
215	CR	220	950	6680	910	2420									
436454	CTL	810													
15707	D DO	7440	2400	6140	7460	7480	7790								
15705	D CMND	7390	7450	7680											
15706	D PNTR	7410	7470	7520	7570	7590	7620	7640							
2	D READ	7370	6130												
37	DDSKCA	7360	7600												
36	DDSKWC	7350	7660												
1	DEBUG	7310	100	120	100	120	100	120							
14175	DEC	1990	260												
15211	DECB	3770	3510	3650											
13405	DECF	2640	2340												
13530	DECL	3540	3600												
13540	DECL1	3620	3710												
15741	DERROR	7780													
13237	DIV	1420	1580												
445300	DK.	740													
445320	DK0	780	6100												
777601	DKMAX	650													
14745	DLOAD	6130	6050												
15726	DNCHEK	7630													
244	DOLLAR	280													
446400	DT.	720													
776701	DTMAX	640													
14076	DUM	1110	160												
14107	DUM1	1210	1160												
14117	DUM2	1280	1180												
14114	DUM3	1250	1200	1330											
13377	DUMA	2540	2610	2650	3240	3290	3900	4710	2940	3130	3160	3190	5190		
13554	DUMP	3860	3950	4060	4170	1260	6920								
13564	DUMX	3940	4740	4790											
740000	DVCMASK	600													
4	DWRITE	7380	2390												
14722	EA	5980	5830	5850											
13605	EQLP	4210	3870	4230	2810										
13210	ERA	1070	1600												
15206	EVAL	1790	370	900	1010	1070	1120	1240	1480	1680					
13175	EVD	850	530												
13124	EVL	430	450	1660											

D

CROSS REFERENCE TABLE

13134	EVL0	510	480														
13145	EVL1	610	540														
13173	EVX	830	500	600													
13242	EVY	1480	910	1030	1080	1130	1330										
13267	EVZ	1670	1630														
241	EXCLAM	260	1590														
13140	EXP	360	1690	1120	1210	1280	1400	1510	1740	4240	4400	5260	6720	6810			
5	FCBLEN	570															
14200	FORM	2050	1900	1950	2000												
14045	FORMAT	890	990	1240	1620	2230	2690	6120	6220	6340	6420	6460	6490	6510			
13566	FORMO	4000	3930	4090	1940												
13635	FORMS	4520	4800	1890													
13655	FORMS1	4690	4600														
13657	FORMS2	4710	4680														
13563	FORMSW	3930	2050														
14343	GETW	3340	3430	3490	3500	3740	3780	6210	6330	6410	6450	6500					
476257	GRO	870															
14346	GW1	3370	3420														
14133	GWDD	1450	1580														
14135	GWD1	1510	1440														
14125	GWORD	1390	1470	1660	1820	3030	6620	6650									
4	HDRLEN	580															
14417	HEA	3900	440														
15210	HEAD	1810	760	3910													
15074	HERE	7050	7280														
14007	IDLE	710	2080	800	850	900	960	5200									
13673	INDB	4850	4540	4690	4720												
10	INDEX	490	2140	2190	2210	2240	2550	2640	2660	2670	2750	2890	2900	2930			
			3000	3010	4010	4050	4070	4340	4460								
14526	INT0	4650	4670	5440													
14533	INT1	4700															
14563	INT2	5010	5050														
14612	INT3	5170	5140														
14365	LDS	3570	400														
212	LF	210	2440														
14332	LK	3210	4730	5610													
14734	LOAD	6040	540														
13671	LOC	4830	490	3880	3920	4030	4080	4140	4550	4660	4700	1130	1300	1750			
			1830	1840	6400	6520	6530	6730	6780	6830	6850	6940					
15025	MAS	6620	560														
15072	MASK	6980	6630	6870													
13201	MIN	950	1560														
255	MINUS	330	1560														
13235	MPY	1370	1570														
14324	MQ	3150	4710	5590													
13672	N	4840	4130	1230	6440	6540	6910										
15071	N1	6970	6840	6950													
13680	NEXT	4130	3940	4020	4160												
13164	NHD	760	690														
13314	NOS	2070	2010														
243	NUMSGN	270	970	6700													
14173	OCT	1940	240														

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CROSS REFERENCE TABLE

13401	OCTF	2590	2550	2320				
13174	OJMP	840	390	860	1650			
13241	ONE	1440	1260	1320				
13674	OPTB	4860	4610					
13204	OR	1000	1590					
13214	OSET	1170	1220	1370	1420			
13227	OST	1280	1210	1230				
13621	P6	4420	4480	4640	2040	2830		
13715	P6OCT	4970	4990					
13711	P6Z	4930	3280	4950	3220	3250		
14155	PAT	1730	180					
14157	PAT0	1760	1850					
14165	PAT1	1820	1780					
14327	PC	3180	4680	5100	5910	5920	5930	5980
13525	PDE1	3510	3460					
13514	PDEC	3430	2640	3740	1990			
13551	PDX	3720	3660					
256	PERIOD	340	350					
13177	PLU	900	380	960	1550			
253	PLUS	310	1550					
256	POINT	350	460	3720	1460			
14751	PPR	6200	6070	6090	6320			
14766	PPR1	6330	6550					
14774	PPR4	6390	6250					
15010	PPRL	6500	6540					
606064	PPT	690	6060					
606460	PTP	710						
606462	PTR	700	6080					
17505	RECOV	470						
14271	REG	2800	360					
14305	REG1	2920	2880					
14263	REG2	2700	2620					
14241	REGF	2530	2650	2760	2800	2990		
14317	REGI	3060	3020	3040				
14254	REGL	2640	2680					
23	REGN	3290	2560					
14724	REGS	6010	2740	4900	5490			
14320	REGT	3100	2540	3290				
13353	RJS1	2300	2210					
13344	RJS2	2220	2290	2350				
13361	RJS3	2360	2260					
13372	RJS4	2450	2410					
13337	RJUS	2170	780	2340	2490			
14517	RS1	4550	4600					
14513	RSAVE	4510	4610	4910	5520			
14236	SAV4	2440	2410	6150				
14232	SAVE	2390	300					
14335	SC	3240	4750	5530				
273	SCOLON	380	930	1790				
13274	SCOUNT	1930	2770	3610	3720	3730	3840	
15030	SEA	6650	580					
15050	SEA1	6810	6760					

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CROSS REFERENCE TABLE

[illegible]

CROSS REFERENCE TABLE

			830	2160	2220	2570	2680	3670	3770	3990	4040	4560	4580	4890
			4980	5050	5110	5150	5170	5370	5480	5500				
15443	T1CHAR	1000	810											
15421	T1LINE	980	830											
15201	T2	1740	770	790	2690	2820	2980	2990	3220	3270	4030	4080	4520	4570
			4590	5020	5040	5410	5420	5450						
15202	T3	1750	1940	2000	2060	2180	2280	2310	2360	2380	2810	2850	3070	3200
			4250	4330	4540	4600	5000	5060						
15203	T4	1760	2730	2860	2900	2940	3010	3050	3150	3310	3340			
15204	T5	1770	2780	2930	1410	1460	1530	1540	1630					
15205	T6	1780												
17500	TAPIN	450												
17502	TAPOT	460												
15241	TBUFFR	490	740	940										
15633	TCHRID	2930	520	1220	1540	2210	2710	3150	3170	3180	3200			
15367	TCOUNT	600	2070	840	890	4310	4430	760	2650					
15661	TDIGIT	3170	3010	3040										
15366	TDLMTN	590	660	1490	920	1140	1760	6670	770	3140				
15613	TFGET9	2620												
14363	TJME	3520	3350	3410	4760	4770								
15370	TJNLIN	720	730	960										
15614	TJNTIN	2640	1190	2000	2720	2740	2780							
15662	TLETTR	3180	3110											
15435	TNUM20	1210	1430											
15461	TNUM26	1460	1230											
15470	TNUM27	1530	1470											
15476	TNUM28	1590	1550											
15477	TNUM29	1600	1520											
15431	TNUMIN	1170	580	1200	1240	1500	1560	1580	1610	1620				
15603	TOCT42	1670												
15513	TOCT44	1750	1820											
15502	TOCTOT	1660	2070	2600	4010	4940	4980	840	890	3280	4310	4430	1850	
646000	TP.	730												
15017	TPR	6560												
15022	TPR1	6570												
14617	TRA	5260	500											
15563	TSIX24	2300	2360											
15572	TSIX26	2380	2330	2340	2350	2470								
15526	TSIXIN	1970	640	720	790	2170	2580	3900	6040	2010	2020	2170		
15561	TSIXOT	2280	2070	670	720	840	890	4310	4430	5080	2300	2320	2500	
15665	TTYTOT	3240	3180	3260	3500	3700	3730	4290	4360	4470	4470	4470	4760	4

TSSDDT1 05/31/72 01:05:15 PDP-9 TIME-SHARING SYSTEM DEBUGGER

PAGE 58

D

CROSS REFERENCE TABLE

14363	WT	3510	3450	3480	6390
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UNDEFINED SYMBOLS

OCTZ	1790	
PURCOD	430	610

